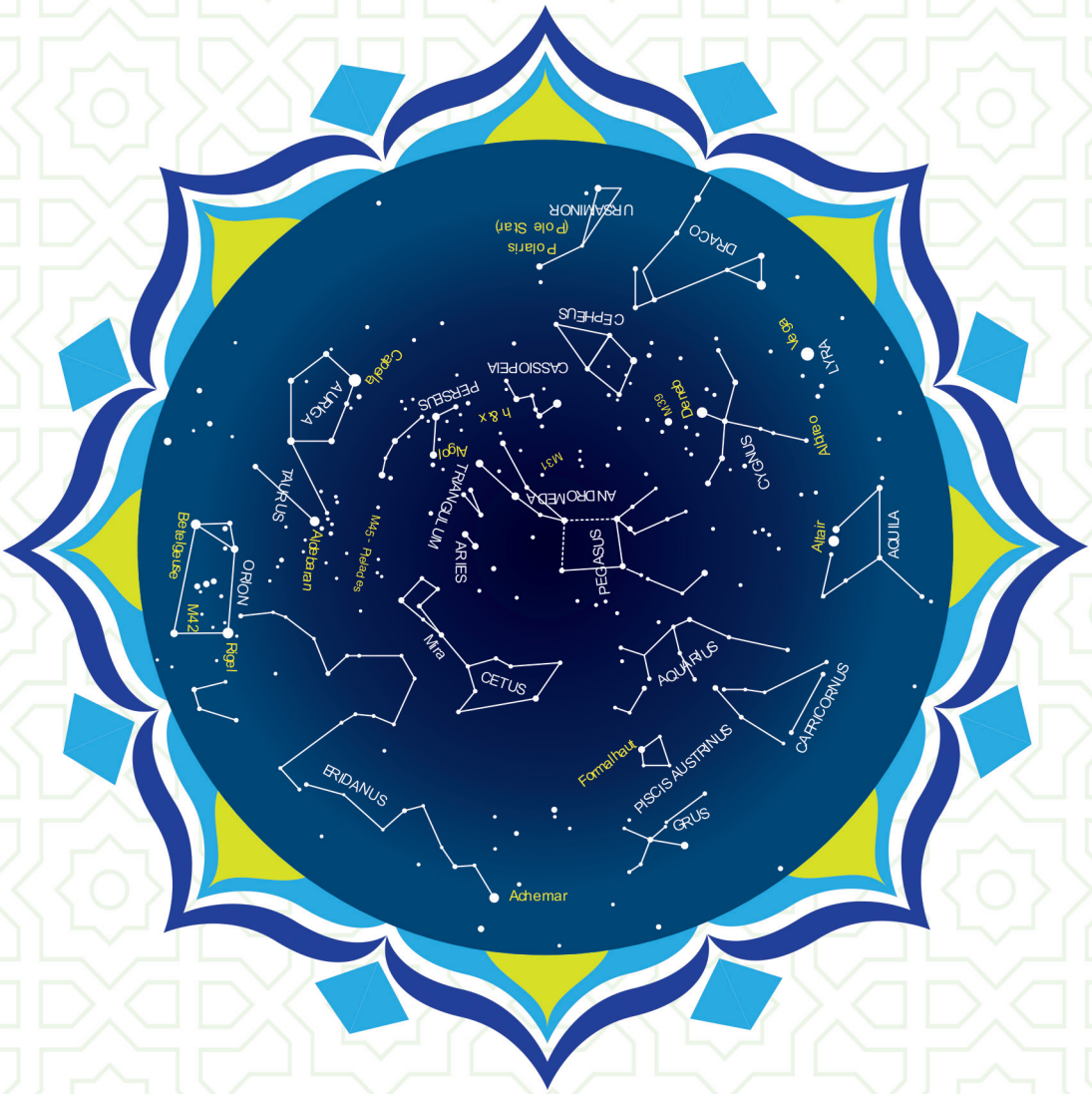
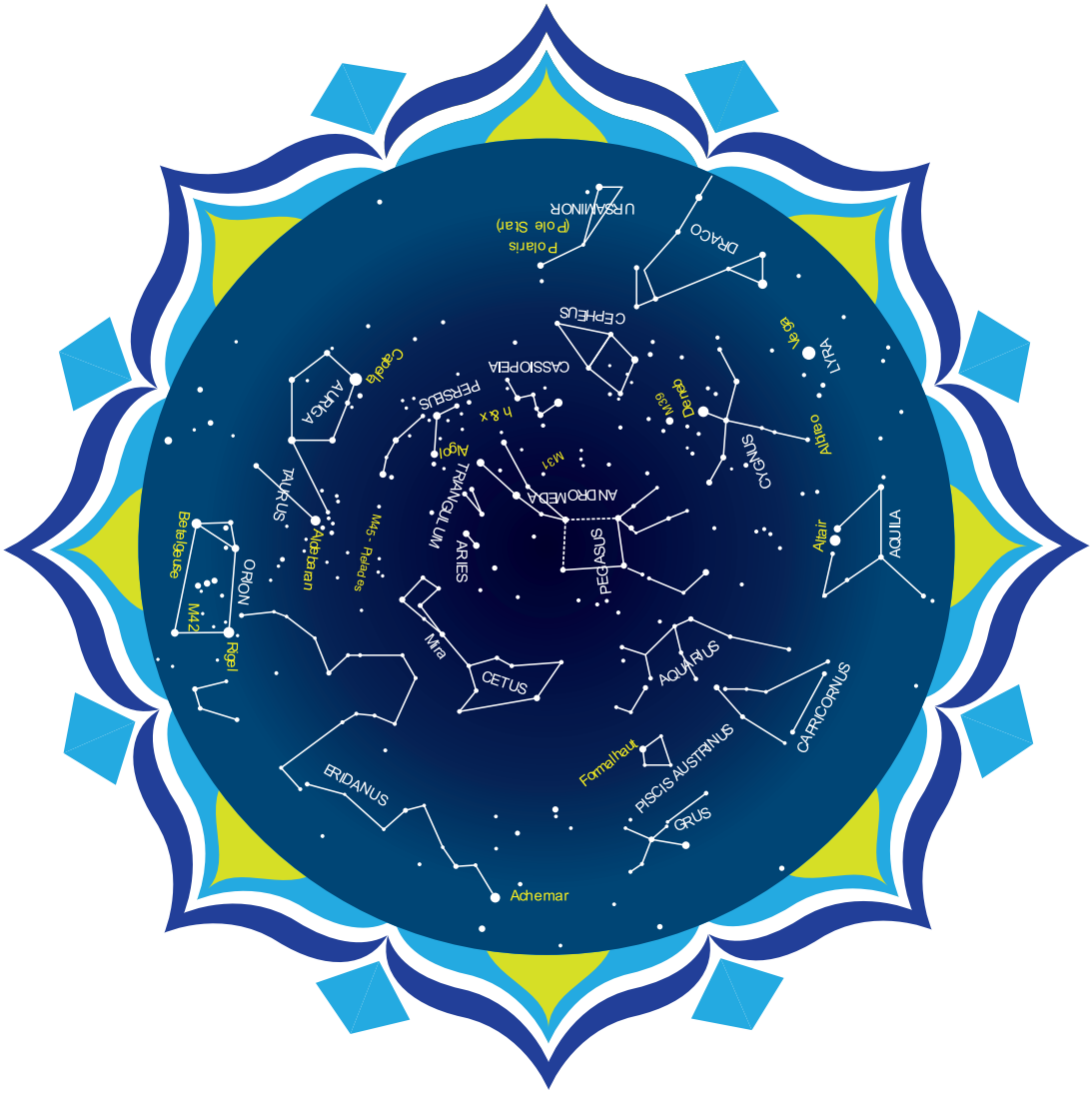
MILIK KEMENTERIAN AGAMA RI
TIDAK DIPERJUALBELIKAN

EPHEMERIS HISAB RUKYAT 2025



DIREKTORAT URUSAN AGAMA ISLAM DAN PEMBINAAN SYARIAH
DIREKTORAT JENDERAL BIMBINGAN MASYARAKAT ISLAM
KEMENTERIAN AGAMA RI

EPHEMERIS HISAB RUKYAT 2025



DIREKTORAT URUSAN AGAMA ISLAM DAN PEMBINAAN SYARIAH
DIREKTORAT JENDERAL BIMBINGAN MASYARAKAT ISLAM
KEMENTERIAN AGAMA RI

KATA PENGANTAR

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

Alhamdulillah, segala puji serta syukur kita panjatkan kepada Allah SWT Tuhan yang Maha Kuasa, yang telah menciptakan langit dan bumi, bulan dan matahari, serta segala yang ada di antara keduanya serta telah memberikan kekuatan sehingga Direktorat Urusan Agama Islam dan Pembinaan Syariah Direktorat Jenderal Bimbingan Masyarakat Islam Kementerian Agama Republik Indonesia dapat menerbitkan "EPHEMERIS HISAB RUKYAT 2025". Selawat serta salam senantiasa tercurah kepada Nabi Muhammad SAW, yang menjadi penerang bagi umat manusia, layaknya matahari yang menyinari dunia. Beliau adalah sumber cahaya yang menunjukkan jalan yang benar, membimbing umat Islam untuk hidup dalam kedamaian dan kebenaran. Semoga kita selalu mendapatkan syafaatnya di dunia dan akhirat.

Buku ini berisi data Matahari dan Bulan lengkap selama satu tahun Masehi dan disertai dengan penjelasan mengenai istilah-istilah dalam data tersebut. Dalam buku ini juga terdapat daftar gerhana Matahari dan gerhana Bulan yang terjadi pada tahun 2025 M, daftar waktu ijtimak, tinggi hilal, serta data posisi Matahari dan Bulan pada setiap awal Bulan Kamariah di tahun 2025 M.

Selain itu, dalam buku ini terdapat lampiran-lampiran yang akan memudahkan pembaca memahami ataupun menggunakan data-data ephemeris dan implikasinya terhadap kajian hisab rukyat. Lampiran tersebut terdiri dari Keputusan Presiden RI Nomor 41 Tahun 1987 tentang Pembagian Wilayah RI Menjadi 3 (tiga) Wilayah Waktu, Kebijakan Pemerintah dalam Menetapkan Awal Bulan Kamariah, Fatwa MUI Nomor 2 Tahun 2004 tentang Penetapan Awal Bulan Ramadhan, Syawal dan Dzulhijjah, Fatwa MUI Nomor 5 Tahun 2010 tentang Arah Kiblat, Daftar Refraksi, Daftar Kerendahan Ufuk, Magnetic Variation Epoch tahun 2020, serta contoh-contoh perhitungan yang menggunakan data dalam ephemeris ini.

Terbitnya buku EPHEMERIS HISAB RUKYAT 2025 ini diharapkan dapat menjadi salah satu rujukan bagi masyarakat yang fokus pada kajian hisab rukyat juga bagi pegawai kantor Kementerian Agama se-Indonesia. Apabila dalam buku ini terdapat kekurangan ataupun kesalahan kami sangat berharap adanya masukan dan saran agar kami dapat membuat buku ini lebih baik lagi.

Jakarta, 23 Jumadilawal 1446 H
25 November 2024 M

Plt. Direktur Urusan Agama Islam
dan Pembinaan Syariah

Dr. H. Ahmad Zayadi, M.Pd.
NIP. 197001141994031002

SAMBUTAN DIREKTUR JENDERAL
BIMBINGAN MASYARAKAT ISLAM

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

Alhamdulillah, segala puji bagi Allah SWT, Tuhan Yang Maha Esa, yang telah menciptakan alam semesta dengan segala keindahan dan keteraturannya. Allah menciptakan matahari yang menyinari bumi di siang hari, memberi kehidupan dan energi, serta bulan yang bersinar di malam hari, memberikan ketenangan dan cahaya yang lembut. Kedua ciptaan-Nya ini mengajarkan kita tentang keseimbangan dan keindahan, serta betapa besar kebesaran Allah yang mengatur alam semesta ini dengan penuh hikmah sehingga atas izin dan kehendak-Nya buku "Ephemeris Hisab Rukyat 2025" ini dapat diterbitkan. Selawat dan salam kita panjatkan kepada Nabi Muhammad SAW yang telah menyampaikan risalah dari Allah SWT agar kita dapat mendekatkan diri kepada-Nya, serta kepada keluarga, para sahabatnya dan pengikutnya hingga hari kiamat sehingga kita dapat berkumpul dengan mereka di surga-Nya.

Berdasarkan Peraturan Menteri Agama Nomor 25 Tahun 2024 tentang Organisasi dan Tata Kerja Kementerian Agama, Direktorat Urusan Agama Islam dan Pembinaan Syariah mempunyai tugas antara lain melaksanakan perumusan dan pelaksanaan kebijakan, standardisasi, bimbingan teknis, dan evaluasi di bidang hisab rukyat. Oleh karena itu, sebagai bentuk pelayanan pemerintah terhadap masyarakat mengenai hal-hal terkait data yang digunakan untuk kajian hisab rukyat, Direktorat Jenderal Bimbingan Masyarakat Islam Kementerian Agama menerbitkan buku Ephemeris Hisab Rukyat 2025.

Buku ini diharapkan menjadi referensi bagi para peminat ilmu falak (astronomi Islam) baik dari unsur pelajar, akademisi, organisasi hisab rukyat, individu, dan juga para pegawai di lingkungan Kementerian Agama se-Indonesia. Hadirnya buku ini diharapkan dapat menjadi standar dalam perhitungan posisi Matahari dan Bulan serta menjadi dasar untuk mempelajari perhitungan yang terkait dengan data pada buku ini seperti perhitungan awal waktu salat, perhitungan awal Bulan Kamariah, dan lain sebagainya.

Akhirnya, kami selaku Direktur Jenderal Bimbingan Masyarakat Islam menyampaikan apresiasi kepada Tim Penyusun yang telah berupaya mewujudkan buku Ephemeris Hisab Rukyat 2025 ini. Semoga upaya kita dalam memberikan pelayanan terbaik kepada umat Islam menjadi catatan amal baik di sisi Allah SWT.

Jakarta, 23 Jumadilawal 1446 H
25 November 2024 M
Direktur Jenderal
Bimbingan Masyarakat Islam

Prof. Dr. Phil. H. Kamaruddin Amin, M.A.
NIP. 196901051996031003

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PENJELASAN DATA EPHEMERIS

I. UMUM

Ephemeris Hisab Rukyat ini menyediakan beberapa data mengenai Matahari dan Bulan yang dapat digunakan untuk kegiatan hisab maupun rukyat, menentukan arah kiblat, waktu-waktu shalat, awal bulan qamariyah, dan gerhana.

Data Matahari yang disediakan adalah: Bujur Ekliptika (Bujur Astronomi), Lintang Ekliptika (Lintang Astronomi), Asensio Rekta, Deklinasi, Jarak Geosentris, Semi Diameter, Kemiringan Ekliptika dan Perata Waktu. Sedangkan data Bulan yang disediakan adalah: Bujur Ekliptika (Bujur Astronomi), Lintang Ekliptika (Lintang Astronomi), Asensio Rekta, Deklinasi, Horizontal Paralaks, Semi Diameter, Sudut Kemiringan Bulan, dan Luas Cahaya Bulan.

II. DATA MATAHARI

1. Ecliptic Longitude

Ecliptic Longitude dikenal dalam bahasa Indonesia dengan Bujur Ekliptika atau Bujur Astronomi yang dikenal pula dengan istilah *Taqwim* atau *Thul*. Thulus Syams adalah jarak matahari dari titik Aries diukur ke arah timur sepanjang lingkaran Ekliptika.

2. Ecliptic Latitude

Ecliptic Latitude dikenal dalam bahasa Indonesia dengan Lintang Ekliptika atau Lintang Astronomi yang dikenal pula dengan *Ardlusy Syams*. Data ini adalah jarak titik pusat Matahari dari Lingkaran Ekliptika. Sebetulnya Ekliptika itu sendiri adalah jarak yang ditempuh oleh gerak semu tahunan Matahari. Sebenarnya, jalannya tidak rata persis, namun ada sedikit geseran. Keadaan seperti ini dapat dilihat pada nilai *Ecliptic Latitude* yang selalu mendekati nol. Karena nilainya yang sangat kecil sehingga banyak sistem perhitungan yang mengabaikan nilai data ini.

3. Apparent Right Ascension

Apparent Right Ascension dikenal dalam bahasa Indonesia dengan Asensio Rekta. Data ini dikenal juga dengan istilah Panjatan Tegak atau *Ash-shu'udul Mustaqim* atau *al-Mathali'ul Baladiyah* adalah jarak Matahari dari titik Aries (Hamal) diukur ke arah timur sepanjang Lingkaran Ekuator.

4. Apparent Declination

Apparent Declination dikenal dalam bahasa Indonesia dengan Deklinasi Matahari yang terlihat (bukan Matahari Hakiki), atau dikenal pula dengan istilah *Mail Syams* adalah jarak Matahari dari Ekuator. Bila nilai Deklinasi positif berarti Matahari berada di sebelah utara Ekuator, tapi bila nilai Deklinasi negatif berarti Matahari berada di sebelah selatan Ekuator.

5. True Geocentric Distance

True Geocentric Distance dikenal dalam bahasa Indonesia dengan istilah Jarak Geosentris. Data ini menggambarkan jarak antara Bumi dan Matahari dalam satuan AU (*Astronomical*

Unit) atau SA (Satuan Astronomi). Orbit Bumi mengelilingi Matahari tidak merupakan lingkaran (bulat bola), melainkan berbentuk elips (menyerupai bulat telur), sehingga jarak Bumi ke Matahari terkadang dekat dan terkadang jauh. Jarak terdekat antara Bumi dengan Matahari disebut *Perigee* atau *Hadlidl*, sedangkan jarak terjauhnya disebut *Apogee* atau *Auj*.

6. Semi Diameter

Semi Diameter dikenal dalam bahasa Indonesia dengan jari-jari yang dikenal pula dengan *Nisfu Quthr Syams* adalah jarak titik pusat Matahari dengan piringan luarnya.

7. True Obliquity

True Obliquity dikenal dalam bahasa Indonesia dengan Kemiringan Ekliptika yang dikenal pula dengan istilah *Mail Kulli* atau *Mail a'dham* adalah Kemiringan Ekliptika dari Ekuator.

8. Equation of Time

Equation of Time dikenal dalam bahasa Indonesia dengan Perata Waktu yang dikenal pula dengan *Ta'dil Waqt* atau *Ta'dil Zaman* adalah selisih antara waktu kulminasi Matahari Hakiki dengan waktu kulminasi Matahari Rata-rata. Data ini biasanya dinyatakan dengan huruf "e" kecil.

III. DATA BULAN

1. Apparent Longitude

Apparent Longitude yaitu Bujur Ekliptika Bulan atau Bujur Astronomi Bulan (yang terlihat) yang dalam bahasa Arab dikenal *Thulul Qamar*. Data ini adalah jarak antara titik Aries sampai Bulan diukur ke arah timur sepanjang Lingkaran Ekliptika.

2. Apparent Latitude

Apparent latitude diterjemahkan dengan Lintang Ekliptika Bulan atau Lintang Astronomi Bulan (yang terlihat) yang dalam istilah Arab disebut *Ardlul Qamar*. Data ini adalah jarak antara Bulan dengan Lingkaran Ekliptika diukur sepanjang Lingkaran Kutub Ekliptika. Nilai Maksimum Lintang Ekliptika Bulan adalah 5° 8′ (lima derajat delapan menit). Nilai positif berarti Bulan berada di utara Ekliptika, dan nilai negatif berarti Bulan berada di sebelah selatan Ekliptika.

3. Apparent Right Ascension

Apparent Right Ascension dikenal dalam bahasa Indonesia dengan Asensio rekta Bulan (yang terlihat) yang dikenal pula dengan istilah Panjatan Tegak atau *Ash shu'udul Mustaqim* atau *Al-Matholi'ul Baladiyah*. Data ini adalah jarak titik pusat Bulan dari titik Aries diukur ke arah timur sepanjang lingkaran Ekuator.

4. Apparent Declination

Apparent Declination disini adalah Deklinasi Bulan yang dikenal pula dengan istilah *Mailul Qamar*. Data ini adalah jarak Bulan dari Ekuator. Nilai Deklinasi positif jika Bulan di sebelah utara Ekuator, dan negatif jika di sebelah selatan Ekuator.

5. Horizontal Parallax

Parallax dikenal dalam bahasa Indonesia dengan "Beda Lihat" atau dalam bahasa Arab *Ikhtilaful Mandhar*. Sedangkan *Horizontal Parallax* adalah besaran sudut yang ditarik dari titik pusat Bulan ketika di ufuk (horizon) ke titik pusat Bumi dan garis yang ditarik dari titik pusat Bulan ketika itu ke permukaan Bumi.

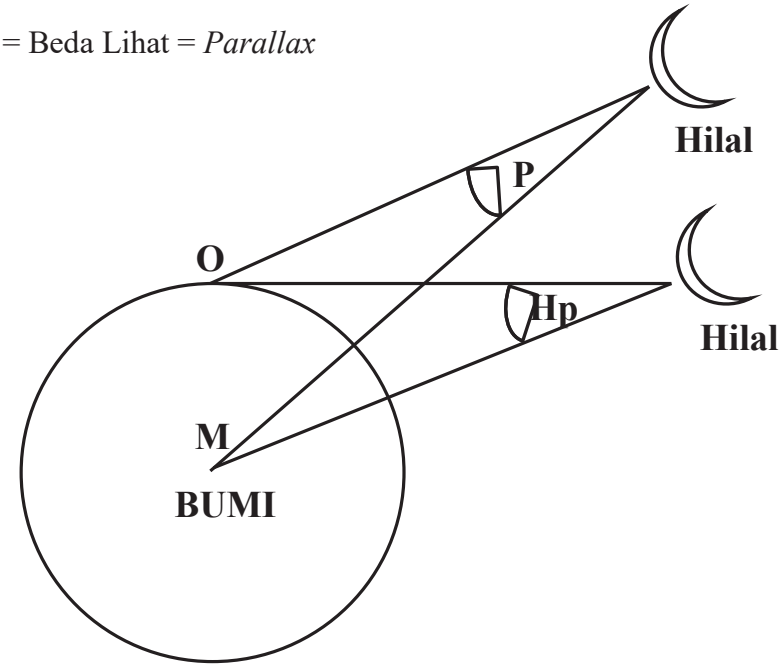
Gambar *Horizontal Parallax* dan *Parallax* diberikan di bawah ini ;

O = Peninjau, Observer

M = Titik Pusat Bumi

HP = *Horizontal Parallax*

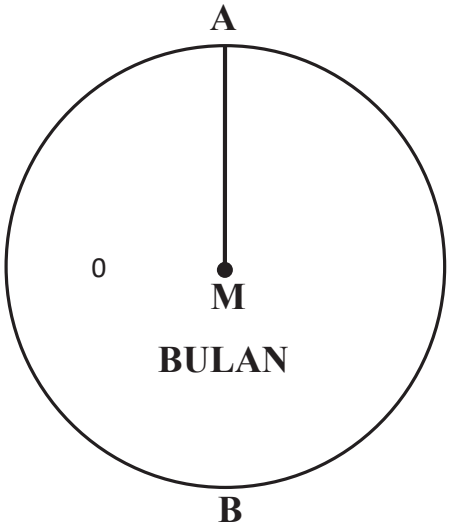
P = Beda Lihat = *Parallax*



6. Semi Diameter

Semi Diameter disini adalah jari-jari Bulan atau *Nisfu Quthril Qamar* adalah jarak antara titik pusat Bulan dengan piringan luarnya.

Gambar Semi Diameter diberikan di bawah ini:



A = Titik teratas pada Piringan Atas, *Upper Limb*.

M = Titik Pusat Bulan

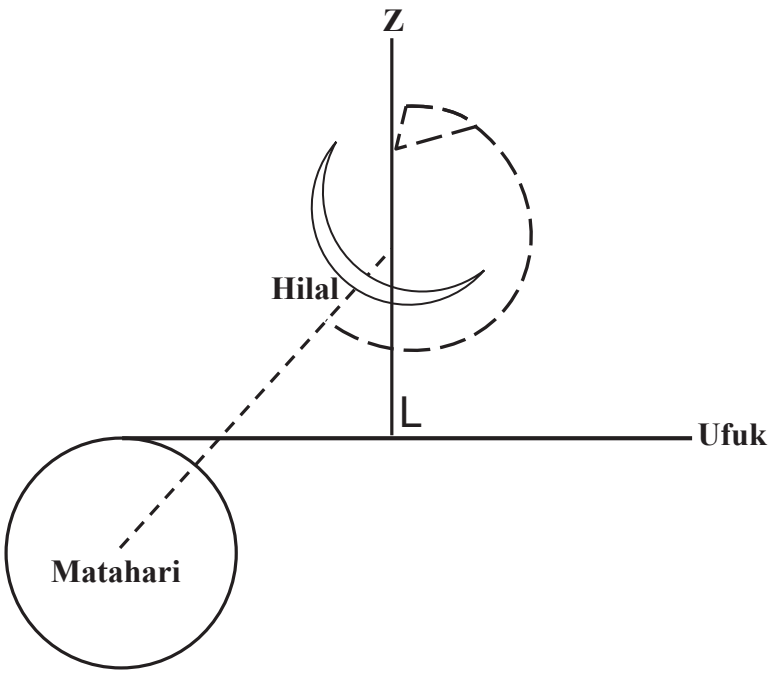
B = Titik terbawah pada Piringan Bawah, *Lower Limb.*

AM = Jari-jari = Semi Diameter Bulan (rata-rata 0° 16′).

7. Angle Bright Limb

Angle Bright Limb dikenal dalam bahasa Indonesia dengan sudut kemiringan hilal, adalah sudut kemiringan piringan hilal yang memancarkan sinar sebagai akibat arah posisi hilal dari Matahari. Sudut ini diukur dari garis yang menghubungkan titik pusat hilal dengan titik *Zenith* ke garis yang menghubungkan titik pusat hilal dengan titik pusat Matahari dengan arah sesuai perputaran jarum jam.

Gambar Sudut Kemiringan Hilal diberikan di bawah ini :



8. Fraction Illumination

Fraction Illumination atau Fraksi Iluminasi adalah besar atau luas piringan Bulan yang menerima sinar Matahari yang tampak dari Bumi. Jika seluruh piringan Bulan yang menerima sinar Matahari terlihat dari Bumi maka bentuknya akan berupa “bulatan penuh”. Dalam keadaan seperti ini nilai Fraksi Iluminasi Bulan adalah 1 (satu), yaitu persis pada saat puncak Bulan Purnama. Sedangkan jika Bumi, Bulan dan Matahari sedang persis berada pada satu garis lurus, maka akan terjadi Gerhana Matahari Total. Dalam keadaan seperti ini nilai Fraksi Iluminasi Bulan adalah nol. Setelah Bulan Purnama, nilai Fraksi Iluminasi akan semakin mengecil sampai pada nilai yang paling kecil, yaitu pada saat ijtimak dan setelah itu nilai Fraksi Iluminasi ini akan kembali membesar sampai mencapai nilai satu, pada saat Bulan Purnama. Dengan demikian, data Fraksi Iluminasi dapat dijadikan pedoman untuk mengetahui kapan terjadinya ijtimak dan kapan Bulan Purnama (istiqbal). Demikian pula

saat *first quarter* dan *last quarter* dari bulan dapat diketahui yaitu dengan mencari nilai Fraksi Iluminasi sebesar 0,5 (setengah).

IV. WAKTU YANG DIPERGUNAKAN

Data Matahari dan Bulan dalam Ephemeris ini disajikan berdasarkan waktu *Universal Time* (UT). Sehingga untuk mencari data Matahari dan Bulan bagi wilayah Indonesia, maka waktu-waktu daerah di Indonesia terlebih dahulu harus diubah menjadi UT dengan cara :

UT = WIB – 7 jam

UT = WITA – 8 jam

UT = WIT – 9 jam

V. CONTOH PENGGUNAAN

Misalnya mencari Deklinasi Matahari dan Bulan pada pukul 18:00 WIB tanggal 22 Maret 2025.

Mengubah WIB menjadi UT, dengan cara:

UT = WIB – 7 jam, sehingga jam 18:00 WIB = jam 11:00 UT.

Dilihat data Matahari dan Bulan pada tanggal 22 Maret 2025.

Dalam kolom jam (paling kiri) pada angka 11 ditarik ke kanan hingga kolom "Apparent Declination".

Lihat angka yang ada pada baris dan kolom itu, yaitu:

Deklinasi Matahari: 00° 49′ 18″

Deklinasi Bulan: -28° 42′ 14″

VI. PENYISIPAN ATAU INTERPOLASI

Oleh karena data Matahari dan Bulan dalam Ephemeris ini disajikan pada setiap jam, maka untuk memperoleh data pada pecahan jam (menit dan detik) diperlukan Langkah penyisipan atau interpolasi atau Ta'dil.

Contoh:

Mencari deklinasi Matahari (Apparent Declination Matahari) pada pukul 18:10:40.59 WIB tanggal 10 Maret 2025.

Langkah 1:

Mengubah WIB menjadi UT dengan cara:

UT = WIB – 7 jam, sehingga jam 18:10:40.59 WIB => 11:10:40.59 UT

Langkah 2:

Melacak data Deklinasi Matahari pada kolom Apparent Declination Matahari ($\delta_\odot$) sebagai berikut:

Data $\delta_\odot$ pada pukul 11 UT = -03° 54′ 48″

Data $\delta_\odot$ pada pukul 12 UT = -03° 53′ 49″

Perubahan dalam 1 jam = -03° 54′ 48″ – -03° 53′ 49″ = -00° 00′ 59″

Perubahan selama 10 menit 40.59 detik = 0° 10′ 40.59″ × -00° 00′ 59″ = -00° 00′ 10.5″

Maka $\delta_\odot$ pada pukul 11:10:40.59 UT = -3° 54′ 48″ – -00° 00′ 10.5″ = -3° 54′ 37.5″

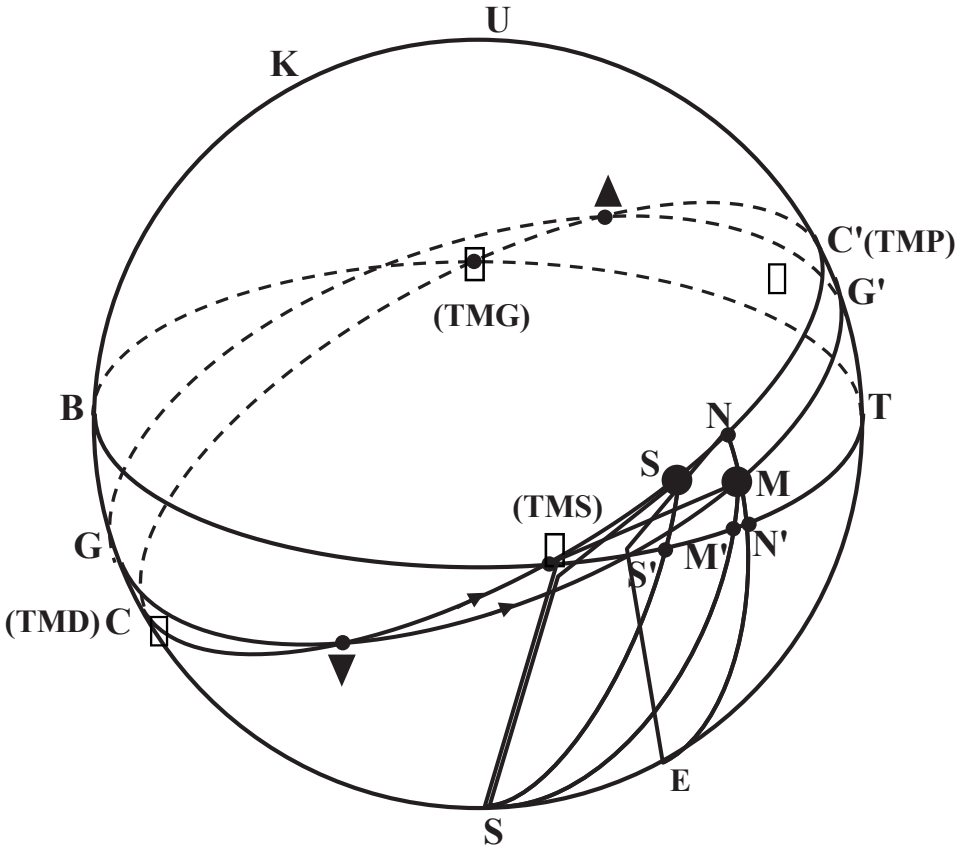
Atau dapat digunakan cara sbb:

$\delta_\odot$ (Deklinasi Matahari) jam 11	= -03° 54′ 48″	→	-03° 54′ 48″
$\delta_\odot$ (Deklinasi Matahari) jam 12	= -03° 53′ 49″ –		
	-00° 00′ 59″		

00° 10′ 40.59″ ×
-00° 00′ 10.5″ → -00° 00′ 10.5″ –

Maka Deklinasi Matahari pada pukul 11:10:40.59 UT

GAMBAR BOLA LANGIT PADA 0º DILIHAT DARI ZENITH

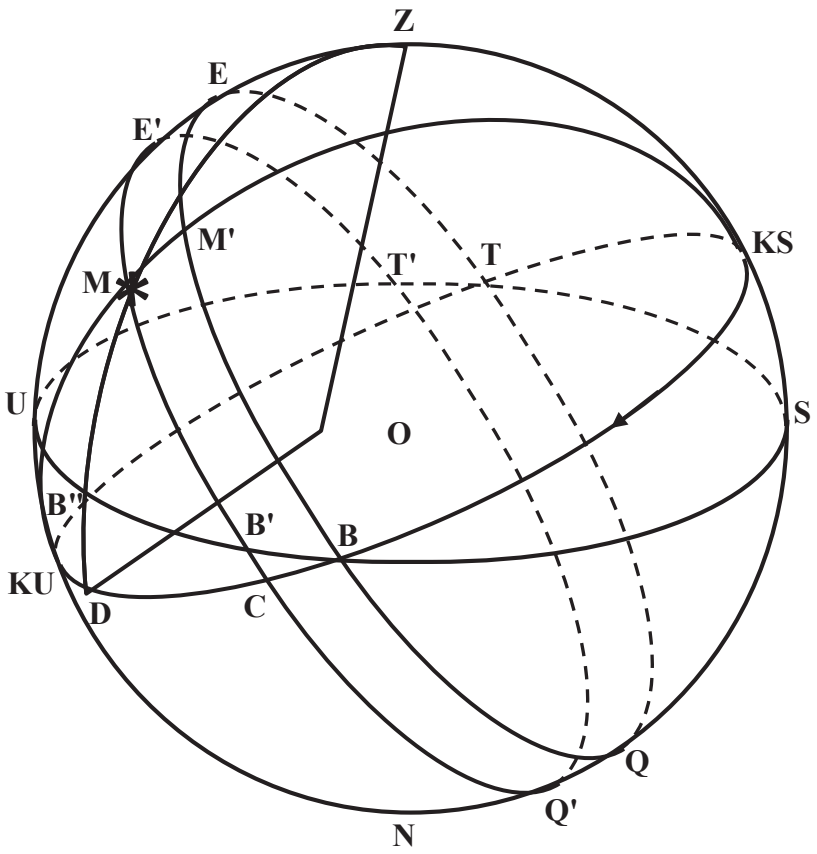


Keterangan:

♈	= Titik Musim Semi Belahan Bumi Utara (TMS)		
♋	= Titik Musim Panas Belahan Bumi Utara (TMP)		
♎	= Titik Musim Gugur Belahan Bumi Utara (TMG)		
♑	= Titik Musim Dingin Belahan Bumi Utara (TMD)		
BUTS	= Barat, Utara, Timur, Selatan	= Lingkaran Horizon	
▼	= Simpul Turun	= *Descending Node*	
▲	= Simpul Naik	= *Ascending Node*	
B-♈ -T-♎	= Khatulistiwa Langit	= Ekuator	
C-♈ -C'-♎	= Ekliptika	= Lingkaran Zodiak	

G-▼-G′-▲	=	Orbit Bulan	= Falak Bulan
KE	=	Kutub Ekliptika	
S	=	*Sun*	= Matahari
γ -S	=	Takwim Matahari	= *Longitude of the Sun*
M	=	Moon	= Bulan
γ -N	=	Takwim Bulan	= *Longitude of the Moon*
γ -S′	=	Asensio Rekta Matahari	= *Right Ascension of the Sun*
γ -M′	=	Asensio Rekta Bulan	= *Right Ascension of the Moon*
SS′	=	Deklinasi Matahari	= *Declination of the Sun*
MM′	=	Deklinasi Bulan	= *Declination of the Moon*
MN′	=	Deklinasi kedua Bulan.	
BC	=	TC′	= Maks. Dekl. Matahari = 23° 27′
MN	=	Lintang Ekliptika Bulan.	
GC	=	G′C′	= Maksimum *'Ard* Bulan = 5° 8′
▼	=	Arah ke Timur	= *Retrograde*

BOLA LANGIT PADA 20º LINTANG SELATAN DILIHAT DARI BARAT



Keterangan :

O	= Observer, Pengamat di Bumi
Z	= Zenith = Puncak Langit
N	= Nadir = Titik terbawah dari Bola Langit
SBUT	= Selatan, Barat, Utara dan timur = Cakrawala = Horizon
KS	= Kutub Langit Selatan
KU	= Kutub Langit Utara
ZE	= Lintang Tempat = *Latitude*
ZUNS	= Meridian Langit
EBQT	= Khatulistiwa Langit = *Equator*
M	= Suatu Benda Langit
ZM	= Jarak Zenith= *Zenith Distance*
E′MB′Q′	= Lingkaran Perjalanan Harian Benda Langit
KUMM′KS	= Lingkaran Waktu/Lingkaran Deklinasi
MM′	= Deklinasi = *Declination*
E’	= Titik Kulminasi Atas
E’MB’	= Setengah Busur Siang
E’M	= Sudut waktu = Sudut Jam = *Hour Angl*e = t
MB’	= *Dair*
B’C	= 90º – Setengah Busur Siang
E’U	= Tinggi Kulminasi
E’KU	= *Ashal* Hakiki
UT’TSBB’	= *Azimuth*
MB”	= Tinggi = *Altitude*
←	= Arah ke barat = *Prograde*

GERHANA MATAHARI DAN BULAN TAHUN 2025

Dalam tahun 2025 M terjadi 4 (empat) kali gerhana, yaitu 2 (dua) kali gerhana matahari dan 2 (dua) kali gerhana bulan:

1. Gerhana Bulan Total 14 Maret 2025. Tengah Bulan Ramadan 1446 Hijriah. Tidak dapat diamati di wilayah Indonesia. Wilayah yang dapat mengamati gerhana: Lautan Pasifik, Amerika, Eropa, Asia.

Magnitudo Umbra	: 1,1784	
Durasi Gerhana		
Umbra	: 03 jam 38 menit 15 detik	
Total	: 01 jam 05 menit 24 detik	
Kontak Umbra 1 (U1)	: 05:09:33 UT	12:09:33 WIB
Kontak Umbra 2 (U2)	: 06:25:59 UT	13:25:59 WIB
Maksimum Gerhana	: 06:58:41,7 UT	13:58:41,7 WIB
Kontak Umbra 3 (U3)	: 07:31:23 UT	14:31:23 WIB
Kontak Umbra 4 (U4)	: 08:47:48 UT	15:47:48 WIB

2. Gerhana Matahari Sebagian (Parsial) 29 Maret 2025. Menjelang awal Bulan Syawal 1446 Hijriah. Tidak dapat diamati di wilayah Indonesia. Wilayah yang dapat mengamati gerhana: Afrika bagian barat laut, Eropa, Rusia bagian utara.

Magnitudo	: 0,9361	
Kontak Penumbra 1 (P1)	: 08:50:34,9 UT	15:50:34,9 WIB
Maksimum Gerhana	: 10:47:18,4 UT	17:47:18,4 WIB
Kontak Penumbra 4 (P4)	: 12:43:36,2 UT	19:43:36,2 WIB

3. Gerhana Bulan Total 7 September 2025. Tengah Bulan Rabi'ul Awal 1447 Hijriah. Dapat diamati di wilayah Indonesia. Wilayah lain yang dapat mengamati gerhana: Eropa, Afrika, Asia, Australia.

Magnitudo Umbra	: 1,3619	
Durasi		
Umbra	: 03 jam 29 menit 24 detik	
Total	: 01 jam 22 menit 06 detik	
Kontak Umbra 1 (U1)	: 16:27:02 UT	23:27:02 WIB
Kontak Umbra 2 (U2)	: 17:30:41 UT	00:30:41 WIB (8 September 2025)
Maksimum Gerhana	: 18:11:43,1 UT	01:11:43,1 WIB
Kontak Umbra 3 (U3)	: 18:52:47 UT	01:52:47 WIB
Kontak Umbra 4 (U4)	: 19:56:26 UT	02:56:26 WIB

4. Gerhana Matahari Sebagian (Parsial) 21 September 2025. Menjelang Awal Bulan Rabi'ul Akhir 1447 Hijriah. Tidak dapat diamati di wilayah Indonesia. Wilayah yang dapat mengamati gerhana: Lautan Pasifik bagian selatan, Selandia Baru, Antartika.

Magnitudo	: 0.8535	
Kontak Penumbra 1 (P1)	: 17:29:31,8 UT	00:29:31,8 WIB (22 September 2025)
Maksimum Gerhana	: 19:41:43,6 UT	02:41:43,6 WIB
Kontak Penumbra 4 (P4)	: 21:53:33,3 UT	04:53:33,3 WIB

Total Lunar Eclipse of 2025 Mar 14

Ecliptic Conjunction = 06:55:48.0 TD (= 06:54:33.5 UT)
Greatest Eclipse = 06:59:56.2 TD (= 06:58:41.7 UT)

Penumbral Magnitude = 2.2595 P. Radius = 1.1899° Gamma = 0.3484
Umbral Magnitude = 1.1784 U. Radius = 0.6537° Axis = 0.3171°

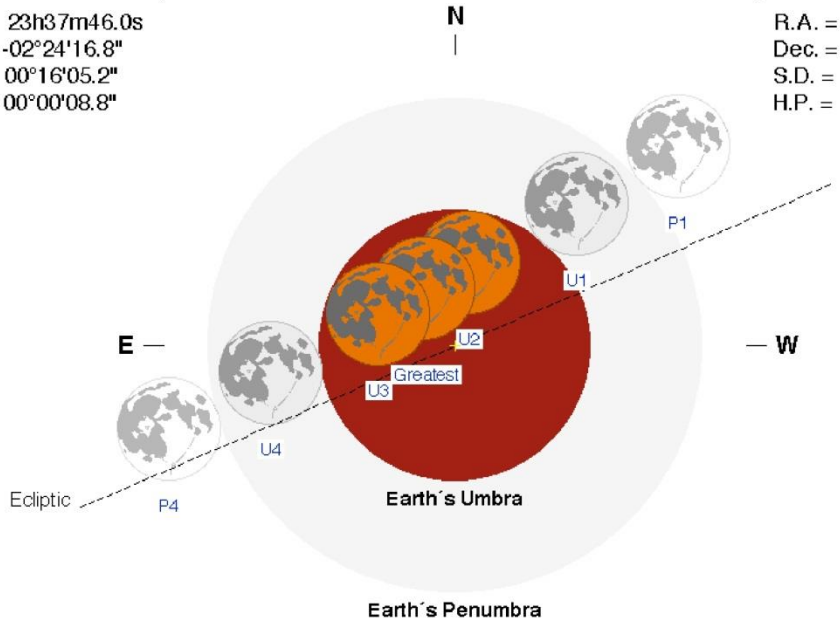
Saros Series = 123 Member = 53 of 73

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 23h37m46.0s
Dec. = -02°24'16.8"
S.D. = 00°16'05.2"
H.P. = 00°00'08.8"

Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 11h38m23.0s
Dec. = +02°40'54.6"
S.D. = 00°14'52.8"
H.P. = 00°54'36.8"



Eclipse Durations

Penumbral = 06h02m37s
Umbral = 03h38m15s
Total = 01h05m24s

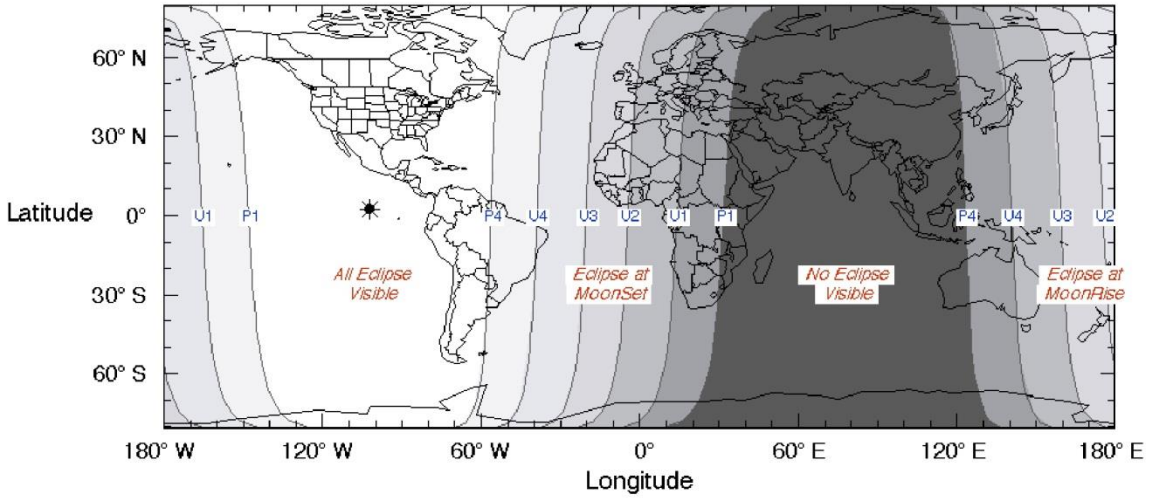
ΔT = 75 s
Rule = CdT (Danjon)
Eph. = VSOP87/ELP2000-85

0 15 30 45 60
Arc-Minutes

F. Espenak, NASA's GSFC
eclipse.gsfc.nasa.gov/eclipse.html

Eclipse Contacts

P1 = 03:57:24 UT
U1 = 05:09:33 UT
U2 = 06:25:59 UT
U3 = 07:31:23 UT
U4 = 08:47:48 UT
P4 = 10:00:01 UT



2009 Apr 29

Partial Solar Eclipse of 2025 Mar 29

Geocentric Conjunction = 11:46:09.2 UT J.D. = 2460763.990384
Greatest Eclipse = 10:47:18.4 UT J.D. = 2460763.949519

Eclipse Magnitude = 0.9361 Gamma = 1.0405

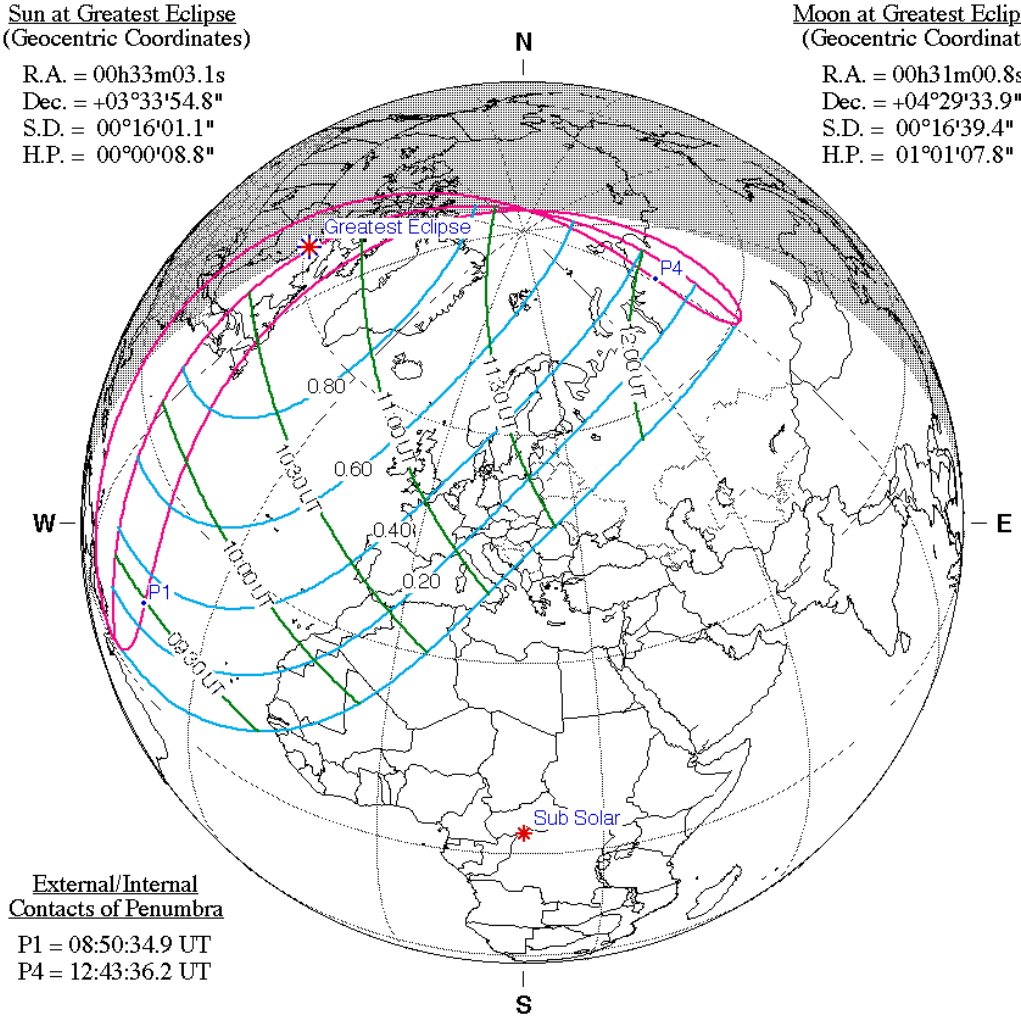
Saros Series = 149 Member = 21 of 71

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 00h33m03.1s
Dec. = +03°33'54.8"
S.D. = 00°16'01.1"
H.P. = 00°00'08.8"

Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 00h31m00.8s
Dec. = +04°29'33.9"
S.D. = 00°16'39.4"
H.P. = 01°01'07.8"



External/Internal Contacts of Penumbra

P1 = 08:50:34.9 UT
P4 = 12:43:36.2 UT

Ephemeris & Constants

Eph. = Newcomb/ILE
ΔT = 82.3 s
k1 = 0.2724880
k2 = 0.2722810
Δb = 0.0" Δl = 0.0"

Geocentric Libration
(Optical + Physical)

l = -2.00°
b = -1.35°
c = -21.73°
Brown Lun. No. = 1265

0 1000 2000 3000 4000 5000
Kilometers

F. Espenak, NASA's GSFC - Fri, Jul 2,
sunearth.gsfc.nasa.gov/eclipse/eclipse.html

Total Lunar Eclipse of 2025 Sep 07

Ecliptic Conjunction = 18:10:03.1 TD (= 18:08:48.3 UT)
Greatest Eclipse = 18:12:57.9 TD (= 18:11:43.1 UT)

Penumbral Magnitude = 2.3440 P. Radius = 1.2655° Gamma = -0.2752
Umbral Magnitude = 1.3619 U. Radius = 0.7364° Axis = 0.2720°

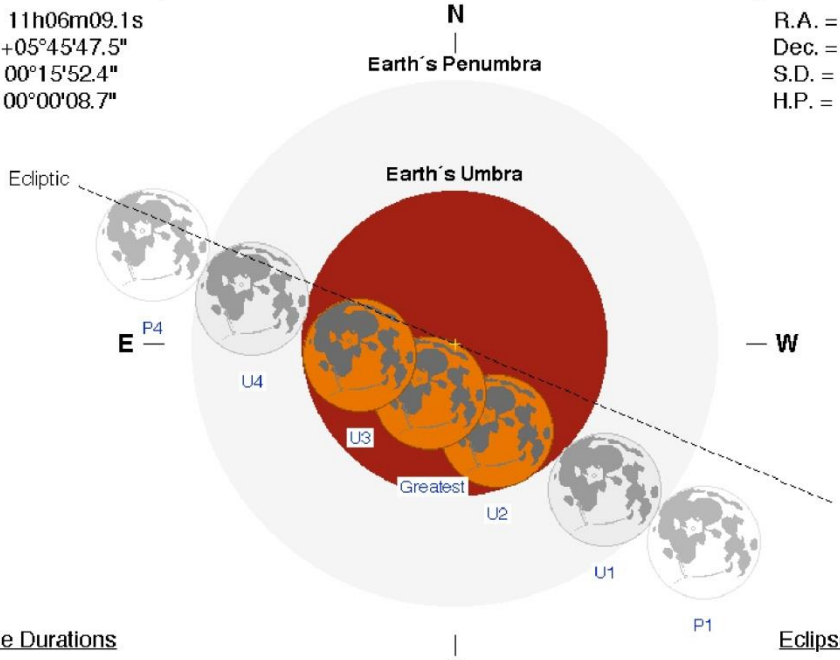
Saros Series = 128 Member = 41 of 71

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 11h06m09.1s
Dec. = +05°45'47.5"
S.D. = 00°15'52.4"
H.P. = 00°00'08.7"

Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 23h06m40.4s
Dec. = -06°00'08.9"
S.D. = 00°16'09.8"
H.P. = 00°59'19.1"



Eclipse Durations

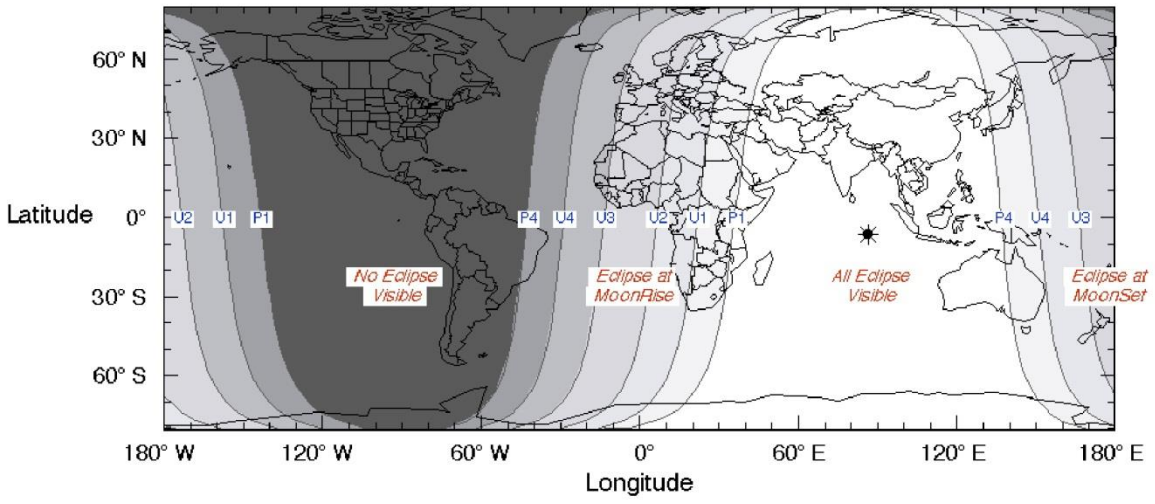
Penumbral = 05h26m40s
Umbral = 03h29m24s
Total = 01h22m06s

ΔT = 75 s
Rule = CdT (Danjon)
Eph. = VSOP87/ELP2000-85

F. Espenak, NASA's GSFC
eclipse.gsfc.nasa.gov/eclipse.html

Eclipse Contacts

P1 = 15:28:21 UT
U1 = 16:27:02 UT
U2 = 17:30:41 UT
U3 = 18:52:47 UT
U4 = 19:56:26 UT
P4 = 20:55:00 UT



2009 Apr 29

Partial Solar Eclipse of 2025 Sep 21

Geocentric Conjunction = 20:50:18.4 UT J.D. = 2460940.368269
Greatest Eclipse = 19:41:43.6 UT J.D. = 2460940.320643

Eclipse Magnitude = 0.8535 Gamma = -1.0652

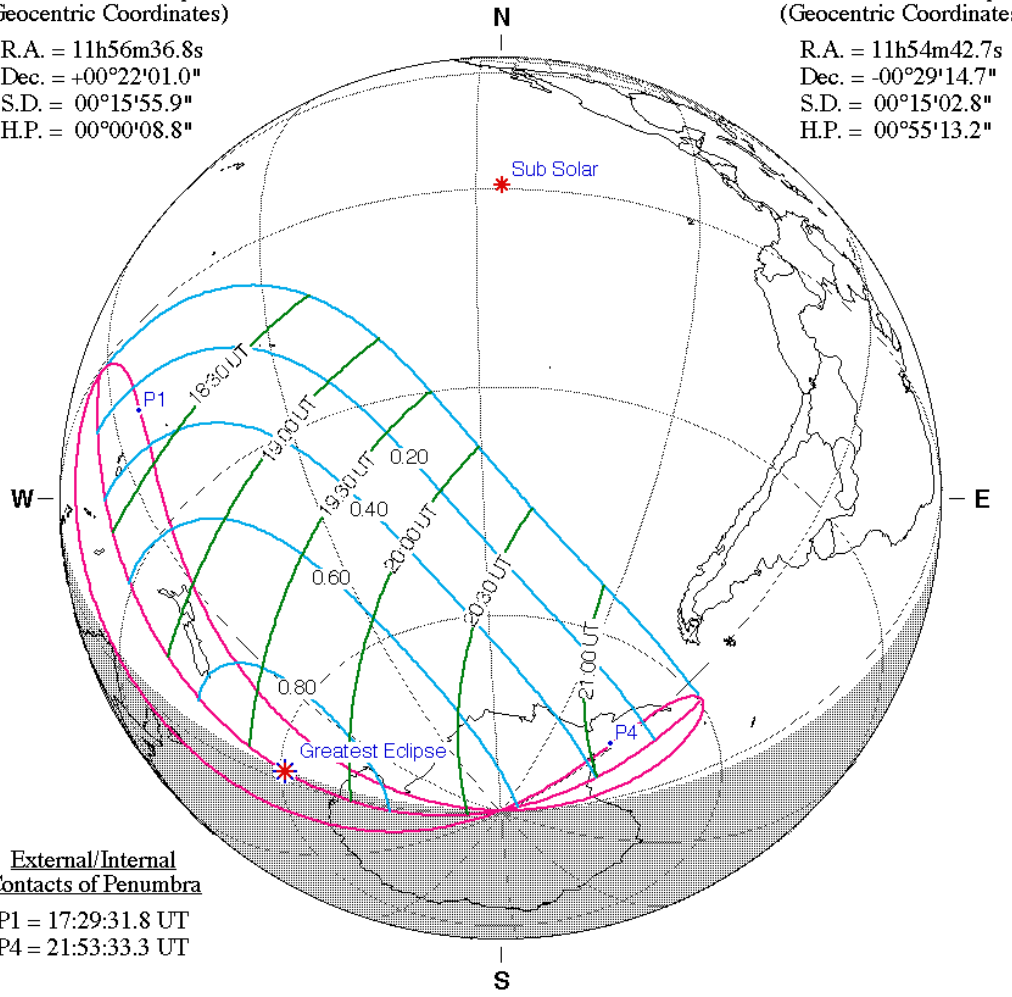
Saros Series = 154 Member = 7 of 71

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 11h56m36.8s
Dec. = +00°22'01.0"
S.D. = 00°15'55.9"
H.P. = 00°00'08.8"

Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 11h54m42.7s
Dec. = -00°29'14.7"
S.D. = 00°15'02.8"
H.P. = 00°55'13.2"



External/Internal Contacts of Penumbra

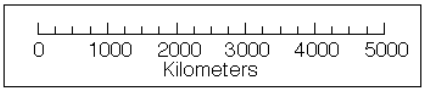
P1 = 17:29:31.8 UT
P4 = 21:53:33.3 UT

Ephemeris & Constants

Eph. = Newcomb/ILE
ΔT = 82.8 s
k1 = 0.2724880
k2 = 0.2722810
Δb = 0.0" Δl = 0.0"

Geocentric Libration
(Optical + Physical)

l = 4.15°
b = 1.31°
c = 21.92°
Brown Lun. No. = 1271



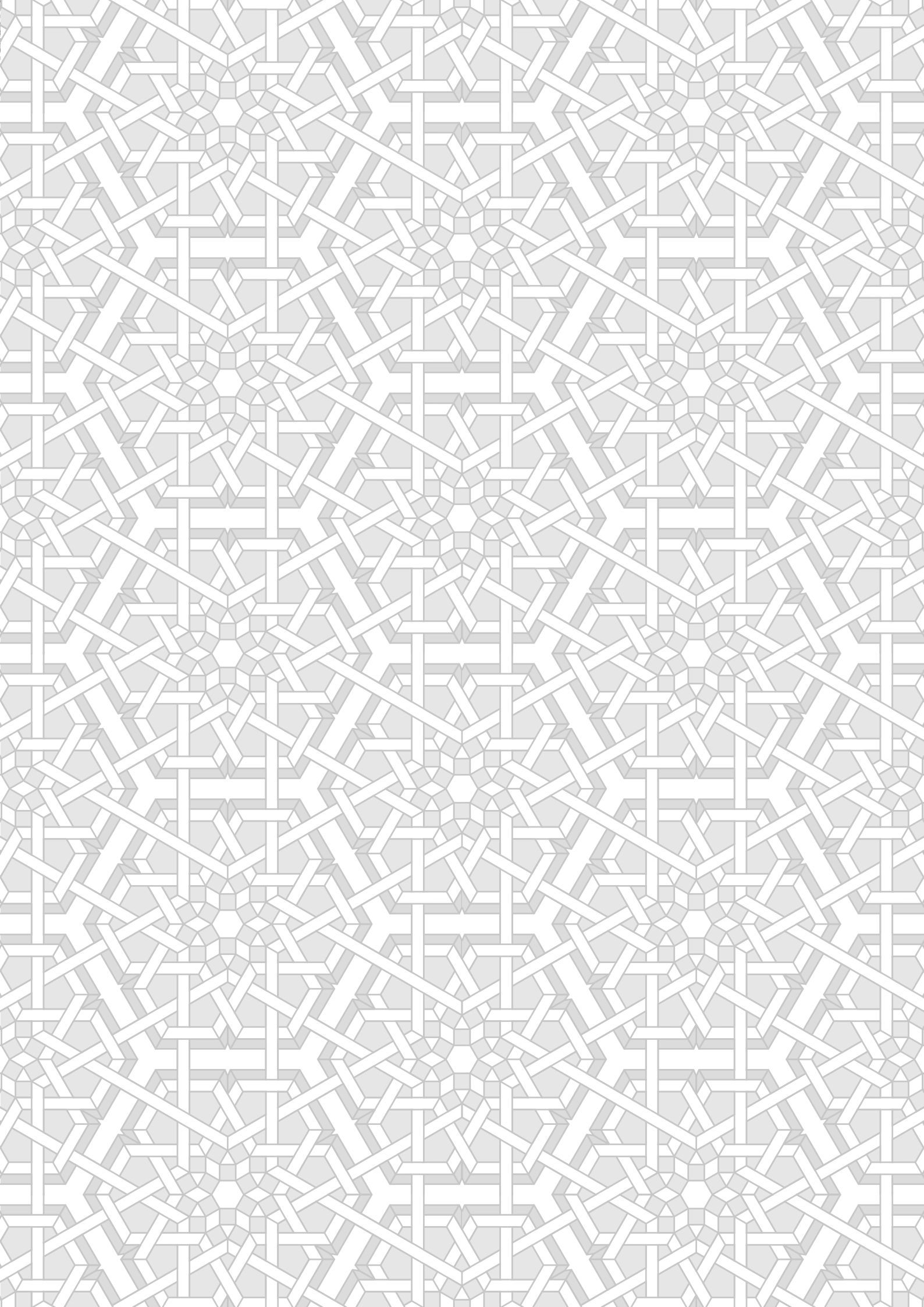
F. Espenak, NASA's GSFC - Fri, Jul 2,
sunearth.gsfc.nasa.gov/eclipse/eclipse.html

DAFTAR WAKTU IJTIMAK, TINGGI HILAL, DAN ELONGASI PENENTU AWAL BULAN HIJRIAH TAHUN 2025 M

No	Bulan	Ijtimak			Tinggi Hilal di Indonesia	Elongasi di Indonesia	Prediksi Awal Bulan	
		Hari	Tanggal	Jam WIB			Hari	Tanggal
1	Sya'ban 1446 H	Rabu	29 Januari 2025 M	19:35:53	-2° 3.21' s.d. '-0° 17.83'	3° 53.45' s.d. 4° 25.48'	Jumat	31 Januari 2025 M
2	Ramadan 1446 H	Jumat	28 Februari 2025 M	07:44:38	3° 1.10' s.d. 4° 41.15'	6° 0.15' s.d. 6° 24.14'	Sabtu	1 Maret 2025 M
3	Syawal 1446 H	Sabtu	29 Maret 2025 M	17:57:38	-3° 17.16' s.d. -1° 4.07'	1° 3.50' s.d. 1° 36.52'	Senin	31 Maret 2025 M
4	Zulqa'dah 1446 H	Senin	28 April 2025 M	02:31:03	3° 24.93' s.d. 6° 49.03'	8° 39.84' s.d. 10° 28.06'	Selasa	29 April 2025 M
5	Zulhijjah 1446 H	Selasa	27 Mei 2025 M	10:02:15	0° 8.37' s.d. 3° 14.48'	5° 47.91' s.d. 7° 6.49'	Rabu	28 Mei 2025 M
6	Muharram 1447 H	Rabu	25 Juni 2025 M	17:31:26	-3° 26.04' s.d. 0° 12.97'	4° 53.72' s.d. 5° 3.03'	Jumat	27 Juni 2025 M
7	Shafar 1447 H	Jumat	25 Juli 2025 M	02:11:01	5° 42.36' s.d. 7° 44.74'	7° 50.14' s.d. 9° 25.28'	Sabtu	26 Juli 2025 M
8	Rabi'ul Awal 1447 H	Sabtu	23 Agustus 2025 M	13:06:22	0° 17.74' s.d. 1° 43.12'	1° 57.77' s.d. 3° 9.75'	Senin	25 Agustus 2025 M
9	Rabi'ul Akhir 1447 H	Senin	22 September 2025 M	02:53:55	3° 24.87' s.d. 4° 41.98'	6° 10.09' s.d. 7° 34.88'	Selasa	23 September 2025 M
10	Jumadal Ula 1447 H	Selasa	21 Oktober 2025 M	19:25:02	-4° 27.42' s.d. -3° 0.26'	3° 21.10' s.d. 3° 41.48'	Kamis	23 Oktober 2025 M
11	Jumadal Akhirah 1447 H	Kamis	20 November 2025 M	13:47:13	-1° 26.80' s.d. 0° 13.90'	4° 51.91' s.d. 5° 15.29'	Sabtu	22 November 2025 M
12	Rajab 1447 H	Sabtu	20 Desember 2025 M	08:43:20	1° 45.57' s.d. 3° 22.67'	5° 41.86' s.d. 6° 29.12'	Ahad	21 Desember 2025 M

Keterangan : 1. Data ini telah sesuai dengan kriteria MABIMS dan diambil dari hasil Sinkronisasi Data Hisab Taqwim Standar Indonesia pada 14 s.d 16 Maret 2023 M bertepatan tanggal 21 s.d 23 Syakban 1444 H di Kab. Badung, Provinsi Bali.

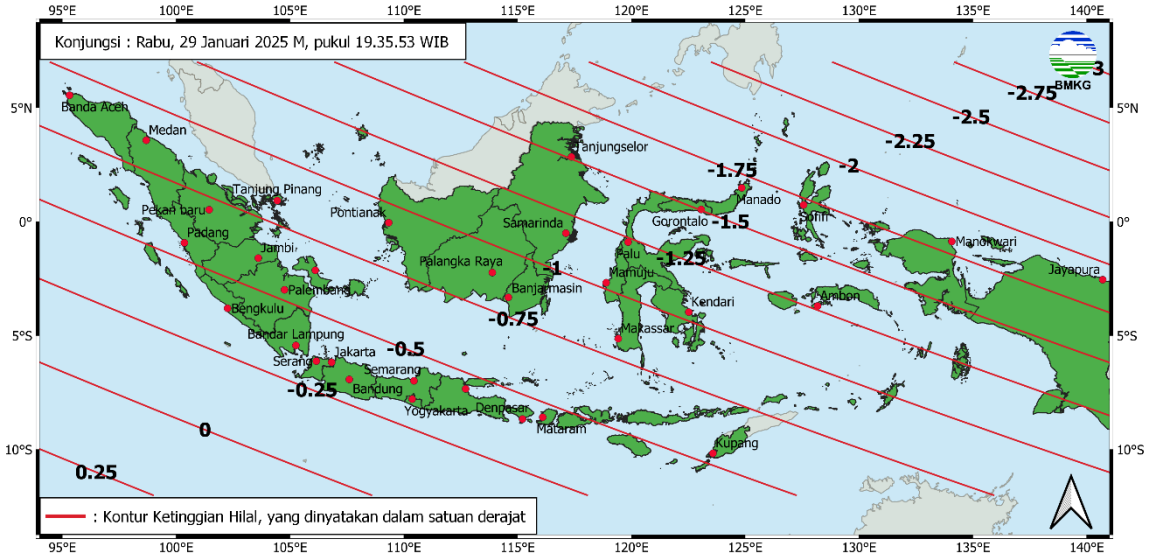
2. Penetapan tanggal 1 Ramadan, 1 Syawal, 1 Zulhijjah 1446 H untuk pelaksanaan ibadah menunggu pengumuman Menteri Agama RI.



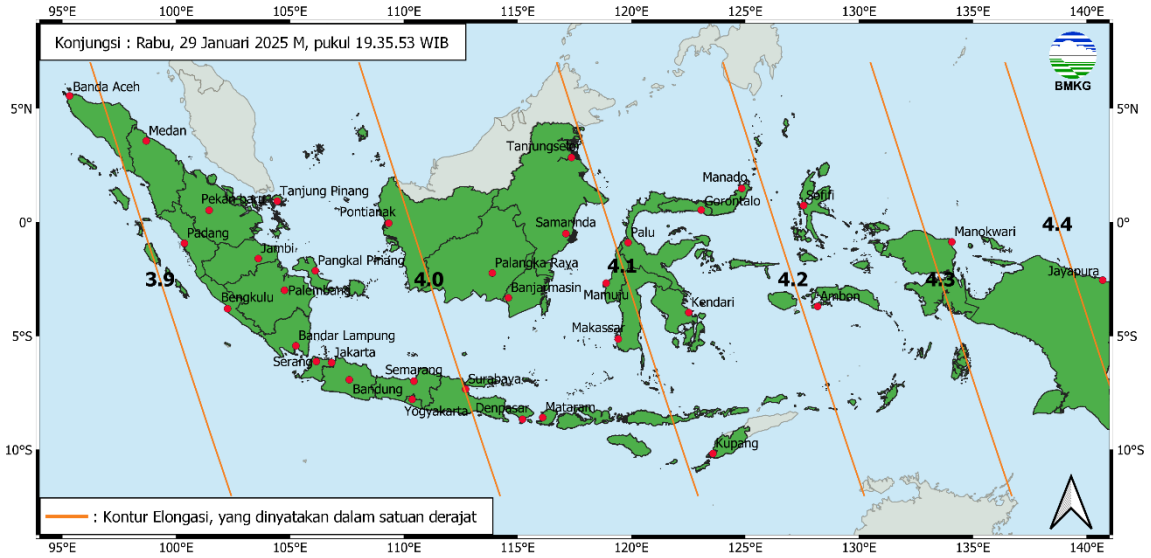
DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
RABU, 29 JANUARI 2025 M
PENENTU AWAL BULAN SYA'BAN 1446 H
IJTIMAK: RABU, 29 JANUARI 2025 PUKUL 19:35:53 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUT				TINGGI BULAN		ELONGASI		FI BULAN
		MATAHARI	BULAN	MATAHARI		BULAN						
				o	'	o	'	°	'	°	'	
1	Banda Aceh	18.48.14 WIB	18.44.57 WIB	252	12.52	248	19.35	0	-54.56	3	53.47	0.12
2	Medan	18.37.18 WIB	18.34.14 WIB	252	13.62	248	19.54	0	-51.74	3	54.55	0.12
3	Padang	18.36.22 WIB	18.34.43 WIB	252	11.48	248	19.46	0	-33.56	3	54.65	0.12
4	Pekanbaru	18.30.09 WIB	18.27.49 WIB	252	12.84	248	18.85	0	-42.43	3	55.34	0.12
5	Bengkulu	18.32.30 WIB	18.31.36 WIB	252	6.50	248	15.88	0	-24.19	3	55.08	0.11
6	Jambi	18.24.15 WIB	18.22.22 WIB	252	10.44	248	16.53	0	-36.60	3	56.04	0.12
7	Tanjung Pinang	18.17.40 WIB	18.14.43 WIB	252	12.97	248	16.66	0	-50.43	3	56.86	0.12
8	Palembang	18.21.26 WIB	18.19.53 WIB	252	8.06	248	14.48	0	-32.34	3	56.38	0.12
9	Bandar Lampung	18.22.36 WIB	18.21.52 WIB	252	2.34	248	10.94	0	-22.35	3	56.24	0.11
10	Pangkal Pinang	18.14.55 WIB	18.12.51 WIB	252	9.51	248	14.08	0	-38.85	3	57.22	0.12
11	Serang	18.19.55 WIB	18.19.18 WIB	252	0.33	248	8.92	0	-20.92	3	56.57	0.11
12	Jakarta	18.17.17 WIB	18.16.36 WIB	252	0.14	248	8.16	0	-21.85	3	56.91	0.11
13	Bandung	18.15.10 WIB	18.14.38 WIB	251	57.74	248	5.95	0	-19.92	3	57.19	0.11
14	Semarang	18.03.54 WIB	18.02.59 WIB	251	57.41	248	2.94	0	-24.53	3	58.74	0.12
15	Yogyakarta	18.05.15 WIB	18.04.39 WIB	251	54.65	248	1.23	0	-20.86	3	58.55	0.12
16	Surabaya	17.55.17 WIB	17.54.10 WIB	251	56.12	247	59.84	0	-26.89	4	0.03	0.12
17	Pontianak	17.59.20 WIB	17.56.00 WIB	252	12.01	248	12.78	0	-55.65	3	59.41	0.13
18	Palangka Raya	17.43.56 WIB	17.40.45 WIB	252	8.99	248	7.43	0	-53.72	4	1.85	0.13
19	Banjarmasin	18.42.32 WITA	18.39.39 WITA	252	6.96	248	5.46	0	-49.54	4	2.08	0.13
20	Samarinda	18.28.48 WITA	18.24.27 WITA	252	11.20	248	6.48	-1	10.09	4	4.49	0.13
21	Tanjungselor	18.23.31 WITA	18.17.51 WITA	252	12.90	248	7.82	-1	30.80	4	5.47	0.14
22	Denpasar	18.47.02 WITA	18.46.03 WITA	251	51.16	247	53.89	0	-25.24	4	1.34	0.12
23	Mataram	18.43.23 WITA	18.42.15 WITA	251	51.43	247	53.15	0	-27.12	4	1.94	0.12
24	Kupang	18.15.35 WITA	18.13.59 WITA	251	44.49	247	40.07	0	-32.66	4	6.99	0.13
25	Mamuju	18.24.31 WITA	18.20.45 WITA	252	8.00	248	2.61	-1	1.79	4	5.28	0.13
26	Makassar	18.25.34 WITA	18.22.40 WITA	252	2.51	247	57.96	0	-49.82	4	5.08	0.13
27	Palu	18.18.22 WITA	18.13.46 WITA	252	10.63	248	3.97	-1	14.04	4	6.45	0.14
28	Kendari	18.11.40 WITA	18.07.51 WITA	252	5.22	247	57.32	-1	2.36	4	7.76	0.14
29	Gorontalo	18.03.42 WITA	17.58.03 WITA	252	11.87	248	2.83	-1	30.47	4	9.39	0.14
30	Manado	17.55.20 WITA	17.49.03 WITA	252	12.32	248	2.24	-1	41.17	4	11.16	0.15
31	Sofifi	18.45.26 WIT	18.39.02 WIT	252	11.80	247	59.69	-1	43.20	4	13.35	0.15
32	Ambon	18.48.41 WIT	18.43.55 WIT	252	5.55	247	52.73	-1	16.33	4	12.62	0.14
33	Manokwari	18.21.26 WIT	18.14.41 WIT	252	10.03	247	52.74	-1	49.24	4	19.02	0.16
34	Jayapura	17.57.06 WIT	17.50.01 WIT	252	7.24	247	44.17	-1	54.67	4	25.28	0.17

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
RABU, 29 JANUARI 2025 M
PENENTU AWAL BULAN SYAKBAN 1446 H



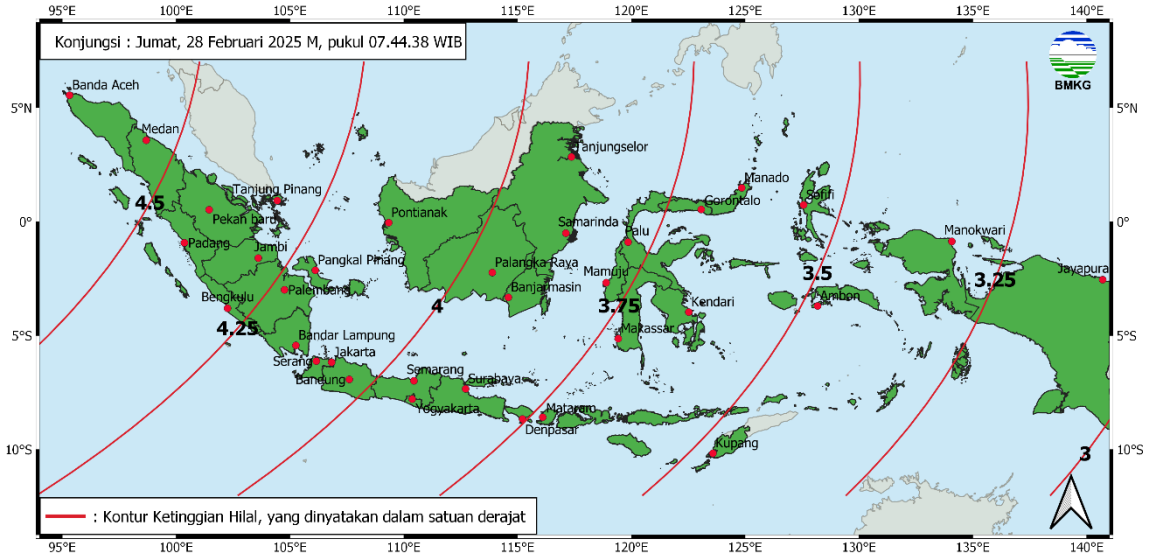
PETA ELONGASI SAAT MATAHARI TERBENAM
RABU, 29 JANUARI 2025 M
PENENTU AWAL BULAN SYAKBAN 1446 H



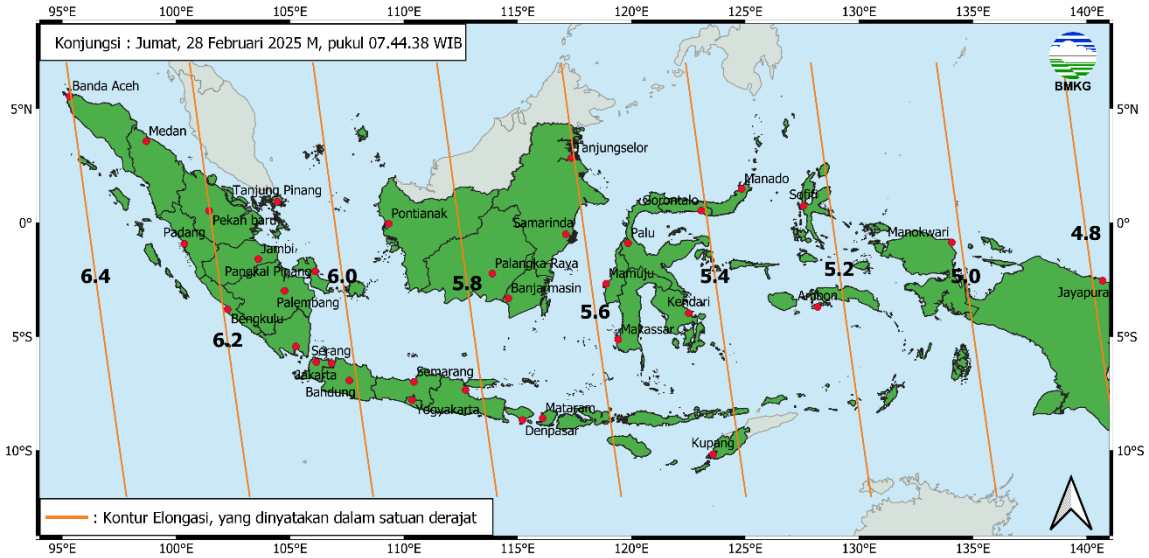
DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
JUMAT, 28 FEBRUARI 2025 M
PENENTU AWAL BULAN RAMADAN 1446 H
IJTIMAK: JUMAT, 28 FEBRUARI 2025 PUKUL 07:44:38 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUT				TINGGI BULAN		ELONGASI		FI BULAN
		MATAHARI	BULAN	MATAHARI		BULAN						
				o	'	o	'	°	'	°	'	
1	Banda Aceh	18.51.31 WIB	19.14.02 WIB	262	16.68	263	8.08	4	40.96	6	24.14	0.22
2	Medan	18.39.07 WIB	19.00.58 WIB	262	16.03	263	17.74	4	32.70	6	17.26	0.22
3	Padang	18.34.52 WIB	18.56.04 WIB	262	12.84	263	42.68	4	24.75	6	14.91	0.21
4	Pekanbaru	18.29.43 WIB	18.50.54 WIB	262	14.08	263	33.22	4	24.32	6	12.05	0.21
5	Bengkulu	18.28.52 WIB	18.49.32 WIB	262	9.23	263	55.59	4	17.05	6	11.58	0.21
6	Jambi	18.22.15 WIB	18.42.57 WIB	262	11.93	263	42.48	4	17.59	6	7.92	0.20
7	Tanjung Pinang	18.17.32 WIB	18.38.20 WIB	262	14.20	263	27.58	4	18.81	6	5.31	0.20
8	Palembang	18.18.25 WIB	18.38.49 WIB	262	10.18	263	48.33	4	13.51	6	5.79	0.20
9	Bandar Lampung	18.17.46 WIB	18.37.53 WIB	262	6.53	263	59.55	4	8.81	6	5.44	0.20
10	Pangkal Pinang	18.12.32 WIB	18.32.50 WIB	262	11.16	263	42.28	4	12.08	6	2.54	0.20
11	Serang	18.14.34 WIB	18.34.30 WIB	262	5.29	264	1.49	4	5.99	6	3.67	0.20
12	Jakarta	18.11.54 WIB	18.31.44 WIB	262	5.16	264	0.81	4	4.66	6	2.19	0.20
13	Bandung	18.09.13 WIB	18.28.53 WIB	262	3.73	264	3.04	4	1.93	6	0.71	0.20
14	Semarang	17.57.54 WIB	18.17.12 WIB	262	3.43	263	59.38	3	56.68	5	54.46	0.19
15	Yogyakarta	17.58.39 WIB	18.17.53 WIB	262	1.86	264	2.80	3	55.40	5	54.88	0.19
16	Surabaya	17.49.01 WIB	18.07.59 WIB	262	2.61	263	57.69	3	51.97	5	49.57	0.18
17	Pontianak	17.58.30 WIB	18.18.31 WIB	262	13.11	263	27.46	4	8.21	5	54.79	0.19
18	Palangka Raya	17.41.29 WIB	18.00.43 WIB	262	10.55	263	33.32	3	57.05	5	45.42	0.18
19	Banjarmasin	18.39.17 WITA	18.58.20 WITA	262	9.12	263	37.65	3	54.42	5	44.20	0.17
20	Samarinda	18.27.37 WITA	18.46.31 WITA	262	12.19	263	20.92	3	52.59	5	37.79	0.17
21	Tanjungselor	18.24.48 WITA	18.43.54 WITA	262	14.54	263	2.97	3	54.53	5	36.25	0.16
22	Denpasar	18.39.47 WITA	18.58.19 WITA	261	59.73	263	59.30	3	45.21	5	44.48	0.18
23	Mataram	18.36.11 WITA	18.54.37 WITA	261	59.85	263	57.74	3	43.78	5	42.50	0.17
24	Kupang	18.07.11 WITA	18.24.32 WITA	261	55.77	263	52.30	3	27.95	5	26.59	0.16
25	Mamuju	18.21.44 WITA	18.40.15 WITA	262	9.69	263	29.31	3	47.03	5	34.56	0.16
26	Makassar	18.20.58 WITA	18.39.14 WITA	262	6.12	263	39.48	3	43.07	5	34.14	0.16
27	Palu	18.16.54 WITA	18.35.24 WITA	262	11.64	263	19.68	3	46.94	5	31.91	0.16
28	Kendari	18.07.56 WITA	18.25.52 WITA	262	7.71	263	30.52	3	38.75	5	27.00	0.15
29	Gorontalo	18.03.17 WITA	18.21.26 WITA	262	12.72	263	8.96	3	41.82	5	24.45	0.15
30	Manado	17.55.38 WITA	18.13.35 WITA	262	13.30	263	2.23	3	38.91	5	20.27	0.14
31	Sofifi	18.45.11 WIT	19.02.42 WIT	262	12.60	263	2.97	3	33.14	5	14.56	0.14
32	Ambon	18.45.09 WIT	19.02.20 WIT	262	7.74	263	22.18	3	28.45	5	14.55	0.14
33	Manokwari	18.20.01 WIT	18.36.32 WIT	262	10.77	263	2.93	3	19.56	5	0.87	0.12
34	Jayapura	17.54.26 WIT	18.09.59 WIT	262	8.47	263	1.96	3	5.91	4	47.03	0.11

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
JUMAT, 28 FEBRUARI 2025 M
PENENTU AWAL BULAN RAMADAN 1446 H



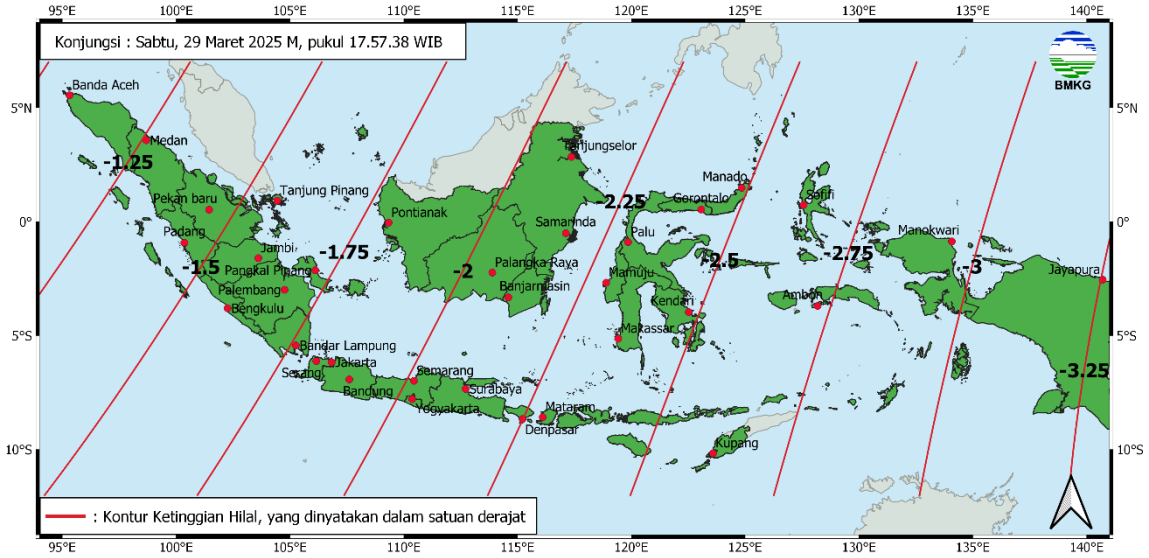
PETA ELONGASI SAAT MATAHARI TERBENAM
JUMAT, 28 FEBRUARI 2025 M
PENENTU AWAL BULAN RAMADAN 1446 H



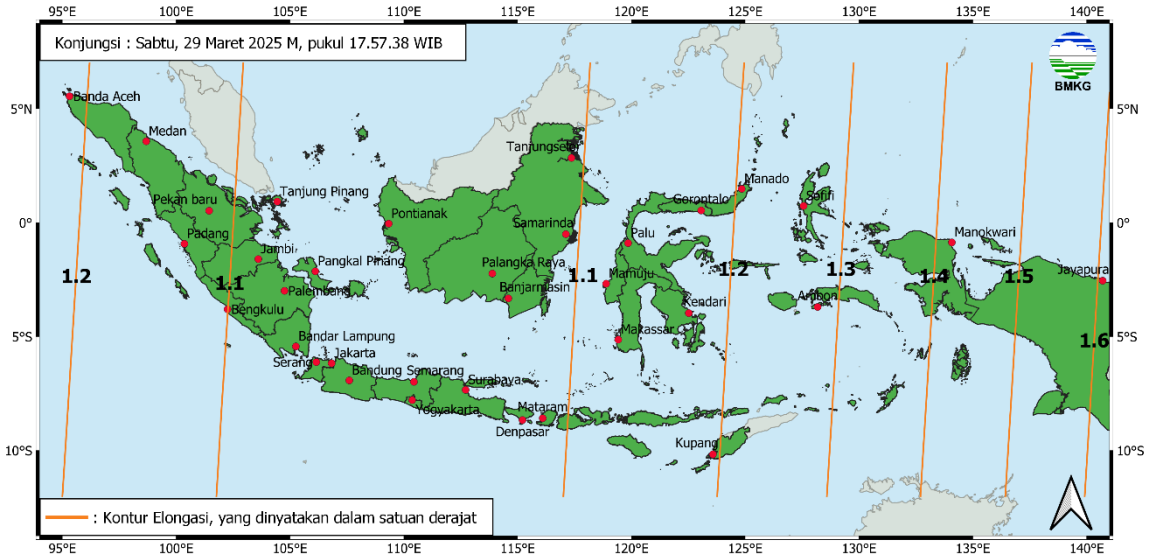
DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
SABTU, 29 MARET 2025 M
PENENTU AWAL BULAN SYAWAL 1446 H
IJTIMAK: SABTU, 29 MARET 2025 PUKUL 17:57:38 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUT				TINGGI BULAN		ELONGASI		FI BULAN
		MATAHARI	BULAN	MATAHARI		BULAN						
				o	'	o	'	o	'	o	'	
1	Banda Aceh	18.48.09 WIB	18.44.36 WIB	273	40,82	274	53,35	-1	4,57	1	12,89	0,02
2	Medan	18.34.10 WIB	18.29.56 WIB	273	38,25	274	47,51	-1	15,71	1	9,21	0,02
3	Padang	18.26.20 WIB	18.21.28 WIB	273	33,79	274	40,37	-1	26,81	1	7,50	0,02
4	Pekanbaru	18.22.20 WIB	18.17.27 WIB	273	34,98	274	40,72	-1	27,28	1	6,74	0,02
5	Bengkulu	18.18.02 WIB	18.12.39 WIB	273	31,58	274	34,85	-1	35,95	1	6,00	0,02
6	Jambi	18.13.11 WIB	18.07.48 WIB	273	33,05	274	35,57	-1	35,97	1	5,28	0,02
7	Tanjung Pinang	18.10.28 WIB	18.05.11 WIB	273	35,16	274	37,73	-1	34,28	1	4,93	0,02
8	Palembang	18.08.14 WIB	18.02.34 WIB	273	31,95	274	32,45	-1	40,99	1	4,66	0,02
9	Bandar Lampung	18.05.38 WIB	17.59.42 WIB	273	30,44	274	29,03	-1	45,87	1	4,39	0,02
10	Pangkal Pinang	18.03.02 WIB	17.57.16 WIB	273	32,48	274	31,75	-1	43,18	1	4,16	0,02
11	Serang	18.01.53 WIB	17.55.46 WIB	273	30,03	274	27,03	-1	49,11	1	4,06	0,02
12	Jakarta	17.59.10 WIB	17.52.57 WIB	273	29,96	274	26,01	-1	50,88	1	3,87	0,02
13	Bandung	17.55.53 WIB	17.49.30 WIB	273	29,56	274	24,08	-1	53,89	1	3,69	0,03
14	Semarang	17.44.31 WIB	17.37.45 WIB	273	29,35	274	19,92	-2	1,11	1	3,52	0,03
15	Yogyakarta	17.44.37 WIB	17.37.48 WIB	273	29,03	274	19,08	-2	1,98	1	3,52	0,03
16	Surabaya	17.35.21 WIB	17.28.16 WIB	273	29,06	274	16,20	-2	7,32	1	3,90	0,03
17	Pontianak	17.50.40 WIB	17.44.35 WIB	273	33,96	274	30,60	-1	48,59	1	3,53	0,02
18	Palangka Raya	17.31.54 WIB	17.25.02 WIB	273	31,90	274	21,69	-2	3,83	1	4,16	0,03
19	Banjarmasin	18.28.50 WITA	18.21.47 WITA	273	31,09	274	19,14	-2	7,12	1	4,45	0,03
20	Samarinda	18.19.25 WITA	18.12.12 WITA	273	33,06	274	20,47	-2	10,36	1	5,63	0,03
21	Tanjungselor	18.19.17 WITA	18.12.14 WITA	273	36,24	274	26,22	-2	6,66	1	5,65	0,03
22	Denpasar	18.25.02 WITA	18.17.31 WITA	273	28,41	274	10,84	-2	15,21	1	4,87	0,03
23	Mataram	18.21.30 WITA	18.13.53 WITA	273	28,38	274	9,61	-2	17,35	1	5,33	0,03
24	Kupang	17.51.13 WITA	17.42.30 WITA	273	27,44	273	56,03	-2	37,47	1	11,67	0,04
25	Mamuju	18.11.49 WITA	18.04.12 WITA	273	31,25	274	14,56	-2	17,84	1	6,90	0,03
26	Makassar	18.09.05 WITA	18.01.15 WITA	273	29,68	274	9,84	-2	22,06	1	7,43	0,03
27	Palu	18.08.24 WITA	18.00.46 WITA	273	32,55	274	16,44	-2	18,35	1	7,57	0,03
28	Kendari	17.56.59 WITA	17.48.48 WITA	273	30,16	274	7,57	-2	29,00	1	10,15	0,03
29	Gorontalo	17.55.55 WITA	17.47.55 WITA	273	33,59	274	15,29	-2	25,55	1	10,42	0,03
30	Manado	17.49.02 WITA	17.40.49 WITA	273	34,37	274	15,16	-2	29,46	1	12,27	0,03
31	Sofifi	18.37.59 WIT	18.29.20 WIT	273	33,48	274	10,42	-2	37,86	1	15,60	0,04
32	Ambon	18.34.25 WIT	18.25.28 WIT	273	29,96	274	0,52	-2	43,75	1	16,76	0,04
33	Manokwari	18.11.32 WIT	18.01.53 WIT	273	31,65	273	59,03	-2	57,07	1	25,08	0,04
34	Jayapura	17.44.37 WIT	17.33.59 WIT	273	29,93	273	46,67	-3	15,47	1	36,38	0,05

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
SABTU, 29 MARET 2025 M
PENENTU AWAL BULAN SYAWAL 1446 H



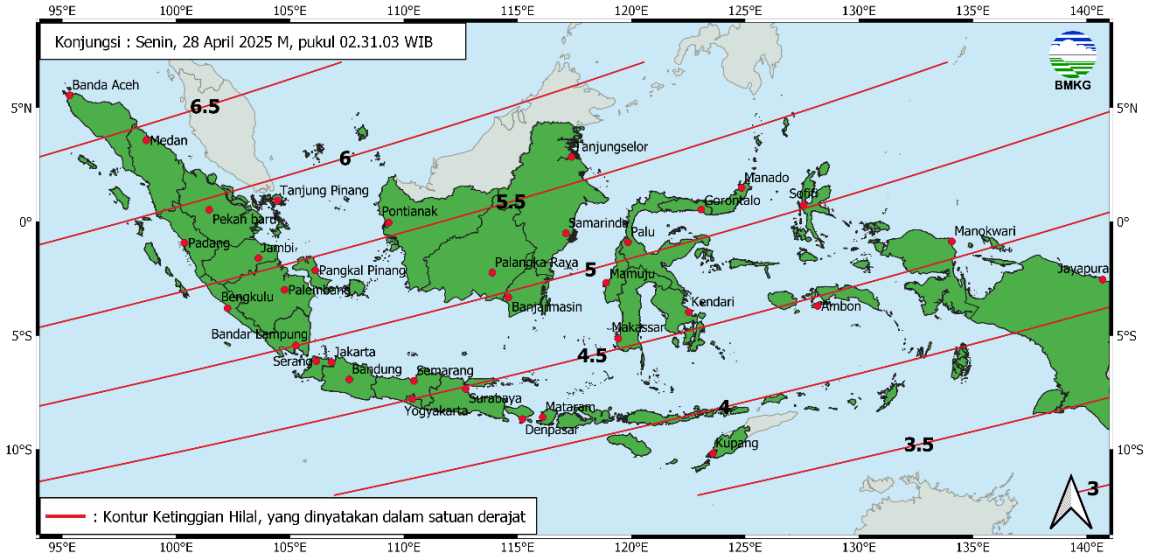
PETA ELONGASI SAAT MATAHARI TERBENAM
SABTU, 29 MARET 2025 M
PENENTU AWAL BULAN SYAWAL 1446 H



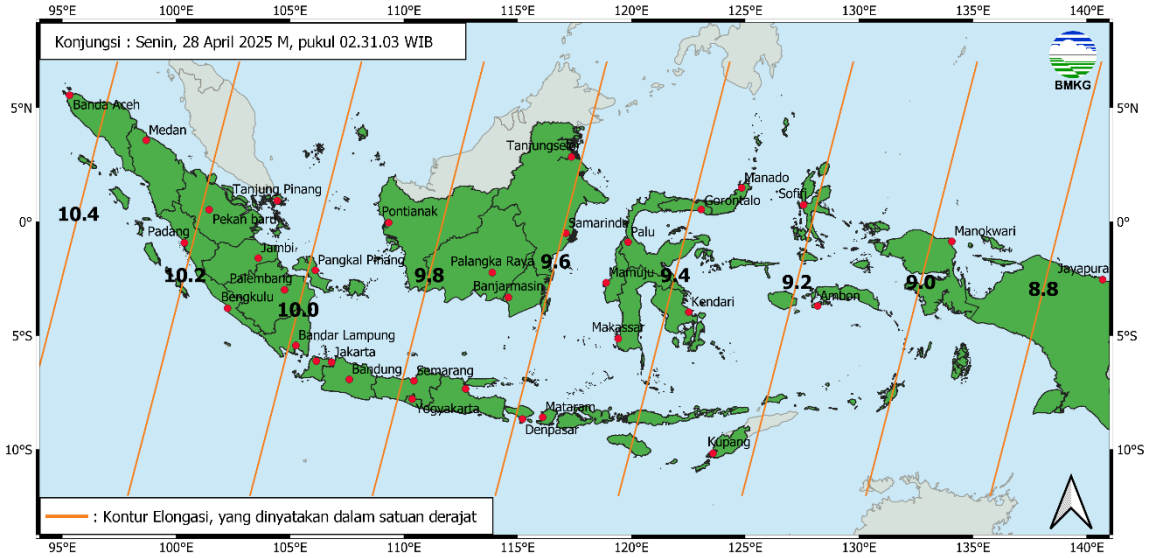
DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
SENIN, 28 APRIL 2025 M
PENENTU AWAL BULAN ZULQA'DAH 1446 H
IJTIMAK: SENIN, 28 APRIL 2025 PUKUL 02:31:03 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUT		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
				o '	o '	o '	o '	
1	Banda Aceh	18.45.19 WIB	19.18.57 WIB	284 28,28	290 35,94	6 46,64	10 27,88	0,71
2	Medan	18.29.48 WIB	19.01.40 WIB	284 23,85	290 46,43	6 24,83	10 19,17	0,70
3	Padang	18.18.30 WIB	18.47.27 WIB	284 18,04	291 16,08	5 46,84	10 12,84	0,69
4	Pekanbaru	18.15.37 WIB	18.45.15 WIB	284 19,24	291 4,79	5 55,83	10 11,23	0,68
5	Bengkulu	18.07.58 WIB	18.34.56 WIB	284 17,13	291 34,96	5 19,63	10 6,95	0,68
6	Jambi	18.04.50 WIB	18.32.52 WIB	284 17,49	291 17,54	5 34,61	10 5,19	0,67
7	Tanjung Pinang	18.04.04 WIB	18.33.25 WIB	284 19,53	290 59,22	5 52,42	10 4,76	0,67
8	Palembang	17.58.48 WIB	18.25.50 WIB	284 17,00	291 26,28	5 21,02	10 1,82	0,67
9	Bandar Lampung	17.54.18 WIB	18.19.50 WIB	284 17,49	291 43,58	4 59,94	9 59,31	0,67
10	Pangkal Pinang	17.54.16 WIB	18.21.35 WIB	284 17,13	291 18,72	5 25,05	9 59,29	0,66
11	Serang	17.50.01 WIB	18.14.59 WIB	284 17,88	291 47,63	4 52,37	9 56,92	0,66
12	Jakarta	17.47.16 WIB	18.12.06 WIB	284 17,88	291 47,22	4 50,55	9 55,38	0,66
13	Bandung	17.43.24 WIB	18.07.40 WIB	284 18,47	291 51,89	4 42,66	9 53,22	0,66
14	Semarang	17.31.59 WIB	17.55.46 WIB	284 18,38	291 48,84	4 36,44	9 46,86	0,64
15	Yogyakarta	17.31.27 WIB	17.54.47 WIB	284 19,24	291 54,92	4 29,83	9 46,57	0,64
16	Surabaya	17.22.32 WIB	17.45.45 WIB	284 18,62	291 48,63	4 28,93	9 41,60	0,63
17	Pontianak	17.43.30 WIB	18.11.29 WIB	284 18,27	291 1,09	5 34,45	9 53,28	0,64
18	Palangka Raya	17.23.03 WIB	17.49.02 WIB	284 16,69	291 11,21	5 7,83	9 41,89	0,62
19	Banjarmasin	18.19.09 WITA	18.44.23 WITA	284 16,47	291 17,86	4 57,81	9 39,72	0,62
20	Samarinda	18.11.54 WITA	18.38.20 WITA	284 17,47	290 56,49	5 14,24	9 35,69	0,60
21	Tanjungselor	18.14.20 WITA	18.42.37 WITA	284 21,57	290 35,38	5 38,32	9 37,04	0,60
22	Denpasar	18.11.11 WITA	18.33.14 WITA	284 20,12	291 55,20	4 12,89	9 35,29	0,62
23	Mataram	18.07.43 WITA	18.29.41 WITA	284 19,96	291 53,47	4 11,80	9 33,37	0,61
24	Kupang	17.36.10 WITA	17.56.03 WITA	284 22,13	291 55,18	3 44,02	9 15,89	0,58
25	Mamuju	18.02.37 WITA	18.27.31 WITA	284 16,32	291 8,86	4 53,86	9 30,53	0,60
26	Makassar	17.57.59 WITA	18.21.25 WITA	284 16,60	291 24,82	4 33,42	9 27,97	0,60
27	Palu	18.00.34 WITA	18.26.20 WITA	284 17,05	290 56,28	5 5,45	9 29,40	0,59
28	Kendari	17.46.47 WITA	18.10.23 WITA	284 16,09	291 13,42	4 36,25	9 21,76	0,58
29	Gorontalo	17.49.12 WITA	18.15.14 WITA	284 18,12	290 44,22	5 9,22	9 23,10	0,58
30	Manado	17.43.02 WITA	18.09.18 WITA	284 19,15	290 36,87	5 12,26	9 19,69	0,57
31	Sofifi	18.31.24 WIT	18.56.48 WIT	284 18,10	290 38,79	5 0,97	9 13,26	0,55
32	Ambon	18.24.25 WIT	18.47.15 WIT	284 15,76	291 5,34	4 26,63	9 9,40	0,55
33	Manokwari	18.03.44 WIT	18.27.10 WIT	284 16,33	290 41,82	4 35,44	8 58,00	0,53
34	Jayapura	17.35.31 WIT	17.56.57 WIT	284 15,20	290 44,70	4 9,23	8 42,52	0,50

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
SENIN, 28 APRIL 2025 M
PENENTU AWAL BULAN ZULKAIDAH 1446 H



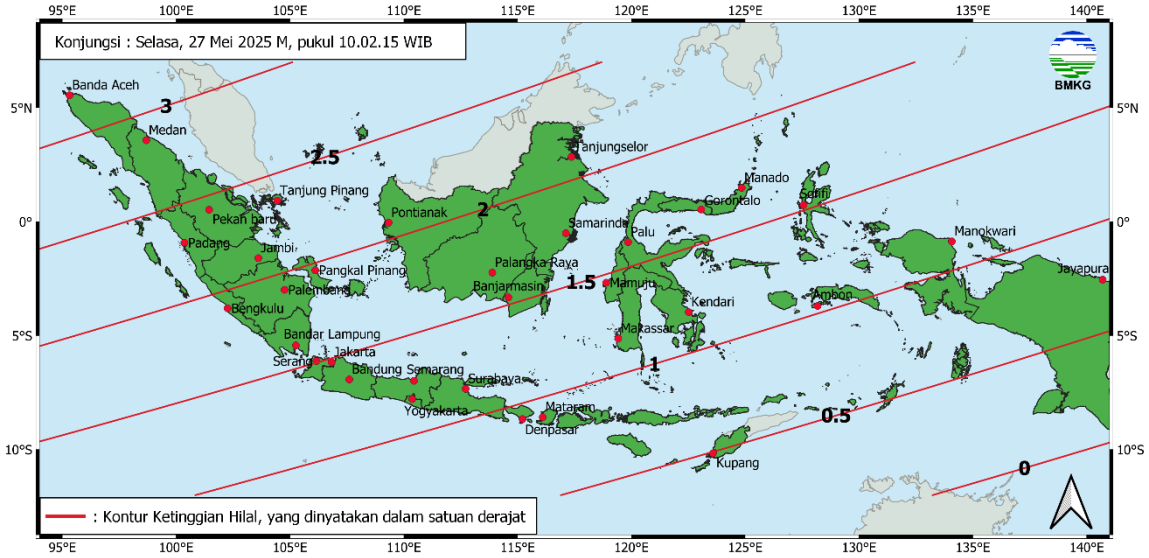
PETA ELONGASI SAAT MATAHARI TERBENAM
SENIN, 28 APRIL 2025 M
PENENTU AWAL BULAN ZULKAIDAH 1446 H



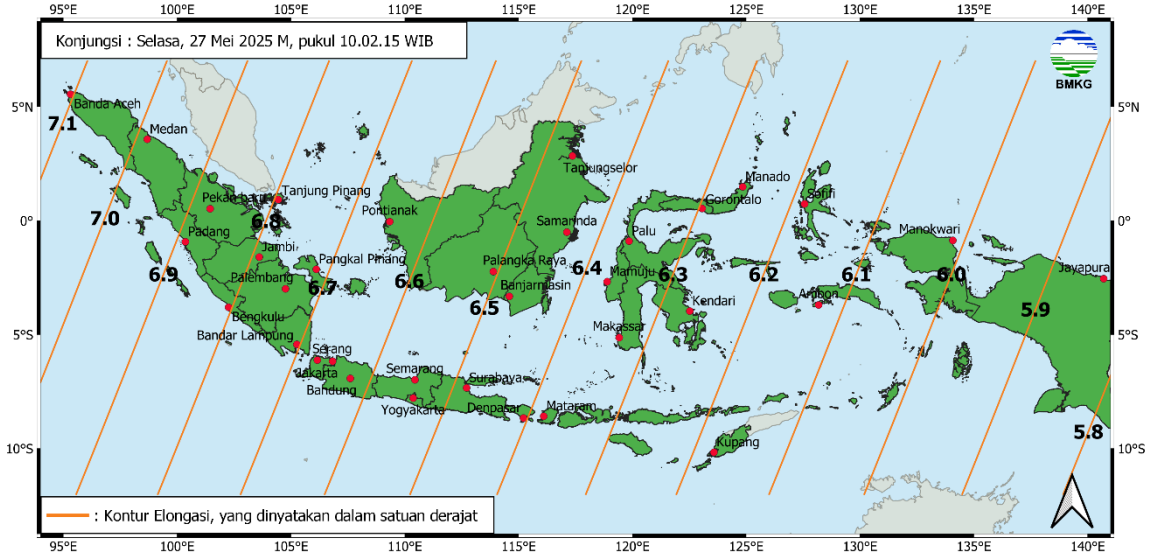
DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
SELASA, 27 MEI 2025 M
PENENTU AWAL BULAN ZULHIJJAH 1446 H
IJTIMAK: SELASA, 27 MEI 2025 PUKUL 10:02:15 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUT		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
				o '	o '	o '	o '	
1	Banda Aceh	18.48.15 WIB	19.06.09 WIB	291 34,78	296 48,50	3 12,29	7 6,27	0,32
2	Medan	18.31.38 WIB	18.47.48 WIB	291 29,07	296 52,07	2 51,88	6 59,14	0,31
3	Padang	18.17.52 WIB	18.31.12 WIB	291 22,30	297 4,95	2 18,02	6 53,32	0,31
4	Pekanbaru	18.15.47 WIB	18.29.44 WIB	291 23,53	296 59,56	2 25,51	6 52,44	0,31
5	Bengkulu	18.05.46 WIB	18.17.09 WIB	291 22,30	297 15,05	1 54,28	6 48,26	0,31
6	Jambi	18.03.50 WIB	18.16.12 WIB	291 21,92	297 5,64	2 6,54	6 47,46	0,30
7	Tanjung Pinang	18.04.27 WIB	18.18.05 WIB	291 23,95	296 57,03	2 21,74	6 47,71	0,30
8	Palembang	17.57.03 WIB	18.08.25 WIB	291 21,88	297 10,21	1 54,62	6 44,65	0,30
9	Bandar Lampung	17.51.13 WIB	18.01.07 WIB	291 23,77	297 20,14	1 36,87	6 42,25	0,30
10	Pangkal Pinang	17.52.59 WIB	18.04.36 WIB	291 21,75	297 6,19	1 57,62	6 42,98	0,30
11	Serang	17.46.32 WIB	17.55.54 WIB	291 24,72	297 22,65	1 30,32	6 40,34	0,30
12	Jakarta	17.43.46 WIB	17.52.58 WIB	291 24,79	297 22,40	1 28,59	6 39,21	0,30
13	Bandung	17.39.28 WIB	17.48.07 WIB	291 26,08	297 25,36	1 21,89	6 37,47	0,30
14	Semarang	17.28.01 WIB	17.36.07 WIB	291 26,13	297 23,48	1 15,81	6 32,86	0,29
15	Yogyakarta	17.27.03 WIB	17.34.42 WIB	291 27,82	297 27,39	1 10,52	6 32,48	0,29
16	Surabaya	17.18.23 WIB	17.25.53 WIB	291 26,77	297 23,37	1 8,93	6 29,03	0,29
17	Pontianak	17.43.21 WIB	17.55.34 WIB	291 22,72	296 57,65	2 4,79	6 39,04	0,29
18	Palangka Raya	17.21.42 WIB	17.31.53 WIB	291 21,53	297 2,13	1 40,66	6 30,35	0,28
19	Banjarmasin	18.17.12 WITA	18.26.39 WITA	291 21,72	297 5,47	1 31,99	6 28,57	0,28
20	Samarinda	18.11.29 WITA	18.22.03 WITA	291 22,12	296 55,18	1 45,28	6 26,32	0,27
21	Tanjungselor	18.15.46 WITA	18.28.07 WITA	291 26,90	296 47,40	2 6,42	6 28,00	0,27
22	Denpasar	18.06.17 WITA	18.12.35 WITA	291 29,83	297 27,72	0 55,20	6 24,29	0,29
23	Mataram	18.02.52 WITA	18.09.03 WITA	291 29,60	297 26,59	0 54,01	6 22,96	0,28
24	Kupang	17.30.25 WITA	17.34.23 WITA	291 34,08	297 27,94	0 29,41	6 10,65	0,27
25	Mamuju	18.01.01 WITA	18.10.03 WITA	291 21,42	297 0,69	1 27,40	6 22,25	0,27
26	Makassar	17.55.02 WITA	18.02.37 WITA	291 23,01	297 9,02	1 10,23	6 19,95	0,27
27	Palu	17.59.57 WITA	18.09.48 WITA	291 21,78	296 54,87	1 37,00	6 21,83	0,27
28	Kendari	17.44.29 WITA	17.52.09 WITA	291 21,86	297 2,73	1 11,60	6 15,92	0,27
29	Gorontalo	17.49.21 WITA	17.59.25 WITA	291 22,95	296 49,80	1 39,51	6 17,77	0,26
30	Manado	17.43.43 WITA	17.53.58 WITA	291 24,20	296 47,08	1 41,81	6 15,63	0,26
31	Sofifi	18.31.40 WIT	18.41.02 WIT	291 23,07	296 47,37	1 31,34	6 11,12	0,25
32	Ambon	18.22.15 WIT	18.29.05 WIT	291 21,53	296 58,25	1 1,95	6 7,65	0,26
33	Manokwari	18.03.07 WIT	18.10.26 WIT	291 21,41	296 47,51	1 7,85	6 0,74	0,24
34	Jayapura	17.33.58 WIT	17.39.12 WIT	291 20,81	296 47,54	0 44,15	5 50,64	0,24

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
SELASA, 27 MEI 2025 M
PENENTU AWAL BULAN ZULHIJAH 1446 H



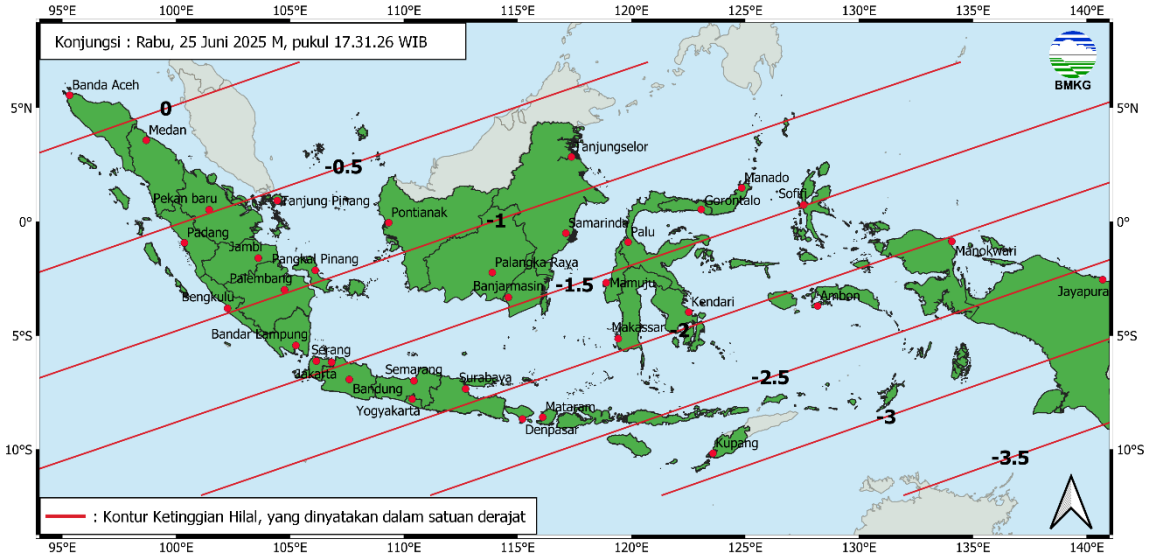
PETA ELONGASI SAAT MATAHARI TERBENAM
SELASA, 27 MEI 2025 M
PENENTU AWAL BULAN ZULHIJAH 1446 H



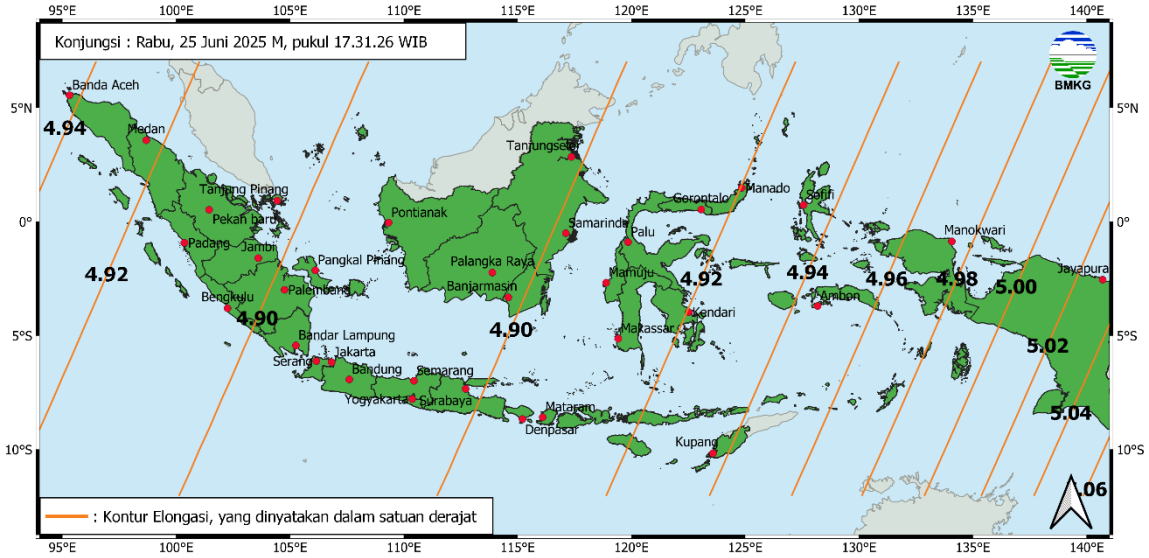
DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
RABU, 25 JUNI 2025 M
PENENTU AWAL BULAN MUHARRAM 1447 H
IJTIMAK: RABU, 25 JUNI 2025 PUKUL 17:31:26 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUT		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
				° '	° '	° '	° '	
1	Banda Aceh	18.54.45 WIB	18.56.55 WIB	293 34.81	298 18.17	0 11.13	4 56.56	0.17
2	Medan	18.37.48 WIB	18.38.22 WIB	293 28.82	298 16.51	0 -6.23	4 55.39	0.18
3	Padang	18.23.19 WIB	18.21.16 WIB	293 21.84	298 14.64	0 -35.74	4 54.64	0.18
4	Pekanbaru	18.21.28 WIB	18.19.58 WIB	293 23.09	298 14.89	0 -29.24	4 54.56	0.18
5	Bengkulu	18.10.45 WIB	18.06.52 WIB	293 22.20	298 16.39	0 -58.69	4 54.16	0.19
6	Jambi	18.09.10 WIB	18.06.11 WIB	293 21.60	298 15.06	0 -47.05	4 54.12	0.19
7	Tanjung Pinang	18.10.11 WIB	18.08.22 WIB	293 23.62	298 15.58	0 -33.06	4 54.15	0.18
8	Palembang	18.02.09 WIB	17.58.14 WIB	293 21.73	298 15.71	0 -59.04	4 53.94	0.19
9	Bandar Lampung	17.55.55 WIB	17.50.38 WIB	293 24.08	298 18.13	-1 18.01	4 53.82	0.19
10	Pangkal Pinang	17.58.13 WIB	17.54.31 WIB	293 21.56	298 15.35	0 -56.36	4 53.86	0.19
11	Serang	17.51.08 WIB	17.45.19 WIB	293 25.23	298 19.04	-1 25.72	4 53.76	0.19
12	Jakarta	17.48.20 WIB	17.42.22 WIB	293 25.34	298 19.03	-1 27.98	4 53.74	0.19
13	Bandung	17.43.56 WIB	17.37.25 WIB	293 26.87	298 20.16	-1 36.18	4 53.72	0.20
14	Semarang	17.32.28 WIB	17.25.24 WIB	293 27.02	298 19.81	-1 44.78	4 53.77	0.20
15	Yogyakarta	17.31.21 WIB	17.23.53 WIB	293 28.97	298 21.25	-1 51.33	4 53.78	0.20
16	Surabaya	17.22.46 WIB	17.15.07 WIB	293 27.85	298 20.01	-1 54.39	4 53.92	0.20
17	Pontianak	17.48.56 WIB	17.45.45 WIB	293 22.53	298 15.84	0 -49.83	4 53.75	0.19
18	Palangka Raya	17.26.56 WIB	17.21.47 WIB	293 21.60	298 15.72	-1 16.34	4 53.85	0.19
19	Banjarmasin	18.22.15 WITA	18.16.24 WITA	293 21.94	298 15.90	-1 26.60	4 53.93	0.19
20	Samarinda	18.17.00 WITA	18.12.11 WITA	293 22.19	298 16.56	-1 11.76	4 54.06	0.19
21	Tanjungselor	18.21.49 WITA	18.18.41 WITA	293 27.15	298 20.61	0 -49.06	4 53.94	0.19
22	Denpasar	18.10.27 WITA	18.01.37 WITA	293 31.45	298 21.91	-2 13.27	4 54.26	0.20
23	Mataram	18.07.02 WITA	17.58.05 WITA	293 31.22	298 21.55	-2 15.26	4 54.39	0.20
24	Kupang	17.34.19 WITA	17.23.08 WITA	293 36.59	298 22.79	-2 51.37	4 56.20	0.21
25	Mamuju	18.06.10 WITA	17.59.54 WITA	293 21.70	298 15.87	-1 33.31	4 54.42	0.20
26	Makassar	17.59.47 WITA	17.52.07 WITA	293 23.71	298 16.57	-1 55.35	4 54.69	0.20
27	Palu	18.05.23 WITA	17.59.53 WITA	293 21.95	298 16.59	-1 21.84	4 54.45	0.19
28	Kendari	17.49.25 WITA	17.41.49 WITA	293 22.43	298 15.91	-1 54.55	4 55.22	0.20
29	Gorontalo	17.55.02 WITA	17.49.42 WITA	293 23.22	298 18.38	-1 19.31	4 54.92	0.19
30	Manado	17.49.33 WITA	17.44.23 WITA	293 24.56	298 20.07	-1 16.73	4 55.21	0.19
31	Sofifi	18.37.23 WIT	18.31.20 WIT	293 23.48	298 19.39	-1 29.87	4 55.98	0.20
32	Ambon	18.27.14 WIT	18.18.46 WIT	293 22.25	298 15.75	-2 9.17	4 56.74	0.21
33	Manokwari	18.08.33 WIT	18.00.31 WIT	293 22.04	298 18.03	-2 2.17	4 58.42	0.21
34	Jayapura	17.39.08 WIT	17.29.02 WIT	293 21.77	298 16.47	-2 37.04	5 1.80	0.22

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
RABU, 25 JUNI 2025 M
PENENTU AWAL BULAN MUHARAM 1447 H



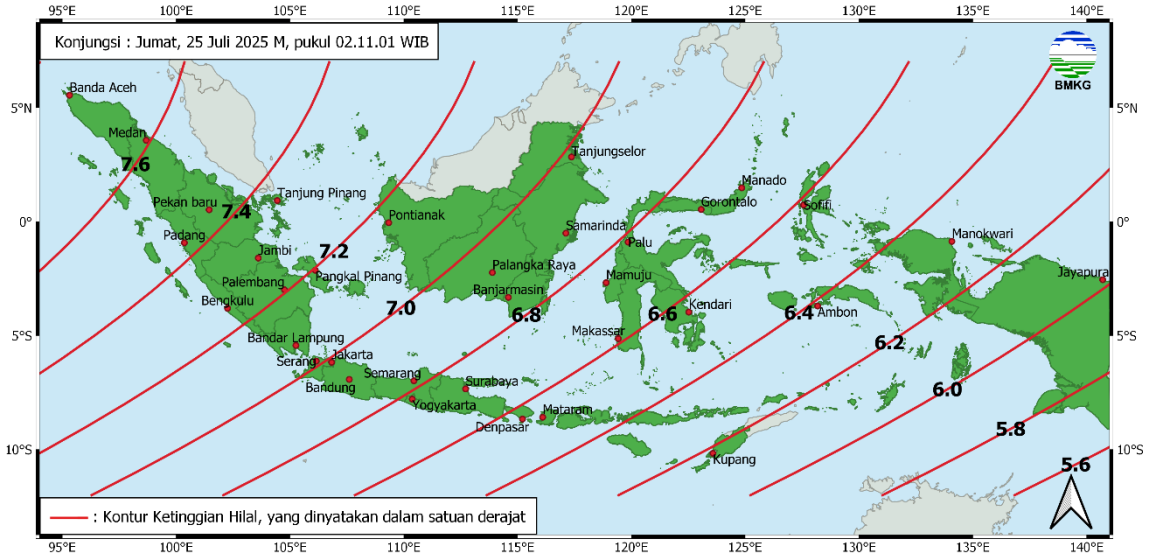
PETA ELONGASI SAAT MATAHARI TERBENAM
RABU, 25 JUNI 2025 M
PENENTU AWAL BULAN MUHARAM 1447 H



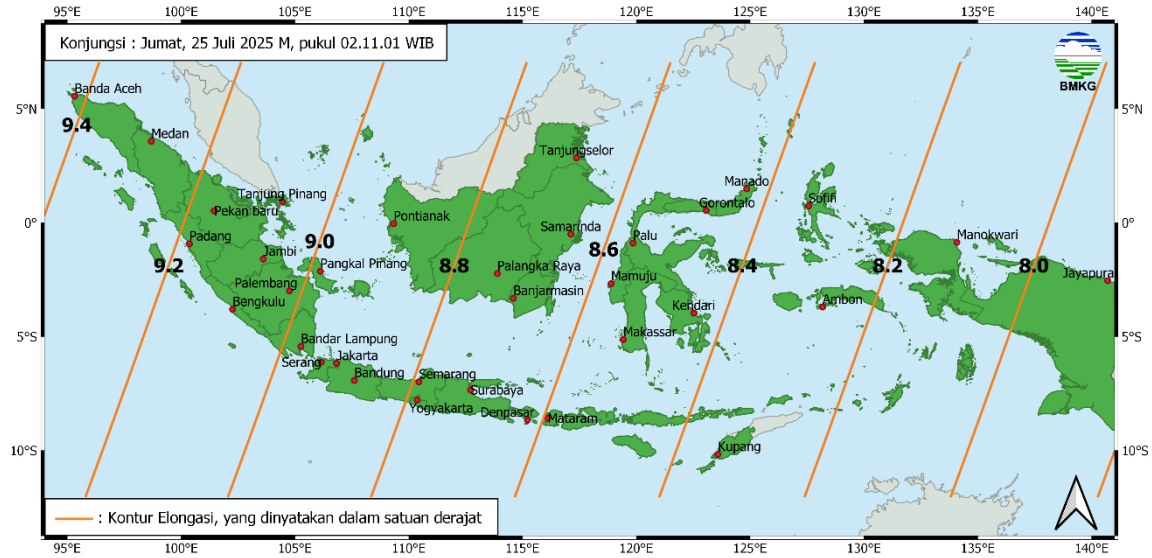
DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
JUMAT, 25 JULI 2025 M
PENENTU AWAL BULAN SHAFAR 1447 H
IJTIMAK: JUMAT, 25 JULI 2025 PUKUL 02:11:01 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUT		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
				° '	° '	° '	° '	
1	Banda Aceh	18.56.46 WIB	19.34.13 WIB	289 42,95	289 43,63	7 44,53	9 25,05	0,55
2	Medan	18.40.27 WIB	19.17.13 WIB	289 37,88	290 2,60	7 36,21	9 17,19	0,53
3	Padang	18.27.21 WIB	19.03.24 WIB	289 31,60	290 44,87	7 25,72	9 10,90	0,52
4	Pekanbaru	18.25.03 WIB	19.01.07 WIB	289 32,86	290 31,74	7 26,33	9 9,80	0,52
5	Bengkulu	18.15.40 WIB	18.51.06 WIB	289 31,56	291 15,42	7 15,18	9 5,30	0,51
6	Jambi	18.13.25 WIB	18.48.55 WIB	289 31,42	290 53,55	7 17,79	9 4,22	0,50
7	Tanjung Pinang	18.13.39 WIB	18.49.19 WIB	289 33,44	290 30,19	7 21,12	9 4,33	0,50
8	Palembang	18.06.49 WIB	18.41.59 WIB	289 31,37	291 8,32	7 12,20	9 1,06	0,50
9	Bandar Lampung	18.01.21 WIB	18.36.08 WIB	289 32,99	291 34,61	7 4,54	8 58,44	0,49
10	Pangkal Pinang	18.02.38 WIB	18.37.42 WIB	289 31,39	291 0,41	7 11,55	8 59,06	0,49
11	Serang	17.56.47 WIB	18.31.20 WIB	289 33,87	291 42,66	7 0,64	8 56,26	0,49
12	Jakarta	17.54.00 WIB	18.28.27 WIB	289 33,97	291 43,57	6 59,10	8 54,94	0,49
13	Bandung	17.49.50 WIB	18.24.03 WIB	289 35,15	291 52,39	6 55,12	8 52,94	0,48
14	Semarang	17.38.23 WIB	18.12.10 WIB	289 35,36	291 54,28	6 49,10	8 47,49	0,47
15	Yogyakarta	17.37.32 WIB	18.11.13 WIB	289 36,85	292 3,42	6 46,58	8 47,08	0,47
16	Surabaya	17.28.48 WIB	18.02.11 WIB	289 36,07	291 59,20	6 43,28	8 42,93	0,47
17	Pontianak	17.52.42 WIB	18.27.33 WIB	289 32,58	290 42,48	7 9,62	8 54,31	0,48
18	Palangka Raya	17.31.23 WIB	18.05.17 WIB	289 31,66	291 6,10	6 55,67	8 44,15	0,46
19	Banjarmasin	18.27.02 WITA	19.00.41 WITA	289 31,82	291 17,23	6 51,49	8 42,09	0,46
20	Samarinda	18.20.55 WITA	18.54.34 WITA	289 32,48	290 51,94	6 53,18	8 39,18	0,45
21	Tanjungselor	18.24.41 WITA	18.58.45 WITA	289 37,01	290 23,66	6 58,90	8 40,98	0,46
22	Denpasar	18.16.54 WITA	18.49.42 WITA	289 38,92	292 15,31	6 33,55	8 37,28	0,45
23	Mataram	18.13.28 WITA	18.46.08 WITA	289 38,77	292 14,72	6 32,01	8 35,65	0,45
24	Kupang	17.41.15 WITA	18.12.30 WITA	289 43,21	292 35,62	6 10,66	8 20,43	0,42
25	Mamuju	18.10.45 WITA	18.43.52 WITA	289 31,84	291 13,35	6 44,50	8 34,37	0,45
26	Makassar	18.05.08 WITA	18.37.49 WITA	289 33,19	291 38,24	6 36,58	8 31,71	0,44
27	Palu	18.09.25 WITA	18.42.38 WITA	289 32,33	290 57,28	6 46,87	8 33,74	0,44
28	Kendari	17.54.24 WITA	18.26.47 WITA	289 32,39	291 28,00	6 33,69	8 26,64	0,43
29	Gorontalo	17.58.38 WITA	18.31.34 WITA	289 33,66	290 46,89	6 43,57	8 28,63	0,43
30	Manado	17.52.51 WITA	18.25.39 WITA	289 34,95	290 40,29	6 41,92	8 25,90	0,43
31	Sofifi	18.40.55 WIT	19.13.13 WIT	289 34,05	290 48,42	6 35,08	8 20,28	0,42
32	Ambon	18.32.09 WIT	19.03.43 WIT	289 32,46	291 28,42	6 23,00	8 16,16	0,41
33	Manokwari	18.12.35 WIT	18.43.43 WIT	289 32,86	291 6,25	6 18,58	8 6,99	0,39
34	Jayapura	17.43.41 WIT	18.13.34 WIT	289 32,63	291 24,88	6 0,97	7 53,53	0,37

PETA KETINGGIAN SAAT MATAHARI TERBENAM
JUMAT, 25 JULI 2025 M
PENENTU AWAL BULAN SAFAR 1447 H



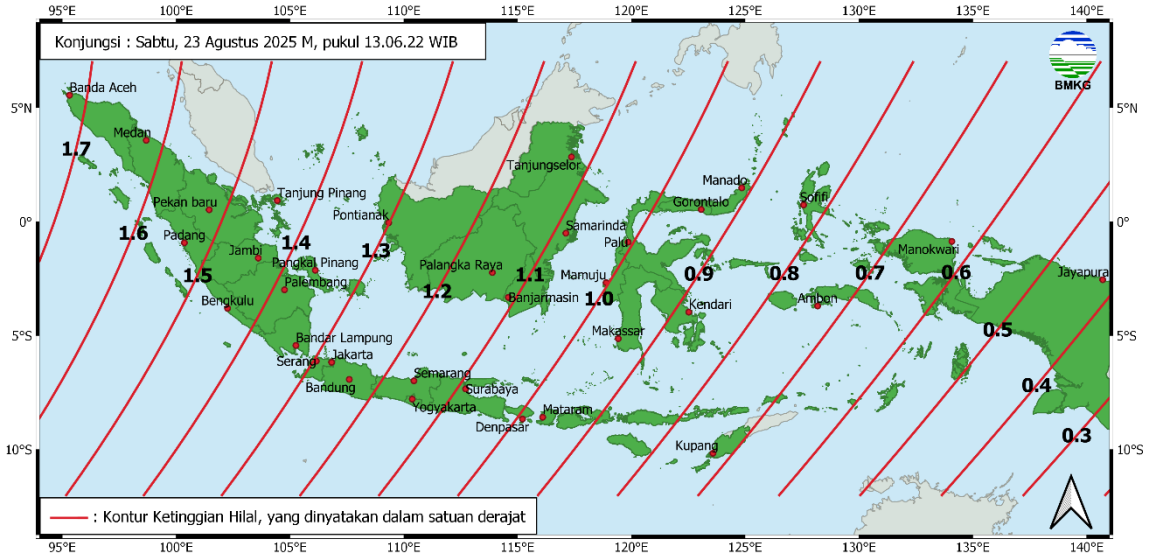
PETA ELONGASI SAAT MATAHARI TERBENAM
JUMAT, 25 JULI 2025 M
PENENTU AWAL BULAN SAFAR 1447 H



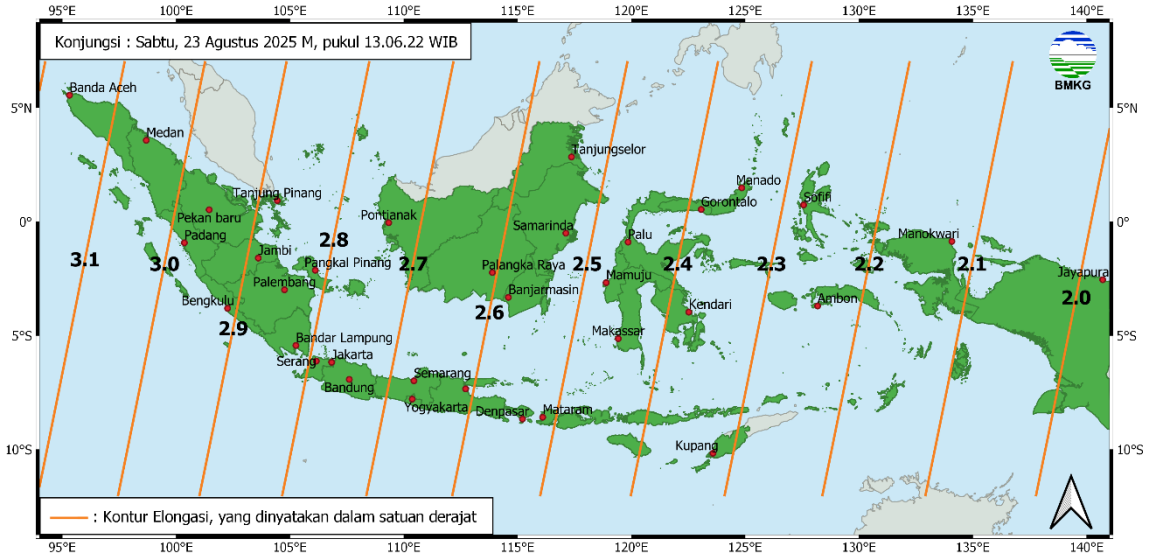
DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
SABTU, 23 AGUSTUS 2025 M
PENENTU AWAL BULAN RABI'UL AWAL 1447 H
IJTIMAK: SABTU, 23 AGUSTUS 2025 PUKUL 13:06:22 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUT		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
				° '	° '	° '	° '	
1	Banda Aceh	18.49.10 WIB	18.58.36 WIB	281 23,60	281 19,66	1 43,04	3 9,64	0,04
2	Medan	18.34.06 WIB	18.43.03 WIB	281 20,15	281 26,66	1 37,09	3 3,19	0,03
3	Padang	18.23.49 WIB	18.32.21 WIB	281 15,04	281 38,36	1 31,85	2 58,84	0,03
4	Pekanbaru	18.20.37 WIB	18.29.05 WIB	281 16,31	281 35,79	1 31,04	2 57,49	0,03
5	Bengkulu	18.13.56 WIB	18.22.04 WIB	281 14,03	281 48,27	1 26,41	2 54,70	0,03
6	Jambi	18.10.18 WIB	18.18.23 WIB	281 14,81	281 43,07	1 26,01	2 53,18	0,03
7	Tanjung Pinang	18.08.58 WIB	18.17.05 WIB	281 16,90	281 37,79	1 26,47	2 52,63	0,03
8	Palembang	18.04.35 WIB	18.12.26 WIB	281 14,31	281 47,93	1 22,95	2 50,82	0,03
9	Bandar Lampung	18.00.38 WIB	18.08.17 WIB	281 14,34	281 55,89	1 19,83	2 49,19	0,03
10	Pangkal Pinang	17.59.51 WIB	18.07.35 WIB	281 14,69	281 46,72	1 21,45	2 48,87	0,03
11	Serang	17.56.30 WIB	18.03.59 WIB	281 14,61	281 58,87	1 17,62	2 47,50	0,03
12	Jakarta	17.53.45 WIB	18.01.09 WIB	281 14,67	281 59,56	1 16,42	2 46,38	0,03
13	Bandung	17.50.03 WIB	17.57.17 WIB	281 15,08	282 2,72	1 14,30	2 44,88	0,03
14	Semarang	17.38.39 WIB	17.45.30 WIB	281 15,28	282 4,97	1 9,43	2 40,28	0,02
15	Yogyakarta	17.38.19 WIB	17.45.07 WIB	281 15,81	282 7,73	1 8,64	2 40,15	0,02
16	Surabaya	17.29.17 WIB	17.35.48 WIB	281 15,63	282 7,79	1 5,20	2 36,57	0,02
17	Pontianak	17.48.37 WIB	17.56.04 WIB	281 16,23	281 44,59	1 17,88	2 44,29	0,03
18	Palangka Raya	17.28.40 WIB	17.35.24 WIB	281 15,09	281 53,80	1 8,61	2 36,33	0,02
19	Banjarmasin	18.25.00 WITA	18.31.33 WITA	281 14,80	281 57,15	1 6,41	2 34,89	0,02
20	Samarinda	18.17.07 WITA	18.23.33 WITA	281 16,30	281 52,86	1 4,97	2 31,83	0,02
21	Tanjungselor	18.18.49 WITA	18.25.27 WITA	281 20,07	281 47,41	1 7,33	2 32,48	0,02
22	Denpasar	18.18.14 WITA	18.24.18 WITA	281 16,83	282 14,11	0 59,39	2 32,25	0,02
23	Mataram	18.14.45 WITA	18.20.42 WITA	281 16,81	282 14,42	0 57,99	2 30,91	0,02
24	Kupang	17.43.33 WITA	17.48.20 WITA	281 18,98	282 24,80	0 43,32	2 19,27	0,02
25	Mamuju	18.08.19 WITA	18.14.22 WITA	281 15,21	281 59,20	1 0,03	2 28,45	0,02
26	Makassar	18.04.14 WITA	18.10.02 WITA	281 15,08	282 5,94	0 56,53	2 26,91	0,02
27	Palu	18.05.53 WITA	18.11.57 WITA	281 16,16	281 56,17	1 0,23	2 27,53	0,02
28	Kendari	17.52.47 WITA	17.58.16 WITA	281 15,17	282 5,36	0 52,75	2 22,64	0,02
29	Gorontalo	17.54.12 WITA	17.59.57 WITA	281 17,55	281 56,59	0 56,47	2 23,16	0,02
30	Manado	17.47.50 WITA	17.53.26 WITA	281 18,69	281 56,89	0 54,54	2 20,82	0,02
31	Sofifi	18.36.22 WIT	18.41.34 WIT	281 18,01	282 0,63	0 49,58	2 16,71	0,02
32	Ambon	18.30.21 WIT	18.35.07 WIT	281 15,51	282 9,37	0 43,87	2 14,60	0,02
33	Manokwari	18.09.02 WIT	18.13.17 WIT	281 16,99	282 9,18	0 37,69	2 7,40	0,01
34	Jayapura	17.41.12 WIT	17.44.26 WIT	281 16,49	282 17,74	0 25,24	1 58,80	0,01

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
SABTU, 23 AGUSTUS 2025 M
PENENTU AWAL BULAN RABIULAWAL 1447 H



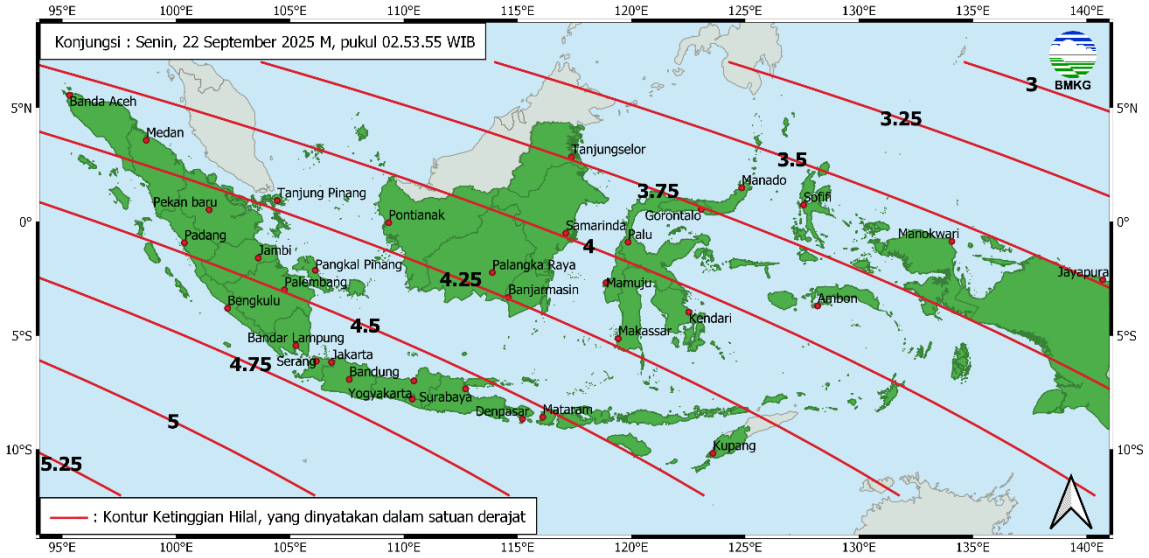
PETA ELONGASI SAAT MATAHARI TERBENAM
SABTU, 23 AGUSTUS 2025 M
PENENTU AWAL BULAN RABIULAWAL 1447 H



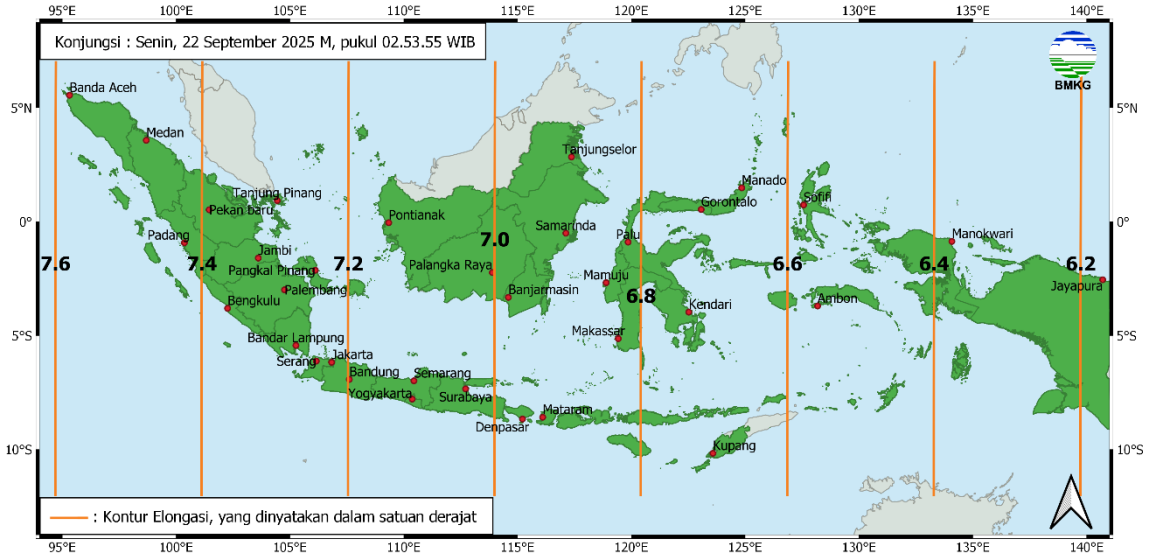
DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
SENIN, 22 SEPTEMBER 2025 M
PENENTU AWAL BULAN RABI'UL AKHIR 1447 H
IJTIMAK: SENIN, 22 SEPTEMBER 2025 PUKUL 02:53:55 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUT		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
				° '	° '	° '	° '	
1	Banda Aceh	18.34.46 WIB	18.54.19 WIB	270 11,45	265 6,69	4 4,72	7 34,88	0,37
2	Medan	18.21.16 WIB	18.41.07 WIB	270 9,92	265 20,42	4 9,51	7 28,57	0,35
3	Padang	18.14.32 WIB	18.35.39 WIB	270 6,08	265 45,84	4 27,76	7 25,43	0,34
4	Pekanbaru	18.10.11 WIB	18.30.43 WIB	270 7,42	265 39,13	4 19,54	7 23,40	0,34
5	Bengkulu	18.06.56 WIB	18.28.45 WIB	270 3,70	266 3,46	4 36,85	7 21,88	0,34
6	Jambi	18.01.33 WIB	18.22.30 WIB	270 5,71	265 52,55	4 25,42	7 19,37	0,33
7	Tanjung Pinang	17.58.14 WIB	18.18.17 WIB	270 7,96	265 40,04	4 12,99	7 17,82	0,33
8	Palembang	17.56.56 WIB	18.18.12 WIB	270 4,57	266 1,18	4 29,39	7 17,21	0,33
9	Bandar Lampung	17.54.55 WIB	18.16.54 WIB	270 2,48	266 15,17	4 38,30	7 16,27	0,32
10	Pangkal Pinang	17.51.32 WIB	18.12.22 WIB	270 5,40	265 57,76	4 23,62	7 14,69	0,32
11	Serang	17.51.20 WIB	18.13.25 WIB	270 1,94	266 19,78	4 39,41	7 14,60	0,32
12	Jakarta	17.48.38 WIB	18.10.39 WIB	270 1,94	266 20,62	4 38,47	7 13,34	0,32
13	Bandung	17.45.32 WIB	18.07.42 WIB	270 1,33	266 25,48	4 39,94	7 11,89	0,32
14	Semarang	17.34.11 WIB	17.56.01 WIB	270 1,47	266 28,04	4 35,35	7 6,59	0,31
15	Yogyakarta	17.34.29 WIB	17.56.35 WIB	270 0,76	266 32,48	4 38,35	7 6,74	0,31
16	Surabaya	17.25.06 WIB	17.46.46 WIB	270 1,31	266 31,76	4 32,76	7 2,36	0,30
17	Pontianak	17.38.39 WIB	17.58.28 WIB	270 7,43	265 49,90	4 9,52	7 8,68	0,32
18	Palangka Raya	17.20.25 WIB	17.40.23 WIB	270 5,82	266 5,46	4 11,37	7 0,18	0,30
19	Banjarmasin	18.17.37 WITA	18.37.50 WITA	270 4,92	266 11,73	4 14,57	6 58,86	0,30
20	Samarinda	18.07.31 WITA	18.26.35 WITA	270 7,53	265 59,82	3 59,06	6 54,16	0,29
21	Tanjungselor	18.06.34 WITA	18.24.35 WITA	270 10,48	265 44,08	3 44,23	6 53,72	0,30
22	Denpasar	18.15.06 WITA	18.36.52 WITA	270 0,32	266 40,94	4 33,06	6 57,70	0,29
23	Mataram	18.11.33 WITA	18.33.11 WITA	270 0,45	266 41,15	4 31,28	6 56,04	0,29
24	Kupang	17.41.39 WITA	18.02.49 WITA	269 59,55	266 55,04	4 23,54	6 42,09	0,27
25	Mamuju	18.00.26 WITA	18.19.57 WITA	270 5,76	266 12,29	4 5,00	6 50,85	0,29
26	Makassar	17.58.17 WITA	18.18.29 WITA	270 3,66	266 25,30	4 13,47	6 49,85	0,28
27	Palu	17.56.35 WITA	18.15.28 WITA	270 7,37	266 4,38	3 56,30	6 49,06	0,29
28	Kendari	17.45.55 WITA	18.05.23 WITA	270 4,87	266 22,00	4 4,00	6 44,08	0,28
29	Gorontalo	17.43.46 WITA	18.01.51 WITA	270 8,83	266 0,69	3 45,29	6 43,08	0,28
30	Manado	17.36.39 WITA	17.54.15 WITA	270 9,78	265 58,13	3 38,52	6 39,76	0,27
31	Sofifi	18.25.47 WIT	18.43.18 WIT	270 9,29	266 4,29	3 37,39	6 34,69	0,27
32	Ambon	18.23.16 WIT	18.42.00 WIT	270 5,48	266 25,62	3 53,68	6 33,52	0,26
33	Manokwari	17.59.43 WIT	18.16.57 WIT	270 8,32	266 17,87	3 33,43	6 22,54	0,25
34	Jayapura	17.33.12 WIT	17.50.08 WIT	270 7,29	266 31,50	3 29,05	6 10,19	0,23

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
SENIN, 22 SEPTEMBER 2025 M
PENENTU AWAL BULAN RABIULAKHIR 1447 H



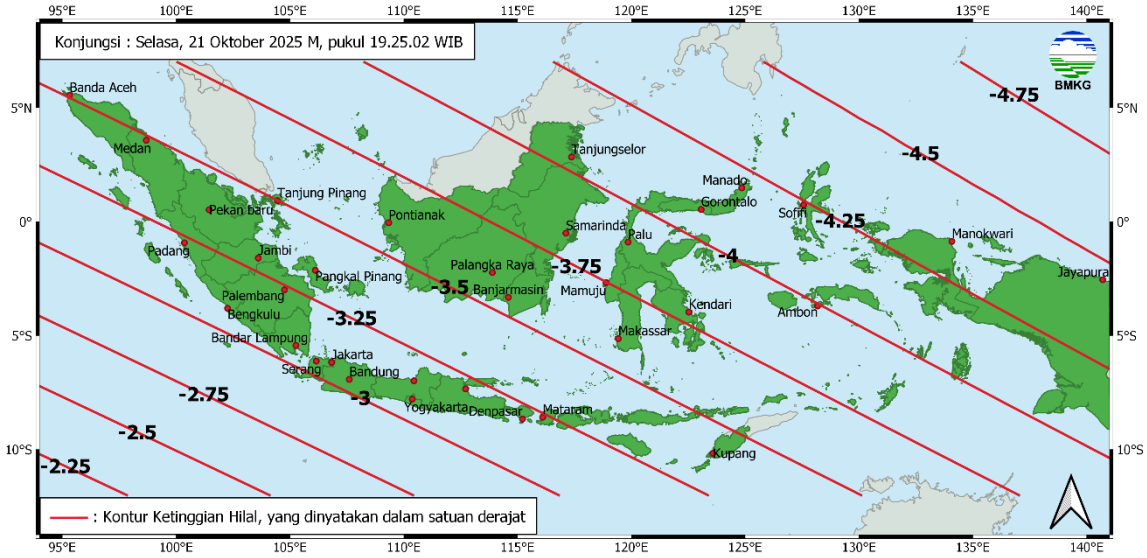
PETA ELONGASI SAAT MATAHARI TERBENAM
SENIN, 22 SEPTEMBER 2025 M
PENENTU AWAL BULAN RABIULAKHIR 1447 H



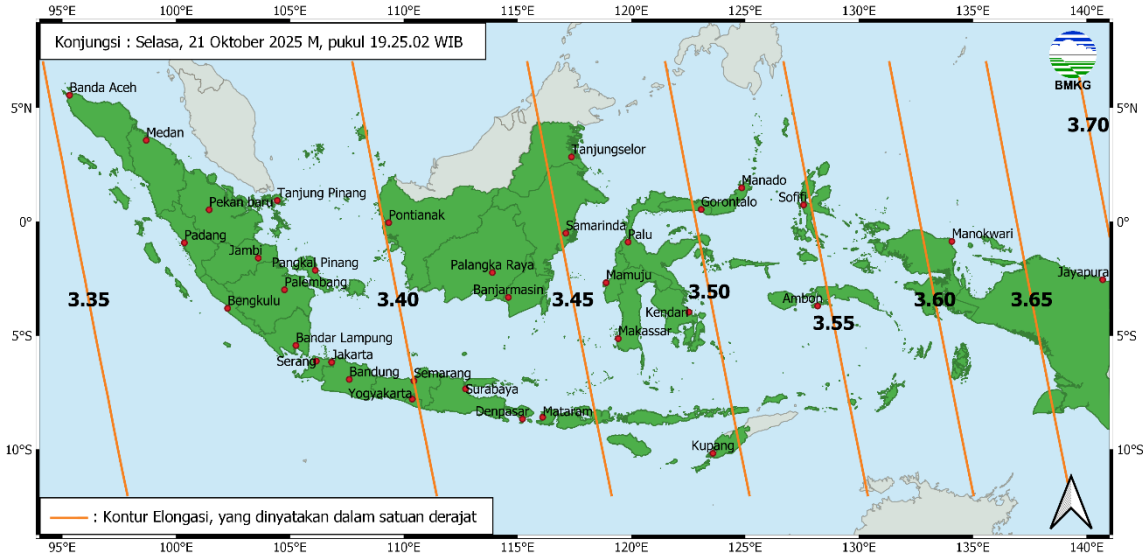
DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM SELASA, 21 OKTOBER 2025 M
PENENTU AWAL BULAN JUMADAL ULA 1447 H
IJTIMAK: SELASA, 21 OKTOBER 2025 PUKUL 19:25:02 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUT		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
				° '	° '	° '	° '	
1	Banda Aceh	18.22.27 WIB	18.10.32 WIB	259 9,12	256 23,28	-3 30,68	3 21,10	0,12
2	Medan	18.10.30 WIB	17.58.41 WIB	259 9,36	256 22,22	-3 29,34	3 21,55	0,12
3	Padang	18.07.15 WIB	17.56.19 WIB	259 6,60	256 11,57	-3 13,93	3 21,69	0,12
4	Pekanbaru	18.01.47 WIB	17.50.23 WIB	259 8,03	256 16,73	-3 22,39	3 21,96	0,12
5	Bengkulu	18.01.53 WIB	17.51.23 WIB	259 2,75	256 3,68	-3 5,28	3 21,96	0,11
6	Jambi	17.54.47 WIB	17.43.37 WIB	259 6,02	256 12,06	-3 17,91	3 22,35	0,12
7	Tanjung Pinang	17.49.31 WIB	17.37.40 WIB	259 8,51	256 20,44	-3 30,16	3 22,68	0,12
8	Palembang	17.51.15 WIB	17.40.16 WIB	259 4,19	256 8,31	-3 14,33	3 22,57	0,12
9	Bandar Lampung	17.51.09 WIB	17.40.40 WIB	258 59,93	255 59,84	-3 4,53	3 22,58	0,11
10	Pangkal Pinang	17.45.11 WIB	17.33.51 WIB	259 5,48	256 12,25	-3 20,91	3 22,97	0,12
11	Serang	17.48.06 WIB	17.37.40 WIB	258 58,55	255 57,79	-3 3,39	3 22,77	0,11
12	Jakarta	17.45.27 WIB	17.34.56 WIB	258 58,47	255 58,01	-3 4,65	3 22,95	0,12
13	Bandung	17.42.56 WIB	17.32.30 WIB	258 56,83	255 55,49	-3 2,95	3 23,13	0,12
14	Semarang	17.31.38 WIB	17.20.51 WIB	258 56,86	255 57,01	-3 9,02	3 24,00	0,12
15	Yogyakarta	17.32.34 WIB	17.21.59 WIB	258 54,91	255 53,57	-3 5,19	3 23,92	0,12
16	Surabaya	17.22.50 WIB	17.11.51 WIB	258 56,15	255 56,91	-3 12,48	3 24,77	0,12
17	Pontianak	17.30.41 WIB	17.18.29 WIB	259 8,01	256 21,64	-3 36,15	3 24,08	0,12
18	Palangka Raya	17.14.09 WIB	17.01.54 WIB	259 5,81	256 17,87	-3 36,67	3 25,59	0,12
19	Banjarmasin	18.12.11 WITA	18.00.06 WITA	259 4,26	256 14,38	-3 33,72	3 25,79	0,12
20	Samarinda	17.59.54 WITA	17.46.54 WITA	259 8,03	256 26,54	-3 49,89	3 27,11	0,13
21	Tanjungselor	17.56.22 WITA	17.42.36 WITA	259 10,28	256 37,57	-4 2,53	3 27,52	0,13
22	Denpasar	18.13.53 WITA	18.02.53 WITA	258 52,93	255 52,53	-3 12,10	3 25,62	0,12
23	Mataram	18.10.16 WITA	17.59.08 WITA	258 53,19	255 53,40	-3 14,43	3 25,99	0,12
24	Kupang	17.41.37 WITA	17.29.53 WITA	258 49,12	255 49,86	-3 23,96	3 29,35	0,12
25	Mamuju	17.54.30 WITA	17.41.46 WITA	259 5,49	256 20,02	-3 45,09	3 27,74	0,13
26	Makassar	17.54.17 WITA	17.42.00 WITA	259 1,36	256 10,58	-3 36,38	3 27,77	0,13
27	Palu	17.49.17 WITA	17.36.02 WITA	259 7,79	256 27,38	-3 53,80	3 28,37	0,13
28	Kendari	17.40.59 WITA	17.28.05 WITA	259 3,67	256 17,57	-3 47,42	3 29,43	0,13
29	Gorontalo	17.35.21 WITA	17.21.26 WITA	259 9,32	256 35,11	-4 5,21	3 30,18	0,13
30	Manado	17.27.29 WITA	17.13.10 WITA	259 10,09	256 39,93	-4 11,92	3 31,28	0,14
31	Sofifi	18.17.12 WIT	18.02.43 WIT	259 9,74	256 39,66	-4 14,52	3 32,80	0,14
32	Ambon	18.18.08 WIT	18.04.30 WIT	259 4,46	256 22,77	-3 59,82	3 32,66	0,13
33	Manokwari	17.52.23 WIT	17.37.28 WIT	259 8,66	256 39,00	-4 21,29	3 36,85	0,14
34	Jayapura	17.27.10 WIT	17.11.48 WIT	259 6,96	256 37,07	-4 27,42	3 41,48	0,15

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
SELASA, 21 OKTOBER 2025 M
PENENTU AWAL BULAN JUMADILAWAL 1447 H



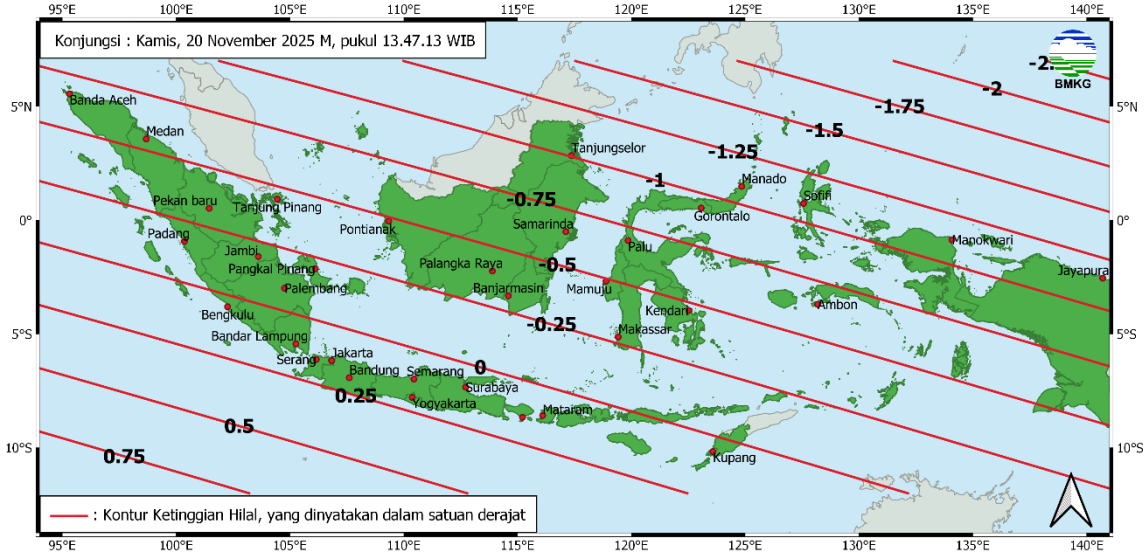
PETA ELONGASI SAAT MATAHARI TERBENAM
SELASA, 21 OKTOBER 2025 M
PENENTU AWAL BULAN JUMADILAWAL 1447 H



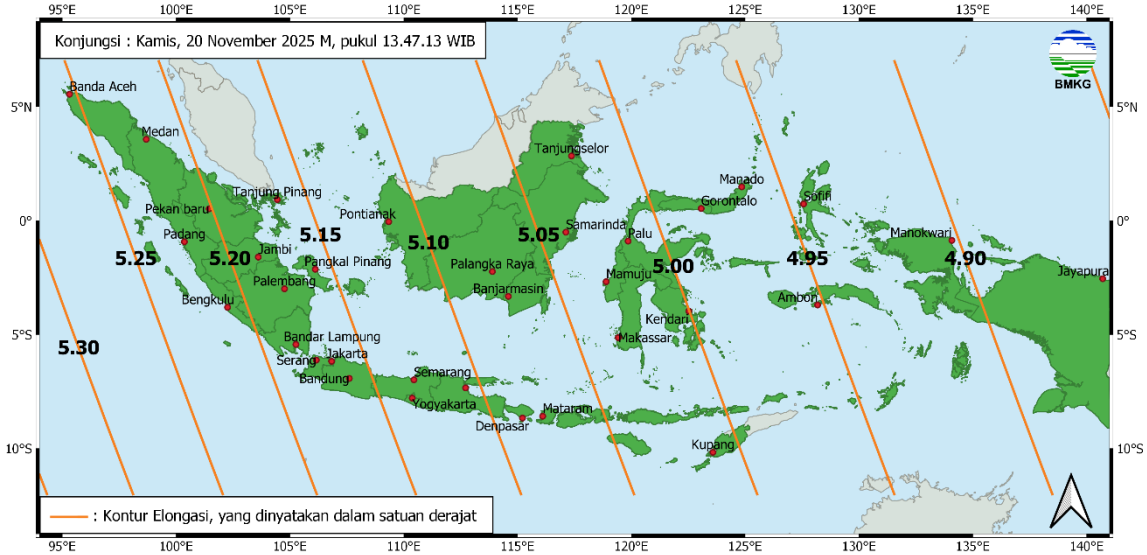
DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
KAMIS, 20 NOVEMBER 2025 M
PENENTU AWAL BULAN JUMADAL AKHIRAH 1447 H
IJTIMAK: KAMIS, 20 NOVEMBER 2025 PUKUL 13:47:13 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUT		TINGGI BULAN		ELONGASI		FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN					
				° '	° '	° '		° '		
1	Banda Aceh	18.19.56 WIB	18.17.41 WIB	250 11,17	244 56,77	0	-39,69	5	15,24	0,21
2	Medan	18.09.19 WIB	18.07.36 WIB	250 12,84	245 1,03	0	-33,17	5	13,28	0,21
3	Padang	18.09.06 WIB	18.09.20 WIB	250 10,91	245 2,87	0	-10,13	5	13,24	0,20
4	Pekanbaru	18.02.39 WIB	18.02.03 WIB	250 12,43	245 3,67	0	-19,89	5	12,09	0,20
5	Bengkulu	18.05.40 WIB	18.07.02 WIB	250 5,70	245 1,44	0	2,64	5	12,62	0,20
6	Jambi	17.57.04 WIB	17.57.12 WIB	250 10,08	245 3,93	0	-11,42	5	11,11	0,20
7	Tanjung Pinang	17.50.06 WIB	17.48.54 WIB	250 12,81	245 5,17	0	-26,87	5	9,90	0,20
8	Palembang	17.54.29 WIB	17.55.07 WIB	250 7,61	245 3,23	0	-5,58	5	10,66	0,20
9	Bandar Lampung	17.56.02 WIB	17.57.46 WIB	250 1,41	245 0,10	0	6,79	5	10,93	0,19
10	Pangkal Pinang	17.47.50 WIB	17.47.52 WIB	250 9,30	245 4,56	0	-12,35	5	9,52	0,20
11	Serang	17.53.27 WIB	17.55.23 WIB	249 59,28	244 59,13	0	9,08	5	10,48	0,19
12	Jakarta	17.50.50 WIB	17.52.42 WIB	249 59,13	244 59,21	0	8,33	5	10,03	0,19
13	Bandung	17.48.50 WIB	17.50.58 WIB	249 56,56	244 57,88	0	11,13	5	9,69	0,19
14	Semarang	17.37.34 WIB	17.39.20 WIB	249 56,45	244 58,43	0	7,10	5	7,81	0,19
15	Yogyakarta	17.39.03 WIB	17.41.13 WIB	249 53,40	244 56,51	0	11,46	5	8,05	0,19
16	Surabaya	17.29.00 WIB	17.30.37 WIB	249 55,23	244 58,14	0	5,47	5	6,43	0,19
17	Pontianak	17.31.55 WIB	17.30.32 WIB	250 12,24	245 7,32	0	-29,12	5	6,90	0,20
18	Palangka Raya	17.16.51 WIB	17.15.54 WIB	250 9,41	245 7,58	0	-23,98	5	4,55	0,19
19	Banjarmasin	18.15.38 WITA	18.15.05 WITA	250 7,27	245 6,45	0	-19,04	5	4,37	0,19
20	Samarinda	18.01.26 WITA	17.59.14 WITA	250 12,05	245 10,65	0	-39,20	5	2,29	0,19
21	Tanjungselor	17.55.39 WITA	17.51.50 WITA	250 13,73	245 12,09	-1	0,52	5	1,47	0,20
22	Denpasar	18.20.58 WITA	18.22.52 WITA	249 49,99	244 55,16	0	8,59	5	5,18	0,19
23	Mataram	18.17.18 WITA	18.19.03 WITA	249 50,36	244 55,55	0	6,81	5	4,62	0,19
24	Kupang	17.49.44 WITA	17.51.12 WITA	249 43,37	244 51,65	0	3,56	5	0,67	0,18
25	Mamuju	17.57.30 WITA	17.56.05 WITA	250 8,76	245 8,98	0	-29,52	5	1,73	0,19
26	Makassar	17.58.56 WITA	17.58.36 WITA	250 2,83	245 4,90	0	-16,73	5	1,93	0,19
27	Palu	17.51.04 WITA	17.48.41 WITA	250 11,68	245 11,53	0	-41,48	5	0,85	0,19
28	Kendari	17.44.51 WITA	17.43.33 WITA	250 6,06	245 8,19	0	-28,12	5	0,01	0,19
29	Gorontalo	17.36.11 WITA	17.32.42 WITA	250 13,24	245 14,27	0	-55,95	4	58,89	0,19
30	Manado	17.27.41 WITA	17.23.31 WITA	250 13,84	245 15,79	-1	5,47	4	57,84	0,19
31	Sofifi	18.17.54 WIT	18.13.44 WIT	250 13,55	245 16,65	-1	5,62	4	56,68	0,19
32	Ambon	18.21.49 WIT	18.19.37 WIT	250 6,92	245 10,68	0	-39,06	4	57,14	0,19
33	Manokwari	17.54.08 WIT	17.49.51 WIT	250 12,25	245 17,90	-1	7,44	4	54,12	0,19
34	Jayapura	17.30.03 WIT	17.25.38 WIT	250 9,83	245 17,70	-1	9,10	4	51,91	0,19

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
KAMIS, 20 NOVEMBER 2025 M
PENENTU AWAL BULAN JUMADILAKHIR 1447 H



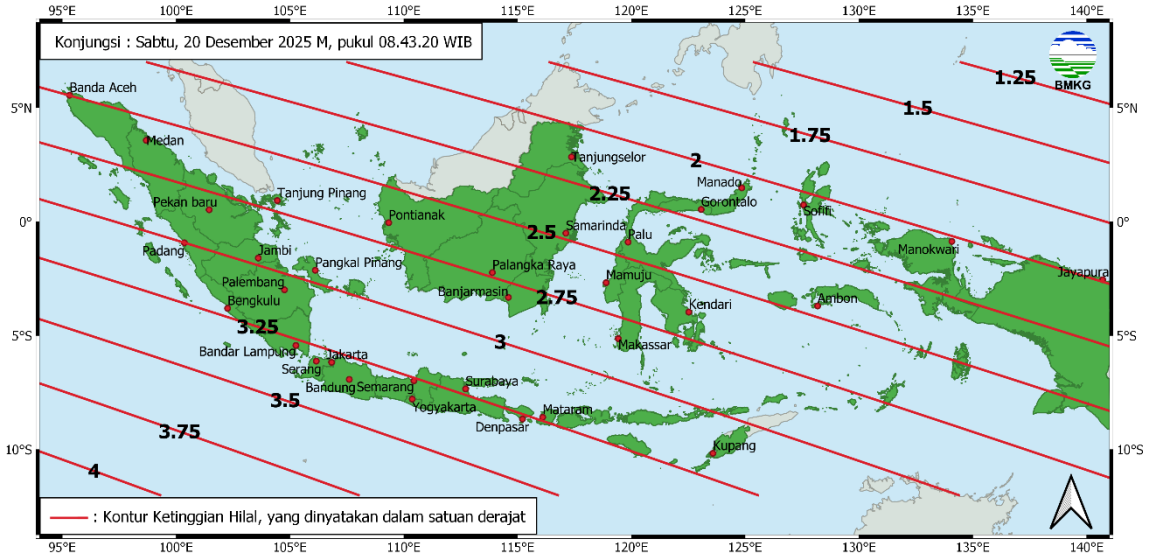
PETA ELONGASI SAAT MATAHARI TERBENAM
KAMIS, 20 NOVEMBER 2025 M
PENENTU AWAL BULAN JUMADILAKHIR 1447 H



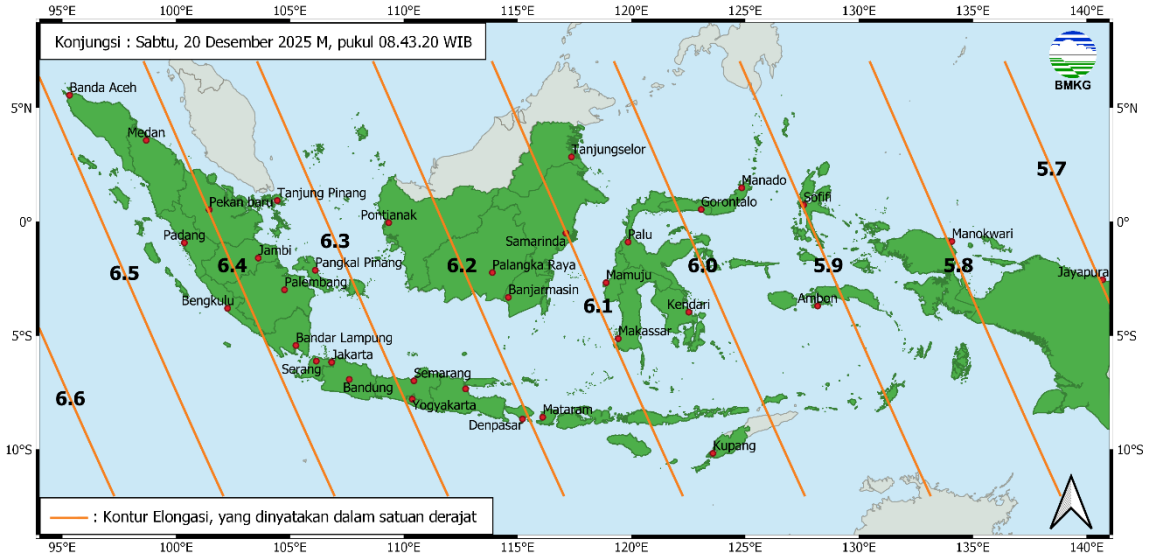
DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
SABTU, 20 DESEMBER 2025 M
PENENTU AWAL BULAN RAJAB 1447 H
IJTIMAK: SABTU, 20 DESEMBER 2025 PUKUL 08:43:20 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUT		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
				° '	° '	° '	° '	
1	Banda Aceh	18.30.24 WIB	18.44.46 WIB	246 32,13	241 24,37	2 29,76	6 28,78	0,27
2	Medan	18.20.22 WIB	18.35.11 WIB	246 34,36	241 35,92	2 36,12	6 25,70	0,27
3	Padang	18.21.28 WIB	18.38.12 WIB	246 32,79	241 56,30	2 59,85	6 26,04	0,26
4	Pekanbaru	18.14.36 WIB	18.30.29 WIB	246 34,30	241 50,44	2 49,53	6 23,94	0,26
5	Bengkulu	18.18.53 WIB	18.36.42 WIB	246 26,95	242 5,49	3 12,72	6 25,25	0,26
6	Jambi	18.09.38 WIB	18.26.13 WIB	246 31,77	241 58,41	2 58,00	6 22,44	0,26
7	Tanjung Pinang	18.01.55 WIB	18.17.11 WIB	246 34,56	241 48,66	2 41,95	6 20,11	0,26
8	Palembang	18.07.27 WIB	18.24.32 WIB	246 28,99	242 2,72	3 3,84	6 21,78	0,25
9	Bandar Lampung	18.09.44 WIB	18.27.53 WIB	246 21,95	242 8,83	3 16,33	6 22,47	0,25
10	Pangkal Pinang	18.00.33 WIB	18.17.02 WIB	246 30,81	241 59,89	2 56,66	6 19,70	0,25
11	Serang	18.07.21 WIB	18.25.42 WIB	246 19,47	242 9,96	3 18,44	6 21,75	0,25
12	Jakarta	18.04.45 WIB	18.23.02 WIB	246 19,27	242 9,88	3 17,54	6 20,96	0,25
13	Bandung	18.02.59 WIB	18.21.30 WIB	246 16,28	242 10,90	3 20,15	6 20,43	0,25
14	Semarang	17.51.44 WIB	18.09.52 WIB	246 16,03	242 10,15	3 15,54	6 17,07	0,24
15	Yogyakarta	17.53.27 WIB	18.12.00 WIB	246 12,52	242 11,18	3 19,85	6 17,59	0,24
16	Surabaya	17.43.16 WIB	18.01.16 WIB	246 14,53	242 9,92	3 13,44	6 14,58	0,24
17	Pontianak	17.44.01 WIB	17.59.03 WIB	246 33,83	241 52,34	2 39,09	6 14,80	0,25
18	Palangka Raya	17.29.36 WIB	17.45.01 WIB	246 30,62	241 59,19	2 43,67	6 10,59	0,24
19	Banjarmasin	18.28.42 WITA	18.44.31 WITA	246 28,21	242 2,02	2 48,54	6 10,33	0,24
20	Samarinda	18.13.41 WITA	18.27.48 WITA	246 33,35	241 53,49	2 28,25	6 6,03	0,24
21	Tanjungselor	18.06.54 WITA	18.19.22 WITA	246 34,76	241 40,56	2 8,29	6 4,11	0,24
22	Denpasar	18.35.38 WITA	18.53.54 WITA	246 8,35	242 10,29	3 15,93	6 12,34	0,24
23	Mataram	18.31.56 WITA	18.50.02 WITA	246 8,74	242 9,93	3 14,00	6 11,27	0,23
24	Kupang	18.04.52 WITA	18.22.39 WITA	246 0,28	242 7,40	3 9,14	6 3,54	0,22
25	Mamuju	18.10.23 WITA	18.25.17 WITA	246 29,71	241 59,71	2 37,49	6 5,10	0,23
26	Makassar	18.12.33 WITA	18.28.32 WITA	246 22,99	242 4,88	2 50,08	6 5,71	0,23
27	Palu	18.03.25 WITA	18.17.20 WITA	246 32,86	241 54,54	2 25,77	6 3,14	0,23
28	Kendari	17.58.07 WITA	18.13.06 WITA	246 26,53	242 2,05	2 38,37	6 1,66	0,23
29	Gorontalo	17.48.06 WITA	18.00.52 WITA	246 34,34	241 49,65	2 12,02	5 58,90	0,23
30	Manado	17.39.19 WITA	17.51.23 WITA	246 34,81	241 46,23	2 3,46	5 56,50	0,23
31	Sofifi	18.29.45 WIT	18.41.47 WIT	246 34,48	241 48,85	2 3,17	5 53,93	0,22
32	Ambon	18.34.59 WIT	18.49.03 WIT	246 27,27	242 0,47	2 27,12	5 55,33	0,22
33	Manokwari	18.06.28 WIT	18.18.19 WIT	246 32,92	241 53,28	2 1,19	5 47,82	0,22
34	Jayapura	17.42.53 WIT	17.54.35 WIT	246 30,03	241 56,31	1 59,33	5 41,86	0,21

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
SABTU, 20 DESEMBER 2025 M
PENENTU AWAL BULAN RAJAB 1447 H



PETA ELONGASI SAAT MATAHARI TERBENAM
SABTU, 20 DESEMBER 2025 M
PENENTU AWAL BULAN RAJAB 1447 H



POSISI MATAHARI DAN BULAN TAHUN 2025 M

1 Januari 2025

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	280° 49' 06"	-0.64"	281° 45' 33"	-22° 59' 54"	0.9833524	16'15.88"	23° 26' 18"	-3 m 27 s
1	280° 51' 39"	-0.64"	281° 48' 18"	-22° 59' 41"	0.9833518	16'15.88"	23° 26' 18"	-3 m 28 s
2	280° 54' 12"	-0.63"	281° 51' 04"	-22° 59' 29"	0.9833512	16'15.88"	23° 26' 18"	-3 m 29 s
3	280° 56' 45"	-0.63"	281° 53' 49"	-22° 59' 16"	0.9833507	16'15.88"	23° 26' 18"	-3 m 30 s
4	280° 59' 18"	-0.63"	281° 56' 35"	-22° 59' 04"	0.9833501	16'15.88"	23° 26' 18"	-3 m 32 s
5	281° 01' 51"	-0.63"	281° 59' 21"	-22° 58' 51"	0.9833495	16'15.88"	23° 26' 18"	-3 m 33 s
6	281° 04' 24"	-0.62"	282° 02' 06"	-22° 58' 39"	0.9833490	16'15.88"	23° 26' 18"	-3 m 34 s
7	281° 06' 57"	-0.62"	282° 04' 52"	-22° 58' 26"	0.9833485	16'15.88"	23° 26' 18"	-3 m 35 s
8	281° 09' 30"	-0.62"	282° 07' 37"	-22° 58' 13"	0.9833479	16'15.88"	23° 26' 18"	-3 m 36 s
9	281° 12' 02"	-0.61"	282° 10' 23"	-22° 58' 00"	0.9833474	16'15.88"	23° 26' 18"	-3 m 37 s
10	281° 14' 35"	-0.61"	282° 13' 08"	-22° 57' 47"	0.9833469	16'15.88"	23° 26' 18"	-3 m 39 s
11	281° 17' 08"	-0.61"	282° 15' 54"	-22° 57' 35"	0.9833463	16'15.88"	23° 26' 18"	-3 m 40 s
12	281° 19' 41"	-0.61"	282° 18' 39"	-22° 57' 22"	0.9833458	16'15.88"	23° 26' 18"	-3 m 41 s
13	281° 22' 14"	-0.60"	282° 21' 25"	-22° 57' 09"	0.9833453	16'15.88"	23° 26' 18"	-3 m 42 s
14	281° 24' 47"	-0.60"	282° 24' 10"	-22° 56' 56"	0.9833448	16'15.88"	23° 26' 18"	-3 m 43 s
15	281° 27' 20"	-0.60"	282° 26' 56"	-22° 56' 43"	0.9833443	16'15.88"	23° 26' 18"	-3 m 44 s
16	281° 29' 53"	-0.59"	282° 29' 41"	-22° 56' 29"	0.9833439	16'15.88"	23° 26' 18"	-3 m 46 s
17	281° 32' 26"	-0.59"	282° 32' 27"	-22° 56' 16"	0.9833434	16'15.88"	23° 26' 18"	-3 m 47 s
18	281° 34' 59"	-0.59"	282° 35' 12"	-22° 56' 03"	0.9833429	16'15.89"	23° 26' 18"	-3 m 48 s
19	281° 37' 32"	-0.58"	282° 37' 58"	-22° 55' 50"	0.9833424	16'15.89"	23° 26' 18"	-3 m 49 s
20	281° 40' 05"	-0.58"	282° 40' 43"	-22° 55' 36"	0.9833420	16'15.89"	23° 26' 18"	-3 m 50 s
21	281° 42' 38"	-0.58"	282° 43' 28"	-22° 55' 23"	0.9833415	16'15.89"	23° 26' 18"	-3 m 51 s
22	281° 45' 11"	-0.57"	282° 46' 14"	-22° 55' 10"	0.9833411	16'15.89"	23° 26' 18"	-3 m 53 s
23	281° 47' 44"	-0.57"	282° 48' 59"	-22° 54' 56"	0.9833407	16'15.89"	23° 26' 18"	-3 m 54 s
24	281° 50' 17"	-0.57"	282° 51' 45"	-22° 54' 43"	0.9833402	16'15.89"	23° 26' 18"	-3 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	293° 53' 60"	-4° 36' 45"	296° 39' 57"	-25° 51' 55"	0° 57' 27"	15' 39.19"	278° 45' 45"	0.01462
1	294° 27' 37"	-4° 35' 35"	297° 16' 20"	-25° 44' 43"	0° 57' 28"	15' 39.54"	277° 46' 14"	0.01565
2	295° 01' 16"	-4° 34' 24"	297° 52' 40"	-25° 37' 21"	0° 57' 29"	15' 39.88"	276° 49' 40"	0.01672
3	295° 34' 56"	-4° 33' 11"	298° 28' 56"	-25° 29' 50"	0° 57' 30"	15' 40.23"	275° 55' 48"	0.01783
4	296° 08' 37"	-4° 31' 56"	299° 05' 10"	-25° 22' 10"	0° 57' 32"	15' 40.57"	275° 4' 22"	0.01898
5	296° 42' 19"	-4° 30' 40"	299° 41' 21"	-25° 14' 21"	0° 57' 33"	15' 40.92"	274° 15' 12"	0.02018
6	297° 16' 03"	-4° 29' 23"	300° 17' 28"	-25° 06' 22"	0° 57' 34"	15' 41.26"	273° 28' 07"	0.02141
7	297° 49' 48"	-4° 28' 03"	300° 53' 32"	-24° 58' 15"	0° 57' 35"	15' 41.60"	272° 42' 57"	0.02268
8	298° 23' 34"	-4° 26' 42"	301° 29' 32"	-24° 49' 58"	0° 57' 37"	15' 41.94"	271° 59' 33"	0.02399
9	298° 57' 21"	-4° 25' 20"	302° 05' 30"	-24° 41' 32"	0° 57' 38"	15' 42.27"	271° 17' 48"	0.02535
10	299° 31' 10"	-4° 23' 55"	302° 41' 23"	-24° 32' 58"	0° 57' 39"	15' 42.60"	270° 37' 35"	0.02674
11	300° 04' 60"	-4° 22' 29"	303° 17' 13"	-24° 24' 14"	0° 57' 40"	15' 42.94"	269° 58' 47"	0.02817
12	300° 38' 51"	-4° 21' 02"	303° 52' 60"	-24° 15' 22"	0° 57' 42"	15' 43.27"	269° 21' 19"	0.02965
13	301° 12' 43"	-4° 19' 33"	304° 28' 43"	-24° 06' 21"	0° 57' 43"	15' 43.59"	268° 45' 06"	0.03116
14	301° 46' 37"	-4° 18' 02"	305° 04' 22"	-23° 57' 12"	0° 57' 44"	15' 43.92"	268° 10' 02"	0.03271
15	302° 20' 31"	-4° 16' 30"	305° 39' 57"	-23° 47' 53"	0° 57' 45"	15' 44.24"	267° 36' 05"	0.03431
16	302° 54' 27"	-4° 14' 56"	306° 15' 29"	-23° 38' 27"	0° 57' 46"	15' 44.57"	267° 3' 09"	0.03594
17	303° 28' 24"	-4° 13' 21"	306° 50' 57"	-23° 28' 51"	0° 57' 47"	15' 44.89"	266° 31' 12"	0.03761
18	304° 02' 21"	-4° 11' 44"	307° 26' 21"	-23° 19' 08"	0° 57' 49"	15' 45.20"	266° 0' 10"	0.03933
19	304° 36' 20"	-4° 10' 05"	308° 01' 41"	-23° 09' 16"	0° 57' 50"	15' 45.52"	265° 29' 60"	0.04108
20	305° 10' 21"	-4° 08' 25"	308° 36' 57"	-22° 59' 16"	0° 57' 51"	15' 45.83"	265° 0' 39"	0.04287
21	305° 44' 22"	-4° 06' 44"	309° 12' 09"	-22° 49' 08"	0° 57' 52"	15' 46.14"	264° 32' 05"	0.04470
22	306° 18' 24"	-4° 05' 00"	309° 47' 17"	-22° 38' 51"	0° 57' 53"	15' 46.45"	264° 4' 16"	0.04658
23	306° 52' 27"	-4° 03' 16"	310° 22' 21"	-22° 28' 27"	0° 57' 54"	15' 46.76"	263° 37' 10"	0.04849
24	307° 26' 32"	-4° 01' 30"	310° 57' 21"	-22° 17' 54"	0° 57' 55"	15' 47.07"	263° 10' 44"	0.05044

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	281° 50' 17"	-0.57"	282° 51' 45"	-22° 54' 43"	0.9833402	16' 15.89"	23° 26' 18"	-3 m 55 s
1	281° 52' 50"	-0.56"	282° 54' 30"	-22° 54' 29"	0.9833398	16' 15.89"	23° 26' 18"	-3 m 56 s
2	281° 55' 22"	-0.56"	282° 57' 15"	-22° 54' 15"	0.9833394	16' 15.89"	23° 26' 18"	-3 m 57 s
3	281° 57' 55"	-0.56"	283° 00' 01"	-22° 54' 02"	0.9833390	16' 15.89"	23° 26' 18"	-3 m 58 s
4	282° 00' 28"	-0.55"	283° 02' 46"	-22° 53' 48"	0.9833386	16' 15.89"	23° 26' 18"	-3 m 60 s
5	282° 03' 01"	-0.55"	283° 05' 32"	-22° 53' 34"	0.9833382	16' 15.89"	23° 26' 18"	-4 m 01 s
6	282° 05' 34"	-0.54"	283° 08' 17"	-22° 53' 20"	0.9833378	16' 15.89"	23° 26' 18"	-4 m 02 s
7	282° 08' 07"	-0.54"	283° 11' 02"	-22° 53' 07"	0.9833374	16' 15.89"	23° 26' 18"	-4 m 03 s
8	282° 10' 40"	-0.54"	283° 13' 47"	-22° 52' 53"	0.9833370	16' 15.89"	23° 26' 18"	-4 m 04 s
9	282° 13' 13"	-0.53"	283° 16' 33"	-22° 52' 39"	0.9833366	16' 15.89"	23° 26' 18"	-4 m 05 s
10	282° 15' 46"	-0.53"	283° 19' 18"	-22° 52' 25"	0.9833363	16' 15.89"	23° 26' 18"	-4 m 07 s
11	282° 18' 19"	-0.52"	283° 22' 03"	-22° 52' 11"	0.9833359	16' 15.89"	23° 26' 18"	-4 m 08 s
12	282° 20' 52"	-0.52"	283° 24' 49"	-22° 51' 57"	0.9833356	16' 15.89"	23° 26' 18"	-4 m 09 s
13	282° 23' 25"	-0.52"	283° 27' 34"	-22° 51' 42"	0.9833352	16' 15.89"	23° 26' 18"	-4 m 10 s
14	282° 25' 58"	-0.51"	283° 30' 19"	-22° 51' 28"	0.9833349	16' 15.89"	23° 26' 18"	-4 m 11 s
15	282° 28' 31"	-0.51"	283° 33' 04"	-22° 51' 14"	0.9833345	16' 15.89"	23° 26' 18"	-4 m 12 s
16	282° 31' 04"	-0.50"	283° 35' 50"	-22° 50' 60"	0.9833342	16' 15.89"	23° 26' 18"	-4 m 13 s
17	282° 33' 37"	-0.50"	283° 38' 35"	-22° 50' 45"	0.9833339	16' 15.89"	23° 26' 18"	-4 m 15 s
18	282° 36' 09"	-0.50"	283° 41' 20"	-22° 50' 31"	0.9833336	16' 15.89"	23° 26' 18"	-4 m 16 s
19	282° 38' 42"	-0.49"	283° 44' 05"	-22° 50' 17"	0.9833333	16' 15.89"	23° 26' 18"	-4 m 17 s
20	282° 41' 15"	-0.49"	283° 46' 51"	-22° 50' 02"	0.9833330	16' 15.90"	23° 26' 18"	-4 m 18 s
21	282° 43' 48"	-0.48"	283° 49' 36"	-22° 49' 48"	0.9833327	16' 15.90"	23° 26' 18"	-4 m 19 s
22	282° 46' 21"	-0.48"	283° 52' 21"	-22° 49' 33"	0.9833324	16' 15.90"	23° 26' 18"	-4 m 20 s
23	282° 48' 54"	-0.47"	283° 55' 06"	-22° 49' 18"	0.9833321	16' 15.90"	23° 26' 18"	-4 m 21 s
24	282° 51' 27"	-0.47"	283° 57' 51"	-22° 49' 04"	0.9833319	16' 15.90"	23° 26' 18"	-4 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	307° 26' 32"	-4° 01' 30"	310° 57' 21"	-22° 17' 54"	0° 57' 55"	15' 47.07"	263° 10' 44"	0.05044
1	308° 00' 37"	-3° 59' 42"	311° 32' 17"	-22° 07' 14"	0° 57' 57"	15' 47.37"	262° 44' 57"	0.05242
2	308° 34' 44"	-3° 57' 53"	312° 07' 09"	-21° 56' 26"	0° 57' 58"	15' 47.67"	262° 19' 47"	0.05445
3	309° 08' 51"	-3° 56' 02"	312° 41' 56"	-21° 45' 30"	0° 57' 59"	15' 47.97"	261° 55' 13"	0.05652
4	309° 42' 59"	-3° 54' 10"	313° 16' 39"	-21° 34' 27"	0° 57' 60"	15' 48.27"	261° 31' 13"	0.05862
5	310° 17' 09"	-3° 52' 16"	313° 51' 19"	-21° 23' 15"	0° 58' 01"	15' 48.56"	261° 7' 46"	0.06077
6	310° 51' 19"	-3° 50' 21"	314° 25' 54"	-21° 11' 57"	0° 58' 02"	15' 48.85"	260° 44' 50"	0.06295
7	311° 25' 31"	-3° 48' 25"	315° 00' 25"	-21° 00' 31"	0° 58' 03"	15' 49.14"	260° 22' 25"	0.06517
8	311° 59' 43"	-3° 46' 27"	315° 34' 51"	-20° 48' 58"	0° 58' 04"	15' 49.43"	260° 0' 29"	0.06743
9	312° 33' 56"	-3° 44' 27"	316° 09' 14"	-20° 37' 17"	0° 58' 05"	15' 49.72"	259° 39' 02"	0.06973
10	313° 08' 10"	-3° 42' 27"	316° 43' 32"	-20° 25' 29"	0° 58' 06"	15' 50.00"	259° 18' 02"	0.07206
11	313° 42' 26"	-3° 40' 24"	317° 17' 46"	-20° 13' 34"	0° 58' 07"	15' 50.28"	258° 57' 28"	0.07443
12	314° 16' 42"	-3° 38' 21"	317° 51' 56"	-20° 01' 33"	0° 58' 08"	15' 50.56"	258° 37' 21"	0.07684
13	314° 50' 58"	-3° 36' 16"	318° 26' 01"	-19° 49' 24"	0° 58' 09"	15' 50.84"	258° 17' 38"	0.07929
14	315° 25' 16"	-3° 34' 09"	319° 00' 03"	-19° 37' 08"	0° 58' 10"	15' 51.11"	257° 58' 20"	0.08178
15	315° 59' 35"	-3° 32' 01"	319° 33' 60"	-19° 24' 46"	0° 58' 11"	15' 51.39"	257° 39' 25"	0.08430
16	316° 33' 54"	-3° 29' 52"	320° 07' 53"	-19° 12' 16"	0° 58' 12"	15' 51.66"	257° 20' 53"	0.08686
17	317° 08' 15"	-3° 27' 42"	320° 41' 42"	-18° 59' 41"	0° 58' 13"	15' 51.92"	257° 2' 44"	0.08946
18	317° 42' 36"	-3° 25' 30"	321° 15' 26"	-18° 46' 59"	0° 58' 14"	15' 52.19"	256° 44' 56"	0.09209
19	318° 16' 58"	-3° 23' 17"	321° 49' 07"	-18° 34' 10"	0° 58' 15"	15' 52.45"	256° 27' 30"	0.09476
20	318° 51' 21"	-3° 21' 03"	322° 22' 43"	-18° 21' 15"	0° 58' 16"	15' 52.71"	256° 10' 24"	0.09746
21	319° 25' 45"	-3° 18' 47"	322° 56' 15"	-18° 08' 13"	0° 58' 17"	15' 52.97"	255° 53' 39"	0.10020
22	320° 00' 09"	-3° 16' 30"	323° 29' 44"	-17° 55' 06"	0° 58' 18"	15' 53.23"	255° 37' 14"	0.10298
23	320° 34' 34"	-3° 14' 12"	324° 03' 08"	-17° 41' 52"	0° 58' 19"	15' 53.48"	255° 21' 08"	0.10579
24	321° 09' 00"	-3° 11' 52"	324° 36' 28"	-17° 28' 33"	0° 58' 20"	15' 53.74"	255° 5' 21"	0.10864

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	282° 51' 27"	-0.47"	283° 57' 51"	-22° 49' 04"	0.9833319	16'15.90"	23° 26' 18"	-4 m 23 s
1	282° 54' 00"	-0.47"	284° 00' 36"	-22° 48' 49"	0.9833316	16'15.90"	23° 26' 18"	-4 m 24 s
2	282° 56' 33"	-0.46"	284° 03' 22"	-22° 48' 34"	0.9833313	16'15.90"	23° 26' 18"	-4 m 25 s
3	282° 59' 06"	-0.46"	284° 06' 07"	-22° 48' 20"	0.9833311	16'15.90"	23° 26' 18"	-4 m 26 s
4	283° 01' 39"	-0.45"	284° 08' 52"	-22° 48' 05"	0.9833308	16'15.90"	23° 26' 18"	-4 m 27 s
5	283° 04' 12"	-0.45"	284° 11' 37"	-22° 47' 50"	0.9833306	16'15.90"	23° 26' 18"	-4 m 28 s
6	283° 06' 45"	-0.44"	284° 14' 22"	-22° 47' 35"	0.9833304	16'15.90"	23° 26' 18"	-4 m 30 s
7	283° 09' 18"	-0.44"	284° 17' 07"	-22° 47' 20"	0.9833302	16'15.90"	23° 26' 18"	-4 m 31 s
8	283° 11' 51"	-0.43"	284° 19' 52"	-22° 47' 05"	0.9833299	16'15.90"	23° 26' 18"	-4 m 32 s
9	283° 14' 24"	-0.43"	284° 22' 37"	-22° 46' 50"	0.9833297	16'15.90"	23° 26' 18"	-4 m 33 s
10	283° 16' 56"	-0.42"	284° 25' 22"	-22° 46' 35"	0.9833295	16'15.90"	23° 26' 18"	-4 m 34 s
11	283° 19' 29"	-0.42"	284° 28' 07"	-22° 46' 19"	0.9833293	16'15.90"	23° 26' 18"	-4 m 35 s
12	283° 22' 02"	-0.41"	284° 30' 52"	-22° 46' 04"	0.9833291	16'15.90"	23° 26' 18"	-4 m 36 s
13	283° 24' 34"	-0.41"	284° 33' 36"	-22° 45' 49"	0.9833290	16'15.90"	23° 26' 18"	-4 m 38 s
14	283° 27' 07"	-0.41"	284° 36' 21"	-22° 45' 34"	0.9833288	16'15.90"	23° 26' 18"	-4 m 39 s
15	283° 29' 40"	-0.40"	284° 39' 06"	-22° 45' 18"	0.9833286	16'15.90"	23° 26' 18"	-4 m 40 s
16	283° 32' 13"	-0.40"	284° 41' 51"	-22° 45' 03"	0.9833285	16'15.90"	23° 26' 18"	-4 m 41 s
17	283° 34' 46"	-0.39"	284° 44' 36"	-22° 44' 47"	0.9833283	16'15.90"	23° 26' 18"	-4 m 42 s
18	283° 37' 19"	-0.39"	284° 47' 21"	-22° 44' 32"	0.9833281	16'15.90"	23° 26' 18"	-4 m 43 s
19	283° 39' 52"	-0.38"	284° 50' 06"	-22° 44' 16"	0.9833280	16'15.90"	23° 26' 18"	-4 m 44 s
20	283° 42' 25"	-0.38"	284° 52' 51"	-22° 44' 01"	0.9833279	16'15.90"	23° 26' 18"	-4 m 45 s
21	283° 44' 58"	-0.37"	284° 55' 36"	-22° 43' 45"	0.9833277	16'15.90"	23° 26' 18"	-4 m 47 s
22	283° 47' 31"	-0.37"	284° 58' 21"	-22° 43' 29"	0.9833276	16'15.90"	23° 26' 18"	-4 m 48 s
23	283° 50' 04"	-0.36"	285° 01' 06"	-22° 43' 14"	0.9833275	16'15.90"	23° 26' 18"	-4 m 49 s
24	283° 52' 37"	-0.36"	285° 03' 51"	-22° 42' 58"	0.9833274	16'15.90"	23° 26' 18"	-4 m 50 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	321° 09' 00"	-3° 11' 52"	324° 36' 28"	-17° 28' 33"	0° 58' 20"	15' 53.74"	255° 5' 21"	0.10864
1	321° 43' 27"	-3° 09' 32"	325° 09' 44"	-17° 15' 07"	0° 58' 21"	15' 53.99"	254° 49' 52"	0.11153
2	322° 17' 55"	-3° 07' 10"	325° 42' 56"	-17° 01' 36"	0° 58' 22"	15' 54.23"	254° 34' 42"	0.11444
3	322° 52' 23"	-3° 04' 47"	326° 16' 04"	-16° 47' 59"	0° 58' 23"	15' 54.48"	254° 19' 51"	0.11740
4	323° 26' 52"	-3° 02' 22"	326° 49' 08"	-16° 34' 16"	0° 58' 24"	15' 54.72"	254° 5' 16"	0.12038
5	324° 01' 22"	-2° 59' 57"	327° 22' 09"	-16° 20' 28"	0° 58' 24"	15' 54.96"	253° 50' 59"	0.12341
6	324° 35' 52"	-2° 57' 30"	327° 55' 05"	-16° 06' 34"	0° 58' 25"	15' 55.20"	253° 36' 59"	0.12646
7	325° 10' 24"	-2° 55' 02"	328° 27' 58"	-15° 52' 35"	0° 58' 26"	15' 55.44"	253° 23' 16"	0.12955
8	325° 44' 55"	-2° 52' 33"	329° 00' 47"	-15° 38' 30"	0° 58' 27"	15' 55.67"	253° 9' 50"	0.13268
9	326° 19' 28"	-2° 50' 03"	329° 33' 32"	-15° 24' 20"	0° 58' 28"	15' 55.90"	252° 56' 39"	0.13583
10	326° 54' 01"	-2° 47' 32"	330° 06' 14"	-15° 10' 05"	0° 58' 29"	15' 56.13"	252° 43' 45"	0.13902
11	327° 28' 35"	-2° 44' 59"	330° 38' 51"	-14° 55' 45"	0° 58' 30"	15' 56.36"	252° 31' 06"	0.14225
12	328° 03' 10"	-2° 42' 26"	331° 11' 26"	-14° 41' 20"	0° 58' 30"	15' 56.58"	252° 18' 43"	0.14550
13	328° 37' 45"	-2° 39' 52"	331° 43' 56"	-14° 26' 51"	0° 58' 31"	15' 56.81"	252° 6' 36"	0.14879
14	329° 12' 21"	-2° 37' 16"	332° 16' 24"	-14° 12' 16"	0° 58' 32"	15' 57.03"	251° 54' 43"	0.15211
15	329° 46' 58"	-2° 34' 39"	332° 48' 47"	-13° 57' 36"	0° 58' 33"	15' 57.24"	251° 43' 06"	0.15546
16	330° 21' 35"	-2° 32' 02"	333° 21' 08"	-13° 42' 52"	0° 58' 34"	15' 57.46"	251° 31' 43"	0.15884
17	330° 56' 13"	-2° 29' 23"	333° 53' 25"	-13° 28' 04"	0° 58' 34"	15' 57.67"	251° 20' 35"	0.16226
18	331° 30' 51"	-2° 26' 44"	334° 25' 38"	-13° 13' 11"	0° 58' 35"	15' 57.88"	251° 9' 41"	0.16570
19	332° 05' 30"	-2° 24' 03"	334° 57' 49"	-12° 58' 13"	0° 58' 36"	15' 58.09"	250° 59' 02"	0.16918
20	332° 40' 10"	-2° 21' 22"	335° 29' 56"	-12° 43' 12"	0° 58' 37"	15' 58.30"	250° 48' 37"	0.17268
21	333° 14' 50"	-2° 18' 39"	336° 01' 60"	-12° 28' 06"	0° 58' 37"	15' 58.50"	250° 38' 26"	0.17622
22	333° 49' 31"	-2° 15' 56"	336° 34' 01"	-12° 12' 56"	0° 58' 38"	15' 58.71"	250° 28' 28"	0.17979
23	334° 24' 12"	-2° 13' 12"	337° 05' 59"	-11° 57' 42"	0° 58' 39"	15' 58.91"	250° 18' 45"	0.18338
24	334° 58' 54"	-2° 10' 27"	337° 37' 54"	-11° 42' 24"	0° 58' 40"	15' 59.10"	250° 9' 15"	0.18701

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	283° 52' 37"	-0.36"	285° 03' 51"	-22° 42' 58"	0.9833274	16' 15.90"	23° 26' 18"	-4 m 50 s
1	283° 55' 09"	-0.35"	285° 06' 36"	-22° 42' 42"	0.9833273	16' 15.90"	23° 26' 18"	-4 m 51 s
2	283° 57' 42"	-0.35"	285° 09' 21"	-22° 42' 26"	0.9833272	16' 15.90"	23° 26' 18"	-4 m 52 s
3	284° 00' 15"	-0.34"	285° 12' 06"	-22° 42' 10"	0.9833271	16' 15.90"	23° 26' 18"	-4 m 53 s
4	284° 02' 48"	-0.34"	285° 14' 50"	-22° 41' 54"	0.9833271	16' 15.90"	23° 26' 18"	-4 m 55 s
5	284° 05' 21"	-0.33"	285° 17' 35"	-22° 41' 38"	0.9833270	16' 15.90"	23° 26' 18"	-4 m 56 s
6	284° 07' 54"	-0.32"	285° 20' 20"	-22° 41' 22"	0.9833269	16' 15.90"	23° 26' 18"	-4 m 57 s
7	284° 10' 27"	-0.32"	285° 23' 05"	-22° 41' 06"	0.9833269	16' 15.90"	23° 26' 18"	-4 m 58 s
8	284° 12' 60"	-0.31"	285° 25' 50"	-22° 40' 50"	0.9833268	16' 15.90"	23° 26' 18"	-4 m 59 s
9	284° 15' 33"	-0.31"	285° 28' 35"	-22° 40' 34"	0.9833268	16' 15.90"	23° 26' 18"	-5 m 00 s
10	284° 18' 06"	-0.30"	285° 31' 19"	-22° 40' 17"	0.9833268	16' 15.90"	23° 26' 18"	-5 m 01 s
11	284° 20' 39"	-0.30"	285° 34' 04"	-22° 40' 01"	0.9833267	16' 15.90"	23° 26' 18"	-5 m 02 s
12	284° 23' 12"	-0.29"	285° 36' 49"	-22° 39' 45"	0.9833267	16' 15.90"	23° 26' 18"	-5 m 04 s
13	284° 25' 45"	-0.29"	285° 39' 34"	-22° 39' 28"	0.9833267	16' 15.90"	23° 26' 18"	-5 m 05 s
14	284° 28' 17"	-0.28"	285° 42' 18"	-22° 39' 12"	0.9833267	16' 15.90"	23° 26' 18"	-5 m 06 s
15	284° 30' 50"	-0.28"	285° 45' 03"	-22° 38' 55"	0.9833267	16' 15.90"	23° 26' 18"	-5 m 07 s
16	284° 33' 23"	-0.27"	285° 47' 48"	-22° 38' 39"	0.9833267	16' 15.90"	23° 26' 18"	-5 m 08 s
17	284° 35' 56"	-0.27"	285° 50' 33"	-22° 38' 22"	0.9833267	16' 15.90"	23° 26' 18"	-5 m 09 s
18	284° 38' 29"	-0.26"	285° 53' 17"	-22° 38' 06"	0.9833268	16' 15.90"	23° 26' 18"	-5 m 10 s
19	284° 41' 02"	-0.26"	285° 56' 02"	-22° 37' 49"	0.9833268	16' 15.90"	23° 26' 18"	-5 m 11 s
20	284° 43' 35"	-0.25"	285° 58' 47"	-22° 37' 32"	0.9833268	16' 15.90"	23° 26' 18"	-5 m 13 s
21	284° 46' 08"	-0.25"	286° 01' 31"	-22° 37' 16"	0.9833269	16' 15.90"	23° 26' 18"	-5 m 14 s
22	284° 48' 41"	-0.24"	286° 04' 16"	-22° 36' 59"	0.9833270	16' 15.90"	23° 26' 18"	-5 m 15 s
23	284° 51' 14"	-0.23"	286° 07' 01"	-22° 36' 42"	0.9833270	16' 15.90"	23° 26' 18"	-5 m 16 s
24	284° 53' 47"	-0.23"	286° 09' 45"	-22° 36' 25"	0.9833271	16' 15.90"	23° 26' 18"	-5 m 17 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	334° 58' 54"	-2° 10' 27"	337° 37' 54"	-11° 42' 24"	0° 58' 40"	15' 59.10"	250° 9' 15"	0.18701
1	335° 33' 37"	-2° 07' 41"	338° 09' 46"	-11° 27' 02"	0° 58' 40"	15' 59.30"	249° 59' 58"	0.19066
2	336° 08' 20"	-2° 04' 54"	338° 41' 35"	-11° 11' 37"	0° 58' 41"	15' 59.49"	249° 50' 55"	0.19434
3	336° 43' 03"	-2° 02' 06"	339° 13' 22"	-10° 56' 08"	0° 58' 42"	15' 59.68"	249° 42' 05"	0.19805
4	337° 17' 47"	-1° 59' 18"	339° 45' 05"	-10° 40' 35"	0° 58' 42"	15' 59.87"	249° 33' 28"	0.20179
5	337° 52' 32"	-1° 56' 28"	340° 16' 46"	-10° 24' 58"	0° 58' 43"	16' 00.06"	249° 25' 04"	0.20556
6	338° 27' 17"	-1° 53' 38"	340° 48' 25"	-10° 09' 19"	0° 58' 44"	16' 00.24"	249° 16' 53"	0.20935
7	339° 02' 03"	-1° 50' 47"	341° 20' 01"	-9° 53' 36"	0° 58' 45"	16' 00.43"	249° 8' 55"	0.21317
8	339° 36' 49"	-1° 47' 56"	341° 51' 34"	-9° 37' 49"	0° 58' 45"	16' 00.61"	249° 1' 10"	0.21701
9	340° 11' 36"	-1° 45' 03"	342° 23' 05"	-9° 21' 60"	0° 58' 46"	16' 00.79"	248° 53' 37"	0.22089
10	340° 46' 24"	-1° 42' 10"	342° 54' 34"	-9° 06' 07"	0° 58' 46"	16' 00.96"	248° 46' 17"	0.22479
11	341° 21' 11"	-1° 39' 17"	343° 26' 00"	-8° 50' 12"	0° 58' 47"	16' 01.14"	248° 39' 09"	0.22871
12	341° 55' 60"	-1° 36' 22"	343° 57' 25"	-8° 34' 13"	0° 58' 48"	16' 01.31"	248° 32' 13"	0.23266
13	342° 30' 48"	-1° 33' 27"	344° 28' 47"	-8° 18' 12"	0° 58' 48"	16' 01.48"	248° 25' 30"	0.23663
14	343° 05' 38"	-1° 30' 31"	345° 00' 07"	-8° 02' 08"	0° 58' 49"	16' 01.64"	248° 18' 59"	0.24063
15	343° 40' 28"	-1° 27' 35"	345° 31' 25"	-7° 46' 02"	0° 58' 50"	16' 01.81"	248° 12' 40"	0.24466
16	344° 15' 18"	-1° 24' 38"	346° 02' 42"	-7° 29' 52"	0° 58' 50"	16' 01.97"	248° 6' 34"	0.24870
17	344° 50' 08"	-1° 21' 41"	346° 33' 56"	-7° 13' 41"	0° 58' 51"	16' 02.13"	248° 0' 39"	0.25277
18	345° 24' 60"	-1° 18' 43"	347° 05' 09"	-6° 57' 27"	0° 58' 51"	16' 02.29"	247° 54' 56"	0.25687
19	345° 59' 51"	-1° 15' 44"	347° 36' 20"	-6° 41' 10"	0° 58' 52"	16' 02.45"	247° 49' 25"	0.26098
20	346° 34' 43"	-1° 12' 45"	348° 07' 29"	-6° 24' 52"	0° 58' 53"	16' 02.61"	247° 44' 06"	0.26512
21	347° 09' 36"	-1° 09' 45"	348° 38' 37"	-6° 08' 31"	0° 58' 53"	16' 02.76"	247° 38' 59"	0.26928
22	347° 44' 29"	-1° 06' 45"	349° 09' 43"	-5° 52' 08"	0° 58' 54"	16' 02.91"	247° 34' 03"	0.27347
23	348° 19' 22"	-1° 03' 44"	349° 40' 49"	-5° 35' 43"	0° 58' 54"	16' 03.06"	247° 29' 19"	0.27767
24	348° 54' 16"	-1° 00' 43"	350° 11' 52"	-5° 19' 17"	0° 58' 55"	16' 03.20"	247° 24' 47"	0.28190

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	284° 53' 47"	-0.23"	286° 09' 45"	-22° 36' 25"	0.9833271	16'15.90"	23° 26' 18"	-5 m 17 s
1	284° 56' 20"	-0.22"	286° 12' 30"	-22° 36' 08"	0.9833272	16'15.90"	23° 26' 18"	-5 m 18 s
2	284° 58' 52"	-0.22"	286° 15' 14"	-22° 35' 51"	0.9833273	16'15.90"	23° 26' 18"	-5 m 19 s
3	285° 01' 25"	-0.21"	286° 17' 59"	-22° 35' 34"	0.9833274	16'15.90"	23° 26' 18"	-5 m 20 s
4	285° 03' 58"	-0.21"	286° 20' 44"	-22° 35' 17"	0.9833275	16'15.90"	23° 26' 18"	-5 m 21 s
5	285° 06' 31"	-0.20"	286° 23' 28"	-22° 34' 60"	0.9833276	16'15.90"	23° 26' 18"	-5 m 23 s
6	285° 09' 04"	-0.20"	286° 26' 13"	-22° 34' 43"	0.9833277	16'15.90"	23° 26' 18"	-5 m 24 s
7	285° 11' 37"	-0.19"	286° 28' 57"	-22° 34' 25"	0.9833278	16'15.90"	23° 26' 18"	-5 m 25 s
8	285° 14' 10"	-0.19"	286° 31' 42"	-22° 34' 08"	0.9833280	16'15.90"	23° 26' 18"	-5 m 26 s
9	285° 16' 43"	-0.18"	286° 34' 26"	-22° 33' 51"	0.9833281	16'15.90"	23° 26' 18"	-5 m 27 s
10	285° 19' 16"	-0.17"	286° 37' 11"	-22° 33' 33"	0.9833283	16'15.90"	23° 26' 18"	-5 m 28 s
11	285° 21' 49"	-0.17"	286° 39' 55"	-22° 33' 16"	0.9833284	16'15.90"	23° 26' 18"	-5 m 29 s
12	285° 24' 22"	-0.16"	286° 42' 40"	-22° 32' 58"	0.9833286	16'15.90"	23° 26' 18"	-5 m 30 s
13	285° 26' 54"	-0.16"	286° 45' 24"	-22° 32' 41"	0.9833288	16'15.90"	23° 26' 18"	-5 m 31 s
14	285° 29' 27"	-0.15"	286° 48' 09"	-22° 32' 23"	0.9833289	16'15.90"	23° 26' 18"	-5 m 33 s
15	285° 32' 00"	-0.15"	286° 50' 53"	-22° 32' 06"	0.9833291	16'15.90"	23° 26' 18"	-5 m 34 s
16	285° 34' 33"	-0.14"	286° 53' 38"	-22° 31' 48"	0.9833293	16'15.90"	23° 26' 18"	-5 m 35 s
17	285° 37' 06"	-0.14"	286° 56' 22"	-22° 31' 30"	0.9833295	16'15.90"	23° 26' 18"	-5 m 36 s
18	285° 39' 39"	-0.13"	286° 59' 06"	-22° 31' 13"	0.9833297	16'15.90"	23° 26' 18"	-5 m 37 s
19	285° 42' 12"	-0.12"	287° 01' 51"	-22° 30' 55"	0.9833300	16'15.90"	23° 26' 18"	-5 m 38 s
20	285° 44' 45"	-0.12"	287° 04' 35"	-22° 30' 37"	0.9833302	16'15.90"	23° 26' 18"	-5 m 39 s
21	285° 47' 18"	-0.11"	287° 07' 20"	-22° 30' 19"	0.9833304	16'15.90"	23° 26' 18"	-5 m 40 s
22	285° 49' 51"	-0.11"	287° 10' 04"	-22° 30' 01"	0.9833307	16'15.90"	23° 26' 18"	-5 m 41 s
23	285° 52' 23"	-0.10"	287° 12' 48"	-22° 29' 43"	0.9833309	16'15.90"	23° 26' 18"	-5 m 42 s
24	285° 54' 56"	-0.10"	287° 15' 33"	-22° 29' 25"	0.9833312	16'15.90"	23° 26' 18"	-5 m 44 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	348° 54' 16"	-1° 00' 43"	350° 11' 52"	-5° 19' 17"	0° 58' 55"	16' 03.20"	247° 24' 47"	0.28190
1	349° 29' 11"	0°-57' 42"	350° 42' 55"	-5° 02' 48"	0° 58' 55"	16' 03.35"	247° 20' 26"	0.28614
2	350° 04' 05"	0°-54' 40"	351° 13' 56"	-4° 46' 18"	0° 58' 56"	16' 03.49"	247° 16' 17"	0.29041
3	350° 39' 01"	0°-51' 38"	351° 44' 57"	-4° 29' 46"	0° 58' 56"	16' 03.63"	247° 12' 19"	0.29469
4	351° 13' 56"	0°-48' 35"	352° 15' 56"	-4° 13' 13"	0° 58' 57"	16' 03.77"	247° 8' 33"	0.29900
5	351° 48' 52"	0°-45' 32"	352° 46' 54"	-3° 56' 38"	0° 58' 57"	16' 03.91"	247° 4' 58"	0.30332
6	352° 23' 49"	0°-42' 29"	353° 17' 52"	-3° 40' 02"	0° 58' 58"	16' 04.04"	247° 1' 34"	0.30766
7	352° 58' 45"	0°-39' 25"	353° 48' 49"	-3° 23' 24"	0° 58' 58"	16' 04.17"	246° 58' 22"	0.31202
8	353° 33' 43"	0°-36' 21"	354° 19' 45"	-3° 06' 46"	0° 58' 59"	16' 04.30"	246° 55' 20"	0.31640
9	354° 08' 40"	0°-33' 17"	354° 50' 41"	-2° 50' 06"	0° 58' 59"	16' 04.43"	246° 52' 30"	0.32080
10	354° 43' 39"	0°-30' 12"	355° 21' 36"	-2° 33' 25"	0° 58' 60"	16' 04.56"	246° 49' 52"	0.32521
11	355° 18' 37"	0°-27' 07"	355° 52' 31"	-2° 16' 43"	0° 59' 00"	16' 04.68"	246° 47' 24"	0.32964
12	355° 53' 36"	0°-24' 02"	356° 23' 25"	-2° 00' 00"	0° 59' 01"	16' 04.81"	246° 45' 08"	0.33408
13	356° 28' 35"	0°-20' 57"	356° 54' 19"	-1° 43' 17"	0° 59' 01"	16' 04.93"	246° 43' 02"	0.33854
14	357° 03' 35"	0°-17' 52"	357° 25' 13"	-1° 26' 32"	0° 59' 01"	16' 05.05"	246° 41' 08"	0.34302
15	357° 38' 35"	0°-14' 46"	357° 56' 07"	-1° 09' 48"	0° 59' 02"	16' 05.16"	246° 39' 25"	0.34751
16	358° 13' 35"	0°-11' 41"	358° 27' 01"	0°-53' 02"	0° 59' 02"	16' 05.28"	246° 37' 53"	0.35202
17	358° 48' 36"	0° -8' 35"	358° 57' 55"	0°-36' 16"	0° 59' 03"	16' 05.39"	246° 36' 31"	0.35654
18	359° 23' 38"	0° -5' 29"	359° 28' 49"	0°-19' 30"	0° 59' 03"	16' 05.50"	246° 35' 21"	0.36107
19	359° 58' 39"	0° -2' 26"	359° 59' 44"	0° -2' 46"	0° 59' 04"	16' 05.61"	246° 34' 23"	0.36562
20	0° 33' 41"	0° 00' 40"	0° 30' 39"	0° 14' 01"	0° 59' 04"	16' 05.71"	246° 33' 34"	0.37018
21	1° 08' 44"	0° 03' 46"	1° 01' 34"	0° 30' 48"	0° 59' 04"	16' 05.82"	246° 32' 57"	0.37475
22	1° 43' 46"	0° 06' 52"	1° 32' 29"	0° 47' 35"	0° 59' 05"	16' 05.92"	246° 32' 30"	0.37934
23	2° 18' 50"	0° 09' 58"	2° 03' 25"	1° 04' 21"	0° 59' 05"	16' 06.02"	246° 32' 15"	0.38393
24	2° 53' 53"	0° 13' 04"	2° 34' 22"	1° 21' 08"	0° 59' 05"	16' 06.12"	246° 32' 10"	0.38854

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	285° 54' 56"	-0.10"	287° 15' 33"	-22° 29' 25"	0.9833312	16' 15.90"	23° 26' 18"	-5 m 44 s
1	285° 57' 29"	-0.09"	287° 18' 17"	-22° 29' 07"	0.9833315	16' 15.90"	23° 26' 18"	-5 m 45 s
2	286° 00' 02"	-0.09"	287° 21' 01"	-22° 28' 49"	0.9833318	16' 15.90"	23° 26' 18"	-5 m 46 s
3	286° 02' 35"	-0.08"	287° 23' 45"	-22° 28' 31"	0.9833321	16' 15.90"	23° 26' 18"	-5 m 47 s
4	286° 05' 08"	-0.08"	287° 26' 30"	-22° 28' 13"	0.9833324	16' 15.90"	23° 26' 18"	-5 m 48 s
5	286° 07' 41"	-0.07"	287° 29' 14"	-22° 27' 54"	0.9833327	16' 15.90"	23° 26' 18"	-5 m 49 s
6	286° 10' 14"	-0.06"	287° 31' 58"	-22° 27' 36"	0.9833330	16' 15.90"	23° 26' 18"	-5 m 50 s
7	286° 12' 47"	-0.06"	287° 34' 42"	-22° 27' 18"	0.9833333	16' 15.89"	23° 26' 18"	-5 m 51 s
8	286° 15' 20"	-0.05"	287° 37' 27"	-22° 26' 59"	0.9833336	16' 15.89"	23° 26' 18"	-5 m 52 s
9	286° 17' 52"	-0.05"	287° 40' 11"	-22° 26' 41"	0.9833340	16' 15.89"	23° 26' 18"	-5 m 53 s
10	286° 20' 25"	-0.04"	287° 42' 55"	-22° 26' 22"	0.9833343	16' 15.89"	23° 26' 18"	-5 m 54 s
11	286° 22' 58"	-0.04"	287° 45' 39"	-22° 26' 04"	0.9833347	16' 15.89"	23° 26' 18"	-5 m 56 s
12	286° 25' 31"	-0.03"	287° 48' 24"	-22° 25' 45"	0.9833350	16' 15.89"	23° 26' 18"	-5 m 57 s
13	286° 28' 04"	-0.03"	287° 51' 08"	-22° 25' 27"	0.9833354	16' 15.89"	23° 26' 18"	-5 m 58 s
14	286° 30' 37"	-0.02"	287° 53' 52"	-22° 25' 08"	0.9833358	16' 15.89"	23° 26' 18"	-5 m 59 s
15	286° 33' 10"	-0.02"	287° 56' 36"	-22° 24' 49"	0.9833362	16' 15.89"	23° 26' 18"	-5 m 60 s
16	286° 35' 43"	-0.01"	287° 59' 20"	-22° 24' 30"	0.9833366	16' 15.89"	23° 26' 18"	-6 m 01 s
17	286° 38' 15"	-0.00"	288° 02' 04"	-22° 24' 12"	0.9833370	16' 15.89"	23° 26' 18"	-6 m 02 s
18	286° 40' 48"	0.00"	288° 04' 48"	-22° 23' 53"	0.9833374	16' 15.89"	23° 26' 18"	-6 m 03 s
19	286° 43' 21"	0.01"	288° 07' 32"	-22° 23' 34"	0.9833378	16' 15.89"	23° 26' 18"	-6 m 04 s
20	286° 45' 54"	0.01"	288° 10' 16"	-22° 23' 15"	0.9833383	16' 15.89"	23° 26' 18"	-6 m 05 s
21	286° 48' 27"	0.02"	288° 13' 00"	-22° 22' 56"	0.9833387	16' 15.89"	23° 26' 18"	-6 m 06 s
22	286° 50' 60"	0.02"	288° 15' 45"	-22° 22' 37"	0.9833392	16' 15.89"	23° 26' 18"	-6 m 07 s
23	286° 53' 33"	0.03"	288° 18' 29"	-22° 22' 18"	0.9833396	16' 15.89"	23° 26' 18"	-6 m 09 s
24	286° 56' 06"	0.03"	288° 21' 13"	-22° 21' 59"	0.9833401	16' 15.89"	23° 26' 18"	-6 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	2° 53' 53"	0° 13' 04"	2° 34' 22"	1° 21' 08"	0° 59' 05"	16' 06.12"	246° 32' 10"	0.38854
1	3° 28' 57"	0° 16' 10"	3° 05' 19"	1° 37' 55"	0° 59' 06"	16' 06.22"	246° 32' 16"	0.39316
2	4° 04' 01"	0° 19' 16"	3° 36' 17"	1° 54' 41"	0° 59' 06"	16' 06.31"	246° 32' 33"	0.39779
3	4° 39' 06"	0° 22' 22"	4° 07' 17"	2° 11' 26"	0° 59' 06"	16' 06.41"	246° 33' 01"	0.40243
4	5° 14' 11"	0° 25' 28"	4° 38' 17"	2° 28' 12"	0° 59' 07"	16' 06.50"	246° 33' 39"	0.40708
5	5° 49' 16"	0° 28' 33"	5° 09' 18"	2° 44' 57"	0° 59' 07"	16' 06.59"	246° 34' 29"	0.41174
6	6° 24' 22"	0° 31' 39"	5° 40' 20"	3° 01' 41"	0° 59' 07"	16' 06.67"	246° 35' 29"	0.41640
7	6° 59' 28"	0° 34' 44"	6° 11' 24"	3° 18' 24"	0° 59' 08"	16' 06.76"	246° 36' 40"	0.42108
8	7° 34' 34"	0° 37' 49"	6° 42' 29"	3° 35' 07"	0° 59' 08"	16' 06.84"	246° 38' 02"	0.42576
9	8° 09' 41"	0° 40' 54"	7° 13' 35"	3° 51' 48"	0° 59' 08"	16' 06.92"	246° 39' 35"	0.43045
10	8° 44' 48"	0° 43' 59"	7° 44' 43"	4° 08' 29"	0° 59' 09"	16' 07.00"	246° 41' 18"	0.43515
11	9° 19' 55"	0° 47' 03"	8° 15' 53"	4° 25' 08"	0° 59' 09"	16' 07.08"	246° 43' 12"	0.43985
12	9° 55' 03"	0° 50' 07"	8° 47' 04"	4° 41' 47"	0° 59' 09"	16' 07.16"	246° 45' 17"	0.44456
13	10° 30' 11"	0° 53' 11"	9° 18' 17"	4° 58' 24"	0° 59' 09"	16' 07.23"	246° 47' 33"	0.44927
14	11° 05' 20"	0° 56' 14"	9° 49' 31"	5° 14' 60"	0° 59' 10"	16' 07.30"	246° 49' 60"	0.45399
15	11° 40' 28"	0° 59' 18"	10° 20' 48"	5° 31' 34"	0° 59' 10"	16' 07.37"	246° 52' 37"	0.45872
16	12° 15' 37"	1° 02' 21"	10° 52' 06"	5° 48' 07"	0° 59' 10"	16' 07.44"	246° 55' 25"	0.46345
17	12° 50' 47"	1° 05' 23"	11° 23' 27"	6° 04' 39"	0° 59' 10"	16' 07.50"	246° 58' 24"	0.46818
18	13° 25' 57"	1° 08' 25"	11° 54' 50"	6° 21' 08"	0° 59' 11"	16' 07.57"	247° 1' 34"	0.47292
19	14° 01' 07"	1° 11' 27"	12° 26' 15"	6° 37' 36"	0° 59' 11"	16' 07.63"	247° 4' 55"	0.47766
20	14° 36' 17"	1° 14' 28"	12° 57' 42"	6° 54' 02"	0° 59' 11"	16' 07.69"	247° 8' 26"	0.48240
21	15° 11' 28"	1° 17' 29"	13° 29' 12"	7° 10' 26"	0° 59' 11"	16' 07.75"	247° 12' 09"	0.48714
22	15° 46' 39"	1° 20' 29"	14° 00' 44"	7° 26' 48"	0° 59' 12"	16' 07.80"	247° 16' 02"	0.49189
23	16° 21' 51"	1° 23' 29"	14° 32' 19"	7° 43' 08"	0° 59' 12"	16' 07.86"	247° 20' 06"	0.49663
24	16° 57' 02"	1° 26' 29"	15° 03' 56"	7° 59' 26"	0° 59' 12"	16' 07.91"	247° 24' 20"	0.50138

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	286° 56' 06"	0.03"	288° 21' 13"	-22° 21' 59"	0.9833401	16'15.89"	23° 26' 18"	-6 m 10 s
1	286° 58' 39"	0.04"	288° 23' 57"	-22° 21' 40"	0.9833406	16'15.89"	23° 26' 18"	-6 m 11 s
2	287° 01' 11"	0.04"	288° 26' 41"	-22° 21' 20"	0.9833411	16'15.89"	23° 26' 18"	-6 m 12 s
3	287° 03' 44"	0.05"	288° 29' 25"	-22° 21' 01"	0.9833416	16'15.89"	23° 26' 18"	-6 m 13 s
4	287° 06' 17"	0.05"	288° 32' 09"	-22° 20' 42"	0.9833421	16'15.89"	23° 26' 18"	-6 m 14 s
5	287° 08' 50"	0.06"	288° 34' 52"	-22° 20' 22"	0.9833426	16'15.89"	23° 26' 18"	-6 m 15 s
6	287° 11' 23"	0.06"	288° 37' 36"	-22° 20' 03"	0.9833431	16'15.89"	23° 26' 18"	-6 m 16 s
7	287° 13' 56"	0.07"	288° 40' 20"	-22° 19' 43"	0.9833436	16'15.88"	23° 26' 18"	-6 m 17 s
8	287° 16' 29"	0.07"	288° 43' 04"	-22° 19' 24"	0.9833442	16'15.88"	23° 26' 18"	-6 m 18 s
9	287° 19' 02"	0.08"	288° 45' 48"	-22° 19' 04"	0.9833447	16'15.88"	23° 26' 18"	-6 m 19 s
10	287° 21' 34"	0.09"	288° 48' 32"	-22° 18' 45"	0.9833453	16'15.88"	23° 26' 18"	-6 m 20 s
11	287° 24' 07"	0.09"	288° 51' 16"	-22° 18' 25"	0.9833458	16'15.88"	23° 26' 18"	-6 m 21 s
12	287° 26' 40"	0.10"	288° 53' 60"	-22° 18' 06"	0.9833464	16'15.88"	23° 26' 18"	-6 m 22 s
13	287° 29' 13"	0.10"	288° 56' 44"	-22° 17' 46"	0.9833470	16'15.88"	23° 26' 18"	-6 m 24 s
14	287° 31' 46"	0.11"	288° 59' 27"	-22° 17' 26"	0.9833476	16'15.88"	23° 26' 18"	-6 m 25 s
15	287° 34' 19"	0.11"	289° 02' 11"	-22° 17' 06"	0.9833482	16'15.88"	23° 26' 18"	-6 m 26 s
16	287° 36' 52"	0.12"	289° 04' 55"	-22° 16' 46"	0.9833488	16'15.88"	23° 26' 18"	-6 m 27 s
17	287° 39' 24"	0.12"	289° 07' 39"	-22° 16' 26"	0.9833495	16'15.88"	23° 26' 18"	-6 m 28 s
18	287° 41' 57"	0.13"	289° 10' 23"	-22° 16' 07"	0.9833501	16'15.88"	23° 26' 18"	-6 m 29 s
19	287° 44' 30"	0.13"	289° 13' 06"	-22° 15' 47"	0.9833507	16'15.88"	23° 26' 18"	-6 m 30 s
20	287° 47' 03"	0.14"	289° 15' 50"	-22° 15' 26"	0.9833514	16'15.88"	23° 26' 18"	-6 m 31 s
21	287° 49' 36"	0.14"	289° 18' 34"	-22° 15' 06"	0.9833520	16'15.88"	23° 26' 18"	-6 m 32 s
22	287° 52' 09"	0.15"	289° 21' 18"	-22° 14' 46"	0.9833527	16'15.88"	23° 26' 18"	-6 m 33 s
23	287° 54' 42"	0.15"	289° 24' 01"	-22° 14' 26"	0.9833534	16'15.88"	23° 26' 18"	-6 m 34 s
24	287° 57' 15"	0.15"	289° 26' 45"	-22° 14' 06"	0.9833541	16'15.87"	23° 26' 18"	-6 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	16° 57' 02"	1° 26' 29"	15° 03' 56"	7° 59' 26"	0° 59' 12"	16' 07.91"	247° 24' 20"	0.50138
1	17° 32' 14"	1° 29' 28"	15° 35' 36"	8° 15' 41"	0° 59' 12"	16' 07.96"	247° 28' 46"	0.50613
2	18° 07' 27"	1° 32' 26"	16° 07' 19"	8° 31' 54"	0° 59' 12"	16' 08.00"	247° 33' 22"	0.51088
3	18° 42' 39"	1° 35' 24"	16° 39' 05"	8° 48' 05"	0° 59' 13"	16' 08.05"	247° 38' 10"	0.51562
4	19° 17' 52"	1° 38' 21"	17° 10' 54"	9° 04' 12"	0° 59' 13"	16' 08.09"	247° 43' 08"	0.52037
5	19° 53' 06"	1° 41' 18"	17° 42' 46"	9° 20' 18"	0° 59' 13"	16' 08.14"	247° 48' 17"	0.52512
6	20° 28' 19"	1° 44' 13"	18° 14' 41"	9° 36' 20"	0° 59' 13"	16' 08.18"	247° 53' 37"	0.52986
7	21° 03' 29"	1° 47' 08"	18° 46' 35"	9° 52' 18"	0° 59' 13"	16' 08.21"	247° 59' 07"	0.53459
8	21° 38' 43"	1° 50' 03"	19° 18' 37"	10° 08' 15"	0° 59' 13"	16' 08.25"	248° 4' 49"	0.53933
9	22° 13' 58"	1° 52' 57"	19° 50' 42"	10° 24' 09"	0° 59' 13"	16' 08.28"	248° 10' 42"	0.54406
10	22° 49' 12"	1° 55' 50"	20° 22' 50"	10° 39' 59"	0° 59' 13"	16' 08.31"	248° 16' 46"	0.54879
11	23° 24' 27"	1° 58' 43"	20° 55' 01"	10° 55' 47"	0° 59' 14"	16' 08.34"	248° 23' 00"	0.55352
12	23° 59' 43"	2° 01' 35"	21° 27' 17"	11° 11' 31"	0° 59' 14"	16' 08.37"	248° 29' 26"	0.55824
13	24° 34' 58"	2° 04' 26"	21° 59' 35"	11° 27' 11"	0° 59' 14"	16' 08.39"	248° 36' 03"	0.56296
14	25° 10' 14"	2° 07' 16"	22° 31' 58"	11° 42' 48"	0° 59' 14"	16' 08.42"	248° 42' 50"	0.56767
15	25° 45' 30"	2° 10' 06"	23° 04' 24"	11° 58' 22"	0° 59' 14"	16' 08.44"	248° 49' 49"	0.57238
16	26° 20' 47"	2° 12' 54"	23° 36' 55"	12° 13' 52"	0° 59' 14"	16' 08.46"	248° 56' 59"	0.57707
17	26° 56' 03"	2° 15' 42"	24° 09' 29"	12° 29' 18"	0° 59' 14"	16' 08.47"	249° 4' 20"	0.58177
18	27° 31' 20"	2° 18' 29"	24° 42' 07"	12° 44' 40"	0° 59' 14"	16' 08.49"	249° 11' 52"	0.58645
19	28° 06' 37"	2° 21' 15"	25° 14' 49"	12° 59' 59"	0° 59' 14"	16' 08.50"	249° 19' 35"	0.59113
20	28° 41' 55"	2° 24' 00"	25° 47' 36"	13° 15' 13"	0° 59' 14"	16' 08.51"	249° 27' 29"	0.59580
21	29° 17' 12"	2° 26' 45"	26° 20' 26"	13° 30' 23"	0° 59' 14"	16' 08.52"	249° 35' 34"	0.60046
22	29° 52' 30"	2° 29' 28"	26° 53' 21"	13° 45' 29"	0° 59' 14"	16' 08.52"	249° 43' 51"	0.60511
23	30° 27' 48"	2° 32' 10"	27° 26' 20"	14° 00' 30"	0° 59' 14"	16' 08.53"	249° 52' 18"	0.60975
24	31° 03' 07"	2° 34' 52"	27° 59' 24"	14° 15' 27"	0° 59' 14"	16' 08.53"	250° 0' 57"	0.61439

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	287° 57' 15"	0.15"	289° 26' 45"	-22° 14' 06"	0.9833541	16' 15.87"	23° 26' 18"	-6 m 35 s
1	287° 59' 47"	0.16"	289° 29' 29"	-22° 13' 46"	0.9833548	16' 15.87"	23° 26' 18"	-6 m 36 s
2	288° 02' 20"	0.16"	289° 32' 12"	-22° 13' 25"	0.9833555	16' 15.87"	23° 26' 18"	-6 m 37 s
3	288° 04' 53"	0.17"	289° 34' 56"	-22° 13' 05"	0.9833562	16' 15.87"	23° 26' 18"	-6 m 38 s
4	288° 07' 26"	0.17"	289° 37' 40"	-22° 12' 44"	0.9833569	16' 15.87"	23° 26' 18"	-6 m 39 s
5	288° 09' 59"	0.18"	289° 40' 23"	-22° 12' 24"	0.9833577	16' 15.87"	23° 26' 18"	-6 m 40 s
6	288° 12' 32"	0.18"	289° 43' 07"	-22° 12' 04"	0.9833584	16' 15.87"	23° 26' 18"	-6 m 42 s
7	288° 15' 04"	0.19"	289° 45' 50"	-22° 11' 43"	0.9833592	16' 15.87"	23° 26' 18"	-6 m 43 s
8	288° 17' 37"	0.19"	289° 48' 34"	-22° 11' 22"	0.9833599	16' 15.87"	23° 26' 18"	-6 m 44 s
9	288° 20' 10"	0.20"	289° 51' 18"	-22° 11' 02"	0.9833607	16' 15.87"	23° 26' 18"	-6 m 45 s
10	288° 22' 43"	0.20"	289° 54' 01"	-22° 10' 41"	0.9833615	16' 15.87"	23° 26' 18"	-6 m 46 s
11	288° 25' 16"	0.21"	289° 56' 45"	-22° 10' 20"	0.9833623	16' 15.87"	23° 26' 18"	-6 m 47 s
12	288° 27' 49"	0.21"	289° 59' 28"	-22° 09' 60"	0.9833631	16' 15.87"	23° 26' 18"	-6 m 48 s
13	288° 30' 22"	0.21"	290° 02' 12"	-22° 09' 39"	0.9833639	16' 15.86"	23° 26' 18"	-6 m 49 s
14	288° 32' 54"	0.22"	290° 04' 55"	-22° 09' 18"	0.9833647	16' 15.86"	23° 26' 18"	-6 m 50 s
15	288° 35' 27"	0.22"	290° 07' 39"	-22° 08' 57"	0.9833656	16' 15.86"	23° 26' 18"	-6 m 51 s
16	288° 38' 00"	0.23"	290° 10' 22"	-22° 08' 36"	0.9833664	16' 15.86"	23° 26' 18"	-6 m 52 s
17	288° 40' 33"	0.23"	290° 13' 06"	-22° 08' 15"	0.9833673	16' 15.86"	23° 26' 18"	-6 m 53 s
18	288° 43' 06"	0.24"	290° 15' 49"	-22° 07' 54"	0.9833681	16' 15.86"	23° 26' 18"	-6 m 54 s
19	288° 45' 39"	0.24"	290° 18' 32"	-22° 07' 33"	0.9833690	16' 15.86"	23° 26' 18"	-6 m 55 s
20	288° 48' 12"	0.24"	290° 21' 16"	-22° 07' 12"	0.9833699	16' 15.86"	23° 26' 18"	-6 m 56 s
21	288° 50' 44"	0.25"	290° 23' 59"	-22° 06' 51"	0.9833708	16' 15.86"	23° 26' 18"	-6 m 57 s
22	288° 53' 17"	0.25"	290° 26' 43"	-22° 06' 29"	0.9833717	16' 15.86"	23° 26' 18"	-6 m 58 s
23	288° 55' 50"	0.26"	290° 29' 26"	-22° 06' 08"	0.9833726	16' 15.86"	23° 26' 18"	-6 m 59 s
24	288° 58' 23"	0.26"	290° 32' 09"	-22° 05' 47"	0.9833735	16' 15.86"	23° 26' 18"	-7 m 00 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	31° 03' 07"	2° 34' 52"	27° 59' 24"	14° 15' 27"	0° 59' 14"	16' 08.53"	250° 0' 57"	0.61439
1	31° 38' 25"	2° 37' 32"	28° 32' 32"	14° 30' 20"	0° 59' 14"	16' 08.53"	250° 9' 47"	0.61901
2	32° 13' 44"	2° 40' 12"	29° 05' 44"	14° 45' 08"	0° 59' 14"	16' 08.52"	250° 18' 48"	0.62362
3	32° 49' 03"	2° 42' 50"	29° 39' 01"	14° 59' 51"	0° 59' 14"	16' 08.52"	250° 28' 01"	0.62822
4	33° 24' 22"	2° 45' 28"	30° 12' 23"	15° 14' 29"	0° 59' 14"	16' 08.51"	250° 37' 24"	0.63281
5	33° 59' 42"	2° 48' 04"	30° 45' 49"	15° 29' 03"	0° 59' 14"	16' 08.50"	250° 46' 59"	0.63739
6	34° 35' 01"	2° 50' 40"	31° 19' 20"	15° 43' 31"	0° 59' 14"	16' 08.49"	250° 56' 46"	0.64195
7	35° 10' 21"	2° 53' 14"	31° 52' 56"	15° 57' 54"	0° 59' 14"	16' 08.47"	251° 6' 43"	0.64650
8	35° 45' 41"	2° 55' 47"	32° 26' 37"	16° 12' 12"	0° 59' 14"	16' 08.46"	251° 16' 52"	0.65104
9	36° 21' 01"	2° 58' 19"	33° 00' 22"	16° 26' 25"	0° 59' 14"	16' 08.44"	251° 27' 13"	0.65556
10	36° 56' 21"	3° 00' 50"	33° 34' 13"	16° 40' 32"	0° 59' 14"	16' 08.41"	251° 37' 44"	0.66007
11	37° 31' 42"	3° 03' 20"	34° 08' 09"	16° 54' 34"	0° 59' 14"	16' 08.39"	251° 48' 28"	0.66457
12	38° 07' 02"	3° 05' 48"	34° 42' 09"	17° 08' 30"	0° 59' 14"	16' 08.36"	251° 59' 22"	0.66905
13	38° 42' 23"	3° 08' 16"	35° 16' 15"	17° 22' 20"	0° 59' 14"	16' 08.33"	252° 10' 28"	0.67351
14	39° 17' 44"	3° 10' 42"	35° 50' 26"	17° 36' 05"	0° 59' 13"	16' 08.30"	252° 21' 45"	0.67796
15	39° 53' 05"	3° 13' 07"	36° 24' 42"	17° 49' 44"	0° 59' 13"	16' 08.27"	252° 33' 14"	0.68239
16	40° 28' 26"	3° 15' 31"	36° 59' 03"	18° 03' 16"	0° 59' 13"	16' 08.23"	252° 44' 55"	0.68681
17	41° 03' 48"	3° 17' 53"	37° 33' 29"	18° 16' 43"	0° 59' 13"	16' 08.19"	252° 56' 46"	0.69120
18	41° 39' 09"	3° 20' 14"	38° 08' 01"	18° 30' 03"	0° 59' 13"	16' 08.15"	253° 8' 50"	0.69558
19	42° 14' 31"	3° 22' 34"	38° 42' 38"	18° 43' 17"	0° 59' 13"	16' 08.11"	253° 21' 05"	0.69995
20	42° 49' 52"	3° 24' 53"	39° 17' 20"	18° 56' 25"	0° 59' 13"	16' 08.06"	253° 33' 31"	0.70429
21	43° 25' 14"	3° 27' 10"	39° 52' 08"	19° 09' 26"	0° 59' 12"	16' 08.01"	253° 46' 09"	0.70862
22	44° 00' 36"	3° 29' 26"	40° 27' 01"	19° 22' 21"	0° 59' 12"	16' 07.96"	253° 58' 59"	0.71292
23	44° 35' 57"	3° 31' 41"	41° 01' 59"	19° 35' 09"	0° 59' 12"	16' 07.90"	254° 12' 00"	0.71721
24	45° 11' 19"	3° 33' 54"	41° 37' 03"	19° 47' 50"	0° 59' 12"	16' 07.85"	254° 25' 13"	0.72147

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	288° 58' 23"	0.26"	290° 32' 09"	-22° 05' 47"	0.9833735	16'15.86"	23° 26' 18"	-7 m 00 s
1	289° 00' 56"	0.27"	290° 34' 53"	-22° 05' 26"	0.9833745	16'15.85"	23° 26' 18"	-7 m 01 s
2	289° 03' 29"	0.27"	290° 37' 36"	-22° 05' 04"	0.9833754	16'15.85"	23° 26' 18"	-7 m 02 s
3	289° 06' 01"	0.27"	290° 40' 19"	-22° 04' 43"	0.9833764	16'15.85"	23° 26' 18"	-7 m 03 s
4	289° 08' 34"	0.28"	290° 43' 03"	-22° 04' 21"	0.9833773	16'15.85"	23° 26' 18"	-7 m 04 s
5	289° 11' 07"	0.28"	290° 45' 46"	-22° 03' 60"	0.9833783	16'15.85"	23° 26' 18"	-7 m 05 s
6	289° 13' 40"	0.29"	290° 48' 29"	-22° 03' 38"	0.9833793	16'15.85"	23° 26' 18"	-7 m 07 s
7	289° 16' 13"	0.29"	290° 51' 12"	-22° 03' 16"	0.9833803	16'15.85"	23° 26' 18"	-7 m 08 s
8	289° 18' 46"	0.29"	290° 53' 56"	-22° 02' 55"	0.9833813	16'15.85"	23° 26' 18"	-7 m 09 s
9	289° 21' 18"	0.30"	290° 56' 39"	-22° 02' 33"	0.9833823	16'15.85"	23° 26' 18"	-7 m 10 s
10	289° 23' 51"	0.30"	290° 59' 22"	-22° 02' 11"	0.9833833	16'15.85"	23° 26' 18"	-7 m 11 s
11	289° 26' 24"	0.30"	291° 02' 05"	-22° 01' 49"	0.9833844	16'15.84"	23° 26' 18"	-7 m 12 s
12	289° 28' 57"	0.31"	291° 04' 48"	-22° 01' 28"	0.9833854	16'15.84"	23° 26' 18"	-7 m 13 s
13	289° 31' 30"	0.31"	291° 07' 31"	-22° 01' 06"	0.9833865	16'15.84"	23° 26' 18"	-7 m 14 s
14	289° 34' 03"	0.31"	291° 10' 15"	-22° 00' 44"	0.9833876	16'15.84"	23° 26' 18"	-7 m 15 s
15	289° 36' 35"	0.32"	291° 12' 58"	-22° 00' 22"	0.9833886	16'15.84"	23° 26' 18"	-7 m 16 s
16	289° 39' 08"	0.32"	291° 15' 41"	-21° 59' 60"	0.9833897	16'15.84"	23° 26' 18"	-7 m 17 s
17	289° 41' 41"	0.32"	291° 18' 24"	-21° 59' 38"	0.9833908	16'15.84"	23° 26' 18"	-7 m 18 s
18	289° 44' 14"	0.33"	291° 21' 07"	-21° 59' 16"	0.9833919	16'15.84"	23° 26' 18"	-7 m 19 s
19	289° 46' 47"	0.33"	291° 23' 50"	-21° 58' 53"	0.9833930	16'15.84"	23° 26' 18"	-7 m 20 s
20	289° 49' 19"	0.33"	291° 26' 33"	-21° 58' 31"	0.9833942	16'15.83"	23° 26' 18"	-7 m 21 s
21	289° 51' 52"	0.34"	291° 29' 16"	-21° 58' 09"	0.9833953	16'15.83"	23° 26' 18"	-7 m 22 s
22	289° 54' 25"	0.34"	291° 31' 59"	-21° 57' 47"	0.9833965	16'15.83"	23° 26' 18"	-7 m 23 s
23	289° 56' 58"	0.34"	291° 34' 42"	-21° 57' 24"	0.9833976	16'15.83"	23° 26' 18"	-7 m 24 s
24	289° 59' 31"	0.35"	291° 37' 25"	-21° 57' 02"	0.9833988	16'15.83"	23° 26' 18"	-7 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	45° 11' 19"	3° 33' 54"	41° 37' 03"	19° 47' 50"	0° 59' 12"	16' 07.85"	254° 25' 13"	0.72147
1	45° 46' 41"	3° 36' 06"	42° 12' 12"	20° 00' 24"	0° 59' 12"	16' 07.79"	254° 38' 37"	0.72572
2	46° 22' 03"	3° 38' 16"	42° 47' 27"	20° 12' 51"	0° 59' 11"	16' 07.72"	254° 52' 14"	0.72994
3	46° 57' 25"	3° 40' 26"	43° 22' 47"	20° 25' 11"	0° 59' 11"	16' 07.66"	255° 6' 01"	0.73415
4	47° 32' 47"	3° 42' 33"	43° 58' 13"	20° 37' 23"	0° 59' 11"	16' 07.59"	255° 20' 01"	0.73833
5	48° 08' 09"	3° 44' 39"	44° 33' 44"	20° 49' 29"	0° 59' 11"	16' 07.52"	255° 34' 12"	0.74249
6	48° 43' 31"	3° 46' 44"	45° 09' 21"	21° 01' 27"	0° 59' 10"	16' 07.45"	255° 48' 35"	0.74663
7	49° 18' 53"	3° 48' 48"	45° 45' 04"	21° 13' 17"	0° 59' 10"	16' 07.37"	256° 3' 10"	0.75074
8	49° 54' 15"	3° 50' 49"	46° 20' 51"	21° 25' 00"	0° 59' 10"	16' 07.29"	256° 17' 56"	0.75483
9	50° 29' 37"	3° 52' 50"	46° 56' 45"	21° 36' 35"	0° 59' 09"	16' 07.21"	256° 32' 54"	0.75890
10	51° 04' 59"	3° 54' 49"	47° 32' 44"	21° 48' 03"	0° 59' 09"	16' 07.13"	256° 48' 04"	0.76294
11	51° 40' 20"	3° 56' 46"	48° 08' 48"	21° 59' 22"	0° 59' 09"	16' 07.04"	257° 3' 26"	0.76696
12	52° 15' 42"	3° 58' 42"	48° 44' 58"	22° 10' 34"	0° 59' 08"	16' 06.95"	257° 18' 60"	0.77095
13	52° 51' 04"	4° 00' 36"	49° 21' 13"	22° 21' 37"	0° 59' 08"	16' 06.86"	257° 34' 45"	0.77492
14	53° 26' 25"	4° 02' 29"	49° 57' 34"	22° 32' 32"	0° 59' 08"	16' 06.76"	257° 50' 42"	0.77887
15	54° 01' 47"	4° 04' 20"	50° 33' 60"	22° 43' 19"	0° 59' 07"	16' 06.67"	258° 6' 52"	0.78279
16	54° 37' 08"	4° 06' 10"	51° 10' 32"	22° 53' 58"	0° 59' 07"	16' 06.56"	258° 23' 13"	0.78668
17	55° 12' 29"	4° 07' 58"	51° 47' 09"	23° 04' 28"	0° 59' 07"	16' 06.46"	258° 39' 46"	0.79054
18	55° 47' 50"	4° 09' 44"	52° 23' 51"	23° 14' 50"	0° 59' 06"	16' 06.35"	258° 56' 31"	0.79438
19	56° 23' 11"	4° 11' 29"	53° 00' 39"	23° 25' 02"	0° 59' 06"	16' 06.24"	259° 13' 28"	0.79819
20	56° 58' 32"	4° 13' 12"	53° 37' 32"	23° 35' 07"	0° 59' 05"	16' 06.13"	259° 30' 37"	0.80197
21	57° 33' 52"	4° 14' 54"	54° 14' 30"	23° 45' 02"	0° 59' 05"	16' 06.01"	259° 47' 57"	0.80573
22	58° 09' 13"	4° 16' 34"	54° 51' 34"	23° 54' 48"	0° 59' 05"	16' 05.90"	260° 5' 30"	0.80946
23	58° 44' 33"	4° 18' 12"	55° 28' 43"	24° 04' 26"	0° 59' 04"	16' 05.77"	260° 23' 15"	0.81315
24	59° 19' 53"	4° 19' 49"	56° 05' 57"	24° 13' 54"	0° 59' 04"	16' 05.65"	260° 41' 13"	0.81682

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	289° 59' 31"	0.35"	291° 37' 25"	-21° 57' 02"	0.9833988	16' 15.83"	23° 26' 18"	-7 m 25 s
1	290° 02' 04"	0.35"	291° 40' 08"	-21° 56' 40"	0.9834000	16' 15.83"	23° 26' 18"	-7 m 26 s
2	290° 04' 36"	0.35"	291° 42' 51"	-21° 56' 17"	0.9834012	16' 15.83"	23° 26' 18"	-7 m 27 s
3	290° 07' 09"	0.36"	291° 45' 34"	-21° 55' 55"	0.9834024	16' 15.83"	23° 26' 18"	-7 m 28 s
4	290° 09' 42"	0.36"	291° 48' 17"	-21° 55' 32"	0.9834036	16' 15.83"	23° 26' 18"	-7 m 29 s
5	290° 12' 15"	0.36"	291° 50' 60"	-21° 55' 09"	0.9834048	16' 15.82"	23° 26' 18"	-7 m 30 s
6	290° 14' 48"	0.36"	291° 53' 43"	-21° 54' 47"	0.9834060	16' 15.82"	23° 26' 18"	-7 m 31 s
7	290° 17' 20"	0.37"	291° 56' 26"	-21° 54' 24"	0.9834073	16' 15.82"	23° 26' 18"	-7 m 32 s
8	290° 19' 53"	0.37"	291° 59' 09"	-21° 54' 01"	0.9834085	16' 15.82"	23° 26' 18"	-7 m 33 s
9	290° 22' 26"	0.37"	292° 01' 52"	-21° 53' 39"	0.9834098	16' 15.82"	23° 26' 18"	-7 m 34 s
10	290° 24' 59"	0.38"	292° 04' 34"	-21° 53' 16"	0.9834111	16' 15.82"	23° 26' 18"	-7 m 35 s
11	290° 27' 32"	0.38"	292° 07' 17"	-21° 52' 53"	0.9834124	16' 15.82"	23° 26' 18"	-7 m 36 s
12	290° 30' 04"	0.38"	292° 09' 60"	-21° 52' 30"	0.9834137	16' 15.82"	23° 26' 18"	-7 m 37 s
13	290° 32' 37"	0.38"	292° 12' 43"	-21° 52' 07"	0.9834150	16' 15.81"	23° 26' 18"	-7 m 38 s
14	290° 35' 10"	0.39"	292° 15' 26"	-21° 51' 44"	0.9834163	16' 15.81"	23° 26' 18"	-7 m 39 s
15	290° 37' 43"	0.39"	292° 18' 08"	-21° 51' 21"	0.9834176	16' 15.81"	23° 26' 18"	-7 m 40 s
16	290° 40' 16"	0.39"	292° 20' 51"	-21° 50' 58"	0.9834190	16' 15.81"	23° 26' 18"	-7 m 41 s
17	290° 42' 48"	0.39"	292° 23' 34"	-21° 50' 35"	0.9834203	16' 15.81"	23° 26' 18"	-7 m 42 s
18	290° 45' 21"	0.40"	292° 26' 17"	-21° 50' 12"	0.9834217	16' 15.81"	23° 26' 18"	-7 m 43 s
19	290° 47' 54"	0.40"	292° 28' 59"	-21° 49' 48"	0.9834231	16' 15.81"	23° 26' 18"	-7 m 44 s
20	290° 50' 27"	0.40"	292° 31' 42"	-21° 49' 25"	0.9834245	16' 15.80"	23° 26' 18"	-7 m 45 s
21	290° 52' 60"	0.40"	292° 34' 25"	-21° 49' 02"	0.9834259	16' 15.80"	23° 26' 18"	-7 m 46 s
22	290° 55' 32"	0.40"	292° 37' 07"	-21° 48' 38"	0.9834273	16' 15.80"	23° 26' 18"	-7 m 47 s
23	290° 58' 05"	0.41"	292° 39' 50"	-21° 48' 15"	0.9834287	16' 15.80"	23° 26' 18"	-7 m 48 s
24	291° 00' 38"	0.41"	292° 42' 33"	-21° 47' 52"	0.9834301	16' 15.80"	23° 26' 18"	-7 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	59° 19' 53"	4° 19' 49"	56° 05' 57"	24° 13' 54"	0° 59' 04"	16' 05.65"	260° 41' 13"	0.81682
1	59° 55' 12"	4° 21' 24"	56° 43' 16"	24° 23' 13"	0° 59' 03"	16' 05.52"	260° 59' 22"	0.82046
2	60° 30' 32"	4° 22' 57"	57° 20' 40"	24° 32' 23"	0° 59' 03"	16' 05.39"	261° 17' 43"	0.82407
3	61° 05' 51"	4° 24' 28"	57° 58' 09"	24° 41' 23"	0° 59' 02"	16' 05.26"	261° 36' 17"	0.82765
4	61° 41' 10"	4° 25' 58"	58° 35' 43"	24° 50' 14"	0° 59' 02"	16' 05.12"	261° 55' 03"	0.83120
5	62° 16' 28"	4° 27' 26"	59° 13' 21"	24° 58' 55"	0° 59' 01"	16' 04.98"	262° 14' 01"	0.83472
6	62° 51' 46"	4° 28' 53"	59° 51' 05"	25° 07' 27"	0° 59' 01"	16' 04.84"	262° 33' 12"	0.83821
7	63° 27' 04"	4° 30' 17"	60° 28' 53"	25° 15' 49"	0° 59' 00"	16' 04.69"	262° 52' 35"	0.84166
8	64° 02' 22"	4° 31' 40"	61° 06' 46"	25° 24' 01"	0° 58' 60"	16' 04.54"	263° 12' 11"	0.84509
9	64° 37' 39"	4° 33' 01"	61° 44' 44"	25° 32' 04"	0° 58' 59"	16' 04.39"	263° 31' 59"	0.84848
10	65° 12' 56"	4° 34' 21"	62° 22' 46"	25° 39' 56"	0° 58' 58"	16' 04.23"	263° 51' 59"	0.85184
11	65° 48' 12"	4° 35' 39"	63° 00' 53"	25° 47' 39"	0° 58' 58"	16' 04.08"	264° 12' 13"	0.85517
12	66° 23' 28"	4° 36' 54"	63° 39' 03"	25° 55' 11"	0° 58' 57"	16' 03.91"	264° 32' 39"	0.85847
13	66° 58' 44"	4° 38' 09"	64° 17' 18"	26° 02' 33"	0° 58' 57"	16' 03.75"	264° 53' 18"	0.86173
14	67° 33' 59"	4° 39' 21"	64° 55' 38"	26° 09' 45"	0° 58' 56"	16' 03.58"	265° 14' 09"	0.86496
15	68° 09' 14"	4° 40' 31"	65° 34' 01"	26° 16' 47"	0° 58' 55"	16' 03.41"	265° 35' 14"	0.86815
16	68° 44' 28"	4° 41' 40"	66° 12' 28"	26° 23' 38"	0° 58' 55"	16' 03.24"	265° 56' 33"	0.87131
17	69° 19' 41"	4° 42' 47"	66° 50' 59"	26° 30' 19"	0° 58' 54"	16' 03.06"	266° 18' 04"	0.87444
18	69° 54' 55"	4° 43' 52"	67° 29' 34"	26° 36' 50"	0° 58' 54"	16' 02.88"	266° 39' 49"	0.87753
19	70° 30' 07"	4° 44' 55"	68° 08' 12"	26° 43' 10"	0° 58' 53"	16' 02.69"	267° 1' 47"	0.88059
20	71° 05' 19"	4° 45' 57"	68° 46' 54"	26° 49' 19"	0° 58' 52"	16' 02.51"	267° 23' 59"	0.88361
21	71° 40' 31"	4° 46' 57"	69° 25' 40"	26° 55' 18"	0° 58' 51"	16' 02.32"	267° 46' 25"	0.88660
22	72° 15' 42"	4° 47' 54"	70° 04' 28"	27° 01' 05"	0° 58' 51"	16' 02.12"	268° 9' 06"	0.88955
23	72° 50' 52"	4° 48' 50"	70° 43' 20"	27° 06' 42"	0° 58' 50"	16' 01.93"	268° 32' 00"	0.89247
24	73° 26' 02"	4° 49' 44"	71° 22' 15"	27° 12' 09"	0° 58' 49"	16' 01.73"	268° 55' 09"	0.89535

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	291° 00' 38"	0.41"	292° 42' 33"	-21° 47' 52"	0.9834301	16'15.80"	23° 26' 18"	-7 m 49 s
1	291° 03' 11"	0.41"	292° 45' 15"	-21° 47' 28"	0.9834316	16'15.80"	23° 26' 18"	-7 m 50 s
2	291° 05' 44"	0.41"	292° 47' 58"	-21° 47' 04"	0.9834330	16'15.80"	23° 26' 18"	-7 m 51 s
3	291° 08' 16"	0.41"	292° 50' 40"	-21° 46' 41"	0.9834345	16'15.79"	23° 26' 18"	-7 m 52 s
4	291° 10' 49"	0.42"	292° 53' 23"	-21° 46' 17"	0.9834359	16'15.79"	23° 26' 18"	-7 m 53 s
5	291° 13' 22"	0.42"	292° 56' 05"	-21° 45' 54"	0.9834374	16'15.79"	23° 26' 18"	-7 m 54 s
6	291° 15' 55"	0.42"	292° 58' 48"	-21° 45' 30"	0.9834389	16'15.79"	23° 26' 18"	-7 m 55 s
7	291° 18' 28"	0.42"	293° 01' 30"	-21° 45' 06"	0.9834404	16'15.79"	23° 26' 18"	-7 m 56 s
8	291° 21' 00"	0.42"	293° 04' 13"	-21° 44' 42"	0.9834419	16'15.79"	23° 26' 18"	-7 m 57 s
9	291° 23' 33"	0.42"	293° 06' 55"	-21° 44' 19"	0.9834435	16'15.79"	23° 26' 18"	-7 m 58 s
10	291° 26' 06"	0.42"	293° 09' 38"	-21° 43' 55"	0.9834450	16'15.78"	23° 26' 18"	-7 m 59 s
11	291° 28' 39"	0.43"	293° 12' 20"	-21° 43' 31"	0.9834466	16'15.78"	23° 26' 18"	-7 m 60 s
12	291° 31' 12"	0.43"	293° 15' 03"	-21° 43' 07"	0.9834481	16'15.78"	23° 26' 18"	-8 m 01 s
13	291° 33' 44"	0.43"	293° 17' 45"	-21° 42' 43"	0.9834497	16'15.78"	23° 26' 18"	-8 m 02 s
14	291° 36' 17"	0.43"	293° 20' 28"	-21° 42' 19"	0.9834513	16'15.78"	23° 26' 18"	-8 m 03 s
15	291° 38' 50"	0.43"	293° 23' 10"	-21° 41' 55"	0.9834529	16'15.78"	23° 26' 18"	-8 m 04 s
16	291° 41' 23"	0.43"	293° 25' 52"	-21° 41' 30"	0.9834545	16'15.77"	23° 26' 18"	-8 m 05 s
17	291° 43' 55"	0.43"	293° 28' 35"	-21° 41' 06"	0.9834561	16'15.77"	23° 26' 18"	-8 m 06 s
18	291° 46' 28"	0.43"	293° 31' 17"	-21° 40' 42"	0.9834577	16'15.77"	23° 26' 18"	-8 m 07 s
19	291° 49' 01"	0.44"	293° 33' 59"	-21° 40' 18"	0.9834594	16'15.77"	23° 26' 18"	-8 m 08 s
20	291° 51' 34"	0.44"	293° 36' 42"	-21° 39' 53"	0.9834610	16'15.77"	23° 26' 18"	-8 m 08 s
21	291° 54' 07"	0.44"	293° 39' 24"	-21° 39' 29"	0.9834627	16'15.77"	23° 26' 18"	-8 m 09 s
22	291° 56' 39"	0.44"	293° 42' 06"	-21° 39' 05"	0.9834643	16'15.76"	23° 26' 18"	-8 m 10 s
23	291° 59' 12"	0.44"	293° 44' 49"	-21° 38' 40"	0.9834660	16'15.76"	23° 26' 18"	-8 m 11 s
24	292° 01' 45"	0.44"	293° 47' 31"	-21° 38' 16"	0.9834677	16'15.76"	23° 26' 18"	-8 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	73° 26' 02"	4° 49' 44"	71° 22' 15"	27° 12' 09"	0° 58' 49"	16' 01.73"	268° 55' 09"	0.89535
1	74° 01' 11"	4° 50' 37"	72° 01' 13"	27° 17' 24"	0° 58' 49"	16' 01.52"	269° 18' 33"	0.89819
2	74° 36' 20"	4° 51' 27"	72° 40' 14"	27° 22' 28"	0° 58' 48"	16' 01.32"	269° 42' 12"	0.90100
3	75° 11' 27"	4° 52' 16"	73° 19' 17"	27° 27' 22"	0° 58' 47"	16' 01.11"	270° 6' 06"	0.90377
4	75° 46' 35"	4° 53' 02"	73° 58' 23"	27° 32' 04"	0° 58' 46"	16' 00.89"	270° 30' 16"	0.90650
5	76° 21' 41"	4° 53' 47"	74° 37' 32"	27° 36' 35"	0° 58' 45"	16' 00.68"	270° 54' 42"	0.90920
6	76° 56' 47"	4° 54' 30"	75° 16' 42"	27° 40' 56"	0° 58' 45"	16' 00.46"	271° 19' 24"	0.91186
7	77° 31' 52"	4° 55' 11"	75° 55' 55"	27° 45' 05"	0° 58' 44"	16' 00.23"	271° 44' 23"	0.91448
8	78° 06' 56"	4° 55' 50"	76° 35' 10"	27° 49' 02"	0° 58' 43"	16' 00.01"	272° 9' 39"	0.91706
9	78° 41' 59"	4° 56' 28"	77° 14' 26"	27° 52' 49"	0° 58' 42"	15' 59.78"	272° 35' 12"	0.91961
10	79° 17' 02"	4° 57' 03"	77° 53' 45"	27° 56' 24"	0° 58' 41"	15' 59.55"	273° 1' 04"	0.92212
11	79° 52' 04"	4° 57' 37"	78° 33' 05"	27° 59' 49"	0° 58' 40"	15' 59.31"	273° 27' 14"	0.92458
12	80° 27' 05"	4° 58' 08"	79° 12' 26"	28° 03' 01"	0° 58' 40"	15' 59.07"	273° 53' 44"	0.92702
13	81° 02' 05"	4° 58' 38"	79° 51' 48"	28° 06' 03"	0° 58' 39"	15' 58.83"	274° 20' 33"	0.92941
14	81° 37' 04"	4° 59' 06"	80° 31' 12"	28° 08' 53"	0° 58' 38"	15' 58.59"	274° 47' 44"	0.93176
15	82° 12' 03"	4° 59' 32"	81° 10' 37"	28° 11' 32"	0° 58' 37"	15' 58.34"	275° 15' 15"	0.93407
16	82° 47' 00"	4° 59' 56"	81° 50' 02"	28° 13' 59"	0° 58' 36"	15' 58.08"	275° 43' 09"	0.93635
17	83° 21' 57"	5° 00' 19"	82° 29' 28"	28° 16' 15"	0° 58' 35"	15' 57.83"	276° 11' 25"	0.93858
18	83° 56' 52"	5° 00' 39"	83° 08' 55"	28° 18' 20"	0° 58' 34"	15' 57.57"	276° 40' 06"	0.94078
19	84° 31' 47"	5° 00' 58"	83° 48' 22"	28° 20' 13"	0° 58' 33"	15' 57.31"	277° 9' 12"	0.94294
20	85° 06' 40"	5° 01' 14"	84° 27' 49"	28° 21' 54"	0° 58' 32"	15' 57.05"	277° 38' 44"	0.94505
21	85° 41' 33"	5° 01' 29"	85° 07' 16"	28° 23' 25"	0° 58' 31"	15' 56.78"	278° 8' 44"	0.94713
22	86° 16' 25"	5° 01' 42"	85° 46' 43"	28° 24' 43"	0° 58' 30"	15' 56.51"	278° 39' 12"	0.94916
23	86° 51' 15"	5° 01' 53"	86° 26' 10"	28° 25' 51"	0° 58' 29"	15' 56.23"	279° 10' 11"	0.95116
24	87° 26' 05"	5° 02' 02"	87° 05' 36"	28° 26' 47"	0° 58' 28"	15' 55.96"	279° 41' 42"	0.95311

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	292° 01' 45"	0.44"	293° 47' 31"	-21° 38' 16"	0.9834677	16' 15.76"	23° 26' 18"	-8 m 12 s
1	292° 04' 18"	0.44"	293° 50' 13"	-21° 37' 51"	0.9834694	16' 15.76"	23° 26' 18"	-8 m 13 s
2	292° 06' 51"	0.44"	293° 52' 55"	-21° 37' 27"	0.9834711	16' 15.76"	23° 26' 18"	-8 m 14 s
3	292° 09' 23"	0.44"	293° 55' 37"	-21° 37' 02"	0.9834729	16' 15.76"	23° 26' 18"	-8 m 15 s
4	292° 11' 56"	0.44"	293° 58' 20"	-21° 36' 37"	0.9834746	16' 15.75"	23° 26' 18"	-8 m 16 s
5	292° 14' 29"	0.44"	294° 01' 02"	-21° 36' 13"	0.9834763	16' 15.75"	23° 26' 18"	-8 m 17 s
6	292° 17' 02"	0.44"	294° 03' 44"	-21° 35' 48"	0.9834781	16' 15.75"	23° 26' 18"	-8 m 18 s
7	292° 19' 34"	0.44"	294° 06' 26"	-21° 35' 23"	0.9834799	16' 15.75"	23° 26' 18"	-8 m 19 s
8	292° 22' 07"	0.44"	294° 09' 08"	-21° 34' 58"	0.9834817	16' 15.75"	23° 26' 18"	-8 m 20 s
9	292° 24' 40"	0.44"	294° 11' 50"	-21° 34' 33"	0.9834835	16' 15.75"	23° 26' 18"	-8 m 21 s
10	292° 27' 13"	0.44"	294° 14' 32"	-21° 34' 08"	0.9834853	16' 15.74"	23° 26' 18"	-8 m 22 s
11	292° 29' 45"	0.44"	294° 17' 14"	-21° 33' 43"	0.9834871	16' 15.74"	23° 26' 18"	-8 m 23 s
12	292° 32' 18"	0.44"	294° 19' 56"	-21° 33' 18"	0.9834889	16' 15.74"	23° 26' 18"	-8 m 24 s
13	292° 34' 51"	0.44"	294° 22' 38"	-21° 32' 53"	0.9834907	16' 15.74"	23° 26' 18"	-8 m 25 s
14	292° 37' 24"	0.44"	294° 25' 21"	-21° 32' 28"	0.9834926	16' 15.74"	23° 26' 18"	-8 m 26 s
15	292° 39' 57"	0.44"	294° 28' 03"	-21° 32' 03"	0.9834945	16' 15.74"	23° 26' 18"	-8 m 27 s
16	292° 42' 29"	0.44"	294° 30' 44"	-21° 31' 38"	0.9834963	16' 15.73"	23° 26' 18"	-8 m 28 s
17	292° 45' 02"	0.44"	294° 33' 26"	-21° 31' 13"	0.9834982	16' 15.73"	23° 26' 18"	-8 m 29 s
18	292° 47' 35"	0.44"	294° 36' 08"	-21° 30' 47"	0.9835001	16' 15.73"	23° 26' 18"	-8 m 30 s
19	292° 50' 08"	0.44"	294° 38' 50"	-21° 30' 22"	0.9835020	16' 15.73"	23° 26' 18"	-8 m 30 s
20	292° 52' 40"	0.44"	294° 41' 32"	-21° 29' 57"	0.9835039	16' 15.73"	23° 26' 18"	-8 m 31 s
21	292° 55' 13"	0.44"	294° 44' 14"	-21° 29' 31"	0.9835059	16' 15.72"	23° 26' 18"	-8 m 32 s
22	292° 57' 46"	0.44"	294° 46' 56"	-21° 29' 06"	0.9835078	16' 15.72"	23° 26' 18"	-8 m 33 s
23	293° 00' 19"	0.44"	294° 49' 38"	-21° 28' 40"	0.9835097	16' 15.72"	23° 26' 18"	-8 m 34 s
24	293° 02' 51"	0.44"	294° 52' 20"	-21° 28' 15"	0.9835117	16' 15.72"	23° 26' 18"	-8 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	87° 26' 05"	5° 02' 02"	87° 05' 36"	28° 26' 47"	0° 58' 28"	15' 55.96"	279° 41' 42"	0.95311
1	88° 00' 53"	5° 02' 09"	87° 45' 02"	28° 27' 32"	0° 58' 27"	15' 55.68"	280° 13' 46"	0.95503
2	88° 35' 41"	5° 02' 14"	88° 24' 27"	28° 28' 05"	0° 58' 26"	15' 55.39"	280° 46' 27"	0.95690
3	89° 10' 27"	5° 02' 18"	89° 03' 51"	28° 28' 26"	0° 58' 25"	15' 55.11"	281° 19' 45"	0.95874
4	89° 45' 12"	5° 02' 19"	89° 43' 14"	28° 28' 37"	0° 58' 24"	15' 54.82"	281° 53' 43"	0.96053
5	90° 19' 56"	5° 02' 19"	90° 22' 35"	28° 28' 36"	0° 58' 23"	15' 54.52"	282° 28' 23"	0.96228
6	90° 54' 39"	5° 02' 17"	91° 01' 56"	28° 28' 24"	0° 58' 22"	15' 54.23"	283° 3' 49"	0.96399
7	91° 29' 20"	5° 02' 13"	91° 41' 14"	28° 27' 60"	0° 58' 21"	15' 53.93"	283° 40' 04"	0.96566
8	92° 04' 01"	5° 02' 07"	92° 20' 31"	28° 27' 25"	0° 58' 20"	15' 53.63"	284° 17' 10"	0.96729
9	92° 38' 40"	5° 01' 59"	92° 59' 46"	28° 26' 39"	0° 58' 18"	15' 53.32"	284° 55' 12"	0.96888
10	93° 13' 18"	5° 01' 50"	93° 38' 59"	28° 25' 41"	0° 58' 17"	15' 53.02"	285° 34' 14"	0.97042
11	93° 47' 55"	5° 01' 38"	94° 18' 10"	28° 24' 33"	0° 58' 16"	15' 52.70"	286° 14' 20"	0.97193
12	94° 22' 30"	5° 01' 25"	94° 57' 19"	28° 23' 13"	0° 58' 15"	15' 52.39"	286° 55' 36"	0.97339
13	94° 57' 04"	5° 01' 10"	95° 36' 25"	28° 21' 42"	0° 58' 14"	15' 52.07"	287° 38' 06"	0.97481
14	95° 31' 37"	5° 00' 53"	96° 15' 28"	28° 19' 60"	0° 58' 13"	15' 51.75"	288° 21' 58"	0.97619
15	96° 06' 08"	5° 00' 34"	96° 54' 29"	28° 18' 06"	0° 58' 12"	15' 51.43"	289° 7' 17"	0.97753
16	96° 40' 38"	5° 00' 14"	97° 33' 26"	28° 16' 02"	0° 58' 10"	15' 51.11"	289° 54' 12"	0.97883
17	97° 15' 07"	4° 59' 52"	98° 12' 21"	28° 13' 47"	0° 58' 09"	15' 50.78"	290° 42' 52"	0.98009
18	97° 49' 34"	4° 59' 27"	98° 51' 12"	28° 11' 21"	0° 58' 08"	15' 50.45"	291° 33' 27"	0.98130
19	98° 24' 00"	4° 59' 01"	99° 30' 00"	28° 08' 44"	0° 58' 07"	15' 50.11"	292° 26' 06"	0.98247
20	98° 58' 25"	4° 58' 34"	100° 08' 44"	28° 05' 56"	0° 58' 05"	15' 49.78"	293° 21' 04"	0.98360
21	99° 32' 48"	4° 58' 04"	100° 47' 25"	28° 02' 57"	0° 58' 04"	15' 49.44"	294° 18' 33"	0.98469
22	100° 07' 09"	4° 57' 33"	101° 26' 02"	27° 59' 48"	0° 58' 03"	15' 49.10"	295° 18' 49"	0.98574
23	100° 41' 29"	4° 56' 59"	102° 04' 35"	27° 56' 28"	0° 58' 02"	15' 48.75"	296° 22' 12"	0.98674
24	101° 15' 48"	4° 56' 25"	102° 43' 04"	27° 52' 58"	0° 58' 00"	15' 48.41"	297° 29' 00"	0.98770

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	293° 02' 51"	0.44"	294° 52' 20"	-21° 28' 15"	0.9835117	16'15.72"	23° 26' 18"	-8 m 35 s
1	293° 05' 24"	0.44"	294° 55' 02"	-21° 27' 49"	0.9835137	16'15.72"	23° 26' 18"	-8 m 36 s
2	293° 07' 57"	0.44"	294° 57' 43"	-21° 27' 24"	0.9835157	16'15.71"	23° 26' 18"	-8 m 37 s
3	293° 10' 30"	0.44"	295° 00' 25"	-21° 26' 58"	0.9835177	16'15.71"	23° 26' 18"	-8 m 38 s
4	293° 13' 02"	0.44"	295° 03' 07"	-21° 26' 32"	0.9835197	16'15.71"	23° 26' 18"	-8 m 39 s
5	293° 15' 35"	0.44"	295° 05' 49"	-21° 26' 06"	0.9835217	16'15.71"	23° 26' 18"	-8 m 40 s
6	293° 18' 08"	0.44"	295° 08' 31"	-21° 25' 41"	0.9835237	16'15.71"	23° 26' 18"	-8 m 41 s
7	293° 20' 41"	0.44"	295° 11' 12"	-21° 25' 15"	0.9835258	16'15.70"	23° 26' 18"	-8 m 42 s
8	293° 23' 13"	0.44"	295° 13' 54"	-21° 24' 49"	0.9835278	16'15.70"	23° 26' 18"	-8 m 43 s
9	293° 25' 46"	0.43"	295° 16' 36"	-21° 24' 23"	0.9835299	16'15.70"	23° 26' 18"	-8 m 44 s
10	293° 28' 19"	0.43"	295° 19' 17"	-21° 23' 57"	0.9835319	16'15.70"	23° 26' 18"	-8 m 45 s
11	293° 30' 52"	0.43"	295° 21' 59"	-21° 23' 31"	0.9835340	16'15.70"	23° 26' 18"	-8 m 45 s
12	293° 33' 24"	0.43"	295° 24' 41"	-21° 23' 05"	0.9835361	16'15.69"	23° 26' 18"	-8 m 46 s
13	293° 35' 57"	0.43"	295° 27' 22"	-21° 22' 39"	0.9835382	16'15.69"	23° 26' 18"	-8 m 47 s
14	293° 38' 30"	0.43"	295° 30' 04"	-21° 22' 13"	0.9835403	16'15.69"	23° 26' 18"	-8 m 48 s
15	293° 41' 03"	0.43"	295° 32' 46"	-21° 21' 47"	0.9835425	16'15.69"	23° 26' 18"	-8 m 49 s
16	293° 43' 35"	0.43"	295° 35' 27"	-21° 21' 20"	0.9835446	16'15.69"	23° 26' 18"	-8 m 50 s
17	293° 46' 08"	0.42"	295° 38' 09"	-21° 20' 54"	0.9835468	16'15.68"	23° 26' 18"	-8 m 51 s
18	293° 48' 41"	0.42"	295° 40' 50"	-21° 20' 28"	0.9835489	16'15.68"	23° 26' 18"	-8 m 52 s
19	293° 51' 14"	0.42"	295° 43' 32"	-21° 20' 02"	0.9835511	16'15.68"	23° 26' 18"	-8 m 53 s
20	293° 53' 46"	0.42"	295° 46' 13"	-21° 19' 35"	0.9835533	16'15.68"	23° 26' 18"	-8 m 54 s
21	293° 56' 19"	0.42"	295° 48' 55"	-21° 19' 09"	0.9835555	16'15.67"	23° 26' 18"	-8 m 55 s
22	293° 58' 52"	0.42"	295° 51' 36"	-21° 18' 42"	0.9835577	16'15.67"	23° 26' 18"	-8 m 56 s
23	294° 01' 25"	0.41"	295° 54' 18"	-21° 18' 16"	0.9835599	16'15.67"	23° 26' 18"	-8 m 56 s
24	294° 03' 57"	0.41"	295° 56' 59"	-21° 17' 49"	0.9835621	16'15.67"	23° 26' 18"	-8 m 57 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	101° 15' 48"	4° 56' 25"	102° 43' 04"	27° 52' 58"	0° 58' 00"	15' 48.41"	297° 29' 00"	0.98770
1	101° 50' 05"	4° 55' 48"	103° 21' 29"	27° 49' 16"	0° 57' 59"	15' 48.06"	298° 39' 39"	0.98863
2	102° 24' 21"	4° 55' 09"	103° 59' 50"	27° 45' 25"	0° 57' 58"	15' 47.70"	299° 54' 34"	0.98950
3	102° 58' 35"	4° 54' 29"	104° 38' 06"	27° 41' 23"	0° 57' 57"	15' 47.35"	301° 14' 17"	0.99034
4	103° 32' 47"	4° 53' 47"	105° 16' 18"	27° 37' 11"	0° 57' 55"	15' 46.99"	302° 39' 24"	0.99114
5	104° 06' 58"	4° 53' 04"	105° 54' 24"	27° 32' 48"	0° 57' 54"	15' 46.63"	304° 10' 37"	0.99189
6	104° 41' 08"	4° 52' 18"	106° 32' 27"	27° 28' 15"	0° 57' 53"	15' 46.27"	305° 48' 43"	0.99261
7	105° 15' 15"	4° 51' 31"	107° 10' 24"	27° 23' 32"	0° 57' 51"	15' 45.91"	307° 34' 37"	0.99328
8	105° 49' 21"	4° 50' 42"	107° 48' 16"	27° 18' 39"	0° 57' 50"	15' 45.54"	309° 29' 25"	0.99391
9	106° 23' 26"	4° 49' 52"	108° 26' 03"	27° 13' 36"	0° 57' 49"	15' 45.17"	311° 34' 20"	0.99449
10	106° 57' 29"	4° 48' 60"	109° 03' 45"	27° 08' 23"	0° 57' 47"	15' 44.80"	313° 50' 49"	0.99504
11	107° 31' 30"	4° 48' 06"	109° 41' 22"	27° 03' 00"	0° 57' 46"	15' 44.42"	316° 20' 32"	0.99555
12	108° 05' 29"	4° 47' 10"	110° 18' 53"	26° 57' 28"	0° 57' 44"	15' 44.05"	319° 5' 20"	0.99601
13	108° 39' 27"	4° 46' 13"	110° 56' 19"	26° 51' 46"	0° 57' 43"	15' 43.67"	322° 7' 19"	0.99643
14	109° 13' 23"	4° 45' 14"	111° 33' 39"	26° 45' 54"	0° 57' 42"	15' 43.29"	325° 28' 47"	0.99681
15	109° 47' 18"	4° 44' 14"	112° 10' 53"	26° 39' 53"	0° 57' 40"	15' 42.90"	329° 12' 08"	0.99715
16	110° 21' 10"	4° 43' 12"	112° 48' 02"	26° 33' 42"	0° 57' 39"	15' 42.52"	333° 19' 45"	0.99745
17	110° 55' 01"	4° 42' 08"	113° 25' 04"	26° 27' 22"	0° 57' 37"	15' 42.13"	337° 53' 41"	0.99771
18	111° 28' 50"	4° 41' 03"	114° 02' 01"	26° 20' 53"	0° 57' 36"	15' 41.74"	342° 55' 20"	0.99793
19	112° 02' 38"	4° 39' 56"	114° 38' 52"	26° 14' 15"	0° 57' 35"	15' 41.35"	348° 24' 51"	0.99810
20	112° 36' 23"	4° 38' 47"	115° 15' 37"	26° 07' 27"	0° 57' 33"	15' 40.96"	354° 20' 33"	0.99824
21	113° 10' 07"	4° 37' 37"	115° 52' 15"	26° 00' 31"	0° 57' 32"	15' 40.57"	0° 38' 31"	0.99833
22	113° 43' 49"	4° 36' 26"	116° 28' 48"	25° 53' 26"	0° 57' 30"	15' 40.17"	7° 12' 18"	0.99839
23	114° 17' 29"	4° 35' 13"	117° 05' 14"	25° 46' 11"	0° 57' 29"	15' 39.77"	13° 53' 26"	0.99840
24	114° 51' 07"	4° 33' 58"	117° 41' 34"	25° 38' 49"	0° 57' 27"	15' 39.37"	20° 32' 23"	0.99838

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	294° 03' 57"	0.41"	295° 56' 59"	-21° 17' 49"	0.9835621	16' 15.67"	23° 26' 18"	-8 m 57 s
1	294° 06' 30"	0.41"	295° 59' 41"	-21° 17' 23"	0.9835644	16' 15.67"	23° 26' 18"	-8 m 58 s
2	294° 09' 03"	0.41"	296° 02' 22"	-21° 16' 56"	0.9835666	16' 15.66"	23° 26' 18"	-8 m 59 s
3	294° 11' 36"	0.41"	296° 05' 03"	-21° 16' 29"	0.9835689	16' 15.66"	23° 26' 18"	-9 m 00 s
4	294° 14' 08"	0.41"	296° 07' 45"	-21° 16' 02"	0.9835712	16' 15.66"	23° 26' 18"	-9 m 01 s
5	294° 16' 41"	0.40"	296° 10' 26"	-21° 15' 36"	0.9835735	16' 15.66"	23° 26' 18"	-9 m 02 s
6	294° 19' 14"	0.40"	296° 13' 08"	-21° 15' 09"	0.9835758	16' 15.65"	23° 26' 18"	-9 m 03 s
7	294° 21' 47"	0.40"	296° 15' 49"	-21° 14' 42"	0.9835781	16' 15.65"	23° 26' 18"	-9 m 04 s
8	294° 24' 19"	0.40"	296° 18' 30"	-21° 14' 15"	0.9835804	16' 15.65"	23° 26' 18"	-9 m 05 s
9	294° 26' 52"	0.39"	296° 21' 11"	-21° 13' 48"	0.9835827	16' 15.65"	23° 26' 18"	-9 m 06 s
10	294° 29' 25"	0.39"	296° 23' 53"	-21° 13' 21"	0.9835851	16' 15.65"	23° 26' 18"	-9 m 06 s
11	294° 31' 58"	0.39"	296° 26' 34"	-21° 12' 54"	0.9835874	16' 15.64"	23° 26' 18"	-9 m 07 s
12	294° 34' 30"	0.39"	296° 29' 15"	-21° 12' 27"	0.9835898	16' 15.64"	23° 26' 18"	-9 m 08 s
13	294° 37' 03"	0.39"	296° 31' 57"	-21° 11' 60"	0.9835922	16' 15.64"	23° 26' 18"	-9 m 09 s
14	294° 39' 36"	0.38"	296° 34' 38"	-21° 11' 33"	0.9835945	16' 15.64"	23° 26' 18"	-9 m 10 s
15	294° 42' 08"	0.38"	296° 37' 19"	-21° 11' 06"	0.9835969	16' 15.63"	23° 26' 18"	-9 m 11 s
16	294° 44' 41"	0.38"	296° 40' 00"	-21° 10' 38"	0.9835993	16' 15.63"	23° 26' 18"	-9 m 12 s
17	294° 47' 14"	0.37"	296° 42' 41"	-21° 10' 11"	0.9836018	16' 15.63"	23° 26' 18"	-9 m 13 s
18	294° 49' 47"	0.37"	296° 45' 22"	-21° 09' 44"	0.9836042	16' 15.63"	23° 26' 18"	-9 m 14 s
19	294° 52' 19"	0.37"	296° 48' 04"	-21° 09' 16"	0.9836066	16' 15.62"	23° 26' 18"	-9 m 15 s
20	294° 54' 52"	0.37"	296° 50' 45"	-21° 08' 49"	0.9836091	16' 15.62"	23° 26' 18"	-9 m 15 s
21	294° 57' 25"	0.36"	296° 53' 26"	-21° 08' 22"	0.9836115	16' 15.62"	23° 26' 18"	-9 m 16 s
22	294° 59' 58"	0.36"	296° 56' 07"	-21° 07' 54"	0.9836140	16' 15.62"	23° 26' 18"	-9 m 17 s
23	295° 02' 30"	0.36"	296° 58' 48"	-21° 07' 27"	0.9836165	16' 15.61"	23° 26' 18"	-9 m 18 s
24	295° 05' 03"	0.36"	297° 01' 29"	-21° 06' 59"	0.9836190	16' 15.61"	23° 26' 18"	-9 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	114° 51' 07"	4° 33' 58"	117° 41' 34"	25° 38' 49"	0° 57' 27"	15' 39.37"	20° 32' 23"	0.99838
1	115° 24' 44"	4° 32' 42"	118° 17' 47"	25° 31' 17"	0° 57' 26"	15' 38.97"	26° 59' 55"	0.99831
2	115° 58' 19"	4° 31' 24"	118° 53' 54"	25° 23' 37"	0° 57' 24"	15' 38.56"	33° 8' 22"	0.99820
3	116° 31' 51"	4° 30' 05"	119° 29' 54"	25° 15' 49"	0° 57' 23"	15' 38.16"	38° 52' 19"	0.99805
4	117° 05' 22"	4° 28' 44"	120° 05' 48"	25° 07' 52"	0° 57' 21"	15' 37.75"	44° 8' 53"	0.99787
5	117° 38' 51"	4° 27' 22"	120° 41' 35"	24° 59' 48"	0° 57' 20"	15' 37.34"	48° 57' 15"	0.99764
6	118° 12' 18"	4° 25' 58"	121° 17' 16"	24° 51' 35"	0° 57' 18"	15' 36.94"	53° 18' 09"	0.99738
7	118° 45' 43"	4° 24' 33"	121° 52' 50"	24° 43' 14"	0° 57' 17"	15' 36.52"	57° 13' 19"	0.99707
8	119° 19' 07"	4° 23' 06"	122° 28' 17"	24° 34' 45"	0° 57' 15"	15' 36.11"	60° 45' 01"	0.99672
9	119° 52' 28"	4° 21' 38"	123° 03' 38"	24° 26' 08"	0° 57' 14"	15' 35.70"	63° 55' 37"	0.99634
10	120° 25' 47"	4° 20' 09"	123° 38' 51"	24° 17' 23"	0° 57' 12"	15' 35.28"	66° 47' 32"	0.99592
11	120° 59' 05"	4° 18' 38"	124° 13' 58"	24° 08' 31"	0° 57' 11"	15' 34.87"	69° 22' 57"	0.99546
12	121° 32' 20"	4° 17' 05"	124° 48' 58"	23° 59' 31"	0° 57' 09"	15' 34.45"	71° 43' 54"	0.99496
13	122° 05' 34"	4° 15' 32"	125° 23' 51"	23° 50' 24"	0° 57' 08"	15' 34.03"	73° 52' 09"	0.99442
14	122° 38' 45"	4° 13' 57"	125° 58' 38"	23° 41' 10"	0° 57' 06"	15' 33.61"	75° 49' 15"	0.99384
15	123° 11' 55"	4° 12' 20"	126° 33' 17"	23° 31' 48"	0° 57' 05"	15' 33.19"	77° 36' 34"	0.99322
16	123° 45' 03"	4° 10' 43"	127° 07' 50"	23° 22' 19"	0° 57' 03"	15' 32.77"	79° 15' 16"	0.99257
17	124° 18' 08"	4° 09' 04"	127° 42' 16"	23° 12' 43"	0° 57' 01"	15' 32.34"	80° 46' 20"	0.99188
18	124° 51' 12"	4° 07' 23"	128° 16' 35"	23° 03' 00"	0° 56' 60"	15' 31.92"	82° 10' 40"	0.99115
19	125° 24' 14"	4° 05' 42"	128° 50' 46"	22° 53' 11"	0° 56' 58"	15' 31.50"	83° 29' 01"	0.99038
20	125° 57' 13"	4° 03' 59"	129° 24' 51"	22° 43' 14"	0° 56' 57"	15' 31.07"	84° 42' 02"	0.98958
21	126° 30' 11"	4° 02' 15"	129° 58' 49"	22° 33' 11"	0° 56' 55"	15' 30.64"	85° 50' 16"	0.98873
22	127° 03' 06"	4° 00' 29"	130° 32' 41"	22° 23' 01"	0° 56' 54"	15' 30.22"	86° 54' 13"	0.98785
23	127° 35' 60"	3° 58' 43"	131° 06' 25"	22° 12' 45"	0° 56' 52"	15' 29.79"	87° 54' 18"	0.98694
24	128° 08' 51"	3° 56' 55"	131° 40' 02"	22° 02' 22"	0° 56' 51"	15' 29.36"	88° 50' 55"	0.98599

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	295° 05' 03"	0.36"	297° 01' 29"	-21° 06' 59"	0.9836190	16'15.61"	23° 26' 18"	-9 m 19 s
1	295° 07' 36"	0.35"	297° 04' 10"	-21° 06' 31"	0.9836215	16'15.61"	23° 26' 18"	-9 m 20 s
2	295° 10' 08"	0.35"	297° 06' 51"	-21° 06' 04"	0.9836240	16'15.61"	23° 26' 18"	-9 m 21 s
3	295° 12' 41"	0.35"	297° 09' 32"	-21° 05' 36"	0.9836266	16'15.60"	23° 26' 18"	-9 m 22 s
4	295° 15' 14"	0.34"	297° 12' 13"	-21° 05' 08"	0.9836291	16'15.60"	23° 26' 18"	-9 m 22 s
5	295° 17' 47"	0.34"	297° 14' 54"	-21° 04' 40"	0.9836316	16'15.60"	23° 26' 18"	-9 m 23 s
6	295° 20' 19"	0.34"	297° 17' 35"	-21° 04' 13"	0.9836342	16'15.60"	23° 26' 18"	-9 m 24 s
7	295° 22' 52"	0.33"	297° 20' 16"	-21° 03' 45"	0.9836368	16'15.59"	23° 26' 18"	-9 m 25 s
8	295° 25' 25"	0.33"	297° 22' 57"	-21° 03' 17"	0.9836394	16'15.59"	23° 26' 18"	-9 m 26 s
9	295° 27' 58"	0.33"	297° 25' 37"	-21° 02' 49"	0.9836420	16'15.59"	23° 26' 18"	-9 m 27 s
10	295° 30' 30"	0.32"	297° 28' 18"	-21° 02' 21"	0.9836446	16'15.59"	23° 26' 18"	-9 m 28 s
11	295° 33' 03"	0.32"	297° 30' 59"	-21° 01' 53"	0.9836472	16'15.58"	23° 26' 18"	-9 m 29 s
12	295° 35' 36"	0.32"	297° 33' 40"	-21° 01' 25"	0.9836498	16'15.58"	23° 26' 18"	-9 m 29 s
13	295° 38' 08"	0.31"	297° 36' 21"	-21° 00' 57"	0.9836524	16'15.58"	23° 26' 18"	-9 m 30 s
14	295° 40' 41"	0.31"	297° 39' 02"	-21° 00' 28"	0.9836551	16'15.58"	23° 26' 18"	-9 m 31 s
15	295° 43' 14"	0.31"	297° 41' 42"	-21° 00' 00"	0.9836578	16'15.57"	23° 26' 18"	-9 m 32 s
16	295° 45' 47"	0.30"	297° 44' 23"	-20° 59' 32"	0.9836604	16'15.57"	23° 26' 18"	-9 m 33 s
17	295° 48' 19"	0.30"	297° 47' 04"	-20° 59' 04"	0.9836631	16'15.57"	23° 26' 18"	-9 m 34 s
18	295° 50' 52"	0.30"	297° 49' 45"	-20° 58' 35"	0.9836658	16'15.57"	23° 26' 18"	-9 m 35 s
19	295° 53' 25"	0.29"	297° 52' 25"	-20° 58' 07"	0.9836685	16'15.56"	23° 26' 18"	-9 m 36 s
20	295° 55' 57"	0.29"	297° 55' 06"	-20° 57' 39"	0.9836712	16'15.56"	23° 26' 18"	-9 m 36 s
21	295° 58' 30"	0.28"	297° 57' 47"	-20° 57' 10"	0.9836739	16'15.56"	23° 26' 18"	-9 m 37 s
22	296° 01' 03"	0.28"	298° 00' 27"	-20° 56' 42"	0.9836767	16'15.55"	23° 26' 18"	-9 m 38 s
23	296° 03' 36"	0.28"	298° 03' 08"	-20° 56' 13"	0.9836794	16'15.55"	23° 26' 18"	-9 m 39 s
24	296° 06' 08"	0.27"	298° 05' 49"	-20° 55' 44"	0.9836822	16'15.55"	23° 26' 18"	-9 m 40 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	128° 08' 51"	3° 56' 55"	131° 40' 02"	22° 02' 22"	0° 56' 51"	15' 29.36"	88° 50' 55"	0.98599
1	128° 41' 41"	3° 55' 06"	132° 13' 33"	21° 51' 54"	0° 56' 49"	15' 28.93"	89° 44' 21"	0.98500
2	129° 14' 28"	3° 53' 15"	132° 46' 56"	21° 41' 19"	0° 56' 47"	15' 28.50"	90° 34' 56"	0.98397
3	129° 47' 14"	3° 51' 24"	133° 20' 13"	21° 30' 37"	0° 56' 46"	15' 28.07"	91° 22' 54"	0.98291
4	130° 19' 57"	3° 49' 31"	133° 53' 23"	21° 19' 50"	0° 56' 44"	15' 27.64"	92° 8' 28"	0.98181
5	130° 52' 39"	3° 47' 37"	134° 26' 26"	21° 08' 58"	0° 56' 43"	15' 27.21"	92° 51' 50"	0.98068
6	131° 25' 18"	3° 45' 42"	134° 59' 22"	20° 57' 59"	0° 56' 41"	15' 26.78"	93° 33' 12"	0.97951
7	131° 57' 55"	3° 43' 46"	135° 32' 12"	20° 46' 55"	0° 56' 39"	15' 26.35"	94° 12' 42"	0.97831
8	132° 30' 30"	3° 41' 49"	136° 04' 55"	20° 35' 45"	0° 56' 38"	15' 25.92"	94° 50' 28"	0.97707
9	133° 03' 03"	3° 39' 51"	136° 37' 31"	20° 24' 29"	0° 56' 36"	15' 25.49"	95° 26' 39"	0.97580
10	133° 35' 34"	3° 37' 51"	137° 10' 00"	20° 13' 08"	0° 56' 35"	15' 25.06"	96° 1' 22"	0.97449
11	134° 08' 03"	3° 35' 51"	137° 42' 23"	20° 01' 42"	0° 56' 33"	15' 24.63"	96° 34' 41"	0.97315
12	134° 40' 30"	3° 33' 49"	138° 14' 39"	19° 50' 11"	0° 56' 32"	15' 24.20"	97° 6' 44"	0.97177
13	135° 12' 55"	3° 31' 47"	138° 46' 48"	19° 38' 34"	0° 56' 30"	15' 23.77"	97° 37' 34"	0.97036
14	135° 45' 18"	3° 29' 43"	139° 18' 51"	19° 26' 53"	0° 56' 28"	15' 23.33"	98° 7' 17"	0.96892
15	136° 17' 39"	3° 27' 38"	139° 50' 47"	19° 15' 06"	0° 56' 27"	15' 22.90"	98° 35' 56"	0.96744
16	136° 49' 57"	3° 25' 33"	140° 22' 37"	19° 03' 15"	0° 56' 25"	15' 22.47"	99° 3' 36"	0.96593
17	137° 22' 14"	3° 23' 26"	140° 54' 20"	18° 51' 19"	0° 56' 24"	15' 22.04"	99° 30' 20"	0.96439
18	137° 54' 29"	3° 21' 19"	141° 25' 57"	18° 39' 18"	0° 56' 22"	15' 21.61"	99° 56' 10"	0.96281
19	138° 26' 41"	3° 19' 10"	141° 57' 28"	18° 27' 13"	0° 56' 21"	15' 21.18"	100° 21' 11"	0.96120
20	138° 58' 52"	3° 17' 01"	142° 28' 52"	18° 15' 03"	0° 56' 19"	15' 20.76"	100° 45' 23"	0.95956
21	139° 30' 60"	3° 14' 50"	143° 00' 10"	18° 02' 49"	0° 56' 17"	15' 20.33"	101° 8' 51"	0.95788
22	140° 03' 06"	3° 12' 39"	143° 31' 22"	17° 50' 30"	0° 56' 16"	15' 19.90"	101° 31' 36"	0.95618
23	140° 35' 11"	3° 10' 27"	144° 02' 27"	17° 38' 08"	0° 56' 14"	15' 19.47"	101° 53' 40"	0.95444
24	141° 07' 13"	3° 08' 14"	144° 33' 27"	17° 25' 41"	0° 56' 13"	15' 19.05"	102° 15' 05"	0.95267

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	296° 06' 08"	0.27"	298° 05' 49"	-20° 55' 44"	0.9836822	16' 15.55"	23° 26' 18"	-9 m 40 s
1	296° 08' 41"	0.27"	298° 08' 29"	-20° 55' 16"	0.9836849	16' 15.55"	23° 26' 18"	-9 m 41 s
2	296° 11' 14"	0.26"	298° 11' 10"	-20° 54' 47"	0.9836877	16' 15.54"	23° 26' 18"	-9 m 42 s
3	296° 13' 46"	0.26"	298° 13' 50"	-20° 54' 19"	0.9836905	16' 15.54"	23° 26' 18"	-9 m 42 s
4	296° 16' 19"	0.26"	298° 16' 31"	-20° 53' 50"	0.9836933	16' 15.54"	23° 26' 18"	-9 m 43 s
5	296° 18' 52"	0.25"	298° 19' 11"	-20° 53' 21"	0.9836961	16' 15.54"	23° 26' 18"	-9 m 44 s
6	296° 21' 25"	0.25"	298° 21' 52"	-20° 52' 52"	0.9836989	16' 15.53"	23° 26' 18"	-9 m 45 s
7	296° 23' 57"	0.24"	298° 24' 32"	-20° 52' 23"	0.9837018	16' 15.53"	23° 26' 18"	-9 m 46 s
8	296° 26' 30"	0.24"	298° 27' 13"	-20° 51' 54"	0.9837046	16' 15.53"	23° 26' 18"	-9 m 47 s
9	296° 29' 03"	0.24"	298° 29' 53"	-20° 51' 25"	0.9837075	16' 15.52"	23° 26' 18"	-9 m 48 s
10	296° 31' 35"	0.23"	298° 32' 34"	-20° 50' 56"	0.9837103	16' 15.52"	23° 26' 18"	-9 m 48 s
11	296° 34' 08"	0.23"	298° 35' 14"	-20° 50' 27"	0.9837132	16' 15.52"	23° 26' 18"	-9 m 49 s
12	296° 36' 41"	0.22"	298° 37' 54"	-20° 49' 58"	0.9837161	16' 15.52"	23° 26' 18"	-9 m 50 s
13	296° 39' 13"	0.22"	298° 40' 35"	-20° 49' 29"	0.9837190	16' 15.51"	23° 26' 18"	-9 m 51 s
14	296° 41' 46"	0.21"	298° 43' 15"	-20° 49' 00"	0.9837219	16' 15.51"	23° 26' 18"	-9 m 52 s
15	296° 44' 19"	0.21"	298° 45' 56"	-20° 48' 31"	0.9837248	16' 15.51"	23° 26' 18"	-9 m 53 s
16	296° 46' 52"	0.20"	298° 48' 36"	-20° 48' 02"	0.9837277	16' 15.50"	23° 26' 19"	-9 m 53 s
17	296° 49' 24"	0.20"	298° 51' 16"	-20° 47' 32"	0.9837307	16' 15.50"	23° 26' 19"	-9 m 54 s
18	296° 51' 57"	0.20"	298° 53' 57"	-20° 47' 03"	0.9837336	16' 15.50"	23° 26' 19"	-9 m 55 s
19	296° 54' 30"	0.19"	298° 56' 37"	-20° 46' 34"	0.9837366	16' 15.49"	23° 26' 19"	-9 m 56 s
20	296° 57' 02"	0.19"	298° 59' 17"	-20° 46' 04"	0.9837395	16' 15.49"	23° 26' 19"	-9 m 57 s
21	296° 59' 35"	0.18"	299° 01' 57"	-20° 45' 35"	0.9837425	16' 15.49"	23° 26' 19"	-9 m 58 s
22	297° 02' 08"	0.18"	299° 04' 38"	-20° 45' 05"	0.9837455	16' 15.49"	23° 26' 19"	-9 m 58 s
23	297° 04' 40"	0.17"	299° 07' 18"	-20° 44' 36"	0.9837485	16' 15.48"	23° 26' 19"	-9 m 59 s
24	297° 07' 13"	0.17"	299° 09' 58"	-20° 44' 06"	0.9837515	16' 15.48"	23° 26' 19"	-10 m 00 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	141° 07' 13"	3° 08' 14"	144° 33' 27"	17° 25' 41"	0° 56' 13"	15' 19.05"	102° 15' 05"	0.95267
1	141° 39' 13"	3° 05' 60"	145° 04' 20"	17° 13' 10"	0° 56' 11"	15' 18.62"	102° 35' 53"	0.95087
2	142° 11' 11"	3° 03' 45"	145° 35' 08"	17° 00' 35"	0° 56' 10"	15' 18.20"	102° 56' 05"	0.94904
3	142° 43' 07"	3° 01' 29"	146° 05' 49"	16° 47' 56"	0° 56' 08"	15' 17.77"	103° 15' 44"	0.94717
4	143° 15' 01"	2° 59' 13"	146° 36' 24"	16° 35' 14"	0° 56' 06"	15' 17.35"	103° 34' 50"	0.94528
5	143° 46' 53"	2° 56' 55"	147° 06' 54"	16° 22' 27"	0° 56' 05"	15' 16.93"	103° 53' 24"	0.94336
6	144° 18' 43"	2° 54' 37"	147° 37' 17"	16° 09' 38"	0° 56' 03"	15' 16.51"	104° 11' 29"	0.94140
7	144° 50' 31"	2° 52' 18"	148° 07' 35"	15° 56' 44"	0° 56' 02"	15' 16.09"	104° 29' 05"	0.93942
8	145° 22' 17"	2° 49' 59"	148° 37' 48"	15° 43' 47"	0° 56' 00"	15' 15.67"	104° 46' 13"	0.93741
9	145° 54' 01"	2° 47' 38"	149° 07' 54"	15° 30' 47"	0° 55' 59"	15' 15.25"	105° 2' 54"	0.93537
10	146° 25' 43"	2° 45' 17"	149° 37' 55"	15° 17' 43"	0° 55' 57"	15' 14.83"	105° 19' 09"	0.93330
11	146° 57' 23"	2° 42' 55"	150° 07' 51"	15° 04' 36"	0° 55' 56"	15' 14.42"	105° 34' 60"	0.93120
12	147° 29' 01"	2° 40' 33"	150° 37' 41"	14° 51' 26"	0° 55' 54"	15' 14.00"	105° 50' 26"	0.92907
13	148° 00' 37"	2° 38' 09"	151° 07' 26"	14° 38' 13"	0° 55' 53"	15' 13.59"	106° 5' 29"	0.92691
14	148° 32' 11"	2° 35' 45"	151° 37' 05"	14° 24' 57"	0° 55' 51"	15' 13.18"	106° 20' 09"	0.92472
15	149° 03' 43"	2° 33' 21"	152° 06' 39"	14° 11' 38"	0° 55' 50"	15' 12.77"	106° 34' 27"	0.92251
16	149° 35' 13"	2° 30' 55"	152° 36' 08"	13° 58' 16"	0° 55' 48"	15' 12.36"	106° 48' 24"	0.92027
17	150° 06' 41"	2° 28' 30"	153° 05' 31"	13° 44' 51"	0° 55' 47"	15' 11.96"	107° 1' 60"	0.91800
18	150° 38' 08"	2° 26' 03"	153° 34' 50"	13° 31' 24"	0° 55' 45"	15' 11.55"	107° 15' 16"	0.91571
19	151° 09' 32"	2° 23' 36"	154° 04' 03"	13° 17' 54"	0° 55' 44"	15' 11.15"	107° 28' 12"	0.91338
20	151° 40' 54"	2° 21' 08"	154° 33' 12"	13° 04' 21"	0° 55' 42"	15' 10.75"	107° 40' 50"	0.91103
21	152° 12' 15"	2° 18' 40"	155° 02' 16"	12° 50' 46"	0° 55' 41"	15' 10.35"	107° 53' 09"	0.90866
22	152° 43' 33"	2° 16' 11"	155° 31' 15"	12° 37' 09"	0° 55' 39"	15' 09.95"	108° 5' 10"	0.90626
23	153° 14' 50"	2° 13' 41"	156° 00' 09"	12° 23' 29"	0° 55' 38"	15' 09.56"	108° 16' 53"	0.90383
24	153° 46' 04"	2° 11' 11"	156° 28' 58"	12° 09' 46"	0° 55' 36"	15' 09.16"	108° 28' 19"	0.90138

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	297° 07' 13"	0.17"	299° 09' 58"	-20° 44' 06"	0.9837515	16'15.48"	23° 26' 19"	-10 m 00 s
1	297° 09' 46"	0.16"	299° 12' 38"	-20° 43' 37"	0.9837545	16'15.48"	23° 26' 19"	-10 m 01 s
2	297° 12' 19"	0.16"	299° 15' 18"	-20° 43' 07"	0.9837576	16'15.47"	23° 26' 19"	-10 m 02 s
3	297° 14' 51"	0.15"	299° 17' 58"	-20° 42' 37"	0.9837606	16'15.47"	23° 26' 19"	-10 m 03 s
4	297° 17' 24"	0.15"	299° 20' 38"	-20° 42' 07"	0.9837636	16'15.47"	23° 26' 19"	-10 m 03 s
5	297° 19' 57"	0.14"	299° 23' 19"	-20° 41' 38"	0.9837667	16'15.47"	23° 26' 19"	-10 m 04 s
6	297° 22' 29"	0.14"	299° 25' 59"	-20° 41' 08"	0.9837698	16'15.46"	23° 26' 19"	-10 m 05 s
7	297° 25' 02"	0.13"	299° 28' 39"	-20° 40' 38"	0.9837729	16'15.46"	23° 26' 19"	-10 m 06 s
8	297° 27' 35"	0.13"	299° 31' 19"	-20° 40' 08"	0.9837760	16'15.46"	23° 26' 19"	-10 m 07 s
9	297° 30' 07"	0.12"	299° 33' 59"	-20° 39' 38"	0.9837791	16'15.45"	23° 26' 19"	-10 m 07 s
10	297° 32' 40"	0.12"	299° 36' 39"	-20° 39' 08"	0.9837822	16'15.45"	23° 26' 19"	-10 m 08 s
11	297° 35' 13"	0.11"	299° 39' 19"	-20° 38' 38"	0.9837853	16'15.45"	23° 26' 19"	-10 m 09 s
12	297° 37' 46"	0.11"	299° 41' 59"	-20° 38' 08"	0.9837884	16'15.44"	23° 26' 19"	-10 m 10 s
13	297° 40' 18"	0.10"	299° 44' 39"	-20° 37' 38"	0.9837916	16'15.44"	23° 26' 19"	-10 m 11 s
14	297° 42' 51"	0.10"	299° 47' 19"	-20° 37' 08"	0.9837947	16'15.44"	23° 26' 19"	-10 m 12 s
15	297° 45' 24"	0.09"	299° 49' 59"	-20° 36' 38"	0.9837979	16'15.43"	23° 26' 19"	-10 m 12 s
16	297° 47' 56"	0.09"	299° 52' 38"	-20° 36' 07"	0.9838011	16'15.43"	23° 26' 19"	-10 m 13 s
17	297° 50' 29"	0.08"	299° 55' 18"	-20° 35' 37"	0.9838042	16'15.43"	23° 26' 19"	-10 m 14 s
18	297° 53' 02"	0.08"	299° 57' 58"	-20° 35' 07"	0.9838074	16'15.42"	23° 26' 19"	-10 m 15 s
19	297° 55' 34"	0.07"	300° 00' 38"	-20° 34' 36"	0.9838106	16'15.42"	23° 26' 19"	-10 m 16 s
20	297° 58' 07"	0.07"	300° 03' 18"	-20° 34' 06"	0.9838139	16'15.42"	23° 26' 19"	-10 m 16 s
21	298° 00' 40"	0.06"	300° 05' 58"	-20° 33' 36"	0.9838171	16'15.42"	23° 26' 19"	-10 m 17 s
22	298° 03' 12"	0.06"	300° 08' 37"	-20° 33' 05"	0.9838203	16'15.41"	23° 26' 19"	-10 m 18 s
23	298° 05' 45"	0.05"	300° 11' 17"	-20° 32' 35"	0.9838236	16'15.41"	23° 26' 19"	-10 m 19 s
24	298° 08' 18"	0.05"	300° 13' 57"	-20° 32' 04"	0.9838268	16'15.41"	23° 26' 19"	-10 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	153° 46' 04"	2° 11' 11"	156° 28' 58"	12° 09' 46"	0° 55' 36"	15' 09.16"	108° 28' 19"	0.90138
1	154° 17' 17"	2° 08' 41"	156° 57' 43"	11° 56' 02"	0° 55' 35"	15' 08.77"	108° 39' 28"	0.89890
2	154° 48' 28"	2° 06' 10"	157° 26' 23"	11° 42' 15"	0° 55' 34"	15' 08.38"	108° 50' 20"	0.89639
3	155° 19' 37"	2° 03' 38"	157° 54' 59"	11° 28' 27"	0° 55' 32"	15' 07.99"	109° 0' 57"	0.89386
4	155° 50' 44"	2° 01' 06"	158° 23' 31"	11° 14' 36"	0° 55' 31"	15' 07.61"	109° 11' 18"	0.89131
5	156° 21' 50"	1° 58' 34"	158° 51' 58"	11° 00' 44"	0° 55' 29"	15' 07.22"	109° 21' 23"	0.88873
6	156° 52' 53"	1° 56' 01"	159° 20' 20"	10° 46' 49"	0° 55' 28"	15' 06.84"	109° 31' 13"	0.88613
7	157° 23' 55"	1° 53' 27"	159° 48' 39"	10° 32' 53"	0° 55' 26"	15' 06.47"	109° 40' 49"	0.88350
8	157° 54' 55"	1° 50' 54"	160° 16' 53"	10° 18' 55"	0° 55' 25"	15' 06.09"	109° 50' 10"	0.88085
9	158° 25' 53"	1° 48' 19"	160° 45' 04"	10° 04' 55"	0° 55' 24"	15' 05.72"	109° 59' 17"	0.87818
10	158° 56' 50"	1° 45' 45"	161° 13' 10"	9° 50' 54"	0° 55' 22"	15' 05.34"	110° 8' 10"	0.87548
11	159° 27' 44"	1° 43' 10"	161° 41' 13"	9° 36' 51"	0° 55' 21"	15' 04.98"	110° 16' 49"	0.87276
12	159° 58' 37"	1° 40' 34"	162° 09' 11"	9° 22' 46"	0° 55' 20"	15' 04.61"	110° 25' 14"	0.87002
13	160° 29' 28"	1° 37' 58"	162° 37' 06"	9° 08' 40"	0° 55' 18"	15' 04.25"	110° 33' 27"	0.86725
14	161° 00' 17"	1° 35' 22"	163° 04' 57"	8° 54' 33"	0° 55' 17"	15' 03.88"	110° 41' 26"	0.86446
15	161° 31' 05"	1° 32' 46"	163° 32' 45"	8° 40' 24"	0° 55' 16"	15' 03.53"	110° 49' 12"	0.86165
16	162° 01' 51"	1° 30' 09"	164° 00' 29"	8° 26' 14"	0° 55' 14"	15' 03.17"	110° 56' 46"	0.85882
17	162° 32' 35"	1° 27' 32"	164° 28' 09"	8° 12' 03"	0° 55' 13"	15' 02.82"	111° 4' 08"	0.85597
18	163° 03' 18"	1° 24' 55"	164° 55' 46"	7° 57' 51"	0° 55' 12"	15' 02.47"	111° 11' 17"	0.85310
19	163° 33' 59"	1° 22' 17"	165° 23' 20"	7° 43' 37"	0° 55' 11"	15' 02.12"	111° 18' 14"	0.85020
20	164° 04' 38"	1° 19' 39"	165° 50' 50"	7° 29' 23"	0° 55' 09"	15' 01.78"	111° 24' 60"	0.84728
21	164° 35' 16"	1° 17' 01"	166° 18' 17"	7° 15' 08"	0° 55' 08"	15' 01.43"	111° 31' 33"	0.84435
22	165° 05' 52"	1° 14' 22"	166° 45' 41"	7° 00' 51"	0° 55' 07"	15' 01.10"	111° 37' 55"	0.84139
23	165° 36' 26"	1° 11' 43"	167° 13' 02"	6° 46' 34"	0° 55' 06"	15' 00.76"	111° 44' 06"	0.83841
24	166° 06' 59"	1° 09' 04"	167° 40' 20"	6° 32' 16"	0° 55' 04"	15' 00.43"	111° 50' 05"	0.83541

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	298° 08' 18"	0.05"	300° 13' 57"	-20° 32' 04"	0.9838268	16' 15.41"	23° 26' 19"	-10 m 20 s
1	298° 10' 50"	0.04"	300° 16' 37"	-20° 31' 34"	0.9838301	16' 15.40"	23° 26' 19"	-10 m 20 s
2	298° 13' 23"	0.04"	300° 19' 16"	-20° 31' 03"	0.9838333	16' 15.40"	23° 26' 19"	-10 m 21 s
3	298° 15' 56"	0.03"	300° 21' 56"	-20° 30' 32"	0.9838366	16' 15.40"	23° 26' 19"	-10 m 22 s
4	298° 18' 28"	0.03"	300° 24' 36"	-20° 30' 02"	0.9838399	16' 15.39"	23° 26' 19"	-10 m 23 s
5	298° 21' 01"	0.02"	300° 27' 15"	-20° 29' 31"	0.9838432	16' 15.39"	23° 26' 19"	-10 m 24 s
6	298° 23' 34"	0.02"	300° 29' 55"	-20° 28' 60"	0.9838465	16' 15.39"	23° 26' 19"	-10 m 24 s
7	298° 26' 07"	0.01"	300° 32' 35"	-20° 28' 29"	0.9838499	16' 15.38"	23° 26' 19"	-10 m 25 s
8	298° 28' 39"	0.00"	300° 35' 14"	-20° 27' 58"	0.9838532	16' 15.38"	23° 26' 19"	-10 m 26 s
9	298° 31' 12"	-0.00"	300° 37' 54"	-20° 27' 27"	0.9838565	16' 15.38"	23° 26' 19"	-10 m 27 s
10	298° 33' 45"	-0.01"	300° 40' 33"	-20° 26' 56"	0.9838599	16' 15.37"	23° 26' 19"	-10 m 28 s
11	298° 36' 17"	-0.01"	300° 43' 13"	-20° 26' 25"	0.9838633	16' 15.37"	23° 26' 19"	-10 m 28 s
12	298° 38' 50"	-0.02"	300° 45' 52"	-20° 25' 54"	0.9838666	16' 15.37"	23° 26' 19"	-10 m 29 s
13	298° 41' 23"	-0.02"	300° 48' 32"	-20° 25' 23"	0.9838700	16' 15.36"	23° 26' 19"	-10 m 30 s
14	298° 43' 55"	-0.03"	300° 51' 11"	-20° 24' 52"	0.9838734	16' 15.36"	23° 26' 19"	-10 m 31 s
15	298° 46' 28"	-0.03"	300° 53' 51"	-20° 24' 21"	0.9838768	16' 15.36"	23° 26' 19"	-10 m 31 s
16	298° 49' 01"	-0.04"	300° 56' 30"	-20° 23' 50"	0.9838802	16' 15.35"	23° 26' 19"	-10 m 32 s
17	298° 51' 33"	-0.04"	300° 59' 10"	-20° 23' 19"	0.9838836	16' 15.35"	23° 26' 19"	-10 m 33 s
18	298° 54' 06"	-0.05"	301° 01' 49"	-20° 22' 47"	0.9838871	16' 15.35"	23° 26' 19"	-10 m 34 s
19	298° 56' 39"	-0.06"	301° 04' 29"	-20° 22' 16"	0.9838905	16' 15.34"	23° 26' 19"	-10 m 35 s
20	298° 59' 11"	-0.06"	301° 07' 08"	-20° 21' 45"	0.9838940	16' 15.34"	23° 26' 19"	-10 m 35 s
21	299° 01' 44"	-0.07"	301° 09' 47"	-20° 21' 13"	0.9838974	16' 15.34"	23° 26' 19"	-10 m 36 s
22	299° 04' 17"	-0.07"	301° 12' 27"	-20° 20' 42"	0.9839009	16' 15.33"	23° 26' 19"	-10 m 37 s
23	299° 06' 49"	-0.08"	301° 15' 06"	-20° 20' 10"	0.9839044	16' 15.33"	23° 26' 19"	-10 m 38 s
24	299° 09' 22"	-0.08"	301° 17' 45"	-20° 19' 39"	0.9839079	16' 15.33"	23° 26' 19"	-10 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	166° 06' 59"	1° 09' 04"	167° 40' 20"	6° 32' 16"	0° 55' 04"	15' 00.43"	111° 50' 05"	0.83541
1	166° 37' 30"	1° 06' 25"	168° 07' 35"	6° 17' 57"	0° 55' 03"	15' 00.10"	111° 55' 54"	0.83240
2	167° 08' 00"	1° 03' 46"	168° 34' 47"	6° 03' 37"	0° 55' 02"	14' 59.77"	112° 1' 31"	0.82936
3	167° 38' 28"	1° 01' 06"	169° 01' 57"	5° 49' 17"	0° 55' 01"	14' 59.45"	112° 6' 58"	0.82630
4	168° 08' 55"	0° 58' 26"	169° 29' 04"	5° 34' 56"	0° 54' 60"	14' 59.13"	112° 12' 14"	0.82323
5	168° 39' 20"	0° 55' 47"	169° 56' 08"	5° 20' 35"	0° 54' 58"	14' 58.82"	112° 17' 19"	0.82013
6	169° 09' 44"	0° 53' 06"	170° 23' 09"	5° 06' 13"	0° 54' 57"	14' 58.50"	112° 22' 14"	0.81702
7	169° 40' 06"	0° 50' 26"	170° 50' 08"	4° 51' 50"	0° 54' 56"	14' 58.19"	112° 26' 58"	0.81389
8	170° 10' 27"	0° 47' 46"	171° 17' 05"	4° 37' 27"	0° 54' 55"	14' 57.89"	112° 31' 33"	0.81074
9	170° 40' 46"	0° 45' 06"	171° 43' 59"	4° 23' 04"	0° 54' 54"	14' 57.58"	112° 35' 57"	0.80758
10	171° 11' 04"	0° 42' 25"	172° 10' 51"	4° 08' 41"	0° 54' 53"	14' 57.28"	112° 40' 11"	0.80439
11	171° 41' 21"	0° 39' 44"	172° 37' 41"	3° 54' 17"	0° 54' 52"	14' 56.99"	112° 44' 15"	0.80119
12	172° 11' 36"	0° 37' 04"	173° 04' 29"	3° 39' 53"	0° 54' 51"	14' 56.70"	112° 48' 09"	0.79797
13	172° 41' 50"	0° 34' 23"	173° 31' 15"	3° 25' 28"	0° 54' 50"	14' 56.41"	112° 51' 54"	0.79474
14	173° 12' 02"	0° 31' 42"	173° 57' 58"	3° 11' 04"	0° 54' 49"	14' 56.12"	112° 55' 29"	0.79149
15	173° 42' 13"	0° 29' 01"	174° 24' 40"	2° 56' 40"	0° 54' 47"	14' 55.84"	112° 58' 55"	0.78822
16	174° 12' 23"	0° 26' 20"	174° 51' 20"	2° 42' 15"	0° 54' 46"	14' 55.57"	113° 2' 11"	0.78493
17	174° 42' 31"	0° 23' 39"	175° 17' 58"	2° 27' 51"	0° 54' 45"	14' 55.29"	113° 5' 18"	0.78163
18	175° 12' 39"	0° 20' 58"	175° 44' 35"	2° 13' 26"	0° 54' 44"	14' 55.02"	113° 8' 15"	0.77831
19	175° 42' 45"	0° 18' 17"	176° 11' 10"	1° 59' 02"	0° 54' 44"	14' 54.76"	113° 11' 03"	0.77498
20	176° 12' 49"	0° 15' 36"	176° 37' 43"	1° 44' 38"	0° 54' 43"	14' 54.49"	113° 13' 42"	0.77163
21	176° 42' 53"	0° 12' 55"	177° 04' 15"	1° 30' 14"	0° 54' 42"	14' 54.23"	113° 16' 12"	0.76827
22	177° 12' 55"	0° 10' 14"	177° 30' 45"	1° 15' 50"	0° 54' 41"	14' 53.98"	113° 18' 33"	0.76489
23	177° 42' 56"	0° 07' 34"	177° 57' 15"	1° 01' 27"	0° 54' 40"	14' 53.73"	113° 20' 45"	0.76150
24	178° 12' 56"	0° 04' 53"	178° 23' 43"	0° 47' 03"	0° 54' 39"	14' 53.48"	113° 22' 48"	0.75809

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	299° 09' 22"	-0.08"	301° 17' 45"	-20° 19' 39"	0.9839079	16'15.33"	23° 26' 19"	-10 m 38 s
1	299° 11' 55"	-0.09"	301° 20' 25"	-20° 19' 07"	0.9839114	16'15.32"	23° 26' 19"	-10 m 39 s
2	299° 14' 27"	-0.09"	301° 23' 04"	-20° 18' 36"	0.9839149	16'15.32"	23° 26' 19"	-10 m 40 s
3	299° 16' 60"	-0.10"	301° 25' 43"	-20° 18' 04"	0.9839184	16'15.31"	23° 26' 19"	-10 m 41 s
4	299° 19' 33"	-0.10"	301° 28' 22"	-20° 17' 32"	0.9839219	16'15.31"	23° 26' 19"	-10 m 41 s
5	299° 22' 05"	-0.11"	301° 31' 02"	-20° 17' 01"	0.9839255	16'15.31"	23° 26' 19"	-10 m 42 s
6	299° 24' 38"	-0.12"	301° 33' 41"	-20° 16' 29"	0.9839290	16'15.30"	23° 26' 19"	-10 m 43 s
7	299° 27' 11"	-0.12"	301° 36' 20"	-20° 15' 57"	0.9839326	16'15.30"	23° 26' 19"	-10 m 44 s
8	299° 29' 43"	-0.13"	301° 38' 59"	-20° 15' 25"	0.9839361	16'15.30"	23° 26' 19"	-10 m 45 s
9	299° 32' 16"	-0.13"	301° 41' 38"	-20° 14' 53"	0.9839397	16'15.29"	23° 26' 19"	-10 m 45 s
10	299° 34' 49"	-0.14"	301° 44' 17"	-20° 14' 21"	0.9839433	16'15.29"	23° 26' 19"	-10 m 46 s
11	299° 37' 21"	-0.14"	301° 46' 56"	-20° 13' 49"	0.9839469	16'15.29"	23° 26' 19"	-10 m 47 s
12	299° 39' 54"	-0.15"	301° 49' 35"	-20° 13' 17"	0.9839505	16'15.28"	23° 26' 19"	-10 m 48 s
13	299° 42' 27"	-0.15"	301° 52' 15"	-20° 12' 45"	0.9839541	16'15.28"	23° 26' 19"	-10 m 48 s
14	299° 44' 59"	-0.16"	301° 54' 54"	-20° 12' 13"	0.9839577	16'15.28"	23° 26' 19"	-10 m 49 s
15	299° 47' 32"	-0.17"	301° 57' 33"	-20° 11' 41"	0.9839614	16'15.27"	23° 26' 19"	-10 m 50 s
16	299° 50' 05"	-0.17"	302° 00' 12"	-20° 11' 09"	0.9839650	16'15.27"	23° 26' 19"	-10 m 51 s
17	299° 52' 37"	-0.18"	302° 02' 51"	-20° 10' 37"	0.9839687	16'15.26"	23° 26' 19"	-10 m 51 s
18	299° 55' 10"	-0.18"	302° 05' 30"	-20° 10' 05"	0.9839723	16'15.26"	23° 26' 19"	-10 m 52 s
19	299° 57' 43"	-0.19"	302° 08' 08"	-20° 09' 32"	0.9839760	16'15.26"	23° 26' 19"	-10 m 53 s
20	300° 00' 15"	-0.19"	302° 10' 47"	-20° 09' 00"	0.9839797	16'15.25"	23° 26' 19"	-10 m 54 s
21	300° 02' 48"	-0.20"	302° 13' 26"	-20° 08' 28"	0.9839834	16'15.25"	23° 26' 19"	-10 m 54 s
22	300° 05' 21"	-0.20"	302° 16' 05"	-20° 07' 55"	0.9839871	16'15.25"	23° 26' 19"	-10 m 55 s
23	300° 07' 53"	-0.21"	302° 18' 44"	-20° 07' 23"	0.9839908	16'15.24"	23° 26' 19"	-10 m 56 s
24	300° 10' 26"	-0.22"	302° 21' 23"	-20° 06' 50"	0.9839945	16'15.24"	23° 26' 19"	-10 m 56 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	178° 12' 56"	0° 04' 53"	178° 23' 43"	0° 47' 03"	0° 54' 39"	14' 53.48"	113° 22' 48"	0.75809
1	178° 42' 55"	0° 02' 12"	178° 50' 09"	0° 32' 41"	0° 54' 38"	14' 53.24"	113° 24' 42"	0.75467
2	179° 12' 53"	0° 00'-29"	179° 16' 35"	0° 18' 18"	0° 54' 37"	14' 53.00"	113° 26' 28"	0.75124
3	179° 42' 50"	0° -3' 09"	179° 42' 59"	0° 03' 56"	0° 54' 36"	14' 52.77"	113° 28' 05"	0.74779
4	180° 12' 45"	0° -5' 50"	180° 09' 23"	0°-10' 25"	0° 54' 35"	14' 52.54"	113° 29' 33"	0.74432
5	180° 42' 40"	0° -8' 30"	180° 35' 46"	0°-24' 46"	0° 54' 35"	14' 52.31"	113° 30' 53"	0.74085
6	181° 12' 33"	0°-11' 10"	181° 02' 08"	0°-39' 06"	0° 54' 34"	14' 52.09"	113° 32' 04"	0.73736
7	181° 42' 26"	0°-13' 50"	181° 28' 29"	0°-53' 26"	0° 54' 33"	14' 51.87"	113° 33' 06"	0.73386
8	182° 12' 17"	0°-16' 30"	181° 54' 49"	-1° 07' 45"	0° 54' 32"	14' 51.66"	113° 34' 01"	0.73034
9	182° 42' 08"	0°-19' 10"	182° 21' 09"	-1° 22' 04"	0° 54' 31"	14' 51.45"	113° 34' 46"	0.72681
10	183° 11' 57"	0°-21' 50"	182° 47' 28"	-1° 36' 21"	0° 54' 31"	14' 51.24"	113° 35' 24"	0.72327
11	183° 41' 46"	0°-24' 29"	183° 13' 47"	-1° 50' 38"	0° 54' 30"	14' 51.04"	113° 35' 53"	0.71972
12	184° 11' 34"	0°-27' 09"	183° 40' 05"	-2° 04' 54"	0° 54' 29"	14' 50.85"	113° 36' 14"	0.71616
13	184° 41' 21"	0°-29' 48"	184° 06' 23"	-2° 19' 09"	0° 54' 28"	14' 50.65"	113° 36' 27"	0.71258
14	185° 11' 07"	0°-32' 27"	184° 32' 41"	-2° 33' 24"	0° 54' 28"	14' 50.47"	113° 36' 31"	0.70899
15	185° 40' 52"	0°-35' 05"	184° 58' 59"	-2° 47' 37"	0° 54' 27"	14' 50.28"	113° 36' 27"	0.70539
16	186° 10' 36"	0°-37' 44"	185° 25' 16"	-3° 01' 49"	0° 54' 26"	14' 50.10"	113° 36' 16"	0.70178
17	186° 40' 19"	0°-40' 22"	185° 51' 34"	-3° 16' 00"	0° 54' 26"	14' 49.93"	113° 35' 56"	0.69816
18	187° 10' 02"	0°-43' 00"	186° 17' 51"	-3° 30' 11"	0° 54' 25"	14' 49.76"	113° 35' 28"	0.69453
19	187° 39' 44"	0°-45' 38"	186° 44' 09"	-3° 44' 20"	0° 54' 25"	14' 49.59"	113° 34' 52"	0.69089
20	188° 09' 25"	0°-48' 15"	187° 10' 27"	-3° 58' 28"	0° 54' 24"	14' 49.43"	113° 34' 08"	0.68723
21	188° 39' 06"	0°-50' 53"	187° 36' 45"	-4° 12' 35"	0° 54' 23"	14' 49.28"	113° 33' 17"	0.68357
22	189° 08' 46"	0°-53' 30"	188° 03' 03"	-4° 26' 40"	0° 54' 23"	14' 49.12"	113° 32' 17"	0.67990
23	189° 38' 25"	0°-56' 06"	188° 29' 21"	-4° 40' 45"	0° 54' 22"	14' 48.98"	113° 31' 09"	0.67621
24	190° 08' 03"	0°-58' 43"	188° 55' 40"	-4° 54' 48"	0° 54' 22"	14' 48.83"	113° 29' 54"	0.67252

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	300° 10' 26"	-0.22"	302° 21' 23"	-20° 06' 50"	0.9839945	16' 15.24"	23° 26' 19"	-10 m 56 s
1	300° 12' 58"	-0.22"	302° 24' 02"	-20° 06' 18"	0.9839982	16' 15.24"	23° 26' 19"	-10 m 57 s
2	300° 15' 31"	-0.23"	302° 26' 41"	-20° 05' 45"	0.9840019	16' 15.23"	23° 26' 19"	-10 m 58 s
3	300° 18' 04"	-0.23"	302° 29' 19"	-20° 05' 13"	0.9840057	16' 15.23"	23° 26' 19"	-10 m 59 s
4	300° 20' 36"	-0.24"	302° 31' 58"	-20° 04' 40"	0.9840094	16' 15.22"	23° 26' 19"	-10 m 59 s
5	300° 23' 09"	-0.24"	302° 34' 37"	-20° 04' 07"	0.9840132	16' 15.22"	23° 26' 19"	-11 m 00 s
6	300° 25' 42"	-0.25"	302° 37' 16"	-20° 03' 35"	0.9840170	16' 15.22"	23° 26' 19"	-11 m 01 s
7	300° 28' 14"	-0.25"	302° 39' 54"	-20° 03' 02"	0.9840207	16' 15.21"	23° 26' 19"	-11 m 02 s
8	300° 30' 47"	-0.26"	302° 42' 33"	-20° 02' 29"	0.9840245	16' 15.21"	23° 26' 19"	-11 m 02 s
9	300° 33' 20"	-0.26"	302° 45' 12"	-20° 01' 56"	0.9840283	16' 15.21"	23° 26' 19"	-11 m 03 s
10	300° 35' 52"	-0.27"	302° 47' 50"	-20° 01' 24"	0.9840321	16' 15.20"	23° 26' 19"	-11 m 04 s
11	300° 38' 25"	-0.27"	302° 50' 29"	-20° 00' 51"	0.9840359	16' 15.20"	23° 26' 19"	-11 m 05 s
12	300° 40' 58"	-0.28"	302° 53' 08"	-20° 00' 18"	0.9840398	16' 15.19"	23° 26' 19"	-11 m 05 s
13	300° 43' 30"	-0.29"	302° 55' 46"	-19° 59' 45"	0.9840436	16' 15.19"	23° 26' 19"	-11 m 06 s
14	300° 46' 03"	-0.29"	302° 58' 25"	-19° 59' 12"	0.9840474	16' 15.19"	23° 26' 19"	-11 m 07 s
15	300° 48' 36"	-0.30"	303° 01' 03"	-19° 58' 39"	0.9840513	16' 15.18"	23° 26' 19"	-11 m 07 s
16	300° 51' 08"	-0.30"	303° 03' 42"	-19° 58' 06"	0.9840552	16' 15.18"	23° 26' 19"	-11 m 08 s
17	300° 53' 41"	-0.31"	303° 06' 20"	-19° 57' 32"	0.9840590	16' 15.18"	23° 26' 19"	-11 m 09 s
18	300° 56' 13"	-0.31"	303° 08' 59"	-19° 56' 59"	0.9840629	16' 15.17"	23° 26' 19"	-11 m 10 s
19	300° 58' 46"	-0.32"	303° 11' 37"	-19° 56' 26"	0.9840668	16' 15.17"	23° 26' 19"	-11 m 10 s
20	301° 01' 19"	-0.32"	303° 14' 16"	-19° 55' 53"	0.9840707	16' 15.16"	23° 26' 19"	-11 m 11 s
21	301° 03' 51"	-0.33"	303° 16' 54"	-19° 55' 19"	0.9840746	16' 15.16"	23° 26' 19"	-11 m 12 s
22	301° 06' 24"	-0.33"	303° 19' 33"	-19° 54' 46"	0.9840785	16' 15.16"	23° 26' 19"	-11 m 12 s
23	301° 08' 57"	-0.34"	303° 22' 11"	-19° 54' 13"	0.9840824	16' 15.15"	23° 26' 19"	-11 m 13 s
24	301° 11' 29"	-0.34"	303° 24' 50"	-19° 53' 39"	0.9840864	16' 15.15"	23° 26' 19"	-11 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	190° 08' 03"	0°-58' 43"	188° 55' 40"	-4° 54' 48"	0° 54' 22"	14' 48.83"	113° 29' 54"	0.67252
1	190° 37' 41"	-1° 01' 19"	189° 22' 00"	-5° 08' 49"	0° 54' 21"	14' 48.70"	113° 28' 30"	0.66882
2	191° 07' 19"	-1° 03' 54"	189° 48' 20"	-5° 22' 50"	0° 54' 21"	14' 48.56"	113° 26' 59"	0.66511
3	191° 36' 55"	-1° 06' 30"	190° 14' 41"	-5° 36' 48"	0° 54' 20"	14' 48.43"	113° 25' 20"	0.66139
4	192° 06' 32"	-1° 09' 05"	190° 41' 03"	-5° 50' 46"	0° 54' 20"	14' 48.31"	113° 23' 34"	0.65766
5	192° 36' 07"	-1° 11' 39"	191° 07' 25"	-6° 04' 42"	0° 54' 19"	14' 48.19"	113° 21' 39"	0.65392
6	193° 05' 42"	-1° 14' 14"	191° 33' 48"	-6° 18' 36"	0° 54' 19"	14' 48.08"	113° 19' 37"	0.65018
7	193° 35' 17"	-1° 16' 48"	192° 00' 12"	-6° 32' 29"	0° 54' 19"	14' 47.97"	113° 17' 27"	0.64642
8	194° 04' 51"	-1° 19' 21"	192° 26' 37"	-6° 46' 20"	0° 54' 18"	14' 47.86"	113° 15' 09"	0.64266
9	194° 34' 25"	-1° 21' 54"	192° 53' 03"	-7° 00' 10"	0° 54' 18"	14' 47.76"	113° 12' 44"	0.63889
10	195° 03' 58"	-1° 24' 27"	193° 19' 31"	-7° 13' 58"	0° 54' 17"	14' 47.67"	113° 10' 11"	0.63511
11	195° 33' 31"	-1° 26' 60"	193° 45' 59"	-7° 27' 44"	0° 54' 17"	14' 47.57"	113° 7' 30"	0.63133
12	196° 03' 04"	-1° 29' 32"	194° 12' 29"	-7° 41' 28"	0° 54' 17"	14' 47.49"	113° 4' 42"	0.62754
13	196° 32' 36"	-1° 32' 03"	194° 39' 00"	-7° 55' 11"	0° 54' 17"	14' 47.41"	113° 1' 46"	0.62374
14	197° 02' 08"	-1° 34' 34"	195° 05' 33"	-8° 08' 51"	0° 54' 16"	14' 47.33"	112° 58' 42"	0.61993
15	197° 31' 39"	-1° 37' 05"	195° 32' 07"	-8° 22' 30"	0° 54' 16"	14' 47.26"	112° 55' 31"	0.61612
16	198° 01' 11"	-1° 39' 35"	195° 58' 42"	-8° 36' 07"	0° 54' 16"	14' 47.19"	112° 52' 12"	0.61230
17	198° 30' 42"	-1° 42' 05"	196° 25' 19"	-8° 49' 42"	0° 54' 16"	14' 47.13"	112° 48' 46"	0.60848
18	199° 00' 13"	-1° 44' 34"	196° 51' 58"	-9° 03' 15"	0° 54' 15"	14' 47.07"	112° 45' 12"	0.60464
19	199° 29' 43"	-1° 47' 03"	197° 18' 39"	-9° 16' 45"	0° 54' 15"	14' 47.02"	112° 41' 30"	0.60081
20	199° 59' 14"	-1° 49' 31"	197° 45' 21"	-9° 30' 14"	0° 54' 15"	14' 46.98"	112° 37' 41"	0.59696
21	200° 28' 44"	-1° 51' 59"	198° 12' 05"	-9° 43' 41"	0° 54' 15"	14' 46.93"	112° 33' 44"	0.59312
22	200° 58' 14"	-1° 54' 26"	198° 38' 52"	-9° 57' 05"	0° 54' 15"	14' 46.90"	112° 29' 40"	0.58926
23	201° 27' 44"	-1° 56' 53"	199° 05' 40"	-10° 10' 27"	0° 54' 15"	14' 46.87"	112° 25' 28"	0.58540
24	201° 57' 14"	-1° 59' 19"	199° 32' 30"	-10° 23' 47"	0° 54' 14"	14' 46.84"	112° 21' 09"	0.58154

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	301° 11' 29"	-0.34"	303° 24' 50"	-19° 53' 39"	0.9840864	16'15.15"	23° 26' 19"	-11 m 14 s
1	301° 14' 02"	-0.35"	303° 27' 28"	-19° 53' 06"	0.9840903	16'15.14"	23° 26' 19"	-11 m 15 s
2	301° 16' 35"	-0.35"	303° 30' 06"	-19° 52' 32"	0.9840943	16'15.14"	23° 26' 19"	-11 m 15 s
3	301° 19' 07"	-0.36"	303° 32' 45"	-19° 51' 59"	0.9840982	16'15.14"	23° 26' 19"	-11 m 16 s
4	301° 21' 40"	-0.36"	303° 35' 23"	-19° 51' 25"	0.9841022	16'15.13"	23° 26' 19"	-11 m 17 s
5	301° 24' 12"	-0.37"	303° 38' 01"	-19° 50' 52"	0.9841062	16'15.13"	23° 26' 19"	-11 m 17 s
6	301° 26' 45"	-0.37"	303° 40' 40"	-19° 50' 18"	0.9841101	16'15.12"	23° 26' 19"	-11 m 18 s
7	301° 29' 18"	-0.38"	303° 43' 18"	-19° 49' 44"	0.9841141	16'15.12"	23° 26' 19"	-11 m 19 s
8	301° 31' 50"	-0.38"	303° 45' 56"	-19° 49' 11"	0.9841181	16'15.12"	23° 26' 19"	-11 m 19 s
9	301° 34' 23"	-0.39"	303° 48' 34"	-19° 48' 37"	0.9841221	16'15.11"	23° 26' 19"	-11 m 20 s
10	301° 36' 56"	-0.39"	303° 51' 12"	-19° 48' 03"	0.9841262	16'15.11"	23° 26' 19"	-11 m 21 s
11	301° 39' 28"	-0.40"	303° 53' 51"	-19° 47' 29"	0.9841302	16'15.10"	23° 26' 19"	-11 m 22 s
12	301° 42' 01"	-0.40"	303° 56' 29"	-19° 46' 55"	0.9841342	16'15.10"	23° 26' 19"	-11 m 22 s
13	301° 44' 34"	-0.41"	303° 59' 07"	-19° 46' 21"	0.9841383	16'15.10"	23° 26' 19"	-11 m 23 s
14	301° 47' 06"	-0.41"	304° 01' 45"	-19° 45' 48"	0.9841423	16'15.09"	23° 26' 19"	-11 m 24 s
15	301° 49' 39"	-0.42"	304° 04' 23"	-19° 45' 14"	0.9841464	16'15.09"	23° 26' 19"	-11 m 24 s
16	301° 52' 11"	-0.42"	304° 07' 01"	-19° 44' 40"	0.9841504	16'15.08"	23° 26' 19"	-11 m 25 s
17	301° 54' 44"	-0.43"	304° 09' 39"	-19° 44' 05"	0.9841545	16'15.08"	23° 26' 19"	-11 m 26 s
18	301° 57' 17"	-0.43"	304° 12' 17"	-19° 43' 31"	0.9841586	16'15.08"	23° 26' 19"	-11 m 26 s
19	301° 59' 49"	-0.44"	304° 14' 55"	-19° 42' 57"	0.9841627	16'15.07"	23° 26' 19"	-11 m 27 s
20	302° 02' 22"	-0.44"	304° 17' 33"	-19° 42' 23"	0.9841668	16'15.07"	23° 26' 19"	-11 m 28 s
21	302° 04' 55"	-0.45"	304° 20' 11"	-19° 41' 49"	0.9841709	16'15.06"	23° 26' 19"	-11 m 28 s
22	302° 07' 27"	-0.45"	304° 22' 49"	-19° 41' 15"	0.9841750	16'15.06"	23° 26' 19"	-11 m 29 s
23	302° 09' 60"	-0.45"	304° 25' 27"	-19° 40' 40"	0.9841792	16'15.06"	23° 26' 19"	-11 m 30 s
24	302° 12' 32"	-0.46"	304° 28' 05"	-19° 40' 06"	0.9841833	16'15.05"	23° 26' 19"	-11 m 30 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	201° 57' 14"	-1° 59' 19"	199° 32' 30"	-10° 23' 47"	0° 54' 14"	14' 46.84"	112° 21' 09"	0.58154
1	202° 26' 44"	-2° 01' 45"	199° 59' 23"	-10° 37' 05"	0° 54' 14"	14' 46.82"	112° 16' 42"	0.57767
2	202° 56' 14"	-2° 04' 10"	200° 26' 17"	-10° 50' 20"	0° 54' 14"	14' 46.80"	112° 12' 07"	0.57380
3	203° 25' 44"	-2° 06' 35"	200° 53' 14"	-11° 03' 33"	0° 54' 14"	14' 46.79"	112° 7' 25"	0.56992
4	203° 55' 13"	-2° 08' 59"	201° 20' 14"	-11° 16' 44"	0° 54' 14"	14' 46.78"	112° 2' 35"	0.56604
5	204° 24' 43"	-2° 11' 23"	201° 47' 16"	-11° 29' 52"	0° 54' 14"	14' 46.78"	111° 57' 38"	0.56215
6	204° 54' 13"	-2° 13' 45"	202° 14' 20"	-11° 42' 57"	0° 54' 14"	14' 46.78"	111° 52' 33"	0.55826
7	205° 23' 43"	-2° 16' 08"	202° 41' 27"	-11° 56' 00"	0° 54' 14"	14' 46.79"	111° 47' 21"	0.55437
8	205° 53' 13"	-2° 18' 29"	203° 08' 36"	-12° 09' 00"	0° 54' 14"	14' 46.80"	111° 42' 01"	0.55047
9	206° 22' 43"	-2° 20' 51"	203° 35' 48"	-12° 21' 58"	0° 54' 14"	14' 46.82"	111° 36' 33"	0.54657
10	206° 52' 14"	-2° 23' 11"	204° 03' 03"	-12° 34' 53"	0° 54' 14"	14' 46.84"	111° 30' 58"	0.54267
11	207° 21' 44"	-2° 25' 31"	204° 30' 20"	-12° 47' 45"	0° 54' 15"	14' 46.87"	111° 25' 15"	0.53876
12	207° 51' 15"	-2° 27' 50"	204° 57' 41"	-13° 00' 35"	0° 54' 15"	14' 46.90"	111° 19' 25"	0.53485
13	208° 20' 46"	-2° 30' 09"	205° 25' 04"	-13° 13' 22"	0° 54' 15"	14' 46.94"	111° 13' 27"	0.53094
14	208° 50' 17"	-2° 32' 27"	205° 52' 31"	-13° 26' 06"	0° 54' 15"	14' 46.98"	111° 7' 22"	0.52702
15	209° 19' 49"	-2° 34' 44"	206° 20' 00"	-13° 38' 47"	0° 54' 15"	14' 47.03"	111° 1' 09"	0.52311
16	209° 49' 21"	-2° 37' 01"	206° 47' 33"	-13° 51' 25"	0° 54' 15"	14' 47.08"	110° 54' 48"	0.51919
17	210° 18' 53"	-2° 39' 17"	207° 15' 09"	-14° 03' 60"	0° 54' 16"	14' 47.14"	110° 48' 20"	0.51527
18	210° 48' 25"	-2° 41' 32"	207° 42' 48"	-14° 16' 32"	0° 54' 16"	14' 47.21"	110° 41' 44"	0.51135
19	211° 17' 58"	-2° 43' 47"	208° 10' 30"	-14° 29' 01"	0° 54' 16"	14' 47.27"	110° 35' 00"	0.50743
20	211° 47' 31"	-2° 46' 00"	208° 38' 16"	-14° 41' 26"	0° 54' 16"	14' 47.35"	110° 28' 09"	0.50350
21	212° 17' 05"	-2° 48' 14"	209° 06' 05"	-14° 53' 49"	0° 54' 17"	14' 47.42"	110° 21' 11"	0.49958
22	212° 46' 39"	-2° 50' 26"	209° 33' 58"	-15° 06' 08"	0° 54' 17"	14' 47.51"	110° 14' 04"	0.49565
23	213° 16' 13"	-2° 52' 38"	210° 01' 54"	-15° 18' 24"	0° 54' 17"	14' 47.60"	110° 6' 50"	0.49172
24	213° 45' 48"	-2° 54' 49"	210° 29' 54"	-15° 30' 37"	0° 54' 18"	14' 47.69"	109° 59' 28"	0.48780

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	302° 12' 32"	-0.46"	304° 28' 05"	-19° 40' 06"	0.9841833	16' 15.05"	23° 26' 19"	-11 m 30 s
1	302° 15' 05"	-0.46"	304° 30' 43"	-19° 39' 32"	0.9841874	16' 15.05"	23° 26' 19"	-11 m 31 s
2	302° 17' 38"	-0.47"	304° 33' 21"	-19° 38' 57"	0.9841916	16' 15.04"	23° 26' 19"	-11 m 32 s
3	302° 20' 10"	-0.47"	304° 35' 59"	-19° 38' 23"	0.9841958	16' 15.04"	23° 26' 19"	-11 m 32 s
4	302° 22' 43"	-0.48"	304° 38' 37"	-19° 37' 48"	0.9841999	16' 15.04"	23° 26' 19"	-11 m 33 s
5	302° 25' 15"	-0.48"	304° 41' 14"	-19° 37' 14"	0.9842041	16' 15.03"	23° 26' 19"	-11 m 34 s
6	302° 27' 48"	-0.49"	304° 43' 52"	-19° 36' 39"	0.9842083	16' 15.03"	23° 26' 19"	-11 m 34 s
7	302° 30' 21"	-0.49"	304° 46' 30"	-19° 36' 05"	0.9842125	16' 15.02"	23° 26' 19"	-11 m 35 s
8	302° 32' 53"	-0.49"	304° 49' 08"	-19° 35' 30"	0.9842167	16' 15.02"	23° 26' 19"	-11 m 36 s
9	302° 35' 26"	-0.50"	304° 51' 46"	-19° 34' 55"	0.9842209	16' 15.01"	23° 26' 19"	-11 m 36 s
10	302° 37' 59"	-0.50"	304° 54' 23"	-19° 34' 20"	0.9842251	16' 15.01"	23° 26' 19"	-11 m 37 s
11	302° 40' 31"	-0.51"	304° 57' 01"	-19° 33' 46"	0.9842294	16' 15.01"	23° 26' 19"	-11 m 38 s
12	302° 43' 04"	-0.51"	304° 59' 39"	-19° 33' 11"	0.9842336	16' 15.00"	23° 26' 19"	-11 m 38 s
13	302° 45' 36"	-0.52"	305° 02' 16"	-19° 32' 36"	0.9842378	16' 15.00"	23° 26' 19"	-11 m 39 s
14	302° 48' 09"	-0.52"	305° 04' 54"	-19° 32' 01"	0.9842421	16' 14.99"	23° 26' 19"	-11 m 40 s
15	302° 50' 42"	-0.52"	305° 07' 32"	-19° 31' 26"	0.9842463	16' 14.99"	23° 26' 19"	-11 m 40 s
16	302° 53' 14"	-0.53"	305° 10' 09"	-19° 30' 51"	0.9842506	16' 14.99"	23° 26' 19"	-11 m 41 s
17	302° 55' 47"	-0.53"	305° 12' 47"	-19° 30' 16"	0.9842549	16' 14.98"	23° 26' 19"	-11 m 42 s
18	302° 58' 19"	-0.54"	305° 15' 24"	-19° 29' 41"	0.9842592	16' 14.98"	23° 26' 19"	-11 m 42 s
19	303° 00' 52"	-0.54"	305° 18' 02"	-19° 29' 06"	0.9842635	16' 14.97"	23° 26' 19"	-11 m 43 s
20	303° 03' 25"	-0.54"	305° 20' 40"	-19° 28' 31"	0.9842678	16' 14.97"	23° 26' 19"	-11 m 44 s
21	303° 05' 57"	-0.55"	305° 23' 17"	-19° 27' 56"	0.9842721	16' 14.96"	23° 26' 19"	-11 m 44 s
22	303° 08' 30"	-0.55"	305° 25' 55"	-19° 27' 21"	0.9842764	16' 14.96"	23° 26' 19"	-11 m 45 s
23	303° 11' 02"	-0.55"	305° 28' 32"	-19° 26' 46"	0.9842807	16' 14.96"	23° 26' 19"	-11 m 46 s
24	303° 13' 35"	-0.56"	305° 31' 09"	-19° 26' 11"	0.9842850	16' 14.95"	23° 26' 19"	-11 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	213° 45' 48"	-2° 54' 49"	210° 29' 54"	-15° 30' 37"	0° 54' 18"	14' 47.69"	109° 59' 28"	0.48780
1	214° 15' 24"	-2° 56' 59"	210° 57' 57"	-15° 42' 47"	0° 54' 18"	14' 47.79"	109° 51' 59"	0.48387
2	214° 44' 60"	-2° 59' 08"	211° 26' 04"	-15° 54' 52"	0° 54' 18"	14' 47.89"	109° 44' 22"	0.47994
3	215° 14' 36"	-3° 01' 17"	211° 54' 16"	-16° 06' 55"	0° 54' 19"	14' 48.00"	109° 36' 37"	0.47601
4	215° 44' 13"	-3° 03' 25"	212° 22' 30"	-16° 18' 54"	0° 54' 19"	14' 48.11"	109° 28' 45"	0.47209
5	216° 13' 51"	-3° 05' 32"	212° 50' 49"	-16° 30' 49"	0° 54' 20"	14' 48.23"	109° 20' 44"	0.46816
6	216° 43' 29"	-3° 07' 38"	213° 19' 12"	-16° 42' 41"	0° 54' 20"	14' 48.35"	109° 12' 37"	0.46423
7	217° 13' 08"	-3° 09' 44"	213° 47' 39"	-16° 54' 29"	0° 54' 20"	14' 48.48"	109° 4' 21"	0.46031
8	217° 42' 48"	-3° 11' 49"	214° 16' 10"	-17° 06' 14"	0° 54' 21"	14' 48.62"	108° 55' 58"	0.45638
9	218° 12' 28"	-3° 13' 53"	214° 44' 45"	-17° 17' 54"	0° 54' 21"	14' 48.75"	108° 47' 26"	0.45246
10	218° 42' 09"	-3° 15' 56"	215° 13' 24"	-17° 29' 31"	0° 54' 22"	14' 48.90"	108° 38' 48"	0.44854
11	219° 11' 51"	-3° 17' 58"	215° 42' 08"	-17° 41' 04"	0° 54' 23"	14' 49.05"	108° 30' 01"	0.44462
12	219° 41' 34"	-3° 19' 59"	216° 10' 56"	-17° 52' 33"	0° 54' 23"	14' 49.20"	108° 21' 06"	0.44070
13	220° 11' 17"	-3° 21' 60"	216° 39' 48"	-18° 03' 58"	0° 54' 24"	14' 49.36"	108° 12' 04"	0.43678
14	220° 41' 01"	-3° 23' 60"	217° 08' 44"	-18° 15' 19"	0° 54' 24"	14' 49.52"	108° 2' 54"	0.43287
15	221° 10' 46"	-3° 25' 59"	217° 37' 45"	-18° 26' 36"	0° 54' 25"	14' 49.69"	107° 53' 36"	0.42896
16	221° 40' 32"	-3° 27' 56"	218° 06' 51"	-18° 37' 48"	0° 54' 26"	14' 49.86"	107° 44' 10"	0.42505
17	222° 10' 19"	-3° 29' 54"	218° 36' 01"	-18° 48' 57"	0° 54' 26"	14' 50.04"	107° 34' 37"	0.42114
18	222° 40' 06"	-3° 31' 50"	219° 05' 16"	-19° 00' 01"	0° 54' 27"	14' 50.22"	107° 24' 55"	0.41724
19	223° 09' 55"	-3° 33' 45"	219° 34' 35"	-19° 11' 01"	0° 54' 28"	14' 50.41"	107° 15' 06"	0.41334
20	223° 39' 45"	-3° 35' 39"	220° 03' 60"	-19° 21' 57"	0° 54' 28"	14' 50.60"	107° 5' 09"	0.40944
21	224° 09' 35"	-3° 37' 33"	220° 33' 28"	-19° 32' 48"	0° 54' 29"	14' 50.80"	106° 55' 04"	0.40555
22	224° 39' 26"	-3° 39' 25"	221° 03' 02"	-19° 43' 34"	0° 54' 30"	14' 51.00"	106° 44' 51"	0.40166
23	225° 09' 19"	-3° 41' 17"	221° 32' 41"	-19° 54' 16"	0° 54' 30"	14' 51.21"	106° 34' 30"	0.39778
24	225° 39' 12"	-3° 43' 07"	222° 02' 24"	-20° 04' 54"	0° 54' 31"	14' 51.42"	106° 24' 01"	0.39389

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	303° 13' 35"	-0.56"	305° 31' 09"	-19° 26' 11"	0.9842850	16'14.95"	23° 26' 19"	-11 m 46 s
1	303° 16' 08"	-0.56"	305° 33' 47"	-19° 25' 35"	0.9842894	16'14.95"	23° 26' 19"	-11 m 47 s
2	303° 18' 40"	-0.57"	305° 36' 24"	-19° 24' 60"	0.9842937	16'14.94"	23° 26' 19"	-11 m 48 s
3	303° 21' 13"	-0.57"	305° 39' 02"	-19° 24' 25"	0.9842981	16'14.94"	23° 26' 19"	-11 m 48 s
4	303° 23' 45"	-0.57"	305° 41' 39"	-19° 23' 49"	0.9843024	16'14.93"	23° 26' 19"	-11 m 49 s
5	303° 26' 18"	-0.58"	305° 44' 16"	-19° 23' 14"	0.9843068	16'14.93"	23° 26' 19"	-11 m 49 s
6	303° 28' 51"	-0.58"	305° 46' 54"	-19° 22' 38"	0.9843112	16'14.93"	23° 26' 19"	-11 m 50 s
7	303° 31' 23"	-0.58"	305° 49' 31"	-19° 22' 03"	0.9843156	16'14.92"	23° 26' 19"	-11 m 51 s
8	303° 33' 56"	-0.59"	305° 52' 08"	-19° 21' 27"	0.9843200	16'14.92"	23° 26' 19"	-11 m 51 s
9	303° 36' 28"	-0.59"	305° 54' 46"	-19° 20' 52"	0.9843244	16'14.91"	23° 26' 19"	-11 m 52 s
10	303° 39' 01"	-0.59"	305° 57' 23"	-19° 20' 16"	0.9843288	16'14.91"	23° 26' 19"	-11 m 53 s
11	303° 41' 34"	-0.60"	306° 00' 00"	-19° 19' 40"	0.9843332	16'14.90"	23° 26' 19"	-11 m 53 s
12	303° 44' 06"	-0.60"	306° 02' 37"	-19° 19' 05"	0.9843376	16'14.90"	23° 26' 19"	-11 m 54 s
13	303° 46' 39"	-0.60"	306° 05' 15"	-19° 18' 29"	0.9843421	16'14.89"	23° 26' 19"	-11 m 54 s
14	303° 49' 11"	-0.61"	306° 07' 52"	-19° 17' 53"	0.9843465	16'14.89"	23° 26' 19"	-11 m 55 s
15	303° 51' 44"	-0.61"	306° 10' 29"	-19° 17' 17"	0.9843509	16'14.89"	23° 26' 19"	-11 m 56 s
16	303° 54' 17"	-0.61"	306° 13' 06"	-19° 16' 42"	0.9843554	16'14.88"	23° 26' 19"	-11 m 56 s
17	303° 56' 49"	-0.62"	306° 15' 43"	-19° 16' 06"	0.9843599	16'14.88"	23° 26' 19"	-11 m 57 s
18	303° 59' 22"	-0.62"	306° 18' 20"	-19° 15' 30"	0.9843643	16'14.87"	23° 26' 19"	-11 m 58 s
19	304° 01' 54"	-0.62"	306° 20' 57"	-19° 14' 54"	0.9843688	16'14.87"	23° 26' 19"	-11 m 58 s
20	304° 04' 27"	-0.62"	306° 23' 34"	-19° 14' 18"	0.9843733	16'14.86"	23° 26' 19"	-11 m 59 s
21	304° 06' 59"	-0.63"	306° 26' 11"	-19° 13' 42"	0.9843778	16'14.86"	23° 26' 19"	-11 m 59 s
22	304° 09' 32"	-0.63"	306° 28' 48"	-19° 13' 06"	0.9843823	16'14.85"	23° 26' 19"	-12 m 00 s
23	304° 12' 05"	-0.63"	306° 31' 25"	-19° 12' 30"	0.9843868	16'14.85"	23° 26' 19"	-12 m 01 s
24	304° 14' 37"	-0.63"	306° 34' 02"	-19° 11' 53"	0.9843913	16'14.85"	23° 26' 19"	-12 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	225° 39' 12"	-3° 43' 07"	222° 02' 24"	-20° 04' 54"	0° 54' 31"	14' 51.42"	106° 24' 01"	0.39389
1	226° 09' 07"	-3° 44' 57"	222° 32' 13"	-20° 15' 27"	0° 54' 32"	14' 51.63"	106° 13' 25"	0.39002
2	226° 39' 03"	-3° 46' 46"	223° 02' 06"	-20° 25' 55"	0° 54' 33"	14' 51.86"	106° 2' 40"	0.38615
3	227° 08' 59"	-3° 48' 33"	223° 32' 05"	-20° 36' 18"	0° 54' 34"	14' 52.08"	105° 51' 48"	0.38228
4	227° 38' 57"	-3° 50' 20"	224° 02' 08"	-20° 46' 37"	0° 54' 35"	14' 52.31"	105° 40' 47"	0.37842
5	228° 08' 56"	-3° 52' 06"	224° 32' 17"	-20° 56' 50"	0° 54' 35"	14' 52.55"	105° 29' 39"	0.37456
6	228° 38' 56"	-3° 53' 51"	225° 02' 31"	-21° 06' 59"	0° 54' 36"	14' 52.79"	105° 18' 22"	0.37071
7	229° 08' 58"	-3° 55' 34"	225° 32' 50"	-21° 17' 02"	0° 54' 37"	14' 53.03"	105° 6' 58"	0.36686
8	229° 39' 00"	-3° 57' 17"	226° 03' 14"	-21° 27' 01"	0° 54' 38"	14' 53.28"	104° 55' 26"	0.36302
9	230° 09' 04"	-3° 58' 59"	226° 33' 44"	-21° 36' 54"	0° 54' 39"	14' 53.53"	104° 43' 45"	0.35919
10	230° 39' 09"	-4° 00' 39"	227° 04' 18"	-21° 46' 42"	0° 54' 40"	14' 53.79"	104° 31' 57"	0.35536
11	231° 09' 15"	-4° 02' 19"	227° 34' 59"	-21° 56' 25"	0° 54' 41"	14' 54.06"	104° 20' 00"	0.35154
12	231° 39' 23"	-4° 03' 57"	228° 05' 44"	-22° 06' 03"	0° 54' 42"	14' 54.32"	104° 7' 56"	0.34773
13	232° 09' 32"	-4° 05' 35"	228° 36' 35"	-22° 15' 35"	0° 54' 43"	14' 54.60"	103° 55' 44"	0.34392
14	232° 39' 42"	-4° 07' 11"	229° 07' 31"	-22° 25' 02"	0° 54' 44"	14' 54.87"	103° 43' 23"	0.34012
15	233° 09' 54"	-4° 08' 47"	229° 38' 33"	-22° 34' 23"	0° 54' 45"	14' 55.15"	103° 30' 55"	0.33633
16	233° 40' 06"	-4° 10' 21"	230° 09' 41"	-22° 43' 38"	0° 54' 46"	14' 55.44"	103° 18' 18"	0.33254
17	234° 10' 21"	-4° 11' 54"	230° 40' 53"	-22° 52' 48"	0° 54' 47"	14' 55.73"	103° 5' 34"	0.32877
18	234° 40' 37"	-4° 13' 26"	231° 12' 12"	-23° 01' 52"	0° 54' 48"	14' 56.02"	102° 52' 41"	0.32500
19	235° 10' 54"	-4° 14' 57"	231° 43' 36"	-23° 10' 51"	0° 54' 49"	14' 56.32"	102° 39' 41"	0.32124
20	235° 41' 12"	-4° 16' 27"	232° 15' 05"	-23° 19' 43"	0° 54' 50"	14' 56.62"	102° 26' 32"	0.31749
21	236° 11' 32"	-4° 17' 55"	232° 46' 40"	-23° 28' 30"	0° 54' 51"	14' 56.93"	102° 13' 16"	0.31374
22	236° 41' 54"	-4° 19' 23"	233° 18' 21"	-23° 37' 10"	0° 54' 53"	14' 57.24"	101° 59' 51"	0.31001
23	237° 12' 17"	-4° 20' 49"	233° 50' 07"	-23° 45' 45"	0° 54' 54"	14' 57.56"	101° 46' 18"	0.30628
24	237° 42' 42"	-4° 22' 14"	234° 21' 59"	-23° 54' 13"	0° 54' 55"	14' 57.88"	101° 32' 38"	0.30257

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	304° 14' 37"	-0.63"	306° 34' 02"	-19° 11' 53"	0.9843913	16' 14.85"	23° 26' 19"	-12 m 01 s
1	304° 17' 10"	-0.64"	306° 36' 39"	-19° 11' 17"	0.9843958	16' 14.84"	23° 26' 19"	-12 m 02 s
2	304° 19' 42"	-0.64"	306° 39' 16"	-19° 10' 41"	0.9844004	16' 14.84"	23° 26' 19"	-12 m 02 s
3	304° 22' 15"	-0.64"	306° 41' 53"	-19° 10' 05"	0.9844049	16' 14.83"	23° 26' 19"	-12 m 03 s
4	304° 24' 48"	-0.64"	306° 44' 30"	-19° 09' 29"	0.9844095	16' 14.83"	23° 26' 19"	-12 m 04 s
5	304° 27' 20"	-0.65"	306° 47' 07"	-19° 08' 52"	0.9844140	16' 14.82"	23° 26' 19"	-12 m 04 s
6	304° 29' 53"	-0.65"	306° 49' 44"	-19° 08' 16"	0.9844186	16' 14.82"	23° 26' 19"	-12 m 05 s
7	304° 32' 25"	-0.65"	306° 52' 21"	-19° 07' 39"	0.9844231	16' 14.81"	23° 26' 19"	-12 m 06 s
8	304° 34' 58"	-0.65"	306° 54' 58"	-19° 07' 03"	0.9844277	16' 14.81"	23° 26' 19"	-12 m 06 s
9	304° 37' 30"	-0.66"	306° 57' 34"	-19° 06' 27"	0.9844323	16' 14.81"	23° 26' 19"	-12 m 07 s
10	304° 40' 03"	-0.66"	307° 00' 11"	-19° 05' 50"	0.9844369	16' 14.80"	23° 26' 19"	-12 m 07 s
11	304° 42' 36"	-0.66"	307° 02' 48"	-19° 05' 14"	0.9844415	16' 14.80"	23° 26' 19"	-12 m 08 s
12	304° 45' 08"	-0.66"	307° 05' 25"	-19° 04' 37"	0.9844461	16' 14.79"	23° 26' 19"	-12 m 09 s
13	304° 47' 41"	-0.66"	307° 08' 01"	-19° 04' 00"	0.9844507	16' 14.79"	23° 26' 19"	-12 m 09 s
14	304° 50' 13"	-0.67"	307° 10' 38"	-19° 03' 24"	0.9844553	16' 14.78"	23° 26' 19"	-12 m 10 s
15	304° 52' 46"	-0.67"	307° 13' 15"	-19° 02' 47"	0.9844599	16' 14.78"	23° 26' 19"	-12 m 10 s
16	304° 55' 18"	-0.67"	307° 15' 51"	-19° 02' 10"	0.9844646	16' 14.77"	23° 26' 19"	-12 m 11 s
17	304° 57' 51"	-0.67"	307° 18' 28"	-19° 01' 33"	0.9844692	16' 14.77"	23° 26' 19"	-12 m 11 s
18	305° 00' 23"	-0.67"	307° 21' 05"	-19° 00' 57"	0.9844739	16' 14.76"	23° 26' 19"	-12 m 12 s
19	305° 02' 56"	-0.68"	307° 23' 41"	-19° 00' 20"	0.9844785	16' 14.76"	23° 26' 19"	-12 m 13 s
20	305° 05' 29"	-0.68"	307° 26' 18"	-18° 59' 43"	0.9844832	16' 14.76"	23° 26' 19"	-12 m 13 s
21	305° 08' 01"	-0.68"	307° 28' 54"	-18° 59' 06"	0.9844878	16' 14.75"	23° 26' 19"	-12 m 14 s
22	305° 10' 34"	-0.68"	307° 31' 31"	-18° 58' 29"	0.9844925	16' 14.75"	23° 26' 19"	-12 m 14 s
23	305° 13' 06"	-0.68"	307° 34' 07"	-18° 57' 52"	0.9844972	16' 14.74"	23° 26' 19"	-12 m 15 s
24	305° 15' 39"	-0.68"	307° 36' 44"	-18° 57' 15"	0.9845019	16' 14.74"	23° 26' 19"	-12 m 16 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	237° 42' 42"	-4° 22' 14"	234° 21' 59"	-23° 54' 13"	0° 54' 55"	14' 57.88"	101° 32' 38"	0.30257
1	238° 13' 08"	-4° 23' 38"	234° 53' 57"	-24° 02' 35"	0° 54' 56"	14' 58.20"	101° 18' 49"	0.29886
2	238° 43' 36"	-4° 25' 01"	235° 26' 00"	-24° 10' 51"	0° 54' 57"	14' 58.53"	101° 4' 52"	0.29517
3	239° 14' 05"	-4° 26' 23"	235° 58' 09"	-24° 19' 01"	0° 54' 59"	14' 58.86"	100° 50' 48"	0.29148
4	239° 44' 36"	-4° 27' 43"	236° 30' 24"	-24° 27' 04"	0° 54' 60"	14' 59.20"	100° 36' 35"	0.28781
5	240° 15' 08"	-4° 29' 02"	237° 02' 44"	-24° 35' 00"	0° 55' 01"	14' 59.54"	100° 22' 14"	0.28414
6	240° 45' 43"	-4° 30' 20"	237° 35' 11"	-24° 42' 51"	0° 55' 02"	14' 59.88"	100° 7' 45"	0.28049
7	241° 16' 18"	-4° 31' 37"	238° 07' 42"	-24° 50' 34"	0° 55' 04"	15' 00.23"	99° 53' 08"	0.27685
8	241° 46' 56"	-4° 32' 53"	238° 40' 20"	-24° 58' 11"	0° 55' 05"	15' 00.59"	99° 38' 23"	0.27321
9	242° 17' 35"	-4° 34' 07"	239° 13' 03"	-25° 05' 41"	0° 55' 06"	15' 00.94"	99° 23' 31"	0.26959
10	242° 48' 16"	-4° 35' 20"	239° 45' 52"	-25° 13' 04"	0° 55' 08"	15' 01.30"	99° 8' 30"	0.26599
11	243° 18' 59"	-4° 36' 32"	240° 18' 47"	-25° 20' 21"	0° 55' 09"	15' 01.67"	98° 53' 21"	0.26239
12	243° 49' 43"	-4° 37' 42"	240° 51' 47"	-25° 27' 30"	0° 55' 10"	15' 02.03"	98° 38' 04"	0.25881
13	244° 20' 29"	-4° 38' 52"	241° 24' 53"	-25° 34' 33"	0° 55' 12"	15' 02.41"	98° 22' 40"	0.25524
14	244° 51' 17"	-4° 39' 60"	241° 58' 05"	-25° 41' 28"	0° 55' 13"	15' 02.78"	98° 7' 07"	0.25168
15	245° 22' 07"	-4° 41' 06"	242° 31' 22"	-25° 48' 16"	0° 55' 14"	15' 03.16"	97° 51' 26"	0.24813
16	245° 52' 58"	-4° 42' 12"	243° 04' 45"	-25° 54' 57"	0° 55' 16"	15' 03.54"	97° 35' 38"	0.24460
17	246° 23' 51"	-4° 43' 16"	243° 38' 13"	-26° 01' 31"	0° 55' 17"	15' 03.93"	97° 19' 42"	0.24109
18	246° 54' 46"	-4° 44' 18"	244° 11' 48"	-26° 07' 57"	0° 55' 19"	15' 04.32"	97° 3' 37"	0.23758
19	247° 25' 43"	-4° 45' 20"	244° 45' 27"	-26° 14' 16"	0° 55' 20"	15' 04.71"	96° 47' 25"	0.23409
20	247° 56' 42"	-4° 46' 20"	245° 19' 13"	-26° 20' 27"	0° 55' 22"	15' 05.11"	96° 31' 05"	0.23062
21	248° 27' 43"	-4° 47' 19"	245° 53' 03"	-26° 26' 30"	0° 55' 23"	15' 05.51"	96° 14' 37"	0.22716
22	248° 58' 46"	-4° 48' 16"	246° 26' 60"	-26° 32' 26"	0° 55' 24"	15' 05.91"	95° 58' 01"	0.22371
23	249° 29' 50"	-4° 49' 12"	247° 01' 02"	-26° 38' 15"	0° 55' 26"	15' 06.32"	95° 41' 18"	0.22028
24	250° 00' 57"	-4° 50' 07"	247° 35' 09"	-26° 43' 55"	0° 55' 27"	15' 06.73"	95° 24' 26"	0.21686

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	305° 15' 39"	-0.68"	307° 36' 44"	-18° 57' 15"	0.9845019	16'14.74"	23° 26' 19"	-12 m 16 s
1	305° 18' 11"	-0.69"	307° 39' 20"	-18° 56' 38"	0.9845066	16'14.73"	23° 26' 19"	-12 m 16 s
2	305° 20' 44"	-0.69"	307° 41' 57"	-18° 56' 01"	0.9845113	16'14.73"	23° 26' 19"	-12 m 17 s
3	305° 23' 17"	-0.69"	307° 44' 33"	-18° 55' 24"	0.9845160	16'14.72"	23° 26' 19"	-12 m 17 s
4	305° 25' 49"	-0.69"	307° 47' 10"	-18° 54' 47"	0.9845207	16'14.72"	23° 26' 19"	-12 m 18 s
5	305° 28' 22"	-0.69"	307° 49' 46"	-18° 54' 10"	0.9845254	16'14.71"	23° 26' 19"	-12 m 18 s
6	305° 30' 54"	-0.69"	307° 52' 22"	-18° 53' 32"	0.9845302	16'14.71"	23° 26' 19"	-12 m 19 s
7	305° 33' 27"	-0.69"	307° 54' 59"	-18° 52' 55"	0.9845349	16'14.70"	23° 26' 19"	-12 m 20 s
8	305° 35' 59"	-0.69"	307° 57' 35"	-18° 52' 18"	0.9845396	16'14.70"	23° 26' 19"	-12 m 20 s
9	305° 38' 32"	-0.69"	308° 00' 11"	-18° 51' 40"	0.9845444	16'14.69"	23° 26' 19"	-12 m 21 s
10	305° 41' 04"	-0.70"	308° 02' 48"	-18° 51' 03"	0.9845491	16'14.69"	23° 26' 19"	-12 m 21 s
11	305° 43' 37"	-0.70"	308° 05' 24"	-18° 50' 26"	0.9845539	16'14.69"	23° 26' 19"	-12 m 22 s
12	305° 46' 09"	-0.70"	308° 08' 00"	-18° 49' 48"	0.9845587	16'14.68"	23° 26' 19"	-12 m 22 s
13	305° 48' 42"	-0.70"	308° 10' 36"	-18° 49' 11"	0.9845635	16'14.68"	23° 26' 19"	-12 m 23 s
14	305° 51' 15"	-0.70"	308° 13' 13"	-18° 48' 33"	0.9845682	16'14.67"	23° 26' 19"	-12 m 23 s
15	305° 53' 47"	-0.70"	308° 15' 49"	-18° 47' 56"	0.9845730	16'14.67"	23° 26' 19"	-12 m 24 s
16	305° 56' 20"	-0.70"	308° 18' 25"	-18° 47' 18"	0.9845778	16'14.66"	23° 26' 19"	-12 m 25 s
17	305° 58' 52"	-0.70"	308° 21' 01"	-18° 46' 40"	0.9845826	16'14.66"	23° 26' 19"	-12 m 25 s
18	306° 01' 25"	-0.70"	308° 23' 37"	-18° 46' 03"	0.9845874	16'14.65"	23° 26' 19"	-12 m 26 s
19	306° 03' 57"	-0.70"	308° 26' 13"	-18° 45' 25"	0.9845923	16'14.65"	23° 26' 19"	-12 m 26 s
20	306° 06' 30"	-0.70"	308° 28' 49"	-18° 44' 47"	0.9845971	16'14.64"	23° 26' 19"	-12 m 27 s
21	306° 09' 02"	-0.70"	308° 31' 25"	-18° 44' 09"	0.9846019	16'14.64"	23° 26' 19"	-12 m 27 s
22	306° 11' 35"	-0.70"	308° 34' 02"	-18° 43' 32"	0.9846068	16'14.63"	23° 26' 19"	-12 m 28 s
23	306° 14' 07"	-0.70"	308° 36' 38"	-18° 42' 54"	0.9846116	16'14.63"	23° 26' 19"	-12 m 28 s
24	306° 16' 40"	-0.70"	308° 39' 14"	-18° 42' 16"	0.9846164	16'14.62"	23° 26' 19"	-12 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	250° 00' 57"	-4° 50' 07"	247° 35' 09"	-26° 43' 55"	0° 55' 27"	15' 06.73"	95° 24' 26"	0.21686
1	250° 32' 05"	-4° 50' 60"	248° 09' 22"	-26° 49' 28"	0° 55' 29"	15' 07.14"	95° 7' 27"	0.21347
2	251° 03' 15"	-4° 51' 52"	248° 43' 40"	-26° 54' 52"	0° 55' 30"	15' 07.56"	94° 50' 20"	0.21008
3	251° 34' 28"	-4° 52' 42"	249° 18' 03"	-27° 00' 09"	0° 55' 32"	15' 07.98"	94° 33' 05"	0.20672
4	252° 05' 42"	-4° 53' 31"	249° 52' 32"	-27° 05' 18"	0° 55' 34"	15' 08.40"	94° 15' 43"	0.20336
5	252° 36' 58"	-4° 54' 19"	250° 27' 06"	-27° 10' 18"	0° 55' 35"	15' 08.83"	93° 58' 12"	0.20003
6	253° 08' 16"	-4° 55' 05"	251° 01' 45"	-27° 15' 10"	0° 55' 37"	15' 09.26"	93° 40' 34"	0.19671
7	253° 39' 37"	-4° 55' 50"	251° 36' 29"	-27° 19' 54"	0° 55' 38"	15' 09.69"	93° 22' 49"	0.19342
8	254° 10' 59"	-4° 56' 33"	252° 11' 18"	-27° 24' 30"	0° 55' 40"	15' 10.12"	93° 4' 55"	0.19013
9	254° 42' 23"	-4° 57' 15"	252° 46' 13"	-27° 28' 57"	0° 55' 42"	15' 10.56"	92° 46' 54"	0.18687
10	255° 13' 50"	-4° 57' 56"	253° 21' 12"	-27° 33' 16"	0° 55' 43"	15' 11.00"	92° 28' 45"	0.18362
11	255° 45' 18"	-4° 58' 35"	253° 56' 16"	-27° 37' 26"	0° 55' 45"	15' 11.45"	92° 10' 28"	0.18040
12	256° 16' 49"	-4° 59' 12"	254° 31' 26"	-27° 41' 28"	0° 55' 46"	15' 11.89"	91° 52' 04"	0.17719
13	256° 48' 21"	-4° 59' 48"	255° 06' 40"	-27° 45' 21"	0° 55' 48"	15' 12.34"	91° 33' 32"	0.17400
14	257° 19' 56"	-5° 00' 23"	255° 41' 58"	-27° 49' 05"	0° 55' 50"	15' 12.79"	91° 14' 53"	0.17083
15	257° 51' 33"	-5° 00' 56"	256° 17' 22"	-27° 52' 41"	0° 55' 51"	15' 13.24"	90° 56' 05"	0.16768
16	258° 23' 12"	-5° 01' 28"	256° 52' 50"	-27° 56' 08"	0° 55' 53"	15' 13.70"	90° 37' 10"	0.16455
17	258° 54' 53"	-5° 01' 58"	257° 28' 22"	-27° 59' 25"	0° 55' 55"	15' 14.16"	90° 18' 08"	0.16144
18	259° 26' 36"	-5° 02' 26"	258° 03' 59"	-28° 02' 34"	0° 55' 56"	15' 14.62"	89° 58' 57"	0.15835
19	259° 58' 21"	-5° 02' 53"	258° 39' 41"	-28° 05' 34"	0° 55' 58"	15' 15.08"	89° 39' 39"	0.15528
20	260° 30' 08"	-5° 03' 19"	259° 15' 26"	-28° 08' 25"	0° 55' 60"	15' 15.55"	89° 20' 13"	0.15224
21	261° 01' 58"	-5° 03' 43"	259° 51' 16"	-28° 11' 06"	0° 56' 02"	15' 16.02"	89° 0' 40"	0.14921
22	261° 33' 50"	-5° 04' 05"	260° 27' 10"	-28° 13' 39"	0° 56' 03"	15' 16.49"	88° 40' 59"	0.14620
23	262° 05' 44"	-5° 04' 26"	261° 03' 09"	-28° 16' 02"	0° 56' 05"	15' 16.96"	88° 21' 10"	0.14322
24	262° 37' 40"	-5° 04' 45"	261° 39' 11"	-28° 18' 16"	0° 56' 07"	15' 17.43"	88° 1' 13"	0.14026

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	306° 16' 40"	-0.70"	308° 39' 14"	-18° 42' 16"	0.9846164	16' 14.62"	23° 26' 19"	-12 m 29 s
1	306° 19' 12"	-0.70"	308° 41' 50"	-18° 41' 38"	0.9846213	16' 14.62"	23° 26' 19"	-12 m 30 s
2	306° 21' 45"	-0.70"	308° 44' 26"	-18° 41' 00"	0.9846262	16' 14.61"	23° 26' 19"	-12 m 30 s
3	306° 24' 18"	-0.70"	308° 47' 01"	-18° 40' 22"	0.9846310	16' 14.61"	23° 26' 19"	-12 m 31 s
4	306° 26' 50"	-0.70"	308° 49' 37"	-18° 39' 44"	0.9846359	16' 14.60"	23° 26' 19"	-12 m 31 s
5	306° 29' 23"	-0.70"	308° 52' 13"	-18° 39' 06"	0.9846408	16' 14.60"	23° 26' 19"	-12 m 32 s
6	306° 31' 55"	-0.70"	308° 54' 49"	-18° 38' 28"	0.9846457	16' 14.59"	23° 26' 19"	-12 m 32 s
7	306° 34' 28"	-0.70"	308° 57' 25"	-18° 37' 50"	0.9846506	16' 14.59"	23° 26' 19"	-12 m 33 s
8	306° 37' 00"	-0.70"	309° 00' 01"	-18° 37' 12"	0.9846555	16' 14.58"	23° 26' 19"	-12 m 33 s
9	306° 39' 33"	-0.70"	309° 02' 37"	-18° 36' 33"	0.9846604	16' 14.58"	23° 26' 19"	-12 m 34 s
10	306° 42' 05"	-0.70"	309° 05' 12"	-18° 35' 55"	0.9846653	16' 14.57"	23° 26' 19"	-12 m 34 s
11	306° 44' 38"	-0.70"	309° 07' 48"	-18° 35' 17"	0.9846702	16' 14.57"	23° 26' 19"	-12 m 35 s
12	306° 47' 10"	-0.70"	309° 10' 24"	-18° 34' 39"	0.9846752	16' 14.57"	23° 26' 19"	-12 m 35 s
13	306° 49' 43"	-0.70"	309° 12' 60"	-18° 34' 00"	0.9846801	16' 14.56"	23° 26' 19"	-12 m 36 s
14	306° 52' 15"	-0.70"	309° 15' 35"	-18° 33' 22"	0.9846850	16' 14.56"	23° 26' 19"	-12 m 36 s
15	306° 54' 48"	-0.70"	309° 18' 11"	-18° 32' 43"	0.9846900	16' 14.55"	23° 26' 19"	-12 m 37 s
16	306° 57' 20"	-0.70"	309° 20' 47"	-18° 32' 05"	0.9846949	16' 14.55"	23° 26' 19"	-12 m 38 s
17	306° 59' 53"	-0.70"	309° 23' 22"	-18° 31' 27"	0.9846999	16' 14.54"	23° 26' 19"	-12 m 38 s
18	307° 02' 25"	-0.70"	309° 25' 58"	-18° 30' 48"	0.9847049	16' 14.54"	23° 26' 19"	-12 m 39 s
19	307° 04' 58"	-0.70"	309° 28' 34"	-18° 30' 09"	0.9847098	16' 14.53"	23° 26' 19"	-12 m 39 s
20	307° 07' 30"	-0.70"	309° 31' 09"	-18° 29' 31"	0.9847148	16' 14.53"	23° 26' 19"	-12 m 40 s
21	307° 10' 03"	-0.70"	309° 33' 45"	-18° 28' 52"	0.9847198	16' 14.52"	23° 26' 19"	-12 m 40 s
22	307° 12' 35"	-0.70"	309° 36' 20"	-18° 28' 14"	0.9847248	16' 14.52"	23° 26' 19"	-12 m 41 s
23	307° 15' 08"	-0.69"	309° 38' 56"	-18° 27' 35"	0.9847298	16' 14.51"	23° 26' 19"	-12 m 41 s
24	307° 17' 40"	-0.69"	309° 41' 31"	-18° 26' 56"	0.9847348	16' 14.51"	23° 26' 19"	-12 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	262° 37' 40"	-5° 04' 45"	261° 39' 11"	-28° 18' 16"	0° 56' 07"	15' 17.43"	88° 1' 13"	0.14026
1	263° 09' 38"	-5° 05' 03"	262° 15' 17"	-28° 20' 20"	0° 56' 08"	15' 17.91"	87° 41' 08"	0.13732
2	263° 41' 38"	-5° 05' 19"	262° 51' 26"	-28° 22' 15"	0° 56' 10"	15' 18.39"	87° 20' 56"	0.13441
3	264° 13' 41"	-5° 05' 34"	263° 27' 40"	-28° 24' 01"	0° 56' 12"	15' 18.87"	87° 0' 35"	0.13152
4	264° 45' 46"	-5° 05' 47"	264° 03' 57"	-28° 25' 37"	0° 56' 14"	15' 19.35"	86° 40' 07"	0.12865
5	265° 17' 53"	-5° 05' 58"	264° 40' 18"	-28° 27' 04"	0° 56' 16"	15' 19.83"	86° 19' 31"	0.12580
6	265° 50' 02"	-5° 06' 08"	265° 16' 42"	-28° 28' 21"	0° 56' 17"	15' 20.31"	85° 58' 46"	0.12298
7	266° 22' 14"	-5° 06' 16"	265° 53' 09"	-28° 29' 28"	0° 56' 19"	15' 20.80"	85° 37' 53"	0.12019
8	266° 54' 27"	-5° 06' 22"	266° 29' 40"	-28° 30' 26"	0° 56' 21"	15' 21.29"	85° 16' 52"	0.11741
9	267° 26' 43"	-5° 06' 27"	267° 06' 14"	-28° 31' 13"	0° 56' 23"	15' 21.78"	84° 55' 43"	0.11467
10	267° 59' 01"	-5° 06' 31"	267° 42' 50"	-28° 31' 52"	0° 56' 24"	15' 22.27"	84° 34' 25"	0.11195
11	268° 31' 22"	-5° 06' 32"	268° 19' 30"	-28° 32' 20"	0° 56' 26"	15' 22.76"	84° 12' 59"	0.10925
12	269° 03' 44"	-5° 06' 32"	268° 56' 13"	-28° 32' 39"	0° 56' 28"	15' 23.25"	83° 51' 23"	0.10658
13	269° 36' 09"	-5° 06' 31"	269° 32' 58"	-28° 32' 47"	0° 56' 30"	15' 23.75"	83° 29' 39"	0.10394
14	270° 08' 36"	-5° 06' 28"	270° 09' 46"	-28° 32' 46"	0° 56' 32"	15' 24.24"	83° 7' 46"	0.10132
15	270° 41' 06"	-5° 06' 23"	270° 46' 36"	-28° 32' 35"	0° 56' 34"	15' 24.74"	82° 45' 44"	0.09873
16	271° 13' 37"	-5° 06' 16"	271° 23' 28"	-28° 32' 13"	0° 56' 35"	15' 25.24"	82° 23' 32"	0.09616
17	271° 46' 11"	-5° 06' 08"	272° 00' 23"	-28° 31' 42"	0° 56' 37"	15' 25.74"	82° 1' 11"	0.09363
18	272° 18' 47"	-5° 05' 58"	272° 37' 20"	-28° 31' 01"	0° 56' 39"	15' 26.24"	81° 38' 40"	0.09112
19	272° 51' 26"	-5° 05' 46"	273° 14' 19"	-28° 30' 09"	0° 56' 41"	15' 26.74"	81° 15' 58"	0.08864
20	273° 24' 06"	-5° 05' 33"	273° 51' 20"	-28° 29' 08"	0° 56' 43"	15' 27.24"	80° 53' 07"	0.08619
21	273° 56' 49"	-5° 05' 18"	274° 28' 23"	-28° 27' 56"	0° 56' 45"	15' 27.74"	80° 30' 04"	0.08376
22	274° 29' 34"	-5° 05' 02"	275° 05' 28"	-28° 26' 34"	0° 56' 46"	15' 28.24"	80° 6' 51"	0.08137
23	275° 02' 22"	-5° 04' 43"	275° 42' 34"	-28° 25' 02"	0° 56' 48"	15' 28.75"	79° 43' 26"	0.07900
24	275° 35' 11"	-5° 04' 23"	276° 19' 41"	-28° 23' 20"	0° 56' 50"	15' 29.25"	79° 19' 49"	0.07667

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	307° 17' 40"	-0.69"	309° 41' 31"	-18° 26' 56"	0.9847348	16'14.51"	23° 26' 19"	-12 m 42 s
1	307° 20' 13"	-0.69"	309° 44' 07"	-18° 26' 17"	0.9847398	16'14.50"	23° 26' 19"	-12 m 42 s
2	307° 22' 45"	-0.69"	309° 46' 42"	-18° 25' 39"	0.9847448	16'14.50"	23° 26' 19"	-12 m 43 s
3	307° 25' 18"	-0.69"	309° 49' 18"	-18° 24' 60"	0.9847498	16'14.49"	23° 26' 19"	-12 m 43 s
4	307° 27' 50"	-0.69"	309° 51' 53"	-18° 24' 21"	0.9847548	16'14.49"	23° 26' 19"	-12 m 44 s
5	307° 30' 23"	-0.69"	309° 54' 29"	-18° 23' 42"	0.9847599	16'14.48"	23° 26' 19"	-12 m 44 s
6	307° 32' 55"	-0.69"	309° 57' 04"	-18° 23' 03"	0.9847649	16'14.48"	23° 26' 19"	-12 m 45 s
7	307° 35' 28"	-0.68"	309° 59' 39"	-18° 22' 24"	0.9847700	16'14.47"	23° 26' 19"	-12 m 45 s
8	307° 38' 00"	-0.68"	310° 02' 15"	-18° 21' 45"	0.9847750	16'14.47"	23° 26' 19"	-12 m 46 s
9	307° 40' 33"	-0.68"	310° 04' 50"	-18° 21' 06"	0.9847801	16'14.46"	23° 26' 19"	-12 m 46 s
10	307° 43' 05"	-0.68"	310° 07' 25"	-18° 20' 27"	0.9847851	16'14.46"	23° 26' 19"	-12 m 47 s
11	307° 45' 38"	-0.68"	310° 10' 01"	-18° 19' 48"	0.9847902	16'14.45"	23° 26' 19"	-12 m 47 s
12	307° 48' 10"	-0.68"	310° 12' 36"	-18° 19' 09"	0.9847953	16'14.45"	23° 26' 19"	-12 m 48 s
13	307° 50' 43"	-0.67"	310° 15' 11"	-18° 18' 30"	0.9848003	16'14.44"	23° 26' 19"	-12 m 48 s
14	307° 53' 15"	-0.67"	310° 17' 46"	-18° 17' 50"	0.9848054	16'14.44"	23° 26' 19"	-12 m 49 s
15	307° 55' 48"	-0.67"	310° 20' 22"	-18° 17' 11"	0.9848105	16'14.43"	23° 26' 19"	-12 m 49 s
16	307° 58' 20"	-0.67"	310° 22' 57"	-18° 16' 32"	0.9848156	16'14.43"	23° 26' 19"	-12 m 50 s
17	308° 00' 53"	-0.67"	310° 25' 32"	-18° 15' 53"	0.9848207	16'14.42"	23° 26' 19"	-12 m 50 s
18	308° 03' 25"	-0.67"	310° 28' 07"	-18° 15' 13"	0.9848258	16'14.42"	23° 26' 19"	-12 m 51 s
19	308° 05' 58"	-0.66"	310° 30' 42"	-18° 14' 34"	0.9848309	16'14.41"	23° 26' 19"	-12 m 51 s
20	308° 08' 30"	-0.66"	310° 33' 17"	-18° 13' 54"	0.9848361	16'14.41"	23° 26' 19"	-12 m 52 s
21	308° 11' 03"	-0.66"	310° 35' 52"	-18° 13' 15"	0.9848412	16'14.40"	23° 26' 19"	-12 m 52 s
22	308° 13' 35"	-0.66"	310° 38' 27"	-18° 12' 35"	0.9848463	16'14.40"	23° 26' 19"	-12 m 53 s
23	308° 16' 08"	-0.65"	310° 41' 02"	-18° 11' 56"	0.9848515	16'14.39"	23° 26' 19"	-12 m 53 s
24	308° 18' 40"	-0.65"	310° 43' 37"	-18° 11' 16"	0.9848566	16'14.39"	23° 26' 19"	-12 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	275° 35' 11"	-5° 04' 23"	276° 19' 41"	-28° 23' 20"	0° 56' 50"	15' 29.25"	79° 19' 49"	0.07667
1	276° 08' 03"	-5° 04' 02"	276° 56' 50"	-28° 21' 28"	0° 56' 52"	15' 29.75"	78° 56' 00"	0.07436
2	276° 40' 57"	-5° 03' 38"	277° 33' 60"	-28° 19' 25"	0° 56' 54"	15' 30.26"	78° 31' 59"	0.07208
3	277° 13' 54"	-5° 03' 13"	278° 11' 11"	-28° 17' 13"	0° 56' 56"	15' 30.76"	78° 7' 44"	0.06984
4	277° 46' 52"	-5° 02' 46"	278° 48' 23"	-28° 14' 49"	0° 56' 58"	15' 31.27"	77° 43' 16"	0.06762
5	278° 19' 53"	-5° 02' 18"	279° 25' 36"	-28° 12' 16"	0° 56' 59"	15' 31.77"	77° 18' 33"	0.06544
6	278° 52' 56"	-5° 01' 47"	280° 02' 50"	-28° 09' 32"	0° 57' 01"	15' 32.28"	76° 53' 35"	0.06328
7	279° 26' 02"	-5° 01' 15"	280° 40' 04"	-28° 06' 39"	0° 57' 03"	15' 32.78"	76° 28' 22"	0.06116
8	279° 59' 09"	-5° 00' 41"	281° 17' 19"	-28° 03' 34"	0° 57' 05"	15' 33.29"	76° 2' 52"	0.05907
9	280° 32' 19"	-5° 00' 06"	281° 54' 34"	-28° 00' 20"	0° 57' 07"	15' 33.79"	75° 37' 04"	0.05702
10	281° 05' 31"	-4° 59' 29"	282° 31' 50"	-27° 56' 55"	0° 57' 09"	15' 34.30"	75° 10' 58"	0.05499
11	281° 38' 45"	-4° 58' 50"	283° 09' 05"	-27° 53' 20"	0° 57' 10"	15' 34.80"	74° 44' 34"	0.05300
12	282° 12' 02"	-4° 58' 09"	283° 46' 21"	-27° 49' 35"	0° 57' 12"	15' 35.30"	74° 17' 48"	0.05104
13	282° 45' 20"	-4° 57' 27"	284° 23' 36"	-27° 45' 39"	0° 57' 14"	15' 35.81"	73° 50' 41"	0.04912
14	283° 18' 41"	-4° 56' 43"	285° 00' 52"	-27° 41' 33"	0° 57' 16"	15' 36.31"	73° 23' 11"	0.04722
15	283° 52' 04"	-4° 55' 57"	285° 38' 07"	-27° 37' 17"	0° 57' 18"	15' 36.81"	72° 55' 17"	0.04537
16	284° 25' 29"	-4° 55' 09"	286° 15' 21"	-27° 32' 50"	0° 57' 20"	15' 37.31"	72° 26' 57"	0.04354
17	284° 58' 57"	-4° 54' 20"	286° 52' 35"	-27° 28' 14"	0° 57' 22"	15' 37.82"	71° 58' 09"	0.04175
18	285° 32' 26"	-4° 53' 29"	287° 29' 49"	-27° 23' 27"	0° 57' 23"	15' 38.32"	71° 28' 51"	0.04000
19	286° 05' 58"	-4° 52' 36"	288° 07' 01"	-27° 18' 29"	0° 57' 25"	15' 38.81"	70° 59' 02"	0.03828
20	286° 39' 32"	-4° 51' 41"	288° 44' 13"	-27° 13' 22"	0° 57' 27"	15' 39.31"	70° 28' 39"	0.03660
21	287° 13' 08"	-4° 50' 45"	289° 21' 24"	-27° 08' 05"	0° 57' 29"	15' 39.81"	69° 57' 39"	0.03495
22	287° 46' 47"	-4° 49' 47"	289° 58' 33"	-27° 02' 37"	0° 57' 31"	15' 40.31"	69° 26' 00"	0.03334
23	288° 20' 27"	-4° 48' 47"	290° 35' 42"	-26° 56' 59"	0° 57' 32"	15' 40.80"	68° 53' 39"	0.03176
24	288° 54' 10"	-4° 47' 45"	291° 12' 49"	-26° 51' 11"	0° 57' 34"	15' 41.30"	68° 20' 32"	0.03022

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	308° 18' 40"	-0.65"	310° 43' 37"	-18° 11' 16"	0.9848566	16' 14.39"	23° 26' 19"	-12 m 53 s
1	308° 21' 13"	-0.65"	310° 46' 12"	-18° 10' 37"	0.9848618	16' 14.38"	23° 26' 19"	-12 m 54 s
2	308° 23' 45"	-0.65"	310° 48' 47"	-18° 09' 57"	0.9848669	16' 14.38"	23° 26' 19"	-12 m 54 s
3	308° 26' 18"	-0.65"	310° 51' 22"	-18° 09' 17"	0.9848721	16' 14.37"	23° 26' 19"	-12 m 55 s
4	308° 28' 50"	-0.64"	310° 53' 57"	-18° 08' 38"	0.9848772	16' 14.37"	23° 26' 19"	-12 m 55 s
5	308° 31' 22"	-0.64"	310° 56' 32"	-18° 07' 58"	0.9848824	16' 14.36"	23° 26' 19"	-12 m 56 s
6	308° 33' 55"	-0.64"	310° 59' 07"	-18° 07' 18"	0.9848876	16' 14.35"	23° 26' 19"	-12 m 56 s
7	308° 36' 27"	-0.63"	311° 01' 42"	-18° 06' 39"	0.9848928	16' 14.35"	23° 26' 19"	-12 m 57 s
8	308° 38' 60"	-0.63"	311° 04' 17"	-18° 05' 59"	0.9848980	16' 14.34"	23° 26' 19"	-12 m 57 s
9	308° 41' 32"	-0.63"	311° 06' 52"	-18° 05' 19"	0.9849032	16' 14.34"	23° 26' 19"	-12 m 58 s
10	308° 44' 05"	-0.63"	311° 09' 26"	-18° 04' 39"	0.9849084	16' 14.33"	23° 26' 19"	-12 m 58 s
11	308° 46' 37"	-0.62"	311° 12' 01"	-18° 03' 59"	0.9849136	16' 14.33"	23° 26' 19"	-12 m 59 s
12	308° 49' 10"	-0.62"	311° 14' 36"	-18° 03' 19"	0.9849188	16' 14.32"	23° 26' 19"	-12 m 59 s
13	308° 51' 42"	-0.62"	311° 17' 11"	-18° 02' 39"	0.9849240	16' 14.32"	23° 26' 19"	-12 m 60 s
14	308° 54' 15"	-0.62"	311° 19' 45"	-18° 01' 59"	0.9849292	16' 14.31"	23° 26' 19"	-13 m 00 s
15	308° 56' 47"	-0.61"	311° 22' 20"	-18° 01' 19"	0.9849345	16' 14.31"	23° 26' 19"	-13 m 00 s
16	308° 59' 19"	-0.61"	311° 24' 55"	-18° 00' 39"	0.9849397	16' 14.30"	23° 26' 19"	-13 m 01 s
17	309° 01' 52"	-0.61"	311° 27' 29"	-17° 59' 59"	0.9849449	16' 14.30"	23° 26' 19"	-13 m 01 s
18	309° 04' 24"	-0.60"	311° 30' 04"	-17° 59' 19"	0.9849502	16' 14.29"	23° 26' 19"	-13 m 02 s
19	309° 06' 57"	-0.60"	311° 32' 39"	-17° 58' 38"	0.9849554	16' 14.29"	23° 26' 19"	-13 m 02 s
20	309° 09' 29"	-0.60"	311° 35' 13"	-17° 57' 58"	0.9849607	16' 14.28"	23° 26' 19"	-13 m 03 s
21	309° 12' 02"	-0.59"	311° 37' 48"	-17° 57' 18"	0.9849659	16' 14.28"	23° 26' 19"	-13 m 03 s
22	309° 14' 34"	-0.59"	311° 40' 22"	-17° 56' 38"	0.9849712	16' 14.27"	23° 26' 19"	-13 m 04 s
23	309° 17' 07"	-0.59"	311° 42' 57"	-17° 55' 57"	0.9849765	16' 14.27"	23° 26' 19"	-13 m 04 s
24	309° 19' 39"	-0.58"	311° 45' 31"	-17° 55' 17"	0.9849818	16' 14.26"	23° 26' 19"	-13 m 05 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	288° 54' 10"	-4° 47' 45"	291° 12' 49"	-26° 51' 11"	0° 57' 34"	15' 41.30"	68° 20' 32"	0.03022
1	289° 27' 54"	-4° 46' 42"	291° 49' 55"	-26° 45' 13"	0° 57' 36"	15' 41.79"	67° 46' 36"	0.02872
2	290° 01' 41"	-4° 45' 37"	292° 26' 59"	-26° 39' 05"	0° 57' 38"	15' 42.28"	67° 11' 45"	0.02725
3	290° 35' 30"	-4° 44' 30"	293° 04' 01"	-26° 32' 46"	0° 57' 40"	15' 42.77"	66° 35' 57"	0.02582
4	291° 09' 21"	-4° 43' 21"	293° 41' 02"	-26° 26' 18"	0° 57' 42"	15' 43.26"	65° 59' 05"	0.02443
5	291° 43' 14"	-4° 42' 11"	294° 18' 01"	-26° 19' 40"	0° 57' 43"	15' 43.74"	65° 21' 03"	0.02308
6	292° 17' 09"	-4° 40' 59"	294° 54' 58"	-26° 12' 52"	0° 57' 45"	15' 44.23"	64° 41' 45"	0.02176
7	292° 51' 06"	-4° 39' 45"	295° 31' 54"	-26° 05' 54"	0° 57' 47"	15' 44.71"	64° 1' 04"	0.02049
8	293° 25' 05"	-4° 38' 30"	296° 08' 47"	-25° 58' 46"	0° 57' 49"	15' 45.19"	63° 18' 51"	0.01925
9	293° 59' 07"	-4° 37' 13"	296° 45' 37"	-25° 51' 28"	0° 57' 50"	15' 45.67"	62° 34' 57"	0.01805
10	294° 33' 10"	-4° 35' 54"	297° 22' 26"	-25° 44' 01"	0° 57' 52"	15' 46.15"	61° 49' 11"	0.01689
11	295° 07' 15"	-4° 34' 33"	297° 59' 12"	-25° 36' 24"	0° 57' 54"	15' 46.63"	61° 1' 21"	0.01577
12	295° 41' 23"	-4° 33' 10"	298° 35' 56"	-25° 28' 37"	0° 57' 56"	15' 47.10"	60° 11' 14"	0.01469
13	296° 15' 32"	-4° 31' 46"	299° 12' 37"	-25° 20' 40"	0° 57' 57"	15' 47.57"	59° 18' 33"	0.01364
14	296° 49' 43"	-4° 30' 20"	299° 49' 16"	-25° 12' 34"	0° 57' 59"	15' 48.04"	58° 22' 59"	0.01264
15	297° 23' 56"	-4° 28' 53"	300° 25' 52"	-25° 04' 18"	0° 58' 01"	15' 48.51"	57° 24' 13"	0.01168
16	297° 58' 12"	-4° 27' 24"	301° 02' 25"	-24° 55' 53"	0° 58' 02"	15' 48.98"	56° 21' 49"	0.01076
17	298° 32' 29"	-4° 25' 53"	301° 38' 55"	-24° 47' 18"	0° 58' 04"	15' 49.44"	55° 15' 19"	0.00988
18	299° 06' 48"	-4° 24' 20"	302° 15' 23"	-24° 38' 34"	0° 58' 06"	15' 49.90"	54° 4' 09"	0.00904
19	299° 41' 09"	-4° 22' 46"	302° 51' 47"	-24° 29' 41"	0° 58' 08"	15' 50.36"	52° 47' 40"	0.00824
20	300° 15' 32"	-4° 21' 10"	303° 28' 09"	-24° 20' 39"	0° 58' 09"	15' 50.81"	51° 25' 05"	0.00749
21	300° 49' 56"	-4° 19' 32"	304° 04' 27"	-24° 11' 27"	0° 58' 11"	15' 51.26"	49° 55' 29"	0.00677
22	301° 24' 23"	-4° 17' 53"	304° 40' 42"	-24° 02' 06"	0° 58' 13"	15' 51.71"	48° 17' 46"	0.00610
23	301° 58' 51"	-4° 16' 11"	305° 16' 54"	-23° 52' 36"	0° 58' 14"	15' 52.16"	46° 30' 38"	0.00546
24	302° 33' 21"	-4° 14' 29"	305° 53' 03"	-23° 42' 57"	0° 58' 16"	15' 52.60"	44° 32' 30"	0.00488

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	309° 19' 39"	-0.58"	311° 45' 31"	-17° 55' 17"	0.9849818	16'14.26"	23° 26' 19"	-13 m 05 s
1	309° 22' 11"	-0.58"	311° 48' 06"	-17° 54' 36"	0.9849870	16'14.26"	23° 26' 19"	-13 m 05 s
2	309° 24' 44"	-0.58"	311° 50' 40"	-17° 53' 56"	0.9849923	16'14.25"	23° 26' 19"	-13 m 05 s
3	309° 27' 16"	-0.57"	311° 53' 15"	-17° 53' 16"	0.9849976	16'14.25"	23° 26' 19"	-13 m 06 s
4	309° 29' 49"	-0.57"	311° 55' 49"	-17° 52' 35"	0.9850029	16'14.24"	23° 26' 19"	-13 m 06 s
5	309° 32' 21"	-0.57"	311° 58' 23"	-17° 51' 55"	0.9850082	16'14.24"	23° 26' 19"	-13 m 07 s
6	309° 34' 54"	-0.56"	312° 00' 58"	-17° 51' 14"	0.9850135	16'14.23"	23° 26' 19"	-13 m 07 s
7	309° 37' 26"	-0.56"	312° 03' 32"	-17° 50' 33"	0.9850189	16'14.22"	23° 26' 19"	-13 m 08 s
8	309° 39' 58"	-0.55"	312° 06' 07"	-17° 49' 53"	0.9850242	16'14.22"	23° 26' 19"	-13 m 08 s
9	309° 42' 31"	-0.55"	312° 08' 41"	-17° 49' 12"	0.9850295	16'14.21"	23° 26' 19"	-13 m 08 s
10	309° 45' 03"	-0.55"	312° 11' 15"	-17° 48' 31"	0.9850348	16'14.21"	23° 26' 19"	-13 m 09 s
11	309° 47' 36"	-0.54"	312° 13' 49"	-17° 47' 51"	0.9850402	16'14.20"	23° 26' 19"	-13 m 09 s
12	309° 50' 08"	-0.54"	312° 16' 24"	-17° 47' 10"	0.9850455	16'14.20"	23° 26' 19"	-13 m 10 s
13	309° 52' 41"	-0.54"	312° 18' 58"	-17° 46' 29"	0.9850509	16'14.19"	23° 26' 19"	-13 m 10 s
14	309° 55' 13"	-0.53"	312° 21' 32"	-17° 45' 48"	0.9850562	16'14.19"	23° 26' 19"	-13 m 11 s
15	309° 57' 45"	-0.53"	312° 24' 06"	-17° 45' 07"	0.9850616	16'14.18"	23° 26' 19"	-13 m 11 s
16	310° 00' 18"	-0.52"	312° 26' 40"	-17° 44' 26"	0.9850670	16'14.18"	23° 26' 19"	-13 m 11 s
17	310° 02' 50"	-0.52"	312° 29' 15"	-17° 43' 46"	0.9850723	16'14.17"	23° 26' 19"	-13 m 12 s
18	310° 05' 23"	-0.52"	312° 31' 49"	-17° 43' 05"	0.9850777	16'14.17"	23° 26' 19"	-13 m 12 s
19	310° 07' 55"	-0.51"	312° 34' 23"	-17° 42' 24"	0.9850831	16'14.16"	23° 26' 19"	-13 m 13 s
20	310° 10' 27"	-0.51"	312° 36' 57"	-17° 41' 43"	0.9850885	16'14.16"	23° 26' 19"	-13 m 13 s
21	310° 12' 60"	-0.50"	312° 39' 31"	-17° 41' 01"	0.9850939	16'14.15"	23° 26' 19"	-13 m 14 s
22	310° 15' 32"	-0.50"	312° 42' 05"	-17° 40' 20"	0.9850993	16'14.15"	23° 26' 19"	-13 m 14 s
23	310° 18' 05"	-0.49"	312° 44' 39"	-17° 39' 39"	0.9851047	16'14.14"	23° 26' 19"	-13 m 14 s
24	310° 20' 37"	-0.49"	312° 47' 13"	-17° 38' 58"	0.9851101	16'14.13"	23° 26' 19"	-13 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	302° 33' 21"	-4° 14' 29"	305° 53' 03"	-23° 42' 57"	0° 58' 16"	15' 52.60"	44° 32' 30"	0.00488
1	303° 07' 53"	-4° 12' 44"	306° 29' 08"	-23° 33' 09"	0° 58' 17"	15' 53.05"	42° 21' 28"	0.00433
2	303° 42' 26"	-4° 10' 59"	307° 05' 09"	-23° 23' 12"	0° 58' 19"	15' 53.49"	39° 55' 21"	0.00382
3	304° 17' 02"	-4° 09' 11"	307° 41' 08"	-23° 13' 06"	0° 58' 21"	15' 53.92"	37° 11' 17"	0.00336
4	304° 51' 39"	-4° 07' 22"	308° 17' 03"	-23° 02' 52"	0° 58' 22"	15' 54.35"	34° 6' 06"	0.00294
5	305° 26' 18"	-4° 05' 31"	308° 52' 54"	-22° 52' 29"	0° 58' 24"	15' 54.78"	30° 36' 00"	0.00257
6	306° 00' 59"	-4° 03' 38"	309° 28' 42"	-22° 41' 57"	0° 58' 25"	15' 55.21"	26° 36' 42"	0.00223
7	306° 35' 42"	-4° 01' 44"	310° 04' 26"	-22° 31' 17"	0° 58' 27"	15' 55.63"	22° 3' 31"	0.00194
8	307° 10' 26"	-3° 59' 48"	310° 40' 07"	-22° 20' 28"	0° 58' 28"	15' 56.05"	16° 51' 55"	0.00170
9	307° 45' 12"	-3° 57' 51"	311° 15' 44"	-22° 09' 31"	0° 58' 30"	15' 56.47"	10° 58' 12"	0.00150
10	308° 19' 59"	-3° 55' 52"	311° 51' 17"	-21° 58' 25"	0° 58' 32"	15' 56.88"	4° 20' 54"	0.00134
11	308° 54' 49"	-3° 53' 51"	312° 26' 47"	-21° 47' 11"	0° 58' 33"	15' 57.29"	357° 2' 28"	0.00122
12	309° 29' 39"	-3° 51' 49"	313° 02' 12"	-21° 35' 49"	0° 58' 34"	15' 57.69"	349° 10' 48"	0.00115
13	310° 04' 32"	-3° 49' 46"	313° 37' 34"	-21° 24' 19"	0° 58' 36"	15' 58.10"	340° 59' 38"	0.00112
14	310° 39' 26"	-3° 47' 41"	314° 12' 52"	-21° 12' 41"	0° 58' 37"	15' 58.49"	332° 46' 41"	0.00114
15	311° 14' 21"	-3° 45' 34"	314° 48' 07"	-21° 00' 55"	0° 58' 39"	15' 58.89"	324° 50' 09"	0.00120
16	311° 49' 18"	-3° 43' 26"	315° 23' 17"	-20° 49' 02"	0° 58' 40"	15' 59.28"	317° 24' 45"	0.00131
17	312° 24' 17"	-3° 41' 16"	315° 58' 23"	-20° 37' 00"	0° 58' 42"	15' 59.67"	310° 39' 38"	0.00146
18	312° 59' 17"	-3° 39' 05"	316° 33' 26"	-20° 24' 51"	0° 58' 43"	16' 00.05"	304° 38' 14"	0.00166
19	313° 34' 19"	-3° 36' 52"	317° 08' 25"	-20° 12' 34"	0° 58' 45"	16' 00.43"	299° 19' 45"	0.00190
20	314° 09' 22"	-3° 34' 38"	317° 43' 19"	-20° 00' 10"	0° 58' 46"	16' 00.80"	294° 40' 50"	0.00219
21	314° 44' 26"	-3° 32' 22"	318° 18' 10"	-19° 47' 38"	0° 58' 47"	16' 01.18"	290° 36' 59"	0.00252
22	315° 19' 32"	-3° 30' 05"	318° 52' 57"	-19° 34' 59"	0° 58' 49"	16' 01.54"	287° 3' 33"	0.00289
23	315° 54' 39"	-3° 27' 47"	319° 27' 40"	-19° 22' 13"	0° 58' 50"	16' 01.91"	283° 56' 08"	0.00332
24	316° 29' 48"	-3° 25' 27"	320° 02' 19"	-19° 09' 19"	0° 58' 51"	16' 02.26"	281° 10' 49"	0.00378

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	310° 20' 37"	-0.49"	312° 47' 13"	-17° 38' 58"	0.9851101	16' 14.13"	23° 26' 19"	-13 m 15 s
1	310° 23' 09"	-0.49"	312° 49' 47"	-17° 38' 17"	0.9851155	16' 14.13"	23° 26' 19"	-13 m 15 s
2	310° 25' 42"	-0.48"	312° 52' 21"	-17° 37' 36"	0.9851209	16' 14.12"	23° 26' 19"	-13 m 16 s
3	310° 28' 14"	-0.48"	312° 54' 55"	-17° 36' 54"	0.9851263	16' 14.12"	23° 26' 19"	-13 m 16 s
4	310° 30' 47"	-0.47"	312° 57' 29"	-17° 36' 13"	0.9851318	16' 14.11"	23° 26' 19"	-13 m 16 s
5	310° 33' 19"	-0.47"	313° 00' 03"	-17° 35' 32"	0.9851372	16' 14.11"	23° 26' 19"	-13 m 17 s
6	310° 35' 51"	-0.46"	313° 02' 36"	-17° 34' 50"	0.9851426	16' 14.10"	23° 26' 19"	-13 m 17 s
7	310° 38' 24"	-0.46"	313° 05' 10"	-17° 34' 09"	0.9851481	16' 14.10"	23° 26' 19"	-13 m 18 s
8	310° 40' 56"	-0.45"	313° 07' 44"	-17° 33' 28"	0.9851535	16' 14.09"	23° 26' 19"	-13 m 18 s
9	310° 43' 29"	-0.45"	313° 10' 18"	-17° 32' 46"	0.9851590	16' 14.09"	23° 26' 19"	-13 m 18 s
10	310° 46' 01"	-0.45"	313° 12' 52"	-17° 32' 05"	0.9851644	16' 14.08"	23° 26' 19"	-13 m 19 s
11	310° 48' 33"	-0.44"	313° 15' 25"	-17° 31' 23"	0.9851699	16' 14.08"	23° 26' 19"	-13 m 19 s
12	310° 51' 06"	-0.44"	313° 17' 59"	-17° 30' 42"	0.9851754	16' 14.07"	23° 26' 19"	-13 m 20 s
13	310° 53' 38"	-0.43"	313° 20' 33"	-17° 29' 60"	0.9851809	16' 14.06"	23° 26' 19"	-13 m 20 s
14	310° 56' 10"	-0.43"	313° 23' 07"	-17° 29' 18"	0.9851863	16' 14.06"	23° 26' 19"	-13 m 20 s
15	310° 58' 43"	-0.42"	313° 25' 40"	-17° 28' 37"	0.9851918	16' 14.05"	23° 26' 19"	-13 m 21 s
16	311° 01' 15"	-0.42"	313° 28' 14"	-17° 27' 55"	0.9851973	16' 14.05"	23° 26' 19"	-13 m 21 s
17	311° 03' 48"	-0.41"	313° 30' 47"	-17° 27' 13"	0.9852028	16' 14.04"	23° 26' 19"	-13 m 21 s
18	311° 06' 20"	-0.41"	313° 33' 21"	-17° 26' 32"	0.9852083	16' 14.04"	23° 26' 19"	-13 m 22 s
19	311° 08' 52"	-0.40"	313° 35' 55"	-17° 25' 50"	0.9852138	16' 14.03"	23° 26' 19"	-13 m 22 s
20	311° 11' 25"	-0.40"	313° 38' 28"	-17° 25' 08"	0.9852193	16' 14.03"	23° 26' 19"	-13 m 23 s
21	311° 13' 57"	-0.39"	313° 41' 02"	-17° 24' 26"	0.9852249	16' 14.02"	23° 26' 19"	-13 m 23 s
22	311° 16' 29"	-0.39"	313° 43' 35"	-17° 23' 44"	0.9852304	16' 14.02"	23° 26' 19"	-13 m 23 s
23	311° 19' 02"	-0.38"	313° 46' 09"	-17° 23' 02"	0.9852359	16' 14.01"	23° 26' 19"	-13 m 24 s
24	311° 21' 34"	-0.38"	313° 48' 42"	-17° 22' 20"	0.9852415	16' 14.00"	23° 26' 19"	-13 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	316° 29' 48"	-3° 25' 27"	320° 02' 19"	-19° 09' 19"	0° 58' 51"	16' 02.26"	281° 10' 49"	0.00378
1	317° 04' 58"	-3° 23' 06"	320° 36' 54"	-18° 56' 19"	0° 58' 53"	16' 02.62"	278° 44' 17"	0.00429
2	317° 40' 09"	-3° 20' 43"	321° 11' 25"	-18° 43' 11"	0° 58' 54"	16' 02.97"	276° 33' 41"	0.00485
3	318° 15' 22"	-3° 18' 19"	321° 45' 52"	-18° 29' 57"	0° 58' 55"	16' 03.32"	274° 36' 39"	0.00546
4	318° 50' 36"	-3° 15' 53"	322° 20' 16"	-18° 16' 35"	0° 58' 56"	16' 03.66"	272° 51' 15"	0.00610
5	319° 25' 51"	-3° 13' 26"	322° 54' 35"	-18° 03' 08"	0° 58' 58"	16' 04.00"	271° 15' 50"	0.00680
6	320° 01' 08"	-3° 10' 58"	323° 28' 50"	-17° 49' 33"	0° 58' 59"	16' 04.33"	269° 49' 02"	0.00754
7	320° 36' 26"	-3° 08' 29"	324° 03' 02"	-17° 35' 52"	0° 59' 00"	16' 04.66"	268° 29' 42"	0.00832
8	321° 11' 44"	-3° 05' 58"	324° 37' 10"	-17° 22' 05"	0° 59' 01"	16' 04.98"	267° 16' 55"	0.00915
9	321° 47' 05"	-3° 03' 26"	325° 11' 14"	-17° 08' 11"	0° 59' 02"	16' 05.30"	266° 9' 50"	0.01003
10	322° 22' 26"	-3° 00' 52"	325° 45' 14"	-16° 54' 11"	0° 59' 04"	16' 05.62"	265° 7' 49"	0.01095
11	322° 57' 48"	-2° 58' 18"	326° 19' 10"	-16° 40' 05"	0° 59' 05"	16' 05.93"	264° 10' 15"	0.01192
12	323° 33' 12"	-2° 55' 42"	326° 53' 02"	-16° 25' 52"	0° 59' 06"	16' 06.24"	263° 16' 39"	0.01293
13	324° 08' 37"	-2° 53' 05"	327° 26' 51"	-16° 11' 34"	0° 59' 07"	16' 06.54"	262° 26' 36"	0.01399
14	324° 44' 02"	-2° 50' 26"	328° 00' 36"	-15° 57' 10"	0° 59' 08"	16' 06.83"	261° 39' 45"	0.01509
15	325° 19' 29"	-2° 47' 47"	328° 34' 17"	-15° 42' 40"	0° 59' 09"	16' 07.13"	260° 55' 45"	0.01624
16	325° 54' 57"	-2° 45' 06"	329° 07' 55"	-15° 28' 05"	0° 59' 10"	16' 07.41"	260° 14' 21"	0.01743
17	326° 30' 26"	-2° 42' 24"	329° 41' 28"	-15° 13' 24"	0° 59' 11"	16' 07.70"	259° 35' 18"	0.01867
18	327° 05' 56"	-2° 39' 41"	330° 14' 59"	-14° 58' 37"	0° 59' 12"	16' 07.98"	258° 58' 24"	0.01996
19	327° 41' 26"	-2° 36' 57"	330° 48' 25"	-14° 43' 45"	0° 59' 13"	16' 08.25"	258° 23' 28"	0.02129
20	328° 16' 58"	-2° 34' 12"	331° 21' 49"	-14° 28' 48"	0° 59' 14"	16' 08.52"	257° 50' 19"	0.02266
21	328° 52' 31"	-2° 31' 25"	331° 55' 08"	-14° 13' 46"	0° 59' 15"	16' 08.78"	257° 18' 49"	0.02409
22	329° 28' 04"	-2° 28' 38"	332° 28' 24"	-13° 58' 39"	0° 59' 16"	16' 09.04"	256° 48' 52"	0.02555
23	330° 03' 39"	-2° 25' 49"	333° 01' 37"	-13° 43' 26"	0° 59' 17"	16' 09.29"	256° 20' 18"	0.02706
24	330° 39' 14"	-2° 22' 60"	333° 34' 47"	-13° 28' 09"	0° 59' 18"	16' 09.54"	255° 53' 04"	0.02862

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	311° 21' 34"	-0.38"	313° 48' 42"	-17° 22' 20"	0.9852415	16'14.00"	23° 26' 19"	-13 m 24 s
1	311° 24' 06"	-0.37"	313° 51' 16"	-17° 21' 38"	0.9852470	16'14.00"	23° 26' 19"	-13 m 24 s
2	311° 26' 39"	-0.37"	313° 53' 49"	-17° 20' 56"	0.9852525	16'13.99"	23° 26' 19"	-13 m 25 s
3	311° 29' 11"	-0.36"	313° 56' 22"	-17° 20' 14"	0.9852581	16'13.99"	23° 26' 19"	-13 m 25 s
4	311° 31' 44"	-0.36"	313° 58' 56"	-17° 19' 32"	0.9852637	16'13.98"	23° 26' 19"	-13 m 26 s
5	311° 34' 16"	-0.35"	314° 01' 29"	-17° 18' 50"	0.9852692	16'13.98"	23° 26' 19"	-13 m 26 s
6	311° 36' 48"	-0.35"	314° 04' 03"	-17° 18' 08"	0.9852748	16'13.97"	23° 26' 19"	-13 m 26 s
7	311° 39' 21"	-0.34"	314° 06' 36"	-17° 17' 26"	0.9852804	16'13.97"	23° 26' 19"	-13 m 27 s
8	311° 41' 53"	-0.34"	314° 09' 09"	-17° 16' 44"	0.9852859	16'13.96"	23° 26' 19"	-13 m 27 s
9	311° 44' 25"	-0.33"	314° 11' 42"	-17° 16' 02"	0.9852915	16'13.96"	23° 26' 19"	-13 m 27 s
10	311° 46' 58"	-0.33"	314° 14' 16"	-17° 15' 19"	0.9852971	16'13.95"	23° 26' 19"	-13 m 28 s
11	311° 49' 30"	-0.32"	314° 16' 49"	-17° 14' 37"	0.9853027	16'13.94"	23° 26' 19"	-13 m 28 s
12	311° 52' 02"	-0.32"	314° 19' 22"	-17° 13' 55"	0.9853083	16'13.94"	23° 26' 19"	-13 m 29 s
13	311° 54' 35"	-0.31"	314° 21' 55"	-17° 13' 12"	0.9853139	16'13.93"	23° 26' 19"	-13 m 29 s
14	311° 57' 07"	-0.31"	314° 24' 29"	-17° 12' 30"	0.9853195	16'13.93"	23° 26' 19"	-13 m 29 s
15	311° 59' 39"	-0.30"	314° 27' 02"	-17° 11' 47"	0.9853251	16'13.92"	23° 26' 19"	-13 m 30 s
16	312° 02' 12"	-0.30"	314° 29' 35"	-17° 11' 05"	0.9853308	16'13.92"	23° 26' 19"	-13 m 30 s
17	312° 04' 44"	-0.29"	314° 32' 08"	-17° 10' 23"	0.9853364	16'13.91"	23° 26' 19"	-13 m 30 s
18	312° 07' 16"	-0.28"	314° 34' 41"	-17° 09' 40"	0.9853420	16'13.91"	23° 26' 19"	-13 m 31 s
19	312° 09' 48"	-0.28"	314° 37' 14"	-17° 08' 57"	0.9853476	16'13.90"	23° 26' 19"	-13 m 31 s
20	312° 12' 21"	-0.27"	314° 39' 47"	-17° 08' 15"	0.9853533	16'13.89"	23° 26' 19"	-13 m 31 s
21	312° 14' 53"	-0.27"	314° 42' 20"	-17° 07' 32"	0.9853589	16'13.89"	23° 26' 19"	-13 m 32 s
22	312° 17' 25"	-0.26"	314° 44' 53"	-17° 06' 50"	0.9853646	16'13.88"	23° 26' 19"	-13 m 32 s
23	312° 19' 58"	-0.26"	314° 47' 26"	-17° 06' 07"	0.9853702	16'13.88"	23° 26' 19"	-13 m 32 s
24	312° 22' 30"	-0.25"	314° 49' 59"	-17° 05' 24"	0.9853759	16'13.87"	23° 26' 19"	-13 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	330° 39' 14"	-2° 22' 60"	333° 34' 47"	-13° 28' 09"	0° 59' 18"	16' 09.54"	255° 53' 04"	0.02862
1	331° 14' 50"	-2° 20' 09"	334° 07' 53"	-13° 12' 47"	0° 59' 19"	16' 09.79"	255° 27' 03"	0.03022
2	331° 50' 27"	-2° 17' 18"	334° 40' 55"	-12° 57' 20"	0° 59' 20"	16' 10.03"	255° 2' 10"	0.03186
3	332° 26' 05"	-2° 14' 25"	335° 13' 55"	-12° 41' 49"	0° 59' 21"	16' 10.26"	254° 38' 20"	0.03355
4	333° 01' 44"	-2° 11' 32"	335° 46' 51"	-12° 26' 13"	0° 59' 21"	16' 10.49"	254° 15' 31"	0.03529
5	333° 37' 23"	-2° 08' 37"	336° 19' 44"	-12° 10' 33"	0° 59' 22"	16' 10.71"	253° 53' 38"	0.03707
6	334° 13' 03"	-2° 05' 42"	336° 52' 34"	-11° 54' 49"	0° 59' 23"	16' 10.93"	253° 32' 38"	0.03889
7	334° 48' 43"	-2° 02' 46"	337° 25' 21"	-11° 38' 60"	0° 59' 24"	16' 11.15"	253° 12' 28"	0.04076
8	335° 24' 25"	-1° 59' 48"	337° 58' 05"	-11° 23' 07"	0° 59' 25"	16' 11.36"	252° 53' 05"	0.04267
9	336° 00' 07"	-1° 56' 50"	338° 30' 46"	-11° 07' 10"	0° 59' 25"	16' 11.56"	252° 34' 27"	0.04462
10	336° 35' 50"	-1° 53' 52"	339° 03' 25"	-10° 51' 10"	0° 59' 26"	16' 11.76"	252° 16' 31"	0.04662
11	337° 11' 33"	-1° 50' 52"	339° 35' 60"	-10° 35' 06"	0° 59' 27"	16' 11.96"	251° 59' 16"	0.04866
12	337° 47' 17"	-1° 47' 52"	340° 08' 32"	-10° 18' 57"	0° 59' 28"	16' 12.15"	251° 42' 40"	0.05075
13	338° 23' 01"	-1° 44' 50"	340° 41' 02"	-10° 02' 46"	0° 59' 28"	16' 12.33"	251° 26' 40"	0.05287
14	338° 58' 46"	-1° 41' 48"	341° 13' 29"	-9° 46' 31"	0° 59' 29"	16' 12.51"	251° 11' 15"	0.05504
15	339° 34' 32"	-1° 38' 46"	341° 45' 54"	-9° 30' 12"	0° 59' 30"	16' 12.68"	250° 56' 24"	0.05726
16	340° 10' 18"	-1° 35' 42"	342° 18' 16"	-9° 13' 50"	0° 59' 30"	16' 12.85"	250° 42' 05"	0.05951
17	340° 46' 04"	-1° 32' 38"	342° 50' 36"	-8° 57' 25"	0° 59' 31"	16' 13.02"	250° 28' 18"	0.06181
18	341° 21' 52"	-1° 29' 33"	343° 22' 53"	-8° 40' 57"	0° 59' 31"	16' 13.18"	250° 15' 00"	0.06415
19	341° 57' 39"	-1° 26' 28"	343° 55' 08"	-8° 24' 26"	0° 59' 32"	16' 13.33"	250° 2' 11"	0.06653
20	342° 33' 27"	-1° 23' 22"	344° 27' 20"	-8° 07' 52"	0° 59' 32"	16' 13.48"	249° 49' 50"	0.06896
21	343° 09' 15"	-1° 20' 15"	344° 59' 31"	-7° 51' 16"	0° 59' 33"	16' 13.63"	249° 37' 55"	0.07142
22	343° 45' 04"	-1° 17' 08"	345° 31' 39"	-7° 34' 36"	0° 59' 33"	16' 13.76"	249° 26' 27"	0.07393
23	344° 20' 53"	-1° 14' 00"	346° 03' 45"	-7° 17' 54"	0° 59' 34"	16' 13.90"	249° 15' 23"	0.07648
24	344° 56' 42"	-1° 10' 52"	346° 35' 49"	-7° 01' 10"	0° 59' 34"	16' 14.03"	249° 4' 44"	0.07907

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	312° 22' 30"	-0.25"	314° 49' 59"	-17° 05' 24"	0.9853759	16' 13.87"	23° 26' 19"	-13 m 33 s
1	312° 25' 02"	-0.25"	314° 52' 32"	-17° 04' 42"	0.9853816	16' 13.87"	23° 26' 19"	-13 m 33 s
2	312° 27' 35"	-0.24"	314° 55' 05"	-17° 03' 59"	0.9853873	16' 13.86"	23° 26' 19"	-13 m 33 s
3	312° 30' 07"	-0.24"	314° 57' 38"	-17° 03' 16"	0.9853929	16' 13.86"	23° 26' 19"	-13 m 34 s
4	312° 32' 39"	-0.23"	315° 00' 11"	-17° 02' 33"	0.9853986	16' 13.85"	23° 26' 19"	-13 m 34 s
5	312° 35' 12"	-0.22"	315° 02' 44"	-17° 01' 50"	0.9854043	16' 13.84"	23° 26' 19"	-13 m 34 s
6	312° 37' 44"	-0.22"	315° 05' 16"	-17° 01' 07"	0.9854100	16' 13.84"	23° 26' 19"	-13 m 35 s
7	312° 40' 16"	-0.21"	315° 07' 49"	-17° 00' 25"	0.9854157	16' 13.83"	23° 26' 19"	-13 m 35 s
8	312° 42' 48"	-0.21"	315° 10' 22"	-16° 59' 42"	0.9854214	16' 13.83"	23° 26' 19"	-13 m 35 s
9	312° 45' 21"	-0.20"	315° 12' 55"	-16° 58' 59"	0.9854271	16' 13.82"	23° 26' 19"	-13 m 36 s
10	312° 47' 53"	-0.20"	315° 15' 27"	-16° 58' 16"	0.9854329	16' 13.82"	23° 26' 19"	-13 m 36 s
11	312° 50' 25"	-0.19"	315° 18' 00"	-16° 57' 33"	0.9854386	16' 13.81"	23° 26' 19"	-13 m 36 s
12	312° 52' 58"	-0.19"	315° 20' 33"	-16° 56' 49"	0.9854443	16' 13.80"	23° 26' 19"	-13 m 37 s
13	312° 55' 30"	-0.18"	315° 23' 06"	-16° 56' 06"	0.9854500	16' 13.80"	23° 26' 19"	-13 m 37 s
14	312° 58' 02"	-0.18"	315° 25' 38"	-16° 55' 23"	0.9854558	16' 13.79"	23° 26' 19"	-13 m 37 s
15	313° 00' 34"	-0.17"	315° 28' 11"	-16° 54' 40"	0.9854615	16' 13.79"	23° 26' 19"	-13 m 38 s
16	313° 03' 07"	-0.16"	315° 30' 43"	-16° 53' 57"	0.9854673	16' 13.78"	23° 26' 19"	-13 m 38 s
17	313° 05' 39"	-0.16"	315° 33' 16"	-16° 53' 14"	0.9854730	16' 13.78"	23° 26' 19"	-13 m 38 s
18	313° 08' 11"	-0.15"	315° 35' 49"	-16° 52' 30"	0.9854788	16' 13.77"	23° 26' 19"	-13 m 39 s
19	313° 10' 43"	-0.15"	315° 38' 21"	-16° 51' 47"	0.9854846	16' 13.76"	23° 26' 19"	-13 m 39 s
20	313° 13' 16"	-0.14"	315° 40' 54"	-16° 51' 04"	0.9854904	16' 13.76"	23° 26' 19"	-13 m 39 s
21	313° 15' 48"	-0.14"	315° 43' 26"	-16° 50' 20"	0.9854961	16' 13.75"	23° 26' 19"	-13 m 40 s
22	313° 18' 20"	-0.13"	315° 45' 59"	-16° 49' 37"	0.9855019	16' 13.75"	23° 26' 19"	-13 m 40 s
23	313° 20' 53"	-0.13"	315° 48' 31"	-16° 48' 54"	0.9855077	16' 13.74"	23° 26' 19"	-13 m 40 s
24	313° 23' 25"	-0.12"	315° 51' 03"	-16° 48' 10"	0.9855135	16' 13.74"	23° 26' 19"	-13 m 40 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	344° 56' 42"	-1° 10' 52"	346° 35' 49"	-7° 01' 10"	0° 59' 34"	16' 14.03"	249° 4' 44"	0.07907
1	345° 32' 32"	-1° 07' 43"	347° 07' 51"	-6° 44' 23"	0° 59' 35"	16' 14.15"	248° 54' 28"	0.08170
2	346° 08' 22"	-1° 04' 34"	347° 39' 51"	-6° 27' 34"	0° 59' 35"	16' 14.27"	248° 44' 35"	0.08436
3	346° 44' 13"	-1° 01' 24"	348° 11' 50"	-6° 10' 43"	0° 59' 36"	16' 14.39"	248° 35' 05"	0.08707
4	347° 20' 03"	0°-58' 13"	348° 43' 46"	-5° 53' 49"	0° 59' 36"	16' 14.50"	248° 25' 56"	0.08982
5	347° 55' 54"	0°-55' 03"	349° 15' 41"	-5° 36' 54"	0° 59' 37"	16' 14.60"	248° 17' 08"	0.09261
6	348° 31' 45"	0°-51' 52"	349° 47' 35"	-5° 19' 57"	0° 59' 37"	16' 14.70"	248° 8' 41"	0.09544
7	349° 07' 36"	0°-48' 40"	350° 19' 27"	-5° 02' 58"	0° 59' 37"	16' 14.79"	248° 0' 34"	0.09830
8	349° 43' 28"	0°-45' 28"	350° 51' 17"	-4° 45' 57"	0° 59' 38"	16' 14.88"	247° 52' 47"	0.10121
9	350° 19' 20"	0°-42' 16"	351° 23' 06"	-4° 28' 55"	0° 59' 38"	16' 14.97"	247° 45' 18"	0.10415
10	350° 55' 11"	0°-39' 04"	351° 54' 54"	-4° 11' 51"	0° 59' 38"	16' 15.05"	247° 38' 09"	0.10713
11	351° 31' 03"	0°-35' 51"	352° 26' 40"	-3° 54' 46"	0° 59' 38"	16' 15.12"	247° 31' 18"	0.11015
12	352° 06' 55"	0°-32' 38"	352° 58' 26"	-3° 37' 39"	0° 59' 39"	16' 15.19"	247° 24' 45"	0.11321
13	352° 42' 48"	0°-29' 25"	353° 30' 10"	-3° 20' 32"	0° 59' 39"	16' 15.26"	247° 18' 30"	0.11630
14	353° 18' 40"	0°-26' 11"	354° 01' 53"	-3° 03' 23"	0° 59' 39"	16' 15.32"	247° 12' 32"	0.11943
15	353° 54' 32"	0°-22' 57"	354° 33' 35"	-2° 46' 13"	0° 59' 39"	16' 15.38"	247° 6' 51"	0.12259
16	354° 30' 24"	0°-19' 44"	355° 05' 17"	-2° 29' 03"	0° 59' 40"	16' 15.43"	247° 1' 27"	0.12580
17	355° 06' 17"	0°-16' 29"	355° 36' 57"	-2° 11' 51"	0° 59' 40"	16' 15.48"	246° 56' 20"	0.12903
18	355° 42' 09"	0°-13' 15"	356° 08' 37"	-1° 54' 39"	0° 59' 40"	16' 15.52"	246° 51' 29"	0.13231
19	356° 18' 02"	0°-10' 01"	356° 40' 17"	-1° 37' 26"	0° 59' 40"	16' 15.55"	246° 46' 53"	0.13561
20	356° 53' 54"	0° -6' 47"	357° 11' 55"	-1° 20' 13"	0° 59' 40"	16' 15.59"	246° 42' 34"	0.13896
21	357° 29' 46"	0° -3' 32"	357° 43' 34"	-1° 02' 59"	0° 59' 40"	16' 15.62"	246° 38' 30"	0.14233
22	358° 05' 38"	0° 00'-18"	358° 15' 11"	0°-45' 45"	0° 59' 40"	16' 15.64"	246° 34' 41"	0.14574
23	358° 41' 31"	0° 02' 56"	358° 46' 49"	0°-28' 31"	0° 59' 40"	16' 15.66"	246° 31' 07"	0.14919
24	359° 17' 23"	0° 06' 08"	359° 18' 27"	0°-11' 19"	0° 59' 40"	16' 15.67"	246° 27' 51"	0.15267

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	313° 23' 25"	-0.12"	315° 51' 03"	-16° 48' 10"	0.9855135	16'13.74"	23° 26' 19"	-13 m 40 s
1	313° 25' 57"	-0.11"	315° 53' 36"	-16° 47' 27"	0.9855193	16'13.73"	23° 26' 19"	-13 m 41 s
2	313° 28' 29"	-0.11"	315° 56' 08"	-16° 46' 43"	0.9855251	16'13.72"	23° 26' 19"	-13 m 41 s
3	313° 31' 02"	-0.10"	315° 58' 41"	-16° 45' 60"	0.9855309	16'13.72"	23° 26' 19"	-13 m 41 s
4	313° 33' 34"	-0.10"	316° 01' 13"	-16° 45' 16"	0.9855368	16'13.71"	23° 26' 19"	-13 m 42 s
5	313° 36' 06"	-0.09"	316° 03' 45"	-16° 44' 33"	0.9855426	16'13.71"	23° 26' 19"	-13 m 42 s
6	313° 38' 38"	-0.09"	316° 06' 18"	-16° 43' 49"	0.9855484	16'13.70"	23° 26' 19"	-13 m 42 s
7	313° 41' 10"	-0.08"	316° 08' 50"	-16° 43' 05"	0.9855543	16'13.70"	23° 26' 19"	-13 m 43 s
8	313° 43' 43"	-0.08"	316° 11' 22"	-16° 42' 22"	0.9855601	16'13.69"	23° 26' 19"	-13 m 43 s
9	313° 46' 15"	-0.07"	316° 13' 54"	-16° 41' 38"	0.9855660	16'13.68"	23° 26' 19"	-13 m 43 s
10	313° 48' 47"	-0.06"	316° 16' 27"	-16° 40' 54"	0.9855718	16'13.68"	23° 26' 19"	-13 m 43 s
11	313° 51' 19"	-0.06"	316° 18' 59"	-16° 40' 10"	0.9855777	16'13.67"	23° 26' 19"	-13 m 44 s
12	313° 53' 52"	-0.05"	316° 21' 31"	-16° 39' 26"	0.9855835	16'13.67"	23° 26' 19"	-13 m 44 s
13	313° 56' 24"	-0.05"	316° 24' 03"	-16° 38' 43"	0.9855894	16'13.66"	23° 26' 19"	-13 m 44 s
14	313° 58' 56"	-0.04"	316° 26' 35"	-16° 37' 59"	0.9855953	16'13.66"	23° 26' 19"	-13 m 45 s
15	314° 01' 28"	-0.04"	316° 29' 07"	-16° 37' 15"	0.9856012	16'13.65"	23° 26' 19"	-13 m 45 s
16	314° 04' 01"	-0.03"	316° 31' 39"	-16° 36' 31"	0.9856071	16'13.64"	23° 26' 19"	-13 m 45 s
17	314° 06' 33"	-0.03"	316° 34' 12"	-16° 35' 47"	0.9856130	16'13.64"	23° 26' 19"	-13 m 45 s
18	314° 09' 05"	-0.02"	316° 36' 44"	-16° 35' 03"	0.9856189	16'13.63"	23° 26' 19"	-13 m 46 s
19	314° 11' 37"	-0.01"	316° 39' 16"	-16° 34' 19"	0.9856248	16'13.63"	23° 26' 19"	-13 m 46 s
20	314° 14' 09"	-0.01"	316° 41' 48"	-16° 33' 35"	0.9856307	16'13.62"	23° 26' 19"	-13 m 46 s
21	314° 16' 42"	-0.00"	316° 44' 20"	-16° 32' 51"	0.9856366	16'13.61"	23° 26' 19"	-13 m 47 s
22	314° 19' 14"	0.00"	316° 46' 52"	-16° 32' 07"	0.9856425	16'13.61"	23° 26' 19"	-13 m 47 s
23	314° 21' 46"	0.01"	316° 49' 24"	-16° 31' 23"	0.9856485	16'13.60"	23° 26' 19"	-13 m 47 s
24	314° 24' 18"	0.01"	316° 51' 55"	-16° 30' 38"	0.9856544	16'13.60"	23° 26' 19"	-13 m 47 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	359° 17' 23"	0° 06' 08"	359° 18' 27"	0°-11' 19"	0° 59' 40"	16' 15.67"	246° 27' 51"	0.15267
1	359° 53' 15"	0° 09' 23"	359° 50' 04"	0° 05' 55"	0° 59' 41"	16' 15.68"	246° 24' 46"	0.15618
2	0° 29' 07"	0° 12' 37"	0° 21' 42"	0° 23' 09"	0° 59' 41"	16' 15.69"	246° 21' 57"	0.15972
3	1° 04' 59"	0° 15' 51"	0° 53' 19"	0° 40' 23"	0° 59' 41"	16' 15.69"	246° 19' 21"	0.16329
4	1° 40' 50"	0° 19' 05"	1° 24' 56"	0° 57' 37"	0° 59' 41"	16' 15.69"	246° 17' 00"	0.16690
5	2° 16' 42"	0° 22' 19"	1° 56' 33"	1° 14' 51"	0° 59' 40"	16' 15.68"	246° 14' 53"	0.17054
6	2° 52' 33"	0° 25' 33"	2° 28' 10"	1° 32' 04"	0° 59' 40"	16' 15.67"	246° 13' 00"	0.17421
7	3° 28' 24"	0° 28' 47"	2° 59' 48"	1° 49' 16"	0° 59' 40"	16' 15.65"	246° 11' 21"	0.17791
8	4° 04' 15"	0° 32' 00"	3° 31' 26"	2° 06' 28"	0° 59' 40"	16' 15.63"	246° 9' 55"	0.18164
9	4° 40' 05"	0° 35' 14"	4° 03' 05"	2° 23' 39"	0° 59' 40"	16' 15.61"	246° 8' 42"	0.18540
10	5° 15' 56"	0° 38' 27"	4° 34' 44"	2° 40' 49"	0° 59' 40"	16' 15.58"	246° 7' 43"	0.18918
11	5° 51' 46"	0° 41' 39"	5° 06' 24"	2° 57' 58"	0° 59' 40"	16' 15.54"	246° 6' 58"	0.19300
12	6° 27' 36"	0° 44' 52"	5° 38' 04"	3° 15' 06"	0° 59' 40"	16' 15.51"	246° 6' 25"	0.19685
13	7° 03' 25"	0° 48' 04"	6° 09' 45"	3° 32' 13"	0° 59' 40"	16' 15.47"	246° 6' 06"	0.20072
14	7° 39' 14"	0° 51' 16"	6° 41' 28"	3° 49' 19"	0° 59' 40"	16' 15.42"	246° 5' 59"	0.20462
15	8° 15' 03"	0° 54' 27"	7° 13' 11"	4° 06' 23"	0° 59' 39"	16' 15.37"	246° 6' 05"	0.20855
16	8° 50' 52"	0° 57' 38"	7° 44' 55"	4° 23' 26"	0° 59' 39"	16' 15.32"	246° 6' 24"	0.21251
17	9° 26' 40"	1° 00' 49"	8° 16' 40"	4° 40' 27"	0° 59' 39"	16' 15.26"	246° 6' 56"	0.21649
18	10° 02' 28"	1° 03' 59"	8° 48' 26"	4° 57' 27"	0° 59' 39"	16' 15.20"	246° 7' 40"	0.22050
19	10° 38' 16"	1° 07' 09"	9° 20' 14"	5° 14' 25"	0° 59' 39"	16' 15.14"	246° 8' 36"	0.22453
20	11° 14' 03"	1° 10' 19"	9° 52' 02"	5° 31' 22"	0° 59' 38"	16' 15.07"	246° 9' 45"	0.22859
21	11° 49' 50"	1° 13' 27"	10° 23' 53"	5° 48' 16"	0° 59' 38"	16' 14.99"	246° 11' 06"	0.23267
22	12° 25' 36"	1° 16' 36"	10° 55' 44"	6° 05' 08"	0° 59' 38"	16' 14.92"	246° 12' 40"	0.23678
23	13° 01' 22"	1° 19' 44"	11° 27' 38"	6° 21' 59"	0° 59' 37"	16' 14.84"	246° 14' 25"	0.24091
24	13° 37' 08"	1° 22' 51"	11° 59' 33"	6° 38' 47"	0° 59' 37"	16' 14.76"	246° 16' 23"	0.24507

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	314° 24' 18"	0.01"	316° 51' 55"	-16° 30' 38"	0.9856544	16' 13.60"	23° 26' 19"	-13 m 47 s
1	314° 26' 50"	0.02"	316° 54' 27"	-16° 29' 54"	0.9856604	16' 13.59"	23° 26' 19"	-13 m 48 s
2	314° 29' 23"	0.02"	316° 56' 59"	-16° 29' 10"	0.9856663	16' 13.59"	23° 26' 19"	-13 m 48 s
3	314° 31' 55"	0.03"	316° 59' 31"	-16° 28' 26"	0.9856723	16' 13.58"	23° 26' 19"	-13 m 48 s
4	314° 34' 27"	0.03"	317° 02' 03"	-16° 27' 41"	0.9856782	16' 13.57"	23° 26' 19"	-13 m 48 s
5	314° 36' 59"	0.04"	317° 04' 35"	-16° 26' 57"	0.9856842	16' 13.57"	23° 26' 19"	-13 m 49 s
6	314° 39' 31"	0.04"	317° 07' 06"	-16° 26' 13"	0.9856902	16' 13.56"	23° 26' 19"	-13 m 49 s
7	314° 42' 04"	0.05"	317° 09' 38"	-16° 25' 28"	0.9856962	16' 13.56"	23° 26' 19"	-13 m 49 s
8	314° 44' 36"	0.06"	317° 12' 10"	-16° 24' 44"	0.9857022	16' 13.55"	23° 26' 19"	-13 m 49 s
9	314° 47' 08"	0.06"	317° 14' 42"	-16° 23' 60"	0.9857082	16' 13.54"	23° 26' 19"	-13 m 50 s
10	314° 49' 40"	0.07"	317° 17' 13"	-16° 23' 15"	0.9857142	16' 13.54"	23° 26' 19"	-13 m 50 s
11	314° 52' 12"	0.07"	317° 19' 45"	-16° 22' 31"	0.9857202	16' 13.53"	23° 26' 19"	-13 m 50 s
12	314° 54' 44"	0.08"	317° 22' 17"	-16° 21' 46"	0.9857262	16' 13.53"	23° 26' 19"	-13 m 51 s
13	314° 57' 17"	0.08"	317° 24' 48"	-16° 21' 02"	0.9857322	16' 13.52"	23° 26' 19"	-13 m 51 s
14	314° 59' 49"	0.09"	317° 27' 20"	-16° 20' 17"	0.9857382	16' 13.51"	23° 26' 19"	-13 m 51 s
15	315° 02' 21"	0.09"	317° 29' 52"	-16° 19' 32"	0.9857443	16' 13.51"	23° 26' 19"	-13 m 51 s
16	315° 04' 53"	0.10"	317° 32' 23"	-16° 18' 48"	0.9857503	16' 13.50"	23° 26' 19"	-13 m 52 s
17	315° 07' 25"	0.10"	317° 34' 55"	-16° 18' 03"	0.9857563	16' 13.50"	23° 26' 19"	-13 m 52 s
18	315° 09' 57"	0.11"	317° 37' 26"	-16° 17' 18"	0.9857624	16' 13.49"	23° 26' 19"	-13 m 52 s
19	315° 12' 30"	0.11"	317° 39' 58"	-16° 16' 34"	0.9857685	16' 13.48"	23° 26' 19"	-13 m 52 s
20	315° 15' 02"	0.12"	317° 42' 29"	-16° 15' 49"	0.9857745	16' 13.48"	23° 26' 19"	-13 m 53 s
21	315° 17' 34"	0.12"	317° 45' 01"	-16° 15' 04"	0.9857806	16' 13.47"	23° 26' 19"	-13 m 53 s
22	315° 20' 06"	0.13"	317° 47' 32"	-16° 14' 19"	0.9857867	16' 13.47"	23° 26' 19"	-13 m 53 s
23	315° 22' 38"	0.13"	317° 50' 03"	-16° 13' 34"	0.9857928	16' 13.46"	23° 26' 19"	-13 m 53 s
24	315° 25' 10"	0.14"	317° 52' 35"	-16° 12' 50"	0.9857988	16' 13.45"	23° 26' 19"	-13 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	13° 37' 08"	1° 22' 51"	11° 59' 33"	6° 38' 47"	0° 59' 37"	16' 14.76"	246° 16' 23"	0.24507
1	14° 12' 53"	1° 25' 58"	12° 31' 29"	6° 55' 33"	0° 59' 37"	16' 14.67"	246° 18' 33"	0.24924
2	14° 48' 38"	1° 29' 04"	13° 03' 28"	7° 12' 16"	0° 59' 36"	16' 14.58"	246° 20' 55"	0.25344
3	15° 24' 22"	1° 32' 09"	13° 35' 28"	7° 28' 57"	0° 59' 36"	16' 14.48"	246° 23' 28"	0.25767
4	16° 00' 06"	1° 35' 14"	14° 07' 30"	7° 45' 36"	0° 59' 36"	16' 14.39"	246° 26' 14"	0.26191
5	16° 35' 50"	1° 38' 18"	14° 39' 35"	8° 02' 12"	0° 59' 35"	16' 14.28"	246° 29' 11"	0.26618
6	17° 11' 33"	1° 41' 22"	15° 11' 41"	8° 18' 45"	0° 59' 35"	16' 14.18"	246° 32' 20"	0.27046
7	17° 47' 15"	1° 44' 25"	15° 43' 49"	8° 35' 15"	0° 59' 35"	16' 14.07"	246° 35' 41"	0.27477
8	18° 22' 57"	1° 47' 27"	16° 16' 00"	8° 51' 42"	0° 59' 34"	16' 13.96"	246° 39' 13"	0.27909
9	18° 58' 38"	1° 50' 28"	16° 48' 13"	9° 08' 06"	0° 59' 34"	16' 13.85"	246° 42' 57"	0.28344
10	19° 34' 19"	1° 53' 29"	17° 20' 29"	9° 24' 27"	0° 59' 33"	16' 13.73"	246° 46' 52"	0.28780
11	20° 09' 60"	1° 56' 29"	17° 52' 47"	9° 40' 45"	0° 59' 33"	16' 13.61"	246° 50' 59"	0.29218
12	20° 45' 39"	1° 59' 28"	18° 25' 07"	9° 56' 60"	0° 59' 32"	16' 13.48"	246° 55' 18"	0.29658
13	21° 21' 19"	2° 02' 26"	18° 57' 30"	10° 13' 11"	0° 59' 32"	16' 13.35"	246° 59' 47"	0.30100
14	21° 56' 57"	2° 05' 24"	19° 29' 56"	10° 29' 19"	0° 59' 31"	16' 13.22"	247° 4' 29"	0.30544
15	22° 32' 35"	2° 08' 20"	20° 02' 24"	10° 45' 23"	0° 59' 31"	16' 13.09"	247° 9' 21"	0.30989
16	23° 08' 13"	2° 11' 16"	20° 34' 55"	11° 01' 23"	0° 59' 30"	16' 12.95"	247° 14' 25"	0.31435
17	23° 43' 50"	2° 14' 10"	21° 07' 29"	11° 17' 19"	0° 59' 30"	16' 12.81"	247° 19' 40"	0.31884
18	24° 19' 26"	2° 17' 04"	21° 40' 06"	11° 33' 12"	0° 59' 29"	16' 12.67"	247° 25' 06"	0.32334
19	24° 55' 02"	2° 19' 57"	22° 12' 46"	11° 49' 01"	0° 59' 29"	16' 12.53"	247° 30' 43"	0.32785
20	25° 30' 37"	2° 22' 49"	22° 45' 29"	12° 04' 46"	0° 59' 28"	16' 12.38"	247° 36' 31"	0.33238
21	26° 06' 08"	2° 25' 40"	23° 18' 12"	12° 20' 24"	0° 59' 28"	16' 12.23"	247° 42' 30"	0.33691
22	26° 41' 42"	2° 28' 30"	23° 51' 02"	12° 36' 01"	0° 59' 27"	16' 12.07"	247° 48' 41"	0.34146
23	27° 17' 16"	2° 31' 19"	24° 23' 54"	12° 51' 32"	0° 59' 27"	16' 11.92"	247° 55' 02"	0.34603
24	27° 52' 48"	2° 34' 07"	24° 56' 50"	13° 06' 60"	0° 59' 26"	16' 11.76"	248° 1' 35"	0.35061

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	315° 25' 10"	0.14"	317° 52' 35"	-16° 12' 50"	0.9857988	16'13.45"	23° 26' 19"	-13 m 53 s
1	315° 27' 42"	0.14"	317° 55' 06"	-16° 12' 05"	0.9858049	16'13.45"	23° 26' 19"	-13 m 54 s
2	315° 30' 15"	0.15"	317° 57' 38"	-16° 11' 20"	0.9858111	16'13.44"	23° 26' 19"	-13 m 54 s
3	315° 32' 47"	0.15"	318° 00' 09"	-16° 10' 35"	0.9858172	16'13.44"	23° 26' 19"	-13 m 54 s
4	315° 35' 19"	0.16"	318° 02' 40"	-16° 09' 50"	0.9858233	16'13.43"	23° 26' 19"	-13 m 54 s
5	315° 37' 51"	0.16"	318° 05' 12"	-16° 09' 05"	0.9858294	16'13.42"	23° 26' 19"	-13 m 55 s
6	315° 40' 23"	0.17"	318° 07' 43"	-16° 08' 20"	0.9858355	16'13.42"	23° 26' 19"	-13 m 55 s
7	315° 42' 55"	0.17"	318° 10' 14"	-16° 07' 35"	0.9858417	16'13.41"	23° 26' 19"	-13 m 55 s
8	315° 45' 27"	0.18"	318° 12' 45"	-16° 06' 50"	0.9858478	16'13.41"	23° 26' 19"	-13 m 55 s
9	315° 47' 59"	0.18"	318° 15' 16"	-16° 06' 04"	0.9858540	16'13.40"	23° 26' 19"	-13 m 56 s
10	315° 50' 32"	0.19"	318° 17' 48"	-16° 05' 19"	0.9858601	16'13.39"	23° 26' 19"	-13 m 56 s
11	315° 53' 04"	0.19"	318° 20' 19"	-16° 04' 34"	0.9858663	16'13.39"	23° 26' 19"	-13 m 56 s
12	315° 55' 36"	0.20"	318° 22' 50"	-16° 03' 49"	0.9858725	16'13.38"	23° 26' 19"	-13 m 56 s
13	315° 58' 08"	0.20"	318° 25' 21"	-16° 03' 04"	0.9858787	16'13.38"	23° 26' 19"	-13 m 56 s
14	316° 00' 40"	0.20"	318° 27' 52"	-16° 02' 18"	0.9858848	16'13.37"	23° 26' 19"	-13 m 57 s
15	316° 03' 12"	0.21"	318° 30' 23"	-16° 01' 33"	0.9858910	16'13.36"	23° 26' 19"	-13 m 57 s
16	316° 05' 44"	0.21"	318° 32' 54"	-16° 00' 48"	0.9858972	16'13.36"	23° 26' 19"	-13 m 57 s
17	316° 08' 16"	0.22"	318° 35' 25"	-16° 00' 02"	0.9859034	16'13.35"	23° 26' 19"	-13 m 57 s
18	316° 10' 48"	0.22"	318° 37' 56"	-15° 59' 17"	0.9859097	16'13.34"	23° 26' 19"	-13 m 58 s
19	316° 13' 20"	0.23"	318° 40' 27"	-15° 58' 31"	0.9859159	16'13.34"	23° 26' 19"	-13 m 58 s
20	316° 15' 53"	0.23"	318° 42' 58"	-15° 57' 46"	0.9859221	16'13.33"	23° 26' 19"	-13 m 58 s
21	316° 18' 25"	0.24"	318° 45' 29"	-15° 57' 01"	0.9859283	16'13.33"	23° 26' 19"	-13 m 58 s
22	316° 20' 57"	0.24"	318° 48' 00"	-15° 56' 15"	0.9859346	16'13.32"	23° 26' 19"	-13 m 58 s
23	316° 23' 29"	0.24"	318° 50' 31"	-15° 55' 29"	0.9859408	16'13.31"	23° 26' 19"	-13 m 59 s
24	316° 26' 01"	0.25"	318° 53' 02"	-15° 54' 44"	0.9859471	16'13.31"	23° 26' 19"	-13 m 59 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	27° 52' 48"	2° 34' 07"	24° 56' 50"	13° 06' 60"	0° 59' 26"	16' 11.76"	248° 1' 35"	0.35061
1	28° 28' 20"	2° 36' 54"	25° 29' 50"	13° 22' 23"	0° 59' 26"	16' 11.59"	248° 8' 18"	0.35520
2	29° 03' 52"	2° 39' 40"	26° 02' 53"	13° 37' 41"	0° 59' 25"	16' 11.43"	248° 15' 13"	0.35980
3	29° 39' 22"	2° 42' 24"	26° 35' 59"	13° 52' 55"	0° 59' 24"	16' 11.26"	248° 22' 18"	0.36442
4	30° 14' 52"	2° 45' 08"	27° 09' 09"	14° 08' 03"	0° 59' 24"	16' 11.09"	248° 29' 34"	0.36904
5	30° 50' 22"	2° 47' 51"	27° 42' 23"	14° 23' 07"	0° 59' 23"	16' 10.92"	248° 37' 01"	0.37368
6	31° 25' 51"	2° 50' 32"	28° 15' 40"	14° 38' 06"	0° 59' 22"	16' 10.75"	248° 44' 39"	0.37832
7	32° 01' 19"	2° 53' 12"	28° 49' 01"	14° 52' 60"	0° 59' 22"	16' 10.57"	248° 52' 27"	0.38297
8	32° 36' 46"	2° 55' 52"	29° 22' 26"	15° 07' 49"	0° 59' 21"	16' 10.39"	249° 0' 26"	0.38763
9	33° 12' 13"	2° 58' 30"	29° 55' 54"	15° 22' 32"	0° 59' 20"	16' 10.21"	249° 8' 36"	0.39231
10	33° 47' 39"	3° 01' 06"	30° 29' 27"	15° 37' 10"	0° 59' 20"	16' 10.02"	249° 16' 57"	0.39698
11	34° 23' 04"	3° 03' 42"	31° 03' 03"	15° 51' 42"	0° 59' 19"	16' 09.84"	249° 25' 28"	0.40167
12	34° 58' 28"	3° 06' 16"	31° 36' 44"	16° 06' 09"	0° 59' 18"	16' 09.65"	249° 34' 10"	0.40636
13	35° 33' 52"	3° 08' 49"	32° 10' 28"	16° 20' 31"	0° 59' 18"	16' 09.46"	249° 43' 02"	0.41106
14	36° 09' 15"	3° 11' 21"	32° 44' 17"	16° 34' 46"	0° 59' 17"	16' 09.26"	249° 52' 05"	0.41576
15	36° 44' 38"	3° 13' 52"	33° 18' 09"	16° 48' 56"	0° 59' 16"	16' 09.07"	250° 1' 18"	0.42047
16	37° 19' 59"	3° 16' 21"	33° 52' 06"	17° 02' 60"	0° 59' 16"	16' 08.87"	250° 10' 42"	0.42519
17	37° 55' 20"	3° 18' 49"	34° 26' 07"	17° 16' 57"	0° 59' 15"	16' 08.67"	250° 20' 16"	0.42991
18	38° 30' 40"	3° 21' 15"	35° 00' 13"	17° 30' 49"	0° 59' 14"	16' 08.47"	250° 30' 00"	0.43463
19	39° 05' 59"	3° 23' 41"	35° 34' 22"	17° 44' 35"	0° 59' 13"	16' 08.27"	250° 39' 55"	0.43936
20	39° 41' 18"	3° 26' 05"	36° 08' 36"	17° 58' 14"	0° 59' 13"	16' 08.06"	250° 50' 01"	0.44409
21	40° 16' 36"	3° 28' 27"	36° 42' 55"	18° 11' 47"	0° 59' 12"	16' 07.85"	251° 0' 16"	0.44882
22	40° 51' 53"	3° 30' 48"	37° 17' 18"	18° 25' 13"	0° 59' 11"	16' 07.64"	251° 10' 42"	0.45356
23	41° 27' 09"	3° 33' 08"	37° 51' 45"	18° 38' 33"	0° 59' 10"	16' 07.43"	251° 21' 18"	0.45830
24	42° 02' 25"	3° 35' 27"	38° 26' 16"	18° 51' 46"	0° 59' 09"	16' 07.22"	251° 32' 04"	0.46303

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	316° 26' 01"	0.25"	318° 53' 02"	-15° 54' 44"	0.9859471	16' 13.31"	23° 26' 19"	-13 m 59 s
1	316° 28' 33"	0.25"	318° 55' 33"	-15° 53' 58"	0.9859534	16' 13.30"	23° 26' 19"	-13 m 59 s
2	316° 31' 05"	0.26"	318° 58' 04"	-15° 53' 13"	0.9859596	16' 13.30"	23° 26' 19"	-13 m 59 s
3	316° 33' 37"	0.26"	319° 00' 34"	-15° 52' 27"	0.9859659	16' 13.29"	23° 26' 19"	-13 m 59 s
4	316° 36' 09"	0.27"	319° 03' 05"	-15° 51' 41"	0.9859722	16' 13.28"	23° 26' 19"	-13 m 60 s
5	316° 38' 41"	0.27"	319° 05' 36"	-15° 50' 56"	0.9859785	16' 13.28"	23° 26' 19"	-13 m 60 s
6	316° 41' 13"	0.27"	319° 08' 07"	-15° 50' 10"	0.9859848	16' 13.27"	23° 26' 19"	-13 m 60 s
7	316° 43' 45"	0.28"	319° 10' 37"	-15° 49' 24"	0.9859911	16' 13.26"	23° 26' 19"	-14 m 00 s
8	316° 46' 17"	0.28"	319° 13' 08"	-15° 48' 38"	0.9859974	16' 13.26"	23° 26' 19"	-14 m 00 s
9	316° 48' 49"	0.29"	319° 15' 39"	-15° 47' 53"	0.9860037	16' 13.25"	23° 26' 19"	-14 m 01 s
10	316° 51' 21"	0.29"	319° 18' 10"	-15° 47' 07"	0.9860101	16' 13.25"	23° 26' 19"	-14 m 01 s
11	316° 53' 54"	0.29"	319° 20' 40"	-15° 46' 21"	0.9860164	16' 13.24"	23° 26' 19"	-14 m 01 s
12	316° 56' 26"	0.30"	319° 23' 11"	-15° 45' 35"	0.9860227	16' 13.23"	23° 26' 19"	-14 m 01 s
13	316° 58' 58"	0.30"	319° 25' 41"	-15° 44' 49"	0.9860291	16' 13.23"	23° 26' 19"	-14 m 01 s
14	317° 01' 30"	0.31"	319° 28' 12"	-15° 44' 03"	0.9860354	16' 13.22"	23° 26' 19"	-14 m 01 s
15	317° 04' 02"	0.31"	319° 30' 43"	-15° 43' 17"	0.9860418	16' 13.21"	23° 26' 19"	-14 m 02 s
16	317° 06' 34"	0.31"	319° 33' 13"	-15° 42' 31"	0.9860482	16' 13.21"	23° 26' 19"	-14 m 02 s
17	317° 09' 06"	0.32"	319° 35' 44"	-15° 41' 45"	0.9860546	16' 13.20"	23° 26' 19"	-14 m 02 s
18	317° 11' 38"	0.32"	319° 38' 14"	-15° 40' 59"	0.9860610	16' 13.20"	23° 26' 19"	-14 m 02 s
19	317° 14' 10"	0.32"	319° 40' 45"	-15° 40' 13"	0.9860674	16' 13.19"	23° 26' 19"	-14 m 02 s
20	317° 16' 42"	0.33"	319° 43' 15"	-15° 39' 27"	0.9860738	16' 13.18"	23° 26' 19"	-14 m 03 s
21	317° 19' 14"	0.33"	319° 45' 45"	-15° 38' 41"	0.9860802	16' 13.18"	23° 26' 19"	-14 m 03 s
22	317° 21' 46"	0.33"	319° 48' 16"	-15° 37' 54"	0.9860866	16' 13.17"	23° 26' 19"	-14 m 03 s
23	317° 24' 18"	0.34"	319° 50' 46"	-15° 37' 08"	0.9860930	16' 13.16"	23° 26' 19"	-14 m 03 s
24	317° 26' 50"	0.34"	319° 53' 17"	-15° 36' 22"	0.9860995	16' 13.16"	23° 26' 19"	-14 m 03 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	42° 02' 25"	3° 35' 27"	38° 26' 16"	18° 51' 46"	0° 59' 09"	16' 07.22"	251° 32' 04"	0.46303
1	42° 37' 39"	3° 37' 44"	39° 00' 52"	19° 04' 52"	0° 59' 09"	16' 07.01"	251° 42' 60"	0.46777
2	43° 12' 53"	3° 39' 59"	39° 35' 33"	19° 17' 52"	0° 59' 08"	16' 06.79"	251° 54' 06"	0.47251
3	43° 48' 07"	3° 42' 13"	40° 10' 18"	19° 30' 45"	0° 59' 07"	16' 06.57"	252° 5' 22"	0.47726
4	44° 23' 19"	3° 44' 26"	40° 45' 08"	19° 43' 30"	0° 59' 06"	16' 06.35"	252° 16' 49"	0.48200
5	44° 58' 30"	3° 46' 37"	41° 20' 02"	19° 56' 09"	0° 59' 05"	16' 06.13"	252° 28' 25"	0.48673
6	45° 33' 41"	3° 48' 47"	41° 55' 01"	20° 08' 40"	0° 59' 05"	16' 05.90"	252° 40' 11"	0.49147
7	46° 08' 51"	3° 50' 55"	42° 30' 04"	20° 21' 05"	0° 59' 04"	16' 05.68"	252° 52' 07"	0.49621
8	46° 44' 00"	3° 53' 02"	43° 05' 12"	20° 33' 21"	0° 59' 03"	16' 05.45"	253° 4' 13"	0.50094
9	47° 19' 09"	3° 55' 07"	43° 40' 25"	20° 45' 31"	0° 59' 02"	16' 05.22"	253° 16' 28"	0.50567
10	47° 54' 16"	3° 57' 11"	44° 15' 43"	20° 57' 33"	0° 59' 01"	16' 04.99"	253° 28' 54"	0.51040
11	48° 29' 23"	3° 59' 13"	44° 51' 05"	21° 09' 27"	0° 59' 00"	16' 04.76"	253° 41' 28"	0.51513
12	49° 04' 28"	4° 01' 14"	45° 26' 31"	21° 21' 13"	0° 58' 60"	16' 04.53"	253° 54' 13"	0.51985
13	49° 39' 33"	4° 03' 13"	46° 02' 02"	21° 32' 52"	0° 58' 59"	16' 04.29"	254° 7' 07"	0.52457
14	50° 14' 38"	4° 05' 10"	46° 37' 38"	21° 44' 23"	0° 58' 58"	16' 04.06"	254° 20' 10"	0.52928
15	50° 49' 41"	4° 07' 06"	47° 13' 19"	21° 55' 46"	0° 58' 57"	16' 03.82"	254° 33' 23"	0.53398
16	51° 24' 43"	4° 09' 00"	47° 49' 04"	22° 07' 00"	0° 58' 56"	16' 03.58"	254° 46' 45"	0.53869
17	51° 59' 45"	4° 10' 53"	48° 24' 54"	22° 18' 07"	0° 58' 55"	16' 03.34"	255° 0' 17"	0.54338
18	52° 34' 46"	4° 12' 44"	49° 00' 49"	22° 29' 06"	0° 58' 54"	16' 03.10"	255° 13' 58"	0.54807
19	53° 09' 45"	4° 14' 33"	49° 36' 48"	22° 39' 56"	0° 58' 53"	16' 02.86"	255° 27' 47"	0.55275
20	53° 44' 44"	4° 16' 21"	50° 12' 51"	22° 50' 38"	0° 58' 53"	16' 02.61"	255° 41' 46"	0.55743
21	54° 19' 43"	4° 18' 07"	50° 48' 60"	23° 01' 11"	0° 58' 52"	16' 02.37"	255° 55' 54"	0.56210
22	54° 54' 40"	4° 19' 52"	51° 25' 13"	23° 11' 36"	0° 58' 51"	16' 02.12"	256° 10' 11"	0.56675
23	55° 29' 36"	4° 21' 35"	52° 01' 30"	23° 21' 52"	0° 58' 50"	16' 01.87"	256° 24' 37"	0.57141
24	56° 04' 32"	4° 23' 16"	52° 37' 52"	23° 31' 60"	0° 58' 49"	16' 01.62"	256° 39' 12"	0.57605

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	317° 26' 50"	0.34"	319° 53' 17"	-15° 36' 22"	0.9860995	16'13.16"	23° 26' 19"	-14 m 03 s
1	317° 29' 22"	0.34"	319° 55' 47"	-15° 35' 36"	0.9861059	16'13.15"	23° 26' 19"	-14 m 03 s
2	317° 31' 54"	0.35"	319° 58' 17"	-15° 34' 49"	0.9861123	16'13.14"	23° 26' 19"	-14 m 04 s
3	317° 34' 26"	0.35"	320° 00' 48"	-15° 34' 03"	0.9861188	16'13.14"	23° 26' 19"	-14 m 04 s
4	317° 36' 58"	0.35"	320° 03' 18"	-15° 33' 17"	0.9861253	16'13.13"	23° 26' 19"	-14 m 04 s
5	317° 39' 30"	0.36"	320° 05' 48"	-15° 32' 30"	0.9861317	16'13.13"	23° 26' 19"	-14 m 04 s
6	317° 42' 02"	0.36"	320° 08' 18"	-15° 31' 44"	0.9861382	16'13.12"	23° 26' 19"	-14 m 04 s
7	317° 44' 34"	0.36"	320° 10' 49"	-15° 30' 58"	0.9861447	16'13.11"	23° 26' 19"	-14 m 04 s
8	317° 47' 06"	0.37"	320° 13' 19"	-15° 30' 11"	0.9861512	16'13.11"	23° 26' 19"	-14 m 05 s
9	317° 49' 38"	0.37"	320° 15' 49"	-15° 29' 25"	0.9861577	16'13.10"	23° 26' 19"	-14 m 05 s
10	317° 52' 10"	0.37"	320° 18' 19"	-15° 28' 38"	0.9861642	16'13.09"	23° 26' 19"	-14 m 05 s
11	317° 54' 42"	0.37"	320° 20' 49"	-15° 27' 52"	0.9861707	16'13.09"	23° 26' 19"	-14 m 05 s
12	317° 57' 14"	0.38"	320° 23' 19"	-15° 27' 05"	0.9861773	16'13.08"	23° 26' 19"	-14 m 05 s
13	317° 59' 46"	0.38"	320° 25' 49"	-15° 26' 18"	0.9861838	16'13.07"	23° 26' 19"	-14 m 05 s
14	318° 02' 18"	0.38"	320° 28' 19"	-15° 25' 32"	0.9861903	16'13.07"	23° 26' 19"	-14 m 05 s
15	318° 04' 50"	0.39"	320° 30' 50"	-15° 24' 45"	0.9861969	16'13.06"	23° 26' 19"	-14 m 06 s
16	318° 07' 22"	0.39"	320° 33' 20"	-15° 23' 58"	0.9862035	16'13.05"	23° 26' 19"	-14 m 06 s
17	318° 09' 54"	0.39"	320° 35' 50"	-15° 23' 12"	0.9862100	16'13.05"	23° 26' 19"	-14 m 06 s
18	318° 12' 26"	0.39"	320° 38' 20"	-15° 22' 25"	0.9862166	16'13.04"	23° 26' 19"	-14 m 06 s
19	318° 14' 58"	0.40"	320° 40' 49"	-15° 21' 38"	0.9862232	16'13.04"	23° 26' 19"	-14 m 06 s
20	318° 17' 30"	0.40"	320° 43' 19"	-15° 20' 51"	0.9862298	16'13.03"	23° 26' 19"	-14 m 06 s
21	318° 20' 02"	0.40"	320° 45' 49"	-15° 20' 05"	0.9862364	16'13.02"	23° 26' 19"	-14 m 06 s
22	318° 22' 34"	0.40"	320° 48' 19"	-15° 19' 18"	0.9862430	16'13.02"	23° 26' 19"	-14 m 07 s
23	318° 25' 06"	0.41"	320° 50' 49"	-15° 18' 31"	0.9862496	16'13.01"	23° 26' 19"	-14 m 07 s
24	318° 27' 38"	0.41"	320° 53' 19"	-15° 17' 44"	0.9862562	16'13.00"	23° 26' 19"	-14 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	56° 04' 32"	4° 23' 16"	52° 37' 52"	23° 31' 60"	0° 58' 49"	16' 01.62"	256° 39' 12"	0.57605
1	56° 39' 26"	4° 24' 56"	53° 14' 18"	23° 41' 58"	0° 58' 48"	16' 01.37"	256° 53' 55"	0.58068
2	57° 14' 20"	4° 26' 33"	53° 50' 49"	23° 51' 48"	0° 58' 47"	16' 01.12"	257° 8' 47"	0.58530
3	57° 49' 13"	4° 28' 09"	54° 27' 24"	24° 01' 29"	0° 58' 46"	16' 00.87"	257° 23' 48"	0.58992
4	58° 24' 05"	4° 29' 44"	55° 04' 04"	24° 11' 01"	0° 58' 45"	16' 00.61"	257° 38' 57"	0.59452
5	58° 58' 56"	4° 31' 17"	55° 40' 48"	24° 20' 24"	0° 58' 44"	16' 00.36"	257° 54' 15"	0.59911
6	59° 33' 46"	4° 32' 48"	56° 17' 36"	24° 29' 38"	0° 58' 43"	16' 00.10"	258° 9' 41"	0.60369
7	60° 08' 35"	4° 34' 17"	56° 54' 28"	24° 38' 43"	0° 58' 42"	15' 59.84"	258° 25' 15"	0.60826
8	60° 43' 24"	4° 35' 45"	57° 31' 25"	24° 47' 38"	0° 58' 41"	15' 59.59"	258° 40' 57"	0.61281
9	61° 18' 11"	4° 37' 10"	58° 08' 26"	24° 56' 24"	0° 58' 40"	15' 59.33"	258° 56' 47"	0.61736
10	61° 52' 57"	4° 38' 35"	58° 45' 31"	25° 05' 00"	0° 58' 40"	15' 59.07"	259° 12' 45"	0.62189
11	62° 27' 43"	4° 39' 57"	59° 22' 40"	25° 13' 27"	0° 58' 39"	15' 58.80"	259° 28' 51"	0.62641
12	63° 02' 28"	4° 41' 17"	59° 59' 53"	25° 21' 45"	0° 58' 38"	15' 58.54"	259° 45' 05"	0.63091
13	63° 37' 11"	4° 42' 36"	60° 37' 10"	25° 29' 53"	0° 58' 37"	15' 58.28"	260° 1' 27"	0.63540
14	64° 11' 54"	4° 43' 53"	61° 14' 30"	25° 37' 51"	0° 58' 36"	15' 58.01"	260° 17' 56"	0.63988
15	64° 46' 36"	4° 45' 09"	61° 51' 55"	25° 45' 39"	0° 58' 35"	15' 57.75"	260° 34' 33"	0.64434
16	65° 21' 17"	4° 46' 22"	62° 29' 23"	25° 53' 18"	0° 58' 34"	15' 57.48"	260° 51' 16"	0.64879
17	65° 55' 57"	4° 47' 34"	63° 06' 55"	26° 00' 46"	0° 58' 33"	15' 57.21"	261° 8' 08"	0.65322
18	66° 30' 36"	4° 48' 44"	63° 44' 31"	26° 08' 05"	0° 58' 32"	15' 56.94"	261° 25' 06"	0.65763
19	67° 05' 14"	4° 49' 52"	64° 22' 09"	26° 15' 14"	0° 58' 31"	15' 56.67"	261° 42' 11"	0.66203
20	67° 39' 51"	4° 50' 58"	64° 59' 52"	26° 22' 12"	0° 58' 30"	15' 56.40"	261° 59' 23"	0.66641
21	68° 14' 27"	4° 52' 03"	65° 37' 38"	26° 29' 01"	0° 58' 29"	15' 56.13"	262° 16' 43"	0.67078
22	68° 49' 02"	4° 53' 06"	66° 15' 27"	26° 35' 39"	0° 58' 28"	15' 55.86"	262° 34' 08"	0.67513
23	69° 23' 37"	4° 54' 06"	66° 53' 19"	26° 42' 08"	0° 58' 27"	15' 55.59"	262° 51' 41"	0.67946
24	69° 58' 10"	4° 55' 06"	67° 31' 14"	26° 48' 26"	0° 58' 26"	15' 55.31"	263° 9' 19"	0.68377

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	318° 27' 38"	0.41"	320° 53' 19"	-15° 17' 44"	0.9862562	16' 13.00"	23° 26' 19"	-14 m 07 s
1	318° 30' 10"	0.41"	320° 55' 49"	-15° 16' 57"	0.9862629	16' 13.00"	23° 26' 19"	-14 m 07 s
2	318° 32' 41"	0.41"	320° 58' 19"	-15° 16' 10"	0.9862695	16' 12.99"	23° 26' 19"	-14 m 07 s
3	318° 35' 13"	0.41"	321° 00' 48"	-15° 15' 23"	0.9862762	16' 12.98"	23° 26' 19"	-14 m 07 s
4	318° 37' 45"	0.42"	321° 03' 18"	-15° 14' 36"	0.9862828	16' 12.98"	23° 26' 19"	-14 m 07 s
5	318° 40' 17"	0.42"	321° 05' 48"	-15° 13' 49"	0.9862895	16' 12.97"	23° 26' 19"	-14 m 08 s
6	318° 42' 49"	0.42"	321° 08' 18"	-15° 13' 02"	0.9862961	16' 12.96"	23° 26' 19"	-14 m 08 s
7	318° 45' 21"	0.42"	321° 10' 47"	-15° 12' 15"	0.9863028	16' 12.96"	23° 26' 19"	-14 m 08 s
8	318° 47' 53"	0.42"	321° 13' 17"	-15° 11' 28"	0.9863095	16' 12.95"	23° 26' 19"	-14 m 08 s
9	318° 50' 25"	0.43"	321° 15' 47"	-15° 10' 41"	0.9863162	16' 12.94"	23° 26' 19"	-14 m 08 s
10	318° 52' 57"	0.43"	321° 18' 16"	-15° 09' 54"	0.9863229	16' 12.94"	23° 26' 19"	-14 m 08 s
11	318° 55' 29"	0.43"	321° 20' 46"	-15° 09' 07"	0.9863296	16' 12.93"	23° 26' 19"	-14 m 08 s
12	318° 58' 01"	0.43"	321° 23' 16"	-15° 08' 19"	0.9863364	16' 12.92"	23° 26' 19"	-14 m 08 s
13	319° 00' 33"	0.43"	321° 25' 45"	-15° 07' 32"	0.9863431	16' 12.92"	23° 26' 19"	-14 m 09 s
14	319° 03' 05"	0.43"	321° 28' 15"	-15° 06' 45"	0.9863498	16' 12.91"	23° 26' 19"	-14 m 09 s
15	319° 05' 37"	0.44"	321° 30' 44"	-15° 05' 58"	0.9863566	16' 12.90"	23° 26' 19"	-14 m 09 s
16	319° 08' 08"	0.44"	321° 33' 14"	-15° 05' 10"	0.9863633	16' 12.90"	23° 26' 19"	-14 m 09 s
17	319° 10' 40"	0.44"	321° 35' 43"	-15° 04' 23"	0.9863701	16' 12.89"	23° 26' 19"	-14 m 09 s
18	319° 13' 12"	0.44"	321° 38' 13"	-15° 03' 36"	0.9863769	16' 12.88"	23° 26' 19"	-14 m 09 s
19	319° 15' 44"	0.44"	321° 40' 42"	-15° 02' 48"	0.9863837	16' 12.88"	23° 26' 19"	-14 m 09 s
20	319° 18' 16"	0.44"	321° 43' 12"	-15° 02' 01"	0.9863905	16' 12.87"	23° 26' 19"	-14 m 09 s
21	319° 20' 48"	0.44"	321° 45' 41"	-15° 01' 13"	0.9863973	16' 12.86"	23° 26' 19"	-14 m 09 s
22	319° 23' 20"	0.44"	321° 48' 10"	-15° 00' 26"	0.9864041	16' 12.86"	23° 26' 19"	-14 m 10 s
23	319° 25' 52"	0.45"	321° 50' 40"	-14° 59' 38"	0.9864109	16' 12.85"	23° 26' 19"	-14 m 10 s
24	319° 28' 24"	0.45"	321° 53' 09"	-14° 58' 51"	0.9864177	16' 12.84"	23° 26' 19"	-14 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	69° 58' 10"	4° 55' 06"	67° 31' 14"	26° 48' 26"	0° 58' 26"	15' 55.31"	263° 9' 19"	0.68377
1	70° 32' 42"	4° 56' 03"	68° 09' 12"	26° 54' 33"	0° 58' 25"	15' 55.04"	263° 27' 04"	0.68807
2	71° 07' 13"	4° 56' 58"	68° 47' 13"	27° 00' 30"	0° 58' 24"	15' 54.76"	263° 44' 56"	0.69234
3	71° 41' 44"	4° 57' 52"	69° 25' 17"	27° 06' 17"	0° 58' 23"	15' 54.49"	264° 2' 53"	0.69660
4	72° 16' 13"	4° 58' 44"	70° 03' 23"	27° 11' 54"	0° 58' 22"	15' 54.21"	264° 20' 56"	0.70084
5	72° 50' 41"	4° 59' 34"	70° 41' 33"	27° 17' 19"	0° 58' 21"	15' 53.93"	264° 39' 06"	0.70506
6	73° 25' 08"	5° 00' 22"	71° 19' 44"	27° 22' 35"	0° 58' 20"	15' 53.65"	264° 57' 21"	0.70925
7	73° 59' 35"	5° 01' 08"	71° 57' 58"	27° 27' 39"	0° 58' 19"	15' 53.37"	265° 15' 41"	0.71343
8	74° 34' 00"	5° 01' 53"	72° 36' 14"	27° 32' 34"	0° 58' 18"	15' 53.09"	265° 34' 07"	0.71759
9	75° 08' 24"	5° 02' 36"	73° 14' 33"	27° 37' 17"	0° 58' 17"	15' 52.81"	265° 52' 38"	0.72172
10	75° 42' 48"	5° 03' 16"	73° 52' 53"	27° 41' 50"	0° 58' 16"	15' 52.53"	266° 11' 15"	0.72584
11	76° 17' 10"	5° 03' 55"	74° 31' 15"	27° 46' 12"	0° 58' 14"	15' 52.25"	266° 29' 56"	0.72993
12	76° 51' 31"	5° 04' 33"	75° 09' 39"	27° 50' 23"	0° 58' 13"	15' 51.96"	266° 48' 43"	0.73400
13	77° 25' 51"	5° 05' 08"	75° 48' 05"	27° 54' 24"	0° 58' 12"	15' 51.68"	267° 7' 34"	0.73805
14	78° 00' 10"	5° 05' 41"	76° 26' 32"	27° 58' 14"	0° 58' 11"	15' 51.39"	267° 26' 30"	0.74208
15	78° 34' 29"	5° 06' 13"	77° 05' 01"	28° 01' 53"	0° 58' 10"	15' 51.11"	267° 45' 30"	0.74608
16	79° 08' 46"	5° 06' 43"	77° 43' 31"	28° 05' 21"	0° 58' 09"	15' 50.82"	268° 4' 35"	0.75006
17	79° 43' 02"	5° 07' 11"	78° 22' 02"	28° 08' 38"	0° 58' 08"	15' 50.53"	268° 23' 45"	0.75402
18	80° 17' 17"	5° 07' 37"	79° 00' 35"	28° 11' 44"	0° 58' 07"	15' 50.24"	268° 42' 58"	0.75795
19	80° 51' 31"	5° 08' 01"	79° 39' 08"	28° 14' 40"	0° 58' 06"	15' 49.96"	269° 2' 15"	0.76186
20	81° 25' 43"	5° 08' 23"	80° 17' 42"	28° 17' 24"	0° 58' 05"	15' 49.67"	269° 21' 36"	0.76575
21	81° 59' 55"	5° 08' 44"	80° 56' 17"	28° 19' 58"	0° 58' 04"	15' 49.38"	269° 41' 01"	0.76961
22	82° 34' 06"	5° 09' 03"	81° 34' 52"	28° 22' 20"	0° 58' 03"	15' 49.08"	270° 0' 30"	0.77344
23	83° 08' 16"	5° 09' 19"	82° 13' 28"	28° 24' 32"	0° 58' 02"	15' 48.79"	270° 20' 02"	0.77725
24	83° 42' 24"	5° 09' 35"	82° 52' 04"	28° 26' 33"	0° 58' 01"	15' 48.50"	270° 39' 37"	0.78104

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	319° 28' 24"	0.45"	321° 53' 09"	-14° 58' 51"	0.9864177	16'12.84"	23° 26' 19"	-14 m 10 s
1	319° 30' 56"	0.45"	321° 55' 39"	-14° 58' 03"	0.9864245	16'12.84"	23° 26' 19"	-14 m 10 s
2	319° 33' 27"	0.45"	321° 58' 08"	-14° 57' 16"	0.9864314	16'12.83"	23° 26' 19"	-14 m 10 s
3	319° 35' 59"	0.45"	322° 00' 37"	-14° 56' 28"	0.9864382	16'12.82"	23° 26' 19"	-14 m 10 s
4	319° 38' 31"	0.45"	322° 03' 06"	-14° 55' 40"	0.9864451	16'12.82"	23° 26' 19"	-14 m 10 s
5	319° 41' 03"	0.45"	322° 05' 36"	-14° 54' 53"	0.9864520	16'12.81"	23° 26' 19"	-14 m 10 s
6	319° 43' 35"	0.45"	322° 08' 05"	-14° 54' 05"	0.9864588	16'12.80"	23° 26' 19"	-14 m 10 s
7	319° 46' 07"	0.45"	322° 10' 34"	-14° 53' 17"	0.9864657	16'12.80"	23° 26' 19"	-14 m 10 s
8	319° 48' 39"	0.45"	322° 13' 03"	-14° 52' 30"	0.9864726	16'12.79"	23° 26' 19"	-14 m 11 s
9	319° 51' 11"	0.45"	322° 15' 32"	-14° 51' 42"	0.9864795	16'12.78"	23° 26' 19"	-14 m 11 s
10	319° 53' 42"	0.45"	322° 18' 02"	-14° 50' 54"	0.9864864	16'12.78"	23° 26' 19"	-14 m 11 s
11	319° 56' 14"	0.45"	322° 20' 31"	-14° 50' 06"	0.9864934	16'12.77"	23° 26' 19"	-14 m 11 s
12	319° 58' 46"	0.46"	322° 22' 60"	-14° 49' 18"	0.9865003	16'12.76"	23° 26' 19"	-14 m 11 s
13	320° 01' 18"	0.46"	322° 25' 29"	-14° 48' 31"	0.9865072	16'12.76"	23° 26' 19"	-14 m 11 s
14	320° 03' 50"	0.46"	322° 27' 58"	-14° 47' 43"	0.9865142	16'12.75"	23° 26' 19"	-14 m 11 s
15	320° 06' 22"	0.46"	322° 30' 27"	-14° 46' 55"	0.9865211	16'12.74"	23° 26' 19"	-14 m 11 s
16	320° 08' 54"	0.46"	322° 32' 56"	-14° 46' 07"	0.9865281	16'12.73"	23° 26' 19"	-14 m 11 s
17	320° 11' 25"	0.46"	322° 35' 25"	-14° 45' 19"	0.9865351	16'12.73"	23° 26' 19"	-14 m 11 s
18	320° 13' 57"	0.46"	322° 37' 54"	-14° 44' 31"	0.9865421	16'12.72"	23° 26' 19"	-14 m 11 s
19	320° 16' 29"	0.46"	322° 40' 23"	-14° 43' 43"	0.9865490	16'12.71"	23° 26' 19"	-14 m 11 s
20	320° 19' 01"	0.46"	322° 42' 52"	-14° 42' 55"	0.9865560	16'12.71"	23° 26' 19"	-14 m 12 s
21	320° 21' 33"	0.46"	322° 45' 21"	-14° 42' 07"	0.9865631	16'12.70"	23° 26' 19"	-14 m 12 s
22	320° 24' 05"	0.46"	322° 47' 50"	-14° 41' 19"	0.9865701	16'12.69"	23° 26' 19"	-14 m 12 s
23	320° 26' 36"	0.46"	322° 50' 18"	-14° 40' 31"	0.9865771	16'12.69"	23° 26' 19"	-14 m 12 s
24	320° 29' 08"	0.46"	322° 52' 47"	-14° 39' 42"	0.9865841	16'12.68"	23° 26' 19"	-14 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	83° 42' 24"	5° 09' 35"	82° 52' 04"	28° 26' 33"	0° 58' 01"	15' 48.50"	270° 39' 37"	0.78104
1	84° 16' 32"	5° 09' 48"	83° 30' 40"	28° 28' 23"	0° 57' 60"	15' 48.21"	270° 59' 16"	0.78480
2	84° 50' 38"	5° 09' 59"	84° 09' 16"	28° 30' 01"	0° 57' 59"	15' 47.91"	271° 18' 58"	0.78853
3	85° 24' 43"	5° 10' 09"	84° 47' 52"	28° 31' 29"	0° 57' 58"	15' 47.62"	271° 38' 42"	0.79224
4	85° 58' 48"	5° 10' 16"	85° 26' 28"	28° 32' 46"	0° 57' 56"	15' 47.32"	271° 58' 30"	0.79592
5	86° 32' 51"	5° 10' 22"	86° 05' 03"	28° 33' 52"	0° 57' 55"	15' 47.03"	272° 18' 20"	0.79957
6	87° 06' 53"	5° 10' 26"	86° 43' 38"	28° 34' 47"	0° 57' 54"	15' 46.73"	272° 38' 13"	0.80320
7	87° 40' 54"	5° 10' 28"	87° 22' 12"	28° 35' 31"	0° 57' 53"	15' 46.43"	272° 58' 08"	0.80680
8	88° 14' 53"	5° 10' 29"	88° 00' 46"	28° 36' 04"	0° 57' 52"	15' 46.14"	273° 18' 06"	0.81037
9	88° 48' 52"	5° 10' 27"	88° 39' 18"	28° 36' 26"	0° 57' 51"	15' 45.84"	273° 38' 06"	0.81391
10	89° 22' 49"	5° 10' 24"	89° 17' 50"	28° 36' 37"	0° 57' 50"	15' 45.54"	273° 58' 08"	0.81743
11	89° 56' 46"	5° 10' 19"	89° 56' 20"	28° 36' 37"	0° 57' 49"	15' 45.24"	274° 18' 13"	0.82092
12	90° 30' 41"	5° 10' 12"	90° 34' 49"	28° 36' 27"	0° 57' 48"	15' 44.94"	274° 38' 19"	0.82437
13	91° 04' 35"	5° 10' 03"	91° 13' 16"	28° 36' 05"	0° 57' 47"	15' 44.64"	274° 58' 27"	0.82780
14	91° 38' 28"	5° 09' 53"	91° 51' 42"	28° 35' 33"	0° 57' 45"	15' 44.33"	275° 18' 37"	0.83120
15	92° 12' 20"	5° 09' 40"	92° 30' 06"	28° 34' 50"	0° 57' 44"	15' 44.03"	275° 38' 48"	0.83458
16	92° 46' 10"	5° 09' 26"	93° 08' 28"	28° 33' 56"	0° 57' 43"	15' 43.73"	275° 59' 02"	0.83792
17	93° 19' 60"	5° 09' 10"	93° 46' 48"	28° 32' 52"	0° 57' 42"	15' 43.42"	276° 19' 16"	0.84123
18	93° 53' 48"	5° 08' 53"	94° 25' 06"	28° 31' 36"	0° 57' 41"	15' 43.12"	276° 39' 32"	0.84451
19	94° 27' 35"	5° 08' 33"	95° 03' 21"	28° 30' 10"	0° 57' 40"	15' 42.81"	276° 59' 50"	0.84776
20	95° 01' 21"	5° 08' 12"	95° 41' 35"	28° 28' 33"	0° 57' 39"	15' 42.51"	277° 20' 08"	0.85099
21	95° 35' 06"	5° 07' 49"	96° 19' 45"	28° 26' 46"	0° 57' 38"	15' 42.20"	277° 40' 28"	0.85418
22	96° 08' 49"	5° 07' 24"	96° 57' 53"	28° 24' 48"	0° 57' 37"	15' 41.89"	278° 0' 50"	0.85734
23	96° 42' 32"	5° 06' 57"	97° 35' 59"	28° 22' 40"	0° 57' 35"	15' 41.59"	278° 21' 12"	0.86047
24	97° 16' 13"	5° 06' 29"	98° 14' 01"	28° 20' 21"	0° 57' 34"	15' 41.28"	278° 41' 35"	0.86356

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	320° 29' 08"	0.46"	322° 52' 47"	-14° 39' 42"	0.9865841	16' 12.68"	23° 26' 19"	-14 m 12 s
1	320° 31' 40"	0.46"	322° 55' 16"	-14° 38' 54"	0.9865912	16' 12.67"	23° 26' 19"	-14 m 12 s
2	320° 34' 12"	0.46"	322° 57' 45"	-14° 38' 06"	0.9865982	16' 12.67"	23° 26' 19"	-14 m 12 s
3	320° 36' 44"	0.45"	323° 00' 14"	-14° 37' 18"	0.9866053	16' 12.66"	23° 26' 19"	-14 m 12 s
4	320° 39' 15"	0.45"	323° 02' 42"	-14° 36' 30"	0.9866124	16' 12.65"	23° 26' 19"	-14 m 12 s
5	320° 41' 47"	0.45"	323° 05' 11"	-14° 35' 41"	0.9866194	16' 12.64"	23° 26' 19"	-14 m 12 s
6	320° 44' 19"	0.45"	323° 07' 40"	-14° 34' 53"	0.9866265	16' 12.64"	23° 26' 19"	-14 m 12 s
7	320° 46' 51"	0.45"	323° 10' 09"	-14° 34' 05"	0.9866336	16' 12.63"	23° 26' 19"	-14 m 12 s
8	320° 49' 23"	0.45"	323° 12' 37"	-14° 33' 16"	0.9866407	16' 12.62"	23° 26' 19"	-14 m 12 s
9	320° 51' 55"	0.45"	323° 15' 06"	-14° 32' 28"	0.9866479	16' 12.62"	23° 26' 19"	-14 m 12 s
10	320° 54' 26"	0.45"	323° 17' 35"	-14° 31' 40"	0.9866550	16' 12.61"	23° 26' 19"	-14 m 12 s
11	320° 56' 58"	0.45"	323° 20' 03"	-14° 30' 51"	0.9866621	16' 12.60"	23° 26' 19"	-14 m 12 s
12	320° 59' 30"	0.45"	323° 22' 32"	-14° 30' 03"	0.9866693	16' 12.60"	23° 26' 19"	-14 m 13 s
13	321° 02' 02"	0.45"	323° 25' 00"	-14° 29' 14"	0.9866764	16' 12.59"	23° 26' 19"	-14 m 13 s
14	321° 04' 34"	0.45"	323° 27' 29"	-14° 28' 26"	0.9866836	16' 12.58"	23° 26' 19"	-14 m 13 s
15	321° 07' 05"	0.45"	323° 29' 58"	-14° 27' 37"	0.9866907	16' 12.57"	23° 26' 19"	-14 m 13 s
16	321° 09' 37"	0.44"	323° 32' 26"	-14° 26' 49"	0.9866979	16' 12.57"	23° 26' 19"	-14 m 13 s
17	321° 12' 09"	0.44"	323° 34' 55"	-14° 26' 00"	0.9867051	16' 12.56"	23° 26' 19"	-14 m 13 s
18	321° 14' 41"	0.44"	323° 37' 23"	-14° 25' 12"	0.9867123	16' 12.55"	23° 26' 19"	-14 m 13 s
19	321° 17' 12"	0.44"	323° 39' 52"	-14° 24' 23"	0.9867195	16' 12.55"	23° 26' 19"	-14 m 13 s
20	321° 19' 44"	0.44"	323° 42' 20"	-14° 23' 34"	0.9867267	16' 12.54"	23° 26' 19"	-14 m 13 s
21	321° 22' 16"	0.44"	323° 44' 48"	-14° 22' 46"	0.9867339	16' 12.53"	23° 26' 19"	-14 m 13 s
22	321° 24' 48"	0.44"	323° 47' 17"	-14° 21' 57"	0.9867412	16' 12.52"	23° 26' 19"	-14 m 13 s
23	321° 27' 20"	0.44"	323° 49' 45"	-14° 21' 08"	0.9867484	16' 12.52"	23° 26' 19"	-14 m 13 s
24	321° 29' 51"	0.43"	323° 52' 13"	-14° 20' 20"	0.9867557	16' 12.51"	23° 26' 19"	-14 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	97° 16' 13"	5° 06' 29"	98° 14' 01"	28° 20' 21"	0° 57' 34"	15' 41.28"	278° 41' 35"	0.86356
1	97° 49' 53"	5° 05' 59"	98° 52' 00"	28° 17' 51"	0° 57' 33"	15' 40.97"	279° 1' 60"	0.86663
2	98° 23' 31"	5° 05' 27"	99° 29' 56"	28° 15' 11"	0° 57' 32"	15' 40.66"	279° 22' 25"	0.86967
3	98° 57' 09"	5° 04' 54"	100° 07' 49"	28° 12' 21"	0° 57' 31"	15' 40.35"	279° 42' 51"	0.87267
4	99° 30' 45"	5° 04' 18"	100° 45' 39"	28° 09' 20"	0° 57' 30"	15' 40.04"	280° 3' 19"	0.87564
5	100° 04' 20"	5° 03' 41"	101° 23' 25"	28° 06' 10"	0° 57' 29"	15' 39.73"	280° 23' 47"	0.87858
6	100° 37' 54"	5° 03' 03"	102° 01' 07"	28° 02' 48"	0° 57' 27"	15' 39.41"	280° 44' 17"	0.88148
7	101° 11' 26"	5° 02' 22"	102° 38' 46"	27° 59' 17"	0° 57' 26"	15' 39.10"	281° 4' 47"	0.88436
8	101° 44' 58"	5° 01' 40"	103° 16' 21"	27° 55' 36"	0° 57' 25"	15' 38.79"	281° 25' 19"	0.88720
9	102° 18' 28"	5° 00' 56"	103° 53' 52"	27° 51' 44"	0° 57' 24"	15' 38.47"	281° 45' 52"	0.89001
10	102° 51' 56"	5° 00' 11"	104° 31' 19"	27° 47' 43"	0° 57' 23"	15' 38.16"	282° 6' 26"	0.89278
11	103° 25' 24"	4° 59' 23"	105° 08' 41"	27° 43' 31"	0° 57' 22"	15' 37.84"	282° 27' 01"	0.89553
12	103° 58' 50"	4° 58' 34"	105° 45' 60"	27° 39' 10"	0° 57' 20"	15' 37.53"	282° 47' 37"	0.89823
13	104° 32' 15"	4° 57' 44"	106° 23' 14"	27° 34' 39"	0° 57' 19"	15' 37.21"	283° 8' 15"	0.90091
14	105° 05' 39"	4° 56' 52"	107° 00' 23"	27° 29' 58"	0° 57' 18"	15' 36.89"	283° 28' 54"	0.90355
15	105° 39' 01"	4° 55' 58"	107° 37' 28"	27° 25' 08"	0° 57' 17"	15' 36.58"	283° 49' 35"	0.90616
16	106° 12' 22"	4° 55' 02"	108° 14' 29"	27° 20' 07"	0° 57' 16"	15' 36.26"	284° 10' 18"	0.90873
17	106° 45' 42"	4° 54' 05"	108° 51' 25"	27° 14' 58"	0° 57' 15"	15' 35.94"	284° 31' 02"	0.91127
18	107° 19' 00"	4° 53' 06"	109° 28' 15"	27° 09' 38"	0° 57' 13"	15' 35.62"	284° 51' 49"	0.91378
19	107° 52' 17"	4° 52' 06"	110° 05' 01"	27° 04' 10"	0° 57' 12"	15' 35.30"	285° 12' 38"	0.91625
20	108° 25' 33"	4° 51' 04"	110° 41' 42"	26° 58' 32"	0° 57' 11"	15' 34.98"	285° 33' 30"	0.91868
21	108° 58' 48"	4° 49' 60"	111° 18' 18"	26° 52' 44"	0° 57' 10"	15' 34.66"	285° 54' 24"	0.92108
22	109° 32' 01"	4° 48' 55"	111° 54' 49"	26° 46' 48"	0° 57' 09"	15' 34.34"	286° 15' 21"	0.92345
23	110° 05' 13"	4° 47' 48"	112° 31' 15"	26° 40' 42"	0° 57' 08"	15' 34.02"	286° 36' 22"	0.92578
24	110° 38' 23"	4° 46' 39"	113° 07' 35"	26° 34' 27"	0° 57' 06"	15' 33.69"	286° 57' 26"	0.92808

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	321° 29' 51"	0.43"	323° 52' 13"	-14° 20' 20"	0.9867557	16'12.51"	23° 26' 19"	-14 m 13 s
1	321° 32' 23"	0.43"	323° 54' 42"	-14° 19' 31"	0.9867629	16'12.50"	23° 26' 19"	-14 m 13 s
2	321° 34' 55"	0.43"	323° 57' 10"	-14° 18' 42"	0.9867702	16'12.50"	23° 26' 19"	-14 m 13 s
3	321° 37' 27"	0.43"	323° 59' 38"	-14° 17' 53"	0.9867775	16'12.49"	23° 26' 19"	-14 m 13 s
4	321° 39' 58"	0.43"	324° 02' 07"	-14° 17' 04"	0.9867848	16'12.48"	23° 26' 19"	-14 m 13 s
5	321° 42' 30"	0.43"	324° 04' 35"	-14° 16' 15"	0.9867921	16'12.47"	23° 26' 19"	-14 m 13 s
6	321° 45' 02"	0.42"	324° 07' 03"	-14° 15' 27"	0.9867994	16'12.47"	23° 26' 19"	-14 m 13 s
7	321° 47' 34"	0.42"	324° 09' 31"	-14° 14' 38"	0.9868067	16'12.46"	23° 26' 19"	-14 m 13 s
8	321° 50' 05"	0.42"	324° 11' 60"	-14° 13' 49"	0.9868140	16'12.45"	23° 26' 19"	-14 m 13 s
9	321° 52' 37"	0.42"	324° 14' 28"	-14° 12' 60"	0.9868213	16'12.45"	23° 26' 19"	-14 m 13 s
10	321° 55' 09"	0.42"	324° 16' 56"	-14° 12' 11"	0.9868287	16'12.44"	23° 26' 19"	-14 m 13 s
11	321° 57' 41"	0.41"	324° 19' 24"	-14° 11' 22"	0.9868360	16'12.43"	23° 26' 19"	-14 m 13 s
12	322° 00' 12"	0.41"	324° 21' 52"	-14° 10' 33"	0.9868434	16'12.42"	23° 26' 19"	-14 m 13 s
13	322° 02' 44"	0.41"	324° 24' 20"	-14° 09' 44"	0.9868507	16'12.42"	23° 26' 19"	-14 m 13 s
14	322° 05' 16"	0.41"	324° 26' 48"	-14° 08' 55"	0.9868581	16'12.41"	23° 26' 19"	-14 m 13 s
15	322° 07' 47"	0.41"	324° 29' 16"	-14° 08' 05"	0.9868655	16'12.40"	23° 26' 19"	-14 m 13 s
16	322° 10' 19"	0.40"	324° 31' 44"	-14° 07' 16"	0.9868729	16'12.39"	23° 26' 19"	-14 m 13 s
17	322° 12' 51"	0.40"	324° 34' 12"	-14° 06' 27"	0.9868803	16'12.39"	23° 26' 19"	-14 m 14 s
18	322° 15' 23"	0.40"	324° 36' 40"	-14° 05' 38"	0.9868877	16'12.38"	23° 26' 19"	-14 m 14 s
19	322° 17' 54"	0.40"	324° 39' 08"	-14° 04' 49"	0.9868951	16'12.37"	23° 26' 19"	-14 m 14 s
20	322° 20' 26"	0.39"	324° 41' 36"	-14° 03' 60"	0.9869026	16'12.37"	23° 26' 19"	-14 m 14 s
21	322° 22' 58"	0.39"	324° 44' 04"	-14° 03' 10"	0.9869100	16'12.36"	23° 26' 19"	-14 m 14 s
22	322° 25' 29"	0.39"	324° 46' 32"	-14° 02' 21"	0.9869175	16'12.35"	23° 26' 19"	-14 m 14 s
23	322° 28' 01"	0.39"	324° 49' 00"	-14° 01' 32"	0.9869249	16'12.34"	23° 26' 19"	-14 m 14 s
24	322° 30' 33"	0.38"	324° 51' 28"	-14° 00' 42"	0.9869324	16'12.34"	23° 26' 19"	-14 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	110° 38' 23"	4° 46' 39"	113° 07' 35"	26° 34' 27"	0° 57' 06"	15' 33.69"	286° 57' 26"	0.92808
1	111° 11' 33"	4° 45' 30"	113° 43' 50"	26° 28' 04"	0° 57' 05"	15' 33.37"	287° 18' 35"	0.93034
2	111° 44' 40"	4° 44' 18"	114° 19' 60"	26° 21' 31"	0° 57' 04"	15' 33.05"	287° 39' 47"	0.93257
3	112° 17' 47"	4° 43' 05"	114° 56' 04"	26° 14' 50"	0° 57' 03"	15' 32.72"	288° 1' 05"	0.93476
4	112° 50' 52"	4° 41' 50"	115° 32' 02"	26° 07' 60"	0° 57' 02"	15' 32.40"	288° 22' 28"	0.93691
5	113° 23' 56"	4° 40' 34"	116° 07' 55"	26° 01' 01"	0° 57' 00"	15' 32.07"	288° 43' 56"	0.93903
6	113° 56' 58"	4° 39' 17"	116° 43' 42"	25° 53' 53"	0° 56' 59"	15' 31.75"	289° 5' 31"	0.94112
7	114° 29' 59"	4° 37' 57"	117° 19' 24"	25° 46' 38"	0° 56' 58"	15' 31.42"	289° 27' 12"	0.94316
8	115° 02' 59"	4° 36' 37"	117° 54' 59"	25° 39' 13"	0° 56' 57"	15' 31.09"	289° 49' 02"	0.94518
9	115° 35' 57"	4° 35' 15"	118° 30' 29"	25° 31' 41"	0° 56' 56"	15' 30.77"	290° 10' 59"	0.94715
10	116° 08' 54"	4° 33' 51"	119° 05' 53"	25° 23' 60"	0° 56' 54"	15' 30.44"	290° 33' 05"	0.94909
11	116° 41' 50"	4° 32' 26"	119° 41' 12"	25° 16' 11"	0° 56' 53"	15' 30.11"	290° 55' 21"	0.95100
12	117° 14' 44"	4° 30' 59"	120° 16' 24"	25° 08' 13"	0° 56' 52"	15' 29.78"	291° 17' 48"	0.95286
13	117° 47' 36"	4° 29' 31"	120° 51' 30"	25° 00' 08"	0° 56' 51"	15' 29.45"	291° 40' 26"	0.95470
14	118° 20' 28"	4° 28' 02"	121° 26' 30"	24° 51' 55"	0° 56' 50"	15' 29.13"	292° 3' 17"	0.95649
15	118° 53' 17"	4° 26' 31"	122° 01' 25"	24° 43' 34"	0° 56' 48"	15' 28.80"	292° 26' 22"	0.95825
16	119° 26' 06"	4° 24' 59"	122° 36' 13"	24° 35' 06"	0° 56' 47"	15' 28.47"	292° 49' 42"	0.95997
17	119° 58' 53"	4° 23' 25"	123° 10' 55"	24° 26' 29"	0° 56' 46"	15' 28.13"	293° 13' 19"	0.96166
18	120° 31' 39"	4° 21' 50"	123° 45' 31"	24° 17' 45"	0° 56' 45"	15' 27.80"	293° 37' 13"	0.96331
19	121° 04' 23"	4° 20' 14"	124° 20' 00"	24° 08' 54"	0° 56' 44"	15' 27.47"	294° 1' 27"	0.96492
20	121° 37' 05"	4° 18' 36"	124° 54' 24"	23° 59' 55"	0° 56' 42"	15' 27.14"	294° 26' 03"	0.96650
21	122° 09' 47"	4° 16' 57"	125° 28' 41"	23° 50' 49"	0° 56' 41"	15' 26.81"	294° 51' 01"	0.96804
22	122° 42' 27"	4° 15' 17"	126° 02' 53"	23° 41' 36"	0° 56' 40"	15' 26.48"	295° 16' 26"	0.96954
23	123° 15' 05"	4° 13' 35"	126° 36' 58"	23° 32' 16"	0° 56' 39"	15' 26.14"	295° 42' 18"	0.97100
24	123° 47' 42"	4° 11' 52"	127° 10' 56"	23° 22' 48"	0° 56' 37"	15' 25.81"	296° 8' 41"	0.97243

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	322° 30' 33"	0.38"	324° 51' 28"	-14° 00' 42"	0.9869324	16' 12.34"	23° 26' 19"	-14 m 14 s
1	322° 33' 05"	0.38"	324° 53' 56"	-13° 59' 53"	0.9869399	16' 12.33"	23° 26' 19"	-14 m 14 s
2	322° 35' 36"	0.38"	324° 56' 24"	-13° 59' 04"	0.9869474	16' 12.32"	23° 26' 19"	-14 m 14 s
3	322° 38' 08"	0.38"	324° 58' 51"	-13° 58' 14"	0.9869549	16' 12.31"	23° 26' 19"	-14 m 14 s
4	322° 40' 40"	0.37"	325° 01' 19"	-13° 57' 25"	0.9869624	16' 12.31"	23° 26' 19"	-14 m 14 s
5	322° 43' 11"	0.37"	325° 03' 47"	-13° 56' 35"	0.9869699	16' 12.30"	23° 26' 19"	-14 m 14 s
6	322° 45' 43"	0.37"	325° 06' 15"	-13° 55' 46"	0.9869774	16' 12.29"	23° 26' 19"	-14 m 14 s
7	322° 48' 15"	0.36"	325° 08' 42"	-13° 54' 56"	0.9869849	16' 12.28"	23° 26' 19"	-14 m 14 s
8	322° 50' 46"	0.36"	325° 11' 10"	-13° 54' 07"	0.9869925	16' 12.28"	23° 26' 19"	-14 m 14 s
9	322° 53' 18"	0.36"	325° 13' 38"	-13° 53' 17"	0.9870000	16' 12.27"	23° 26' 19"	-14 m 14 s
10	322° 55' 50"	0.35"	325° 16' 05"	-13° 52' 28"	0.9870076	16' 12.26"	23° 26' 19"	-14 m 14 s
11	322° 58' 21"	0.35"	325° 18' 33"	-13° 51' 38"	0.9870152	16' 12.25"	23° 26' 19"	-14 m 14 s
12	323° 00' 53"	0.35"	325° 21' 01"	-13° 50' 49"	0.9870227	16' 12.25"	23° 26' 19"	-14 m 14 s
13	323° 03' 25"	0.34"	325° 23' 28"	-13° 49' 59"	0.9870303	16' 12.24"	23° 26' 19"	-14 m 13 s
14	323° 05' 57"	0.34"	325° 25' 56"	-13° 49' 09"	0.9870379	16' 12.23"	23° 26' 19"	-14 m 13 s
15	323° 08' 28"	0.34"	325° 28' 24"	-13° 48' 20"	0.9870455	16' 12.22"	23° 26' 19"	-14 m 13 s
16	323° 10' 60"	0.33"	325° 30' 51"	-13° 47' 30"	0.9870531	16' 12.22"	23° 26' 19"	-14 m 13 s
17	323° 13' 32"	0.33"	325° 33' 19"	-13° 46' 40"	0.9870608	16' 12.21"	23° 26' 19"	-14 m 13 s
18	323° 16' 03"	0.33"	325° 35' 46"	-13° 45' 50"	0.9870684	16' 12.20"	23° 26' 19"	-14 m 13 s
19	323° 18' 35"	0.32"	325° 38' 14"	-13° 45' 01"	0.9870760	16' 12.19"	23° 26' 19"	-14 m 13 s
20	323° 21' 06"	0.32"	325° 40' 41"	-13° 44' 11"	0.9870837	16' 12.19"	23° 26' 19"	-14 m 13 s
21	323° 23' 38"	0.32"	325° 43' 08"	-13° 43' 21"	0.9870913	16' 12.18"	23° 26' 19"	-14 m 13 s
22	323° 26' 10"	0.31"	325° 45' 36"	-13° 42' 31"	0.9870990	16' 12.17"	23° 26' 19"	-14 m 13 s
23	323° 28' 41"	0.31"	325° 48' 03"	-13° 41' 41"	0.9871067	16' 12.16"	23° 26' 19"	-14 m 13 s
24	323° 31' 13"	0.31"	325° 50' 31"	-13° 40' 51"	0.9871144	16' 12.16"	23° 26' 19"	-14 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	123° 47' 42"	4° 11' 52"	127° 10' 56"	23° 22' 48"	0° 56' 37"	15' 25.81"	296° 8' 41"	0.97243
1	124° 20' 18"	4° 10' 08"	127° 44' 49"	23° 13' 14"	0° 56' 36"	15' 25.48"	296° 35' 38"	0.97382
2	124° 52' 52"	4° 08' 22"	128° 18' 35"	23° 03' 33"	0° 56' 35"	15' 25.15"	297° 3' 12"	0.97518
3	125° 25' 24"	4° 06' 35"	128° 52' 15"	22° 53' 45"	0° 56' 34"	15' 24.81"	297° 31' 25"	0.97650
4	125° 57' 55"	4° 04' 47"	129° 25' 49"	22° 43' 50"	0° 56' 33"	15' 24.48"	298° 0' 24"	0.97778
5	126° 30' 25"	4° 02' 57"	129° 59' 16"	22° 33' 49"	0° 56' 31"	15' 24.14"	298° 30' 11"	0.97902
6	127° 02' 53"	4° 01' 07"	130° 32' 38"	22° 23' 41"	0° 56' 30"	15' 23.81"	299° 0' 51"	0.98023
7	127° 35' 20"	3° 59' 15"	131° 05' 53"	22° 13' 26"	0° 56' 29"	15' 23.48"	299° 32' 32"	0.98140
8	128° 07' 45"	3° 57' 22"	131° 39' 01"	22° 03' 06"	0° 56' 28"	15' 23.14"	300° 5' 18"	0.98253
9	128° 40' 09"	3° 55' 27"	132° 12' 04"	21° 52' 39"	0° 56' 26"	15' 22.81"	300° 39' 16"	0.98363
10	129° 12' 31"	3° 53' 32"	132° 45' 00"	21° 42' 06"	0° 56' 25"	15' 22.47"	301° 14' 36"	0.98468
11	129° 44' 52"	3° 51' 35"	133° 17' 51"	21° 31' 27"	0° 56' 24"	15' 22.14"	301° 51' 26"	0.98571
12	130° 17' 12"	3° 49' 37"	133° 50' 34"	21° 20' 42"	0° 56' 23"	15' 21.80"	302° 29' 56"	0.98669
13	130° 49' 29"	3° 47' 38"	134° 23' 12"	21° 09' 51"	0° 56' 22"	15' 21.47"	303° 10' 19"	0.98764
14	131° 21' 46"	3° 45' 38"	134° 55' 44"	20° 58' 55"	0° 56' 20"	15' 21.13"	303° 52' 48"	0.98855
15	131° 54' 01"	3° 43' 37"	135° 28' 09"	20° 47' 52"	0° 56' 19"	15' 20.79"	304° 37' 39"	0.98942
16	132° 26' 14"	3° 41' 34"	136° 00' 29"	20° 36' 44"	0° 56' 18"	15' 20.46"	305° 25' 10"	0.99026
17	132° 58' 26"	3° 39' 31"	136° 32' 42"	20° 25' 31"	0° 56' 17"	15' 20.12"	306° 15' 44"	0.99106
18	133° 30' 36"	3° 37' 26"	137° 04' 49"	20° 14' 12"	0° 56' 15"	15' 19.79"	307° 9' 45"	0.99182
19	134° 02' 45"	3° 35' 21"	137° 36' 50"	20° 02' 47"	0° 56' 14"	15' 19.45"	308° 7' 43"	0.99255
20	134° 34' 53"	3° 33' 14"	138° 08' 46"	19° 51' 18"	0° 56' 13"	15' 19.12"	309° 10' 13"	0.99323
21	135° 06' 58"	3° 31' 06"	138° 40' 35"	19° 39' 43"	0° 56' 12"	15' 18.78"	310° 17' 58"	0.99389
22	135° 39' 03"	3° 28' 58"	139° 12' 18"	19° 28' 03"	0° 56' 10"	15' 18.45"	311° 31' 49"	0.99450
23	136° 11' 06"	3° 26' 48"	139° 43' 55"	19° 16' 18"	0° 56' 09"	15' 18.11"	312° 52' 46"	0.99508
24	136° 43' 07"	3° 24' 37"	140° 15' 27"	19° 04' 28"	0° 56' 08"	15' 17.78"	314° 22' 05"	0.99562

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	323° 31' 13"	0.31"	325° 50' 31"	-13° 40' 51"	0.9871144	16'12.16"	23° 26' 19"	-14 m 13 s
1	323° 33' 45"	0.30"	325° 52' 58"	-13° 40' 01"	0.9871221	16'12.15"	23° 26' 19"	-14 m 13 s
2	323° 36' 16"	0.30"	325° 55' 25"	-13° 39' 11"	0.9871298	16'12.14"	23° 26' 19"	-14 m 13 s
3	323° 38' 48"	0.29"	325° 57' 53"	-13° 38' 21"	0.9871375	16'12.13"	23° 26' 19"	-14 m 13 s
4	323° 41' 20"	0.29"	326° 00' 20"	-13° 37' 31"	0.9871452	16'12.13"	23° 26' 19"	-14 m 13 s
5	323° 43' 51"	0.29"	326° 02' 47"	-13° 36' 41"	0.9871529	16'12.12"	23° 26' 19"	-14 m 13 s
6	323° 46' 23"	0.28"	326° 05' 15"	-13° 35' 51"	0.9871607	16'12.11"	23° 26' 19"	-14 m 13 s
7	323° 48' 55"	0.28"	326° 07' 42"	-13° 35' 01"	0.9871684	16'12.10"	23° 26' 19"	-14 m 13 s
8	323° 51' 26"	0.27"	326° 10' 09"	-13° 34' 11"	0.9871762	16'12.10"	23° 26' 19"	-14 m 13 s
9	323° 53' 58"	0.27"	326° 12' 36"	-13° 33' 21"	0.9871840	16'12.09"	23° 26' 19"	-14 m 13 s
10	323° 56' 29"	0.27"	326° 15' 04"	-13° 32' 31"	0.9871917	16'12.08"	23° 26' 19"	-14 m 13 s
11	323° 59' 01"	0.26"	326° 17' 31"	-13° 31' 41"	0.9871995	16'12.07"	23° 26' 19"	-14 m 13 s
12	324° 01' 33"	0.26"	326° 19' 58"	-13° 30' 51"	0.9872073	16'12.07"	23° 26' 19"	-14 m 13 s
13	324° 04' 04"	0.25"	326° 22' 25"	-13° 30' 01"	0.9872151	16'12.06"	23° 26' 19"	-14 m 13 s
14	324° 06' 36"	0.25"	326° 24' 52"	-13° 29' 10"	0.9872229	16'12.05"	23° 26' 19"	-14 m 13 s
15	324° 09' 07"	0.25"	326° 27' 19"	-13° 28' 20"	0.9872308	16'12.04"	23° 26' 19"	-14 m 13 s
16	324° 11' 39"	0.24"	326° 29' 46"	-13° 27' 30"	0.9872386	16'12.03"	23° 26' 19"	-14 m 13 s
17	324° 14' 11"	0.24"	326° 32' 13"	-13° 26' 40"	0.9872464	16'12.03"	23° 26' 19"	-14 m 13 s
18	324° 16' 42"	0.23"	326° 34' 40"	-13° 25' 49"	0.9872543	16'12.02"	23° 26' 19"	-14 m 13 s
19	324° 19' 14"	0.23"	326° 37' 07"	-13° 24' 59"	0.9872621	16'12.01"	23° 26' 19"	-14 m 12 s
20	324° 21' 46"	0.22"	326° 39' 34"	-13° 24' 09"	0.9872700	16'12.00"	23° 26' 19"	-14 m 12 s
21	324° 24' 17"	0.22"	326° 42' 01"	-13° 23' 18"	0.9872779	16'12.00"	23° 26' 19"	-14 m 12 s
22	324° 26' 49"	0.21"	326° 44' 28"	-13° 22' 28"	0.9872858	16'11.99"	23° 26' 19"	-14 m 12 s
23	324° 29' 20"	0.21"	326° 46' 55"	-13° 21' 37"	0.9872937	16'11.98"	23° 26' 19"	-14 m 12 s
24	324° 31' 52"	0.21"	326° 49' 22"	-13° 20' 47"	0.9873016	16'11.97"	23° 26' 19"	-14 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	136° 43' 07"	3° 24' 37"	140° 15' 27"	19° 04' 28"	0° 56' 08"	15' 17.78"	314° 22' 05"	0.99562
1	137° 15' 07"	3° 22' 25"	140° 46' 52"	18° 52' 33"	0° 56' 07"	15' 17.44"	316° 1' 16"	0.99613
2	137° 47' 05"	3° 20' 13"	141° 18' 12"	18° 40' 34"	0° 56' 06"	15' 17.11"	317° 52' 13"	0.99659
3	138° 19' 02"	3° 17' 59"	141° 49' 26"	18° 28' 29"	0° 56' 04"	15' 16.77"	319° 57' 16"	0.99703
4	138° 50' 57"	3° 15' 44"	142° 20' 34"	18° 16' 21"	0° 56' 03"	15' 16.44"	322° 19' 19"	0.99742
5	139° 22' 51"	3° 13' 29"	142° 51' 36"	18° 04' 07"	0° 56' 02"	15' 16.10"	325° 2' 00"	0.99778
6	139° 54' 43"	3° 11' 13"	143° 22' 33"	17° 51' 50"	0° 56' 01"	15' 15.77"	328° 9' 51"	0.99810
7	140° 26' 34"	3° 08' 55"	143° 53' 24"	17° 39' 28"	0° 55' 59"	15' 15.44"	331° 48' 26"	0.99839
8	140° 58' 23"	3° 06' 37"	144° 24' 10"	17° 27' 01"	0° 55' 58"	15' 15.10"	336° 4' 29"	0.99864
9	141° 30' 11"	3° 04' 18"	144° 54' 50"	17° 14' 31"	0° 55' 57"	15' 14.77"	341° 5' 45"	0.99885
10	142° 01' 57"	3° 01' 58"	145° 25' 25"	17° 01' 56"	0° 55' 56"	15' 14.44"	347° 0' 26"	0.99903
11	142° 33' 42"	2° 59' 37"	145° 55' 54"	16° 49' 17"	0° 55' 55"	15' 14.10"	353° 55' 32"	0.99917
12	143° 05' 25"	2° 57' 15"	146° 26' 17"	16° 36' 35"	0° 55' 53"	15' 13.77"	1° 53' 53"	0.99927
13	143° 37' 07"	2° 54' 53"	146° 56' 36"	16° 23' 48"	0° 55' 52"	15' 13.44"	10° 50' 02"	0.99934
14	144° 08' 47"	2° 52' 30"	147° 26' 49"	16° 10' 58"	0° 55' 51"	15' 13.11"	20° 26' 41"	0.99937
15	144° 40' 26"	2° 50' 06"	147° 56' 57"	15° 58' 04"	0° 55' 50"	15' 12.78"	30° 15' 40"	0.99937
16	145° 12' 03"	2° 47' 41"	148° 26' 59"	15° 45' 06"	0° 55' 48"	15' 12.45"	39° 44' 59"	0.99933
17	145° 43' 38"	2° 45' 15"	148° 56' 57"	15° 32' 05"	0° 55' 47"	15' 12.12"	48° 28' 30"	0.99926
18	146° 15' 13"	2° 42' 49"	149° 26' 49"	15° 19' 00"	0° 55' 46"	15' 11.79"	56° 11' 46"	0.99915
19	146° 46' 45"	2° 40' 22"	149° 56' 37"	15° 05' 52"	0° 55' 45"	15' 11.46"	62° 51' 35"	0.99900
20	147° 18' 16"	2° 37' 54"	150° 26' 19"	14° 52' 41"	0° 55' 44"	15' 11.14"	68° 32' 05"	0.99882
21	147° 49' 46"	2° 35' 26"	150° 55' 56"	14° 39' 26"	0° 55' 42"	15' 10.81"	73° 20' 45"	0.99861
22	148° 21' 14"	2° 32' 56"	151° 25' 29"	14° 26' 09"	0° 55' 41"	15' 10.48"	77° 25' 45"	0.99836
23	148° 52' 41"	2° 30' 27"	151° 54' 57"	14° 12' 48"	0° 55' 40"	15' 10.16"	80° 54' 40"	0.99807
24	149° 24' 06"	2° 27' 56"	152° 24' 20"	13° 59' 24"	0° 55' 39"	15' 09.83"	83° 53' 56"	0.99775

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	324° 31' 52"	0.21"	326° 49' 22"	-13° 20' 47"	0.9873016	16' 11.97"	23° 26' 19"	-14 m 12 s
1	324° 34' 23"	0.20"	326° 51' 49"	-13° 19' 56"	0.9873095	16' 11.96"	23° 26' 19"	-14 m 12 s
2	324° 36' 55"	0.20"	326° 54' 16"	-13° 19' 06"	0.9873174	16' 11.96"	23° 26' 19"	-14 m 12 s
3	324° 39' 27"	0.19"	326° 56' 43"	-13° 18' 15"	0.9873253	16' 11.95"	23° 26' 19"	-14 m 12 s
4	324° 41' 58"	0.19"	326° 59' 10"	-13° 17' 25"	0.9873332	16' 11.94"	23° 26' 19"	-14 m 12 s
5	324° 44' 30"	0.18"	327° 01' 36"	-13° 16' 34"	0.9873412	16' 11.93"	23° 26' 19"	-14 m 12 s
6	324° 47' 01"	0.18"	327° 04' 03"	-13° 15' 44"	0.9873491	16' 11.93"	23° 26' 19"	-14 m 12 s
7	324° 49' 33"	0.17"	327° 06' 30"	-13° 14' 53"	0.9873571	16' 11.92"	23° 26' 19"	-14 m 12 s
8	324° 52' 05"	0.17"	327° 08' 57"	-13° 14' 02"	0.9873651	16' 11.91"	23° 26' 19"	-14 m 12 s
9	324° 54' 36"	0.16"	327° 11' 24"	-13° 13' 12"	0.9873731	16' 11.90"	23° 26' 19"	-14 m 12 s
10	324° 57' 08"	0.16"	327° 13' 50"	-13° 12' 21"	0.9873811	16' 11.89"	23° 26' 19"	-14 m 12 s
11	324° 59' 39"	0.15"	327° 16' 17"	-13° 11' 30"	0.9873891	16' 11.89"	23° 26' 19"	-14 m 11 s
12	325° 02' 11"	0.15"	327° 18' 44"	-13° 10' 40"	0.9873971	16' 11.88"	23° 26' 19"	-14 m 11 s
13	325° 04' 42"	0.14"	327° 21' 10"	-13° 09' 49"	0.9874051	16' 11.87"	23° 26' 19"	-14 m 11 s
14	325° 07' 14"	0.14"	327° 23' 37"	-13° 08' 58"	0.9874131	16' 11.86"	23° 26' 19"	-14 m 11 s
15	325° 09' 45"	0.13"	327° 26' 04"	-13° 08' 07"	0.9874211	16' 11.85"	23° 26' 19"	-14 m 11 s
16	325° 12' 17"	0.13"	327° 28' 30"	-13° 07' 17"	0.9874292	16' 11.85"	23° 26' 19"	-14 m 11 s
17	325° 14' 49"	0.12"	327° 30' 57"	-13° 06' 26"	0.9874372	16' 11.84"	23° 26' 19"	-14 m 11 s
18	325° 17' 20"	0.12"	327° 33' 23"	-13° 05' 35"	0.9874453	16' 11.83"	23° 26' 19"	-14 m 11 s
19	325° 19' 52"	0.11"	327° 35' 50"	-13° 04' 44"	0.9874534	16' 11.82"	23° 26' 19"	-14 m 11 s
20	325° 22' 23"	0.11"	327° 38' 16"	-13° 03' 53"	0.9874614	16' 11.82"	23° 26' 19"	-14 m 11 s
21	325° 24' 55"	0.10"	327° 40' 43"	-13° 03' 02"	0.9874695	16' 11.81"	23° 26' 19"	-14 m 11 s
22	325° 27' 26"	0.10"	327° 43' 09"	-13° 02' 11"	0.9874776	16' 11.80"	23° 26' 19"	-14 m 11 s
23	325° 29' 58"	0.09"	327° 45' 36"	-13° 01' 20"	0.9874857	16' 11.79"	23° 26' 19"	-14 m 10 s
24	325° 32' 29"	0.09"	327° 48' 02"	-13° 00' 29"	0.9874938	16' 11.78"	23° 26' 19"	-14 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	149° 24' 06"	2° 27' 56"	152° 24' 20"	13° 59' 24"	0° 55' 39"	15' 09.83"	83° 53' 56"	0.99775
1	149° 55' 30"	2° 25' 25"	152° 53' 38"	13° 45' 57"	0° 55' 38"	15' 09.51"	86° 28' 54"	0.99739
2	150° 26' 52"	2° 22' 53"	153° 22' 51"	13° 32' 27"	0° 55' 36"	15' 09.18"	88° 43' 52"	0.99700
3	150° 58' 12"	2° 20' 21"	153° 52' 00"	13° 18' 55"	0° 55' 35"	15' 08.86"	90° 42' 18"	0.99658
4	151° 29' 32"	2° 17' 48"	154° 21' 05"	13° 05' 19"	0° 55' 34"	15' 08.54"	92° 26' 56"	0.99612
5	152° 00' 49"	2° 15' 14"	154° 50' 05"	12° 51' 41"	0° 55' 33"	15' 08.22"	94° 0' 01"	0.99562
6	152° 32' 06"	2° 12' 40"	155° 19' 00"	12° 38' 01"	0° 55' 32"	15' 07.90"	95° 23' 19"	0.99510
7	153° 03' 20"	2° 10' 05"	155° 47' 51"	12° 24' 18"	0° 55' 31"	15' 07.58"	96° 38' 19"	0.99453
8	153° 34' 34"	2° 07' 30"	156° 16' 38"	12° 10' 32"	0° 55' 29"	15' 07.26"	97° 46' 12"	0.99394
9	154° 05' 45"	2° 04' 54"	156° 45' 21"	11° 56' 44"	0° 55' 28"	15' 06.94"	98° 47' 56"	0.99331
10	154° 36' 56"	2° 02' 18"	157° 13' 59"	11° 42' 54"	0° 55' 27"	15' 06.63"	99° 44' 20"	0.99264
11	155° 08' 05"	1° 59' 41"	157° 42' 33"	11° 29' 01"	0° 55' 26"	15' 06.31"	100° 36' 05"	0.99194
12	155° 39' 12"	1° 57' 04"	158° 11' 04"	11° 15' 07"	0° 55' 25"	15' 06.00"	101° 23' 44"	0.99121
13	156° 10' 18"	1° 54' 26"	158° 39' 30"	11° 01' 10"	0° 55' 24"	15' 05.69"	102° 7' 46"	0.99045
14	156° 41' 23"	1° 51' 47"	159° 07' 52"	10° 47' 11"	0° 55' 22"	15' 05.37"	102° 48' 36"	0.98965
15	157° 12' 26"	1° 49' 09"	159° 36' 11"	10° 33' 10"	0° 55' 21"	15' 05.06"	103° 26' 35"	0.98882
16	157° 43' 28"	1° 46' 30"	160° 04' 25"	10° 19' 07"	0° 55' 20"	15' 04.75"	104° 1' 60"	0.98795
17	158° 14' 28"	1° 43' 50"	160° 32' 36"	10° 05' 03"	0° 55' 19"	15' 04.45"	104° 35' 06"	0.98705
18	158° 45' 27"	1° 41' 10"	161° 00' 43"	9° 50' 56"	0° 55' 18"	15' 04.14"	105° 6' 08"	0.98612
19	159° 16' 24"	1° 38' 30"	161° 28' 47"	9° 36' 48"	0° 55' 17"	15' 03.83"	105° 35' 16"	0.98516
20	159° 47' 20"	1° 35' 49"	161° 56' 47"	9° 22' 38"	0° 55' 16"	15' 03.53"	106° 2' 42"	0.98417
21	160° 18' 15"	1° 33' 08"	162° 24' 44"	9° 08' 27"	0° 55' 15"	15' 03.23"	106° 28' 33"	0.98314
22	160° 49' 08"	1° 30' 26"	162° 52' 37"	8° 54' 14"	0° 55' 13"	15' 02.93"	106° 52' 57"	0.98208
23	161° 19' 60"	1° 27' 45"	163° 20' 26"	8° 39' 60"	0° 55' 12"	15' 02.63"	107° 16' 03"	0.98099
24	161° 50' 50"	1° 25' 02"	163° 48' 13"	8° 25' 44"	0° 55' 11"	15' 02.33"	107° 37' 55"	0.97986

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	325° 32' 29"	0.09"	327° 48' 02"	-13° 00' 29"	0.9874938	16'11.78"	23° 26' 19"	-14 m 10 s
1	325° 35' 01"	0.08"	327° 50' 29"	-12° 59' 38"	0.9875019	16'11.78"	23° 26' 19"	-14 m 10 s
2	325° 37' 32"	0.08"	327° 52' 55"	-12° 58' 47"	0.9875101	16'11.77"	23° 26' 19"	-14 m 10 s
3	325° 40' 04"	0.07"	327° 55' 22"	-12° 57' 56"	0.9875182	16'11.76"	23° 26' 19"	-14 m 10 s
4	325° 42' 35"	0.07"	327° 57' 48"	-12° 57' 05"	0.9875264	16'11.75"	23° 26' 19"	-14 m 10 s
5	325° 45' 07"	0.06"	328° 00' 14"	-12° 56' 14"	0.9875345	16'11.74"	23° 26' 19"	-14 m 10 s
6	325° 47' 38"	0.06"	328° 02' 41"	-12° 55' 23"	0.9875427	16'11.74"	23° 26' 19"	-14 m 10 s
7	325° 50' 10"	0.05"	328° 05' 07"	-12° 54' 32"	0.9875508	16'11.73"	23° 26' 19"	-14 m 10 s
8	325° 52' 41"	0.05"	328° 07' 33"	-12° 53' 41"	0.9875590	16'11.72"	23° 26' 19"	-14 m 10 s
9	325° 55' 13"	0.04"	328° 09' 60"	-12° 52' 49"	0.9875672	16'11.71"	23° 26' 19"	-14 m 10 s
10	325° 57' 45"	0.04"	328° 12' 26"	-12° 51' 58"	0.9875754	16'11.70"	23° 26' 19"	-14 m 09 s
11	326° 00' 16"	0.03"	328° 14' 52"	-12° 51' 07"	0.9875836	16'11.69"	23° 26' 19"	-14 m 09 s
12	326° 02' 48"	0.03"	328° 17' 18"	-12° 50' 16"	0.9875918	16'11.69"	23° 26' 19"	-14 m 09 s
13	326° 05' 19"	0.02"	328° 19' 45"	-12° 49' 25"	0.9876001	16'11.68"	23° 26' 19"	-14 m 09 s
14	326° 07' 51"	0.01"	328° 22' 11"	-12° 48' 33"	0.9876083	16'11.67"	23° 26' 19"	-14 m 09 s
15	326° 10' 22"	0.01"	328° 24' 37"	-12° 47' 42"	0.9876165	16'11.66"	23° 26' 19"	-14 m 09 s
16	326° 12' 54"	0.00"	328° 27' 03"	-12° 46' 51"	0.9876248	16'11.65"	23° 26' 19"	-14 m 09 s
17	326° 15' 25"	-0.00"	328° 29' 29"	-12° 45' 59"	0.9876330	16'11.65"	23° 26' 19"	-14 m 09 s
18	326° 17' 56"	-0.01"	328° 31' 55"	-12° 45' 08"	0.9876413	16'11.64"	23° 26' 19"	-14 m 09 s
19	326° 20' 28"	-0.01"	328° 34' 21"	-12° 44' 16"	0.9876496	16'11.63"	23° 26' 19"	-14 m 08 s
20	326° 22' 59"	-0.02"	328° 36' 48"	-12° 43' 25"	0.9876578	16'11.62"	23° 26' 19"	-14 m 08 s
21	326° 25' 31"	-0.02"	328° 39' 14"	-12° 42' 34"	0.9876661	16'11.61"	23° 26' 19"	-14 m 08 s
22	326° 28' 02"	-0.03"	328° 41' 40"	-12° 41' 42"	0.9876744	16'11.61"	23° 26' 19"	-14 m 08 s
23	326° 30' 34"	-0.03"	328° 44' 06"	-12° 40' 51"	0.9876827	16'11.60"	23° 26' 19"	-14 m 08 s
24	326° 33' 05"	-0.04"	328° 46' 32"	-12° 39' 59"	0.9876911	16'11.59"	23° 26' 19"	-14 m 08 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	161° 50' 50"	1° 25' 02"	163° 48' 13"	8° 25' 44"	0° 55' 11"	15' 02.33"	107° 37' 55"	0.97986
1	162° 21' 39"	1° 22' 20"	164° 15' 56"	8° 11' 26"	0° 55' 10"	15' 02.03"	107° 58' 40"	0.97871
2	162° 52' 27"	1° 19' 37"	164° 43' 36"	7° 57' 08"	0° 55' 09"	15' 01.73"	108° 18' 21"	0.97752
3	163° 23' 13"	1° 16' 54"	165° 11' 13"	7° 42' 48"	0° 55' 08"	15' 01.44"	108° 37' 05"	0.97630
4	163° 53' 58"	1° 14' 11"	165° 38' 47"	7° 28' 27"	0° 55' 07"	15' 01.15"	108° 54' 54"	0.97505
5	164° 24' 42"	1° 11' 27"	166° 06' 18"	7° 14' 05"	0° 55' 06"	15' 00.86"	109° 11' 52"	0.97377
6	164° 55' 24"	1° 08' 44"	166° 33' 46"	6° 59' 42"	0° 55' 05"	15' 00.57"	109° 28' 03"	0.97246
7	165° 26' 05"	1° 05' 60"	167° 01' 11"	6° 45' 18"	0° 55' 04"	15' 00.28"	109° 43' 29"	0.97111
8	165° 56' 44"	1° 03' 15"	167° 28' 34"	6° 30' 53"	0° 55' 03"	14' 60.00"	109° 58' 13"	0.96974
9	166° 27' 23"	1° 00' 31"	167° 55' 53"	6° 16' 27"	0° 55' 02"	14' 59.71"	110° 12' 18"	0.96834
10	166° 57' 59"	0° 57' 46"	168° 23' 10"	6° 02' 00"	0° 55' 01"	14' 59.43"	110° 25' 45"	0.96690
11	167° 28' 35"	0° 55' 01"	168° 50' 25"	5° 47' 33"	0° 54' 60"	14' 59.15"	110° 38' 36"	0.96544
12	167° 59' 09"	0° 52' 16"	169° 17' 37"	5° 33' 05"	0° 54' 59"	14' 58.87"	110° 50' 54"	0.96394
13	168° 29' 42"	0° 49' 31"	169° 44' 46"	5° 18' 36"	0° 54' 58"	14' 58.59"	111° 2' 40"	0.96242
14	169° 00' 14"	0° 46' 46"	170° 11' 53"	5° 04' 06"	0° 54' 57"	14' 58.32"	111° 13' 56"	0.96086
15	169° 30' 45"	0° 44' 01"	170° 38' 58"	4° 49' 36"	0° 54' 56"	14' 58.05"	111° 24' 43"	0.95928
16	170° 01' 14"	0° 41' 15"	171° 06' 01"	4° 35' 06"	0° 54' 55"	14' 57.78"	111° 35' 02"	0.95767
17	170° 31' 42"	0° 38' 30"	171° 33' 01"	4° 20' 35"	0° 54' 54"	14' 57.51"	111° 44' 55"	0.95602
18	171° 02' 08"	0° 35' 44"	171° 59' 59"	4° 06' 03"	0° 54' 53"	14' 57.24"	111° 54' 23"	0.95435
19	171° 32' 34"	0° 32' 58"	172° 26' 56"	3° 51' 31"	0° 54' 52"	14' 56.98"	112° 3' 26"	0.95265
20	172° 02' 58"	0° 30' 12"	172° 53' 50"	3° 36' 59"	0° 54' 51"	14' 56.71"	112° 12' 06"	0.95092
21	172° 33' 21"	0° 27' 26"	173° 20' 42"	3° 22' 27"	0° 54' 50"	14' 56.45"	112° 20' 24"	0.94916
22	173° 03' 43"	0° 24' 41"	173° 47' 32"	3° 07' 54"	0° 54' 49"	14' 56.20"	112° 28' 21"	0.94738
23	173° 34' 04"	0° 21' 55"	174° 14' 21"	2° 53' 22"	0° 54' 48"	14' 55.94"	112° 35' 56"	0.94556
24	174° 04' 23"	0° 19' 09"	174° 41' 08"	2° 38' 49"	0° 54' 47"	14' 55.69"	112° 43' 12"	0.94372

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	326° 33' 05"	-0.04"	328° 46' 32"	-12° 39' 59"	0.9876911	16' 11.59"	23° 26' 19"	-14 m 08 s
1	326° 35' 37"	-0.04"	328° 48' 58"	-12° 39' 08"	0.9876994	16' 11.58"	23° 26' 19"	-14 m 08 s
2	326° 38' 08"	-0.05"	328° 51' 24"	-12° 38' 16"	0.9877077	16' 11.57"	23° 26' 19"	-14 m 08 s
3	326° 40' 40"	-0.06"	328° 53' 50"	-12° 37' 24"	0.9877160	16' 11.56"	23° 26' 19"	-14 m 07 s
4	326° 43' 11"	-0.06"	328° 56' 15"	-12° 36' 33"	0.9877244	16' 11.56"	23° 26' 19"	-14 m 07 s
5	326° 45' 43"	-0.07"	328° 58' 41"	-12° 35' 41"	0.9877327	16' 11.55"	23° 26' 19"	-14 m 07 s
6	326° 48' 14"	-0.07"	329° 01' 07"	-12° 34' 50"	0.9877411	16' 11.54"	23° 26' 19"	-14 m 07 s
7	326° 50' 46"	-0.08"	329° 03' 33"	-12° 33' 58"	0.9877495	16' 11.53"	23° 26' 19"	-14 m 07 s
8	326° 53' 17"	-0.08"	329° 05' 59"	-12° 33' 06"	0.9877579	16' 11.52"	23° 26' 19"	-14 m 07 s
9	326° 55' 49"	-0.09"	329° 08' 25"	-12° 32' 15"	0.9877663	16' 11.52"	23° 26' 19"	-14 m 07 s
10	326° 58' 20"	-0.09"	329° 10' 51"	-12° 31' 23"	0.9877746	16' 11.51"	23° 26' 19"	-14 m 07 s
11	327° 00' 51"	-0.10"	329° 13' 16"	-12° 30' 31"	0.9877831	16' 11.50"	23° 26' 19"	-14 m 06 s
12	327° 03' 23"	-0.11"	329° 15' 42"	-12° 29' 39"	0.9877915	16' 11.49"	23° 26' 19"	-14 m 06 s
13	327° 05' 54"	-0.11"	329° 18' 08"	-12° 28' 48"	0.9877999	16' 11.48"	23° 26' 19"	-14 m 06 s
14	327° 08' 26"	-0.12"	329° 20' 34"	-12° 27' 56"	0.9878083	16' 11.47"	23° 26' 19"	-14 m 06 s
15	327° 10' 57"	-0.12"	329° 22' 59"	-12° 27' 04"	0.9878168	16' 11.47"	23° 26' 19"	-14 m 06 s
16	327° 13' 29"	-0.13"	329° 25' 25"	-12° 26' 12"	0.9878252	16' 11.46"	23° 26' 19"	-14 m 06 s
17	327° 16' 00"	-0.13"	329° 27' 51"	-12° 25' 20"	0.9878337	16' 11.45"	23° 26' 19"	-14 m 06 s
18	327° 18' 32"	-0.14"	329° 30' 17"	-12° 24' 28"	0.9878421	16' 11.44"	23° 26' 19"	-14 m 05 s
19	327° 21' 03"	-0.14"	329° 32' 42"	-12° 23' 36"	0.9878506	16' 11.43"	23° 26' 19"	-14 m 05 s
20	327° 23' 34"	-0.15"	329° 35' 08"	-12° 22' 45"	0.9878591	16' 11.42"	23° 26' 19"	-14 m 05 s
21	327° 26' 06"	-0.15"	329° 37' 33"	-12° 21' 53"	0.9878675	16' 11.42"	23° 26' 19"	-14 m 05 s
22	327° 28' 37"	-0.16"	329° 39' 59"	-12° 21' 01"	0.9878760	16' 11.41"	23° 26' 19"	-14 m 05 s
23	327° 31' 09"	-0.17"	329° 42' 25"	-12° 20' 09"	0.9878845	16' 11.40"	23° 26' 19"	-14 m 05 s
24	327° 33' 40"	-0.17"	329° 44' 50"	-12° 19' 17"	0.9878930	16' 11.39"	23° 26' 19"	-14 m 05 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	174° 04' 23"	0° 19' 09"	174° 41' 08"	2° 38' 49"	0° 54' 47"	14' 55.69"	112° 43' 12"	0.94372
1	174° 34' 41"	0° 16' 23"	175° 07' 53"	2° 24' 16"	0° 54' 46"	14' 55.44"	112° 50' 08"	0.94185
2	175° 04' 59"	0° 13' 37"	175° 34' 37"	2° 09' 44"	0° 54' 45"	14' 55.19"	112° 56' 46"	0.93995
3	175° 35' 14"	0° 10' 51"	176° 01' 19"	1° 55' 11"	0° 54' 44"	14' 54.94"	113° 3' 05"	0.93803
4	176° 05' 29"	0° 08' 05"	176° 27' 60"	1° 40' 39"	0° 54' 43"	14' 54.70"	113° 9' 07"	0.93607
5	176° 35' 43"	0° 05' 19"	176° 54' 39"	1° 26' 06"	0° 54' 42"	14' 54.46"	113° 14' 52"	0.93409
6	177° 05' 55"	0° 02' 34"	177° 21' 17"	1° 11' 34"	0° 54' 42"	14' 54.22"	113° 20' 21"	0.93209
7	177° 36' 07"	0° 00'-12"	177° 47' 54"	0° 57' 02"	0° 54' 41"	14' 53.98"	113° 25' 33"	0.93005
8	178° 06' 17"	0° -2' 58"	178° 14' 29"	0° 42' 31"	0° 54' 40"	14' 53.75"	113° 30' 30"	0.92799
9	178° 36' 27"	0° -5' 43"	178° 41' 04"	0° 27' 59"	0° 54' 39"	14' 53.51"	113° 35' 11"	0.92591
10	179° 06' 35"	0° -8' 28"	179° 07' 37"	0° 13' 29"	0° 54' 38"	14' 53.29"	113° 39' 38"	0.92379
11	179° 36' 42"	0°-11' 14"	179° 34' 09"	0° -1' 02"	0° 54' 37"	14' 53.06"	113° 43' 50"	0.92165
12	180° 06' 48"	0°-13' 59"	180° 00' 41"	0°-15' 32"	0° 54' 36"	14' 52.84"	113° 47' 48"	0.91949
13	180° 36' 53"	0°-16' 44"	180° 27' 11"	0°-30' 01"	0° 54' 36"	14' 52.61"	113° 51' 32"	0.91730
14	181° 06' 57"	0°-19' 28"	180° 53' 41"	0°-44' 30"	0° 54' 35"	14' 52.40"	113° 55' 03"	0.91508
15	181° 36' 60"	0°-22' 13"	181° 20' 10"	0°-58' 58"	0° 54' 34"	14' 52.18"	113° 58' 21"	0.91284
16	182° 07' 02"	0°-24' 57"	181° 46' 38"	-1° 13' 25"	0° 54' 33"	14' 51.97"	114° 1' 25"	0.91057
17	182° 37' 03"	0°-27' 42"	182° 13' 06"	-1° 27' 52"	0° 54' 33"	14' 51.76"	114° 4' 17"	0.90828
18	183° 07' 03"	0°-30' 26"	182° 39' 33"	-1° 42' 18"	0° 54' 32"	14' 51.55"	114° 6' 56"	0.90596
19	183° 37' 02"	0°-33' 09"	183° 05' 60"	-1° 56' 43"	0° 54' 31"	14' 51.35"	114° 9' 23"	0.90362
20	184° 07' 00"	0°-35' 53"	183° 32' 26"	-2° 11' 07"	0° 54' 30"	14' 51.15"	114° 11' 39"	0.90125
21	184° 36' 57"	0°-38' 36"	183° 58' 52"	-2° 25' 30"	0° 54' 30"	14' 50.95"	114° 13' 42"	0.89886
22	185° 06' 54"	0°-41' 20"	184° 25' 17"	-2° 39' 52"	0° 54' 29"	14' 50.75"	114° 15' 34"	0.89644
23	185° 36' 49"	0°-44' 02"	184° 51' 43"	-2° 54' 14"	0° 54' 28"	14' 50.56"	114° 17' 14"	0.89401
24	186° 06' 44"	0°-46' 45"	185° 18' 08"	-3° 08' 34"	0° 54' 27"	14' 50.37"	114° 18' 44"	0.89154

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	327° 33' 40"	-0.17"	329° 44' 50"	-12° 19' 17"	0.9878930	16'11.39"	23° 26' 19"	-14 m 05 s
1	327° 36' 12"	-0.18"	329° 47' 16"	-12° 18' 25"	0.9879016	16'11.38"	23° 26' 19"	-14 m 04 s
2	327° 38' 43"	-0.18"	329° 49' 41"	-12° 17' 33"	0.9879101	16'11.37"	23° 26' 19"	-14 m 04 s
3	327° 41' 14"	-0.19"	329° 52' 07"	-12° 16' 40"	0.9879186	16'11.37"	23° 26' 19"	-14 m 04 s
4	327° 43' 46"	-0.19"	329° 54' 32"	-12° 15' 48"	0.9879272	16'11.36"	23° 26' 19"	-14 m 04 s
5	327° 46' 17"	-0.20"	329° 56' 58"	-12° 14' 56"	0.9879357	16'11.35"	23° 26' 19"	-14 m 04 s
6	327° 48' 49"	-0.20"	329° 59' 23"	-12° 14' 04"	0.9879443	16'11.34"	23° 26' 19"	-14 m 04 s
7	327° 51' 20"	-0.21"	330° 01' 49"	-12° 13' 12"	0.9879528	16'11.33"	23° 26' 19"	-14 m 03 s
8	327° 53' 51"	-0.22"	330° 04' 14"	-12° 12' 20"	0.9879614	16'11.32"	23° 26' 19"	-14 m 03 s
9	327° 56' 23"	-0.22"	330° 06' 39"	-12° 11' 28"	0.9879700	16'11.31"	23° 26' 19"	-14 m 03 s
10	327° 58' 54"	-0.23"	330° 09' 05"	-12° 10' 35"	0.9879786	16'11.31"	23° 26' 19"	-14 m 03 s
11	328° 01' 26"	-0.23"	330° 11' 30"	-12° 09' 43"	0.9879872	16'11.30"	23° 26' 19"	-14 m 03 s
12	328° 03' 57"	-0.24"	330° 13' 56"	-12° 08' 51"	0.9879958	16'11.29"	23° 26' 19"	-14 m 03 s
13	328° 06' 28"	-0.24"	330° 16' 21"	-12° 07' 59"	0.9880044	16'11.28"	23° 26' 19"	-14 m 02 s
14	328° 08' 60"	-0.25"	330° 18' 46"	-12° 07' 06"	0.9880130	16'11.27"	23° 26' 19"	-14 m 02 s
15	328° 11' 31"	-0.25"	330° 21' 11"	-12° 06' 14"	0.9880216	16'11.26"	23° 26' 19"	-14 m 02 s
16	328° 14' 03"	-0.26"	330° 23' 37"	-12° 05' 22"	0.9880303	16'11.26"	23° 26' 19"	-14 m 02 s
17	328° 16' 34"	-0.26"	330° 26' 02"	-12° 04' 29"	0.9880389	16'11.25"	23° 26' 19"	-14 m 02 s
18	328° 19' 05"	-0.27"	330° 28' 27"	-12° 03' 37"	0.9880476	16'11.24"	23° 26' 19"	-14 m 02 s
19	328° 21' 37"	-0.27"	330° 30' 52"	-12° 02' 45"	0.9880562	16'11.23"	23° 26' 19"	-14 m 01 s
20	328° 24' 08"	-0.28"	330° 33' 18"	-12° 01' 52"	0.9880649	16'11.22"	23° 26' 19"	-14 m 01 s
21	328° 26' 40"	-0.28"	330° 35' 43"	-12° 00' 60"	0.9880735	16'11.21"	23° 26' 19"	-14 m 01 s
22	328° 29' 11"	-0.29"	330° 38' 08"	-12° 00' 07"	0.9880822	16'11.20"	23° 26' 19"	-14 m 01 s
23	328° 31' 42"	-0.30"	330° 40' 33"	-11° 59' 15"	0.9880909	16'11.20"	23° 26' 19"	-14 m 01 s
24	328° 34' 14"	-0.30"	330° 42' 58"	-11° 58' 22"	0.9880996	16'11.19"	23° 26' 19"	-14 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	186° 06' 44"	0°-46' 45"	185° 18' 08"	-3° 08' 34"	0° 54' 27"	14' 50.37"	114° 18' 44"	0.89154
1	186° 36' 37"	0°-49' 27"	185° 44' 33"	-3° 22' 53"	0° 54' 27"	14' 50.19"	114° 20' 02"	0.88906
2	187° 06' 30"	0°-52' 09"	186° 10' 58"	-3° 37' 11"	0° 54' 26"	14' 50.01"	114° 21' 09"	0.88655
3	187° 36' 22"	0°-54' 51"	186° 37' 24"	-3° 51' 28"	0° 54' 25"	14' 49.83"	114° 22' 06"	0.88401
4	188° 06' 13"	0°-57' 32"	187° 03' 49"	-4° 05' 44"	0° 54' 25"	14' 49.65"	114° 22' 52"	0.88146
5	188° 36' 03"	-1° 00' 13"	187° 30' 14"	-4° 19' 58"	0° 54' 24"	14' 49.48"	114° 23' 28"	0.87888
6	189° 05' 53"	-1° 02' 54"	187° 56' 40"	-4° 34' 11"	0° 54' 24"	14' 49.31"	114° 23' 53"	0.87627
7	189° 35' 41"	-1° 05' 34"	188° 23' 06"	-4° 48' 23"	0° 54' 23"	14' 49.14"	114° 24' 08"	0.87365
8	190° 05' 29"	-1° 08' 14"	188° 49' 33"	-5° 02' 33"	0° 54' 22"	14' 48.98"	114° 24' 14"	0.87100
9	190° 35' 16"	-1° 10' 54"	189° 15' 59"	-5° 16' 42"	0° 54' 22"	14' 48.82"	114° 24' 09"	0.86833
10	191° 05' 03"	-1° 13' 33"	189° 42' 27"	-5° 30' 49"	0° 54' 21"	14' 48.66"	114° 23' 54"	0.86564
11	191° 34' 48"	-1° 16' 12"	190° 08' 54"	-5° 44' 55"	0° 54' 21"	14' 48.51"	114° 23' 30"	0.86293
12	192° 04' 33"	-1° 18' 51"	190° 35' 23"	-5° 58' 59"	0° 54' 20"	14' 48.36"	114° 22' 56"	0.86019
13	192° 34' 18"	-1° 21' 29"	191° 01' 52"	-6° 13' 02"	0° 54' 19"	14' 48.21"	114° 22' 13"	0.85744
14	193° 04' 01"	-1° 24' 06"	191° 28' 22"	-6° 27' 02"	0° 54' 19"	14' 48.07"	114° 21' 20"	0.85466
15	193° 33' 44"	-1° 26' 43"	191° 54' 53"	-6° 41' 02"	0° 54' 18"	14' 47.93"	114° 20' 18"	0.85186
16	194° 03' 26"	-1° 29' 20"	192° 21' 24"	-6° 54' 59"	0° 54' 18"	14' 47.79"	114° 19' 07"	0.84904
17	194° 33' 08"	-1° 31' 56"	192° 47' 57"	-7° 08' 55"	0° 54' 17"	14' 47.66"	114° 17' 47"	0.84620
18	195° 02' 49"	-1° 34' 32"	193° 14' 30"	-7° 22' 49"	0° 54' 17"	14' 47.53"	114° 16' 17"	0.84334
19	195° 32' 29"	-1° 37' 08"	193° 41' 05"	-7° 36' 41"	0° 54' 17"	14' 47.41"	114° 14' 39"	0.84046
20	196° 02' 09"	-1° 39' 43"	194° 07' 40"	-7° 50' 31"	0° 54' 16"	14' 47.29"	114° 12' 52"	0.83756
21	196° 31' 49"	-1° 42' 17"	194° 34' 17"	-8° 04' 19"	0° 54' 16"	14' 47.17"	114° 10' 56"	0.83464
22	197° 01' 27"	-1° 44' 51"	195° 00' 55"	-8° 18' 05"	0° 54' 15"	14' 47.06"	114° 8' 51"	0.83169
23	197° 31' 06"	-1° 47' 24"	195° 27' 35"	-8° 31' 49"	0° 54' 15"	14' 46.95"	114° 6' 37"	0.82873
24	198° 00' 43"	-1° 49' 57"	195° 54' 16"	-8° 45' 31"	0° 54' 14"	14' 46.84"	114° 4' 15"	0.82575

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	328° 34' 14"	-0.30"	330° 42' 58"	-11° 58' 22"	0.9880996	16' 11.19"	23° 26' 19"	-14 m 01 s
1	328° 36' 45"	-0.31"	330° 45' 23"	-11° 57' 30"	0.9881083	16' 11.18"	23° 26' 19"	-14 m 00 s
2	328° 39' 16"	-0.31"	330° 47' 48"	-11° 56' 37"	0.9881170	16' 11.17"	23° 26' 19"	-14 m 00 s
3	328° 41' 48"	-0.32"	330° 50' 14"	-11° 55' 45"	0.9881257	16' 11.16"	23° 26' 19"	-14 m 00 s
4	328° 44' 19"	-0.32"	330° 52' 39"	-11° 54' 52"	0.9881345	16' 11.15"	23° 26' 19"	-13 m 60 s
5	328° 46' 50"	-0.33"	330° 55' 04"	-11° 53' 59"	0.9881432	16' 11.14"	23° 26' 19"	-13 m 60 s
6	328° 49' 22"	-0.33"	330° 57' 29"	-11° 53' 07"	0.9881519	16' 11.14"	23° 26' 19"	-13 m 59 s
7	328° 51' 53"	-0.34"	330° 59' 54"	-11° 52' 14"	0.9881607	16' 11.13"	23° 26' 19"	-13 m 59 s
8	328° 54' 24"	-0.34"	331° 02' 19"	-11° 51' 22"	0.9881694	16' 11.12"	23° 26' 19"	-13 m 59 s
9	328° 56' 56"	-0.35"	331° 04' 44"	-11° 50' 29"	0.9881782	16' 11.11"	23° 26' 19"	-13 m 59 s
10	328° 59' 27"	-0.35"	331° 07' 09"	-11° 49' 36"	0.9881870	16' 11.10"	23° 26' 19"	-13 m 59 s
11	329° 01' 59"	-0.36"	331° 09' 33"	-11° 48' 43"	0.9881957	16' 11.09"	23° 26' 19"	-13 m 58 s
12	329° 04' 30"	-0.36"	331° 11' 58"	-11° 47' 51"	0.9882045	16' 11.08"	23° 26' 19"	-13 m 58 s
13	329° 07' 01"	-0.37"	331° 14' 23"	-11° 46' 58"	0.9882133	16' 11.08"	23° 26' 19"	-13 m 58 s
14	329° 09' 33"	-0.37"	331° 16' 48"	-11° 46' 05"	0.9882221	16' 11.07"	23° 26' 19"	-13 m 58 s
15	329° 12' 04"	-0.38"	331° 19' 13"	-11° 45' 12"	0.9882309	16' 11.06"	23° 26' 19"	-13 m 58 s
16	329° 14' 35"	-0.38"	331° 21' 38"	-11° 44' 20"	0.9882397	16' 11.05"	23° 26' 19"	-13 m 57 s
17	329° 17' 07"	-0.39"	331° 24' 03"	-11° 43' 27"	0.9882486	16' 11.04"	23° 26' 19"	-13 m 57 s
18	329° 19' 38"	-0.39"	331° 26' 28"	-11° 42' 34"	0.9882574	16' 11.03"	23° 26' 19"	-13 m 57 s
19	329° 22' 09"	-0.40"	331° 28' 52"	-11° 41' 41"	0.9882662	16' 11.02"	23° 26' 19"	-13 m 57 s
20	329° 24' 41"	-0.40"	331° 31' 17"	-11° 40' 48"	0.9882751	16' 11.02"	23° 26' 19"	-13 m 57 s
21	329° 27' 12"	-0.41"	331° 33' 42"	-11° 39' 55"	0.9882839	16' 11.01"	23° 26' 19"	-13 m 56 s
22	329° 29' 43"	-0.41"	331° 36' 07"	-11° 39' 02"	0.9882928	16' 11.00"	23° 26' 19"	-13 m 56 s
23	329° 32' 14"	-0.42"	331° 38' 31"	-11° 38' 09"	0.9883016	16' 10.99"	23° 26' 19"	-13 m 56 s
24	329° 34' 46"	-0.42"	331° 40' 56"	-11° 37' 16"	0.9883105	16' 10.98"	23° 26' 19"	-13 m 56 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	198° 00' 43"	-1° 49' 57"	195° 54' 16"	-8° 45' 31"	0° 54' 14"	14' 46.84"	114° 4' 15"	0.82575
1	198° 30' 20"	-1° 52' 29"	196° 20' 58"	-8° 59' 11"	0° 54' 14"	14' 46.74"	114° 1' 44"	0.82275
2	198° 59' 57"	-1° 55' 01"	196° 47' 42"	-9° 12' 49"	0° 54' 14"	14' 46.64"	113° 59' 04"	0.81973
3	199° 29' 33"	-1° 57' 32"	197° 14' 27"	-9° 26' 24"	0° 54' 13"	14' 46.55"	113° 56' 16"	0.81669
4	199° 59' 09"	-2° 00' 03"	197° 41' 14"	-9° 39' 57"	0° 54' 13"	14' 46.46"	113° 53' 20"	0.81364
5	200° 28' 45"	-2° 02' 33"	198° 08' 03"	-9° 53' 28"	0° 54' 13"	14' 46.37"	113° 50' 15"	0.81056
6	200° 58' 20"	-2° 05' 03"	198° 34' 53"	-10° 06' 57"	0° 54' 12"	14' 46.29"	113° 47' 02"	0.80747
7	201° 27' 54"	-2° 07' 32"	199° 01' 45"	-10° 20' 23"	0° 54' 12"	14' 46.21"	113° 43' 41"	0.80435
8	201° 57' 28"	-2° 10' 00"	199° 28' 39"	-10° 33' 47"	0° 54' 12"	14' 46.13"	113° 40' 11"	0.80122
9	202° 27' 02"	-2° 12' 28"	199° 55' 35"	-10° 47' 08"	0° 54' 12"	14' 46.06"	113° 36' 33"	0.79808
10	202° 56' 36"	-2° 14' 55"	200° 22' 33"	-11° 00' 27"	0° 54' 11"	14' 46.00"	113° 32' 47"	0.79491
11	203° 26' 09"	-2° 17' 22"	200° 49' 33"	-11° 13' 43"	0° 54' 11"	14' 45.93"	113° 28' 53"	0.79173
12	203° 55' 42"	-2° 19' 47"	201° 16' 35"	-11° 26' 56"	0° 54' 11"	14' 45.87"	113° 24' 51"	0.78852
13	204° 25' 15"	-2° 22' 13"	201° 43' 40"	-11° 40' 07"	0° 54' 11"	14' 45.82"	113° 20' 40"	0.78531
14	204° 54' 47"	-2° 24' 37"	202° 10' 46"	-11° 53' 16"	0° 54' 11"	14' 45.77"	113° 16' 22"	0.78207
15	205° 24' 19"	-2° 27' 01"	202° 37' 55"	-12° 06' 21"	0° 54' 10"	14' 45.72"	113° 11' 56"	0.77882
16	205° 53' 51"	-2° 29' 24"	203° 05' 06"	-12° 19' 24"	0° 54' 10"	14' 45.68"	113° 7' 21"	0.77555
17	206° 23' 23"	-2° 31' 47"	203° 32' 20"	-12° 32' 24"	0° 54' 10"	14' 45.64"	113° 2' 39"	0.77226
18	206° 52' 54"	-2° 34' 09"	203° 59' 36"	-12° 45' 21"	0° 54' 10"	14' 45.61"	112° 57' 49"	0.76896
19	207° 22' 26"	-2° 36' 30"	204° 26' 55"	-12° 58' 15"	0° 54' 10"	14' 45.58"	112° 52' 51"	0.76564
20	207° 51' 57"	-2° 38' 51"	204° 54' 16"	-13° 11' 06"	0° 54' 10"	14' 45.56"	112° 47' 45"	0.76231
21	208° 21' 28"	-2° 41' 10"	205° 21' 40"	-13° 23' 54"	0° 54' 10"	14' 45.54"	112° 42' 31"	0.75896
22	208° 50' 59"	-2° 43' 30"	205° 49' 06"	-13° 36' 39"	0° 54' 10"	14' 45.52"	112° 37' 09"	0.75559
23	209° 20' 30"	-2° 45' 48"	206° 16' 36"	-13° 49' 22"	0° 54' 10"	14' 45.51"	112° 31' 40"	0.75221
24	209° 50' 01"	-2° 48' 05"	206° 44' 08"	-14° 02' 00"	0° 54' 10"	14' 45.50"	112° 26' 02"	0.74882

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	329° 34' 46"	-0.42"	331° 40' 56"	-11° 37' 16"	0.9883105	16'10.98"	23° 26' 19"	-13 m 56 s
1	329° 37' 17"	-0.42"	331° 43' 21"	-11° 36' 23"	0.9883194	16'10.97"	23° 26' 19"	-13 m 56 s
2	329° 39' 48"	-0.43"	331° 45' 45"	-11° 35' 30"	0.9883283	16'10.96"	23° 26' 19"	-13 m 55 s
3	329° 42' 20"	-0.43"	331° 48' 10"	-11° 34' 37"	0.9883372	16'10.95"	23° 26' 19"	-13 m 55 s
4	329° 44' 51"	-0.44"	331° 50' 35"	-11° 33' 44"	0.9883461	16'10.95"	23° 26' 19"	-13 m 55 s
5	329° 47' 22"	-0.44"	331° 52' 59"	-11° 32' 51"	0.9883550	16'10.94"	23° 26' 19"	-13 m 55 s
6	329° 49' 54"	-0.45"	331° 55' 24"	-11° 31' 58"	0.9883639	16'10.93"	23° 26' 19"	-13 m 55 s
7	329° 52' 25"	-0.45"	331° 57' 49"	-11° 31' 05"	0.9883728	16'10.92"	23° 26' 19"	-13 m 54 s
8	329° 54' 56"	-0.46"	332° 00' 13"	-11° 30' 12"	0.9883817	16'10.91"	23° 26' 19"	-13 m 54 s
9	329° 57' 27"	-0.46"	332° 02' 38"	-11° 29' 19"	0.9883907	16'10.90"	23° 26' 19"	-13 m 54 s
10	329° 59' 59"	-0.47"	332° 05' 02"	-11° 28' 26"	0.9883996	16'10.89"	23° 26' 19"	-13 m 54 s
11	330° 02' 30"	-0.47"	332° 07' 27"	-11° 27' 32"	0.9884085	16'10.88"	23° 26' 19"	-13 m 53 s
12	330° 05' 01"	-0.47"	332° 09' 51"	-11° 26' 39"	0.9884175	16'10.88"	23° 26' 19"	-13 m 53 s
13	330° 07' 33"	-0.48"	332° 12' 16"	-11° 25' 46"	0.9884265	16'10.87"	23° 26' 19"	-13 m 53 s
14	330° 10' 04"	-0.48"	332° 14' 40"	-11° 24' 53"	0.9884354	16'10.86"	23° 26' 19"	-13 m 53 s
15	330° 12' 35"	-0.49"	332° 17' 05"	-11° 23' 60"	0.9884444	16'10.85"	23° 26' 19"	-13 m 53 s
16	330° 15' 06"	-0.49"	332° 19' 29"	-11° 23' 06"	0.9884534	16'10.84"	23° 26' 19"	-13 m 52 s
17	330° 17' 38"	-0.49"	332° 21' 53"	-11° 22' 13"	0.9884624	16'10.83"	23° 26' 19"	-13 m 52 s
18	330° 20' 09"	-0.50"	332° 24' 18"	-11° 21' 20"	0.9884714	16'10.82"	23° 26' 19"	-13 m 52 s
19	330° 22' 40"	-0.50"	332° 26' 42"	-11° 20' 26"	0.9884804	16'10.81"	23° 26' 19"	-13 m 52 s
20	330° 25' 12"	-0.51"	332° 29' 07"	-11° 19' 33"	0.9884894	16'10.80"	23° 26' 19"	-13 m 51 s
21	330° 27' 43"	-0.51"	332° 31' 31"	-11° 18' 40"	0.9884984	16'10.80"	23° 26' 19"	-13 m 51 s
22	330° 30' 14"	-0.51"	332° 33' 55"	-11° 17' 46"	0.9885074	16'10.79"	23° 26' 19"	-13 m 51 s
23	330° 32' 45"	-0.52"	332° 36' 20"	-11° 16' 53"	0.9885164	16'10.78"	23° 26' 19"	-13 m 51 s
24	330° 35' 17"	-0.52"	332° 38' 44"	-11° 15' 59"	0.9885255	16'10.77"	23° 26' 19"	-13 m 50 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	209° 50' 01"	-2° 48' 05"	206° 44' 08"	-14° 02' 00"	0° 54' 10"	14' 45.50"	112° 26' 02"	0.74882
1	210° 19' 32"	-2° 50' 22"	207° 11' 43"	-14° 14' 36"	0° 54' 10"	14' 45.50"	112° 20' 17"	0.74541
2	210° 49' 02"	-2° 52' 38"	207° 39' 21"	-14° 27' 09"	0° 54' 10"	14' 45.50"	112° 14' 25"	0.74198
3	211° 18' 33"	-2° 54' 54"	208° 07' 02"	-14° 39' 38"	0° 54' 10"	14' 45.50"	112° 8' 24"	0.73854
4	211° 48' 04"	-2° 57' 08"	208° 34' 46"	-14° 52' 04"	0° 54' 10"	14' 45.51"	112° 2' 16"	0.73508
5	212° 17' 35"	-2° 59' 22"	209° 02' 33"	-15° 04' 26"	0° 54' 10"	14' 45.53"	111° 56' 00"	0.73161
6	212° 47' 05"	-3° 01' 35"	209° 30' 23"	-15° 16' 45"	0° 54' 10"	14' 45.55"	111° 49' 37"	0.72813
7	213° 16' 36"	-3° 03' 47"	209° 58' 17"	-15° 29' 01"	0° 54' 10"	14' 45.57"	111° 43' 06"	0.72463
8	213° 46' 07"	-3° 05' 59"	210° 26' 14"	-15° 41' 13"	0° 54' 10"	14' 45.60"	111° 36' 27"	0.72112
9	214° 15' 39"	-3° 08' 09"	210° 54' 14"	-15° 53' 22"	0° 54' 10"	14' 45.63"	111° 29' 41"	0.71759
10	214° 45' 10"	-3° 10' 19"	211° 22' 17"	-16° 05' 27"	0° 54' 10"	14' 45.67"	111° 22' 47"	0.71405
11	215° 14' 41"	-3° 12' 28"	211° 50' 24"	-16° 17' 28"	0° 54' 10"	14' 45.71"	111° 15' 46"	0.71050
12	215° 44' 13"	-3° 14' 36"	212° 18' 35"	-16° 29' 26"	0° 54' 10"	14' 45.76"	111° 8' 36"	0.70693
13	216° 13' 45"	-3° 16' 43"	212° 46' 49"	-16° 41' 20"	0° 54' 11"	14' 45.81"	111° 1' 20"	0.70335
14	216° 43' 17"	-3° 18' 49"	213° 15' 06"	-16° 53' 10"	0° 54' 11"	14' 45.86"	110° 53' 56"	0.69976
15	217° 12' 49"	-3° 20' 55"	213° 43' 27"	-17° 04' 56"	0° 54' 11"	14' 45.93"	110° 46' 24"	0.69616
16	217° 42' 21"	-3° 22' 60"	214° 11' 52"	-17° 16' 39"	0° 54' 11"	14' 45.99"	110° 38' 45"	0.69254
17	218° 11' 54"	-3° 25' 03"	214° 40' 21"	-17° 28' 17"	0° 54' 12"	14' 46.06"	110° 30' 58"	0.68891
18	218° 41' 27"	-3° 27' 06"	215° 08' 53"	-17° 39' 51"	0° 54' 12"	14' 46.13"	110° 23' 04"	0.68527
19	219° 11' 01"	-3° 29' 08"	215° 37' 30"	-17° 51' 22"	0° 54' 12"	14' 46.21"	110° 15' 02"	0.68161
20	219° 40' 34"	-3° 31' 09"	216° 06' 10"	-18° 02' 48"	0° 54' 12"	14' 46.30"	110° 6' 53"	0.67795
21	220° 10' 08"	-3° 33' 09"	216° 34' 54"	-18° 14' 10"	0° 54' 13"	14' 46.38"	109° 58' 36"	0.67427
22	220° 39' 43"	-3° 35' 08"	217° 03' 42"	-18° 25' 28"	0° 54' 13"	14' 46.48"	109° 50' 12"	0.67058
23	221° 09' 18"	-3° 37' 07"	217° 32' 34"	-18° 36' 42"	0° 54' 13"	14' 46.58"	109° 41' 41"	0.66688
24	221° 38' 53"	-3° 39' 04"	218° 01' 31"	-18° 47' 52"	0° 54' 14"	14' 46.68"	109° 33' 02"	0.66317

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	330° 35' 17"	-0.52"	332° 38' 44"	-11° 15' 59"	0.9885255	16' 10.77"	23° 26' 19"	-13 m 50 s
1	330° 37' 48"	-0.53"	332° 41' 08"	-11° 15' 06"	0.9885345	16' 10.76"	23° 26' 19"	-13 m 50 s
2	330° 40' 19"	-0.53"	332° 43' 32"	-11° 14' 12"	0.9885436	16' 10.75"	23° 26' 19"	-13 m 50 s
3	330° 42' 50"	-0.53"	332° 45' 57"	-11° 13' 19"	0.9885526	16' 10.74"	23° 26' 19"	-13 m 50 s
4	330° 45' 22"	-0.54"	332° 48' 21"	-11° 12' 25"	0.9885617	16' 10.73"	23° 26' 19"	-13 m 49 s
5	330° 47' 53"	-0.54"	332° 50' 45"	-11° 11' 32"	0.9885708	16' 10.72"	23° 26' 19"	-13 m 49 s
6	330° 50' 24"	-0.55"	332° 53' 09"	-11° 10' 38"	0.9885798	16' 10.72"	23° 26' 19"	-13 m 49 s
7	330° 52' 55"	-0.55"	332° 55' 33"	-11° 09' 45"	0.9885889	16' 10.71"	23° 26' 19"	-13 m 49 s
8	330° 55' 27"	-0.55"	332° 57' 58"	-11° 08' 51"	0.9885980	16' 10.70"	23° 26' 19"	-13 m 48 s
9	330° 57' 58"	-0.56"	333° 00' 22"	-11° 07' 58"	0.9886071	16' 10.69"	23° 26' 19"	-13 m 48 s
10	331° 00' 29"	-0.56"	333° 02' 46"	-11° 07' 04"	0.9886162	16' 10.68"	23° 26' 19"	-13 m 48 s
11	331° 03' 00"	-0.56"	333° 05' 10"	-11° 06' 10"	0.9886253	16' 10.67"	23° 26' 19"	-13 m 48 s
12	331° 05' 32"	-0.57"	333° 07' 34"	-11° 05' 17"	0.9886344	16' 10.66"	23° 26' 19"	-13 m 47 s
13	331° 08' 03"	-0.57"	333° 09' 58"	-11° 04' 23"	0.9886435	16' 10.65"	23° 26' 19"	-13 m 47 s
14	331° 10' 34"	-0.57"	333° 12' 22"	-11° 03' 29"	0.9886527	16' 10.64"	23° 26' 19"	-13 m 47 s
15	331° 13' 05"	-0.58"	333° 14' 46"	-11° 02' 36"	0.9886618	16' 10.64"	23° 26' 19"	-13 m 47 s
16	331° 15' 36"	-0.58"	333° 17' 10"	-11° 01' 42"	0.9886709	16' 10.63"	23° 26' 19"	-13 m 46 s
17	331° 18' 08"	-0.58"	333° 19' 34"	-11° 00' 48"	0.9886801	16' 10.62"	23° 26' 19"	-13 m 46 s
18	331° 20' 39"	-0.59"	333° 21' 58"	-10° 59' 55"	0.9886892	16' 10.61"	23° 26' 19"	-13 m 46 s
19	331° 23' 10"	-0.59"	333° 24' 22"	-10° 59' 01"	0.9886984	16' 10.60"	23° 26' 19"	-13 m 46 s
20	331° 25' 41"	-0.59"	333° 26' 46"	-10° 58' 07"	0.9887076	16' 10.59"	23° 26' 19"	-13 m 45 s
21	331° 28' 13"	-0.60"	333° 29' 10"	-10° 57' 13"	0.9887167	16' 10.58"	23° 26' 19"	-13 m 45 s
22	331° 30' 44"	-0.60"	333° 31' 34"	-10° 56' 19"	0.9887259	16' 10.57"	23° 26' 19"	-13 m 45 s
23	331° 33' 15"	-0.60"	333° 33' 58"	-10° 55' 26"	0.9887351	16' 10.56"	23° 26' 19"	-13 m 45 s
24	331° 35' 46"	-0.60"	333° 36' 22"	-10° 54' 32"	0.9887443	16' 10.55"	23° 26' 19"	-13 m 44 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	221° 38' 53"	-3° 39' 04"	218° 01' 31"	-18° 47' 52"	0° 54' 14"	14' 46.68"	109° 33' 02"	0.66317
1	222° 08' 29"	-3° 41' 00"	218° 30' 31"	-18° 58' 57"	0° 54' 14"	14' 46.79"	109° 24' 15"	0.65945
2	222° 38' 05"	-3° 42' 56"	218° 59' 36"	-19° 09' 57"	0° 54' 15"	14' 46.90"	109° 15' 22"	0.65572
3	223° 07' 42"	-3° 44' 50"	219° 28' 45"	-19° 20' 54"	0° 54' 15"	14' 47.02"	109° 6' 21"	0.65197
4	223° 37' 19"	-3° 46' 44"	219° 57' 58"	-19° 31' 45"	0° 54' 16"	14' 47.14"	108° 57' 12"	0.64822
5	224° 06' 57"	-3° 48' 36"	220° 27' 15"	-19° 42' 33"	0° 54' 16"	14' 47.26"	108° 47' 56"	0.64446
6	224° 36' 35"	-3° 50' 28"	220° 56' 37"	-19° 53' 15"	0° 54' 16"	14' 47.39"	108° 38' 33"	0.64068
7	225° 06' 14"	-3° 52' 19"	221° 26' 03"	-20° 03' 53"	0° 54' 17"	14' 47.53"	108° 29' 02"	0.63690
8	225° 35' 54"	-3° 54' 08"	221° 55' 34"	-20° 14' 27"	0° 54' 18"	14' 47.67"	108° 19' 25"	0.63310
9	226° 05' 34"	-3° 55' 57"	222° 25' 09"	-20° 24' 55"	0° 54' 18"	14' 47.82"	108° 9' 39"	0.62930
10	226° 35' 15"	-3° 57' 44"	222° 54' 49"	-20° 35' 19"	0° 54' 19"	14' 47.97"	107° 59' 47"	0.62549
11	227° 04' 56"	-3° 59' 31"	223° 24' 33"	-20° 45' 37"	0° 54' 19"	14' 48.12"	107° 49' 47"	0.62167
12	227° 34' 38"	-4° 01' 16"	223° 54' 22"	-20° 55' 51"	0° 54' 20"	14' 48.28"	107° 39' 40"	0.61783
13	228° 04' 21"	-4° 03' 01"	224° 24' 15"	-21° 06' 00"	0° 54' 20"	14' 48.45"	107° 29' 26"	0.61400
14	228° 34' 05"	-4° 04' 44"	224° 54' 14"	-21° 16' 04"	0° 54' 21"	14' 48.62"	107° 19' 04"	0.61015
15	229° 03' 49"	-4° 06' 26"	225° 24' 16"	-21° 26' 03"	0° 54' 22"	14' 48.80"	107° 8' 35"	0.60629
16	229° 33' 34"	-4° 08' 07"	225° 54' 24"	-21° 35' 56"	0° 54' 22"	14' 48.98"	106° 57' 59"	0.60243
17	230° 03' 20"	-4° 09' 48"	226° 24' 36"	-21° 45' 44"	0° 54' 23"	14' 49.16"	106° 47' 16"	0.59855
18	230° 33' 06"	-4° 11' 27"	226° 54' 54"	-21° 55' 27"	0° 54' 24"	14' 49.35"	106° 36' 26"	0.59467
19	231° 02' 54"	-4° 13' 05"	227° 25' 16"	-22° 05' 05"	0° 54' 24"	14' 49.54"	106° 25' 28"	0.59078
20	231° 32' 42"	-4° 14' 42"	227° 55' 43"	-22° 14' 38"	0° 54' 25"	14' 49.74"	106° 14' 24"	0.58689
21	232° 02' 32"	-4° 16' 18"	228° 26' 15"	-22° 24' 04"	0° 54' 26"	14' 49.95"	106° 3' 12"	0.58298
22	232° 32' 22"	-4° 17' 52"	228° 56' 51"	-22° 33' 26"	0° 54' 27"	14' 50.16"	105° 51' 53"	0.57907
23	233° 02' 13"	-4° 19' 26"	229° 27' 33"	-22° 42' 42"	0° 54' 27"	14' 50.37"	105° 40' 27"	0.57515
24	233° 32' 05"	-4° 20' 58"	229° 58' 20"	-22° 51' 52"	0° 54' 28"	14' 50.59"	105° 28' 54"	0.57123

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	331° 35' 46"	-0.60"	333° 36' 22"	-10° 54' 32"	0.9887443	16'10.55"	23° 26' 19"	-13 m 44 s
1	331° 38' 17"	-0.61"	333° 38' 46"	-10° 53' 38"	0.9887535	16'10.55"	23° 26' 19"	-13 m 44 s
2	331° 40' 49"	-0.61"	333° 41' 10"	-10° 52' 44"	0.9887627	16'10.54"	23° 26' 19"	-13 m 44 s
3	331° 43' 20"	-0.61"	333° 43' 33"	-10° 51' 50"	0.9887719	16'10.53"	23° 26' 19"	-13 m 44 s
4	331° 45' 51"	-0.62"	333° 45' 57"	-10° 50' 56"	0.9887811	16'10.52"	23° 26' 19"	-13 m 43 s
5	331° 48' 22"	-0.62"	333° 48' 21"	-10° 50' 02"	0.9887903	16'10.51"	23° 26' 19"	-13 m 43 s
6	331° 50' 53"	-0.62"	333° 50' 45"	-10° 49' 08"	0.9887995	16'10.50"	23° 26' 19"	-13 m 43 s
7	331° 53' 25"	-0.62"	333° 53' 09"	-10° 48' 14"	0.9888088	16'10.49"	23° 26' 19"	-13 m 42 s
8	331° 55' 56"	-0.63"	333° 55' 32"	-10° 47' 20"	0.9888180	16'10.48"	23° 26' 19"	-13 m 42 s
9	331° 58' 27"	-0.63"	333° 57' 56"	-10° 46' 26"	0.9888273	16'10.47"	23° 26' 19"	-13 m 42 s
10	332° 00' 58"	-0.63"	334° 00' 20"	-10° 45' 32"	0.9888365	16'10.46"	23° 26' 19"	-13 m 42 s
11	332° 03' 29"	-0.63"	334° 02' 44"	-10° 44' 38"	0.9888458	16'10.45"	23° 26' 19"	-13 m 41 s
12	332° 06' 00"	-0.64"	334° 05' 07"	-10° 43' 44"	0.9888550	16'10.45"	23° 26' 19"	-13 m 41 s
13	332° 08' 32"	-0.64"	334° 07' 31"	-10° 42' 50"	0.9888643	16'10.44"	23° 26' 19"	-13 m 41 s
14	332° 11' 03"	-0.64"	334° 09' 55"	-10° 41' 56"	0.9888736	16'10.43"	23° 26' 19"	-13 m 41 s
15	332° 13' 34"	-0.64"	334° 12' 18"	-10° 41' 02"	0.9888828	16'10.42"	23° 26' 19"	-13 m 40 s
16	332° 16' 05"	-0.64"	334° 14' 42"	-10° 40' 07"	0.9888921	16'10.41"	23° 26' 19"	-13 m 40 s
17	332° 18' 36"	-0.65"	334° 17' 05"	-10° 39' 13"	0.9889014	16'10.40"	23° 26' 19"	-13 m 40 s
18	332° 21' 07"	-0.65"	334° 19' 29"	-10° 38' 19"	0.9889107	16'10.39"	23° 26' 19"	-13 m 39 s
19	332° 23' 39"	-0.65"	334° 21' 53"	-10° 37' 25"	0.9889200	16'10.38"	23° 26' 19"	-13 m 39 s
20	332° 26' 10"	-0.65"	334° 24' 16"	-10° 36' 31"	0.9889293	16'10.37"	23° 26' 19"	-13 m 39 s
21	332° 28' 41"	-0.65"	334° 26' 40"	-10° 35' 36"	0.9889386	16'10.36"	23° 26' 19"	-13 m 38 s
22	332° 31' 12"	-0.66"	334° 29' 03"	-10° 34' 42"	0.9889480	16'10.35"	23° 26' 19"	-13 m 38 s
23	332° 33' 43"	-0.66"	334° 31' 27"	-10° 33' 48"	0.9889573	16'10.35"	23° 26' 19"	-13 m 38 s
24	332° 36' 14"	-0.66"	334° 33' 50"	-10° 32' 54"	0.9889666	16'10.34"	23° 26' 19"	-13 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	233° 32' 05"	-4° 20' 58"	229° 58' 20"	-22° 51' 52"	0° 54' 28"	14' 50.59"	105° 28' 54"	0.57123
1	234° 01' 58"	-4° 22' 30"	230° 29' 12"	-23° 00' 56"	0° 54' 29"	14' 50.81"	105° 17' 14"	0.56730
2	234° 31' 52"	-4° 23' 60"	231° 00' 08"	-23° 09' 55"	0° 54' 30"	14' 51.04"	105° 5' 27"	0.56336
3	235° 01' 47"	-4° 25' 29"	231° 31' 10"	-23° 18' 48"	0° 54' 31"	14' 51.28"	104° 53' 33"	0.55942
4	235° 31' 43"	-4° 26' 57"	232° 02' 17"	-23° 27' 36"	0° 54' 32"	14' 51.52"	104° 41' 32"	0.55547
5	236° 01' 40"	-4° 28' 24"	232° 33' 29"	-23° 36' 17"	0° 54' 33"	14' 51.76"	104° 29' 24"	0.55151
6	236° 31' 38"	-4° 29' 49"	233° 04' 46"	-23° 44' 52"	0° 54' 33"	14' 52.01"	104° 17' 09"	0.54755
7	237° 01' 37"	-4° 31' 14"	233° 36' 08"	-23° 53' 21"	0° 54' 34"	14' 52.26"	104° 4' 47"	0.54358
8	237° 31' 38"	-4° 32' 37"	234° 07' 36"	-24° 01' 44"	0° 54' 35"	14' 52.52"	103° 52' 18"	0.53961
9	238° 01' 39"	-4° 33' 59"	234° 39' 08"	-24° 10' 01"	0° 54' 36"	14' 52.78"	103° 39' 43"	0.53563
10	238° 31' 42"	-4° 35' 20"	235° 10' 46"	-24° 18' 12"	0° 54' 37"	14' 53.05"	103° 27' 01"	0.53165
11	239° 01' 46"	-4° 36' 39"	235° 42' 29"	-24° 26' 17"	0° 54' 38"	14' 53.32"	103° 14' 11"	0.52766
12	239° 31' 51"	-4° 37' 58"	236° 14' 17"	-24° 34' 15"	0° 54' 39"	14' 53.60"	103° 1' 16"	0.52367
13	240° 01' 57"	-4° 39' 15"	236° 46' 10"	-24° 42' 07"	0° 54' 40"	14' 53.88"	102° 48' 13"	0.51967
14	240° 32' 04"	-4° 40' 31"	237° 18' 09"	-24° 49' 52"	0° 54' 41"	14' 54.17"	102° 35' 04"	0.51567
15	241° 02' 13"	-4° 41' 45"	237° 50' 13"	-24° 57' 31"	0° 54' 42"	14' 54.46"	102° 21' 49"	0.51167
16	241° 32' 23"	-4° 42' 59"	238° 22' 22"	-25° 05' 03"	0° 54' 44"	14' 54.76"	102° 8' 26"	0.50766
17	242° 02' 35"	-4° 44' 11"	238° 54' 36"	-25° 12' 29"	0° 54' 45"	14' 55.06"	101° 54' 57"	0.50365
18	242° 32' 48"	-4° 45' 22"	239° 26' 55"	-25° 19' 47"	0° 54' 46"	14' 55.37"	101° 41' 22"	0.49964
19	243° 03' 02"	-4° 46' 31"	239° 59' 20"	-25° 26' 60"	0° 54' 47"	14' 55.68"	101° 27' 40"	0.49562
20	243° 33' 17"	-4° 47' 40"	240° 31' 50"	-25° 34' 05"	0° 54' 48"	14' 56.00"	101° 13' 52"	0.49160
21	244° 03' 34"	-4° 48' 47"	241° 04' 25"	-25° 41' 03"	0° 54' 49"	14' 56.32"	100° 59' 58"	0.48758
22	244° 33' 52"	-4° 49' 53"	241° 37' 05"	-25° 47' 55"	0° 54' 50"	14' 56.64"	100° 45' 57"	0.48355
23	245° 04' 12"	-4° 50' 57"	242° 09' 51"	-25° 54' 39"	0° 54' 52"	14' 56.97"	100° 31' 49"	0.47952
24	245° 34' 33"	-4° 52' 00"	242° 42' 41"	-26° 01' 16"	0° 54' 53"	14' 57.31"	100° 17' 36"	0.47549

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	332° 36' 14"	-0.66"	334° 33' 50"	-10° 32' 54"	0.9889666	16' 10.34"	23° 26' 19"	-13 m 38 s
1	332° 38' 46"	-0.66"	334° 36' 14"	-10° 31' 59"	0.9889759	16' 10.33"	23° 26' 19"	-13 m 37 s
2	332° 41' 17"	-0.66"	334° 38' 37"	-10° 31' 05"	0.9889853	16' 10.32"	23° 26' 19"	-13 m 37 s
3	332° 43' 48"	-0.66"	334° 41' 01"	-10° 30' 11"	0.9889946	16' 10.31"	23° 26' 19"	-13 m 37 s
4	332° 46' 19"	-0.67"	334° 43' 24"	-10° 29' 16"	0.9890040	16' 10.30"	23° 26' 19"	-13 m 36 s
5	332° 48' 50"	-0.67"	334° 45' 47"	-10° 28' 22"	0.9890133	16' 10.29"	23° 26' 19"	-13 m 36 s
6	332° 51' 21"	-0.67"	334° 48' 11"	-10° 27' 28"	0.9890227	16' 10.28"	23° 26' 19"	-13 m 36 s
7	332° 53' 52"	-0.67"	334° 50' 34"	-10° 26' 33"	0.9890321	16' 10.27"	23° 26' 19"	-13 m 36 s
8	332° 56' 24"	-0.67"	334° 52' 58"	-10° 25' 39"	0.9890415	16' 10.26"	23° 26' 19"	-13 m 35 s
9	332° 58' 55"	-0.67"	334° 55' 21"	-10° 24' 44"	0.9890508	16' 10.25"	23° 26' 19"	-13 m 35 s
10	333° 01' 26"	-0.67"	334° 57' 44"	-10° 23' 50"	0.9890602	16' 10.24"	23° 26' 19"	-13 m 35 s
11	333° 03' 57"	-0.68"	335° 00' 08"	-10° 22' 55"	0.9890696	16' 10.24"	23° 26' 19"	-13 m 34 s
12	333° 06' 28"	-0.68"	335° 02' 31"	-10° 22' 01"	0.9890790	16' 10.23"	23° 26' 19"	-13 m 34 s
13	333° 08' 59"	-0.68"	335° 04' 54"	-10° 21' 06"	0.9890884	16' 10.22"	23° 26' 19"	-13 m 34 s
14	333° 11' 30"	-0.68"	335° 07' 17"	-10° 20' 12"	0.9890978	16' 10.21"	23° 26' 19"	-13 m 33 s
15	333° 14' 01"	-0.68"	335° 09' 41"	-10° 19' 17"	0.9891072	16' 10.20"	23° 26' 19"	-13 m 33 s
16	333° 16' 32"	-0.68"	335° 12' 04"	-10° 18' 23"	0.9891166	16' 10.19"	23° 26' 19"	-13 m 33 s
17	333° 19' 04"	-0.68"	335° 14' 27"	-10° 17' 28"	0.9891261	16' 10.18"	23° 26' 19"	-13 m 32 s
18	333° 21' 35"	-0.68"	335° 16' 50"	-10° 16' 34"	0.9891355	16' 10.17"	23° 26' 19"	-13 m 32 s
19	333° 24' 06"	-0.68"	335° 19' 14"	-10° 15' 39"	0.9891449	16' 10.16"	23° 26' 19"	-13 m 32 s
20	333° 26' 37"	-0.68"	335° 21' 37"	-10° 14' 44"	0.9891544	16' 10.15"	23° 26' 19"	-13 m 32 s
21	333° 29' 08"	-0.68"	335° 23' 60"	-10° 13' 50"	0.9891638	16' 10.14"	23° 26' 19"	-13 m 31 s
22	333° 31' 39"	-0.68"	335° 26' 23"	-10° 12' 55"	0.9891733	16' 10.13"	23° 26' 19"	-13 m 31 s
23	333° 34' 10"	-0.69"	335° 28' 46"	-10° 12' 00"	0.9891827	16' 10.12"	23° 26' 19"	-13 m 31 s
24	333° 36' 41"	-0.69"	335° 31' 09"	-10° 11' 06"	0.9891922	16' 10.11"	23° 26' 19"	-13 m 30 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	245° 34' 33"	-4° 52' 00"	242° 42' 41"	-26° 01' 16"	0° 54' 53"	14' 57.31"	100° 17' 36"	0.47549
1	246° 04' 56"	-4° 53' 02"	243° 15' 37"	-26° 07' 46"	0° 54' 54"	14' 57.65"	100° 3' 17"	0.47146
2	246° 35' 20"	-4° 54' 03"	243° 48' 38"	-26° 14' 09"	0° 54' 55"	14' 57.99"	99° 48' 51"	0.46743
3	247° 05' 46"	-4° 55' 02"	244° 21' 44"	-26° 20' 25"	0° 54' 57"	14' 58.34"	99° 34' 19"	0.46339
4	247° 36' 13"	-4° 56' 00"	244° 54' 56"	-26° 26' 33"	0° 54' 58"	14' 58.70"	99° 19' 41"	0.45935
5	248° 06' 42"	-4° 56' 57"	245° 28' 12"	-26° 32' 34"	0° 54' 59"	14' 59.05"	99° 4' 58"	0.45532
6	248° 37' 12"	-4° 57' 52"	246° 01' 34"	-26° 38' 28"	0° 55' 01"	14' 59.42"	98° 50' 08"	0.45128
7	249° 07' 44"	-4° 58' 46"	246° 35' 00"	-26° 44' 14"	0° 55' 02"	14' 59.79"	98° 35' 13"	0.44724
8	249° 38' 18"	-4° 59' 38"	247° 08' 32"	-26° 49' 52"	0° 55' 03"	15' 00.16"	98° 20' 12"	0.44320
9	250° 08' 53"	-5° 00' 29"	247° 42' 09"	-26° 55' 23"	0° 55' 05"	15' 00.53"	98° 5' 05"	0.43916
10	250° 39' 30"	-5° 01' 19"	248° 15' 50"	-27° 00' 46"	0° 55' 06"	15' 00.92"	97° 49' 52"	0.43512
11	251° 10' 08"	-5° 02' 07"	248° 49' 37"	-27° 06' 01"	0° 55' 08"	15' 01.30"	97° 34' 34"	0.43109
12	251° 40' 49"	-5° 02' 54"	249° 23' 28"	-27° 11' 09"	0° 55' 09"	15' 01.69"	97° 19' 11"	0.42705
13	252° 11' 31"	-5° 03' 40"	249° 57' 25"	-27° 16' 09"	0° 55' 10"	15' 02.09"	97° 3' 42"	0.42301
14	252° 42' 15"	-5° 04' 24"	250° 31' 26"	-27° 21' 00"	0° 55' 12"	15' 02.49"	96° 48' 07"	0.41898
15	253° 13' 00"	-5° 05' 07"	251° 05' 32"	-27° 25' 44"	0° 55' 13"	15' 02.89"	96° 32' 28"	0.41494
16	253° 43' 47"	-5° 05' 48"	251° 39' 43"	-27° 30' 20"	0° 55' 15"	15' 03.30"	96° 16' 43"	0.41091
17	254° 14' 37"	-5° 06' 28"	252° 13' 59"	-27° 34' 47"	0° 55' 16"	15' 03.71"	96° 0' 53"	0.40688
18	254° 45' 28"	-5° 07' 06"	252° 48' 19"	-27° 39' 06"	0° 55' 18"	15' 04.13"	95° 44' 58"	0.40285
19	255° 16' 20"	-5° 07' 43"	253° 22' 44"	-27° 43' 17"	0° 55' 19"	15' 04.55"	95° 28' 58"	0.39882
20	255° 47' 15"	-5° 08' 19"	253° 57' 14"	-27° 47' 20"	0° 55' 21"	15' 04.98"	95° 12' 53"	0.39479
21	256° 18' 12"	-5° 08' 53"	254° 31' 48"	-27° 51' 15"	0° 55' 23"	15' 05.41"	94° 56' 43"	0.39077
22	256° 49' 10"	-5° 09' 26"	255° 06' 27"	-27° 55' 01"	0° 55' 24"	15' 05.84"	94° 40' 29"	0.38675
23	257° 20' 10"	-5° 09' 57"	255° 41' 10"	-27° 58' 38"	0° 55' 26"	15' 06.28"	94° 24' 10"	0.38274
24	257° 51' 13"	-5° 10' 26"	256° 15' 58"	-28° 02' 07"	0° 55' 27"	15' 06.72"	94° 7' 46"	0.37873

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	333° 36' 41"	-0.69"	335° 31' 09"	-10° 11' 06"	0.9891922	16'10.11"	23° 26' 19"	-13 m 30 s
1	333° 39' 12"	-0.69"	335° 33' 32"	-10° 10' 11"	0.9892016	16'10.11"	23° 26' 19"	-13 m 30 s
2	333° 41' 44"	-0.69"	335° 35' 55"	-10° 09' 16"	0.9892111	16'10.10"	23° 26' 19"	-13 m 30 s
3	333° 44' 15"	-0.69"	335° 38' 19"	-10° 08' 22"	0.9892206	16'10.09"	23° 26' 19"	-13 m 29 s
4	333° 46' 46"	-0.69"	335° 40' 42"	-10° 07' 27"	0.9892301	16'10.08"	23° 26' 19"	-13 m 29 s
5	333° 49' 17"	-0.69"	335° 43' 05"	-10° 06' 32"	0.9892395	16'10.07"	23° 26' 19"	-13 m 29 s
6	333° 51' 48"	-0.69"	335° 45' 28"	-10° 05' 37"	0.9892490	16'10.06"	23° 26' 19"	-13 m 28 s
7	333° 54' 19"	-0.69"	335° 47' 51"	-10° 04' 42"	0.9892585	16'10.05"	23° 26' 19"	-13 m 28 s
8	333° 56' 50"	-0.69"	335° 50' 14"	-10° 03' 48"	0.9892680	16'10.04"	23° 26' 19"	-13 m 28 s
9	333° 59' 21"	-0.69"	335° 52' 37"	-10° 02' 53"	0.9892775	16'10.03"	23° 26' 19"	-13 m 27 s
10	334° 01' 52"	-0.69"	335° 54' 60"	-10° 01' 58"	0.9892870	16'10.02"	23° 26' 19"	-13 m 27 s
11	334° 04' 23"	-0.69"	335° 57' 22"	-10° 01' 03"	0.9892965	16'10.01"	23° 26' 19"	-13 m 27 s
12	334° 06' 54"	-0.69"	335° 59' 45"	-10° 00' 08"	0.9893061	16'10.00"	23° 26' 19"	-13 m 26 s
13	334° 09' 25"	-0.69"	336° 02' 08"	-9° 59' 13"	0.9893156	16'09.99"	23° 26' 19"	-13 m 26 s
14	334° 11' 56"	-0.69"	336° 04' 31"	-9° 58' 18"	0.9893251	16'09.98"	23° 26' 19"	-13 m 26 s
15	334° 14' 27"	-0.69"	336° 06' 54"	-9° 57' 23"	0.9893346	16'09.98"	23° 26' 19"	-13 m 25 s
16	334° 16' 59"	-0.69"	336° 09' 17"	-9° 56' 28"	0.9893442	16'09.97"	23° 26' 19"	-13 m 25 s
17	334° 19' 30"	-0.69"	336° 11' 40"	-9° 55' 33"	0.9893537	16'09.96"	23° 26' 19"	-13 m 25 s
18	334° 22' 01"	-0.69"	336° 14' 03"	-9° 54' 39"	0.9893633	16'09.95"	23° 26' 19"	-13 m 24 s
19	334° 24' 32"	-0.68"	336° 16' 25"	-9° 53' 44"	0.9893728	16'09.94"	23° 26' 19"	-13 m 24 s
20	334° 27' 03"	-0.68"	336° 18' 48"	-9° 52' 49"	0.9893824	16'09.93"	23° 26' 19"	-13 m 24 s
21	334° 29' 34"	-0.68"	336° 21' 11"	-9° 51' 53"	0.9893919	16'09.92"	23° 26' 19"	-13 m 23 s
22	334° 32' 05"	-0.68"	336° 23' 34"	-9° 50' 58"	0.9894015	16'09.91"	23° 26' 19"	-13 m 23 s
23	334° 34' 36"	-0.68"	336° 25' 57"	-9° 50' 03"	0.9894111	16'09.90"	23° 26' 19"	-13 m 23 s
24	334° 37' 07"	-0.68"	336° 28' 19"	-9° 49' 08"	0.9894206	16'09.89"	23° 26' 19"	-13 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	257° 51' 13"	-5° 10' 26"	256° 15' 58"	-28° 02' 07"	0° 55' 27"	15' 06.72"	94° 7' 46"	0.37873
1	258° 22' 17"	-5° 10' 55"	256° 50' 50"	-28° 05' 28"	0° 55' 29"	15' 07.17"	93° 51' 18"	0.37472
2	258° 53' 23"	-5° 11' 21"	257° 25' 46"	-28° 08' 40"	0° 55' 31"	15' 07.62"	93° 34' 46"	0.37071
3	259° 24' 31"	-5° 11' 46"	258° 00' 46"	-28° 11' 43"	0° 55' 32"	15' 08.07"	93° 18' 09"	0.36671
4	259° 55' 41"	-5° 12' 10"	258° 35' 51"	-28° 14' 37"	0° 55' 34"	15' 08.53"	93° 1' 29"	0.36272
5	260° 26' 54"	-5° 12' 32"	259° 10' 60"	-28° 17' 23"	0° 55' 36"	15' 08.99"	92° 44' 44"	0.35873
6	260° 58' 08"	-5° 12' 53"	259° 46' 13"	-28° 19' 59"	0° 55' 37"	15' 09.46"	92° 27' 55"	0.35474
7	261° 29' 24"	-5° 13' 12"	260° 21' 29"	-28° 22' 27"	0° 55' 39"	15' 09.93"	92° 11' 02"	0.35076
8	262° 00' 43"	-5° 13' 30"	260° 56' 50"	-28° 24' 46"	0° 55' 41"	15' 10.40"	91° 54' 06"	0.34678
9	262° 32' 03"	-5° 13' 46"	261° 32' 14"	-28° 26' 56"	0° 55' 43"	15' 10.88"	91° 37' 06"	0.34282
10	263° 03' 26"	-5° 14' 00"	262° 07' 43"	-28° 28' 57"	0° 55' 44"	15' 11.36"	91° 20' 02"	0.33885
11	263° 34' 50"	-5° 14' 13"	262° 43' 14"	-28° 30' 49"	0° 55' 46"	15' 11.85"	91° 2' 55"	0.33490
12	264° 06' 17"	-5° 14' 25"	263° 18' 50"	-28° 32' 31"	0° 55' 48"	15' 12.34"	90° 45' 45"	0.33095
13	264° 37' 46"	-5° 14' 35"	263° 54' 29"	-28° 34' 05"	0° 55' 50"	15' 12.83"	90° 28' 31"	0.32700
14	265° 09' 17"	-5° 14' 43"	264° 30' 11"	-28° 35' 29"	0° 55' 52"	15' 13.33"	90° 11' 14"	0.32307
15	265° 40' 51"	-5° 14' 49"	265° 05' 57"	-28° 36' 44"	0° 55' 54"	15' 13.83"	89° 53' 55"	0.31914
16	266° 12' 26"	-5° 14' 55"	265° 41' 46"	-28° 37' 50"	0° 55' 55"	15' 14.33"	89° 36' 32"	0.31522
17	266° 44' 04"	-5° 14' 58"	266° 17' 39"	-28° 38' 46"	0° 55' 57"	15' 14.84"	89° 19' 06"	0.31131
18	267° 15' 44"	-5° 15' 00"	266° 53' 34"	-28° 39' 33"	0° 55' 59"	15' 15.35"	89° 1' 38"	0.30740
19	267° 47' 26"	-5° 15' 00"	267° 29' 32"	-28° 40' 10"	0° 56' 01"	15' 15.87"	88° 44' 08"	0.30351
20	268° 19' 11"	-5° 14' 59"	268° 05' 34"	-28° 40' 38"	0° 56' 03"	15' 16.38"	88° 26' 35"	0.29962
21	268° 50' 58"	-5° 14' 56"	268° 41' 38"	-28° 40' 56"	0° 56' 05"	15' 16.90"	88° 8' 59"	0.29574
22	269° 22' 47"	-5° 14' 52"	269° 17' 45"	-28° 41' 05"	0° 56' 07"	15' 17.43"	87° 51' 21"	0.29188
23	269° 54' 38"	-5° 14' 46"	269° 53' 55"	-28° 41' 05"	0° 56' 09"	15' 17.96"	87° 33' 42"	0.28802
24	270° 26' 32"	-5° 14' 38"	270° 30' 07"	-28° 40' 54"	0° 56' 11"	15' 18.49"	87° 16' 00"	0.28417

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	334° 37' 07"	-0.68"	336° 28' 19"	-9° 49' 08"	0.9894206	16'09.89"	23° 26' 19"	-13 m 22 s
1	334° 39' 38"	-0.68"	336° 30' 42"	-9° 48' 13"	0.9894302	16'09.88"	23° 26' 19"	-13 m 22 s
2	334° 42' 09"	-0.68"	336° 33' 05"	-9° 47' 18"	0.9894398	16'09.87"	23° 26' 19"	-13 m 22 s
3	334° 44' 40"	-0.68"	336° 35' 27"	-9° 46' 23"	0.9894494	16'09.86"	23° 26' 19"	-13 m 21 s
4	334° 47' 11"	-0.68"	336° 37' 50"	-9° 45' 28"	0.9894590	16'09.85"	23° 26' 19"	-13 m 21 s
5	334° 49' 42"	-0.68"	336° 40' 13"	-9° 44' 33"	0.9894686	16'09.84"	23° 26' 19"	-13 m 20 s
6	334° 52' 13"	-0.68"	336° 42' 35"	-9° 43' 38"	0.9894782	16'09.83"	23° 26' 19"	-13 m 20 s
7	334° 54' 44"	-0.67"	336° 44' 58"	-9° 42' 42"	0.9894878	16'09.83"	23° 26' 19"	-13 m 20 s
8	334° 57' 15"	-0.67"	336° 47' 21"	-9° 41' 47"	0.9894974	16'09.82"	23° 26' 19"	-13 m 19 s
9	334° 59' 46"	-0.67"	336° 49' 43"	-9° 40' 52"	0.9895070	16'09.81"	23° 26' 19"	-13 m 19 s
10	335° 02' 17"	-0.67"	336° 52' 06"	-9° 39' 57"	0.9895166	16'09.80"	23° 26' 19"	-13 m 19 s
11	335° 04' 48"	-0.67"	336° 54' 28"	-9° 39' 01"	0.9895262	16'09.79"	23° 26' 19"	-13 m 18 s
12	335° 07' 19"	-0.67"	336° 56' 51"	-9° 38' 06"	0.9895358	16'09.78"	23° 26' 19"	-13 m 18 s
13	335° 09' 50"	-0.67"	336° 59' 13"	-9° 37' 11"	0.9895455	16'09.77"	23° 26' 19"	-13 m 18 s
14	335° 12' 21"	-0.66"	337° 01' 36"	-9° 36' 16"	0.9895551	16'09.76"	23° 26' 19"	-13 m 17 s
15	335° 14' 52"	-0.66"	337° 03' 58"	-9° 35' 20"	0.9895647	16'09.75"	23° 26' 19"	-13 m 17 s
16	335° 17' 23"	-0.66"	337° 06' 21"	-9° 34' 25"	0.9895744	16'09.74"	23° 26' 19"	-13 m 17 s
17	335° 19' 54"	-0.66"	337° 08' 43"	-9° 33' 30"	0.9895840	16'09.73"	23° 26' 19"	-13 m 16 s
18	335° 22' 25"	-0.66"	337° 11' 06"	-9° 32' 34"	0.9895937	16'09.72"	23° 26' 19"	-13 m 16 s
19	335° 24' 56"	-0.66"	337° 13' 28"	-9° 31' 39"	0.9896033	16'09.71"	23° 26' 19"	-13 m 15 s
20	335° 27' 27"	-0.65"	337° 15' 51"	-9° 30' 43"	0.9896130	16'09.70"	23° 26' 19"	-13 m 15 s
21	335° 29' 58"	-0.65"	337° 18' 13"	-9° 29' 48"	0.9896226	16'09.69"	23° 26' 19"	-13 m 15 s
22	335° 32' 29"	-0.65"	337° 20' 36"	-9° 28' 53"	0.9896323	16'09.68"	23° 26' 19"	-13 m 14 s
23	335° 35' 00"	-0.65"	337° 22' 58"	-9° 27' 57"	0.9896420	16'09.67"	23° 26' 19"	-13 m 14 s
24	335° 37' 31"	-0.65"	337° 25' 20"	-9° 27' 02"	0.9896516	16'09.66"	23° 26' 19"	-13 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	270° 26' 32"	-5° 14' 38"	270° 30' 07"	-28° 40' 54"	0° 56' 11"	15' 18.49"	87° 16' 00"	0.28417
1	270° 58' 28"	-5° 14' 29"	271° 06' 22"	-28° 40' 34"	0° 56' 13"	15' 19.02"	86° 58' 17"	0.28033
2	271° 30' 27"	-5° 14' 18"	271° 42' 39"	-28° 40' 04"	0° 56' 15"	15' 19.56"	86° 40' 31"	0.27651
3	272° 02' 27"	-5° 14' 05"	272° 18' 58"	-28° 39' 25"	0° 56' 17"	15' 20.09"	86° 22' 44"	0.27269
4	272° 34' 30"	-5° 13' 51"	272° 55' 20"	-28° 38' 35"	0° 56' 18"	15' 20.64"	86° 4' 56"	0.26889
5	273° 06' 36"	-5° 13' 35"	273° 31' 44"	-28° 37' 36"	0° 56' 20"	15' 21.18"	85° 47' 06"	0.26510
6	273° 38' 44"	-5° 13' 17"	274° 08' 10"	-28° 36' 28"	0° 56' 23"	15' 21.73"	85° 29' 15"	0.26132
7	274° 10' 54"	-5° 12' 58"	274° 44' 37"	-28° 35' 09"	0° 56' 25"	15' 22.28"	85° 11' 23"	0.25755
8	274° 43' 07"	-5° 12' 37"	275° 21' 07"	-28° 33' 40"	0° 56' 27"	15' 22.83"	84° 53' 30"	0.25379
9	275° 15' 22"	-5° 12' 14"	275° 57' 38"	-28° 32' 02"	0° 56' 29"	15' 23.39"	84° 35' 36"	0.25005
10	275° 47' 40"	-5° 11' 50"	276° 34' 11"	-28° 30' 13"	0° 56' 31"	15' 23.95"	84° 17' 42"	0.24632
11	276° 19' 60"	-5° 11' 24"	277° 10' 45"	-28° 28' 15"	0° 56' 33"	15' 24.51"	83° 59' 46"	0.24261
12	276° 52' 22"	-5° 10' 56"	277° 47' 21"	-28° 26' 07"	0° 56' 35"	15' 25.07"	83° 41' 51"	0.23891
13	277° 24' 47"	-5° 10' 27"	278° 23' 58"	-28° 23' 49"	0° 56' 37"	15' 25.64"	83° 23' 54"	0.23522
14	277° 57' 15"	-5° 09' 56"	279° 00' 36"	-28° 21' 20"	0° 56' 39"	15' 26.21"	83° 5' 58"	0.23155
15	278° 29' 45"	-5° 09' 23"	279° 37' 16"	-28° 18' 42"	0° 56' 41"	15' 26.78"	82° 48' 01"	0.22789
16	279° 02' 17"	-5° 08' 48"	280° 13' 56"	-28° 15' 54"	0° 56' 43"	15' 27.35"	82° 30' 05"	0.22425
17	279° 34' 52"	-5° 08' 12"	280° 50' 37"	-28° 12' 55"	0° 56' 45"	15' 27.93"	82° 12' 08"	0.22063
18	280° 07' 30"	-5° 07' 34"	281° 27' 20"	-28° 09' 47"	0° 56' 47"	15' 28.50"	81° 54' 12"	0.21702
19	280° 40' 10"	-5° 06' 55"	282° 04' 02"	-28° 06' 29"	0° 56' 49"	15' 29.08"	81° 36' 16"	0.21342
20	281° 12' 52"	-5° 06' 13"	282° 40' 46"	-28° 03' 00"	0° 56' 52"	15' 29.66"	81° 18' 20"	0.20985
21	281° 45' 38"	-5° 05' 30"	283° 17' 30"	-27° 59' 22"	0° 56' 54"	15' 30.25"	81° 0' 25"	0.20629
22	282° 18' 25"	-5° 04' 46"	283° 54' 14"	-27° 55' 33"	0° 56' 56"	15' 30.83"	80° 42' 31"	0.20274
23	282° 51' 15"	-5° 03' 59"	284° 30' 59"	-27° 51' 35"	0° 56' 58"	15' 31.42"	80° 24' 37"	0.19922
24	283° 24' 08"	-5° 03' 11"	285° 07' 43"	-27° 47' 26"	0° 57' 00"	15' 32.01"	80° 6' 44"	0.19571

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	335° 37' 31"	-0.65"	337° 25' 20"	-9° 27' 02"	0.9896516	16'09.66"	23° 26' 19"	-13 m 14 s
1	335° 40' 02"	-0.64"	337° 27' 43"	-9° 26' 06"	0.9896613	16'09.65"	23° 26' 19"	-13 m 13 s
2	335° 42' 33"	-0.64"	337° 30' 05"	-9° 25' 11"	0.9896710	16'09.65"	23° 26' 19"	-13 m 13 s
3	335° 45' 04"	-0.64"	337° 32' 27"	-9° 24' 15"	0.9896807	16'09.64"	23° 26' 19"	-13 m 12 s
4	335° 47' 35"	-0.64"	337° 34' 50"	-9° 23' 20"	0.9896904	16'09.63"	23° 26' 19"	-13 m 12 s
5	335° 50' 06"	-0.64"	337° 37' 12"	-9° 22' 24"	0.9897001	16'09.62"	23° 26' 19"	-13 m 12 s
6	335° 52' 37"	-0.63"	337° 39' 34"	-9° 21' 29"	0.9897098	16'09.61"	23° 26' 19"	-13 m 11 s
7	335° 55' 08"	-0.63"	337° 41' 56"	-9° 20' 33"	0.9897195	16'09.60"	23° 26' 19"	-13 m 11 s
8	335° 57' 39"	-0.63"	337° 44' 19"	-9° 19' 38"	0.9897292	16'09.59"	23° 26' 19"	-13 m 11 s
9	336° 00' 10"	-0.63"	337° 46' 41"	-9° 18' 42"	0.9897389	16'09.58"	23° 26' 19"	-13 m 10 s
10	336° 02' 41"	-0.62"	337° 49' 03"	-9° 17' 47"	0.9897486	16'09.57"	23° 26' 19"	-13 m 10 s
11	336° 05' 12"	-0.62"	337° 51' 25"	-9° 16' 51"	0.9897583	16'09.56"	23° 26' 19"	-13 m 09 s
12	336° 07' 43"	-0.62"	337° 53' 48"	-9° 15' 55"	0.9897680	16'09.55"	23° 26' 19"	-13 m 09 s
13	336° 10' 14"	-0.62"	337° 56' 10"	-9° 14' 60"	0.9897777	16'09.54"	23° 26' 19"	-13 m 09 s
14	336° 12' 44"	-0.61"	337° 58' 32"	-9° 14' 04"	0.9897875	16'09.53"	23° 26' 19"	-13 m 08 s
15	336° 15' 15"	-0.61"	338° 00' 54"	-9° 13' 08"	0.9897972	16'09.52"	23° 26' 19"	-13 m 08 s
16	336° 17' 46"	-0.61"	338° 03' 16"	-9° 12' 13"	0.9898069	16'09.51"	23° 26' 19"	-13 m 07 s
17	336° 20' 17"	-0.61"	338° 05' 38"	-9° 11' 17"	0.9898167	16'09.50"	23° 26' 19"	-13 m 07 s
18	336° 22' 48"	-0.60"	338° 08' 00"	-9° 10' 21"	0.9898264	16'09.49"	23° 26' 19"	-13 m 07 s
19	336° 25' 19"	-0.60"	338° 10' 22"	-9° 09' 25"	0.9898361	16'09.48"	23° 26' 19"	-13 m 06 s
20	336° 27' 50"	-0.60"	338° 12' 45"	-9° 08' 30"	0.9898459	16'09.47"	23° 26' 19"	-13 m 06 s
21	336° 30' 21"	-0.59"	338° 15' 07"	-9° 07' 34"	0.9898556	16'09.46"	23° 26' 19"	-13 m 06 s
22	336° 32' 52"	-0.59"	338° 17' 29"	-9° 06' 38"	0.9898654	16'09.46"	23° 26' 19"	-13 m 05 s
23	336° 35' 23"	-0.59"	338° 19' 51"	-9° 05' 42"	0.9898751	16'09.45"	23° 26' 19"	-13 m 05 s
24	336° 37' 54"	-0.58"	338° 22' 13"	-9° 04' 47"	0.9898849	16'09.44"	23° 26' 19"	-13 m 04 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	283° 24' 08"	-5° 03' 11"	285° 07' 43"	-27° 47' 26"	0° 57' 00"	15' 32.01"	80° 6' 44"	0.19571
1	283° 57' 04"	-5° 02' 21"	285° 44' 28"	-27° 43' 07"	0° 57' 02"	15' 32.59"	79° 48' 52"	0.19223
2	284° 30' 01"	-5° 01' 29"	286° 21' 13"	-27° 38' 38"	0° 57' 05"	15' 33.19"	79° 31' 02"	0.18876
3	285° 03' 02"	-5° 00' 36"	286° 57' 58"	-27° 33' 59"	0° 57' 07"	15' 33.78"	79° 13' 12"	0.18531
4	285° 36' 05"	-4° 59' 41"	287° 34' 43"	-27° 29' 10"	0° 57' 09"	15' 34.37"	78° 55' 24"	0.18188
5	286° 09' 11"	-4° 58' 44"	288° 11' 27"	-27° 24' 11"	0° 57' 11"	15' 34.97"	78° 37' 37"	0.17847
6	286° 42' 19"	-4° 57' 45"	288° 48' 11"	-27° 19' 02"	0° 57' 13"	15' 35.56"	78° 19' 52"	0.17508
7	287° 15' 30"	-4° 56' 45"	289° 24' 55"	-27° 13' 43"	0° 57' 15"	15' 36.16"	78° 2' 08"	0.17171
8	287° 48' 43"	-4° 55' 43"	290° 01' 38"	-27° 08' 14"	0° 57' 18"	15' 36.76"	77° 44' 26"	0.16836
9	288° 21' 59"	-4° 54' 39"	290° 38' 20"	-27° 02' 35"	0° 57' 20"	15' 37.36"	77° 26' 46"	0.16504
10	288° 55' 18"	-4° 53' 33"	291° 15' 01"	-26° 56' 46"	0° 57' 22"	15' 37.96"	77° 9' 07"	0.16173
11	289° 28' 40"	-4° 52' 26"	291° 51' 42"	-26° 50' 47"	0° 57' 24"	15' 38.56"	76° 51' 30"	0.15845
12	290° 02' 03"	-4° 51' 17"	292° 28' 22"	-26° 44' 38"	0° 57' 26"	15' 39.16"	76° 33' 56"	0.15519
13	290° 35' 30"	-4° 50' 06"	293° 05' 00"	-26° 38' 19"	0° 57' 29"	15' 39.76"	76° 16' 23"	0.15195
14	291° 08' 59"	-4° 48' 54"	293° 41' 38"	-26° 31' 50"	0° 57' 31"	15' 40.36"	75° 58' 53"	0.14874
15	291° 42' 31"	-4° 47' 39"	294° 18' 14"	-26° 25' 11"	0° 57' 33"	15' 40.96"	75° 41' 24"	0.14555
16	292° 16' 05"	-4° 46' 23"	294° 54' 50"	-26° 18' 22"	0° 57' 35"	15' 41.57"	75° 23' 58"	0.14238
17	292° 49' 42"	-4° 45' 05"	295° 31' 23"	-26° 11' 24"	0° 57' 38"	15' 42.17"	75° 6' 34"	0.13924
18	293° 23' 22"	-4° 43' 46"	296° 07' 56"	-26° 04' 16"	0° 57' 40"	15' 42.77"	74° 49' 13"	0.13613
19	293° 57' 04"	-4° 42' 25"	296° 44' 26"	-25° 56' 57"	0° 57' 42"	15' 43.38"	74° 31' 54"	0.13304
20	294° 30' 49"	-4° 41' 01"	297° 20' 56"	-25° 49' 30"	0° 57' 44"	15' 43.98"	74° 14' 37"	0.12997
21	295° 04' 37"	-4° 39' 37"	297° 57' 23"	-25° 41' 52"	0° 57' 46"	15' 44.59"	73° 57' 23"	0.12693
22	295° 38' 27"	-4° 38' 10"	298° 33' 49"	-25° 34' 05"	0° 57' 49"	15' 45.19"	73° 40' 11"	0.12392
23	296° 12' 20"	-4° 36' 42"	299° 10' 13"	-25° 26' 08"	0° 57' 51"	15' 45.79"	73° 23' 02"	0.12093
24	296° 46' 15"	-4° 35' 12"	299° 46' 35"	-25° 18' 01"	0° 57' 53"	15' 46.40"	73° 5' 55"	0.11797

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	336° 37' 54"	-0.58"	338° 22' 13"	-9° 04' 47"	0.9898849	16'09.44"	23° 26' 19"	-13 m 04 s
1	336° 40' 25"	-0.58"	338° 24' 35"	-9° 03' 51"	0.9898947	16'09.43"	23° 26' 19"	-13 m 04 s
2	336° 42' 56"	-0.58"	338° 26' 57"	-9° 02' 55"	0.9899044	16'09.42"	23° 26' 19"	-13 m 04 s
3	336° 45' 27"	-0.57"	338° 29' 19"	-9° 01' 59"	0.9899142	16'09.41"	23° 26' 19"	-13 m 03 s
4	336° 47' 57"	-0.57"	338° 31' 41"	-9° 01' 03"	0.9899240	16'09.40"	23° 26' 19"	-13 m 03 s
5	336° 50' 28"	-0.57"	338° 34' 02"	-9° 00' 07"	0.9899337	16'09.39"	23° 26' 19"	-13 m 02 s
6	336° 52' 59"	-0.56"	338° 36' 24"	-8° 59' 12"	0.9899435	16'09.38"	23° 26' 19"	-13 m 02 s
7	336° 55' 30"	-0.56"	338° 38' 46"	-8° 58' 16"	0.9899533	16'09.37"	23° 26' 19"	-13 m 02 s
8	336° 58' 01"	-0.56"	338° 41' 08"	-8° 57' 20"	0.9899631	16'09.36"	23° 26' 19"	-13 m 01 s
9	337° 00' 32"	-0.55"	338° 43' 30"	-8° 56' 24"	0.9899729	16'09.35"	23° 26' 19"	-13 m 01 s
10	337° 03' 03"	-0.55"	338° 45' 52"	-8° 55' 28"	0.9899827	16'09.34"	23° 26' 19"	-13 m 00 s
11	337° 05' 34"	-0.55"	338° 48' 14"	-8° 54' 32"	0.9899925	16'09.33"	23° 26' 19"	-12 m 60 s
12	337° 08' 05"	-0.54"	338° 50' 36"	-8° 53' 36"	0.9900023	16'09.32"	23° 26' 19"	-12 m 60 s
13	337° 10' 35"	-0.54"	338° 52' 57"	-8° 52' 40"	0.9900121	16'09.31"	23° 26' 19"	-12 m 59 s
14	337° 13' 06"	-0.54"	338° 55' 19"	-8° 51' 44"	0.9900219	16'09.30"	23° 26' 19"	-12 m 59 s
15	337° 15' 37"	-0.53"	338° 57' 41"	-8° 50' 48"	0.9900317	16'09.29"	23° 26' 19"	-12 m 58 s
16	337° 18' 08"	-0.53"	339° 00' 03"	-8° 49' 52"	0.9900415	16'09.28"	23° 26' 19"	-12 m 58 s
17	337° 20' 39"	-0.52"	339° 02' 25"	-8° 48' 56"	0.9900513	16'09.27"	23° 26' 19"	-12 m 57 s
18	337° 23' 10"	-0.52"	339° 04' 46"	-8° 47' 60"	0.9900611	16'09.26"	23° 26' 19"	-12 m 57 s
19	337° 25' 41"	-0.52"	339° 07' 08"	-8° 47' 04"	0.9900709	16'09.25"	23° 26' 19"	-12 m 57 s
20	337° 28' 12"	-0.51"	339° 09' 30"	-8° 46' 08"	0.9900807	16'09.24"	23° 26' 19"	-12 m 56 s
21	337° 30' 42"	-0.51"	339° 11' 51"	-8° 45' 12"	0.9900906	16'09.23"	23° 26' 19"	-12 m 56 s
22	337° 33' 13"	-0.50"	339° 14' 13"	-8° 44' 16"	0.9901004	16'09.22"	23° 26' 19"	-12 m 55 s
23	337° 35' 44"	-0.50"	339° 16' 35"	-8° 43' 19"	0.9901102	16'09.22"	23° 26' 19"	-12 m 55 s
24	337° 38' 15"	-0.50"	339° 18' 56"	-8° 42' 23"	0.9901201	16'09.21"	23° 26' 19"	-12 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	296° 46' 15"	-4° 35' 12"	299° 46' 35"	-25° 18' 01"	0° 57' 53"	15' 46.40"	73° 5' 55"	0.11797
1	297° 20' 13"	-4° 33' 40"	300° 22' 55"	-25° 09' 45"	0° 57' 55"	15' 47.00"	72° 48' 51"	0.11504
2	297° 54' 14"	-4° 32' 07"	300° 59' 13"	-25° 01' 19"	0° 57' 57"	15' 47.60"	72° 31' 49"	0.11214
3	298° 28' 17"	-4° 30' 31"	301° 35' 29"	-24° 52' 44"	0° 57' 60"	15' 48.20"	72° 14' 50"	0.10926
4	299° 02' 23"	-4° 28' 54"	302° 11' 43"	-24° 43' 59"	0° 58' 02"	15' 48.80"	71° 57' 53"	0.10641
5	299° 36' 31"	-4° 27' 16"	302° 47' 54"	-24° 35' 05"	0° 58' 04"	15' 49.40"	71° 40' 58"	0.10360
6	300° 10' 42"	-4° 25' 35"	303° 24' 04"	-24° 26' 02"	0° 58' 06"	15' 50.00"	71° 24' 06"	0.10081
7	300° 44' 55"	-4° 23' 53"	304° 00' 11"	-24° 16' 49"	0° 58' 08"	15' 50.60"	71° 7' 16"	0.09805
8	301° 19' 12"	-4° 22' 10"	304° 36' 15"	-24° 07' 27"	0° 58' 11"	15' 51.20"	70° 50' 29"	0.09532
9	301° 53' 30"	-4° 20' 24"	305° 12' 17"	-23° 57' 56"	0° 58' 13"	15' 51.79"	70° 33' 43"	0.09263
10	302° 27' 52"	-4° 18' 37"	305° 48' 17"	-23° 48' 15"	0° 58' 15"	15' 52.39"	70° 16' 60"	0.08996
11	303° 02' 16"	-4° 16' 48"	306° 24' 14"	-23° 38' 25"	0° 58' 17"	15' 52.98"	70° 0' 18"	0.08732
12	303° 36' 42"	-4° 14' 57"	307° 00' 09"	-23° 28' 27"	0° 58' 19"	15' 53.57"	69° 43' 39"	0.08472
13	304° 11' 11"	-4° 13' 05"	307° 36' 00"	-23° 18' 19"	0° 58' 22"	15' 54.16"	69° 27' 01"	0.08215
14	304° 45' 42"	-4° 11' 11"	308° 11' 49"	-23° 08' 03"	0° 58' 24"	15' 54.75"	69° 10' 24"	0.07961
15	305° 20' 16"	-4° 09' 15"	308° 47' 36"	-22° 57' 37"	0° 58' 26"	15' 55.33"	68° 53' 49"	0.07711
16	305° 54' 53"	-4° 07' 18"	309° 23' 19"	-22° 47' 03"	0° 58' 28"	15' 55.92"	68° 37' 15"	0.07464
17	306° 29' 32"	-4° 05' 19"	309° 59' 00"	-22° 36' 19"	0° 58' 30"	15' 56.50"	68° 20' 42"	0.07220
18	307° 04' 14"	-4° 03' 19"	310° 34' 38"	-22° 25' 28"	0° 58' 32"	15' 57.08"	68° 4' 10"	0.06980
19	307° 38' 58"	-4° 01' 16"	311° 10' 13"	-22° 14' 27"	0° 58' 34"	15' 57.66"	67° 47' 38"	0.06743
20	308° 13' 44"	-3° 59' 12"	311° 45' 46"	-22° 03' 18"	0° 58' 36"	15' 58.24"	67° 31' 06"	0.06509
21	308° 48' 33"	-3° 57' 07"	312° 21' 15"	-21° 52' 00"	0° 58' 39"	15' 58.81"	67° 14' 34"	0.06279
22	309° 23' 25"	-3° 54' 60"	312° 56' 41"	-21° 40' 34"	0° 58' 41"	15' 59.38"	66° 58' 01"	0.06053
23	309° 58' 19"	-3° 52' 51"	313° 32' 04"	-21° 28' 60"	0° 58' 43"	15' 59.95"	66° 41' 28"	0.05830
24	310° 33' 15"	-3° 50' 40"	314° 07' 25"	-21° 17' 17"	0° 58' 45"	16' 00.52"	66° 24' 52"	0.05611

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	337° 38' 15"	-0.50"	339° 18' 56"	-8° 42' 23"	0.9901201	16'09.21"	23° 26' 19"	-12 m 55 s
1	337° 40' 46"	-0.49"	339° 21' 18"	-8° 41' 27"	0.9901299	16'09.20"	23° 26' 19"	-12 m 54 s
2	337° 43' 17"	-0.49"	339° 23' 40"	-8° 40' 31"	0.9901397	16'09.19"	23° 26' 19"	-12 m 54 s
3	337° 45' 48"	-0.48"	339° 26' 01"	-8° 39' 35"	0.9901496	16'09.18"	23° 26' 19"	-12 m 53 s
4	337° 48' 18"	-0.48"	339° 28' 23"	-8° 38' 39"	0.9901594	16'09.17"	23° 26' 19"	-12 m 53 s
5	337° 50' 49"	-0.48"	339° 30' 45"	-8° 37' 42"	0.9901693	16'09.16"	23° 26' 19"	-12 m 52 s
6	337° 53' 20"	-0.47"	339° 33' 06"	-8° 36' 46"	0.9901791	16'09.15"	23° 26' 19"	-12 m 52 s
7	337° 55' 51"	-0.47"	339° 35' 28"	-8° 35' 50"	0.9901890	16'09.14"	23° 26' 19"	-12 m 52 s
8	337° 58' 22"	-0.46"	339° 37' 49"	-8° 34' 54"	0.9901988	16'09.13"	23° 26' 19"	-12 m 51 s
9	338° 00' 53"	-0.46"	339° 40' 11"	-8° 33' 57"	0.9902087	16'09.12"	23° 26' 19"	-12 m 51 s
10	338° 03' 23"	-0.45"	339° 42' 32"	-8° 33' 01"	0.9902185	16'09.11"	23° 26' 19"	-12 m 50 s
11	338° 05' 54"	-0.45"	339° 44' 54"	-8° 32' 05"	0.9902284	16'09.10"	23° 26' 19"	-12 m 50 s
12	338° 08' 25"	-0.44"	339° 47' 15"	-8° 31' 09"	0.9902383	16'09.09"	23° 26' 19"	-12 m 49 s
13	338° 10' 56"	-0.44"	339° 49' 37"	-8° 30' 12"	0.9902481	16'09.08"	23° 26' 19"	-12 m 49 s
14	338° 13' 27"	-0.44"	339° 51' 58"	-8° 29' 16"	0.9902580	16'09.07"	23° 26' 19"	-12 m 49 s
15	338° 15' 58"	-0.43"	339° 54' 20"	-8° 28' 20"	0.9902679	16'09.06"	23° 26' 19"	-12 m 48 s
16	338° 18' 28"	-0.43"	339° 56' 41"	-8° 27' 23"	0.9902778	16'09.05"	23° 26' 19"	-12 m 48 s
17	338° 20' 59"	-0.42"	339° 59' 02"	-8° 26' 27"	0.9902876	16'09.04"	23° 26' 19"	-12 m 47 s
18	338° 23' 30"	-0.42"	340° 01' 24"	-8° 25' 31"	0.9902975	16'09.03"	23° 26' 19"	-12 m 47 s
19	338° 26' 01"	-0.41"	340° 03' 45"	-8° 24' 34"	0.9903074	16'09.02"	23° 26' 19"	-12 m 46 s
20	338° 28' 32"	-0.41"	340° 06' 07"	-8° 23' 38"	0.9903173	16'09.01"	23° 26' 19"	-12 m 46 s
21	338° 31' 02"	-0.40"	340° 08' 28"	-8° 22' 41"	0.9903272	16'09.00"	23° 26' 19"	-12 m 45 s
22	338° 33' 33"	-0.40"	340° 10' 49"	-8° 21' 45"	0.9903371	16'08.99"	23° 26' 19"	-12 m 45 s
23	338° 36' 04"	-0.39"	340° 13' 11"	-8° 20' 49"	0.9903470	16'08.98"	23° 26' 19"	-12 m 45 s
24	338° 38' 35"	-0.39"	340° 15' 32"	-8° 19' 52"	0.9903569	16'08.97"	23° 26' 19"	-12 m 44 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	310° 33' 15"	-3° 50' 40"	314° 07' 25"	-21° 17' 17"	0° 58' 45"	16' 00.52"	66° 24' 52"	0.05611
1	311° 08' 14"	-3° 48' 28"	314° 42' 42"	-21° 05' 26"	0° 58' 47"	16' 01.08"	66° 8' 15"	0.05396
2	311° 43' 15"	-3° 46' 15"	315° 17' 56"	-20° 53' 27"	0° 58' 49"	16' 01.64"	65° 51' 35"	0.05184
3	312° 18' 18"	-3° 43' 60"	315° 53' 07"	-20° 41' 20"	0° 58' 51"	16' 02.20"	65° 34' 53"	0.04976
4	312° 53' 24"	-3° 41' 43"	316° 28' 15"	-20° 29' 04"	0° 58' 53"	16' 02.76"	65° 18' 06"	0.04772
5	313° 28' 33"	-3° 39' 25"	317° 03' 20"	-20° 16' 41"	0° 58' 55"	16' 03.31"	65° 1' 15"	0.04572
6	314° 03' 43"	-3° 37' 05"	317° 38' 22"	-20° 04' 10"	0° 58' 57"	16' 03.86"	64° 44' 19"	0.04375
7	314° 38' 56"	-3° 34' 43"	318° 13' 21"	-19° 51' 31"	0° 58' 59"	16' 04.40"	64° 27' 16"	0.04183
8	315° 14' 12"	-3° 32' 21"	318° 48' 16"	-19° 38' 44"	0° 59' 01"	16' 04.95"	64° 10' 06"	0.03994
9	315° 49' 29"	-3° 29' 56"	319° 23' 09"	-19° 25' 50"	0° 59' 03"	16' 05.48"	63° 52' 48"	0.03809
10	316° 24' 49"	-3° 27' 30"	319° 57' 58"	-19° 12' 48"	0° 59' 05"	16' 06.02"	63° 35' 21"	0.03629
11	317° 00' 11"	-3° 25' 03"	320° 32' 44"	-18° 59' 38"	0° 59' 07"	16' 06.55"	63° 17' 42"	0.03452
12	317° 35' 36"	-3° 22' 34"	321° 07' 27"	-18° 46' 22"	0° 59' 09"	16' 07.08"	62° 59' 52"	0.03279
13	318° 11' 03"	-3° 20' 03"	321° 42' 07"	-18° 32' 58"	0° 59' 11"	16' 07.60"	62° 41' 47"	0.03111
14	318° 46' 31"	-3° 17' 32"	322° 16' 44"	-18° 19' 26"	0° 59' 13"	16' 08.12"	62° 23' 27"	0.02946
15	319° 22' 03"	-3° 14' 58"	322° 51' 18"	-18° 05' 48"	0° 59' 15"	16' 08.64"	62° 4' 48"	0.02786
16	319° 57' 36"	-3° 12' 24"	323° 25' 49"	-17° 52' 02"	0° 59' 17"	16' 09.15"	61° 45' 50"	0.02630
17	320° 33' 11"	-3° 09' 48"	324° 00' 16"	-17° 38' 10"	0° 59' 18"	16' 09.66"	61° 26' 28"	0.02479
18	321° 08' 49"	-3° 07' 10"	324° 34' 41"	-17° 24' 10"	0° 59' 20"	16' 10.16"	61° 6' 41"	0.02331
19	321° 44' 29"	-3° 04' 31"	325° 09' 02"	-17° 10' 04"	0° 59' 22"	16' 10.66"	60° 46' 24"	0.02188
20	322° 20' 10"	-3° 01' 51"	325° 43' 20"	-16° 55' 51"	0° 59' 24"	16' 11.15"	60° 25' 34"	0.02049
21	322° 55' 54"	-2° 59' 09"	326° 17' 36"	-16° 41' 31"	0° 59' 26"	16' 11.64"	60° 4' 07"	0.01914
22	323° 31' 40"	-2° 56' 26"	326° 51' 48"	-16° 27' 05"	0° 59' 27"	16' 12.13"	59° 41' 57"	0.01784
23	324° 07' 28"	-2° 53' 42"	327° 25' 57"	-16° 12' 33"	0° 59' 29"	16' 12.61"	59° 18' 58"	0.01659
24	324° 43' 18"	-2° 50' 56"	328° 00' 03"	-15° 57' 54"	0° 59' 31"	16' 13.08"	58° 55' 05"	0.01537

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	338° 38' 35"	-0.39"	340° 15' 32"	-8° 19' 52"	0.9903569	16'08.97"	23° 26' 19"	-12 m 44 s
1	338° 41' 05"	-0.38"	340° 17' 53"	-8° 18' 56"	0.9903668	16'08.96"	23° 26' 19"	-12 m 44 s
2	338° 43' 36"	-0.38"	340° 20' 15"	-8° 17' 59"	0.9903767	16'08.95"	23° 26' 19"	-12 m 43 s
3	338° 46' 07"	-0.37"	340° 22' 36"	-8° 17' 03"	0.9903866	16'08.94"	23° 26' 19"	-12 m 43 s
4	338° 48' 38"	-0.37"	340° 24' 57"	-8° 16' 06"	0.9903965	16'08.94"	23° 26' 19"	-12 m 42 s
5	338° 51' 09"	-0.36"	340° 27' 18"	-8° 15' 10"	0.9904064	16'08.93"	23° 26' 19"	-12 m 42 s
6	338° 53' 39"	-0.36"	340° 29' 40"	-8° 14' 13"	0.9904163	16'08.92"	23° 26' 19"	-12 m 41 s
7	338° 56' 10"	-0.35"	340° 32' 01"	-8° 13' 17"	0.9904262	16'08.91"	23° 26' 19"	-12 m 41 s
8	338° 58' 41"	-0.35"	340° 34' 22"	-8° 12' 20"	0.9904361	16'08.90"	23° 26' 19"	-12 m 41 s
9	339° 01' 12"	-0.34"	340° 36' 43"	-8° 11' 23"	0.9904460	16'08.89"	23° 26' 19"	-12 m 40 s
10	339° 03' 42"	-0.34"	340° 39' 04"	-8° 10' 27"	0.9904560	16'08.88"	23° 26' 19"	-12 m 40 s
11	339° 06' 13"	-0.33"	340° 41' 25"	-8° 09' 30"	0.9904659	16'08.87"	23° 26' 19"	-12 m 39 s
12	339° 08' 44"	-0.33"	340° 43' 47"	-8° 08' 34"	0.9904758	16'08.86"	23° 26' 19"	-12 m 39 s
13	339° 11' 15"	-0.32"	340° 46' 08"	-8° 07' 37"	0.9904857	16'08.85"	23° 26' 19"	-12 m 38 s
14	339° 13' 45"	-0.32"	340° 48' 29"	-8° 06' 40"	0.9904957	16'08.84"	23° 26' 19"	-12 m 38 s
15	339° 16' 16"	-0.31"	340° 50' 50"	-8° 05' 44"	0.9905056	16'08.83"	23° 26' 19"	-12 m 37 s
16	339° 18' 47"	-0.31"	340° 53' 11"	-8° 04' 47"	0.9905155	16'08.82"	23° 26' 19"	-12 m 37 s
17	339° 21' 18"	-0.30"	340° 55' 32"	-8° 03' 51"	0.9905255	16'08.81"	23° 26' 19"	-12 m 36 s
18	339° 23' 48"	-0.30"	340° 57' 53"	-8° 02' 54"	0.9905354	16'08.80"	23° 26' 19"	-12 m 36 s
19	339° 26' 19"	-0.29"	341° 00' 14"	-8° 01' 57"	0.9905453	16'08.79"	23° 26' 19"	-12 m 36 s
20	339° 28' 50"	-0.29"	341° 02' 35"	-8° 01' 00"	0.9905553	16'08.78"	23° 26' 19"	-12 m 35 s
21	339° 31' 21"	-0.28"	341° 04' 56"	-8° 00' 04"	0.9905652	16'08.77"	23° 26' 19"	-12 m 35 s
22	339° 33' 51"	-0.28"	341° 07' 17"	-7° 59' 07"	0.9905752	16'08.76"	23° 26' 19"	-12 m 34 s
23	339° 36' 22"	-0.27"	341° 09' 38"	-7° 58' 10"	0.9905851	16'08.75"	23° 26' 19"	-12 m 34 s
24	339° 38' 53"	-0.26"	341° 11' 59"	-7° 57' 14"	0.9905951	16'08.74"	23° 26' 19"	-12 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	324° 43' 18"	-2° 50' 56"	328° 00' 03"	-15° 57' 54"	0° 59' 31"	16' 13.08"	58° 55' 05"	0.01537
1	325° 19' 10"	-2° 48' 10"	328° 34' 07"	-15° 43' 09"	0° 59' 33"	16' 13.55"	58° 30' 09"	0.01420
2	325° 55' 04"	-2° 45' 21"	329° 08' 07"	-15° 28' 17"	0° 59' 34"	16' 14.02"	58° 3' 60"	0.01308
3	326° 31' 00"	-2° 42' 32"	329° 42' 05"	-15° 13' 20"	0° 59' 36"	16' 14.48"	57° 36' 28"	0.01200
4	327° 06' 58"	-2° 39' 41"	330° 15' 59"	-14° 58' 16"	0° 59' 38"	16' 14.94"	57° 7' 21"	0.01097
5	327° 42' 58"	-2° 36' 50"	330° 49' 51"	-14° 43' 07"	0° 59' 39"	16' 15.39"	56° 36' 22"	0.00998
6	328° 18' 59"	-2° 33' 56"	331° 23' 40"	-14° 27' 52"	0° 59' 41"	16' 15.83"	56° 3' 14"	0.00904
7	328° 55' 03"	-2° 31' 02"	331° 57' 27"	-14° 12' 31"	0° 59' 43"	16' 16.27"	55° 27' 34"	0.00815
8	329° 31' 08"	-2° 28' 07"	332° 31' 10"	-13° 57' 05"	0° 59' 44"	16' 16.70"	54° 48' 55"	0.00730
9	330° 07' 15"	-2° 25' 10"	333° 04' 51"	-13° 41' 33"	0° 59' 46"	16' 17.13"	54° 6' 42"	0.00650
10	330° 43' 24"	-2° 22' 12"	333° 38' 29"	-13° 25' 56"	0° 59' 47"	16' 17.55"	53° 20' 13"	0.00574
11	331° 19' 35"	-2° 19' 14"	334° 12' 05"	-13° 10' 13"	0° 59' 49"	16' 17.97"	52° 28' 34"	0.00504
12	331° 55' 47"	-2° 16' 14"	334° 45' 38"	-12° 54' 26"	0° 59' 50"	16' 18.38"	51° 30' 36"	0.00438
13	332° 32' 01"	-2° 13' 13"	335° 19' 08"	-12° 38' 33"	0° 59' 52"	16' 18.79"	50° 24' 47"	0.00376
14	333° 08' 17"	-2° 10' 11"	335° 52' 36"	-12° 22' 35"	0° 59' 53"	16' 19.18"	49° 9' 07"	0.00320
15	333° 44' 33"	-2° 07' 08"	336° 26' 00"	-12° 06' 33"	0° 59' 55"	16' 19.58"	47° 40' 54"	0.00268
16	334° 20' 52"	-2° 04' 04"	336° 59' 24"	-11° 50' 26"	0° 59' 56"	16' 19.97"	45° 56' 15"	0.00222
17	334° 57' 13"	-2° 00' 59"	337° 32' 44"	-11° 34' 14"	0° 59' 58"	16' 20.35"	43° 49' 49"	0.00180
18	335° 33' 35"	-1° 57' 53"	338° 06' 03"	-11° 17' 57"	0° 59' 59"	16' 20.72"	41° 13' 42"	0.00142
19	336° 09' 59"	-1° 54' 46"	338° 39' 19"	-11° 01' 36"	1° 00' 00"	16' 21.09"	37° 56' 01"	0.00110
20	336° 46' 24"	-1° 51' 38"	339° 12' 33"	-10° 45' 10"	1° 00' 02"	16' 21.45"	33° 38' 23"	0.00083
21	337° 22' 51"	-1° 48' 29"	339° 45' 45"	-10° 28' 41"	1° 00' 03"	16' 21.81"	27° 51' 43"	0.00060
22	337° 59' 19"	-1° 45' 20"	340° 18' 55"	-10° 12' 07"	1° 00' 04"	16' 22.16"	19° 50' 18"	0.00043
23	338° 35' 48"	-1° 42' 09"	340° 52' 02"	-9° 55' 28"	1° 00' 06"	16' 22.50"	8° 28' 29"	0.00030
24	339° 12' 19"	-1° 38' 58"	341° 25' 08"	-9° 38' 46"	1° 00' 07"	16' 22.83"	352° 43' 15"	0.00022

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	339° 38' 53"	-0.26"	341° 11' 59"	-7° 57' 14"	0.9905951	16'08.74"	23° 26' 19"	-12 m 33 s
1	339° 41' 23"	-0.26"	341° 14' 20"	-7° 56' 17"	0.9906050	16'08.73"	23° 26' 19"	-12 m 33 s
2	339° 43' 54"	-0.25"	341° 16' 41"	-7° 55' 20"	0.9906150	16'08.72"	23° 26' 19"	-12 m 32 s
3	339° 46' 25"	-0.25"	341° 19' 02"	-7° 54' 23"	0.9906249	16'08.71"	23° 26' 19"	-12 m 32 s
4	339° 48' 56"	-0.24"	341° 21' 23"	-7° 53' 26"	0.9906349	16'08.70"	23° 26' 19"	-12 m 31 s
5	339° 51' 26"	-0.24"	341° 23' 44"	-7° 52' 30"	0.9906449	16'08.69"	23° 26' 19"	-12 m 31 s
6	339° 53' 57"	-0.23"	341° 26' 05"	-7° 51' 33"	0.9906548	16'08.68"	23° 26' 19"	-12 m 30 s
7	339° 56' 28"	-0.23"	341° 28' 26"	-7° 50' 36"	0.9906648	16'08.67"	23° 26' 19"	-12 m 30 s
8	339° 58' 58"	-0.22"	341° 30' 47"	-7° 49' 39"	0.9906748	16'08.66"	23° 26' 19"	-12 m 29 s
9	340° 01' 29"	-0.22"	341° 33' 07"	-7° 48' 42"	0.9906847	16'08.65"	23° 26' 19"	-12 m 29 s
10	340° 03' 60"	-0.21"	341° 35' 28"	-7° 47' 45"	0.9906947	16'08.64"	23° 26' 19"	-12 m 29 s
11	340° 06' 30"	-0.21"	341° 37' 49"	-7° 46' 49"	0.9907047	16'08.63"	23° 26' 19"	-12 m 28 s
12	340° 09' 01"	-0.20"	341° 40' 10"	-7° 45' 52"	0.9907147	16'08.62"	23° 26' 19"	-12 m 28 s
13	340° 11' 32"	-0.19"	341° 42' 31"	-7° 44' 55"	0.9907246	16'08.61"	23° 26' 19"	-12 m 27 s
14	340° 14' 02"	-0.19"	341° 44' 52"	-7° 43' 58"	0.9907346	16'08.60"	23° 26' 19"	-12 m 27 s
15	340° 16' 33"	-0.18"	341° 47' 12"	-7° 43' 01"	0.9907446	16'08.59"	23° 26' 19"	-12 m 26 s
16	340° 19' 04"	-0.18"	341° 49' 33"	-7° 42' 04"	0.9907546	16'08.58"	23° 26' 19"	-12 m 26 s
17	340° 21' 34"	-0.17"	341° 51' 54"	-7° 41' 07"	0.9907646	16'08.58"	23° 26' 19"	-12 m 25 s
18	340° 24' 05"	-0.17"	341° 54' 15"	-7° 40' 10"	0.9907746	16'08.57"	23° 26' 19"	-12 m 25 s
19	340° 26' 36"	-0.16"	341° 56' 35"	-7° 39' 13"	0.9907846	16'08.56"	23° 26' 19"	-12 m 24 s
20	340° 29' 06"	-0.16"	341° 58' 56"	-7° 38' 16"	0.9907946	16'08.55"	23° 26' 19"	-12 m 24 s
21	340° 31' 37"	-0.15"	342° 01' 17"	-7° 37' 19"	0.9908046	16'08.54"	23° 26' 19"	-12 m 23 s
22	340° 34' 08"	-0.14"	342° 03' 37"	-7° 36' 22"	0.9908146	16'08.53"	23° 26' 19"	-12 m 23 s
23	340° 36' 38"	-0.14"	342° 05' 58"	-7° 35' 25"	0.9908246	16'08.52"	23° 26' 19"	-12 m 22 s
24	340° 39' 09"	-0.13"	342° 08' 19"	-7° 34' 28"	0.9908346	16'08.51"	23° 26' 19"	-12 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	339° 12' 19"	-1° 38' 58"	341° 25' 08"	-9° 38' 46"	1° 00' 07"	16' 22.83"	352° 43' 15"	0.00022
1	339° 48' 52"	-1° 35' 46"	341° 58' 12"	-9° 22' 01"	1° 00' 08"	16' 23.16"	333° 8' 48"	0.00020
2	340° 25' 25"	-1° 32' 33"	342° 31' 14"	-9° 05' 11"	1° 00' 09"	16' 23.49"	313° 23' 24"	0.00022
3	341° 02' 00"	-1° 29' 19"	343° 04' 14"	-8° 48' 18"	1° 00' 10"	16' 23.80"	297° 16' 29"	0.00029
4	341° 38' 37"	-1° 26' 05"	343° 37' 12"	-8° 31' 21"	1° 00' 11"	16' 24.11"	285° 36' 02"	0.00041
5	342° 15' 14"	-1° 22' 49"	344° 10' 08"	-8° 14' 21"	1° 00' 13"	16' 24.41"	277° 22' 12"	0.00058
6	342° 51' 53"	-1° 19' 34"	344° 43' 03"	-7° 57' 18"	1° 00' 14"	16' 24.71"	271° 28' 03"	0.00080
7	343° 28' 33"	-1° 16' 17"	345° 15' 57"	-7° 40' 11"	1° 00' 15"	16' 25.00"	267° 6' 15"	0.00108
8	344° 05' 14"	-1° 12' 60"	345° 48' 48"	-7° 23' 01"	1° 00' 16"	16' 25.28"	263° 46' 37"	0.00140
9	344° 41' 56"	-1° 09' 42"	346° 21' 39"	-7° 05' 49"	1° 00' 17"	16' 25.55"	261° 10' 05"	0.00177
10	345° 18' 40"	-1° 06' 24"	346° 54' 28"	-6° 48' 33"	1° 00' 18"	16' 25.82"	259° 4' 21"	0.00219
11	345° 55' 24"	-1° 03' 05"	347° 27' 15"	-6° 31' 15"	1° 00' 19"	16' 26.08"	257° 21' 16"	0.00267
12	346° 32' 10"	0°-59' 45"	348° 00' 01"	-6° 13' 54"	1° 00' 20"	16' 26.33"	255° 55' 16"	0.00319
13	347° 08' 56"	0°-56' 25"	348° 32' 47"	-5° 56' 30"	1° 00' 20"	16' 26.57"	254° 42' 26"	0.00376
14	347° 45' 44"	0°-53' 05"	349° 05' 30"	-5° 39' 04"	1° 00' 21"	16' 26.81"	253° 39' 59"	0.00438
15	348° 22' 32"	0°-49' 44"	349° 38' 13"	-5° 21' 36"	1° 00' 22"	16' 27.04"	252° 45' 51"	0.00506
16	348° 59' 21"	0°-46' 23"	350° 10' 55"	-5° 04' 05"	1° 00' 23"	16' 27.27"	251° 58' 28"	0.00578
17	349° 36' 11"	0°-43' 01"	350° 43' 36"	-4° 46' 33"	1° 00' 24"	16' 27.48"	251° 16' 39"	0.00656
18	350° 13' 02"	0°-39' 39"	351° 16' 16"	-4° 28' 58"	1° 00' 25"	16' 27.69"	250° 39' 30"	0.00738
19	350° 49' 54"	0°-36' 16"	351° 48' 55"	-4° 11' 22"	1° 00' 25"	16' 27.89"	250° 6' 17"	0.00826
20	351° 26' 47"	0°-32' 53"	352° 21' 34"	-3° 53' 44"	1° 00' 26"	16' 28.09"	249° 36' 25"	0.00918
21	352° 03' 40"	0°-29' 30"	352° 54' 11"	-3° 36' 04"	1° 00' 27"	16' 28.27"	249° 9' 26"	0.01016
22	352° 40' 34"	0°-26' 06"	353° 26' 49"	-3° 18' 22"	1° 00' 27"	16' 28.45"	248° 44' 58"	0.01118
23	353° 17' 29"	0°-22' 43"	353° 59' 25"	-3° 00' 40"	1° 00' 28"	16' 28.63"	248° 22' 42"	0.01226
24	353° 54' 24"	0°-19' 19"	354° 32' 01"	-2° 42' 56"	1° 00' 29"	16' 28.79"	248° 2' 23"	0.01338

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	340° 39' 09"	-0.13"	342° 08' 19"	-7° 34' 28"	0.9908346	16'08.51"	23° 26' 19"	-12 m 22 s
1	340° 41' 40"	-0.13"	342° 10' 39"	-7° 33' 31"	0.9908446	16'08.50"	23° 26' 19"	-12 m 21 s
2	340° 44' 10"	-0.12"	342° 12' 60"	-7° 32' 34"	0.9908546	16'08.49"	23° 26' 19"	-12 m 21 s
3	340° 46' 41"	-0.12"	342° 15' 21"	-7° 31' 37"	0.9908646	16'08.48"	23° 26' 19"	-12 m 20 s
4	340° 49' 12"	-0.11"	342° 17' 41"	-7° 30' 40"	0.9908746	16'08.47"	23° 26' 19"	-12 m 20 s
5	340° 51' 42"	-0.11"	342° 20' 02"	-7° 29' 43"	0.9908846	16'08.46"	23° 26' 19"	-12 m 19 s
6	340° 54' 13"	-0.10"	342° 22' 22"	-7° 28' 46"	0.9908946	16'08.45"	23° 26' 19"	-12 m 19 s
7	340° 56' 43"	-0.09"	342° 24' 43"	-7° 27' 49"	0.9909046	16'08.44"	23° 26' 19"	-12 m 18 s
8	340° 59' 14"	-0.09"	342° 27' 03"	-7° 26' 51"	0.9909147	16'08.43"	23° 26' 19"	-12 m 18 s
9	341° 01' 45"	-0.08"	342° 29' 24"	-7° 25' 54"	0.9909247	16'08.42"	23° 26' 19"	-12 m 17 s
10	341° 04' 15"	-0.08"	342° 31' 45"	-7° 24' 57"	0.9909347	16'08.41"	23° 26' 19"	-12 m 17 s
11	341° 06' 46"	-0.07"	342° 34' 05"	-7° 23' 60"	0.9909447	16'08.40"	23° 26' 19"	-12 m 16 s
12	341° 09' 16"	-0.07"	342° 36' 26"	-7° 23' 03"	0.9909548	16'08.39"	23° 26' 19"	-12 m 16 s
13	341° 11' 47"	-0.06"	342° 38' 46"	-7° 22' 06"	0.9909648	16'08.38"	23° 26' 19"	-12 m 15 s
14	341° 14' 18"	-0.06"	342° 41' 06"	-7° 21' 08"	0.9909748	16'08.37"	23° 26' 19"	-12 m 15 s
15	341° 16' 48"	-0.05"	342° 43' 27"	-7° 20' 11"	0.9909849	16'08.36"	23° 26' 19"	-12 m 14 s
16	341° 19' 19"	-0.05"	342° 45' 47"	-7° 19' 14"	0.9909949	16'08.35"	23° 26' 19"	-12 m 14 s
17	341° 21' 49"	-0.04"	342° 48' 08"	-7° 18' 17"	0.9910049	16'08.34"	23° 26' 19"	-12 m 13 s
18	341° 24' 20"	-0.03"	342° 50' 28"	-7° 17' 20"	0.9910150	16'08.33"	23° 26' 19"	-12 m 13 s
19	341° 26' 51"	-0.03"	342° 52' 49"	-7° 16' 22"	0.9910250	16'08.32"	23° 26' 19"	-12 m 12 s
20	341° 29' 21"	-0.02"	342° 55' 09"	-7° 15' 25"	0.9910351	16'08.31"	23° 26' 19"	-12 m 12 s
21	341° 31' 52"	-0.02"	342° 57' 29"	-7° 14' 28"	0.9910451	16'08.30"	23° 26' 19"	-12 m 11 s
22	341° 34' 22"	-0.01"	342° 59' 50"	-7° 13' 31"	0.9910551	16'08.29"	23° 26' 19"	-12 m 11 s
23	341° 36' 53"	-0.01"	343° 02' 10"	-7° 12' 33"	0.9910652	16'08.28"	23° 26' 19"	-12 m 10 s
24	341° 39' 23"	-0.00"	343° 04' 30"	-7° 11' 36"	0.9910753	16'08.27"	23° 26' 19"	-12 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	353° 54' 24"	0°-19' 19"	354° 32' 01"	-2° 42' 56"	1° 00' 29"	16' 28.79"	248° 2' 23"	0.01338
1	354° 31' 20"	0°-15' 55"	355° 04' 37"	-2° 25' 10"	1° 00' 29"	16' 28.95"	247° 43' 46"	0.01456
2	355° 08' 17"	0°-12' 30"	355° 37' 13"	-2° 07' 24"	1° 00' 30"	16' 29.10"	247° 26' 42"	0.01578
3	355° 45' 14"	0° -9' 06"	356° 09' 48"	-1° 49' 37"	1° 00' 30"	16' 29.24"	247° 11' 01"	0.01706
4	356° 22' 12"	0° -5' 41"	356° 42' 23"	-1° 31' 48"	1° 00' 31"	16' 29.37"	246° 56' 34"	0.01838
5	356° 59' 10"	0° -2' 19"	357° 14' 59"	-1° 14' 02"	1° 00' 31"	16' 29.50"	246° 43' 24"	0.01975
6	357° 36' 09"	0° 01' 06"	357° 47' 34"	0°-56' 12"	1° 00' 32"	16' 29.62"	246° 31' 08"	0.02118
7	358° 13' 08"	0° 04' 31"	358° 20' 09"	0°-38' 22"	1° 00' 32"	16' 29.73"	246° 19' 48"	0.02265
8	358° 50' 07"	0° 07' 55"	358° 52' 44"	0°-20' 31"	1° 00' 32"	16' 29.83"	246° 9' 22"	0.02417
9	359° 27' 07"	0° 11' 20"	359° 25' 19"	0° -2' 41"	1° 00' 33"	16' 29.93"	245° 59' 43"	0.02574
10	0° 04' 07"	0° 14' 45"	359° 57' 55"	0° 15' 10"	1° 00' 33"	16' 30.02"	245° 50' 50"	0.02736
11	0° 41' 08"	0° 18' 10"	0° 30' 31"	0° 33' 01"	1° 00' 33"	16' 30.10"	245° 42' 39"	0.02902
12	1° 18' 08"	0° 21' 34"	1° 03' 07"	0° 50' 52"	1° 00' 34"	16' 30.17"	245° 35' 08"	0.03074
13	1° 55' 09"	0° 24' 59"	1° 35' 44"	1° 08' 43"	1° 00' 34"	16' 30.24"	245° 28' 13"	0.03250
14	2° 32' 10"	0° 28' 23"	2° 08' 21"	1° 26' 33"	1° 00' 34"	16' 30.30"	245° 21' 53"	0.03431
15	3° 09' 12"	0° 31' 47"	2° 40' 59"	1° 44' 24"	1° 00' 34"	16' 30.35"	245° 16' 06"	0.03617
16	3° 46' 13"	0° 35' 11"	3° 13' 37"	2° 02' 13"	1° 00' 34"	16' 30.39"	245° 10' 51"	0.03808
17	4° 23' 15"	0° 38' 35"	3° 46' 17"	2° 20' 02"	1° 00' 35"	16' 30.43"	245° 6' 04"	0.04003
18	5° 00' 16"	0° 41' 58"	4° 18' 57"	2° 37' 50"	1° 00' 35"	16' 30.46"	245° 1' 46"	0.04203
19	5° 37' 18"	0° 45' 21"	4° 51' 38"	2° 55' 38"	1° 00' 35"	16' 30.48"	244° 57' 55"	0.04408
20	6° 14' 20"	0° 48' 44"	5° 24' 20"	3° 13' 24"	1° 00' 35"	16' 30.49"	244° 54' 30"	0.04618
21	6° 51' 22"	0° 52' 07"	5° 57' 04"	3° 31' 10"	1° 00' 35"	16' 30.50"	244° 51' 29"	0.04832
22	7° 28' 23"	0° 55' 29"	6° 29' 48"	3° 48' 54"	1° 00' 35"	16' 30.50"	244° 48' 52"	0.05050
23	8° 05' 25"	0° 58' 51"	7° 02' 34"	4° 06' 37"	1° 00' 35"	16' 30.49"	244° 46' 38"	0.05274
24	8° 42' 26"	1° 02' 12"	7° 35' 20"	4° 24' 18"	1° 00' 35"	16' 30.47"	244° 44' 46"	0.05501

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	341° 39' 23"	-0.00"	343° 04' 30"	-7° 11' 36"	0.9910753	16'08.27"	23° 26' 19"	-12 m 10 s
1	341° 41' 54"	0.00"	343° 06' 51"	-7° 10' 39"	0.9910853	16'08.26"	23° 26' 19"	-12 m 09 s
2	341° 44' 25"	0.01"	343° 09' 11"	-7° 09' 41"	0.9910954	16'08.25"	23° 26' 19"	-12 m 09 s
3	341° 46' 55"	0.01"	343° 11' 31"	-7° 08' 44"	0.9911054	16'08.24"	23° 26' 19"	-12 m 08 s
4	341° 49' 26"	0.02"	343° 13' 52"	-7° 07' 47"	0.9911155	16'08.23"	23° 26' 19"	-12 m 08 s
5	341° 51' 56"	0.03"	343° 16' 12"	-7° 06' 49"	0.9911255	16'08.22"	23° 26' 19"	-12 m 07 s
6	341° 54' 27"	0.03"	343° 18' 32"	-7° 05' 52"	0.9911356	16'08.21"	23° 26' 19"	-12 m 07 s
7	341° 56' 57"	0.04"	343° 20' 52"	-7° 04' 55"	0.9911457	16'08.20"	23° 26' 19"	-12 m 06 s
8	341° 59' 28"	0.04"	343° 23' 13"	-7° 03' 57"	0.9911558	16'08.19"	23° 26' 19"	-12 m 06 s
9	342° 01' 58"	0.05"	343° 25' 33"	-7° 02' 60"	0.9911658	16'08.18"	23° 26' 19"	-12 m 05 s
10	342° 04' 29"	0.05"	343° 27' 53"	-7° 02' 03"	0.9911759	16'08.17"	23° 26' 19"	-12 m 05 s
11	342° 06' 59"	0.06"	343° 30' 13"	-7° 01' 05"	0.9911860	16'08.16"	23° 26' 19"	-12 m 04 s
12	342° 09' 30"	0.06"	343° 32' 34"	-7° 00' 08"	0.9911961	16'08.15"	23° 26' 19"	-12 m 04 s
13	342° 12' 00"	0.07"	343° 34' 54"	-6° 59' 10"	0.9912061	16'08.14"	23° 26' 19"	-12 m 03 s
14	342° 14' 31"	0.07"	343° 37' 14"	-6° 58' 13"	0.9912162	16'08.13"	23° 26' 19"	-12 m 03 s
15	342° 17' 02"	0.08"	343° 39' 34"	-6° 57' 15"	0.9912263	16'08.12"	23° 26' 19"	-12 m 02 s
16	342° 19' 32"	0.08"	343° 41' 54"	-6° 56' 18"	0.9912364	16'08.11"	23° 26' 19"	-12 m 02 s
17	342° 22' 03"	0.09"	343° 44' 14"	-6° 55' 20"	0.9912465	16'08.10"	23° 26' 19"	-12 m 01 s
18	342° 24' 33"	0.09"	343° 46' 34"	-6° 54' 23"	0.9912566	16'08.09"	23° 26' 19"	-12 m 01 s
19	342° 27' 04"	0.10"	343° 48' 54"	-6° 53' 25"	0.9912667	16'08.08"	23° 26' 19"	-12 m 00 s
20	342° 29' 34"	0.10"	343° 51' 15"	-6° 52' 28"	0.9912768	16'08.07"	23° 26' 19"	-11 m 60 s
21	342° 32' 05"	0.11"	343° 53' 35"	-6° 51' 30"	0.9912869	16'08.06"	23° 26' 19"	-11 m 59 s
22	342° 34' 35"	0.12"	343° 55' 55"	-6° 50' 33"	0.9912970	16'08.06"	23° 26' 19"	-11 m 58 s
23	342° 37' 05"	0.12"	343° 58' 15"	-6° 49' 35"	0.9913071	16'08.05"	23° 26' 19"	-11 m 58 s
24	342° 39' 36"	0.13"	344° 00' 35"	-6° 48' 38"	0.9913172	16'08.04"	23° 26' 19"	-11 m 57 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	8° 42' 26"	1° 02' 12"	7° 35' 20"	4° 24' 18"	1° 00' 35"	16' 30.47"	244° 44' 46"	0.05501
1	9° 19' 28"	1° 05' 33"	8° 08' 09"	4° 41' 58"	1° 00' 35"	16' 30.45"	244° 43' 15"	0.05734
2	9° 56' 29"	1° 08' 53"	8° 40' 58"	4° 59' 36"	1° 00' 35"	16' 30.42"	244° 42' 04"	0.05970
3	10° 33' 30"	1° 12' 13"	9° 13' 49"	5° 17' 13"	1° 00' 34"	16' 30.38"	244° 41' 14"	0.06212
4	11° 10' 30"	1° 15' 33"	9° 46' 42"	5° 34' 47"	1° 00' 34"	16' 30.34"	244° 40' 43"	0.06457
5	11° 47' 31"	1° 18' 51"	10° 19' 37"	5° 52' 20"	1° 00' 34"	16' 30.29"	244° 40' 31"	0.06707
6	12° 24' 31"	1° 22' 10"	10° 52' 33"	6° 09' 50"	1° 00' 34"	16' 30.23"	244° 40' 38"	0.06962
7	13° 01' 31"	1° 25' 27"	11° 25' 31"	6° 27' 19"	1° 00' 34"	16' 30.16"	244° 41' 02"	0.07221
8	13° 38' 30"	1° 28' 44"	11° 58' 30"	6° 44' 45"	1° 00' 33"	16' 30.09"	244° 41' 44"	0.07484
9	14° 15' 29"	1° 32' 01"	12° 31' 32"	7° 02' 08"	1° 00' 33"	16' 30.01"	244° 42' 43"	0.07751
10	14° 52' 28"	1° 35' 16"	13° 04' 36"	7° 19' 29"	1° 00' 33"	16' 29.92"	244° 43' 59"	0.08023
11	15° 29' 26"	1° 38' 31"	13° 37' 42"	7° 36' 47"	1° 00' 32"	16' 29.83"	244° 45' 31"	0.08299
12	16° 06' 24"	1° 41' 46"	14° 10' 50"	7° 54' 03"	1° 00' 32"	16' 29.73"	244° 47' 19"	0.08579
13	16° 43' 21"	1° 44' 59"	14° 43' 60"	8° 11' 15"	1° 00' 32"	16' 29.62"	244° 49' 23"	0.08863
14	17° 20' 18"	1° 48' 12"	15° 17' 12"	8° 28' 25"	1° 00' 31"	16' 29.51"	244° 51' 43"	0.09151
15	17° 57' 14"	1° 51' 24"	15° 50' 27"	8° 45' 32"	1° 00' 31"	16' 29.39"	244° 54' 18"	0.09443
16	18° 34' 10"	1° 54' 35"	16° 23' 44"	9° 02' 35"	1° 00' 30"	16' 29.26"	244° 57' 08"	0.09739
17	19° 11' 05"	1° 57' 45"	16° 57' 04"	9° 19' 35"	1° 00' 30"	16' 29.12"	245° 0' 12"	0.10039
18	19° 47' 60"	2° 00' 55"	17° 30' 26"	9° 36' 31"	1° 00' 29"	16' 28.98"	245° 3' 32"	0.10343
19	20° 24' 53"	2° 04' 03"	18° 03' 51"	9° 53' 24"	1° 00' 29"	16' 28.83"	245° 7' 05"	0.10652
20	21° 01' 46"	2° 07' 11"	18° 37' 18"	10° 10' 13"	1° 00' 28"	16' 28.68"	245° 10' 53"	0.10963
21	21° 38' 39"	2° 10' 17"	19° 10' 49"	10° 26' 59"	1° 00' 28"	16' 28.52"	245° 14' 54"	0.11279
22	22° 15' 30"	2° 13' 23"	19° 44' 22"	10° 43' 40"	1° 00' 27"	16' 28.35"	245° 19' 10"	0.11599
23	22° 52' 21"	2° 16' 28"	20° 17' 57"	11° 00' 18"	1° 00' 26"	16' 28.18"	245° 23' 39"	0.11922
24	23° 29' 11"	2° 19' 31"	20° 51' 36"	11° 16' 51"	1° 00' 26"	16' 28.00"	245° 28' 22"	0.12249

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	342° 39' 36"	0.13"	344° 00' 35"	-6° 48' 38"	0.9913172	16'08.04"	23° 26' 19"	-11 m 57 s
1	342° 42' 06"	0.13"	344° 02' 55"	-6° 47' 40"	0.9913273	16'08.03"	23° 26' 19"	-11 m 57 s
2	342° 44' 37"	0.14"	344° 05' 15"	-6° 46' 43"	0.9913374	16'08.02"	23° 26' 19"	-11 m 56 s
3	342° 47' 07"	0.14"	344° 07' 35"	-6° 45' 45"	0.9913475	16'08.01"	23° 26' 19"	-11 m 56 s
4	342° 49' 38"	0.15"	344° 09' 55"	-6° 44' 48"	0.9913576	16'08.00"	23° 26' 19"	-11 m 55 s
5	342° 52' 08"	0.15"	344° 12' 15"	-6° 43' 50"	0.9913677	16'07.99"	23° 26' 19"	-11 m 55 s
6	342° 54' 39"	0.16"	344° 14' 35"	-6° 42' 52"	0.9913779	16'07.98"	23° 26' 19"	-11 m 54 s
7	342° 57' 09"	0.16"	344° 16' 55"	-6° 41' 55"	0.9913880	16'07.97"	23° 26' 19"	-11 m 54 s
8	342° 59' 40"	0.17"	344° 19' 15"	-6° 40' 57"	0.9913981	16'07.96"	23° 26' 19"	-11 m 53 s
9	343° 02' 10"	0.17"	344° 21' 35"	-6° 39' 60"	0.9914082	16'07.95"	23° 26' 19"	-11 m 53 s
10	343° 04' 41"	0.17"	344° 23' 54"	-6° 39' 02"	0.9914184	16'07.94"	23° 26' 19"	-11 m 52 s
11	343° 07' 11"	0.18"	344° 26' 14"	-6° 38' 04"	0.9914285	16'07.93"	23° 26' 19"	-11 m 52 s
12	343° 09' 41"	0.18"	344° 28' 34"	-6° 37' 07"	0.9914386	16'07.92"	23° 26' 19"	-11 m 51 s
13	343° 12' 12"	0.19"	344° 30' 54"	-6° 36' 09"	0.9914488	16'07.91"	23° 26' 19"	-11 m 50 s
14	343° 14' 42"	0.19"	344° 33' 14"	-6° 35' 11"	0.9914589	16'07.90"	23° 26' 19"	-11 m 50 s
15	343° 17' 13"	0.20"	344° 35' 34"	-6° 34' 14"	0.9914691	16'07.89"	23° 26' 19"	-11 m 49 s
16	343° 19' 43"	0.20"	344° 37' 54"	-6° 33' 16"	0.9914792	16'07.88"	23° 26' 19"	-11 m 49 s
17	343° 22' 14"	0.21"	344° 40' 13"	-6° 32' 18"	0.9914894	16'07.87"	23° 26' 19"	-11 m 48 s
18	343° 24' 44"	0.21"	344° 42' 33"	-6° 31' 21"	0.9914995	16'07.86"	23° 26' 19"	-11 m 48 s
19	343° 27' 14"	0.22"	344° 44' 53"	-6° 30' 23"	0.9915097	16'07.85"	23° 26' 19"	-11 m 47 s
20	343° 29' 45"	0.22"	344° 47' 13"	-6° 29' 25"	0.9915198	16'07.84"	23° 26' 19"	-11 m 47 s
21	343° 32' 15"	0.23"	344° 49' 33"	-6° 28' 27"	0.9915300	16'07.83"	23° 26' 19"	-11 m 46 s
22	343° 34' 46"	0.23"	344° 51' 52"	-6° 27' 30"	0.9915401	16'07.82"	23° 26' 19"	-11 m 46 s
23	343° 37' 16"	0.24"	344° 54' 12"	-6° 26' 32"	0.9915503	16'07.81"	23° 26' 19"	-11 m 45 s
24	343° 39' 46"	0.24"	344° 56' 32"	-6° 25' 34"	0.9915605	16'07.80"	23° 26' 19"	-11 m 44 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	23° 29' 11"	2° 19' 31"	20° 51' 36"	11° 16' 51"	1° 00' 26"	16' 28.00"	245° 28' 22"	0.12249
1	24° 06' 00"	2° 22' 34"	21° 25' 18"	11° 33' 20"	1° 00' 25"	16' 27.82"	245° 33' 17"	0.12579
2	24° 42' 49"	2° 25' 36"	21° 59' 03"	11° 49' 45"	1° 00' 24"	16' 27.63"	245° 38' 27"	0.12913
3	25° 19' 36"	2° 28' 36"	22° 32' 51"	12° 06' 06"	1° 00' 24"	16' 27.43"	245° 43' 49"	0.13251
4	25° 56' 23"	2° 31' 35"	23° 06' 42"	12° 22' 21"	1° 00' 23"	16' 27.23"	245° 49' 24"	0.13592
5	26° 33' 09"	2° 34' 34"	23° 40' 36"	12° 38' 33"	1° 00' 22"	16' 27.02"	245° 55' 12"	0.13937
6	27° 09' 53"	2° 37' 31"	24° 14' 34"	12° 54' 39"	1° 00' 21"	16' 26.80"	246° 1' 12"	0.14285
7	27° 46' 37"	2° 40' 27"	24° 48' 34"	13° 10' 41"	1° 00' 21"	16' 26.58"	246° 7' 25"	0.14636
8	28° 23' 20"	2° 43' 22"	25° 22' 39"	13° 26' 37"	1° 00' 20"	16' 26.35"	246° 13' 51"	0.14991
9	29° 00' 02"	2° 46' 15"	25° 56' 46"	13° 42' 28"	1° 00' 19"	16' 26.12"	246° 20' 28"	0.15349
10	29° 36' 39"	2° 49' 07"	26° 30' 54"	13° 58' 13"	1° 00' 18"	16' 25.88"	246° 27' 18"	0.15710
11	30° 13' 19"	2° 51' 58"	27° 05' 09"	14° 13' 54"	1° 00' 17"	16' 25.64"	246° 34' 20"	0.16074
12	30° 49' 58"	2° 54' 48"	27° 39' 27"	14° 29' 30"	1° 00' 16"	16' 25.39"	246° 41' 34"	0.16442
13	31° 26' 35"	2° 57' 37"	28° 13' 49"	14° 44' 60"	1° 00' 15"	16' 25.14"	246° 49' 00"	0.16812
14	32° 03' 12"	3° 00' 24"	28° 48' 14"	15° 00' 24"	1° 00' 14"	16' 24.88"	246° 56' 38"	0.17186
15	32° 39' 47"	3° 03' 10"	29° 22' 43"	15° 15' 43"	1° 00' 13"	16' 24.61"	247° 4' 28"	0.17563
16	33° 16' 21"	3° 05' 55"	29° 57' 16"	15° 30' 55"	1° 00' 12"	16' 24.34"	247° 12' 29"	0.17943
17	33° 52' 54"	3° 08' 38"	30° 31' 53"	15° 46' 02"	1° 00' 11"	16' 24.07"	247° 20' 42"	0.18325
18	34° 29' 26"	3° 11' 20"	31° 06' 33"	16° 01' 03"	1° 00' 10"	16' 23.79"	247° 29' 07"	0.18711
19	35° 05' 56"	3° 14' 00"	31° 41' 18"	16° 15' 58"	1° 00' 09"	16' 23.51"	247° 37' 43"	0.19099
20	35° 42' 25"	3° 16' 39"	32° 16' 06"	16° 30' 46"	1° 00' 08"	16' 23.22"	247° 46' 30"	0.19490
21	36° 18' 53"	3° 19' 17"	32° 50' 58"	16° 45' 28"	1° 00' 07"	16' 22.92"	247° 55' 28"	0.19884
22	36° 55' 20"	3° 21' 53"	33° 25' 54"	17° 00' 04"	1° 00' 06"	16' 22.62"	248° 4' 38"	0.20280
23	37° 31' 45"	3° 24' 28"	34° 00' 54"	17° 14' 33"	1° 00' 05"	16' 22.32"	248° 13' 59"	0.20679
24	38° 08' 10"	3° 27' 01"	34° 35' 58"	17° 28' 55"	1° 00' 04"	16' 22.01"	248° 23' 30"	0.21081

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	343° 39' 46"	0.24"	344° 56' 32"	-6° 25' 34"	0.9915605	16'07.80"	23° 26' 19"	-11 m 44 s
1	343° 42' 17"	0.24"	344° 58' 52"	-6° 24' 36"	0.9915706	16'07.79"	23° 26' 19"	-11 m 44 s
2	343° 44' 47"	0.25"	345° 01' 11"	-6° 23' 38"	0.9915808	16'07.78"	23° 26' 19"	-11 m 43 s
3	343° 47' 18"	0.25"	345° 03' 31"	-6° 22' 41"	0.9915910	16'07.77"	23° 26' 19"	-11 m 43 s
4	343° 49' 48"	0.26"	345° 05' 51"	-6° 21' 43"	0.9916012	16'07.76"	23° 26' 19"	-11 m 42 s
5	343° 52' 18"	0.26"	345° 08' 10"	-6° 20' 45"	0.9916113	16'07.75"	23° 26' 19"	-11 m 42 s
6	343° 54' 49"	0.27"	345° 10' 30"	-6° 19' 47"	0.9916215	16'07.74"	23° 26' 19"	-11 m 41 s
7	343° 57' 19"	0.27"	345° 12' 50"	-6° 18' 49"	0.9916317	16'07.73"	23° 26' 19"	-11 m 41 s
8	343° 59' 50"	0.27"	345° 15' 09"	-6° 17' 52"	0.9916419	16'07.72"	23° 26' 19"	-11 m 40 s
9	344° 02' 20"	0.28"	345° 17' 29"	-6° 16' 54"	0.9916521	16'07.71"	23° 26' 19"	-11 m 40 s
10	344° 04' 50"	0.28"	345° 19' 49"	-6° 15' 56"	0.9916623	16'07.70"	23° 26' 19"	-11 m 39 s
11	344° 07' 21"	0.29"	345° 22' 08"	-6° 14' 58"	0.9916725	16'07.69"	23° 26' 19"	-11 m 38 s
12	344° 09' 51"	0.29"	345° 24' 28"	-6° 14' 00"	0.9916827	16'07.68"	23° 26' 19"	-11 m 38 s
13	344° 12' 21"	0.29"	345° 26' 47"	-6° 13' 02"	0.9916929	16'07.67"	23° 26' 19"	-11 m 37 s
14	344° 14' 52"	0.30"	345° 29' 07"	-6° 12' 04"	0.9917031	16'07.66"	23° 26' 19"	-11 m 37 s
15	344° 17' 22"	0.30"	345° 31' 27"	-6° 11' 06"	0.9917133	16'07.65"	23° 26' 19"	-11 m 36 s
16	344° 19' 52"	0.31"	345° 33' 46"	-6° 10' 09"	0.9917235	16'07.64"	23° 26' 19"	-11 m 36 s
17	344° 22' 23"	0.31"	345° 36' 06"	-6° 09' 11"	0.9917337	16'07.63"	23° 26' 19"	-11 m 35 s
18	344° 24' 53"	0.31"	345° 38' 25"	-6° 08' 13"	0.9917439	16'07.62"	23° 26' 19"	-11 m 35 s
19	344° 27' 23"	0.32"	345° 40' 45"	-6° 07' 15"	0.9917541	16'07.61"	23° 26' 19"	-11 m 34 s
20	344° 29' 54"	0.32"	345° 43' 04"	-6° 06' 17"	0.9917644	16'07.60"	23° 26' 19"	-11 m 33 s
21	344° 32' 24"	0.32"	345° 45' 24"	-6° 05' 19"	0.9917746	16'07.59"	23° 26' 19"	-11 m 33 s
22	344° 34' 54"	0.33"	345° 47' 43"	-6° 04' 21"	0.9917848	16'07.58"	23° 26' 19"	-11 m 32 s
23	344° 37' 25"	0.33"	345° 50' 03"	-6° 03' 23"	0.9917950	16'07.57"	23° 26' 19"	-11 m 32 s
24	344° 39' 55"	0.33"	345° 52' 22"	-6° 02' 25"	0.9918053	16'07.56"	23° 26' 19"	-11 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	38° 08' 10"	3° 27' 01"	34° 35' 58"	17° 28' 55"	1° 00' 04"	16' 22.01"	248° 23' 30"	0.21081
1	38° 44' 32"	3° 29' 33"	35° 11' 07"	17° 43' 10"	1° 00' 03"	16' 21.70"	248° 33' 13"	0.21485
2	39° 20' 54"	3° 32' 03"	35° 46' 19"	17° 57' 19"	1° 00' 01"	16' 21.38"	248° 43' 07"	0.21892
3	39° 57' 14"	3° 34' 32"	36° 21' 35"	18° 11' 21"	1° 00' 00"	16' 21.06"	248° 53' 11"	0.22301
4	40° 33' 32"	3° 36' 59"	36° 56' 55"	18° 25' 16"	0° 59' 59"	16' 20.74"	249° 3' 26"	0.22712
5	41° 09' 50"	3° 39' 25"	37° 32' 20"	18° 39' 03"	0° 59' 58"	16' 20.41"	249° 13' 51"	0.23126
6	41° 46' 05"	3° 41' 49"	38° 07' 49"	18° 52' 43"	0° 59' 57"	16' 20.08"	249° 24' 27"	0.23542
7	42° 22' 20"	3° 44' 11"	38° 43' 22"	19° 06' 16"	0° 59' 55"	16' 19.74"	249° 35' 14"	0.23960
8	42° 58' 33"	3° 46' 32"	39° 18' 59"	19° 19' 42"	0° 59' 54"	16' 19.40"	249° 46' 11"	0.24380
9	43° 34' 44"	3° 48' 51"	39° 54' 40"	19° 32' 60"	0° 59' 53"	16' 19.05"	249° 57' 18"	0.24803
10	44° 10' 54"	3° 51' 09"	40° 30' 25"	19° 46' 10"	0° 59' 52"	16' 18.70"	250° 8' 35"	0.25227
11	44° 47' 02"	3° 53' 25"	41° 06' 15"	19° 59' 13"	0° 59' 50"	16' 18.35"	250° 20' 03"	0.25654
12	45° 23' 09"	3° 55' 40"	41° 42' 09"	20° 12' 07"	0° 59' 49"	16' 17.99"	250° 31' 40"	0.26082
13	45° 59' 15"	3° 57' 52"	42° 18' 07"	20° 24' 54"	0° 59' 48"	16' 17.63"	250° 43' 28"	0.26513
14	46° 35' 19"	4° 00' 03"	42° 54' 09"	20° 37' 33"	0° 59' 46"	16' 17.27"	250° 55' 25"	0.26945
15	47° 11' 21"	4° 02' 13"	43° 30' 16"	20° 50' 04"	0° 59' 45"	16' 16.91"	251° 7' 32"	0.27379
16	47° 47' 22"	4° 04' 20"	44° 06' 27"	21° 02' 26"	0° 59' 44"	16' 16.54"	251° 19' 49"	0.27815
17	48° 23' 21"	4° 06' 26"	44° 42' 42"	21° 14' 41"	0° 59' 42"	16' 16.16"	251° 32' 16"	0.28252
18	48° 59' 18"	4° 08' 31"	45° 19' 01"	21° 26' 47"	0° 59' 41"	16' 15.79"	251° 44' 52"	0.28692
19	49° 35' 14"	4° 10' 33"	45° 55' 24"	21° 38' 44"	0° 59' 39"	16' 15.41"	251° 57' 37"	0.29133
20	50° 11' 09"	4° 12' 34"	46° 31' 51"	21° 50' 33"	0° 59' 38"	16' 15.02"	252° 10' 32"	0.29575
21	50° 47' 01"	4° 14' 33"	47° 08' 23"	22° 02' 13"	0° 59' 37"	16' 14.64"	252° 23' 36"	0.30019
22	51° 22' 52"	4° 16' 31"	47° 44' 59"	22° 13' 45"	0° 59' 35"	16' 14.25"	252° 36' 49"	0.30464
23	51° 58' 42"	4° 18' 26"	48° 21' 39"	22° 25' 08"	0° 59' 34"	16' 13.86"	252° 50' 11"	0.30911
24	52° 34' 29"	4° 20' 20"	48° 58' 22"	22° 36' 22"	0° 59' 32"	16' 13.47"	253° 3' 43"	0.31359

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	344° 39' 55"	0.33"	345° 52' 22"	-6° 02' 25"	0.9918053	16'07.56"	23° 26' 19"	-11 m 31 s
1	344° 42' 25"	0.34"	345° 54' 41"	-6° 01' 27"	0.9918155	16'07.55"	23° 26' 19"	-11 m 31 s
2	344° 44' 56"	0.34"	345° 57' 01"	-6° 00' 29"	0.9918258	16'07.54"	23° 26' 19"	-11 m 30 s
3	344° 47' 26"	0.35"	345° 59' 20"	-5° 59' 31"	0.9918360	16'07.53"	23° 26' 19"	-11 m 29 s
4	344° 49' 56"	0.35"	346° 01' 40"	-5° 58' 33"	0.9918462	16'07.52"	23° 26' 19"	-11 m 29 s
5	344° 52' 26"	0.35"	346° 03' 59"	-5° 57' 35"	0.9918565	16'07.51"	23° 26' 19"	-11 m 28 s
6	344° 54' 57"	0.36"	346° 06' 19"	-5° 56' 37"	0.9918667	16'07.50"	23° 26' 19"	-11 m 28 s
7	344° 57' 27"	0.36"	346° 08' 38"	-5° 55' 39"	0.9918770	16'07.49"	23° 26' 19"	-11 m 27 s
8	344° 59' 57"	0.36"	346° 10' 57"	-5° 54' 41"	0.9918873	16'07.48"	23° 26' 19"	-11 m 27 s
9	345° 02' 28"	0.36"	346° 13' 17"	-5° 53' 43"	0.9918975	16'07.47"	23° 26' 19"	-11 m 26 s
10	345° 04' 58"	0.37"	346° 15' 36"	-5° 52' 45"	0.9919078	16'07.46"	23° 26' 19"	-11 m 25 s
11	345° 07' 28"	0.37"	346° 17' 55"	-5° 51' 47"	0.9919181	16'07.45"	23° 26' 19"	-11 m 25 s
12	345° 09' 58"	0.37"	346° 20' 15"	-5° 50' 49"	0.9919283	16'07.44"	23° 26' 19"	-11 m 24 s
13	345° 12' 29"	0.38"	346° 22' 34"	-5° 49' 50"	0.9919386	16'07.43"	23° 26' 19"	-11 m 24 s
14	345° 14' 59"	0.38"	346° 24' 53"	-5° 48' 52"	0.9919489	16'07.42"	23° 26' 19"	-11 m 23 s
15	345° 17' 29"	0.38"	346° 27' 12"	-5° 47' 54"	0.9919592	16'07.41"	23° 26' 19"	-11 m 23 s
16	345° 19' 59"	0.39"	346° 29' 32"	-5° 46' 56"	0.9919695	16'07.40"	23° 26' 19"	-11 m 22 s
17	345° 22' 30"	0.39"	346° 31' 51"	-5° 45' 58"	0.9919797	16'07.39"	23° 26' 19"	-11 m 21 s
18	345° 24' 60"	0.39"	346° 34' 10"	-5° 44' 60"	0.9919900	16'07.38"	23° 26' 19"	-11 m 21 s
19	345° 27' 30"	0.39"	346° 36' 29"	-5° 44' 02"	0.9920003	16'07.37"	23° 26' 19"	-11 m 20 s
20	345° 30' 00"	0.40"	346° 38' 49"	-5° 43' 04"	0.9920106	16'07.36"	23° 26' 19"	-11 m 20 s
21	345° 32' 31"	0.40"	346° 41' 08"	-5° 42' 05"	0.9920209	16'07.35"	23° 26' 19"	-11 m 19 s
22	345° 35' 01"	0.40"	346° 43' 27"	-5° 41' 07"	0.9920312	16'07.34"	23° 26' 19"	-11 m 19 s
23	345° 37' 31"	0.40"	346° 45' 46"	-5° 40' 09"	0.9920415	16'07.33"	23° 26' 19"	-11 m 18 s
24	345° 40' 01"	0.41"	346° 48' 05"	-5° 39' 11"	0.9920519	16'07.32"	23° 26' 19"	-11 m 17 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	52° 34' 29"	4° 20' 20"	48° 58' 22"	22° 36' 22"	0° 59' 32"	16' 13.47"	253° 3' 43"	0.31359
1	53° 10' 15"	4° 22' 12"	49° 35' 10"	22° 47' 27"	0° 59' 31"	16' 13.07"	253° 17' 23"	0.31809
2	53° 45' 60"	4° 24' 02"	50° 12' 02"	22° 58' 23"	0° 59' 29"	16' 12.67"	253° 31' 11"	0.32260
3	54° 21' 42"	4° 25' 51"	50° 48' 58"	23° 09' 10"	0° 59' 28"	16' 12.27"	253° 45' 09"	0.32712
4	54° 57' 23"	4° 27' 37"	51° 25' 58"	23° 19' 47"	0° 59' 27"	16' 11.87"	253° 59' 15"	0.33165
5	55° 33' 03"	4° 29' 22"	52° 03' 02"	23° 30' 16"	0° 59' 25"	16' 11.46"	254° 13' 29"	0.33619
6	56° 08' 40"	4° 31' 05"	52° 40' 10"	23° 40' 35"	0° 59' 24"	16' 11.05"	254° 27' 52"	0.34075
7	56° 44' 16"	4° 32' 46"	53° 17' 22"	23° 50' 45"	0° 59' 22"	16' 10.64"	254° 42' 23"	0.34531
8	57° 19' 50"	4° 34' 26"	53° 54' 37"	24° 00' 45"	0° 59' 21"	16' 10.23"	254° 57' 02"	0.34988
9	57° 55' 22"	4° 36' 03"	54° 31' 56"	24° 10' 36"	0° 59' 19"	16' 09.82"	255° 11' 50"	0.35447
10	58° 30' 53"	4° 37' 39"	55° 09' 19"	24° 20' 17"	0° 59' 17"	16' 09.40"	255° 26' 45"	0.35906
11	59° 06' 22"	4° 39' 12"	55° 46' 46"	24° 29' 48"	0° 59' 16"	16' 08.98"	255° 41' 47"	0.36366
12	59° 41' 49"	4° 40' 44"	56° 24' 16"	24° 39' 10"	0° 59' 14"	16' 08.56"	255° 56' 58"	0.36827
13	60° 17' 14"	4° 42' 14"	57° 01' 49"	24° 48' 21"	0° 59' 13"	16' 08.14"	256° 12' 16"	0.37289
14	60° 52' 37"	4° 43' 43"	57° 39' 26"	24° 57' 23"	0° 59' 11"	16' 07.71"	256° 27' 41"	0.37751
15	61° 27' 59"	4° 45' 09"	58° 17' 07"	25° 06' 15"	0° 59' 10"	16' 07.29"	256° 43' 14"	0.38214
16	62° 03' 19"	4° 46' 33"	58° 54' 51"	25° 14' 57"	0° 59' 08"	16' 06.86"	256° 58' 53"	0.38677
17	62° 38' 37"	4° 47' 56"	59° 32' 38"	25° 23' 29"	0° 59' 07"	16' 06.43"	257° 14' 40"	0.39142
18	63° 13' 53"	4° 49' 17"	60° 10' 28"	25° 31' 51"	0° 59' 05"	16' 06.00"	257° 30' 34"	0.39606
19	63° 49' 07"	4° 50' 35"	60° 48' 22"	25° 40' 02"	0° 59' 03"	16' 05.57"	257° 46' 34"	0.40071
20	64° 24' 20"	4° 51' 52"	61° 26' 18"	25° 48' 04"	0° 59' 02"	16' 05.14"	258° 2' 41"	0.40537
21	64° 59' 31"	4° 53' 07"	62° 04' 18"	25° 55' 55"	0° 59' 00"	16' 04.71"	258° 18' 55"	0.41003
22	65° 34' 40"	4° 54' 21"	62° 42' 20"	26° 03' 35"	0° 58' 59"	16' 04.27"	258° 35' 14"	0.41469
23	66° 09' 47"	4° 55' 32"	63° 20' 25"	26° 11' 05"	0° 58' 57"	16' 03.83"	258° 51' 40"	0.41936
24	66° 44' 52"	4° 56' 41"	63° 58' 33"	26° 18' 25"	0° 58' 55"	16' 03.40"	259° 8' 13"	0.42402

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	345° 40' 01"	0.41"	346° 48' 05"	-5° 39' 11"	0.9920519	16'07.32"	23° 26' 19"	-11 m 17 s
1	345° 42' 31"	0.41"	346° 50' 25"	-5° 38' 13"	0.9920622	16'07.31"	23° 26' 19"	-11 m 17 s
2	345° 45' 02"	0.41"	346° 52' 44"	-5° 37' 15"	0.9920725	16'07.30"	23° 26' 19"	-11 m 16 s
3	345° 47' 32"	0.41"	346° 55' 03"	-5° 36' 16"	0.9920828	16'07.29"	23° 26' 19"	-11 m 16 s
4	345° 50' 02"	0.42"	346° 57' 22"	-5° 35' 18"	0.9920932	16'07.28"	23° 26' 19"	-11 m 15 s
5	345° 52' 32"	0.42"	346° 59' 41"	-5° 34' 20"	0.9921035	16'07.27"	23° 26' 19"	-11 m 14 s
6	345° 55' 02"	0.42"	347° 02' 00"	-5° 33' 22"	0.9921138	16'07.26"	23° 26' 19"	-11 m 14 s
7	345° 57' 33"	0.42"	347° 04' 19"	-5° 32' 24"	0.9921242	16'07.25"	23° 26' 19"	-11 m 13 s
8	346° 00' 03"	0.42"	347° 06' 39"	-5° 31' 25"	0.9921345	16'07.24"	23° 26' 19"	-11 m 13 s
9	346° 02' 33"	0.43"	347° 08' 58"	-5° 30' 27"	0.9921448	16'07.23"	23° 26' 19"	-11 m 12 s
10	346° 05' 03"	0.43"	347° 11' 17"	-5° 29' 29"	0.9921552	16'07.22"	23° 26' 19"	-11 m 11 s
11	346° 07' 33"	0.43"	347° 13' 36"	-5° 28' 31"	0.9921655	16'07.21"	23° 26' 19"	-11 m 11 s
12	346° 10' 04"	0.43"	347° 15' 55"	-5° 27' 32"	0.9921759	16'07.20"	23° 26' 19"	-11 m 10 s
13	346° 12' 34"	0.43"	347° 18' 14"	-5° 26' 34"	0.9921863	16'07.19"	23° 26' 19"	-11 m 10 s
14	346° 15' 04"	0.44"	347° 20' 33"	-5° 25' 36"	0.9921966	16'07.18"	23° 26' 19"	-11 m 09 s
15	346° 17' 34"	0.44"	347° 22' 52"	-5° 24' 37"	0.9922070	16'07.17"	23° 26' 19"	-11 m 09 s
16	346° 20' 04"	0.44"	347° 25' 11"	-5° 23' 39"	0.9922174	16'07.16"	23° 26' 19"	-11 m 08 s
17	346° 22' 34"	0.44"	347° 27' 30"	-5° 22' 41"	0.9922277	16'07.15"	23° 26' 19"	-11 m 07 s
18	346° 25' 05"	0.44"	347° 29' 49"	-5° 21' 43"	0.9922381	16'07.14"	23° 26' 19"	-11 m 07 s
19	346° 27' 35"	0.44"	347° 32' 08"	-5° 20' 44"	0.9922485	16'07.13"	23° 26' 19"	-11 m 06 s
20	346° 30' 05"	0.45"	347° 34' 27"	-5° 19' 46"	0.9922589	16'07.12"	23° 26' 19"	-11 m 06 s
21	346° 32' 35"	0.45"	347° 36' 46"	-5° 18' 48"	0.9922693	16'07.11"	23° 26' 19"	-11 m 05 s
22	346° 35' 05"	0.45"	347° 39' 05"	-5° 17' 49"	0.9922797	16'07.10"	23° 26' 19"	-11 m 04 s
23	346° 37' 35"	0.45"	347° 41' 24"	-5° 16' 51"	0.9922901	16'07.09"	23° 26' 19"	-11 m 04 s
24	346° 40' 05"	0.45"	347° 43' 43"	-5° 15' 53"	0.9923005	16'07.08"	23° 26' 19"	-11 m 03 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	66° 44' 52"	4° 56' 41"	63° 58' 33"	26° 18' 25"	0° 58' 55"	16' 03.40"	259° 8' 13"	0.42402
1	67° 19' 55"	4° 57' 48"	64° 36' 43"	26° 25' 35"	0° 58' 54"	16' 02.96"	259° 24' 50"	0.42869
2	67° 54' 57"	4° 58' 54"	65° 14' 57"	26° 32' 33"	0° 58' 52"	16' 02.52"	259° 41' 34"	0.43336
3	68° 29' 57"	4° 59' 57"	65° 53' 12"	26° 39' 21"	0° 58' 51"	16' 02.08"	259° 58' 23"	0.43804
4	69° 04' 55"	5° 00' 59"	66° 31' 30"	26° 45' 59"	0° 58' 49"	16' 01.64"	260° 15' 18"	0.44271
5	69° 39' 51"	5° 01' 59"	67° 09' 50"	26° 52' 26"	0° 58' 47"	16' 01.20"	260° 32' 18"	0.44738
6	70° 14' 45"	5° 02' 57"	67° 48' 12"	26° 58' 42"	0° 58' 46"	16' 00.75"	260° 49' 24"	0.45206
7	70° 49' 37"	5° 03' 53"	68° 26' 37"	27° 04' 47"	0° 58' 44"	16' 00.31"	261° 6' 34"	0.45673
8	71° 24' 28"	5° 04' 47"	69° 05' 03"	27° 10' 42"	0° 58' 42"	15' 59.87"	261° 23' 49"	0.46140
9	71° 59' 16"	5° 05' 39"	69° 43' 31"	27° 16' 26"	0° 58' 41"	15' 59.42"	261° 41' 09"	0.46607
10	72° 34' 03"	5° 06' 29"	70° 22' 01"	27° 21' 59"	0° 58' 39"	15' 58.98"	261° 58' 33"	0.47074
11	73° 08' 48"	5° 07' 17"	71° 00' 32"	27° 27' 21"	0° 58' 38"	15' 58.53"	262° 16' 01"	0.47541
12	73° 43' 31"	5° 08' 04"	71° 39' 05"	27° 32' 32"	0° 58' 36"	15' 58.09"	262° 33' 34"	0.48007
13	74° 18' 12"	5° 08' 48"	72° 17' 40"	27° 37' 32"	0° 58' 34"	15' 57.64"	262° 51' 11"	0.48473
14	74° 52' 51"	5° 09' 31"	72° 56' 16"	27° 42' 22"	0° 58' 33"	15' 57.19"	263° 8' 52"	0.48939
15	75° 27' 28"	5° 10' 11"	73° 34' 53"	27° 46' 60"	0° 58' 31"	15' 56.75"	263° 26' 36"	0.49404
16	76° 02' 04"	5° 10' 50"	74° 13' 30"	27° 51' 27"	0° 58' 29"	15' 56.30"	263° 44' 24"	0.49869
17	76° 36' 38"	5° 11' 27"	74° 52' 09"	27° 55' 44"	0° 58' 28"	15' 55.85"	264° 2' 15"	0.50333
18	77° 11' 09"	5° 12' 01"	75° 30' 49"	27° 59' 49"	0° 58' 26"	15' 55.41"	264° 20' 10"	0.50797
19	77° 45' 39"	5° 12' 34"	76° 09' 30"	28° 03' 43"	0° 58' 24"	15' 54.96"	264° 38' 07"	0.51261
20	78° 20' 07"	5° 13' 05"	76° 48' 11"	28° 07' 26"	0° 58' 23"	15' 54.51"	264° 56' 07"	0.51723
21	78° 54' 33"	5° 13' 35"	77° 26' 52"	28° 10' 59"	0° 58' 21"	15' 54.06"	265° 14' 10"	0.52185
22	79° 28' 58"	5° 14' 02"	78° 05' 34"	28° 14' 20"	0° 58' 20"	15' 53.62"	265° 32' 16"	0.52647
23	80° 03' 20"	5° 14' 27"	78° 44' 16"	28° 17' 30"	0° 58' 18"	15' 53.17"	265° 50' 24"	0.53108
24	80° 37' 41"	5° 14' 51"	79° 22' 58"	28° 20' 29"	0° 58' 16"	15' 52.72"	266° 8' 34"	0.53568

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	346° 40' 05"	0.45"	347° 43' 43"	-5° 15' 53"	0.9923005	16'07.08"	23° 26' 19"	-11 m 03 s
1	346° 42' 36"	0.45"	347° 46' 01"	-5° 14' 54"	0.9923109	16'07.07"	23° 26' 19"	-11 m 03 s
2	346° 45' 06"	0.45"	347° 48' 20"	-5° 13' 56"	0.9923213	16'07.06"	23° 26' 19"	-11 m 02 s
3	346° 47' 36"	0.45"	347° 50' 39"	-5° 12' 57"	0.9923317	16'07.05"	23° 26' 19"	-11 m 01 s
4	346° 50' 06"	0.46"	347° 52' 58"	-5° 11' 59"	0.9923421	16'07.04"	23° 26' 19"	-11 m 01 s
5	346° 52' 36"	0.46"	347° 55' 17"	-5° 11' 01"	0.9923526	16'07.03"	23° 26' 19"	-11 m 00 s
6	346° 55' 06"	0.46"	347° 57' 36"	-5° 10' 02"	0.9923630	16'07.02"	23° 26' 19"	-10 m 60 s
7	346° 57' 36"	0.46"	347° 59' 55"	-5° 09' 04"	0.9923734	16'07.00"	23° 26' 19"	-10 m 59 s
8	347° 00' 06"	0.46"	348° 02' 13"	-5° 08' 06"	0.9923839	16'06.99"	23° 26' 19"	-10 m 58 s
9	347° 02' 36"	0.46"	348° 04' 32"	-5° 07' 07"	0.9923943	16'06.98"	23° 26' 19"	-10 m 58 s
10	347° 05' 06"	0.46"	348° 06' 51"	-5° 06' 09"	0.9924047	16'06.97"	23° 26' 19"	-10 m 57 s
11	347° 07' 37"	0.46"	348° 09' 10"	-5° 05' 10"	0.9924152	16'06.96"	23° 26' 19"	-10 m 57 s
12	347° 10' 07"	0.46"	348° 11' 29"	-5° 04' 12"	0.9924257	16'06.95"	23° 26' 19"	-10 m 56 s
13	347° 12' 37"	0.46"	348° 13' 47"	-5° 03' 13"	0.9924361	16'06.94"	23° 26' 19"	-10 m 55 s
14	347° 15' 07"	0.46"	348° 16' 06"	-5° 02' 15"	0.9924466	16'06.93"	23° 26' 19"	-10 m 55 s
15	347° 17' 37"	0.46"	348° 18' 25"	-5° 01' 16"	0.9924570	16'06.92"	23° 26' 19"	-10 m 54 s
16	347° 20' 07"	0.46"	348° 20' 44"	-5° 00' 18"	0.9924675	16'06.91"	23° 26' 19"	-10 m 53 s
17	347° 22' 37"	0.46"	348° 23' 03"	-4° 59' 20"	0.9924780	16'06.90"	23° 26' 19"	-10 m 53 s
18	347° 25' 07"	0.47"	348° 25' 21"	-4° 58' 21"	0.9924885	16'06.89"	23° 26' 19"	-10 m 52 s
19	347° 27' 37"	0.47"	348° 27' 40"	-4° 57' 23"	0.9924989	16'06.88"	23° 26' 19"	-10 m 52 s
20	347° 30' 07"	0.47"	348° 29' 59"	-4° 56' 24"	0.9925094	16'06.87"	23° 26' 19"	-10 m 51 s
21	347° 32' 37"	0.47"	348° 32' 17"	-4° 55' 26"	0.9925199	16'06.86"	23° 26' 19"	-10 m 50 s
22	347° 35' 07"	0.47"	348° 34' 36"	-4° 54' 27"	0.9925304	16'06.85"	23° 26' 19"	-10 m 50 s
23	347° 37' 37"	0.47"	348° 36' 55"	-4° 53' 29"	0.9925409	16'06.84"	23° 26' 19"	-10 m 49 s
24	347° 40' 07"	0.47"	348° 39' 13"	-4° 52' 30"	0.9925514	16'06.83"	23° 26' 19"	-10 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	80° 37' 41"	5° 14' 51"	79° 22' 58"	28° 20' 29"	0° 58' 16"	15' 52.72"	266° 8' 34"	0.53568
1	81° 11' 59"	5° 15' 12"	80° 01' 40"	28° 23' 16"	0° 58' 15"	15' 52.28"	266° 26' 46"	0.54027
2	81° 46' 16"	5° 15' 32"	80° 40' 22"	28° 25' 53"	0° 58' 13"	15' 51.83"	266° 44' 59"	0.54486
3	82° 20' 31"	5° 15' 50"	81° 19' 03"	28° 28' 19"	0° 58' 11"	15' 51.38"	267° 3' 15"	0.54943
4	82° 54' 44"	5° 16' 06"	81° 57' 44"	28° 30' 33"	0° 58' 10"	15' 50.94"	267° 21' 32"	0.55400
5	83° 28' 55"	5° 16' 20"	82° 36' 25"	28° 32' 37"	0° 58' 08"	15' 50.49"	267° 39' 50"	0.55856
6	84° 03' 04"	5° 16' 32"	83° 15' 05"	28° 34' 29"	0° 58' 06"	15' 50.05"	267° 58' 09"	0.56311
7	84° 37' 12"	5° 16' 42"	83° 53' 44"	28° 36' 11"	0° 58' 05"	15' 49.60"	268° 16' 29"	0.56765
8	85° 11' 18"	5° 16' 50"	84° 32' 22"	28° 37' 41"	0° 58' 03"	15' 49.16"	268° 34' 50"	0.57217
9	85° 45' 21"	5° 16' 57"	85° 10' 59"	28° 39' 01"	0° 58' 02"	15' 48.71"	268° 53' 12"	0.57669
10	86° 19' 23"	5° 17' 02"	85° 49' 35"	28° 40' 09"	0° 57' 60"	15' 48.27"	269° 11' 34"	0.58120
11	86° 53' 23"	5° 17' 04"	86° 28' 09"	28° 41' 06"	0° 57' 58"	15' 47.83"	269° 29' 56"	0.58570
12	87° 27' 22"	5° 17' 05"	87° 06' 42"	28° 41' 53"	0° 57' 57"	15' 47.39"	269° 48' 18"	0.59018
13	88° 01' 18"	5° 17' 04"	87° 45' 14"	28° 42' 28"	0° 57' 55"	15' 46.94"	270° 6' 40"	0.59465
14	88° 35' 12"	5° 17' 02"	88° 23' 44"	28° 42' 52"	0° 57' 53"	15' 46.50"	270° 25' 02"	0.59911
15	89° 09' 05"	5° 16' 57"	89° 02' 11"	28° 43' 06"	0° 57' 52"	15' 46.06"	270° 43' 23"	0.60356
16	89° 42' 56"	5° 16' 51"	89° 40' 37"	28° 43' 09"	0° 57' 50"	15' 45.62"	271° 1' 44"	0.60799
17	90° 16' 45"	5° 16' 42"	90° 19' 01"	28° 43' 00"	0° 57' 49"	15' 45.19"	271° 20' 04"	0.61242
18	90° 50' 32"	5° 16' 32"	90° 57' 23"	28° 42' 41"	0° 57' 47"	15' 44.75"	271° 38' 23"	0.61682
19	91° 24' 18"	5° 16' 21"	91° 35' 42"	28° 42' 12"	0° 57' 45"	15' 44.31"	271° 56' 41"	0.62122
20	91° 58' 01"	5° 16' 07"	92° 13' 59"	28° 41' 31"	0° 57' 44"	15' 43.87"	272° 14' 58"	0.62560
21	92° 31' 43"	5° 15' 51"	92° 52' 13"	28° 40' 40"	0° 57' 42"	15' 43.44"	272° 33' 13"	0.62996
22	93° 05' 23"	5° 15' 34"	93° 30' 25"	28° 39' 38"	0° 57' 41"	15' 43.00"	272° 51' 26"	0.63431
23	93° 39' 01"	5° 15' 15"	94° 08' 33"	28° 38' 25"	0° 57' 39"	15' 42.57"	273° 9' 38"	0.63865
24	94° 12' 37"	5° 14' 54"	94° 46' 39"	28° 37' 02"	0° 57' 37"	15' 42.14"	273° 27' 48"	0.64297

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	347° 40' 07"	0.47"	348° 39' 13"	-4° 52' 30"	0.9925514	16'06.83"	23° 26' 19"	-10 m 49 s
1	347° 42' 37"	0.47"	348° 41' 32"	-4° 51' 32"	0.9925619	16'06.82"	23° 26' 19"	-10 m 48 s
2	347° 45' 07"	0.47"	348° 43' 51"	-4° 50' 33"	0.9925724	16'06.81"	23° 26' 19"	-10 m 47 s
3	347° 47' 37"	0.47"	348° 46' 09"	-4° 49' 35"	0.9925830	16'06.80"	23° 26' 19"	-10 m 47 s
4	347° 50' 07"	0.47"	348° 48' 28"	-4° 48' 36"	0.9925935	16'06.79"	23° 26' 19"	-10 m 46 s
5	347° 52' 38"	0.46"	348° 50' 47"	-4° 47' 37"	0.9926040	16'06.78"	23° 26' 19"	-10 m 45 s
6	347° 55' 08"	0.46"	348° 53' 05"	-4° 46' 39"	0.9926145	16'06.77"	23° 26' 19"	-10 m 45 s
7	347° 57' 38"	0.46"	348° 55' 24"	-4° 45' 40"	0.9926251	16'06.76"	23° 26' 19"	-10 m 44 s
8	348° 00' 08"	0.46"	348° 57' 42"	-4° 44' 42"	0.9926356	16'06.75"	23° 26' 19"	-10 m 44 s
9	348° 02' 38"	0.46"	349° 00' 01"	-4° 43' 43"	0.9926462	16'06.74"	23° 26' 19"	-10 m 43 s
10	348° 05' 08"	0.46"	349° 02' 20"	-4° 42' 45"	0.9926567	16'06.73"	23° 26' 19"	-10 m 42 s
11	348° 07' 38"	0.46"	349° 04' 38"	-4° 41' 46"	0.9926673	16'06.72"	23° 26' 19"	-10 m 42 s
12	348° 10' 08"	0.46"	349° 06' 57"	-4° 40' 47"	0.9926778	16'06.71"	23° 26' 19"	-10 m 41 s
13	348° 12' 38"	0.46"	349° 09' 15"	-4° 39' 49"	0.9926884	16'06.70"	23° 26' 19"	-10 m 41 s
14	348° 15' 08"	0.46"	349° 11' 34"	-4° 38' 50"	0.9926990	16'06.69"	23° 26' 19"	-10 m 40 s
15	348° 17' 37"	0.46"	349° 13' 52"	-4° 37' 52"	0.9927095	16'06.68"	23° 26' 19"	-10 m 39 s
16	348° 20' 07"	0.46"	349° 16' 11"	-4° 36' 53"	0.9927201	16'06.67"	23° 26' 19"	-10 m 39 s
17	348° 22' 37"	0.46"	349° 18' 29"	-4° 35' 54"	0.9927307	16'06.66"	23° 26' 19"	-10 m 38 s
18	348° 25' 07"	0.46"	349° 20' 48"	-4° 34' 56"	0.9927413	16'06.65"	23° 26' 19"	-10 m 37 s
19	348° 27' 37"	0.46"	349° 23' 06"	-4° 33' 57"	0.9927519	16'06.64"	23° 26' 19"	-10 m 37 s
20	348° 30' 07"	0.45"	349° 25' 25"	-4° 32' 59"	0.9927625	16'06.63"	23° 26' 19"	-10 m 36 s
21	348° 32' 37"	0.45"	349° 27' 43"	-4° 31' 60"	0.9927731	16'06.62"	23° 26' 19"	-10 m 36 s
22	348° 35' 07"	0.45"	349° 30' 02"	-4° 31' 01"	0.9927837	16'06.61"	23° 26' 19"	-10 m 35 s
23	348° 37' 37"	0.45"	349° 32' 20"	-4° 30' 03"	0.9927943	16'06.59"	23° 26' 19"	-10 m 34 s
24	348° 40' 07"	0.45"	349° 34' 38"	-4° 29' 04"	0.9928049	16'06.58"	23° 26' 19"	-10 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	94° 12' 37"	5° 14' 54"	94° 46' 39"	28° 37' 02"	0° 57' 37"	15' 42.14"	273° 27' 48"	0.64297
1	94° 46' 12"	5° 14' 32"	95° 24' 42"	28° 35' 28"	0° 57' 36"	15' 41.71"	273° 45' 56"	0.64727
2	95° 19' 45"	5° 14' 07"	96° 02' 41"	28° 33' 44"	0° 57' 34"	15' 41.28"	274° 4' 01"	0.65156
3	95° 53' 16"	5° 13' 41"	96° 40' 37"	28° 31' 49"	0° 57' 33"	15' 40.85"	274° 22' 04"	0.65583
4	96° 26' 45"	5° 13' 13"	97° 18' 30"	28° 29' 44"	0° 57' 31"	15' 40.42"	274° 40' 05"	0.66008
5	97° 00' 12"	5° 12' 44"	97° 56' 19"	28° 27' 29"	0° 57' 30"	15' 39.99"	274° 58' 02"	0.66432
6	97° 33' 38"	5° 12' 12"	98° 34' 05"	28° 25' 03"	0° 57' 28"	15' 39.56"	275° 15' 57"	0.66854
7	98° 07' 02"	5° 11' 39"	99° 11' 47"	28° 22' 27"	0° 57' 26"	15' 39.14"	275° 33' 49"	0.67275
8	98° 40' 24"	5° 11' 04"	99° 49' 25"	28° 19' 40"	0° 57' 25"	15' 38.72"	275° 51' 38"	0.67693
9	99° 13' 44"	5° 10' 28"	100° 26' 59"	28° 16' 44"	0° 57' 23"	15' 38.29"	276° 9' 24"	0.68110
10	99° 47' 03"	5° 09' 49"	101° 04' 29"	28° 13' 37"	0° 57' 22"	15' 37.87"	276° 27' 06"	0.68525
11	100° 20' 20"	5° 09' 09"	101° 41' 55"	28° 10' 21"	0° 57' 20"	15' 37.45"	276° 44' 44"	0.68938
12	100° 53' 35"	5° 08' 28"	102° 19' 17"	28° 06' 54"	0° 57' 19"	15' 37.03"	277° 2' 19"	0.69349
13	101° 26' 48"	5° 07' 44"	102° 56' 34"	28° 03' 17"	0° 57' 17"	15' 36.61"	277° 19' 50"	0.69758
14	101° 59' 60"	5° 06' 59"	103° 33' 47"	27° 59' 31"	0° 57' 16"	15' 36.19"	277° 37' 17"	0.70166
15	102° 33' 09"	5° 06' 13"	104° 10' 56"	27° 55' 35"	0° 57' 14"	15' 35.78"	277° 54' 40"	0.70571
16	103° 06' 18"	5° 05' 24"	104° 47' 60"	27° 51' 29"	0° 57' 13"	15' 35.36"	278° 11' 59"	0.70974
17	103° 39' 24"	5° 04' 34"	105° 24' 59"	27° 47' 13"	0° 57' 11"	15' 34.95"	278° 29' 13"	0.71376
18	104° 12' 29"	5° 03' 43"	106° 01' 53"	27° 42' 48"	0° 57' 10"	15' 34.54"	278° 46' 23"	0.71775
19	104° 45' 32"	5° 02' 49"	106° 38' 43"	27° 38' 13"	0° 57' 08"	15' 34.13"	279° 3' 29"	0.72172
20	105° 18' 33"	5° 01' 54"	107° 15' 27"	27° 33' 28"	0° 57' 07"	15' 33.72"	279° 20' 29"	0.72568
21	105° 51' 33"	5° 00' 58"	107° 52' 07"	27° 28' 35"	0° 57' 05"	15' 33.31"	279° 37' 25"	0.72961
22	106° 24' 30"	4° 59' 60"	108° 28' 42"	27° 23' 31"	0° 57' 04"	15' 32.90"	279° 54' 16"	0.73352
23	106° 57' 27"	4° 58' 60"	109° 05' 11"	27° 18' 19"	0° 57' 02"	15' 32.50"	280° 11' 02"	0.73740
24	107° 30' 21"	4° 57' 58"	109° 41' 35"	27° 12' 58"	0° 57' 01"	15' 32.09"	280° 27' 43"	0.74127

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	348° 40' 07"	0.45"	349° 34' 38"	-4° 29' 04"	0.9928049	16'06.58"	23° 26' 19"	-10 m 34 s
1	348° 42' 37"	0.45"	349° 36' 57"	-4° 28' 05"	0.9928155	16'06.57"	23° 26' 19"	-10 m 33 s
2	348° 45' 07"	0.45"	349° 39' 15"	-4° 27' 07"	0.9928262	16'06.56"	23° 26' 19"	-10 m 32 s
3	348° 47' 37"	0.45"	349° 41' 34"	-4° 26' 08"	0.9928368	16'06.55"	23° 26' 19"	-10 m 32 s
4	348° 50' 07"	0.44"	349° 43' 52"	-4° 25' 09"	0.9928474	16'06.54"	23° 26' 19"	-10 m 31 s
5	348° 52' 37"	0.44"	349° 46' 10"	-4° 24' 11"	0.9928581	16'06.53"	23° 26' 19"	-10 m 30 s
6	348° 55' 07"	0.44"	349° 48' 29"	-4° 23' 12"	0.9928687	16'06.52"	23° 26' 19"	-10 m 30 s
7	348° 57' 37"	0.44"	349° 50' 47"	-4° 22' 13"	0.9928794	16'06.51"	23° 26' 19"	-10 m 29 s
8	349° 00' 07"	0.44"	349° 53' 05"	-4° 21' 15"	0.9928900	16'06.50"	23° 26' 19"	-10 m 29 s
9	349° 02' 37"	0.44"	349° 55' 24"	-4° 20' 16"	0.9929007	16'06.49"	23° 26' 19"	-10 m 28 s
10	349° 05' 06"	0.43"	349° 57' 42"	-4° 19' 17"	0.9929113	16'06.48"	23° 26' 19"	-10 m 27 s
11	349° 07' 36"	0.43"	350° 00' 00"	-4° 18' 18"	0.9929220	16'06.47"	23° 26' 19"	-10 m 27 s
12	349° 10' 06"	0.43"	350° 02' 19"	-4° 17' 20"	0.9929327	16'06.46"	23° 26' 19"	-10 m 26 s
13	349° 12' 36"	0.43"	350° 04' 37"	-4° 16' 21"	0.9929434	16'06.45"	23° 26' 19"	-10 m 25 s
14	349° 15' 06"	0.43"	350° 06' 55"	-4° 15' 22"	0.9929541	16'06.44"	23° 26' 19"	-10 m 25 s
15	349° 17' 36"	0.42"	350° 09' 14"	-4° 14' 23"	0.9929647	16'06.43"	23° 26' 19"	-10 m 24 s
16	349° 20' 06"	0.42"	350° 11' 32"	-4° 13' 25"	0.9929754	16'06.42"	23° 26' 19"	-10 m 23 s
17	349° 22' 36"	0.42"	350° 13' 50"	-4° 12' 26"	0.9929861	16'06.41"	23° 26' 19"	-10 m 23 s
18	349° 25' 06"	0.42"	350° 16' 08"	-4° 11' 27"	0.9929968	16'06.40"	23° 26' 19"	-10 m 22 s
19	349° 27' 35"	0.42"	350° 18' 27"	-4° 10' 28"	0.9930076	16'06.39"	23° 26' 19"	-10 m 22 s
20	349° 30' 05"	0.41"	350° 20' 45"	-4° 09' 30"	0.9930183	16'06.38"	23° 26' 19"	-10 m 21 s
21	349° 32' 35"	0.41"	350° 23' 03"	-4° 08' 31"	0.9930290	16'06.37"	23° 26' 19"	-10 m 20 s
22	349° 35' 05"	0.41"	350° 25' 21"	-4° 07' 32"	0.9930397	16'06.36"	23° 26' 19"	-10 m 20 s
23	349° 37' 35"	0.41"	350° 27' 40"	-4° 06' 33"	0.9930504	16'06.35"	23° 26' 19"	-10 m 19 s
24	349° 40' 05"	0.40"	350° 29' 58"	-4° 05' 35"	0.9930612	16'06.34"	23° 26' 19"	-10 m 18 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	107° 30' 21"	4° 57' 58"	109° 41' 35"	27° 12' 58"	0° 57' 01"	15' 32.09"	280° 27' 43"	0.74127
1	108° 03' 14"	4° 56' 55"	110° 17' 54"	27° 07' 27"	0° 56' 59"	15' 31.69"	280° 44' 18"	0.74511
2	108° 36' 05"	4° 55' 51"	110° 54' 08"	27° 01' 47"	0° 56' 58"	15' 31.29"	281° 0' 48"	0.74893
3	109° 08' 55"	4° 54' 45"	111° 30' 16"	26° 55' 58"	0° 56' 56"	15' 30.89"	281° 17' 13"	0.75273
4	109° 41' 43"	4° 53' 37"	112° 06' 19"	26° 50' 01"	0° 56' 55"	15' 30.49"	281° 33' 32"	0.75651
5	110° 14' 29"	4° 52' 28"	112° 42' 16"	26° 43' 54"	0° 56' 53"	15' 30.10"	281° 49' 46"	0.76026
6	110° 47' 13"	4° 51' 17"	113° 18' 07"	26° 37' 39"	0° 56' 52"	15' 29.70"	282° 5' 54"	0.76399
7	111° 19' 56"	4° 50' 05"	113° 53' 53"	26° 31' 15"	0° 56' 50"	15' 29.31"	282° 21' 56"	0.76770
8	111° 52' 38"	4° 48' 51"	114° 29' 34"	26° 24' 43"	0° 56' 49"	15' 28.91"	282° 37' 52"	0.77138
9	112° 25' 17"	4° 47' 36"	115° 05' 08"	26° 18' 02"	0° 56' 47"	15' 28.52"	282° 53' 42"	0.77504
10	112° 57' 56"	4° 46' 19"	115° 40' 37"	26° 11' 12"	0° 56' 46"	15' 28.13"	283° 9' 26"	0.77867
11	113° 30' 32"	4° 45' 01"	116° 15' 60"	26° 04' 14"	0° 56' 45"	15' 27.74"	283° 25' 04"	0.78228
12	114° 03' 07"	4° 43' 42"	116° 51' 17"	25° 57' 08"	0° 56' 43"	15' 27.36"	283° 40' 36"	0.78587
13	114° 35' 40"	4° 42' 20"	117° 26' 28"	25° 49' 54"	0° 56' 42"	15' 26.97"	283° 56' 02"	0.78943
14	115° 08' 12"	4° 40' 58"	118° 01' 34"	25° 42' 32"	0° 56' 40"	15' 26.59"	284° 11' 21"	0.79297
15	115° 40' 42"	4° 39' 34"	118° 36' 33"	25° 35' 01"	0° 56' 39"	15' 26.20"	284° 26' 34"	0.79648
16	116° 13' 10"	4° 38' 08"	119° 11' 26"	25° 27' 23"	0° 56' 38"	15' 25.82"	284° 41' 40"	0.79997
17	116° 45' 37"	4° 36' 41"	119° 46' 14"	25° 19' 36"	0° 56' 36"	15' 25.44"	284° 56' 40"	0.80343
18	117° 18' 02"	4° 35' 13"	120° 20' 55"	25° 11' 42"	0° 56' 35"	15' 25.06"	285° 11' 34"	0.80686
19	117° 50' 26"	4° 33' 43"	120° 55' 30"	25° 03' 40"	0° 56' 33"	15' 24.69"	285° 26' 20"	0.81027
20	118° 22' 48"	4° 32' 12"	121° 29' 59"	24° 55' 31"	0° 56' 32"	15' 24.31"	285° 41' 00"	0.81365
21	118° 55' 09"	4° 30' 40"	122° 04' 22"	24° 47' 14"	0° 56' 31"	15' 23.94"	285° 55' 33"	0.81701
22	119° 27' 28"	4° 29' 06"	122° 38' 39"	24° 38' 49"	0° 56' 29"	15' 23.57"	286° 9' 60"	0.82034
23	119° 59' 46"	4° 27' 31"	123° 12' 50"	24° 30' 18"	0° 56' 28"	15' 23.20"	286° 24' 19"	0.82365
24	120° 32' 02"	4° 25' 54"	123° 46' 55"	24° 21' 38"	0° 56' 27"	15' 22.83"	286° 38' 32"	0.82692

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	349° 40' 05"	0.40"	350° 29' 58"	-4° 05' 35"	0.9930612	16'06.34"	23° 26' 19"	-10 m 18 s
1	349° 42' 35"	0.40"	350° 32' 16"	-4° 04' 36"	0.9930719	16'06.32"	23° 26' 19"	-10 m 18 s
2	349° 45' 05"	0.40"	350° 34' 34"	-4° 03' 37"	0.9930827	16'06.31"	23° 26' 19"	-10 m 17 s
3	349° 47' 34"	0.40"	350° 36' 52"	-4° 02' 38"	0.9930934	16'06.30"	23° 26' 19"	-10 m 16 s
4	349° 50' 04"	0.39"	350° 39' 11"	-4° 01' 39"	0.9931042	16'06.29"	23° 26' 19"	-10 m 16 s
5	349° 52' 34"	0.39"	350° 41' 29"	-4° 00' 41"	0.9931149	16'06.28"	23° 26' 19"	-10 m 15 s
6	349° 55' 04"	0.39"	350° 43' 47"	-3° 59' 42"	0.9931257	16'06.27"	23° 26' 19"	-10 m 14 s
7	349° 57' 34"	0.39"	350° 46' 05"	-3° 58' 43"	0.9931365	16'06.26"	23° 26' 19"	-10 m 14 s
8	350° 00' 04"	0.38"	350° 48' 23"	-3° 57' 44"	0.9931472	16'06.25"	23° 26' 19"	-10 m 13 s
9	350° 02' 33"	0.38"	350° 50' 41"	-3° 56' 45"	0.9931580	16'06.24"	23° 26' 19"	-10 m 12 s
10	350° 05' 03"	0.38"	350° 52' 59"	-3° 55' 46"	0.9931688	16'06.23"	23° 26' 19"	-10 m 12 s
11	350° 07' 33"	0.37"	350° 55' 17"	-3° 54' 48"	0.9931796	16'06.22"	23° 26' 19"	-10 m 11 s
12	350° 10' 03"	0.37"	350° 57' 36"	-3° 53' 49"	0.9931904	16'06.21"	23° 26' 19"	-10 m 11 s
13	350° 12' 33"	0.37"	350° 59' 54"	-3° 52' 50"	0.9932012	16'06.20"	23° 26' 19"	-10 m 10 s
14	350° 15' 02"	0.36"	351° 02' 12"	-3° 51' 51"	0.9932120	16'06.19"	23° 26' 19"	-10 m 09 s
15	350° 17' 32"	0.36"	351° 04' 30"	-3° 50' 52"	0.9932228	16'06.18"	23° 26' 19"	-10 m 09 s
16	350° 20' 02"	0.36"	351° 06' 48"	-3° 49' 53"	0.9932336	16'06.17"	23° 26' 19"	-10 m 08 s
17	350° 22' 32"	0.35"	351° 09' 06"	-3° 48' 54"	0.9932445	16'06.16"	23° 26' 19"	-10 m 07 s
18	350° 25' 02"	0.35"	351° 11' 24"	-3° 47' 56"	0.9932553	16'06.15"	23° 26' 19"	-10 m 07 s
19	350° 27' 31"	0.35"	351° 13' 42"	-3° 46' 57"	0.9932661	16'06.14"	23° 26' 19"	-10 m 06 s
20	350° 30' 01"	0.34"	351° 15' 60"	-3° 45' 58"	0.9932769	16'06.13"	23° 26' 19"	-10 m 05 s
21	350° 32' 31"	0.34"	351° 18' 18"	-3° 44' 59"	0.9932878	16'06.11"	23° 26' 19"	-10 m 05 s
22	350° 35' 01"	0.34"	351° 20' 36"	-3° 44' 00"	0.9932986	16'06.10"	23° 26' 19"	-10 m 04 s
23	350° 37' 31"	0.33"	351° 22' 54"	-3° 43' 01"	0.9933095	16'06.09"	23° 26' 19"	-10 m 03 s
24	350° 40' 00"	0.33"	351° 25' 12"	-3° 42' 02"	0.9933204	16'06.08"	23° 26' 19"	-10 m 03 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	120° 32' 02"	4° 25' 54"	123° 46' 55"	24° 21' 38"	0° 56' 27"	15' 22.83"	286° 38' 32"	0.82692
1	121° 04' 16"	4° 24' 16"	124° 20' 54"	24° 12' 52"	0° 56' 25"	15' 22.46"	286° 52' 38"	0.83017
2	121° 36' 29"	4° 22' 37"	124° 54' 46"	24° 03' 58"	0° 56' 24"	15' 22.09"	287° 6' 37"	0.83340
3	122° 08' 41"	4° 20' 57"	125° 28' 32"	23° 54' 58"	0° 56' 22"	15' 21.73"	287° 20' 29"	0.83659
4	122° 40' 51"	4° 19' 15"	126° 02' 12"	23° 45' 50"	0° 56' 21"	15' 21.36"	287° 34' 14"	0.83976
5	123° 12' 59"	4° 17' 32"	126° 35' 46"	23° 36' 36"	0° 56' 20"	15' 21.00"	287° 47' 51"	0.84290
6	123° 45' 06"	4° 15' 47"	127° 09' 14"	23° 27' 14"	0° 56' 19"	15' 20.64"	288° 1' 22"	0.84601
7	124° 17' 12"	4° 14' 02"	127° 42' 35"	23° 17' 46"	0° 56' 17"	15' 20.28"	288° 14' 46"	0.84910
8	124° 49' 16"	4° 12' 15"	128° 15' 51"	23° 08' 12"	0° 56' 16"	15' 19.93"	288° 28' 02"	0.85216
9	125° 21' 18"	4° 10' 27"	128° 49' 00"	22° 58' 31"	0° 56' 15"	15' 19.57"	288° 41' 12"	0.85519
10	125° 53' 19"	4° 08' 37"	129° 22' 03"	22° 48' 43"	0° 56' 13"	15' 19.22"	288° 54' 14"	0.85819
11	126° 25' 19"	4° 06' 47"	129° 55' 00"	22° 38' 49"	0° 56' 12"	15' 18.86"	289° 7' 09"	0.86116
12	126° 57' 17"	4° 04' 55"	130° 27' 51"	22° 28' 49"	0° 56' 11"	15' 18.51"	289° 19' 57"	0.86410
13	127° 29' 14"	4° 03' 02"	131° 00' 36"	22° 18' 42"	0° 56' 09"	15' 18.16"	289° 32' 37"	0.86702
14	128° 01' 09"	4° 01' 08"	131° 33' 15"	22° 08' 29"	0° 56' 08"	15' 17.82"	289° 45' 11"	0.86990
15	128° 33' 03"	3° 59' 13"	132° 05' 47"	21° 58' 10"	0° 56' 07"	15' 17.47"	289° 57' 37"	0.87276
16	129° 04' 55"	3° 57' 16"	132° 38' 14"	21° 47' 46"	0° 56' 06"	15' 17.12"	290° 9' 56"	0.87559
17	129° 36' 46"	3° 55' 19"	133° 10' 35"	21° 37' 15"	0° 56' 04"	15' 16.78"	290° 22' 07"	0.87838
18	130° 08' 36"	3° 53' 20"	133° 42' 49"	21° 26' 39"	0° 56' 03"	15' 16.44"	290° 34' 12"	0.88115
19	130° 40' 24"	3° 51' 20"	134° 14' 58"	21° 15' 56"	0° 56' 02"	15' 16.10"	290° 46' 09"	0.88389
20	131° 12' 11"	3° 49' 19"	134° 47' 00"	21° 05' 08"	0° 56' 01"	15' 15.76"	290° 57' 59"	0.88660
21	131° 43' 56"	3° 47' 17"	135° 18' 57"	20° 54' 15"	0° 55' 59"	15' 15.42"	291° 9' 42"	0.88928
22	132° 15' 40"	3° 45' 14"	135° 50' 48"	20° 43' 16"	0° 55' 58"	15' 15.09"	291° 21' 17"	0.89193
23	132° 47' 22"	3° 43' 10"	136° 22' 33"	20° 32' 12"	0° 55' 57"	15' 14.75"	291° 32' 46"	0.89455
24	133° 19' 04"	3° 41' 04"	136° 54' 12"	20° 21' 02"	0° 55' 56"	15' 14.42"	291° 44' 07"	0.89714

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	350° 40' 00"	0.33"	351° 25' 12"	-3° 42' 02"	0.9933204	16'06.08"	23° 26' 19"	-10 m 03 s
1	350° 42' 30"	0.33"	351° 27' 30"	-3° 41' 03"	0.9933312	16'06.07"	23° 26' 19"	-10 m 02 s
2	350° 44' 60"	0.32"	351° 29' 48"	-3° 40' 04"	0.9933421	16'06.06"	23° 26' 19"	-10 m 01 s
3	350° 47' 30"	0.32"	351° 32' 06"	-3° 39' 06"	0.9933530	16'06.05"	23° 26' 19"	-10 m 01 s
4	350° 49' 59"	0.32"	351° 34' 24"	-3° 38' 07"	0.9933638	16'06.04"	23° 26' 19"	-10 m 00 s
5	350° 52' 29"	0.31"	351° 36' 42"	-3° 37' 08"	0.9933747	16'06.03"	23° 26' 19"	-9 m 59 s
6	350° 54' 59"	0.31"	351° 38' 60"	-3° 36' 09"	0.9933856	16'06.02"	23° 26' 19"	-9 m 59 s
7	350° 57' 29"	0.30"	351° 41' 18"	-3° 35' 10"	0.9933965	16'06.01"	23° 26' 19"	-9 m 58 s
8	350° 59' 58"	0.30"	351° 43' 36"	-3° 34' 11"	0.9934074	16'06.00"	23° 26' 19"	-9 m 57 s
9	351° 02' 28"	0.30"	351° 45' 54"	-3° 33' 12"	0.9934183	16'05.99"	23° 26' 19"	-9 m 57 s
10	351° 04' 58"	0.29"	351° 48' 11"	-3° 32' 13"	0.9934292	16'05.98"	23° 26' 19"	-9 m 56 s
11	351° 07' 28"	0.29"	351° 50' 29"	-3° 31' 14"	0.9934401	16'05.97"	23° 26' 19"	-9 m 55 s
12	351° 09' 57"	0.28"	351° 52' 47"	-3° 30' 15"	0.9934511	16'05.96"	23° 26' 19"	-9 m 55 s
13	351° 12' 27"	0.28"	351° 55' 05"	-3° 29' 16"	0.9934620	16'05.95"	23° 26' 19"	-9 m 54 s
14	351° 14' 57"	0.28"	351° 57' 23"	-3° 28' 17"	0.9934729	16'05.93"	23° 26' 19"	-9 m 53 s
15	351° 17' 26"	0.27"	351° 59' 41"	-3° 27' 18"	0.9934839	16'05.92"	23° 26' 19"	-9 m 53 s
16	351° 19' 56"	0.27"	352° 01' 59"	-3° 26' 19"	0.9934948	16'05.91"	23° 26' 19"	-9 m 52 s
17	351° 22' 26"	0.26"	352° 04' 17"	-3° 25' 20"	0.9935058	16'05.90"	23° 26' 19"	-9 m 51 s
18	351° 24' 56"	0.26"	352° 06' 34"	-3° 24' 21"	0.9935167	16'05.89"	23° 26' 19"	-9 m 51 s
19	351° 27' 25"	0.26"	352° 08' 52"	-3° 23' 22"	0.9935277	16'05.88"	23° 26' 19"	-9 m 50 s
20	351° 29' 55"	0.25"	352° 11' 10"	-3° 22' 23"	0.9935386	16'05.87"	23° 26' 19"	-9 m 49 s
21	351° 32' 25"	0.25"	352° 13' 28"	-3° 21' 24"	0.9935496	16'05.86"	23° 26' 19"	-9 m 49 s
22	351° 34' 54"	0.24"	352° 15' 46"	-3° 20' 25"	0.9935606	16'05.85"	23° 26' 19"	-9 m 48 s
23	351° 37' 24"	0.24"	352° 18' 04"	-3° 19' 26"	0.9935715	16'05.84"	23° 26' 19"	-9 m 47 s
24	351° 39' 54"	0.23"	352° 20' 21"	-3° 18' 27"	0.9935825	16'05.83"	23° 26' 19"	-9 m 47 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	133° 19' 04"	3° 41' 04"	136° 54' 12"	20° 21' 02"	0° 55' 56"	15' 14.42"	291° 44' 07"	0.89714
1	133° 50' 43"	3° 38' 58"	137° 25' 45"	20° 09' 47"	0° 55' 54"	15' 14.09"	291° 55' 21"	0.89970
2	134° 22' 22"	3° 36' 51"	137° 57' 13"	19° 58' 27"	0° 55' 53"	15' 13.76"	292° 6' 27"	0.90223
3	134° 53' 59"	3° 34' 42"	138° 28' 34"	19° 47' 02"	0° 55' 52"	15' 13.43"	292° 17' 27"	0.90472
4	135° 25' 34"	3° 32' 33"	138° 59' 50"	19° 35' 31"	0° 55' 51"	15' 13.10"	292° 28' 20"	0.90719
5	135° 57' 09"	3° 30' 23"	139° 31' 01"	19° 23' 56"	0° 55' 50"	15' 12.78"	292° 39' 05"	0.90963
6	136° 28' 42"	3° 28' 11"	140° 02' 06"	19° 12' 16"	0° 55' 48"	15' 12.45"	292° 49' 43"	0.91203
7	137° 00' 13"	3° 25' 59"	140° 33' 05"	19° 00' 31"	0° 55' 47"	15' 12.13"	293° 0' 15"	0.91441
8	137° 31' 44"	3° 23' 46"	141° 03' 58"	18° 48' 42"	0° 55' 46"	15' 11.81"	293° 10' 39"	0.91675
9	138° 03' 13"	3° 21' 32"	141° 34' 47"	18° 36' 48"	0° 55' 45"	15' 11.49"	293° 20' 56"	0.91906
10	138° 34' 41"	3° 19' 16"	142° 05' 29"	18° 24' 49"	0° 55' 44"	15' 11.17"	293° 31' 06"	0.92134
11	139° 06' 07"	3° 17' 00"	142° 36' 06"	18° 12' 46"	0° 55' 43"	15' 10.85"	293° 41' 10"	0.92359
12	139° 37' 32"	3° 14' 43"	143° 06' 38"	18° 00' 38"	0° 55' 41"	15' 10.54"	293° 51' 07"	0.92581
13	140° 08' 56"	3° 12' 26"	143° 37' 05"	17° 48' 26"	0° 55' 40"	15' 10.23"	294° 0' 56"	0.92799
14	140° 40' 18"	3° 10' 07"	144° 07' 26"	17° 36' 10"	0° 55' 39"	15' 09.91"	294° 10' 39"	0.93015
15	141° 11' 39"	3° 07' 47"	144° 37' 42"	17° 23' 50"	0° 55' 38"	15' 09.60"	294° 20' 16"	0.93227
16	141° 42' 59"	3° 05' 27"	145° 07' 53"	17° 11' 26"	0° 55' 37"	15' 09.29"	294° 29' 45"	0.93436
17	142° 14' 18"	3° 03' 06"	145° 37' 59"	16° 58' 57"	0° 55' 36"	15' 08.99"	294° 39' 08"	0.93642
18	142° 45' 35"	3° 00' 43"	146° 07' 59"	16° 46' 25"	0° 55' 35"	15' 08.68"	294° 48' 25"	0.93845
19	143° 16' 51"	2° 58' 20"	146° 37' 55"	16° 33' 48"	0° 55' 33"	15' 08.38"	294° 57' 35"	0.94045
20	143° 48' 06"	2° 55' 57"	147° 07' 45"	16° 21' 08"	0° 55' 32"	15' 08.07"	295° 6' 39"	0.94241
21	144° 19' 20"	2° 53' 32"	147° 37' 31"	16° 08' 25"	0° 55' 31"	15' 07.77"	295° 15' 36"	0.94434
22	144° 50' 32"	2° 51' 07"	148° 07' 11"	15° 55' 37"	0° 55' 30"	15' 07.47"	295° 24' 27"	0.94624
23	145° 21' 43"	2° 48' 41"	148° 36' 47"	15° 42' 46"	0° 55' 29"	15' 07.17"	295° 33' 12"	0.94810
24	145° 52' 53"	2° 46' 14"	149° 06' 18"	15° 29' 51"	0° 55' 28"	15' 06.88"	295° 41' 51"	0.94994

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	351° 39' 54"	0.23"	352° 20' 21"	-3° 18' 27"	0.9935825	16'05.83"	23° 26' 19"	-9 m 47 s
1	351° 42' 23"	0.23"	352° 22' 39"	-3° 17' 28"	0.9935935	16'05.82"	23° 26' 19"	-9 m 46 s
2	351° 44' 53"	0.22"	352° 24' 57"	-3° 16' 29"	0.9936045	16'05.81"	23° 26' 19"	-9 m 45 s
3	351° 47' 23"	0.22"	352° 27' 15"	-3° 15' 30"	0.9936155	16'05.80"	23° 26' 19"	-9 m 45 s
4	351° 49' 52"	0.22"	352° 29' 32"	-3° 14' 31"	0.9936265	16'05.79"	23° 26' 19"	-9 m 44 s
5	351° 52' 22"	0.21"	352° 31' 50"	-3° 13' 32"	0.9936375	16'05.77"	23° 26' 19"	-9 m 43 s
6	351° 54' 52"	0.21"	352° 34' 08"	-3° 12' 33"	0.9936486	16'05.76"	23° 26' 19"	-9 m 43 s
7	351° 57' 21"	0.20"	352° 36' 26"	-3° 11' 34"	0.9936596	16'05.75"	23° 26' 19"	-9 m 42 s
8	351° 59' 51"	0.20"	352° 38' 43"	-3° 10' 35"	0.9936706	16'05.74"	23° 26' 19"	-9 m 41 s
9	352° 02' 21"	0.19"	352° 41' 01"	-3° 09' 36"	0.9936816	16'05.73"	23° 26' 19"	-9 m 41 s
10	352° 04' 50"	0.19"	352° 43' 19"	-3° 08' 37"	0.9936927	16'05.72"	23° 26' 19"	-9 m 40 s
11	352° 07' 20"	0.18"	352° 45' 37"	-3° 07' 38"	0.9937037	16'05.71"	23° 26' 19"	-9 m 39 s
12	352° 09' 50"	0.18"	352° 47' 54"	-3° 06' 39"	0.9937148	16'05.70"	23° 26' 19"	-9 m 39 s
13	352° 12' 19"	0.17"	352° 50' 12"	-3° 05' 40"	0.9937258	16'05.69"	23° 26' 19"	-9 m 38 s
14	352° 14' 49"	0.17"	352° 52' 30"	-3° 04' 41"	0.9937369	16'05.68"	23° 26' 19"	-9 m 37 s
15	352° 17' 19"	0.16"	352° 54' 47"	-3° 03' 42"	0.9937479	16'05.67"	23° 26' 19"	-9 m 37 s
16	352° 19' 48"	0.16"	352° 57' 05"	-3° 02' 43"	0.9937590	16'05.66"	23° 26' 19"	-9 m 36 s
17	352° 22' 18"	0.15"	352° 59' 23"	-3° 01' 44"	0.9937701	16'05.65"	23° 26' 19"	-9 m 35 s
18	352° 24' 47"	0.15"	353° 01' 40"	-3° 00' 45"	0.9937812	16'05.64"	23° 26' 19"	-9 m 35 s
19	352° 27' 17"	0.14"	353° 03' 58"	-2° 59' 46"	0.9937922	16'05.62"	23° 26' 19"	-9 m 34 s
20	352° 29' 47"	0.14"	353° 06' 16"	-2° 58' 47"	0.9938033	16'05.61"	23° 26' 19"	-9 m 33 s
21	352° 32' 16"	0.13"	353° 08' 33"	-2° 57' 48"	0.9938144	16'05.60"	23° 26' 19"	-9 m 33 s
22	352° 34' 46"	0.13"	353° 10' 51"	-2° 56' 48"	0.9938255	16'05.59"	23° 26' 19"	-9 m 32 s
23	352° 37' 16"	0.12"	353° 13' 08"	-2° 55' 49"	0.9938366	16'05.58"	23° 26' 19"	-9 m 31 s
24	352° 39' 45"	0.12"	353° 15' 26"	-2° 54' 50"	0.9938478	16'05.57"	23° 26' 19"	-9 m 31 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	145° 52' 53"	2° 46' 14"	149° 06' 18"	15° 29' 51"	0° 55' 28"	15' 06.88"	295° 41' 51"	0.94994
1	146° 24' 02"	2° 43' 47"	149° 35' 45"	15° 16' 53"	0° 55' 27"	15' 06.58"	295° 50' 24"	0.95174
2	146° 55' 09"	2° 41' 18"	150° 05' 06"	15° 03' 52"	0° 55' 26"	15' 06.29"	295° 58' 51"	0.95351
3	147° 26' 16"	2° 38' 49"	150° 34' 24"	14° 50' 47"	0° 55' 25"	15' 06.00"	296° 7' 13"	0.95525
4	147° 57' 21"	2° 36' 20"	151° 03' 36"	14° 37' 39"	0° 55' 24"	15' 05.70"	296° 15' 29"	0.95695
5	148° 28' 25"	2° 33' 49"	151° 32' 44"	14° 24' 28"	0° 55' 23"	15' 05.42"	296° 23' 39"	0.95862
6	148° 59' 27"	2° 31' 18"	152° 01' 48"	14° 11' 14"	0° 55' 22"	15' 05.13"	296° 31' 44"	0.96026
7	149° 30' 29"	2° 28' 47"	152° 30' 47"	13° 57' 56"	0° 55' 21"	15' 04.84"	296° 39' 44"	0.96187
8	150° 01' 29"	2° 26' 14"	152° 59' 42"	13° 44' 36"	0° 55' 19"	15' 04.56"	296° 47' 39"	0.96344
9	150° 32' 28"	2° 23' 41"	153° 28' 32"	13° 31' 13"	0° 55' 18"	15' 04.27"	296° 55' 30"	0.96498
10	151° 03' 26"	2° 21' 08"	153° 57' 18"	13° 17' 47"	0° 55' 17"	15' 03.99"	297° 3' 15"	0.96649
11	151° 34' 23"	2° 18' 34"	154° 26' 00"	13° 04' 18"	0° 55' 16"	15' 03.71"	297° 10' 57"	0.96796
12	152° 05' 18"	2° 15' 59"	154° 54' 39"	12° 50' 46"	0° 55' 15"	15' 03.43"	297° 18' 34"	0.96940
13	152° 36' 13"	2° 13' 24"	155° 23' 13"	12° 37' 12"	0° 55' 14"	15' 03.15"	297° 26' 07"	0.97081
14	153° 07' 06"	2° 10' 48"	155° 51' 43"	12° 23' 35"	0° 55' 13"	15' 02.88"	297° 33' 36"	0.97218
15	153° 37' 58"	2° 08' 11"	156° 20' 09"	12° 09' 56"	0° 55' 12"	15' 02.60"	297° 41' 03"	0.97353
16	154° 08' 49"	2° 05' 34"	156° 48' 31"	11° 56' 15"	0° 55' 11"	15' 02.33"	297° 48' 26"	0.97484
17	154° 39' 39"	2° 02' 57"	157° 16' 49"	11° 42' 30"	0° 55' 10"	15' 02.06"	297° 55' 46"	0.97611
18	155° 10' 28"	2° 00' 19"	157° 45' 04"	11° 28' 44"	0° 55' 09"	15' 01.79"	298° 3' 05"	0.97735
19	155° 41' 16"	1° 57' 40"	158° 13' 15"	11° 14' 55"	0° 55' 08"	15' 01.52"	298° 10' 21"	0.97856
20	156° 12' 02"	1° 55' 02"	158° 41' 22"	11° 01' 04"	0° 55' 07"	15' 01.26"	298° 17' 37"	0.97974
21	156° 42' 48"	1° 52' 22"	159° 09' 26"	10° 47' 11"	0° 55' 06"	15' 00.99"	298° 24' 51"	0.98088
22	157° 13' 32"	1° 49' 42"	159° 37' 26"	10° 33' 16"	0° 55' 05"	15' 00.73"	298° 32' 06"	0.98199
23	157° 44' 16"	1° 47' 02"	160° 05' 23"	10° 19' 19"	0° 55' 04"	15' 00.47"	298° 39' 21"	0.98307
24	158° 14' 58"	1° 44' 21"	160° 33' 17"	10° 05' 20"	0° 55' 04"	15' 00.20"	298° 46' 37"	0.98411

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	352° 39' 45"	0.12"	353° 15' 26"	-2° 54' 50"	0.9938478	16'05.57"	23° 26' 19"	-9 m 31 s
1	352° 42' 15"	0.11"	353° 17' 44"	-2° 53' 51"	0.9938589	16'05.56"	23° 26' 19"	-9 m 30 s
2	352° 44' 44"	0.11"	353° 20' 01"	-2° 52' 52"	0.9938700	16'05.55"	23° 26' 19"	-9 m 29 s
3	352° 47' 14"	0.10"	353° 22' 19"	-2° 51' 53"	0.9938811	16'05.54"	23° 26' 19"	-9 m 28 s
4	352° 49' 43"	0.10"	353° 24' 36"	-2° 50' 54"	0.9938922	16'05.53"	23° 26' 19"	-9 m 28 s
5	352° 52' 13"	0.09"	353° 26' 54"	-2° 49' 55"	0.9939034	16'05.52"	23° 26' 19"	-9 m 27 s
6	352° 54' 43"	0.09"	353° 29' 12"	-2° 48' 56"	0.9939145	16'05.51"	23° 26' 19"	-9 m 26 s
7	352° 57' 12"	0.08"	353° 31' 29"	-2° 47' 57"	0.9939257	16'05.49"	23° 26' 19"	-9 m 26 s
8	352° 59' 42"	0.08"	353° 33' 47"	-2° 46' 57"	0.9939368	16'05.48"	23° 26' 19"	-9 m 25 s
9	353° 02' 11"	0.07"	353° 36' 04"	-2° 45' 58"	0.9939480	16'05.47"	23° 26' 19"	-9 m 24 s
10	353° 04' 41"	0.07"	353° 38' 22"	-2° 44' 59"	0.9939592	16'05.46"	23° 26' 19"	-9 m 24 s
11	353° 07' 10"	0.06"	353° 40' 39"	-2° 44' 00"	0.9939703	16'05.45"	23° 26' 19"	-9 m 23 s
12	353° 09' 40"	0.06"	353° 42' 57"	-2° 43' 01"	0.9939815	16'05.44"	23° 26' 19"	-9 m 22 s
13	353° 12' 10"	0.05"	353° 45' 14"	-2° 42' 02"	0.9939927	16'05.43"	23° 26' 19"	-9 m 22 s
14	353° 14' 39"	0.05"	353° 47' 32"	-2° 41' 03"	0.9940039	16'05.42"	23° 26' 19"	-9 m 21 s
15	353° 17' 09"	0.04"	353° 49' 49"	-2° 40' 04"	0.9940150	16'05.41"	23° 26' 19"	-9 m 20 s
16	353° 19' 38"	0.03"	353° 52' 07"	-2° 39' 04"	0.9940262	16'05.40"	23° 26' 19"	-9 m 20 s
17	353° 22' 08"	0.03"	353° 54' 24"	-2° 38' 05"	0.9940374	16'05.39"	23° 26' 19"	-9 m 19 s
18	353° 24' 37"	0.02"	353° 56' 42"	-2° 37' 06"	0.9940486	16'05.38"	23° 26' 19"	-9 m 18 s
19	353° 27' 07"	0.02"	353° 58' 59"	-2° 36' 07"	0.9940599	16'05.36"	23° 26' 19"	-9 m 17 s
20	353° 29' 36"	0.01"	354° 01' 17"	-2° 35' 08"	0.9940711	16'05.35"	23° 26' 19"	-9 m 17 s
21	353° 32' 06"	0.01"	354° 03' 34"	-2° 34' 09"	0.9940823	16'05.34"	23° 26' 19"	-9 m 16 s
22	353° 34' 35"	0.00"	354° 05' 52"	-2° 33' 10"	0.9940935	16'05.33"	23° 26' 19"	-9 m 15 s
23	353° 37' 05"	-0.00"	354° 08' 09"	-2° 32' 10"	0.9941047	16'05.32"	23° 26' 19"	-9 m 15 s
24	353° 39' 34"	-0.01"	354° 10' 27"	-2° 31' 11"	0.9941160	16'05.31"	23° 26' 19"	-9 m 14 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	158° 14' 58"	1° 44' 21"	160° 33' 17"	10° 05' 20"	0° 55' 04"	15' 00.20"	298° 46' 37"	0.98411
1	158° 45' 39"	1° 41' 40"	161° 01' 07"	9° 51' 19"	0° 55' 03"	14' 59.95"	298° 53' 56"	0.98512
2	159° 16' 19"	1° 38' 58"	161° 28' 54"	9° 37' 17"	0° 55' 02"	14' 59.69"	299° 1' 17"	0.98610
3	159° 46' 58"	1° 36' 16"	161° 56' 37"	9° 23' 12"	0° 55' 01"	14' 59.43"	299° 8' 43"	0.98705
4	160° 17' 36"	1° 33' 34"	162° 24' 18"	9° 09' 06"	0° 54' 60"	14' 59.18"	299° 16' 15"	0.98796
5	160° 48' 13"	1° 30' 51"	162° 51' 55"	8° 54' 58"	0° 54' 59"	14' 58.93"	299° 23' 54"	0.98883
6	161° 18' 49"	1° 28' 08"	163° 19' 30"	8° 40' 48"	0° 54' 58"	14' 58.68"	299° 31' 42"	0.98968
7	161° 49' 24"	1° 25' 25"	163° 47' 01"	8° 26' 37"	0° 54' 57"	14' 58.43"	299° 39' 40"	0.99049
8	162° 19' 58"	1° 22' 41"	164° 14' 30"	8° 12' 25"	0° 54' 56"	14' 58.18"	299° 47' 52"	0.99126
9	162° 50' 31"	1° 19' 57"	164° 41' 56"	7° 58' 11"	0° 54' 55"	14' 57.93"	299° 56' 20"	0.99201
10	163° 21' 03"	1° 17' 13"	165° 09' 19"	7° 43' 56"	0° 54' 54"	14' 57.69"	300° 5' 07"	0.99272
11	163° 51' 33"	1° 14' 28"	165° 36' 39"	7° 29' 39"	0° 54' 53"	14' 57.45"	300° 14' 18"	0.99340
12	164° 22' 03"	1° 11' 43"	166° 03' 57"	7° 15' 21"	0° 54' 52"	14' 57.20"	300° 23' 57"	0.99404
13	164° 52' 32"	1° 08' 58"	166° 31' 12"	7° 01' 02"	0° 54' 52"	14' 56.96"	300° 34' 09"	0.99465
14	165° 22' 60"	1° 06' 13"	166° 58' 25"	6° 46' 42"	0° 54' 51"	14' 56.73"	300° 45' 03"	0.99523
15	165° 53' 27"	1° 03' 27"	167° 25' 35"	6° 32' 21"	0° 54' 50"	14' 56.49"	300° 56' 48"	0.99577
16	166° 23' 53"	1° 00' 42"	167° 52' 43"	6° 17' 59"	0° 54' 49"	14' 56.26"	301° 9' 34"	0.99628
17	166° 54' 18"	0° 57' 56"	168° 19' 49"	6° 03' 35"	0° 54' 48"	14' 56.02"	301° 23' 36"	0.99676
18	167° 24' 42"	0° 55' 09"	168° 46' 52"	5° 49' 11"	0° 54' 47"	14' 55.79"	301° 39' 14"	0.99721
19	167° 55' 05"	0° 52' 23"	169° 13' 53"	5° 34' 46"	0° 54' 46"	14' 55.56"	301° 56' 54"	0.99762
20	168° 25' 27"	0° 49' 36"	169° 40' 52"	5° 20' 21"	0° 54' 46"	14' 55.33"	302° 17' 09"	0.99800
21	168° 55' 48"	0° 46' 50"	170° 07' 49"	5° 05' 54"	0° 54' 45"	14' 55.11"	302° 40' 49"	0.99834
22	169° 26' 08"	0° 44' 03"	170° 34' 44"	4° 51' 27"	0° 54' 44"	14' 54.88"	303° 9' 03"	0.99866
23	169° 56' 27"	0° 41' 16"	171° 01' 37"	4° 36' 59"	0° 54' 43"	14' 54.66"	303° 43' 36"	0.99894
24	170° 26' 46"	0° 38' 29"	171° 28' 28"	4° 22' 30"	0° 54' 42"	14' 54.44"	304° 27' 12"	0.99918

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	353° 39' 34"	-0.01"	354° 10' 27"	-2° 31' 11"	0.9941160	16'05.31"	23° 26' 19"	-9 m 14 s
1	353° 42' 04"	-0.01"	354° 12' 44"	-2° 30' 12"	0.9941272	16'05.30"	23° 26' 19"	-9 m 13 s
2	353° 44' 34"	-0.02"	354° 15' 01"	-2° 29' 13"	0.9941385	16'05.29"	23° 26' 19"	-9 m 13 s
3	353° 47' 03"	-0.03"	354° 17' 19"	-2° 28' 14"	0.9941497	16'05.28"	23° 26' 19"	-9 m 12 s
4	353° 49' 33"	-0.03"	354° 19' 36"	-2° 27' 15"	0.9941610	16'05.27"	23° 26' 19"	-9 m 11 s
5	353° 52' 02"	-0.04"	354° 21' 54"	-2° 26' 15"	0.9941722	16'05.26"	23° 26' 19"	-9 m 11 s
6	353° 54' 32"	-0.04"	354° 24' 11"	-2° 25' 16"	0.9941835	16'05.24"	23° 26' 19"	-9 m 10 s
7	353° 57' 01"	-0.05"	354° 26' 29"	-2° 24' 17"	0.9941948	16'05.23"	23° 26' 19"	-9 m 09 s
8	353° 59' 31"	-0.05"	354° 28' 46"	-2° 23' 18"	0.9942060	16'05.22"	23° 26' 19"	-9 m 08 s
9	354° 01' 60"	-0.06"	354° 31' 03"	-2° 22' 19"	0.9942173	16'05.21"	23° 26' 19"	-9 m 08 s
10	354° 04' 29"	-0.06"	354° 33' 21"	-2° 21' 20"	0.9942286	16'05.20"	23° 26' 19"	-9 m 07 s
11	354° 06' 59"	-0.07"	354° 35' 38"	-2° 20' 20"	0.9942399	16'05.19"	23° 26' 19"	-9 m 06 s
12	354° 09' 28"	-0.08"	354° 37' 55"	-2° 19' 21"	0.9942512	16'05.18"	23° 26' 19"	-9 m 06 s
13	354° 11' 58"	-0.08"	354° 40' 13"	-2° 18' 22"	0.9942625	16'05.17"	23° 26' 19"	-9 m 05 s
14	354° 14' 27"	-0.09"	354° 42' 30"	-2° 17' 23"	0.9942738	16'05.16"	23° 26' 19"	-9 m 04 s
15	354° 16' 57"	-0.09"	354° 44' 48"	-2° 16' 24"	0.9942851	16'05.15"	23° 26' 19"	-9 m 04 s
16	354° 19' 26"	-0.10"	354° 47' 05"	-2° 15' 24"	0.9942964	16'05.13"	23° 26' 19"	-9 m 03 s
17	354° 21' 56"	-0.10"	354° 49' 22"	-2° 14' 25"	0.9943077	16'05.12"	23° 26' 19"	-9 m 02 s
18	354° 24' 25"	-0.11"	354° 51' 40"	-2° 13' 26"	0.9943191	16'05.11"	23° 26' 19"	-9 m 01 s
19	354° 26' 55"	-0.11"	354° 53' 57"	-2° 12' 27"	0.9943304	16'05.10"	23° 26' 19"	-9 m 01 s
20	354° 29' 24"	-0.12"	354° 56' 14"	-2° 11' 28"	0.9943417	16'05.09"	23° 26' 19"	-9 m 00 s
21	354° 31' 54"	-0.13"	354° 58' 31"	-2° 10' 28"	0.9943531	16'05.08"	23° 26' 19"	-8 m 59 s
22	354° 34' 23"	-0.13"	355° 00' 49"	-2° 09' 29"	0.9943644	16'05.07"	23° 26' 19"	-8 m 59 s
23	354° 36' 52"	-0.14"	355° 03' 06"	-2° 08' 30"	0.9943758	16'05.06"	23° 26' 19"	-8 m 58 s
24	354° 39' 22"	-0.14"	355° 05' 23"	-2° 07' 31"	0.9943871	16'05.05"	23° 26' 19"	-8 m 57 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	170° 26' 46"	0° 38' 29"	171° 28' 28"	4° 22' 30"	0° 54' 42"	14' 54.44"	304° 27' 12"	0.99918
1	170° 57' 03"	0° 35' 42"	171° 55' 17"	4° 08' 01"	0° 54' 42"	14' 54.22"	305° 24' 21"	0.99940
2	171° 27' 20"	0° 32' 54"	172° 22' 05"	3° 53' 32"	0° 54' 41"	14' 54.00"	306° 43' 05"	0.99958
3	171° 57' 35"	0° 30' 07"	172° 48' 50"	3° 39' 02"	0° 54' 40"	14' 53.79"	308° 39' 10"	0.99973
4	172° 27' 50"	0° 27' 20"	173° 15' 35"	3° 24' 31"	0° 54' 39"	14' 53.57"	311° 48' 13"	0.99984
5	172° 58' 04"	0° 24' 32"	173° 42' 17"	3° 10' 01"	0° 54' 38"	14' 53.36"	317° 49' 28"	0.99993
6	173° 28' 17"	0° 21' 45"	174° 08' 58"	2° 55' 30"	0° 54' 38"	14' 53.15"	333° 11' 28"	0.99998
7	173° 58' 29"	0° 18' 57"	174° 35' 38"	2° 40' 59"	0° 54' 37"	14' 52.94"	28° 25' 08"	0.99999
8	174° 28' 41"	0° 16' 10"	175° 02' 16"	2° 26' 27"	0° 54' 36"	14' 52.74"	84° 32' 18"	0.99998
9	174° 58' 51"	0° 13' 22"	175° 28' 53"	2° 11' 56"	0° 54' 35"	14' 52.53"	100° 10' 46"	0.99993
10	175° 29' 01"	0° 10' 35"	175° 55' 29"	1° 57' 24"	0° 54' 35"	14' 52.33"	106° 15' 48"	0.99985
11	175° 59' 09"	0° 07' 47"	176° 22' 04"	1° 42' 53"	0° 54' 34"	14' 52.13"	109° 25' 42"	0.99974
12	176° 29' 17"	0° 04' 60"	176° 48' 37"	1° 28' 21"	0° 54' 33"	14' 51.93"	111° 21' 33"	0.99959
13	176° 59' 24"	0° 02' 12"	177° 15' 10"	1° 13' 50"	0° 54' 32"	14' 51.73"	112° 39' 29"	0.99941
14	177° 29' 31"	0° 00'-35"	177° 41' 41"	0° 59' 18"	0° 54' 32"	14' 51.54"	113° 35' 25"	0.99920
15	177° 59' 36"	0° -3' 22"	178° 08' 11"	0° 44' 47"	0° 54' 31"	14' 51.34"	114° 17' 30"	0.99896
16	178° 29' 41"	0° -6' 10"	178° 34' 41"	0° 30' 16"	0° 54' 30"	14' 51.15"	114° 50' 15"	0.99869
17	178° 59' 45"	0° -8' 57"	179° 01' 10"	0° 15' 46"	0° 54' 30"	14' 50.96"	115° 16' 26"	0.99838
18	179° 29' 48"	0°-11' 44"	179° 27' 38"	0° 01' 15"	0° 54' 29"	14' 50.78"	115° 37' 47"	0.99804
19	179° 59' 50"	0°-14' 30"	179° 54' 05"	0°-13' 15"	0° 54' 28"	14' 50.59"	115° 55' 29"	0.99767
20	180° 29' 52"	0°-17' 17"	180° 20' 31"	0°-27' 44"	0° 54' 28"	14' 50.41"	116° 10' 21"	0.99727
21	180° 59' 53"	0°-20' 04"	180° 46' 58"	0°-42' 13"	0° 54' 27"	14' 50.23"	116° 22' 58"	0.99683
22	181° 29' 53"	0°-22' 50"	181° 13' 23"	0°-56' 42"	0° 54' 26"	14' 50.05"	116° 33' 45"	0.99637
23	181° 59' 52"	0°-25' 36"	181° 39' 48"	-1° 11' 10"	0° 54' 26"	14' 49.87"	116° 43' 02"	0.99587
24	182° 29' 51"	0°-28' 22"	182° 06' 13"	-1° 25' 37"	0° 54' 25"	14' 49.69"	116° 51' 03"	0.99534

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	354° 39' 22"	-0.14"	355° 05' 23"	-2° 07' 31"	0.9943871	16'05.05"	23° 26' 19"	-8 m 57 s
1	354° 41' 51"	-0.15"	355° 07' 41"	-2° 06' 32"	0.9943985	16'05.04"	23° 26' 19"	-8 m 57 s
2	354° 44' 21"	-0.15"	355° 09' 58"	-2° 05' 32"	0.9944099	16'05.02"	23° 26' 19"	-8 m 56 s
3	354° 46' 50"	-0.16"	355° 12' 15"	-2° 04' 33"	0.9944212	16'05.01"	23° 26' 19"	-8 m 55 s
4	354° 49' 20"	-0.16"	355° 14' 32"	-2° 03' 34"	0.9944326	16'05.00"	23° 26' 19"	-8 m 54 s
5	354° 51' 49"	-0.17"	355° 16' 50"	-2° 02' 35"	0.9944440	16'04.99"	23° 26' 19"	-8 m 54 s
6	354° 54' 18"	-0.18"	355° 19' 07"	-2° 01' 35"	0.9944554	16'04.98"	23° 26' 19"	-8 m 53 s
7	354° 56' 48"	-0.18"	355° 21' 24"	-2° 00' 36"	0.9944667	16'04.97"	23° 26' 19"	-8 m 52 s
8	354° 59' 17"	-0.19"	355° 23' 42"	-1° 59' 37"	0.9944781	16'04.96"	23° 26' 19"	-8 m 52 s
9	355° 01' 47"	-0.19"	355° 25' 59"	-1° 58' 38"	0.9944895	16'04.95"	23° 26' 19"	-8 m 51 s
10	355° 04' 16"	-0.20"	355° 28' 16"	-1° 57' 39"	0.9945009	16'04.94"	23° 26' 19"	-8 m 50 s
11	355° 06' 45"	-0.20"	355° 30' 33"	-1° 56' 39"	0.9945124	16'04.93"	23° 26' 19"	-8 m 50 s
12	355° 09' 15"	-0.21"	355° 32' 50"	-1° 55' 40"	0.9945238	16'04.91"	23° 26' 19"	-8 m 49 s
13	355° 11' 44"	-0.21"	355° 35' 08"	-1° 54' 41"	0.9945352	16'04.90"	23° 26' 19"	-8 m 48 s
14	355° 14' 14"	-0.22"	355° 37' 25"	-1° 53' 42"	0.9945466	16'04.89"	23° 26' 19"	-8 m 47 s
15	355° 16' 43"	-0.22"	355° 39' 42"	-1° 52' 42"	0.9945580	16'04.88"	23° 26' 19"	-8 m 47 s
16	355° 19' 12"	-0.23"	355° 41' 59"	-1° 51' 43"	0.9945695	16'04.87"	23° 26' 19"	-8 m 46 s
17	355° 21' 42"	-0.24"	355° 44' 16"	-1° 50' 44"	0.9945809	16'04.86"	23° 26' 19"	-8 m 45 s
18	355° 24' 11"	-0.24"	355° 46' 34"	-1° 49' 45"	0.9945923	16'04.85"	23° 26' 19"	-8 m 45 s
19	355° 26' 41"	-0.25"	355° 48' 51"	-1° 48' 45"	0.9946038	16'04.84"	23° 26' 19"	-8 m 44 s
20	355° 29' 10"	-0.25"	355° 51' 08"	-1° 47' 46"	0.9946152	16'04.83"	23° 26' 19"	-8 m 43 s
21	355° 31' 39"	-0.26"	355° 53' 25"	-1° 46' 47"	0.9946267	16'04.81"	23° 26' 19"	-8 m 42 s
22	355° 34' 09"	-0.26"	355° 55' 42"	-1° 45' 48"	0.9946382	16'04.80"	23° 26' 19"	-8 m 42 s
23	355° 36' 38"	-0.27"	355° 57' 60"	-1° 44' 48"	0.9946496	16'04.79"	23° 26' 19"	-8 m 41 s
24	355° 39' 07"	-0.27"	356° 00' 17"	-1° 43' 49"	0.9946611	16'04.78"	23° 26' 19"	-8 m 40 s

*) for mean equinox of date

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	182° 29' 51"	0°-28' 22"	182° 06' 13"	-1° 25' 37"	0° 54' 25"	14' 49.69"	116° 51' 03"	0.99534
1	182° 59' 49"	0°-31' 08"	182° 32' 37"	-1° 40' 04"	0° 54' 24"	14' 49.52"	116° 58' 00"	0.99478
2	183° 29' 46"	0°-33' 54"	182° 59' 01"	-1° 54' 30"	0° 54' 24"	14' 49.35"	117° 4' 02"	0.99419
3	183° 59' 42"	0°-36' 39"	183° 25' 25"	-2° 08' 55"	0° 54' 23"	14' 49.18"	117° 9' 17"	0.99356
4	184° 29' 38"	0°-39' 24"	183° 51' 49"	-2° 23' 20"	0° 54' 22"	14' 49.01"	117° 13' 49"	0.99291
5	184° 59' 33"	0°-42' 09"	184° 18' 13"	-2° 37' 43"	0° 54' 22"	14' 48.85"	117° 17' 45"	0.99222
6	185° 29' 28"	0°-44' 54"	184° 44' 37"	-2° 52' 06"	0° 54' 21"	14' 48.69"	117° 21' 07"	0.99150
7	185° 59' 21"	0°-47' 38"	185° 11' 00"	-3° 06' 28"	0° 54' 21"	14' 48.53"	117° 23' 60"	0.99076
8	186° 29' 14"	0°-50' 23"	185° 37' 24"	-3° 20' 49"	0° 54' 20"	14' 48.37"	117° 26' 26"	0.98998
9	186° 59' 07"	0°-53' 06"	186° 03' 48"	-3° 35' 08"	0° 54' 19"	14' 48.21"	117° 28' 27"	0.98917
10	187° 28' 59"	0°-55' 50"	186° 30' 12"	-3° 49' 27"	0° 54' 19"	14' 48.06"	117° 30' 05"	0.98832
11	187° 58' 50"	0°-58' 33"	186° 56' 37"	-4° 03' 44"	0° 54' 18"	14' 47.91"	117° 31' 22"	0.98745
12	188° 28' 40"	-1° 01' 16"	187° 23' 01"	-4° 18' 01"	0° 54' 18"	14' 47.76"	117° 32' 21"	0.98655
13	188° 58' 30"	-1° 03' 59"	187° 49' 27"	-4° 32' 16"	0° 54' 17"	14' 47.61"	117° 33' 01"	0.98562
14	189° 28' 19"	-1° 06' 41"	188° 15' 52"	-4° 46' 30"	0° 54' 17"	14' 47.46"	117° 33' 23"	0.98465
15	189° 58' 08"	-1° 09' 23"	188° 42' 18"	-5° 00' 42"	0° 54' 16"	14' 47.32"	117° 33' 30"	0.98366
16	190° 27' 56"	-1° 12' 04"	189° 08' 45"	-5° 14' 53"	0° 54' 16"	14' 47.18"	117° 33' 22"	0.98263
17	190° 57' 44"	-1° 14' 45"	189° 35' 12"	-5° 29' 03"	0° 54' 15"	14' 47.04"	117° 32' 60"	0.98158
18	191° 27' 30"	-1° 17' 26"	190° 01' 40"	-5° 43' 11"	0° 54' 15"	14' 46.91"	117° 32' 23"	0.98049
19	191° 57' 17"	-1° 20' 06"	190° 28' 09"	-5° 57' 18"	0° 54' 14"	14' 46.78"	117° 31' 34"	0.97938
20	192° 27' 03"	-1° 22' 46"	190° 54' 39"	-6° 11' 23"	0° 54' 14"	14' 46.64"	117° 30' 32"	0.97824
21	192° 56' 48"	-1° 25' 26"	191° 21' 09"	-6° 25' 27"	0° 54' 13"	14' 46.52"	117° 29' 18"	0.97706
22	193° 26' 33"	-1° 28' 05"	191° 47' 41"	-6° 39' 29"	0° 54' 13"	14' 46.39"	117° 27' 52"	0.97586
23	193° 56' 17"	-1° 30' 43"	192° 14' 13"	-6° 53' 29"	0° 54' 12"	14' 46.27"	117° 26' 15"	0.97462
24	194° 26' 00"	-1° 33' 21"	192° 40' 46"	-7° 07' 27"	0° 54' 12"	14' 46.15"	117° 24' 27"	0.97336

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	355° 39' 07"	-0.27"	356° 00' 17"	-1° 43' 49"	0.9946611	16'04.78"	23° 26' 19"	-8 m 40 s
1	355° 41' 37"	-0.28"	356° 02' 34"	-1° 42' 50"	0.9946726	16'04.77"	23° 26' 19"	-8 m 40 s
2	355° 44' 06"	-0.28"	356° 04' 51"	-1° 41' 51"	0.9946840	16'04.76"	23° 26' 19"	-8 m 39 s
3	355° 46' 35"	-0.29"	356° 07' 08"	-1° 40' 51"	0.9946955	16'04.75"	23° 26' 19"	-8 m 38 s
4	355° 49' 05"	-0.29"	356° 09' 25"	-1° 39' 52"	0.9947070	16'04.74"	23° 26' 19"	-8 m 37 s
5	355° 51' 34"	-0.30"	356° 11' 42"	-1° 38' 53"	0.9947185	16'04.73"	23° 26' 19"	-8 m 37 s
6	355° 54' 03"	-0.31"	356° 13' 60"	-1° 37' 54"	0.9947300	16'04.71"	23° 26' 19"	-8 m 36 s
7	355° 56' 33"	-0.31"	356° 16' 17"	-1° 36' 54"	0.9947415	16'04.70"	23° 26' 19"	-8 m 35 s
8	355° 59' 02"	-0.32"	356° 18' 34"	-1° 35' 55"	0.9947530	16'04.69"	23° 26' 19"	-8 m 35 s
9	356° 01' 31"	-0.32"	356° 20' 51"	-1° 34' 56"	0.9947645	16'04.68"	23° 26' 19"	-8 m 34 s
10	356° 04' 01"	-0.33"	356° 23' 08"	-1° 33' 56"	0.9947760	16'04.67"	23° 26' 19"	-8 m 33 s
11	356° 06' 30"	-0.33"	356° 25' 25"	-1° 32' 57"	0.9947875	16'04.66"	23° 26' 19"	-8 m 32 s
12	356° 08' 59"	-0.34"	356° 27' 42"	-1° 31' 58"	0.9947991	16'04.65"	23° 26' 19"	-8 m 32 s
13	356° 11' 29"	-0.34"	356° 29' 59"	-1° 30' 59"	0.9948106	16'04.64"	23° 26' 19"	-8 m 31 s
14	356° 13' 58"	-0.35"	356° 32' 16"	-1° 29' 59"	0.9948221	16'04.62"	23° 26' 19"	-8 m 30 s
15	356° 16' 27"	-0.35"	356° 34' 33"	-1° 29' 00"	0.9948337	16'04.61"	23° 26' 19"	-8 m 30 s
16	356° 18' 57"	-0.36"	356° 36' 51"	-1° 28' 01"	0.9948452	16'04.60"	23° 26' 19"	-8 m 29 s
17	356° 21' 26"	-0.36"	356° 39' 08"	-1° 27' 02"	0.9948568	16'04.59"	23° 26' 19"	-8 m 28 s
18	356° 23' 55"	-0.37"	356° 41' 25"	-1° 26' 02"	0.9948683	16'04.58"	23° 26' 19"	-8 m 27 s
19	356° 26' 25"	-0.37"	356° 43' 42"	-1° 25' 03"	0.9948799	16'04.57"	23° 26' 19"	-8 m 27 s
20	356° 28' 54"	-0.38"	356° 45' 59"	-1° 24' 04"	0.9948914	16'04.56"	23° 26' 19"	-8 m 26 s
21	356° 31' 23"	-0.38"	356° 48' 16"	-1° 23' 04"	0.9949030	16'04.55"	23° 26' 19"	-8 m 25 s
22	356° 33' 52"	-0.39"	356° 50' 33"	-1° 22' 05"	0.9949146	16'04.54"	23° 26' 19"	-8 m 25 s
23	356° 36' 22"	-0.39"	356° 52' 50"	-1° 21' 06"	0.9949261	16'04.52"	23° 26' 19"	-8 m 24 s
24	356° 38' 51"	-0.40"	356° 55' 07"	-1° 20' 07"	0.9949377	16'04.51"	23° 26' 19"	-8 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	194° 26' 00"	-1° 33' 21"	192° 40' 46"	-7° 07' 27"	0° 54' 12"	14' 46.15"	117° 24' 27"	0.97336
1	194° 55' 44"	-1° 35' 59"	193° 07' 21"	-7° 21' 24"	0° 54' 11"	14' 46.03"	117° 22' 28"	0.97207
2	195° 25' 26"	-1° 38' 36"	193° 33' 57"	-7° 35' 19"	0° 54' 11"	14' 45.91"	117° 20' 19"	0.97075
3	195° 55' 08"	-1° 41' 13"	194° 00' 34"	-7° 49' 12"	0° 54' 11"	14' 45.80"	117° 18' 00"	0.96940
4	196° 24' 50"	-1° 43' 49"	194° 27' 12"	-8° 03' 03"	0° 54' 10"	14' 45.69"	117° 15' 32"	0.96802
5	196° 54' 31"	-1° 46' 25"	194° 53' 51"	-8° 16' 52"	0° 54' 10"	14' 45.58"	117° 12' 53"	0.96661
6	197° 24' 12"	-1° 48' 60"	195° 20' 32"	-8° 30' 39"	0° 54' 09"	14' 45.48"	117° 10' 05"	0.96517
7	197° 53' 53"	-1° 51' 34"	195° 47' 14"	-8° 44' 24"	0° 54' 09"	14' 45.37"	117° 7' 08"	0.96370
8	198° 23' 32"	-1° 54' 08"	196° 13' 58"	-8° 58' 07"	0° 54' 09"	14' 45.27"	117° 4' 02"	0.96221
9	198° 53' 12"	-1° 56' 42"	196° 40' 44"	-9° 11' 48"	0° 54' 08"	14' 45.18"	117° 0' 47"	0.96068
10	199° 22' 51"	-1° 59' 15"	197° 07' 31"	-9° 25' 26"	0° 54' 08"	14' 45.08"	116° 57' 23"	0.95913
11	199° 52' 30"	-2° 01' 47"	197° 34' 19"	-9° 39' 02"	0° 54' 08"	14' 44.99"	116° 53' 50"	0.95755
12	200° 22' 08"	-2° 04' 19"	198° 01' 10"	-9° 52' 36"	0° 54' 07"	14' 44.90"	116° 50' 09"	0.95594
13	200° 51' 46"	-2° 06' 50"	198° 28' 02"	-10° 06' 08"	0° 54' 07"	14' 44.81"	116° 46' 20"	0.95431
14	201° 21' 23"	-2° 09' 21"	198° 54' 56"	-10° 19' 37"	0° 54' 07"	14' 44.73"	116° 42' 22"	0.95264
15	201° 51' 01"	-2° 11' 51"	199° 21' 52"	-10° 33' 04"	0° 54' 06"	14' 44.65"	116° 38' 16"	0.95095
16	202° 20' 38"	-2° 14' 20"	199° 48' 50"	-10° 46' 28"	0° 54' 06"	14' 44.57"	116° 34' 02"	0.94923
17	202° 50' 14"	-2° 16' 49"	200° 15' 49"	-10° 59' 50"	0° 54' 06"	14' 44.49"	116° 29' 40"	0.94748
18	203° 19' 50"	-2° 19' 17"	200° 42' 51"	-11° 13' 09"	0° 54' 06"	14' 44.42"	116° 25' 09"	0.94571
19	203° 49' 26"	-2° 21' 44"	201° 09' 55"	-11° 26' 26"	0° 54' 05"	14' 44.35"	116° 20' 31"	0.94391
20	204° 19' 02"	-2° 24' 11"	201° 37' 01"	-11° 39' 40"	0° 54' 05"	14' 44.29"	116° 15' 45"	0.94208
21	204° 48' 37"	-2° 26' 37"	202° 04' 10"	-11° 52' 51"	0° 54' 05"	14' 44.22"	116° 10' 51"	0.94022
22	205° 18' 12"	-2° 29' 03"	202° 31' 21"	-12° 05' 59"	0° 54' 05"	14' 44.16"	116° 5' 50"	0.93834
23	205° 47' 47"	-2° 31' 27"	202° 58' 34"	-12° 19' 05"	0° 54' 04"	14' 44.10"	116° 0' 41"	0.93643
24	206° 17' 21"	-2° 33' 52"	203° 25' 49"	-12° 32' 08"	0° 54' 04"	14' 44.05"	115° 55' 24"	0.93449

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	356° 38' 51"	-0.40"	356° 55' 07"	-1° 20' 07"	0.9949377	16'04.51"	23° 26' 19"	-8 m 23 s
1	356° 41' 20"	-0.40"	356° 57' 24"	-1° 19' 07"	0.9949493	16'04.50"	23° 26' 19"	-8 m 22 s
2	356° 43' 50"	-0.41"	356° 59' 41"	-1° 18' 08"	0.9949609	16'04.49"	23° 26' 19"	-8 m 22 s
3	356° 46' 19"	-0.41"	357° 01' 58"	-1° 17' 09"	0.9949725	16'04.48"	23° 26' 19"	-8 m 21 s
4	356° 48' 48"	-0.42"	357° 04' 15"	-1° 16' 09"	0.9949841	16'04.47"	23° 26' 19"	-8 m 20 s
5	356° 51' 17"	-0.42"	357° 06' 32"	-1° 15' 10"	0.9949956	16'04.46"	23° 26' 19"	-8 m 20 s
6	356° 53' 47"	-0.43"	357° 08' 49"	-1° 14' 11"	0.9950072	16'04.45"	23° 26' 19"	-8 m 19 s
7	356° 56' 16"	-0.43"	357° 11' 06"	-1° 13' 12"	0.9950189	16'04.43"	23° 26' 19"	-8 m 18 s
8	356° 58' 45"	-0.43"	357° 13' 23"	-1° 12' 12"	0.9950305	16'04.42"	23° 26' 19"	-8 m 17 s
9	357° 01' 14"	-0.44"	357° 15' 40"	-1° 11' 13"	0.9950421	16'04.41"	23° 26' 19"	-8 m 17 s
10	357° 03' 44"	-0.44"	357° 17' 57"	-1° 10' 14"	0.9950537	16'04.40"	23° 26' 19"	-8 m 16 s
11	357° 06' 13"	-0.45"	357° 20' 14"	-1° 09' 14"	0.9950653	16'04.39"	23° 26' 19"	-8 m 15 s
12	357° 08' 42"	-0.45"	357° 22' 31"	-1° 08' 15"	0.9950769	16'04.38"	23° 26' 19"	-8 m 14 s
13	357° 11' 11"	-0.46"	357° 24' 48"	-1° 07' 16"	0.9950886	16'04.37"	23° 26' 19"	-8 m 14 s
14	357° 13' 41"	-0.46"	357° 27' 05"	-1° 06' 16"	0.9951002	16'04.36"	23° 26' 19"	-8 m 13 s
15	357° 16' 10"	-0.47"	357° 29' 22"	-1° 05' 17"	0.9951119	16'04.34"	23° 26' 19"	-8 m 12 s
16	357° 18' 39"	-0.47"	357° 31' 39"	-1° 04' 18"	0.9951235	16'04.33"	23° 26' 19"	-8 m 12 s
17	357° 21' 08"	-0.48"	357° 33' 56"	-1° 03' 19"	0.9951351	16'04.32"	23° 26' 19"	-8 m 11 s
18	357° 23' 38"	-0.48"	357° 36' 13"	-1° 02' 19"	0.9951468	16'04.31"	23° 26' 19"	-8 m 10 s
19	357° 26' 07"	-0.48"	357° 38' 30"	-1° 01' 20"	0.9951585	16'04.30"	23° 26' 19"	-8 m 09 s
20	357° 28' 36"	-0.49"	357° 40' 47"	-1° 00' 21"	0.9951701	16'04.29"	23° 26' 19"	-8 m 09 s
21	357° 31' 05"	-0.49"	357° 43' 04"	0°-59' 21"	0.9951818	16'04.28"	23° 26' 19"	-8 m 08 s
22	357° 33' 34"	-0.50"	357° 45' 21"	0°-58' 22"	0.9951934	16'04.26"	23° 26' 19"	-8 m 07 s
23	357° 36' 04"	-0.50"	357° 47' 38"	0°-57' 23"	0.9952051	16'04.25"	23° 26' 19"	-8 m 07 s
24	357° 38' 33"	-0.50"	357° 49' 54"	0°-56' 23"	0.9952168	16'04.24"	23° 26' 19"	-8 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	206° 17' 21"	-2° 33' 52"	203° 25' 49"	-12° 32' 08"	0° 54' 04"	14' 44.05"	115° 55' 24"	0.93449
1	206° 46' 55"	-2° 36' 15"	203° 53' 07"	-12° 45' 08"	0° 54' 04"	14' 44.00"	115° 49' 60"	0.93252
2	207° 16' 29"	-2° 38' 37"	204° 20' 27"	-12° 58' 05"	0° 54' 04"	14' 43.95"	115° 44' 28"	0.93053
3	207° 46' 03"	-2° 40' 59"	204° 47' 50"	-13° 10' 59"	0° 54' 04"	14' 43.90"	115° 38' 49"	0.92852
4	208° 15' 37"	-2° 43' 20"	205° 15' 15"	-13° 23' 49"	0° 54' 04"	14' 43.86"	115° 33' 02"	0.92647
5	208° 45' 10"	-2° 45' 41"	205° 42' 43"	-13° 36' 37"	0° 54' 03"	14' 43.82"	115° 27' 08"	0.92441
6	209° 14' 43"	-2° 48' 00"	206° 10' 14"	-13° 49' 22"	0° 54' 03"	14' 43.78"	115° 21' 06"	0.92231
7	209° 44' 16"	-2° 50' 19"	206° 37' 48"	-14° 02' 03"	0° 54' 03"	14' 43.75"	115° 14' 57"	0.92019
8	210° 13' 49"	-2° 52' 37"	207° 05' 24"	-14° 14' 41"	0° 54' 03"	14' 43.72"	115° 8' 41"	0.91804
9	210° 43' 22"	-2° 54' 55"	207° 33' 03"	-14° 27' 16"	0° 54' 03"	14' 43.69"	115° 2' 18"	0.91587
10	211° 12' 55"	-2° 57' 11"	208° 00' 45"	-14° 39' 48"	0° 54' 03"	14' 43.67"	114° 55' 47"	0.91367
11	211° 42' 27"	-2° 59' 27"	208° 28' 30"	-14° 52' 16"	0° 54' 03"	14' 43.65"	114° 49' 09"	0.91145
12	212° 11' 60"	-3° 01' 42"	208° 56' 18"	-15° 04' 41"	0° 54' 03"	14' 43.63"	114° 42' 24"	0.90920
13	212° 41' 32"	-3° 03' 56"	209° 24' 09"	-15° 17' 02"	0° 54' 03"	14' 43.62"	114° 35' 31"	0.90693
14	213° 11' 04"	-3° 06' 09"	209° 52' 03"	-15° 29' 20"	0° 54' 03"	14' 43.61"	114° 28' 32"	0.90463
15	213° 40' 36"	-3° 08' 21"	210° 20' 00"	-15° 41' 34"	0° 54' 03"	14' 43.60"	114° 21' 25"	0.90231
16	214° 10' 08"	-3° 10' 33"	210° 48' 01"	-15° 53' 44"	0° 54' 03"	14' 43.60"	114° 14' 11"	0.89996
17	214° 39' 41"	-3° 12' 44"	211° 16' 04"	-16° 05' 51"	0° 54' 03"	14' 43.60"	114° 6' 51"	0.89759
18	215° 09' 13"	-3° 14' 54"	211° 44' 11"	-16° 17' 54"	0° 54' 03"	14' 43.60"	113° 59' 23"	0.89519
19	215° 38' 45"	-3° 17' 03"	212° 12' 21"	-16° 29' 54"	0° 54' 03"	14' 43.61"	113° 51' 48"	0.89277
20	216° 08' 17"	-3° 19' 11"	212° 40' 35"	-16° 41' 49"	0° 54' 03"	14' 43.62"	113° 44' 06"	0.89033
21	216° 37' 49"	-3° 21' 18"	213° 08' 52"	-16° 53' 41"	0° 54' 03"	14' 43.63"	113° 36' 17"	0.88786
22	217° 07' 21"	-3° 23' 24"	213° 37' 12"	-17° 05' 29"	0° 54' 03"	14' 43.65"	113° 28' 21"	0.88536
23	217° 36' 53"	-3° 25' 30"	214° 05' 36"	-17° 17' 12"	0° 54' 03"	14' 43.67"	113° 20' 18"	0.88285
24	218° 06' 25"	-3° 27' 34"	214° 34' 04"	-17° 28' 52"	0° 54' 03"	14' 43.69"	113° 12' 08"	0.88031

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	357° 38' 33"	-0.50"	357° 49' 54"	0°-56' 23"	0.9952168	16'04.24"	23° 26' 19"	-8 m 06 s
1	357° 41' 02"	-0.51"	357° 52' 11"	0°-55' 24"	0.9952285	16'04.23"	23° 26' 19"	-8 m 05 s
2	357° 43' 31"	-0.51"	357° 54' 28"	0°-54' 25"	0.9952402	16'04.22"	23° 26' 19"	-8 m 04 s
3	357° 46' 00"	-0.52"	357° 56' 45"	0°-53' 26"	0.9952518	16'04.21"	23° 26' 19"	-8 m 04 s
4	357° 48' 30"	-0.52"	357° 59' 02"	0°-52' 26"	0.9952635	16'04.20"	23° 26' 19"	-8 m 03 s
5	357° 50' 59"	-0.53"	358° 01' 19"	0°-51' 27"	0.9952752	16'04.19"	23° 26' 19"	-8 m 02 s
6	357° 53' 28"	-0.53"	358° 03' 36"	0°-50' 28"	0.9952869	16'04.17"	23° 26' 19"	-8 m 01 s
7	357° 55' 57"	-0.53"	358° 05' 53"	0°-49' 28"	0.9952986	16'04.16"	23° 26' 19"	-8 m 01 s
8	357° 58' 26"	-0.54"	358° 08' 10"	0°-48' 29"	0.9953103	16'04.15"	23° 26' 19"	-7 m 60 s
9	358° 00' 55"	-0.54"	358° 10' 27"	0°-47' 30"	0.9953220	16'04.14"	23° 26' 19"	-7 m 59 s
10	358° 03' 25"	-0.54"	358° 12' 43"	0°-46' 30"	0.9953338	16'04.13"	23° 26' 19"	-7 m 59 s
11	358° 05' 54"	-0.55"	358° 15' 00"	0°-45' 31"	0.9953455	16'04.12"	23° 26' 19"	-7 m 58 s
12	358° 08' 23"	-0.55"	358° 17' 17"	0°-44' 32"	0.9953572	16'04.11"	23° 26' 19"	-7 m 57 s
13	358° 10' 52"	-0.56"	358° 19' 34"	0°-43' 33"	0.9953689	16'04.09"	23° 26' 19"	-7 m 56 s
14	358° 13' 21"	-0.56"	358° 21' 51"	0°-42' 33"	0.9953807	16'04.08"	23° 26' 19"	-7 m 56 s
15	358° 15' 50"	-0.56"	358° 24' 08"	0°-41' 34"	0.9953924	16'04.07"	23° 26' 19"	-7 m 55 s
16	358° 18' 20"	-0.57"	358° 26' 25"	0°-40' 35"	0.9954041	16'04.06"	23° 26' 19"	-7 m 54 s
17	358° 20' 49"	-0.57"	358° 28' 42"	0°-39' 35"	0.9954159	16'04.05"	23° 26' 19"	-7 m 53 s
18	358° 23' 18"	-0.57"	358° 30' 58"	0°-38' 36"	0.9954276	16'04.04"	23° 26' 19"	-7 m 53 s
19	358° 25' 47"	-0.58"	358° 33' 15"	0°-37' 37"	0.9954394	16'04.03"	23° 26' 19"	-7 m 52 s
20	358° 28' 16"	-0.58"	358° 35' 32"	0°-36' 37"	0.9954511	16'04.02"	23° 26' 19"	-7 m 51 s
21	358° 30' 45"	-0.58"	358° 37' 49"	0°-35' 38"	0.9954629	16'04.00"	23° 26' 19"	-7 m 50 s
22	358° 33' 14"	-0.59"	358° 40' 06"	0°-34' 39"	0.9954746	16'03.99"	23° 26' 19"	-7 m 50 s
23	358° 35' 44"	-0.59"	358° 42' 23"	0°-33' 40"	0.9954864	16'03.98"	23° 26' 19"	-7 m 49 s
24	358° 38' 13"	-0.59"	358° 44' 40"	0°-32' 40"	0.9954981	16'03.97"	23° 26' 19"	-7 m 48 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	218° 06' 25"	-3° 27' 34"	214° 34' 04"	-17° 28' 52"	0° 54' 03"	14' 43.69"	113° 12' 08"	0.88031
1	218° 35' 57"	-3° 29' 38"	215° 02' 35"	-17° 40' 28"	0° 54' 03"	14' 43.72"	113° 3' 51"	0.87774
2	219° 05' 30"	-3° 31' 40"	215° 31' 10"	-17° 51' 59"	0° 54' 03"	14' 43.75"	112° 55' 27"	0.87516
3	219° 35' 02"	-3° 33' 42"	215° 59' 48"	-18° 03' 26"	0° 54' 03"	14' 43.78"	112° 46' 56"	0.87254
4	220° 04' 35"	-3° 35' 43"	216° 28' 30"	-18° 14' 49"	0° 54' 03"	14' 43.82"	112° 38' 18"	0.86991
5	220° 34' 08"	-3° 37' 43"	216° 57' 16"	-18° 26' 08"	0° 54' 04"	14' 43.86"	112° 29' 34"	0.86726
6	221° 03' 40"	-3° 39' 41"	217° 26' 06"	-18° 37' 23"	0° 54' 04"	14' 43.91"	112° 20' 42"	0.86458
7	221° 33' 13"	-3° 41' 39"	217° 54' 59"	-18° 48' 33"	0° 54' 04"	14' 43.96"	112° 11' 44"	0.86187
8	222° 02' 47"	-3° 43' 36"	218° 23' 56"	-18° 59' 38"	0° 54' 04"	14' 44.01"	112° 2' 39"	0.85915
9	222° 32' 20"	-3° 45' 32"	218° 52' 58"	-19° 10' 39"	0° 54' 04"	14' 44.06"	111° 53' 27"	0.85640
10	223° 01' 53"	-3° 47' 27"	219° 22' 03"	-19° 21' 36"	0° 54' 04"	14' 44.12"	111° 44' 08"	0.85364
11	223° 31' 27"	-3° 49' 21"	219° 51' 12"	-19° 32' 28"	0° 54' 05"	14' 44.19"	111° 34' 42"	0.85084
12	224° 01' 01"	-3° 51' 14"	220° 20' 25"	-19° 43' 15"	0° 54' 05"	14' 44.26"	111° 25' 10"	0.84803
13	224° 30' 36"	-3° 53' 06"	220° 49' 42"	-19° 53' 58"	0° 54' 05"	14' 44.33"	111° 15' 31"	0.84520
14	225° 00' 10"	-3° 54' 57"	221° 19' 04"	-20° 04' 36"	0° 54' 06"	14' 44.40"	111° 5' 45"	0.84234
15	225° 29' 45"	-3° 56' 46"	221° 48' 29"	-20° 15' 09"	0° 54' 06"	14' 44.48"	110° 55' 52"	0.83946
16	225° 59' 20"	-3° 58' 35"	222° 17' 59"	-20° 25' 37"	0° 54' 06"	14' 44.56"	110° 45' 53"	0.83656
17	226° 28' 55"	-4° 00' 23"	222° 47' 33"	-20° 36' 00"	0° 54' 06"	14' 44.65"	110° 35' 47"	0.83364
18	226° 58' 31"	-4° 02' 10"	223° 17' 11"	-20° 46' 18"	0° 54' 07"	14' 44.74"	110° 25' 34"	0.83070
19	227° 28' 07"	-4° 03' 55"	223° 46' 53"	-20° 56' 32"	0° 54' 07"	14' 44.84"	110° 15' 15"	0.82774
20	227° 57' 44"	-4° 05' 40"	224° 16' 40"	-21° 06' 40"	0° 54' 07"	14' 44.94"	110° 4' 49"	0.82476
21	228° 27' 21"	-4° 07' 23"	224° 46' 30"	-21° 16' 43"	0° 54' 08"	14' 45.04"	109° 54' 16"	0.82175
22	228° 56' 58"	-4° 09' 06"	225° 16' 26"	-21° 26' 41"	0° 54' 08"	14' 45.14"	109° 43' 37"	0.81873
23	229° 26' 35"	-4° 10' 47"	225° 46' 25"	-21° 36' 34"	0° 54' 09"	14' 45.25"	109° 32' 51"	0.81568
24	229° 56' 13"	-4° 12' 27"	226° 16' 29"	-21° 46' 21"	0° 54' 09"	14' 45.37"	109° 21' 59"	0.81262

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	358° 38' 13"	-0.59"	358° 44' 40"	0°-32' 40"	0.9954981	16'03.97"	23° 26' 19"	-7 m 48 s
1	358° 40' 42"	-0.60"	358° 46' 56"	0°-31' 41"	0.9955099	16'03.96"	23° 26' 19"	-7 m 48 s
2	358° 43' 11"	-0.60"	358° 49' 13"	0°-30' 42"	0.9955217	16'03.95"	23° 26' 19"	-7 m 47 s
3	358° 45' 40"	-0.60"	358° 51' 30"	0°-29' 42"	0.9955335	16'03.94"	23° 26' 19"	-7 m 46 s
4	358° 48' 09"	-0.60"	358° 53' 47"	0°-28' 43"	0.9955452	16'03.92"	23° 26' 19"	-7 m 45 s
5	358° 50' 38"	-0.61"	358° 56' 04"	0°-27' 44"	0.9955570	16'03.91"	23° 26' 19"	-7 m 45 s
6	358° 53' 07"	-0.61"	358° 58' 20"	0°-26' 44"	0.9955688	16'03.90"	23° 26' 19"	-7 m 44 s
7	358° 55' 37"	-0.61"	359° 00' 37"	0°-25' 45"	0.9955806	16'03.89"	23° 26' 19"	-7 m 43 s
8	358° 58' 06"	-0.62"	359° 02' 54"	0°-24' 46"	0.9955924	16'03.88"	23° 26' 19"	-7 m 42 s
9	359° 00' 35"	-0.62"	359° 05' 11"	0°-23' 47"	0.9956042	16'03.87"	23° 26' 19"	-7 m 42 s
10	359° 03' 04"	-0.62"	359° 07' 28"	0°-22' 47"	0.9956160	16'03.86"	23° 26' 19"	-7 m 41 s
11	359° 05' 33"	-0.62"	359° 09' 45"	0°-21' 48"	0.9956278	16'03.84"	23° 26' 19"	-7 m 40 s
12	359° 08' 02"	-0.63"	359° 12' 01"	0°-20' 49"	0.9956396	16'03.83"	23° 26' 19"	-7 m 39 s
13	359° 10' 31"	-0.63"	359° 14' 18"	0°-19' 49"	0.9956514	16'03.82"	23° 26' 19"	-7 m 39 s
14	359° 13' 00"	-0.63"	359° 16' 35"	0°-18' 50"	0.9956632	16'03.81"	23° 26' 19"	-7 m 38 s
15	359° 15' 29"	-0.63"	359° 18' 52"	0°-17' 51"	0.9956750	16'03.80"	23° 26' 19"	-7 m 37 s
16	359° 17' 58"	-0.64"	359° 21' 08"	0°-16' 51"	0.9956869	16'03.79"	23° 26' 19"	-7 m 37 s
17	359° 20' 27"	-0.64"	359° 23' 25"	0°-15' 52"	0.9956987	16'03.78"	23° 26' 19"	-7 m 36 s
18	359° 22' 57"	-0.64"	359° 25' 42"	0°-14' 53"	0.9957105	16'03.76"	23° 26' 19"	-7 m 35 s
19	359° 25' 26"	-0.64"	359° 27' 59"	0°-13' 54"	0.9957223	16'03.75"	23° 26' 19"	-7 m 34 s
20	359° 27' 55"	-0.65"	359° 30' 16"	0°-12' 54"	0.9957342	16'03.74"	23° 26' 19"	-7 m 34 s
21	359° 30' 24"	-0.65"	359° 32' 32"	0°-11' 55"	0.9957460	16'03.73"	23° 26' 19"	-7 m 33 s
22	359° 32' 53"	-0.65"	359° 34' 49"	0°-10' 56"	0.9957578	16'03.72"	23° 26' 19"	-7 m 32 s
23	359° 35' 22"	-0.65"	359° 37' 06"	0° -9' 56"	0.9957697	16'03.71"	23° 26' 19"	-7 m 31 s
24	359° 37' 51"	-0.66"	359° 39' 23"	0° -8' 57"	0.9957815	16'03.70"	23° 26' 19"	-7 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	229° 56' 13"	-4° 12' 27"	226° 16' 29"	-21° 46' 21"	0° 54' 09"	14' 45.37"	109° 21' 59"	0.81262
1	230° 25' 52"	-4° 14' 06"	226° 46' 37"	-21° 56' 03"	0° 54' 09"	14' 45.49"	109° 10' 60"	0.80953
2	230° 55' 31"	-4° 15' 44"	227° 16' 50"	-22° 05' 40"	0° 54' 10"	14' 45.61"	108° 59' 54"	0.80643
3	231° 25' 10"	-4° 17' 21"	227° 47' 07"	-22° 15' 11"	0° 54' 10"	14' 45.74"	108° 48' 42"	0.80331
4	231° 54' 50"	-4° 18' 57"	228° 17' 29"	-22° 24' 36"	0° 54' 11"	14' 45.87"	108° 37' 24"	0.80016
5	232° 24' 30"	-4° 20' 32"	228° 47' 55"	-22° 33' 57"	0° 54' 11"	14' 46.00"	108° 25' 59"	0.79700
6	232° 54' 11"	-4° 22' 05"	229° 18' 26"	-22° 43' 11"	0° 54' 12"	14' 46.14"	108° 14' 28"	0.79381
7	233° 23' 53"	-4° 23' 38"	229° 49' 01"	-22° 52' 20"	0° 54' 12"	14' 46.28"	108° 2' 50"	0.79061
8	233° 53' 35"	-4° 25' 09"	230° 19' 41"	-23° 01' 23"	0° 54' 13"	14' 46.43"	107° 51' 06"	0.78739
9	234° 23' 17"	-4° 26' 39"	230° 50' 25"	-23° 10' 20"	0° 54' 14"	14' 46.58"	107° 39' 16"	0.78415
10	234° 53' 01"	-4° 28' 08"	231° 21' 14"	-23° 19' 12"	0° 54' 14"	14' 46.74"	107° 27' 19"	0.78089
11	235° 22' 44"	-4° 29' 35"	231° 52' 07"	-23° 27' 57"	0° 54' 15"	14' 46.90"	107° 15' 16"	0.77762
12	235° 52' 29"	-4° 31' 02"	232° 23' 05"	-23° 36' 37"	0° 54' 15"	14' 47.06"	107° 3' 07"	0.77432
13	236° 22' 14"	-4° 32' 27"	232° 54' 08"	-23° 45' 10"	0° 54' 16"	14' 47.23"	106° 50' 52"	0.77101
14	236° 51' 59"	-4° 33' 51"	233° 25' 15"	-23° 53' 38"	0° 54' 17"	14' 47.40"	106° 38' 30"	0.76767
15	237° 21' 46"	-4° 35' 14"	233° 56' 27"	-24° 01' 59"	0° 54' 17"	14' 47.58"	106° 26' 03"	0.76432
16	237° 51' 33"	-4° 36' 36"	234° 27' 44"	-24° 10' 15"	0° 54' 18"	14' 47.76"	106° 13' 29"	0.76096
17	238° 21' 21"	-4° 37' 56"	234° 59' 05"	-24° 18' 24"	0° 54' 19"	14' 47.94"	106° 0' 49"	0.75757
18	238° 51' 09"	-4° 39' 16"	235° 30' 31"	-24° 26' 26"	0° 54' 19"	14' 48.13"	105° 48' 03"	0.75417
19	239° 20' 58"	-4° 40' 34"	236° 02' 02"	-24° 34' 23"	0° 54' 20"	14' 48.33"	105° 35' 11"	0.75075
20	239° 50' 48"	-4° 41' 50"	236° 33' 37"	-24° 42' 13"	0° 54' 21"	14' 48.53"	105° 22' 13"	0.74731
21	240° 20' 39"	-4° 43' 06"	237° 05' 17"	-24° 49' 56"	0° 54' 21"	14' 48.73"	105° 9' 10"	0.74386
22	240° 50' 30"	-4° 44' 20"	237° 37' 01"	-24° 57' 33"	0° 54' 22"	14' 48.93"	104° 56' 00"	0.74038
23	241° 20' 23"	-4° 45' 33"	238° 08' 51"	-25° 05' 04"	0° 54' 23"	14' 49.15"	104° 42' 45"	0.73690
24	241° 50' 16"	-4° 46' 45"	238° 40' 44"	-25° 12' 27"	0° 54' 24"	14' 49.36"	104° 29' 23"	0.73339

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	359° 37' 51"	-0.66"	359° 39' 23"	0° -8' 57"	0.9957815	16'03.70"	23° 26' 19"	-7 m 31 s
1	359° 40' 20"	-0.66"	359° 41' 39"	0° -7' 58"	0.9957934	16'03.68"	23° 26' 19"	-7 m 30 s
2	359° 42' 49"	-0.66"	359° 43' 56"	0° -6' 59"	0.9958052	16'03.67"	23° 26' 19"	-7 m 29 s
3	359° 45' 18"	-0.66"	359° 46' 13"	0° -5' 59"	0.9958171	16'03.66"	23° 26' 19"	-7 m 28 s
4	359° 47' 47"	-0.66"	359° 48' 30"	0° -5' 00"	0.9958289	16'03.65"	23° 26' 19"	-7 m 28 s
5	359° 50' 16"	-0.66"	359° 50' 46"	0° -4' 01"	0.9958408	16'03.64"	23° 26' 19"	-7 m 27 s
6	359° 52' 45"	-0.67"	359° 53' 03"	0° -3' 01"	0.9958527	16'03.63"	23° 26' 19"	-7 m 26 s
7	359° 55' 14"	-0.67"	359° 55' 20"	0° -2' 02"	0.9958645	16'03.62"	23° 26' 19"	-7 m 25 s
8	359° 57' 43"	-0.67"	359° 57' 37"	0° -1' 03"	0.9958764	16'03.60"	23° 26' 19"	-7 m 25 s
9	0° 00' 12"	-0.67"	359° 59' 53"	0° 00' -4"	0.9958883	16'03.59"	23° 26' 19"	-7 m 24 s
10	0° 02' 41"	-0.67"	0° 02' 10"	0° 00' 56"	0.9959001	16'03.58"	23° 26' 19"	-7 m 23 s
11	0° 05' 10"	-0.67"	0° 04' 27"	0° 01' 55"	0.9959120	16'03.57"	23° 26' 19"	-7 m 22 s
12	0° 07' 39"	-0.68"	0° 06' 43"	0° 02' 54"	0.9959239	16'03.56"	23° 26' 19"	-7 m 22 s
13	0° 10' 08"	-0.68"	0° 09' 00"	0° 03' 53"	0.9959358	16'03.55"	23° 26' 19"	-7 m 21 s
14	0° 12' 37"	-0.68"	0° 11' 17"	0° 04' 53"	0.9959477	16'03.53"	23° 26' 19"	-7 m 20 s
15	0° 15' 06"	-0.68"	0° 13' 34"	0° 05' 52"	0.9959596	16'03.52"	23° 26' 19"	-7 m 20 s
16	0° 17' 35"	-0.68"	0° 15' 50"	0° 06' 51"	0.9959714	16'03.51"	23° 26' 19"	-7 m 19 s
17	0° 20' 04"	-0.68"	0° 18' 07"	0° 07' 51"	0.9959833	16'03.50"	23° 26' 19"	-7 m 18 s
18	0° 22' 33"	-0.68"	0° 20' 24"	0° 08' 50"	0.9959952	16'03.49"	23° 26' 19"	-7 m 17 s
19	0° 25' 02"	-0.68"	0° 22' 40"	0° 09' 49"	0.9960071	16'03.48"	23° 26' 19"	-7 m 17 s
20	0° 27' 31"	-0.69"	0° 24' 57"	0° 10' 48"	0.9960190	16'03.47"	23° 26' 19"	-7 m 16 s
21	0° 30' 00"	-0.69"	0° 27' 14"	0° 11' 48"	0.9960309	16'03.45"	23° 26' 19"	-7 m 15 s
22	0° 32' 29"	-0.69"	0° 29' 31"	0° 12' 47"	0.9960428	16'03.44"	23° 26' 19"	-7 m 14 s
23	0° 34' 58"	-0.69"	0° 31' 47"	0° 13' 46"	0.9960548	16'03.43"	23° 26' 19"	-7 m 14 s
24	0° 37' 27"	-0.69"	0° 34' 04"	0° 14' 45"	0.9960667	16'03.42"	23° 26' 19"	-7 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	241° 50' 16"	-4° 46' 45"	238° 40' 44"	-25° 12' 27"	0° 54' 24"	14' 49.36"	104° 29' 23"	0.73339
1	242° 20' 10"	-4° 47' 56"	239° 12' 43"	-25° 19' 45"	0° 54' 25"	14' 49.58"	104° 15' 56"	0.72987
2	242° 50' 05"	-4° 49' 05"	239° 44' 46"	-25° 26' 55"	0° 54' 25"	14' 49.81"	104° 2' 24"	0.72633
3	243° 20' 01"	-4° 50' 13"	240° 16' 54"	-25° 33' 59"	0° 54' 26"	14' 50.03"	103° 48' 46"	0.72278
4	243° 49' 57"	-4° 51' 20"	240° 49' 06"	-25° 40' 55"	0° 54' 27"	14' 50.27"	103° 35' 02"	0.71921
5	244° 19' 55"	-4° 52' 25"	241° 21' 23"	-25° 47' 45"	0° 54' 28"	14' 50.50"	103° 21' 12"	0.71563
6	244° 49' 54"	-4° 53' 29"	241° 53' 45"	-25° 54' 28"	0° 54' 29"	14' 50.75"	103° 7' 17"	0.71202
7	245° 19' 53"	-4° 54' 32"	242° 26' 11"	-26° 01' 04"	0° 54' 30"	14' 50.99"	102° 53' 17"	0.70841
8	245° 49' 54"	-4° 55' 34"	242° 58' 42"	-26° 07' 33"	0° 54' 31"	14' 51.24"	102° 39' 12"	0.70478
9	246° 19' 55"	-4° 56' 34"	243° 31' 17"	-26° 13' 55"	0° 54' 32"	14' 51.50"	102° 25' 01"	0.70113
10	246° 49' 58"	-4° 57' 33"	244° 03' 57"	-26° 20' 09"	0° 54' 33"	14' 51.76"	102° 10' 44"	0.69747
11	247° 20' 01"	-4° 58' 30"	244° 36' 42"	-26° 26' 17"	0° 54' 33"	14' 52.02"	101° 56' 23"	0.69379
12	247° 50' 06"	-4° 59' 26"	245° 09' 31"	-26° 32' 17"	0° 54' 34"	14' 52.29"	101° 41' 56"	0.69010
13	248° 20' 11"	-5° 00' 21"	245° 42' 24"	-26° 38' 09"	0° 54' 35"	14' 52.56"	101° 27' 25"	0.68640
14	248° 50' 18"	-5° 01' 15"	246° 15' 22"	-26° 43' 55"	0° 54' 36"	14' 52.84"	101° 12' 48"	0.68268
15	249° 20' 26"	-5° 02' 07"	246° 48' 24"	-26° 49' 33"	0° 54' 38"	14' 53.12"	100° 58' 07"	0.67895
16	249° 50' 35"	-5° 02' 58"	247° 21' 31"	-26° 55' 03"	0° 54' 39"	14' 53.41"	100° 43' 20"	0.67520
17	250° 20' 45"	-5° 03' 47"	247° 54' 42"	-27° 00' 26"	0° 54' 40"	14' 53.70"	100° 28' 29"	0.67144
18	250° 50' 56"	-5° 04' 35"	248° 27' 57"	-27° 05' 41"	0° 54' 41"	14' 54.00"	100° 13' 33"	0.66766
19	251° 21' 09"	-5° 05' 22"	249° 01' 17"	-27° 10' 49"	0° 54' 42"	14' 54.30"	99° 58' 33"	0.66387
20	251° 51' 22"	-5° 06' 07"	249° 34' 41"	-27° 15' 49"	0° 54' 43"	14' 54.60"	99° 43' 28"	0.66007
21	252° 21' 37"	-5° 06' 51"	250° 08' 09"	-27° 20' 41"	0° 54' 44"	14' 54.91"	99° 28' 18"	0.65626
22	252° 51' 53"	-5° 07' 34"	250° 41' 41"	-27° 25' 25"	0° 54' 45"	14' 55.22"	99° 13' 04"	0.65243
23	253° 22' 10"	-5° 08' 15"	251° 15' 18"	-27° 30' 01"	0° 54' 46"	14' 55.54"	98° 57' 46"	0.64859
24	253° 52' 29"	-5° 08' 55"	251° 48' 58"	-27° 34' 30"	0° 54' 48"	14' 55.87"	98° 42' 23"	0.64474

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	0° 37' 27"	-0.69"	0° 34' 04"	0° 14' 45"	0.9960667	16'03.42"	23° 26' 19"	-7 m 13 s
1	0° 39' 56"	-0.69"	0° 36' 21"	0° 15' 45"	0.9960786	16'03.41"	23° 26' 19"	-7 m 12 s
2	0° 42' 25"	-0.69"	0° 38' 37"	0° 16' 44"	0.9960905	16'03.40"	23° 26' 19"	-7 m 11 s
3	0° 44' 54"	-0.69"	0° 40' 54"	0° 17' 43"	0.9961024	16'03.38"	23° 26' 19"	-7 m 11 s
4	0° 47' 23"	-0.69"	0° 43' 11"	0° 18' 42"	0.9961143	16'03.37"	23° 26' 19"	-7 m 10 s
5	0° 49' 52"	-0.69"	0° 45' 27"	0° 19' 42"	0.9961263	16'03.36"	23° 26' 19"	-7 m 09 s
6	0° 52' 21"	-0.69"	0° 47' 44"	0° 20' 41"	0.9961382	16'03.35"	23° 26' 19"	-7 m 08 s
7	0° 54' 50"	-0.69"	0° 50' 01"	0° 21' 40"	0.9961501	16'03.34"	23° 26' 19"	-7 m 08 s
8	0° 57' 19"	-0.69"	0° 52' 17"	0° 22' 39"	0.9961621	16'03.33"	23° 26' 19"	-7 m 07 s
9	0° 59' 48"	-0.69"	0° 54' 34"	0° 23' 39"	0.9961740	16'03.32"	23° 26' 19"	-7 m 06 s
10	1° 02' 17"	-0.69"	0° 56' 51"	0° 24' 38"	0.9961859	16'03.30"	23° 26' 19"	-7 m 05 s
11	1° 04' 46"	-0.69"	0° 59' 07"	0° 25' 37"	0.9961979	16'03.29"	23° 26' 19"	-7 m 05 s
12	1° 07' 15"	-0.70"	1° 01' 24"	0° 26' 36"	0.9962098	16'03.28"	23° 26' 19"	-7 m 04 s
13	1° 09' 44"	-0.70"	1° 03' 41"	0° 27' 36"	0.9962217	16'03.27"	23° 26' 19"	-7 m 03 s
14	1° 12' 13"	-0.70"	1° 05' 57"	0° 28' 35"	0.9962337	16'03.26"	23° 26' 19"	-7 m 02 s
15	1° 14' 42"	-0.70"	1° 08' 14"	0° 29' 34"	0.9962456	16'03.25"	23° 26' 19"	-7 m 02 s
16	1° 17' 11"	-0.70"	1° 10' 31"	0° 30' 33"	0.9962576	16'03.23"	23° 26' 19"	-7 m 01 s
17	1° 19' 39"	-0.70"	1° 12' 47"	0° 31' 32"	0.9962695	16'03.22"	23° 26' 19"	-7 m 00 s
18	1° 22' 08"	-0.69"	1° 15' 04"	0° 32' 32"	0.9962815	16'03.21"	23° 26' 19"	-6 m 59 s
19	1° 24' 37"	-0.69"	1° 17' 21"	0° 33' 31"	0.9962935	16'03.20"	23° 26' 19"	-6 m 59 s
20	1° 27' 06"	-0.69"	1° 19' 37"	0° 34' 30"	0.9963054	16'03.19"	23° 26' 19"	-6 m 58 s
21	1° 29' 35"	-0.69"	1° 21' 54"	0° 35' 29"	0.9963174	16'03.18"	23° 26' 19"	-6 m 57 s
22	1° 32' 04"	-0.69"	1° 24' 11"	0° 36' 29"	0.9963293	16'03.17"	23° 26' 19"	-6 m 56 s
23	1° 34' 33"	-0.69"	1° 26' 27"	0° 37' 28"	0.9963413	16'03.15"	23° 26' 19"	-6 m 56 s
24	1° 37' 02"	-0.69"	1° 28' 44"	0° 38' 27"	0.9963533	16'03.14"	23° 26' 19"	-6 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	253° 52' 29"	-5° 08' 55"	251° 48' 58"	-27° 34' 30"	0° 54' 48"	14' 55.87"	98° 42' 23"	0.64474
1	254° 22' 49"	-5° 09' 33"	252° 22' 43"	-27° 38' 51"	0° 54' 49"	14' 56.19"	98° 26' 56"	0.64087
2	254° 53' 10"	-5° 10' 10"	252° 56' 32"	-27° 43' 03"	0° 54' 50"	14' 56.52"	98° 11' 25"	0.63700
3	255° 23' 33"	-5° 10' 46"	253° 30' 24"	-27° 47' 08"	0° 54' 51"	14' 56.86"	97° 55' 51"	0.63311
4	255° 53' 57"	-5° 11' 20"	254° 04' 21"	-27° 51' 04"	0° 54' 52"	14' 57.20"	97° 40' 12"	0.62921
5	256° 24' 22"	-5° 11' 52"	254° 38' 22"	-27° 54' 52"	0° 54' 54"	14' 57.55"	97° 24' 29"	0.62530
6	256° 54' 49"	-5° 12' 23"	255° 12' 26"	-27° 58' 32"	0° 54' 55"	14' 57.90"	97° 8' 43"	0.62137
7	257° 25' 17"	-5° 12' 53"	255° 46' 34"	-28° 02' 04"	0° 54' 56"	14' 58.25"	96° 52' 53"	0.61744
8	257° 55' 46"	-5° 13' 22"	256° 20' 46"	-28° 05' 28"	0° 54' 58"	14' 58.61"	96° 36' 59"	0.61349
9	258° 26' 17"	-5° 13' 48"	256° 55' 02"	-28° 08' 43"	0° 54' 59"	14' 58.97"	96° 21' 02"	0.60953
10	258° 56' 49"	-5° 14' 14"	257° 29' 21"	-28° 11' 50"	0° 55' 00"	14' 59.34"	96° 5' 02"	0.60557
11	259° 27' 23"	-5° 14' 38"	258° 03' 44"	-28° 14' 48"	0° 55' 02"	14' 59.71"	95° 48' 58"	0.60159
12	259° 57' 59"	-5° 15' 00"	258° 38' 11"	-28° 17' 38"	0° 55' 03"	15' 00.09"	95° 32' 52"	0.59760
13	260° 28' 36"	-5° 15' 21"	259° 12' 40"	-28° 20' 19"	0° 55' 04"	15' 00.47"	95° 16' 42"	0.59360
14	260° 59' 14"	-5° 15' 41"	259° 47' 14"	-28° 22' 52"	0° 55' 06"	15' 00.86"	95° 0' 29"	0.58960
15	261° 29' 54"	-5° 15' 59"	260° 21' 50"	-28° 25' 16"	0° 55' 07"	15' 01.25"	94° 44' 13"	0.58558
16	262° 00' 36"	-5° 16' 16"	260° 56' 30"	-28° 27' 31"	0° 55' 09"	15' 01.64"	94° 27' 55"	0.58155
17	262° 31' 19"	-5° 16' 31"	261° 31' 13"	-28° 29' 38"	0° 55' 10"	15' 02.04"	94° 11' 34"	0.57751
18	263° 02' 03"	-5° 16' 44"	262° 05' 59"	-28° 31' 36"	0° 55' 12"	15' 02.44"	93° 55' 10"	0.57347
19	263° 32' 50"	-5° 16' 56"	262° 40' 49"	-28° 33' 26"	0° 55' 13"	15' 02.85"	93° 38' 44"	0.56941
20	264° 03' 38"	-5° 17' 07"	263° 15' 41"	-28° 35' 06"	0° 55' 15"	15' 03.26"	93° 22' 16"	0.56535
21	264° 34' 28"	-5° 17' 16"	263° 50' 36"	-28° 36' 38"	0° 55' 16"	15' 03.68"	93° 5' 45"	0.56128
22	265° 05' 19"	-5° 17' 23"	264° 25' 34"	-28° 38' 01"	0° 55' 18"	15' 04.10"	92° 49' 13"	0.55720
23	265° 36' 12"	-5° 17' 30"	265° 00' 35"	-28° 39' 15"	0° 55' 19"	15' 04.53"	92° 32' 38"	0.55311
24	266° 07' 07"	-5° 17' 34"	265° 35' 39"	-28° 40' 20"	0° 55' 21"	15' 04.96"	92° 16' 02"	0.54902

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	1° 37' 02"	-0.69"	1° 28' 44"	0° 38' 27"	0.9963533	16'03.14"	23° 26' 19"	-6 m 55 s
1	1° 39' 31"	-0.69"	1° 31' 01"	0° 39' 26"	0.9963652	16'03.13"	23° 26' 19"	-6 m 54 s
2	1° 41' 60"	-0.69"	1° 33' 17"	0° 40' 25"	0.9963772	16'03.12"	23° 26' 19"	-6 m 53 s
3	1° 44' 29"	-0.69"	1° 35' 34"	0° 41' 25"	0.9963892	16'03.11"	23° 26' 19"	-6 m 53 s
4	1° 46' 58"	-0.69"	1° 37' 50"	0° 42' 24"	0.9964011	16'03.10"	23° 26' 19"	-6 m 52 s
5	1° 49' 26"	-0.69"	1° 40' 07"	0° 43' 23"	0.9964131	16'03.08"	23° 26' 19"	-6 m 51 s
6	1° 51' 55"	-0.69"	1° 42' 24"	0° 44' 22"	0.9964251	16'03.07"	23° 26' 19"	-6 m 50 s
7	1° 54' 24"	-0.69"	1° 44' 40"	0° 45' 21"	0.9964371	16'03.06"	23° 26' 19"	-6 m 50 s
8	1° 56' 53"	-0.69"	1° 46' 57"	0° 46' 21"	0.9964491	16'03.05"	23° 26' 19"	-6 m 49 s
9	1° 59' 22"	-0.69"	1° 49' 14"	0° 47' 20"	0.9964610	16'03.04"	23° 26' 19"	-6 m 48 s
10	2° 01' 51"	-0.69"	1° 51' 30"	0° 48' 19"	0.9964730	16'03.03"	23° 26' 19"	-6 m 47 s
11	2° 04' 20"	-0.68"	1° 53' 47"	0° 49' 18"	0.9964850	16'03.01"	23° 26' 19"	-6 m 47 s
12	2° 06' 49"	-0.68"	1° 56' 03"	0° 50' 17"	0.9964970	16'03.00"	23° 26' 19"	-6 m 46 s
13	2° 09' 17"	-0.68"	1° 58' 20"	0° 51' 17"	0.9965090	16'02.99"	23° 26' 19"	-6 m 45 s
14	2° 11' 46"	-0.68"	2° 00' 37"	0° 52' 16"	0.9965210	16'02.98"	23° 26' 19"	-6 m 44 s
15	2° 14' 15"	-0.68"	2° 02' 53"	0° 53' 15"	0.9965330	16'02.97"	23° 26' 19"	-6 m 44 s
16	2° 16' 44"	-0.68"	2° 05' 10"	0° 54' 14"	0.9965450	16'02.96"	23° 26' 19"	-6 m 43 s
17	2° 19' 13"	-0.68"	2° 07' 27"	0° 55' 13"	0.9965570	16'02.95"	23° 26' 19"	-6 m 42 s
18	2° 21' 42"	-0.68"	2° 09' 43"	0° 56' 12"	0.9965690	16'02.93"	23° 26' 19"	-6 m 41 s
19	2° 24' 11"	-0.67"	2° 11' 60"	0° 57' 12"	0.9965810	16'02.92"	23° 26' 19"	-6 m 41 s
20	2° 26' 39"	-0.67"	2° 14' 16"	0° 58' 11"	0.9965930	16'02.91"	23° 26' 19"	-6 m 40 s
21	2° 29' 08"	-0.67"	2° 16' 33"	0° 59' 10"	0.9966050	16'02.90"	23° 26' 19"	-6 m 39 s
22	2° 31' 37"	-0.67"	2° 18' 50"	1° 00' 09"	0.9966170	16'02.89"	23° 26' 19"	-6 m 38 s
23	2° 34' 06"	-0.67"	2° 21' 06"	1° 01' 08"	0.9966290	16'02.88"	23° 26' 19"	-6 m 38 s
24	2° 36' 35"	-0.67"	2° 23' 23"	1° 02' 07"	0.9966410	16'02.86"	23° 26' 19"	-6 m 37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	266° 07' 07"	-5° 17' 34"	265° 35' 39"	-28° 40' 20"	0° 55' 21"	15' 04.96"	92° 16' 02"	0.54902
1	266° 38' 04"	-5° 17' 37"	266° 10' 45"	-28° 41' 15"	0° 55' 23"	15' 05.39"	91° 59' 24"	0.54491
2	267° 09' 02"	-5° 17' 38"	266° 45' 54"	-28° 42' 02"	0° 55' 24"	15' 05.83"	91° 42' 44"	0.54080
3	267° 40' 02"	-5° 17' 38"	267° 21' 05"	-28° 42' 40"	0° 55' 26"	15' 06.27"	91° 26' 03"	0.53669
4	268° 11' 04"	-5° 17' 37"	267° 56' 19"	-28° 43' 09"	0° 55' 27"	15' 06.72"	91° 9' 20"	0.53256
5	268° 42' 08"	-5° 17' 33"	268° 31' 35"	-28° 43' 29"	0° 55' 29"	15' 07.17"	90° 52' 36"	0.52843
6	269° 13' 14"	-5° 17' 29"	269° 06' 53"	-28° 43' 39"	0° 55' 31"	15' 07.62"	90° 35' 51"	0.52429
7	269° 44' 21"	-5° 17' 22"	269° 42' 14"	-28° 43' 41"	0° 55' 32"	15' 08.08"	90° 19' 05"	0.52015
8	270° 15' 30"	-5° 17' 15"	270° 17' 37"	-28° 43' 33"	0° 55' 34"	15' 08.55"	90° 2' 18"	0.51600
9	270° 46' 42"	-5° 17' 05"	270° 53' 01"	-28° 43' 16"	0° 55' 36"	15' 09.02"	89° 45' 30"	0.51184
10	271° 17' 55"	-5° 16' 54"	271° 28' 28"	-28° 42' 49"	0° 55' 38"	15' 09.49"	89° 28' 42"	0.50768
11	271° 49' 10"	-5° 16' 42"	272° 03' 56"	-28° 42' 14"	0° 55' 39"	15' 09.97"	89° 11' 53"	0.50351
12	272° 20' 27"	-5° 16' 27"	272° 39' 27"	-28° 41' 29"	0° 55' 41"	15' 10.45"	88° 55' 04"	0.49934
13	272° 51' 46"	-5° 16' 12"	273° 14' 59"	-28° 40' 35"	0° 55' 43"	15' 10.93"	88° 38' 14"	0.49517
14	273° 23' 07"	-5° 15' 54"	273° 50' 32"	-28° 39' 31"	0° 55' 45"	15' 11.42"	88° 21' 25"	0.49098
15	273° 54' 30"	-5° 15' 36"	274° 26' 07"	-28° 38' 18"	0° 55' 46"	15' 11.91"	88° 4' 35"	0.48680
16	274° 25' 55"	-5° 15' 15"	275° 01' 44"	-28° 36' 56"	0° 55' 48"	15' 12.41"	87° 47' 46"	0.48261
17	274° 57' 22"	-5° 14' 53"	275° 37' 22"	-28° 35' 24"	0° 55' 50"	15' 12.91"	87° 30' 56"	0.47841
18	275° 28' 51"	-5° 14' 29"	276° 13' 01"	-28° 33' 43"	0° 55' 52"	15' 13.42"	87° 14' 08"	0.47422
19	276° 00' 22"	-5° 14' 04"	276° 48' 42"	-28° 31' 52"	0° 55' 54"	15' 13.92"	86° 57' 19"	0.47002
20	276° 31' 56"	-5° 13' 37"	277° 24' 23"	-28° 29' 52"	0° 55' 56"	15' 14.44"	86° 40' 32"	0.46581
21	277° 03' 31"	-5° 13' 09"	278° 00' 06"	-28° 27' 43"	0° 55' 58"	15' 14.95"	86° 23' 45"	0.46161
22	277° 35' 09"	-5° 12' 38"	278° 35' 49"	-28° 25' 24"	0° 55' 60"	15' 15.47"	86° 6' 59"	0.45740
23	278° 06' 48"	-5° 12' 07"	279° 11' 34"	-28° 22' 55"	0° 56' 01"	15' 16.00"	85° 50' 14"	0.45319
24	278° 38' 30"	-5° 11' 33"	279° 47' 19"	-28° 20' 17"	0° 56' 03"	15' 16.53"	85° 33' 30"	0.44897

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	2° 36' 35"	-0.67"	2° 23' 23"	1° 02' 07"	0.9966410	16'02.86"	23° 26' 19"	-6 m 37 s
1	2° 39' 04"	-0.66"	2° 25' 39"	1° 03' 07"	0.9966530	16'02.85"	23° 26' 19"	-6 m 36 s
2	2° 41' 32"	-0.66"	2° 27' 56"	1° 04' 06"	0.9966650	16'02.84"	23° 26' 19"	-6 m 35 s
3	2° 44' 01"	-0.66"	2° 30' 13"	1° 05' 05"	0.9966770	16'02.83"	23° 26' 19"	-6 m 35 s
4	2° 46' 30"	-0.66"	2° 32' 29"	1° 06' 04"	0.9966890	16'02.82"	23° 26' 19"	-6 m 34 s
5	2° 48' 59"	-0.66"	2° 34' 46"	1° 07' 03"	0.9967010	16'02.81"	23° 26' 19"	-6 m 33 s
6	2° 51' 28"	-0.66"	2° 37' 02"	1° 08' 02"	0.9967130	16'02.79"	23° 26' 19"	-6 m 32 s
7	2° 53' 57"	-0.65"	2° 39' 19"	1° 09' 01"	0.9967251	16'02.78"	23° 26' 19"	-6 m 32 s
8	2° 56' 25"	-0.65"	2° 41' 36"	1° 10' 01"	0.9967371	16'02.77"	23° 26' 19"	-6 m 31 s
9	2° 58' 54"	-0.65"	2° 43' 52"	1° 10' 60"	0.9967491	16'02.76"	23° 26' 19"	-6 m 30 s
10	3° 01' 23"	-0.65"	2° 46' 09"	1° 11' 59"	0.9967611	16'02.75"	23° 26' 19"	-6 m 29 s
11	3° 03' 52"	-0.64"	2° 48' 25"	1° 12' 58"	0.9967731	16'02.74"	23° 26' 19"	-6 m 29 s
12	3° 06' 21"	-0.64"	2° 50' 42"	1° 13' 57"	0.9967851	16'02.73"	23° 26' 19"	-6 m 28 s
13	3° 08' 49"	-0.64"	2° 52' 58"	1° 14' 56"	0.9967972	16'02.71"	23° 26' 19"	-6 m 27 s
14	3° 11' 18"	-0.64"	2° 55' 15"	1° 15' 55"	0.9968092	16'02.70"	23° 26' 19"	-6 m 26 s
15	3° 13' 47"	-0.64"	2° 57' 32"	1° 16' 54"	0.9968212	16'02.69"	23° 26' 19"	-6 m 26 s
16	3° 16' 16"	-0.63"	2° 59' 48"	1° 17' 54"	0.9968332	16'02.68"	23° 26' 19"	-6 m 25 s
17	3° 18' 45"	-0.63"	3° 02' 05"	1° 18' 53"	0.9968453	16'02.67"	23° 26' 19"	-6 m 24 s
18	3° 21' 13"	-0.63"	3° 04' 21"	1° 19' 52"	0.9968573	16'02.66"	23° 26' 19"	-6 m 23 s
19	3° 23' 42"	-0.62"	3° 06' 38"	1° 20' 51"	0.9968693	16'02.64"	23° 26' 19"	-6 m 23 s
20	3° 26' 11"	-0.62"	3° 08' 55"	1° 21' 50"	0.9968813	16'02.63"	23° 26' 19"	-6 m 22 s
21	3° 28' 40"	-0.62"	3° 11' 11"	1° 22' 49"	0.9968934	16'02.62"	23° 26' 19"	-6 m 21 s
22	3° 31' 08"	-0.62"	3° 13' 28"	1° 23' 48"	0.9969054	16'02.61"	23° 26' 19"	-6 m 20 s
23	3° 33' 37"	-0.61"	3° 15' 44"	1° 24' 47"	0.9969174	16'02.60"	23° 26' 19"	-6 m 20 s
24	3° 36' 06"	-0.61"	3° 18' 01"	1° 25' 46"	0.9969295	16'02.59"	23° 26' 19"	-6 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	278° 38' 30"	-5° 11' 33"	279° 47' 19"	-28° 20' 17"	0° 56' 03"	15' 16.53"	85° 33' 30"	0.44897
1	279° 10' 14"	-5° 10' 58"	280° 23' 05"	-28° 17' 30"	0° 56' 05"	15' 17.06"	85° 16' 48"	0.44476
2	279° 42' 00"	-5° 10' 22"	280° 58' 51"	-28° 14' 33"	0° 56' 07"	15' 17.59"	85° 0' 07"	0.44054
3	280° 13' 49"	-5° 09' 44"	281° 34' 38"	-28° 11' 26"	0° 56' 09"	15' 18.13"	84° 43' 27"	0.43632
4	280° 45' 39"	-5° 09' 04"	282° 10' 25"	-28° 08' 10"	0° 56' 11"	15' 18.68"	84° 26' 49"	0.43210
5	281° 17' 32"	-5° 08' 22"	282° 46' 13"	-28° 04' 44"	0° 56' 13"	15' 19.22"	84° 10' 14"	0.42788
6	281° 49' 27"	-5° 07' 39"	283° 22' 01"	-28° 01' 09"	0° 56' 15"	15' 19.77"	83° 53' 40"	0.42366
7	282° 21' 25"	-5° 06' 54"	283° 57' 50"	-27° 57' 24"	0° 56' 17"	15' 20.33"	83° 37' 08"	0.41944
8	282° 53' 24"	-5° 06' 08"	284° 33' 38"	-27° 53' 30"	0° 56' 19"	15' 20.88"	83° 20' 38"	0.41522
9	283° 25' 26"	-5° 05' 20"	285° 09' 26"	-27° 49' 26"	0° 56' 21"	15' 21.44"	83° 4' 11"	0.41100
10	283° 57' 31"	-5° 04' 30"	285° 45' 15"	-27° 45' 13"	0° 56' 24"	15' 22.01"	82° 47' 47"	0.40678
11	284° 29' 37"	-5° 03' 39"	286° 21' 03"	-27° 40' 50"	0° 56' 26"	15' 22.57"	82° 31' 25"	0.40257
12	285° 01' 47"	-5° 02' 46"	286° 56' 51"	-27° 36' 17"	0° 56' 28"	15' 23.14"	82° 15' 05"	0.39835
13	285° 33' 58"	-5° 01' 51"	287° 32' 39"	-27° 31' 35"	0° 56' 30"	15' 23.72"	81° 58' 49"	0.39413
14	286° 06' 12"	-5° 00' 55"	288° 08' 26"	-27° 26' 44"	0° 56' 32"	15' 24.29"	81° 42' 36"	0.38992
15	286° 38' 28"	-4° 59' 57"	288° 44' 13"	-27° 21' 43"	0° 56' 34"	15' 24.87"	81° 26' 26"	0.38571
16	287° 10' 46"	-4° 58' 57"	289° 19' 59"	-27° 16' 32"	0° 56' 36"	15' 25.46"	81° 10' 19"	0.38150
17	287° 43' 07"	-4° 57' 56"	289° 55' 45"	-27° 11' 12"	0° 56' 38"	15' 26.04"	80° 54' 15"	0.37730
18	288° 15' 31"	-4° 56' 53"	290° 31' 30"	-27° 05' 42"	0° 56' 40"	15' 26.63"	80° 38' 16"	0.37310
19	288° 47' 57"	-4° 55' 49"	291° 07' 15"	-27° 00' 03"	0° 56' 43"	15' 27.23"	80° 22' 19"	0.36890
20	289° 20' 25"	-4° 54' 42"	291° 42' 59"	-26° 54' 15"	0° 56' 45"	15' 27.82"	80° 6' 27"	0.36470
21	289° 52' 56"	-4° 53' 34"	292° 18' 41"	-26° 48' 17"	0° 56' 47"	15' 28.42"	79° 50' 39"	0.36051
22	290° 25' 29"	-4° 52' 25"	292° 54' 23"	-26° 42' 09"	0° 56' 49"	15' 29.02"	79° 34' 54"	0.35633
23	290° 58' 05"	-4° 51' 14"	293° 30' 04"	-26° 35' 52"	0° 56' 51"	15' 29.62"	79° 19' 14"	0.35214
24	291° 30' 44"	-4° 50' 01"	294° 05' 44"	-26° 29' 26"	0° 56' 54"	15' 30.23"	79° 3' 38"	0.34797

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	3° 36' 06"	-0.61"	3° 18' 01"	1° 25' 46"	0.9969295	16'02.59"	23° 26' 19"	-6 m 19 s
1	3° 38' 35"	-0.61"	3° 20' 17"	1° 26' 45"	0.9969415	16'02.57"	23° 26' 19"	-6 m 18 s
2	3° 41' 03"	-0.61"	3° 22' 34"	1° 27' 44"	0.9969535	16'02.56"	23° 26' 19"	-6 m 17 s
3	3° 43' 32"	-0.60"	3° 24' 51"	1° 28' 43"	0.9969656	16'02.55"	23° 26' 19"	-6 m 17 s
4	3° 46' 01"	-0.60"	3° 27' 07"	1° 29' 43"	0.9969776	16'02.54"	23° 26' 19"	-6 m 16 s
5	3° 48' 30"	-0.60"	3° 29' 24"	1° 30' 42"	0.9969896	16'02.53"	23° 26' 19"	-6 m 15 s
6	3° 50' 58"	-0.59"	3° 31' 40"	1° 31' 41"	0.9970017	16'02.52"	23° 26' 19"	-6 m 14 s
7	3° 53' 27"	-0.59"	3° 33' 57"	1° 32' 40"	0.9970137	16'02.50"	23° 26' 19"	-6 m 14 s
8	3° 55' 56"	-0.59"	3° 36' 13"	1° 33' 39"	0.9970257	16'02.49"	23° 26' 19"	-6 m 13 s
9	3° 58' 25"	-0.58"	3° 38' 30"	1° 34' 38"	0.9970378	16'02.48"	23° 26' 19"	-6 m 12 s
10	4° 00' 53"	-0.58"	3° 40' 47"	1° 35' 37"	0.9970498	16'02.47"	23° 26' 19"	-6 m 11 s
11	4° 03' 22"	-0.58"	3° 43' 03"	1° 36' 36"	0.9970618	16'02.46"	23° 26' 19"	-6 m 11 s
12	4° 05' 51"	-0.57"	3° 45' 20"	1° 37' 35"	0.9970739	16'02.45"	23° 26' 19"	-6 m 10 s
13	4° 08' 20"	-0.57"	3° 47' 36"	1° 38' 34"	0.9970859	16'02.43"	23° 26' 19"	-6 m 09 s
14	4° 10' 48"	-0.57"	3° 49' 53"	1° 39' 33"	0.9970979	16'02.42"	23° 26' 19"	-6 m 08 s
15	4° 13' 17"	-0.56"	3° 52' 09"	1° 40' 32"	0.9971100	16'02.41"	23° 26' 19"	-6 m 08 s
16	4° 15' 46"	-0.56"	3° 54' 26"	1° 41' 31"	0.9971220	16'02.40"	23° 26' 19"	-6 m 07 s
17	4° 18' 14"	-0.56"	3° 56' 42"	1° 42' 30"	0.9971340	16'02.39"	23° 26' 19"	-6 m 06 s
18	4° 20' 43"	-0.55"	3° 58' 59"	1° 43' 29"	0.9971461	16'02.38"	23° 26' 19"	-6 m 05 s
19	4° 23' 12"	-0.55"	4° 01' 16"	1° 44' 28"	0.9971581	16'02.36"	23° 26' 19"	-6 m 05 s
20	4° 25' 41"	-0.54"	4° 03' 32"	1° 45' 27"	0.9971702	16'02.35"	23° 26' 19"	-6 m 04 s
21	4° 28' 09"	-0.54"	4° 05' 49"	1° 46' 26"	0.9971822	16'02.34"	23° 26' 19"	-6 m 03 s
22	4° 30' 38"	-0.54"	4° 08' 05"	1° 47' 25"	0.9971942	16'02.33"	23° 26' 19"	-6 m 02 s
23	4° 33' 07"	-0.53"	4° 10' 22"	1° 48' 24"	0.9972063	16'02.32"	23° 26' 19"	-6 m 02 s
24	4° 35' 35"	-0.53"	4° 12' 38"	1° 49' 23"	0.9972183	16'02.31"	23° 26' 19"	-6 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	291° 30' 44"	-4° 50' 01"	294° 05' 44"	-26° 29' 26"	0° 56' 54"	15' 30.23"	79° 3' 38"	0.34797
1	292° 03' 25"	-4° 48' 46"	294° 41' 22"	-26° 22' 51"	0° 56' 56"	15' 30.84"	78° 48' 06"	0.34380
2	292° 36' 08"	-4° 47' 30"	295° 16' 60"	-26° 16' 06"	0° 56' 58"	15' 31.45"	78° 32' 39"	0.33963
3	293° 08' 54"	-4° 46' 12"	295° 52' 36"	-26° 09' 11"	0° 57' 00"	15' 32.06"	78° 17' 17"	0.33547
4	293° 41' 43"	-4° 44' 53"	296° 28' 11"	-26° 02' 08"	0° 57' 03"	15' 32.68"	78° 1' 60"	0.33132
5	294° 14' 34"	-4° 43' 31"	297° 03' 44"	-25° 54' 55"	0° 57' 05"	15' 33.30"	77° 46' 47"	0.32718
6	294° 47' 28"	-4° 42' 09"	297° 39' 16"	-25° 47' 32"	0° 57' 07"	15' 33.92"	77° 31' 40"	0.32304
7	295° 20' 24"	-4° 40' 44"	298° 14' 46"	-25° 40' 01"	0° 57' 10"	15' 34.54"	77° 16' 37"	0.31891
8	295° 53' 23"	-4° 39' 18"	298° 50' 15"	-25° 32' 20"	0° 57' 12"	15' 35.17"	77° 1' 40"	0.31478
9	296° 26' 25"	-4° 37' 50"	299° 25' 42"	-25° 24' 30"	0° 57' 14"	15' 35.80"	76° 46' 48"	0.31067
10	296° 59' 29"	-4° 36' 21"	300° 01' 08"	-25° 16' 31"	0° 57' 16"	15' 36.43"	76° 32' 02"	0.30656
11	297° 32' 36"	-4° 34' 50"	300° 36' 32"	-25° 08' 23"	0° 57' 19"	15' 37.06"	76° 17' 21"	0.30247
12	298° 05' 46"	-4° 33' 17"	301° 11' 54"	-25° 00' 06"	0° 57' 21"	15' 37.69"	76° 2' 47"	0.29838
13	298° 38' 58"	-4° 31' 42"	301° 47' 14"	-24° 51' 39"	0° 57' 23"	15' 38.33"	75° 48' 18"	0.29430
14	299° 12' 13"	-4° 30' 06"	302° 22' 33"	-24° 43' 04"	0° 57' 26"	15' 38.96"	75° 33' 54"	0.29024
15	299° 45' 30"	-4° 28' 28"	302° 57' 49"	-24° 34' 20"	0° 57' 28"	15' 39.60"	75° 19' 37"	0.28618
16	300° 18' 51"	-4° 26' 49"	303° 33' 04"	-24° 25' 26"	0° 57' 30"	15' 40.24"	75° 5' 27"	0.28213
17	300° 52' 14"	-4° 25' 08"	304° 08' 16"	-24° 16' 24"	0° 57' 33"	15' 40.88"	74° 51' 22"	0.27810
18	301° 25' 39"	-4° 23' 25"	304° 43' 27"	-24° 07' 13"	0° 57' 35"	15' 41.53"	74° 37' 24"	0.27407
19	301° 59' 08"	-4° 21' 41"	305° 18' 35"	-23° 57' 53"	0° 57' 38"	15' 42.17"	74° 23' 32"	0.27006
20	302° 32' 39"	-4° 19' 55"	305° 53' 42"	-23° 48' 24"	0° 57' 40"	15' 42.82"	74° 9' 47"	0.26606
21	303° 06' 13"	-4° 18' 08"	306° 28' 46"	-23° 38' 47"	0° 57' 42"	15' 43.47"	73° 56' 09"	0.26208
22	303° 39' 50"	-4° 16' 18"	307° 03' 48"	-23° 29' 01"	0° 57' 45"	15' 44.12"	73° 42' 37"	0.25811
23	304° 13' 29"	-4° 14' 28"	307° 38' 48"	-23° 19' 06"	0° 57' 47"	15' 44.76"	73° 29' 13"	0.25415
24	304° 47' 11"	-4° 12' 35"	308° 13' 46"	-23° 09' 02"	0° 57' 49"	15' 45.42"	73° 15' 55"	0.25020

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	4° 35' 35"	-0.53"	4° 12' 38"	1° 49' 23"	0.9972183	16'02.31"	23° 26' 19"	-6 m 01 s
1	4° 38' 04"	-0.53"	4° 14' 55"	1° 50' 22"	0.9972304	16'02.30"	23° 26' 19"	-6 m 00 s
2	4° 40' 33"	-0.52"	4° 17' 11"	1° 51' 21"	0.9972424	16'02.28"	23° 26' 19"	-5 m 59 s
3	4° 43' 01"	-0.52"	4° 19' 28"	1° 52' 20"	0.9972544	16'02.27"	23° 26' 19"	-5 m 59 s
4	4° 45' 30"	-0.51"	4° 21' 45"	1° 53' 19"	0.9972665	16'02.26"	23° 26' 19"	-5 m 58 s
5	4° 47' 59"	-0.51"	4° 24' 01"	1° 54' 18"	0.9972785	16'02.25"	23° 26' 19"	-5 m 57 s
6	4° 50' 27"	-0.51"	4° 26' 18"	1° 55' 17"	0.9972905	16'02.24"	23° 26' 19"	-5 m 56 s
7	4° 52' 56"	-0.50"	4° 28' 34"	1° 56' 16"	0.9973026	16'02.23"	23° 26' 19"	-5 m 56 s
8	4° 55' 25"	-0.50"	4° 30' 51"	1° 57' 15"	0.9973146	16'02.21"	23° 26' 19"	-5 m 55 s
9	4° 57' 53"	-0.49"	4° 33' 07"	1° 58' 14"	0.9973267	16'02.20"	23° 26' 19"	-5 m 54 s
10	5° 00' 22"	-0.49"	4° 35' 24"	1° 59' 13"	0.9973387	16'02.19"	23° 26' 19"	-5 m 53 s
11	5° 02' 51"	-0.48"	4° 37' 40"	2° 00' 12"	0.9973507	16'02.18"	23° 26' 19"	-5 m 53 s
12	5° 05' 19"	-0.48"	4° 39' 57"	2° 01' 11"	0.9973628	16'02.17"	23° 26' 19"	-5 m 52 s
13	5° 07' 48"	-0.48"	4° 42' 14"	2° 02' 10"	0.9973748	16'02.16"	23° 26' 19"	-5 m 51 s
14	5° 10' 17"	-0.47"	4° 44' 30"	2° 03' 08"	0.9973868	16'02.14"	23° 26' 19"	-5 m 50 s
15	5° 12' 45"	-0.47"	4° 46' 47"	2° 04' 07"	0.9973989	16'02.13"	23° 26' 19"	-5 m 50 s
16	5° 15' 14"	-0.46"	4° 49' 03"	2° 05' 06"	0.9974109	16'02.12"	23° 26' 19"	-5 m 49 s
17	5° 17' 43"	-0.46"	4° 51' 20"	2° 06' 05"	0.9974229	16'02.11"	23° 26' 19"	-5 m 48 s
18	5° 20' 11"	-0.45"	4° 53' 36"	2° 07' 04"	0.9974350	16'02.10"	23° 26' 19"	-5 m 47 s
19	5° 22' 40"	-0.45"	4° 55' 53"	2° 08' 03"	0.9974470	16'02.09"	23° 26' 19"	-5 m 47 s
20	5° 25' 09"	-0.45"	4° 58' 09"	2° 09' 02"	0.9974590	16'02.07"	23° 26' 19"	-5 m 46 s
21	5° 27' 37"	-0.44"	5° 00' 26"	2° 10' 01"	0.9974711	16'02.06"	23° 26' 19"	-5 m 45 s
22	5° 30' 06"	-0.44"	5° 02' 43"	2° 10' 60"	0.9974831	16'02.05"	23° 26' 19"	-5 m 44 s
23	5° 32' 34"	-0.43"	5° 04' 59"	2° 11' 59"	0.9974951	16'02.04"	23° 26' 19"	-5 m 43 s
24	5° 35' 03"	-0.43"	5° 07' 16"	2° 12' 58"	0.9975072	16'02.03"	23° 26' 19"	-5 m 43 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	304° 47' 11"	-4° 12' 35"	308° 13' 46"	-23° 09' 02"	0° 57' 49"	15' 45.42"	73° 15' 55"	0.25020
1	305° 20' 56"	-4° 10' 41"	308° 48' 41"	-22° 58' 50"	0° 57' 52"	15' 46.07"	73° 2' 45"	0.24627
2	305° 54' 44"	-4° 08' 45"	309° 23' 34"	-22° 48' 29"	0° 57' 54"	15' 46.72"	72° 49' 42"	0.24235
3	306° 28' 34"	-4° 06' 48"	309° 58' 25"	-22° 38' 00"	0° 57' 57"	15' 47.37"	72° 36' 46"	0.23845
4	307° 02' 28"	-4° 04' 49"	310° 33' 13"	-22° 27' 23"	0° 57' 59"	15' 48.03"	72° 23' 57"	0.23457
5	307° 36' 24"	-4° 02' 49"	311° 07' 60"	-22° 16' 37"	0° 58' 01"	15' 48.68"	72° 11' 16"	0.23070
6	308° 10' 23"	-4° 00' 47"	311° 42' 43"	-22° 05' 42"	0° 58' 04"	15' 49.33"	71° 58' 43"	0.22685
7	308° 44' 24"	-3° 58' 43"	312° 17' 25"	-21° 54' 40"	0° 58' 06"	15' 49.99"	71° 46' 18"	0.22301
8	309° 18' 29"	-3° 56' 38"	312° 52' 04"	-21° 43' 29"	0° 58' 09"	15' 50.65"	71° 33' 60"	0.21920
9	309° 52' 36"	-3° 54' 31"	313° 26' 41"	-21° 32' 10"	0° 58' 11"	15' 51.30"	71° 21' 50"	0.21540
10	310° 26' 46"	-3° 52' 23"	314° 01' 15"	-21° 20' 43"	0° 58' 13"	15' 51.96"	71° 9' 48"	0.21161
11	311° 00' 59"	-3° 50' 13"	314° 35' 47"	-21° 09' 08"	0° 58' 16"	15' 52.61"	70° 57' 55"	0.20785
12	311° 35' 14"	-3° 48' 01"	315° 10' 16"	-20° 57' 25"	0° 58' 18"	15' 53.27"	70° 46' 09"	0.20411
13	312° 09' 33"	-3° 45' 48"	315° 44' 43"	-20° 45' 34"	0° 58' 21"	15' 53.92"	70° 34' 32"	0.20038
14	312° 43' 54"	-3° 43' 34"	316° 19' 08"	-20° 33' 35"	0° 58' 23"	15' 54.58"	70° 23' 04"	0.19668
15	313° 18' 18"	-3° 41' 18"	316° 53' 30"	-20° 21' 28"	0° 58' 25"	15' 55.23"	70° 11' 44"	0.19299
16	313° 52' 45"	-3° 38' 60"	317° 27' 49"	-20° 09' 13"	0° 58' 28"	15' 55.89"	70° 0' 32"	0.18933
17	314° 27' 15"	-3° 36' 41"	318° 02' 07"	-19° 56' 51"	0° 58' 30"	15' 56.54"	69° 49' 29"	0.18569
18	315° 01' 47"	-3° 34' 20"	318° 36' 21"	-19° 44' 21"	0° 58' 33"	15' 57.19"	69° 38' 35"	0.18207
19	315° 36' 22"	-3° 31' 58"	319° 10' 34"	-19° 31' 43"	0° 58' 35"	15' 57.85"	69° 27' 50"	0.17847
20	316° 11' 00"	-3° 29' 34"	319° 44' 44"	-19° 18' 58"	0° 58' 37"	15' 58.50"	69° 17' 14"	0.17489
21	316° 45' 41"	-3° 27' 09"	320° 18' 51"	-19° 06' 06"	0° 58' 40"	15' 59.15"	69° 6' 47"	0.17134
22	317° 20' 25"	-3° 24' 43"	320° 52' 56"	-18° 53' 06"	0° 58' 42"	15' 59.80"	68° 56' 29"	0.16781
23	317° 55' 12"	-3° 22' 15"	321° 26' 59"	-18° 39' 59"	0° 58' 45"	16' 00.44"	68° 46' 20"	0.16430
24	318° 30' 01"	-3° 19' 45"	322° 00' 59"	-18° 26' 44"	0° 58' 47"	16' 01.09"	68° 36' 21"	0.16082

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	5° 35' 03"	-0.43"	5° 07' 16"	2° 12' 58"	0.9975072	16'02.03"	23° 26' 19"	-5 m 43 s
1	5° 37' 32"	-0.42"	5° 09' 32"	2° 13' 56"	0.9975192	16'02.02"	23° 26' 19"	-5 m 42 s
2	5° 40' 00"	-0.42"	5° 11' 49"	2° 14' 55"	0.9975312	16'02.00"	23° 26' 19"	-5 m 41 s
3	5° 42' 29"	-0.41"	5° 14' 05"	2° 15' 54"	0.9975432	16'01.99"	23° 26' 19"	-5 m 40 s
4	5° 44' 57"	-0.41"	5° 16' 22"	2° 16' 53"	0.9975553	16'01.98"	23° 26' 19"	-5 m 40 s
5	5° 47' 26"	-0.40"	5° 18' 38"	2° 17' 52"	0.9975673	16'01.97"	23° 26' 19"	-5 m 39 s
6	5° 49' 55"	-0.40"	5° 20' 55"	2° 18' 51"	0.9975793	16'01.96"	23° 26' 19"	-5 m 38 s
7	5° 52' 23"	-0.39"	5° 23' 12"	2° 19' 50"	0.9975914	16'01.95"	23° 26' 19"	-5 m 37 s
8	5° 54' 52"	-0.39"	5° 25' 28"	2° 20' 48"	0.9976034	16'01.94"	23° 26' 19"	-5 m 37 s
9	5° 57' 20"	-0.38"	5° 27' 45"	2° 21' 47"	0.9976154	16'01.92"	23° 26' 19"	-5 m 36 s
10	5° 59' 49"	-0.38"	5° 30' 01"	2° 22' 46"	0.9976274	16'01.91"	23° 26' 19"	-5 m 35 s
11	6° 02' 18"	-0.37"	5° 32' 18"	2° 23' 45"	0.9976394	16'01.90"	23° 26' 19"	-5 m 34 s
12	6° 04' 46"	-0.37"	5° 34' 34"	2° 24' 44"	0.9976515	16'01.89"	23° 26' 19"	-5 m 34 s
13	6° 07' 15"	-0.36"	5° 36' 51"	2° 25' 43"	0.9976635	16'01.88"	23° 26' 19"	-5 m 33 s
14	6° 09' 43"	-0.36"	5° 39' 07"	2° 26' 41"	0.9976755	16'01.87"	23° 26' 19"	-5 m 32 s
15	6° 12' 12"	-0.35"	5° 41' 24"	2° 27' 40"	0.9976875	16'01.85"	23° 26' 19"	-5 m 31 s
16	6° 14' 40"	-0.35"	5° 43' 41"	2° 28' 39"	0.9976995	16'01.84"	23° 26' 19"	-5 m 31 s
17	6° 17' 09"	-0.34"	5° 45' 57"	2° 29' 38"	0.9977116	16'01.83"	23° 26' 19"	-5 m 30 s
18	6° 19' 38"	-0.34"	5° 48' 14"	2° 30' 37"	0.9977236	16'01.82"	23° 26' 19"	-5 m 29 s
19	6° 22' 06"	-0.33"	5° 50' 30"	2° 31' 35"	0.9977356	16'01.81"	23° 26' 19"	-5 m 28 s
20	6° 24' 35"	-0.33"	5° 52' 47"	2° 32' 34"	0.9977476	16'01.80"	23° 26' 19"	-5 m 28 s
21	6° 27' 03"	-0.32"	5° 55' 03"	2° 33' 33"	0.9977596	16'01.78"	23° 26' 19"	-5 m 27 s
22	6° 29' 32"	-0.32"	5° 57' 20"	2° 34' 32"	0.9977716	16'01.77"	23° 26' 19"	-5 m 26 s
23	6° 32' 00"	-0.31"	5° 59' 36"	2° 35' 31"	0.9977836	16'01.76"	23° 26' 19"	-5 m 25 s
24	6° 34' 29"	-0.31"	6° 01' 53"	2° 36' 29"	0.9977956	16'01.75"	23° 26' 19"	-5 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	318° 30' 01"	-3° 19' 45"	322° 00' 59"	-18° 26' 44"	0° 58' 47"	16' 01.09"	68° 36' 21"	0.16082
1	319° 04' 53"	-3° 17' 14"	322° 34' 57"	-18° 13' 23"	0° 58' 49"	16' 01.74"	68° 26' 32"	0.15737
2	319° 39' 48"	-3° 14' 42"	323° 08' 53"	-17° 59' 54"	0° 58' 52"	16' 02.38"	68° 16' 51"	0.15394
3	320° 14' 45"	-3° 12' 08"	323° 42' 46"	-17° 46' 18"	0° 58' 54"	16' 03.02"	68° 7' 21"	0.15053
4	320° 49' 46"	-3° 09' 33"	324° 16' 37"	-17° 32' 35"	0° 58' 56"	16' 03.66"	67° 58' 00"	0.14715
5	321° 24' 49"	-3° 06' 56"	324° 50' 26"	-17° 18' 46"	0° 58' 59"	16' 04.30"	67° 48' 50"	0.14380
6	321° 59' 55"	-3° 04' 18"	325° 24' 12"	-17° 04' 49"	0° 59' 01"	16' 04.94"	67° 39' 49"	0.14048
7	322° 35' 04"	-3° 01' 39"	325° 57' 57"	-16° 50' 46"	0° 59' 03"	16' 05.57"	67° 30' 59"	0.13718
8	323° 10' 15"	-2° 58' 58"	326° 31' 38"	-16° 36' 36"	0° 59' 06"	16' 06.20"	67° 22' 18"	0.13391
9	323° 45' 29"	-2° 56' 16"	327° 05' 18"	-16° 22' 19"	0° 59' 08"	16' 06.83"	67° 13' 48"	0.13067
10	324° 20' 46"	-2° 53' 33"	327° 38' 56"	-16° 07' 56"	0° 59' 10"	16' 07.46"	67° 5' 29"	0.12746
11	324° 56' 06"	-2° 50' 48"	328° 12' 31"	-15° 53' 27"	0° 59' 13"	16' 08.09"	66° 57' 20"	0.12428
12	325° 31' 29"	-2° 48' 02"	328° 46' 05"	-15° 38' 51"	0° 59' 15"	16' 08.71"	66° 49' 22"	0.12113
13	326° 06' 54"	-2° 45' 15"	329° 19' 36"	-15° 24' 09"	0° 59' 17"	16' 09.33"	66° 41' 35"	0.11801
14	326° 42' 22"	-2° 42' 27"	329° 53' 05"	-15° 09' 20"	0° 59' 19"	16' 09.95"	66° 33' 59"	0.11492
15	327° 17' 52"	-2° 39' 37"	330° 26' 32"	-14° 54' 26"	0° 59' 22"	16' 10.56"	66° 26' 33"	0.11186
16	327° 53' 25"	-2° 36' 46"	330° 59' 58"	-14° 39' 25"	0° 59' 24"	16' 11.17"	66° 19' 20"	0.10883
17	328° 29' 01"	-2° 33' 53"	331° 33' 21"	-14° 24' 19"	0° 59' 26"	16' 11.78"	66° 12' 17"	0.10584
18	329° 04' 40"	-2° 30' 60"	332° 06' 42"	-14° 09' 07"	0° 59' 28"	16' 12.38"	66° 5' 26"	0.10287
19	329° 40' 21"	-2° 28' 05"	332° 40' 02"	-13° 53' 48"	0° 59' 31"	16' 12.98"	65° 58' 47"	0.09994
20	330° 16' 05"	-2° 25' 09"	333° 13' 20"	-13° 38' 24"	0° 59' 33"	16' 13.58"	65° 52' 20"	0.09705
21	330° 51' 51"	-2° 22' 12"	333° 46' 36"	-13° 22' 55"	0° 59' 35"	16' 14.18"	65° 46' 05"	0.09419
22	331° 27' 40"	-2° 19' 14"	334° 19' 50"	-13° 07' 20"	0° 59' 37"	16' 14.77"	65° 40' 02"	0.09136
23	332° 03' 32"	-2° 16' 15"	334° 53' 03"	-12° 51' 39"	0° 59' 39"	16' 15.35"	65° 34' 11"	0.08857
24	332° 39' 26"	-2° 13' 14"	335° 26' 14"	-12° 35' 54"	0° 59' 41"	16' 15.94"	65° 28' 33"	0.08581

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	6° 34' 29"	-0.31"	6° 01' 53"	2° 36' 29"	0.9977956	16'01.75"	23° 26' 19"	-5 m 25 s
1	6° 36' 57"	-0.30"	6° 04' 10"	2° 37' 28"	0.9978077	16'01.74"	23° 26' 19"	-5 m 24 s
2	6° 39' 26"	-0.30"	6° 06' 26"	2° 38' 27"	0.9978197	16'01.73"	23° 26' 19"	-5 m 23 s
3	6° 41' 54"	-0.29"	6° 08' 43"	2° 39' 26"	0.9978317	16'01.72"	23° 26' 19"	-5 m 22 s
4	6° 44' 23"	-0.29"	6° 10' 59"	2° 40' 24"	0.9978437	16'01.70"	23° 26' 19"	-5 m 22 s
5	6° 46' 52"	-0.28"	6° 13' 16"	2° 41' 23"	0.9978557	16'01.69"	23° 26' 19"	-5 m 21 s
6	6° 49' 20"	-0.28"	6° 15' 32"	2° 42' 22"	0.9978677	16'01.68"	23° 26' 19"	-5 m 20 s
7	6° 51' 49"	-0.27"	6° 17' 49"	2° 43' 20"	0.9978797	16'01.67"	23° 26' 19"	-5 m 19 s
8	6° 54' 17"	-0.27"	6° 20' 05"	2° 44' 19"	0.9978917	16'01.66"	23° 26' 19"	-5 m 19 s
9	6° 56' 46"	-0.26"	6° 22' 22"	2° 45' 18"	0.9979037	16'01.65"	23° 26' 19"	-5 m 18 s
10	6° 59' 14"	-0.26"	6° 24' 39"	2° 46' 17"	0.9979157	16'01.63"	23° 26' 19"	-5 m 17 s
11	7° 01' 43"	-0.25"	6° 26' 55"	2° 47' 15"	0.9979277	16'01.62"	23° 26' 19"	-5 m 16 s
12	7° 04' 11"	-0.24"	6° 29' 12"	2° 48' 14"	0.9979396	16'01.61"	23° 26' 19"	-5 m 16 s
13	7° 06' 40"	-0.24"	6° 31' 28"	2° 49' 13"	0.9979516	16'01.60"	23° 26' 19"	-5 m 15 s
14	7° 09' 08"	-0.23"	6° 33' 45"	2° 50' 11"	0.9979636	16'01.59"	23° 26' 19"	-5 m 14 s
15	7° 11' 37"	-0.23"	6° 36' 01"	2° 51' 10"	0.9979756	16'01.58"	23° 26' 19"	-5 m 13 s
16	7° 14' 05"	-0.22"	6° 38' 18"	2° 52' 09"	0.9979876	16'01.57"	23° 26' 19"	-5 m 13 s
17	7° 16' 34"	-0.22"	6° 40' 35"	2° 53' 07"	0.9979996	16'01.55"	23° 26' 19"	-5 m 12 s
18	7° 19' 02"	-0.21"	6° 42' 51"	2° 54' 06"	0.9980116	16'01.54"	23° 26' 19"	-5 m 11 s
19	7° 21' 31"	-0.21"	6° 45' 08"	2° 55' 05"	0.9980236	16'01.53"	23° 26' 19"	-5 m 10 s
20	7° 23' 59"	-0.20"	6° 47' 24"	2° 56' 03"	0.9980355	16'01.52"	23° 26' 19"	-5 m 10 s
21	7° 26' 27"	-0.20"	6° 49' 41"	2° 57' 02"	0.9980475	16'01.51"	23° 26' 19"	-5 m 09 s
22	7° 28' 56"	-0.19"	6° 51' 57"	2° 58' 01"	0.9980595	16'01.50"	23° 26' 19"	-5 m 08 s
23	7° 31' 24"	-0.19"	6° 54' 14"	2° 58' 59"	0.9980715	16'01.48"	23° 26' 19"	-5 m 07 s
24	7° 33' 53"	-0.18"	6° 56' 31"	2° 59' 58"	0.9980834	16'01.47"	23° 26' 19"	-5 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	332° 39' 26"	-2° 13' 14"	335° 26' 14"	-12° 35' 54"	0° 59' 41"	16' 15.94"	65° 28' 33"	0.08581
1	333° 15' 23"	-2° 10' 13"	335° 59' 23"	-12° 20' 02"	0° 59' 44"	16' 16.51"	65° 23' 08"	0.08309
2	333° 51' 23"	-2° 07' 10"	336° 32' 31"	-12° 04' 06"	0° 59' 46"	16' 17.09"	65° 17' 56"	0.08041
3	334° 27' 24"	-2° 04' 07"	337° 05' 37"	-11° 48' 05"	0° 59' 48"	16' 17.66"	65° 12' 58"	0.07776
4	335° 03' 29"	-2° 01' 02"	337° 38' 42"	-11° 31' 58"	0° 59' 50"	16' 18.22"	65° 8' 13"	0.07515
5	335° 39' 36"	-1° 57' 56"	338° 11' 46"	-11° 15' 47"	0° 59' 52"	16' 18.78"	65° 3' 42"	0.07258
6	336° 15' 45"	-1° 54' 49"	338° 44' 48"	-10° 59' 31"	0° 59' 54"	16' 19.34"	64° 59' 25"	0.07004
7	336° 51' 57"	-1° 51' 42"	339° 17' 49"	-10° 43' 10"	0° 59' 56"	16' 19.89"	64° 55' 22"	0.06755
8	337° 28' 11"	-1° 48' 33"	339° 50' 49"	-10° 26' 44"	0° 59' 58"	16' 20.44"	64° 51' 35"	0.06509
9	338° 04' 28"	-1° 45' 23"	340° 23' 47"	-10° 10' 14"	0° 59' 60"	16' 20.98"	64° 48' 02"	0.06267
10	338° 40' 47"	-1° 42' 13"	340° 56' 45"	-9° 53' 40"	1° 00' 02"	16' 21.52"	64° 44' 45"	0.06030
11	339° 17' 09"	-1° 39' 01"	341° 29' 41"	-9° 37' 01"	1° 00' 04"	16' 22.05"	64° 41' 43"	0.05796
12	339° 53' 33"	-1° 35' 49"	342° 02' 37"	-9° 20' 18"	1° 00' 06"	16' 22.57"	64° 38' 58"	0.05566
13	340° 29' 59"	-1° 32' 36"	342° 35' 31"	-9° 03' 30"	1° 00' 08"	16' 23.10"	64° 36' 30"	0.05341
14	341° 06' 28"	-1° 29' 22"	343° 08' 25"	-8° 46' 39"	1° 00' 10"	16' 23.61"	64° 34' 19"	0.05119
15	341° 42' 58"	-1° 26' 07"	343° 41' 17"	-8° 29' 44"	1° 00' 11"	16' 24.12"	64° 32' 26"	0.04902
16	342° 19' 32"	-1° 22' 51"	344° 14' 09"	-8° 12' 44"	1° 00' 13"	16' 24.62"	64° 30' 52"	0.04689
17	342° 56' 07"	-1° 19' 35"	344° 47' 00"	-7° 55' 41"	1° 00' 15"	16' 25.12"	64° 29' 36"	0.04480
18	343° 32' 45"	-1° 16' 18"	345° 19' 51"	-7° 38' 35"	1° 00' 17"	16' 25.61"	64° 28' 41"	0.04276
19	344° 09' 24"	-1° 12' 60"	345° 52' 41"	-7° 21' 25"	1° 00' 19"	16' 26.10"	64° 28' 06"	0.04076
20	344° 46' 06"	-1° 09' 41"	346° 25' 31"	-7° 04' 11"	1° 00' 21"	16' 26.58"	64° 27' 52"	0.03880
21	345° 22' 51"	-1° 06' 22"	346° 58' 20"	-6° 46' 54"	1° 00' 22"	16' 27.05"	64° 28' 01"	0.03689
22	345° 59' 37"	-1° 03' 02"	347° 31' 09"	-6° 29' 34"	1° 00' 24"	16' 27.52"	64° 28' 34"	0.03502
23	346° 36' 25"	0°-59' 42"	348° 03' 57"	-6° 12' 11"	1° 00' 26"	16' 27.98"	64° 29' 31"	0.03320
24	347° 13' 16"	0°-56' 21"	348° 36' 45"	-5° 54' 44"	1° 00' 27"	16' 28.43"	64° 30' 54"	0.03142

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	7° 33' 53"	-0.18"	6° 56' 31"	2° 59' 58"	0.9980834	16'01.47"	23° 26' 19"	-5 m 07 s
1	7° 36' 21"	-0.17"	6° 58' 47"	3° 00' 57"	0.9980954	16'01.46"	23° 26' 19"	-5 m 06 s
2	7° 38' 50"	-0.17"	7° 01' 04"	3° 01' 55"	0.9981074	16'01.45"	23° 26' 19"	-5 m 05 s
3	7° 41' 18"	-0.16"	7° 03' 20"	3° 02' 54"	0.9981194	16'01.44"	23° 26' 19"	-5 m 04 s
4	7° 43' 47"	-0.16"	7° 05' 37"	3° 03' 52"	0.9981313	16'01.43"	23° 26' 19"	-5 m 04 s
5	7° 46' 15"	-0.15"	7° 07' 54"	3° 04' 51"	0.9981433	16'01.42"	23° 26' 19"	-5 m 03 s
6	7° 48' 44"	-0.15"	7° 10' 10"	3° 05' 50"	0.9981552	16'01.40"	23° 26' 19"	-5 m 02 s
7	7° 51' 12"	-0.14"	7° 12' 27"	3° 06' 48"	0.9981672	16'01.39"	23° 26' 19"	-5 m 01 s
8	7° 53' 40"	-0.14"	7° 14' 43"	3° 07' 47"	0.9981792	16'01.38"	23° 26' 19"	-5 m 01 s
9	7° 56' 09"	-0.13"	7° 16' 60"	3° 08' 45"	0.9981911	16'01.37"	23° 26' 19"	-4 m 60 s
10	7° 58' 37"	-0.13"	7° 19' 16"	3° 09' 44"	0.9982031	16'01.36"	23° 26' 19"	-4 m 59 s
11	8° 01' 06"	-0.12"	7° 21' 33"	3° 10' 42"	0.9982150	16'01.35"	23° 26' 19"	-4 m 58 s
12	8° 03' 34"	-0.11"	7° 23' 50"	3° 11' 41"	0.9982270	16'01.33"	23° 26' 19"	-4 m 58 s
13	8° 06' 03"	-0.11"	7° 26' 06"	3° 12' 39"	0.9982389	16'01.32"	23° 26' 19"	-4 m 57 s
14	8° 08' 31"	-0.10"	7° 28' 23"	3° 13' 38"	0.9982509	16'01.31"	23° 26' 19"	-4 m 56 s
15	8° 10' 59"	-0.10"	7° 30' 39"	3° 14' 37"	0.9982628	16'01.30"	23° 26' 19"	-4 m 55 s
16	8° 13' 28"	-0.09"	7° 32' 56"	3° 15' 35"	0.9982748	16'01.29"	23° 26' 19"	-4 m 55 s
17	8° 15' 56"	-0.09"	7° 35' 13"	3° 16' 34"	0.9982867	16'01.28"	23° 26' 19"	-4 m 54 s
18	8° 18' 25"	-0.08"	7° 37' 29"	3° 17' 32"	0.9982987	16'01.27"	23° 26' 19"	-4 m 53 s
19	8° 20' 53"	-0.08"	7° 39' 46"	3° 18' 31"	0.9983106	16'01.25"	23° 26' 19"	-4 m 52 s
20	8° 23' 21"	-0.07"	7° 42' 02"	3° 19' 29"	0.9983226	16'01.24"	23° 26' 19"	-4 m 52 s
21	8° 25' 50"	-0.06"	7° 44' 19"	3° 20' 28"	0.9983345	16'01.23"	23° 26' 19"	-4 m 51 s
22	8° 28' 18"	-0.06"	7° 46' 36"	3° 21' 26"	0.9983464	16'01.22"	23° 26' 19"	-4 m 50 s
23	8° 30' 47"	-0.05"	7° 48' 52"	3° 22' 25"	0.9983584	16'01.21"	23° 26' 19"	-4 m 49 s
24	8° 33' 15"	-0.05"	7° 51' 09"	3° 23' 23"	0.9983703	16'01.20"	23° 26' 19"	-4 m 48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	347° 13' 16"	0°-56' 21"	348° 36' 45"	-5° 54' 44"	1° 00' 27"	16' 28.43"	64° 30' 54"	0.03142
1	347° 50' 08"	0°-52' 59"	349° 09' 33"	-5° 37' 15"	1° 00' 29"	16' 28.88"	64° 32' 44"	0.02969
2	348° 27' 03"	0°-49' 37"	349° 42' 21"	-5° 19' 43"	1° 00' 31"	16' 29.32"	64° 35' 03"	0.02801
3	349° 03' 59"	0°-46' 14"	350° 15' 09"	-5° 02' 08"	1° 00' 32"	16' 29.76"	64° 37' 53"	0.02637
4	349° 40' 58"	0°-42' 51"	350° 47' 57"	-4° 44' 31"	1° 00' 34"	16' 30.18"	64° 41' 16"	0.02477
5	350° 17' 58"	0°-39' 27"	351° 20' 45"	-4° 26' 51"	1° 00' 35"	16' 30.60"	64° 45' 14"	0.02323
6	350° 55' 01"	0°-36' 03"	351° 53' 33"	-4° 09' 09"	1° 00' 37"	16' 31.02"	64° 49' 50"	0.02173
7	351° 32' 05"	0°-32' 38"	352° 26' 21"	-3° 51' 24"	1° 00' 38"	16' 31.42"	64° 55' 07"	0.02028
8	352° 09' 11"	0°-29' 13"	352° 59' 10"	-3° 33' 38"	1° 00' 40"	16' 31.82"	65° 1' 08"	0.01888
9	352° 46' 19"	0°-25' 48"	353° 31' 59"	-3° 15' 49"	1° 00' 41"	16' 32.21"	65° 7' 57"	0.01752
10	353° 23' 29"	0°-22' 24"	354° 04' 49"	-2° 58' 00"	1° 00' 43"	16' 32.59"	65° 15' 29"	0.01622
11	354° 00' 40"	0°-18' 58"	354° 37' 39"	-2° 40' 08"	1° 00' 44"	16' 32.97"	65° 24' 09"	0.01496
12	354° 37' 54"	0°-15' 32"	355° 10' 30"	-2° 22' 14"	1° 00' 45"	16' 33.34"	65° 33' 53"	0.01376
13	355° 15' 08"	0°-12' 05"	355° 43' 21"	-2° 04' 18"	1° 00' 47"	16' 33.70"	65° 44' 48"	0.01260
14	355° 52' 25"	0° -8' 39"	356° 16' 13"	-1° 46' 21"	1° 00' 48"	16' 34.05"	65° 57' 05"	0.01149
15	356° 29' 43"	0° -5' 12"	356° 49' 06"	-1° 28' 22"	1° 00' 49"	16' 34.40"	66° 10' 52"	0.01043
16	357° 07' 03"	0° -1' 44"	357° 21' 59"	-1° 10' 22"	1° 00' 50"	16' 34.73"	66° 26' 24"	0.00942
17	357° 44' 24"	0° 01' 43"	357° 54' 54"	0°-52' 21"	1° 00' 52"	16' 35.06"	66° 43' 55"	0.00847
18	358° 21' 47"	0° 05' 11"	358° 27' 50"	0°-34' 19"	1° 00' 53"	16' 35.38"	67° 3' 44"	0.00756
19	358° 59' 11"	0° 08' 38"	359° 00' 46"	0°-16' 16"	1° 00' 54"	16' 35.69"	67° 26' 17"	0.00670
20	359° 36' 37"	0° 12' 06"	359° 33' 44"	0° 01' 48"	1° 00' 55"	16' 36.00"	67° 52' 03"	0.00590
21	0° 14' 04"	0° 15' 33"	0° 06' 43"	0° 19' 52"	1° 00' 56"	16' 36.29"	68° 21' 41"	0.00515
22	0° 51' 33"	0° 19' 01"	0° 39' 44"	0° 37' 57"	1° 00' 57"	16' 36.58"	68° 56' 01"	0.00444
23	1° 29' 03"	0° 22' 29"	1° 12' 46"	0° 56' 03"	1° 00' 58"	16' 36.86"	69° 36' 12"	0.00379
24	2° 06' 34"	0° 25' 56"	1° 45' 49"	1° 14' 08"	1° 00' 59"	16' 37.13"	70° 23' 45"	0.00320

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	8° 33' 15"	-0.05"	7° 51' 09"	3° 23' 23"	0.9983703	16'01.20"	23° 26' 19"	-4 m 48 s
1	8° 35' 43"	-0.04"	7° 53' 25"	3° 24' 21"	0.9983822	16'01.18"	23° 26' 19"	-4 m 48 s
2	8° 38' 12"	-0.04"	7° 55' 42"	3° 25' 20"	0.9983941	16'01.17"	23° 26' 19"	-4 m 47 s
3	8° 40' 40"	-0.03"	7° 57' 59"	3° 26' 18"	0.9984061	16'01.16"	23° 26' 19"	-4 m 46 s
4	8° 43' 08"	-0.03"	8° 00' 15"	3° 27' 17"	0.9984180	16'01.15"	23° 26' 19"	-4 m 45 s
5	8° 45' 37"	-0.02"	8° 02' 32"	3° 28' 15"	0.9984299	16'01.14"	23° 26' 19"	-4 m 45 s
6	8° 48' 05"	-0.02"	8° 04' 48"	3° 29' 14"	0.9984418	16'01.13"	23° 26' 19"	-4 m 44 s
7	8° 50' 33"	-0.01"	8° 07' 05"	3° 30' 12"	0.9984537	16'01.12"	23° 26' 19"	-4 m 43 s
8	8° 53' 02"	-0.01"	8° 09' 22"	3° 31' 11"	0.9984657	16'01.10"	23° 26' 19"	-4 m 42 s
9	8° 55' 30"	-0.00"	8° 11' 38"	3° 32' 09"	0.9984776	16'01.09"	23° 26' 19"	-4 m 42 s
10	8° 57' 59"	0.01"	8° 13' 55"	3° 33' 07"	0.9984895	16'01.08"	23° 26' 19"	-4 m 41 s
11	9° 00' 27"	0.01"	8° 16' 12"	3° 34' 06"	0.9985014	16'01.07"	23° 26' 19"	-4 m 40 s
12	9° 02' 55"	0.02"	8° 18' 28"	3° 35' 04"	0.9985133	16'01.06"	23° 26' 19"	-4 m 39 s
13	9° 05' 24"	0.02"	8° 20' 45"	3° 36' 03"	0.9985252	16'01.05"	23° 26' 19"	-4 m 39 s
14	9° 07' 52"	0.03"	8° 23' 01"	3° 37' 01"	0.9985371	16'01.04"	23° 26' 19"	-4 m 38 s
15	9° 10' 20"	0.03"	8° 25' 18"	3° 37' 59"	0.9985490	16'01.02"	23° 26' 19"	-4 m 37 s
16	9° 12' 49"	0.04"	8° 27' 35"	3° 38' 58"	0.9985609	16'01.01"	23° 26' 19"	-4 m 36 s
17	9° 15' 17"	0.04"	8° 29' 51"	3° 39' 56"	0.9985728	16'01.00"	23° 26' 19"	-4 m 36 s
18	9° 17' 45"	0.05"	8° 32' 08"	3° 40' 54"	0.9985847	16'00.99"	23° 26' 19"	-4 m 35 s
19	9° 20' 13"	0.05"	8° 34' 25"	3° 41' 53"	0.9985966	16'00.98"	23° 26' 19"	-4 m 34 s
20	9° 22' 42"	0.06"	8° 36' 41"	3° 42' 51"	0.9986085	16'00.97"	23° 26' 19"	-4 m 33 s
21	9° 25' 10"	0.06"	8° 38' 58"	3° 43' 49"	0.9986203	16'00.96"	23° 26' 19"	-4 m 33 s
22	9° 27' 38"	0.07"	8° 41' 14"	3° 44' 48"	0.9986322	16'00.94"	23° 26' 19"	-4 m 32 s
23	9° 30' 07"	0.07"	8° 43' 31"	3° 45' 46"	0.9986441	16'00.93"	23° 26' 19"	-4 m 31 s
24	9° 32' 35"	0.08"	8° 45' 48"	3° 46' 44"	0.9986560	16'00.92"	23° 26' 19"	-4 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	2° 06' 34"	0° 25' 56"	1° 45' 49"	1° 14' 08"	1° 00' 59"	16' 37.13"	70° 23' 45"	0.00320
1	2° 44' 07"	0° 29' 24"	2° 18' 54"	1° 32' 14"	1° 01' 00"	16' 37.39"	71° 20' 45"	0.00265
2	3° 21' 40"	0° 32' 51"	2° 52' 00"	1° 50' 20"	1° 01' 01"	16' 37.65"	72° 30' 15"	0.00216
3	3° 59' 15"	0° 36' 19"	3° 25' 09"	2° 08' 26"	1° 01' 02"	16' 37.89"	73° 56' 40"	0.00172
4	4° 36' 49"	0° 39' 46"	3° 58' 17"	2° 26' 30"	1° 01' 03"	16' 38.13"	75° 46' 45"	0.00133
5	5° 14' 27"	0° 43' 13"	4° 31' 29"	2° 44' 36"	1° 01' 04"	16' 38.36"	78° 11' 43"	0.00099
6	5° 52' 05"	0° 46' 39"	5° 04' 43"	3° 02' 41"	1° 01' 05"	16' 38.58"	81° 30' 13"	0.00071
7	6° 29' 44"	0° 50' 06"	5° 37' 58"	3° 20' 45"	1° 01' 05"	16' 38.79"	86° 16' 21"	0.00048
8	7° 07' 25"	0° 53' 32"	6° 11' 16"	3° 38' 49"	1° 01' 06"	16' 38.99"	93° 36' 37"	0.00030
9	7° 45' 06"	0° 56' 58"	6° 44' 36"	3° 56' 52"	1° 01' 07"	16' 39.18"	105° 46' 14"	0.00018
10	8° 22' 48"	1° 00' 23"	7° 17' 58"	4° 14' 54"	1° 01' 07"	16' 39.36"	126° 39' 52"	0.00010
11	9° 00' 32"	1° 03' 49"	7° 51' 22"	4° 32' 55"	1° 01' 08"	16' 39.54"	157° 1' 01"	0.00009
12	9° 38' 16"	1° 07' 13"	8° 24' 49"	4° 50' 54"	1° 01' 09"	16' 39.70"	184° 40' 30"	0.00012
13	10° 16' 00"	1° 10' 38"	8° 58' 18"	5° 08' 53"	1° 01' 09"	16' 39.86"	201° 55' 55"	0.00021
14	10° 53' 46"	1° 14' 02"	9° 31' 50"	5° 26' 50"	1° 01' 10"	16' 40.00"	212° 0' 01"	0.00035
15	11° 31' 32"	1° 17' 25"	10° 05' 24"	5° 44' 45"	1° 01' 10"	16' 40.14"	218° 15' 02"	0.00055
16	12° 09' 19"	1° 20' 48"	10° 39' 01"	6° 02' 39"	1° 01' 11"	16' 40.27"	222° 25' 46"	0.00080
17	12° 47' 07"	1° 24' 10"	11° 12' 41"	6° 20' 31"	1° 01' 11"	16' 40.39"	225° 24' 04"	0.00110
18	13° 24' 55"	1° 27' 32"	11° 46' 23"	6° 38' 21"	1° 01' 12"	16' 40.50"	227° 37' 12"	0.00146
19	14° 02' 44"	1° 30' 53"	12° 20' 09"	6° 56' 09"	1° 01' 12"	16' 40.60"	229° 20' 32"	0.00187
20	14° 40' 34"	1° 34' 14"	12° 53' 57"	7° 13' 54"	1° 01' 12"	16' 40.69"	230° 43' 15"	0.00233
21	15° 18' 23"	1° 37' 34"	13° 27' 48"	7° 31' 38"	1° 01' 13"	16' 40.77"	231° 51' 14"	0.00285
22	15° 56' 14"	1° 40' 53"	14° 01' 42"	7° 49' 19"	1° 01' 13"	16' 40.85"	232° 48' 17"	0.00342
23	16° 34' 04"	1° 44' 11"	14° 35' 39"	8° 06' 57"	1° 01' 13"	16' 40.91"	233° 37' 04"	0.00404
24	17° 11' 56"	1° 47' 29"	15° 09' 40"	8° 24' 32"	1° 01' 13"	16' 40.97"	234° 19' 28"	0.00472

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	9° 32' 35"	0.08"	8° 45' 48"	3° 46' 44"	0.9986560	16'00.92"	23° 26' 19"	-4 m 31 s
1	9° 35' 03"	0.08"	8° 48' 04"	3° 47' 43"	0.9986679	16'00.91"	23° 26' 19"	-4 m 30 s
2	9° 37' 32"	0.09"	8° 50' 21"	3° 48' 41"	0.9986798	16'00.90"	23° 26' 19"	-4 m 29 s
3	9° 39' 60"	0.09"	8° 52' 38"	3° 49' 39"	0.9986916	16'00.89"	23° 26' 19"	-4 m 28 s
4	9° 42' 28"	0.10"	8° 54' 54"	3° 50' 37"	0.9987035	16'00.88"	23° 26' 19"	-4 m 28 s
5	9° 44' 56"	0.10"	8° 57' 11"	3° 51' 36"	0.9987154	16'00.86"	23° 26' 19"	-4 m 27 s
6	9° 47' 25"	0.11"	8° 59' 28"	3° 52' 34"	0.9987272	16'00.85"	23° 26' 19"	-4 m 26 s
7	9° 49' 53"	0.11"	9° 01' 44"	3° 53' 32"	0.9987391	16'00.84"	23° 26' 19"	-4 m 25 s
8	9° 52' 21"	0.12"	9° 04' 01"	3° 54' 30"	0.9987510	16'00.83"	23° 26' 19"	-4 m 25 s
9	9° 54' 49"	0.12"	9° 06' 18"	3° 55' 29"	0.9987628	16'00.82"	23° 26' 19"	-4 m 24 s
10	9° 57' 18"	0.13"	9° 08' 34"	3° 56' 27"	0.9987747	16'00.81"	23° 26' 19"	-4 m 23 s
11	9° 59' 46"	0.13"	9° 10' 51"	3° 57' 25"	0.9987865	16'00.80"	23° 26' 19"	-4 m 22 s
12	10° 02' 14"	0.14"	9° 13' 08"	3° 58' 23"	0.9987984	16'00.78"	23° 26' 19"	-4 m 22 s
13	10° 04' 42"	0.14"	9° 15' 24"	3° 59' 22"	0.9988102	16'00.77"	23° 26' 19"	-4 m 21 s
14	10° 07' 11"	0.15"	9° 17' 41"	4° 00' 20"	0.9988221	16'00.76"	23° 26' 19"	-4 m 20 s
15	10° 09' 39"	0.15"	9° 19' 58"	4° 01' 18"	0.9988339	16'00.75"	23° 26' 19"	-4 m 19 s
16	10° 12' 07"	0.16"	9° 22' 14"	4° 02' 16"	0.9988458	16'00.74"	23° 26' 19"	-4 m 19 s
17	10° 14' 35"	0.16"	9° 24' 31"	4° 03' 14"	0.9988576	16'00.73"	23° 26' 19"	-4 m 18 s
18	10° 17' 04"	0.17"	9° 26' 48"	4° 04' 12"	0.9988695	16'00.72"	23° 26' 19"	-4 m 17 s
19	10° 19' 32"	0.17"	9° 29' 04"	4° 05' 11"	0.9988813	16'00.70"	23° 26' 19"	-4 m 16 s
20	10° 22' 00"	0.18"	9° 31' 21"	4° 06' 09"	0.9988932	16'00.69"	23° 26' 19"	-4 m 16 s
21	10° 24' 28"	0.18"	9° 33' 38"	4° 07' 07"	0.9989050	16'00.68"	23° 26' 19"	-4 m 15 s
22	10° 26' 57"	0.18"	9° 35' 54"	4° 08' 05"	0.9989168	16'00.67"	23° 26' 19"	-4 m 14 s
23	10° 29' 25"	0.19"	9° 38' 11"	4° 09' 03"	0.9989287	16'00.66"	23° 26' 19"	-4 m 13 s
24	10° 31' 53"	0.19"	9° 40' 28"	4° 10' 01"	0.9989405	16'00.65"	23° 26' 19"	-4 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	17° 11' 56"	1° 47' 29"	15° 09' 40"	8° 24' 32"	1° 01' 13"	16' 40.97"	234° 19' 28"	0.00472
1	17° 49' 47"	1° 50' 46"	15° 43' 44"	8° 42' 05"	1° 01' 13"	16' 41.01"	234° 56' 49"	0.00544
2	18° 27' 39"	1° 54' 02"	16° 17' 51"	8° 59' 35"	1° 01' 14"	16' 41.05"	235° 30' 09"	0.00623
3	19° 05' 31"	1° 57' 18"	16° 52' 01"	9° 17' 02"	1° 01' 14"	16' 41.08"	236° 0' 12"	0.00706
4	19° 43' 23"	2° 00' 32"	17° 26' 15"	9° 34' 25"	1° 01' 14"	16' 41.09"	236° 27' 36"	0.00795
5	20° 21' 15"	2° 03' 46"	18° 00' 33"	9° 51' 45"	1° 01' 14"	16' 41.10"	236° 52' 47"	0.00889
6	20° 59' 07"	2° 06' 58"	18° 34' 54"	10° 09' 02"	1° 01' 14"	16' 41.10"	237° 16' 07"	0.00989
7	21° 36' 60"	2° 10' 10"	19° 09' 18"	10° 26' 15"	1° 01' 14"	16' 41.09"	237° 37' 55"	0.01093
8	22° 14' 52"	2° 13' 21"	19° 43' 47"	10° 43' 24"	1° 01' 14"	16' 41.07"	237° 58' 25"	0.01203
9	22° 52' 45"	2° 16' 31"	20° 18' 19"	11° 00' 29"	1° 01' 14"	16' 41.05"	238° 17' 49"	0.01318
10	23° 30' 37"	2° 19' 40"	20° 52' 54"	11° 17' 31"	1° 01' 13"	16' 41.01"	238° 36' 17"	0.01439
11	24° 08' 29"	2° 22' 47"	21° 27' 34"	11° 34' 28"	1° 01' 13"	16' 40.96"	238° 53' 57"	0.01564
12	24° 46' 22"	2° 25' 54"	22° 02' 18"	11° 51' 21"	1° 01' 13"	16' 40.91"	239° 10' 55"	0.01695
13	25° 24' 14"	2° 28' 60"	22° 37' 06"	12° 08' 09"	1° 01' 13"	16' 40.84"	239° 27' 19"	0.01831
14	26° 02' 05"	2° 32' 04"	23° 11' 57"	12° 24' 53"	1° 01' 13"	16' 40.77"	239° 43' 12"	0.01972
15	26° 39' 57"	2° 35' 07"	23° 46' 53"	12° 41' 33"	1° 01' 12"	16' 40.69"	239° 58' 39"	0.02118
16	27° 17' 48"	2° 38' 09"	24° 21' 53"	12° 58' 07"	1° 01' 12"	16' 40.59"	240° 13' 44"	0.02269
17	27° 55' 39"	2° 41' 10"	24° 56' 57"	13° 14' 37"	1° 01' 12"	16' 40.49"	240° 28' 31"	0.02426
18	28° 33' 30"	2° 44' 10"	25° 32' 05"	13° 31' 01"	1° 01' 11"	16' 40.38"	240° 43' 01"	0.02587
19	29° 11' 20"	2° 47' 09"	26° 07' 17"	13° 47' 21"	1° 01' 11"	16' 40.27"	240° 57' 18"	0.02753
20	29° 49' 09"	2° 50' 06"	26° 42' 34"	14° 03' 35"	1° 01' 10"	16' 40.14"	241° 11' 23"	0.02925
21	30° 26' 58"	2° 53' 02"	27° 17' 55"	14° 19' 43"	1° 01' 10"	16' 40.00"	241° 25' 19"	0.03101
22	31° 04' 47"	2° 55' 56"	27° 53' 21"	14° 35' 46"	1° 01' 09"	16' 39.86"	241° 39' 08"	0.03282
23	31° 42' 32"	2° 58' 49"	28° 28' 48"	14° 51' 43"	1° 01' 09"	16' 39.70"	241° 52' 48"	0.03468
24	32° 20' 20"	3° 01' 41"	29° 04' 23"	15° 07' 34"	1° 01' 08"	16' 39.54"	242° 6' 25"	0.03659

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	10° 31' 53"	0.19"	9° 40' 28"	4° 10' 01"	0.9989405	16'00.65"	23° 26' 19"	-4 m 13 s
1	10° 34' 21"	0.20"	9° 42' 44"	4° 10' 59"	0.9989523	16'00.64"	23° 26' 19"	-4 m 12 s
2	10° 36' 49"	0.20"	9° 45' 01"	4° 11' 58"	0.9989641	16'00.63"	23° 26' 19"	-4 m 11 s
3	10° 39' 18"	0.21"	9° 47' 18"	4° 12' 56"	0.9989760	16'00.61"	23° 26' 19"	-4 m 10 s
4	10° 41' 46"	0.21"	9° 49' 35"	4° 13' 54"	0.9989878	16'00.60"	23° 26' 19"	-4 m 10 s
5	10° 44' 14"	0.22"	9° 51' 51"	4° 14' 52"	0.9989996	16'00.59"	23° 26' 19"	-4 m 09 s
6	10° 46' 42"	0.22"	9° 54' 08"	4° 15' 50"	0.9990114	16'00.58"	23° 26' 19"	-4 m 08 s
7	10° 49' 10"	0.22"	9° 56' 25"	4° 16' 48"	0.9990232	16'00.57"	23° 26' 19"	-4 m 07 s
8	10° 51' 38"	0.23"	9° 58' 41"	4° 17' 46"	0.9990350	16'00.56"	23° 26' 19"	-4 m 07 s
9	10° 54' 07"	0.23"	10° 00' 58"	4° 18' 44"	0.9990469	16'00.55"	23° 26' 19"	-4 m 06 s
10	10° 56' 35"	0.24"	10° 03' 15"	4° 19' 42"	0.9990587	16'00.53"	23° 26' 19"	-4 m 05 s
11	10° 59' 03"	0.24"	10° 05' 32"	4° 20' 40"	0.9990705	16'00.52"	23° 26' 19"	-4 m 04 s
12	11° 01' 31"	0.25"	10° 07' 48"	4° 21' 38"	0.9990823	16'00.51"	23° 26' 19"	-4 m 04 s
13	11° 03' 59"	0.25"	10° 10' 05"	4° 22' 36"	0.9990941	16'00.50"	23° 26' 19"	-4 m 03 s
14	11° 06' 27"	0.25"	10° 12' 22"	4° 23' 34"	0.9991059	16'00.49"	23° 26' 19"	-4 m 02 s
15	11° 08' 56"	0.26"	10° 14' 38"	4° 24' 32"	0.9991177	16'00.48"	23° 26' 19"	-4 m 01 s
16	11° 11' 24"	0.26"	10° 16' 55"	4° 25' 30"	0.9991295	16'00.47"	23° 26' 19"	-4 m 01 s
17	11° 13' 52"	0.27"	10° 19' 12"	4° 26' 28"	0.9991413	16'00.45"	23° 26' 19"	-3 m 60 s
18	11° 16' 20"	0.27"	10° 21' 29"	4° 27' 26"	0.9991531	16'00.44"	23° 26' 19"	-3 m 59 s
19	11° 18' 48"	0.27"	10° 23' 45"	4° 28' 24"	0.9991648	16'00.43"	23° 26' 19"	-3 m 58 s
20	11° 21' 16"	0.28"	10° 26' 02"	4° 29' 22"	0.9991766	16'00.42"	23° 26' 19"	-3 m 58 s
21	11° 23' 44"	0.28"	10° 28' 19"	4° 30' 20"	0.9991884	16'00.41"	23° 26' 19"	-3 m 57 s
22	11° 26' 13"	0.28"	10° 30' 36"	4° 31' 18"	0.9992002	16'00.40"	23° 26' 19"	-3 m 56 s
23	11° 28' 41"	0.29"	10° 32' 52"	4° 32' 16"	0.9992120	16'00.39"	23° 26' 19"	-3 m 55 s
24	11° 31' 09"	0.29"	10° 35' 09"	4° 33' 14"	0.9992238	16'00.38"	23° 26' 19"	-3 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	32° 20' 20"	3° 01' 41"	29° 04' 23"	15° 07' 34"	1° 01' 08"	16' 39.54"	242° 6' 25"	0.03659
1	32° 58' 06"	3° 04' 32"	29° 40' 02"	15° 23' 20"	1° 01' 07"	16' 39.37"	242° 19' 58"	0.03855
2	33° 35' 52"	3° 07' 21"	30° 15' 45"	15° 38' 59"	1° 01' 07"	16' 39.19"	242° 33' 29"	0.04056
3	34° 13' 38"	3° 10' 08"	30° 51' 33"	15° 54' 33"	1° 01' 06"	16' 39.00"	242° 46' 58"	0.04261
4	34° 51' 22"	3° 12' 55"	31° 27' 26"	16° 09' 60"	1° 01' 05"	16' 38.81"	243° 0' 26"	0.04471
5	35° 29' 06"	3° 15' 39"	32° 03' 23"	16° 25' 20"	1° 01' 05"	16' 38.60"	243° 13' 54"	0.04686
6	36° 06' 48"	3° 18' 23"	32° 39' 25"	16° 40' 34"	1° 01' 04"	16' 38.39"	243° 27' 22"	0.04906
7	36° 44' 30"	3° 21' 04"	33° 15' 32"	16° 55' 42"	1° 01' 03"	16' 38.17"	243° 40' 52"	0.05130
8	37° 22' 11"	3° 23' 45"	33° 51' 43"	17° 10' 42"	1° 01' 02"	16' 37.94"	243° 54' 23"	0.05359
9	37° 59' 51"	3° 26' 23"	34° 27' 59"	17° 25' 36"	1° 01' 01"	16' 37.70"	244° 7' 57"	0.05593
10	38° 37' 30"	3° 29' 00"	35° 04' 19"	17° 40' 22"	1° 01' 00"	16' 37.46"	244° 21' 34"	0.05831
11	39° 15' 08"	3° 31' 36"	35° 40' 45"	17° 55' 02"	1° 00' 60"	16' 37.21"	244° 35' 14"	0.06073
12	39° 52' 45"	3° 34' 10"	36° 17' 15"	18° 09' 34"	1° 00' 59"	16' 36.95"	244° 48' 57"	0.06320
13	40° 30' 20"	3° 36' 42"	36° 53' 50"	18° 23' 58"	1° 00' 58"	16' 36.68"	245° 2' 45"	0.06572
14	41° 07' 55"	3° 39' 13"	37° 30' 30"	18° 38' 15"	1° 00' 57"	16' 36.40"	245° 16' 37"	0.06828
15	41° 45' 28"	3° 41' 41"	38° 07' 14"	18° 52' 25"	1° 00' 56"	16' 36.12"	245° 30' 33"	0.07088
16	42° 23' 00"	3° 44' 09"	38° 44' 03"	19° 06' 27"	1° 00' 54"	16' 35.82"	245° 44' 34"	0.07352
17	43° 00' 31"	3° 46' 34"	39° 20' 57"	19° 20' 20"	1° 00' 53"	16' 35.52"	245° 58' 41"	0.07621
18	43° 38' 01"	3° 48' 58"	39° 57' 56"	19° 34' 06"	1° 00' 52"	16' 35.22"	246° 12' 52"	0.07894
19	44° 15' 29"	3° 51' 20"	40° 34' 60"	19° 47' 44"	1° 00' 51"	16' 34.90"	246° 27' 09"	0.08171
20	44° 52' 56"	3° 53' 40"	41° 12' 08"	20° 01' 13"	1° 00' 50"	16' 34.58"	246° 41' 32"	0.08452
21	45° 30' 21"	3° 55' 59"	41° 49' 21"	20° 14' 34"	1° 00' 49"	16' 34.26"	246° 56' 00"	0.08738
22	46° 07' 45"	3° 58' 16"	42° 26' 39"	20° 27' 47"	1° 00' 47"	16' 33.92"	247° 10' 34"	0.09027
23	46° 45' 08"	4° 00' 31"	43° 04' 01"	20° 40' 51"	1° 00' 46"	16' 33.58"	247° 25' 15"	0.09321
24	47° 22' 29"	4° 02' 44"	43° 41' 29"	20° 53' 46"	1° 00' 45"	16' 33.23"	247° 40' 01"	0.09618

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	11° 31' 09"	0.29"	10° 35' 09"	4° 33' 14"	0.9992238	16'00.38"	23° 26' 19"	-3 m 55 s
1	11° 33' 37"	0.30"	10° 37' 26"	4° 34' 12"	0.9992355	16'00.36"	23° 26' 19"	-3 m 54 s
2	11° 36' 05"	0.30"	10° 39' 43"	4° 35' 10"	0.9992473	16'00.35"	23° 26' 19"	-3 m 53 s
3	11° 38' 33"	0.30"	10° 41' 59"	4° 36' 07"	0.9992591	16'00.34"	23° 26' 19"	-3 m 53 s
4	11° 41' 01"	0.31"	10° 44' 16"	4° 37' 05"	0.9992709	16'00.33"	23° 26' 19"	-3 m 52 s
5	11° 43' 29"	0.31"	10° 46' 33"	4° 38' 03"	0.9992826	16'00.32"	23° 26' 19"	-3 m 51 s
6	11° 45' 57"	0.31"	10° 48' 50"	4° 39' 01"	0.9992944	16'00.31"	23° 26' 19"	-3 m 50 s
7	11° 48' 25"	0.32"	10° 51' 06"	4° 39' 59"	0.9993062	16'00.30"	23° 26' 19"	-3 m 50 s
8	11° 50' 54"	0.32"	10° 53' 23"	4° 40' 57"	0.9993179	16'00.28"	23° 26' 19"	-3 m 49 s
9	11° 53' 22"	0.32"	10° 55' 40"	4° 41' 55"	0.9993297	16'00.27"	23° 26' 19"	-3 m 48 s
10	11° 55' 50"	0.33"	10° 57' 57"	4° 42' 52"	0.9993414	16'00.26"	23° 26' 19"	-3 m 47 s
11	11° 58' 18"	0.33"	11° 00' 14"	4° 43' 50"	0.9993532	16'00.25"	23° 26' 19"	-3 m 47 s
12	12° 00' 46"	0.33"	11° 02' 30"	4° 44' 48"	0.9993650	16'00.24"	23° 26' 19"	-3 m 46 s
13	12° 03' 14"	0.34"	11° 04' 47"	4° 45' 46"	0.9993767	16'00.23"	23° 26' 19"	-3 m 45 s
14	12° 05' 42"	0.34"	11° 07' 04"	4° 46' 44"	0.9993885	16'00.22"	23° 26' 19"	-3 m 44 s
15	12° 08' 10"	0.34"	11° 09' 21"	4° 47' 41"	0.9994002	16'00.21"	23° 26' 19"	-3 m 44 s
16	12° 10' 38"	0.35"	11° 11' 37"	4° 48' 39"	0.9994120	16'00.19"	23° 26' 19"	-3 m 43 s
17	12° 13' 06"	0.35"	11° 13' 54"	4° 49' 37"	0.9994237	16'00.18"	23° 26' 19"	-3 m 42 s
18	12° 15' 34"	0.35"	11° 16' 11"	4° 50' 35"	0.9994355	16'00.17"	23° 26' 19"	-3 m 41 s
19	12° 18' 02"	0.35"	11° 18' 28"	4° 51' 32"	0.9994472	16'00.16"	23° 26' 19"	-3 m 41 s
20	12° 20' 30"	0.36"	11° 20' 45"	4° 52' 30"	0.9994589	16'00.15"	23° 26' 19"	-3 m 40 s
21	12° 22' 58"	0.36"	11° 23' 02"	4° 53' 28"	0.9994707	16'00.14"	23° 26' 19"	-3 m 39 s
22	12° 25' 26"	0.36"	11° 25' 18"	4° 54' 26"	0.9994824	16'00.13"	23° 26' 19"	-3 m 39 s
23	12° 27' 54"	0.36"	11° 27' 35"	4° 55' 23"	0.9994942	16'00.12"	23° 26' 19"	-3 m 38 s
24	12° 30' 22"	0.37"	11° 29' 52"	4° 56' 21"	0.9995059	16'00.10"	23° 26' 19"	-3 m 37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	47° 22' 29"	4° 02' 44"	43° 41' 29"	20° 53' 46"	1° 00' 45"	16' 33.23"	247° 40' 01"	0.09618
1	47° 59' 48"	4° 04' 55"	44° 19' 00"	21° 06' 33"	1° 00' 44"	16' 32.87"	247° 54' 54"	0.09920
2	48° 37' 06"	4° 07' 05"	44° 56' 37"	21° 19' 10"	1° 00' 42"	16' 32.51"	248° 9' 53"	0.10225
3	49° 14' 22"	4° 09' 13"	45° 34' 18"	21° 31' 39"	1° 00' 41"	16' 32.14"	248° 24' 58"	0.10534
4	49° 51' 37"	4° 11' 19"	46° 12' 04"	21° 43' 59"	1° 00' 40"	16' 31.76"	248° 40' 10"	0.10847
5	50° 28' 50"	4° 13' 23"	46° 49' 54"	21° 56' 09"	1° 00' 38"	16' 31.38"	248° 55' 28"	0.11163
6	51° 06' 01"	4° 15' 25"	47° 27' 49"	22° 08' 10"	1° 00' 37"	16' 30.99"	249° 10' 52"	0.11483
7	51° 43' 10"	4° 17' 25"	48° 05' 48"	22° 20' 02"	1° 00' 35"	16' 30.60"	249° 26' 23"	0.11807
8	52° 20' 18"	4° 19' 23"	48° 43' 52"	22° 31' 44"	1° 00' 34"	16' 30.20"	249° 42' 01"	0.12135
9	52° 57' 24"	4° 21' 19"	49° 21' 60"	22° 43' 17"	1° 00' 32"	16' 29.79"	249° 57' 45"	0.12466
10	53° 34' 28"	4° 23' 14"	50° 00' 12"	22° 54' 40"	1° 00' 31"	16' 29.38"	250° 13' 35"	0.12800
11	54° 11' 31"	4° 25' 06"	50° 38' 29"	23° 05' 53"	1° 00' 29"	16' 28.96"	250° 29' 32"	0.13138
12	54° 48' 31"	4° 26' 57"	51° 16' 50"	23° 16' 56"	1° 00' 28"	16' 28.53"	250° 45' 36"	0.13479
13	55° 25' 30"	4° 28' 46"	51° 55' 15"	23° 27' 50"	1° 00' 26"	16' 28.10"	251° 1' 46"	0.13824
14	56° 02' 27"	4° 30' 32"	52° 33' 44"	23° 38' 33"	1° 00' 25"	16' 27.67"	251° 18' 02"	0.14172
15	56° 39' 21"	4° 32' 17"	53° 12' 18"	23° 49' 06"	1° 00' 23"	16' 27.23"	251° 34' 24"	0.14523
16	57° 16' 14"	4° 33' 60"	53° 50' 55"	23° 59' 29"	1° 00' 21"	16' 26.78"	251° 50' 53"	0.14877
17	57° 53' 05"	4° 35' 40"	54° 29' 36"	24° 09' 42"	1° 00' 20"	16' 26.33"	252° 7' 28"	0.15234
18	58° 29' 54"	4° 37' 19"	55° 08' 21"	24° 19' 44"	1° 00' 18"	16' 25.87"	252° 24' 10"	0.15595
19	59° 06' 40"	4° 38' 56"	55° 47' 10"	24° 29' 36"	1° 00' 16"	16' 25.41"	252° 40' 57"	0.15959
20	59° 43' 25"	4° 40' 30"	56° 26' 02"	24° 39' 17"	1° 00' 15"	16' 24.94"	252° 57' 50"	0.16325
21	60° 20' 07"	4° 42' 03"	57° 04' 58"	24° 48' 48"	1° 00' 13"	16' 24.47"	253° 14' 50"	0.16695
22	60° 56' 48"	4° 43' 34"	57° 43' 58"	24° 58' 08"	1° 00' 11"	16' 24.00"	253° 31' 55"	0.17067
23	61° 33' 26"	4° 45' 02"	58° 23' 01"	25° 07' 17"	1° 00' 09"	16' 23.52"	253° 49' 06"	0.17442
24	62° 10' 02"	4° 46' 29"	59° 02' 07"	25° 16' 16"	1° 00' 07"	16' 23.03"	254° 6' 22"	0.17820

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	12° 30' 22"	0.37"	11° 29' 52"	4° 56' 21"	0.9995059	16'00.10"	23° 26' 19"	-3 m 37 s
1	12° 32' 50"	0.37"	11° 32' 09"	4° 57' 19"	0.9995176	16'00.09"	23° 26' 19"	-3 m 36 s
2	12° 35' 18"	0.37"	11° 34' 26"	4° 58' 16"	0.9995294	16'00.08"	23° 26' 19"	-3 m 36 s
3	12° 37' 46"	0.38"	11° 36' 42"	4° 59' 14"	0.9995411	16'00.07"	23° 26' 19"	-3 m 35 s
4	12° 40' 14"	0.38"	11° 38' 59"	5° 00' 12"	0.9995528	16'00.06"	23° 26' 19"	-3 m 34 s
5	12° 42' 42"	0.38"	11° 41' 16"	5° 01' 09"	0.9995645	16'00.05"	23° 26' 19"	-3 m 33 s
6	12° 45' 10"	0.38"	11° 43' 33"	5° 02' 07"	0.9995763	16'00.04"	23° 26' 19"	-3 m 33 s
7	12° 47' 38"	0.38"	11° 45' 50"	5° 03' 05"	0.9995880	16'00.03"	23° 26' 19"	-3 m 32 s
8	12° 50' 06"	0.39"	11° 48' 07"	5° 04' 02"	0.9995997	16'00.01"	23° 26' 19"	-3 m 31 s
9	12° 52' 34"	0.39"	11° 50' 23"	5° 04' 60"	0.9996114	16'00.00"	23° 26' 19"	-3 m 30 s
10	12° 55' 02"	0.39"	11° 52' 40"	5° 05' 58"	0.9996232	15'59.99"	23° 26' 19"	-3 m 30 s
11	12° 57' 30"	0.39"	11° 54' 57"	5° 06' 55"	0.9996349	15'59.98"	23° 26' 19"	-3 m 29 s
12	12° 59' 58"	0.40"	11° 57' 14"	5° 07' 53"	0.9996466	15'59.97"	23° 26' 19"	-3 m 28 s
13	13° 02' 26"	0.40"	11° 59' 31"	5° 08' 50"	0.9996583	15'59.96"	23° 26' 19"	-3 m 27 s
14	13° 04' 54"	0.40"	12° 01' 48"	5° 09' 48"	0.9996700	15'59.95"	23° 26' 19"	-3 m 27 s
15	13° 07' 22"	0.40"	12° 04' 05"	5° 10' 45"	0.9996817	15'59.94"	23° 26' 19"	-3 m 26 s
16	13° 09' 50"	0.40"	12° 06' 21"	5° 11' 43"	0.9996934	15'59.92"	23° 26' 19"	-3 m 25 s
17	13° 12' 18"	0.41"	12° 08' 38"	5° 12' 41"	0.9997051	15'59.91"	23° 26' 19"	-3 m 25 s
18	13° 14' 46"	0.41"	12° 10' 55"	5° 13' 38"	0.9997169	15'59.90"	23° 26' 19"	-3 m 24 s
19	13° 17' 14"	0.41"	12° 13' 12"	5° 14' 36"	0.9997286	15'59.89"	23° 26' 19"	-3 m 23 s
20	13° 19' 42"	0.41"	12° 15' 29"	5° 15' 33"	0.9997403	15'59.88"	23° 26' 19"	-3 m 22 s
21	13° 22' 10"	0.41"	12° 17' 46"	5° 16' 31"	0.9997520	15'59.87"	23° 26' 19"	-3 m 22 s
22	13° 24' 38"	0.41"	12° 20' 03"	5° 17' 28"	0.9997637	15'59.86"	23° 26' 19"	-3 m 21 s
23	13° 27' 06"	0.41"	12° 22' 20"	5° 18' 26"	0.9997754	15'59.85"	23° 26' 19"	-3 m 20 s
24	13° 29' 34"	0.42"	12° 24' 37"	5° 19' 23"	0.9997871	15'59.83"	23° 26' 19"	-3 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	62° 10' 02"	4° 46' 29"	59° 02' 07"	25° 16' 16"	1° 00' 07"	16' 23.03"	254° 6' 22"	0.17820
1	62° 46' 36"	4° 47' 53"	59° 41' 16"	25° 25' 03"	1° 00' 06"	16' 22.54"	254° 23' 44"	0.18201
2	63° 23' 08"	4° 49' 16"	60° 20' 29"	25° 33' 40"	1° 00' 04"	16' 22.05"	254° 41' 12"	0.18584
3	63° 59' 37"	4° 50' 37"	60° 59' 45"	25° 42' 05"	1° 00' 02"	16' 21.55"	254° 58' 45"	0.18970
4	64° 36' 05"	4° 51' 55"	61° 39' 03"	25° 50' 20"	1° 00' 00"	16' 21.05"	255° 16' 23"	0.19359
5	65° 12' 30"	4° 53' 11"	62° 18' 25"	25° 58' 23"	0° 59' 58"	16' 20.54"	255° 34' 06"	0.19750
6	65° 48' 52"	4° 54' 26"	62° 57' 49"	26° 06' 15"	0° 59' 56"	16' 20.03"	255° 51' 54"	0.20143
7	66° 25' 13"	4° 55' 38"	63° 37' 15"	26° 13' 56"	0° 59' 55"	16' 19.52"	256° 9' 47"	0.20539
8	67° 01' 31"	4° 56' 48"	64° 16' 45"	26° 21' 26"	0° 59' 53"	16' 19.00"	256° 27' 45"	0.20937
9	67° 37' 46"	4° 57' 56"	64° 56' 16"	26° 28' 44"	0° 59' 51"	16' 18.48"	256° 45' 47"	0.21338
10	68° 13' 60"	4° 59' 03"	65° 35' 50"	26° 35' 51"	0° 59' 49"	16' 17.95"	257° 3' 54"	0.21741
11	68° 50' 11"	5° 00' 07"	66° 15' 26"	26° 42' 46"	0° 59' 47"	16' 17.43"	257° 22' 05"	0.22146
12	69° 26' 20"	5° 01' 09"	66° 55' 04"	26° 49' 30"	0° 59' 45"	16' 16.89"	257° 40' 21"	0.22553
13	70° 02' 26"	5° 02' 09"	67° 34' 44"	26° 56' 03"	0° 59' 43"	16' 16.36"	257° 58' 40"	0.22963
14	70° 38' 30"	5° 03' 07"	68° 14' 26"	27° 02' 24"	0° 59' 41"	16' 15.82"	258° 17' 03"	0.23374
15	71° 14' 31"	5° 04' 02"	68° 54' 09"	27° 08' 33"	0° 59' 39"	16' 15.28"	258° 35' 30"	0.23787
16	71° 50' 30"	5° 04' 56"	69° 33' 54"	27° 14' 31"	0° 59' 37"	16' 14.74"	258° 54' 00"	0.24203
17	72° 26' 27"	5° 05' 48"	70° 13' 40"	27° 20' 17"	0° 59' 35"	16' 14.19"	259° 12' 34"	0.24620
18	73° 02' 21"	5° 06' 37"	70° 53' 28"	27° 25' 51"	0° 59' 33"	16' 13.64"	259° 31' 11"	0.25039
19	73° 38' 12"	5° 07' 25"	71° 33' 16"	27° 31' 14"	0° 59' 31"	16' 13.09"	259° 49' 52"	0.25460
20	74° 14' 01"	5° 08' 11"	72° 13' 06"	27° 36' 25"	0° 59' 29"	16' 12.54"	260° 8' 35"	0.25883
21	74° 49' 48"	5° 08' 54"	72° 52' 56"	27° 41' 24"	0° 59' 27"	16' 11.98"	260° 27' 21"	0.26307
22	75° 25' 32"	5° 09' 36"	73° 32' 47"	27° 46' 12"	0° 59' 25"	16' 11.43"	260° 46' 09"	0.26733
23	76° 01' 14"	5° 10' 15"	74° 12' 38"	27° 50' 47"	0° 59' 23"	16' 10.86"	261° 4' 60"	0.27160
24	76° 36' 53"	5° 10' 52"	74° 52' 30"	27° 55' 11"	0° 59' 21"	16' 10.30"	261° 23' 53"	0.27590

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	13° 29' 34"	0.42"	12° 24' 37"	5° 19' 23"	0.9997871	15'59.83"	23° 26' 19"	-3 m 19 s
1	13° 32' 02"	0.42"	12° 26' 53"	5° 20' 21"	0.9997988	15'59.82"	23° 26' 19"	-3 m 19 s
2	13° 34' 30"	0.42"	12° 29' 10"	5° 21' 18"	0.9998105	15'59.81"	23° 26' 19"	-3 m 18 s
3	13° 36' 57"	0.42"	12° 31' 27"	5° 22' 15"	0.9998222	15'59.80"	23° 26' 19"	-3 m 17 s
4	13° 39' 25"	0.42"	12° 33' 44"	5° 23' 13"	0.9998338	15'59.79"	23° 26' 19"	-3 m 17 s
5	13° 41' 53"	0.42"	12° 36' 01"	5° 24' 10"	0.9998455	15'59.78"	23° 26' 19"	-3 m 16 s
6	13° 44' 21"	0.42"	12° 38' 18"	5° 25' 08"	0.9998572	15'59.77"	23° 26' 19"	-3 m 15 s
7	13° 46' 49"	0.43"	12° 40' 35"	5° 26' 05"	0.9998689	15'59.76"	23° 26' 19"	-3 m 14 s
8	13° 49' 17"	0.43"	12° 42' 52"	5° 27' 03"	0.9998806	15'59.74"	23° 26' 19"	-3 m 14 s
9	13° 51' 45"	0.43"	12° 45' 09"	5° 27' 60"	0.9998923	15'59.73"	23° 26' 19"	-3 m 13 s
10	13° 54' 13"	0.43"	12° 47' 26"	5° 28' 57"	0.9999040	15'59.72"	23° 26' 19"	-3 m 12 s
11	13° 56' 41"	0.43"	12° 49' 43"	5° 29' 55"	0.9999157	15'59.71"	23° 26' 19"	-3 m 11 s
12	13° 59' 08"	0.43"	12° 51' 60"	5° 30' 52"	0.9999273	15'59.70"	23° 26' 19"	-3 m 11 s
13	14° 01' 36"	0.43"	12° 54' 17"	5° 31' 49"	0.9999390	15'59.69"	23° 26' 19"	-3 m 10 s
14	14° 04' 04"	0.43"	12° 56' 34"	5° 32' 47"	0.9999507	15'59.68"	23° 26' 19"	-3 m 09 s
15	14° 06' 32"	0.43"	12° 58' 50"	5° 33' 44"	0.9999624	15'59.67"	23° 26' 19"	-3 m 09 s
16	14° 08' 60"	0.43"	13° 01' 07"	5° 34' 41"	0.9999741	15'59.65"	23° 26' 19"	-3 m 08 s
17	14° 11' 28"	0.43"	13° 03' 24"	5° 35' 39"	0.9999858	15'59.64"	23° 26' 19"	-3 m 07 s
18	14° 13' 56"	0.43"	13° 05' 41"	5° 36' 36"	0.9999974	15'59.63"	23° 26' 19"	-3 m 06 s
19	14° 16' 23"	0.43"	13° 07' 58"	5° 37' 33"	1.0000091	15'59.62"	23° 26' 19"	-3 m 06 s
20	14° 18' 51"	0.43"	13° 10' 15"	5° 38' 30"	1.0000208	15'59.61"	23° 26' 19"	-3 m 05 s
21	14° 21' 19"	0.43"	13° 12' 32"	5° 39' 28"	1.0000325	15'59.60"	23° 26' 19"	-3 m 04 s
22	14° 23' 47"	0.44"	13° 14' 49"	5° 40' 25"	1.0000441	15'59.59"	23° 26' 19"	-3 m 03 s
23	14° 26' 15"	0.44"	13° 17' 06"	5° 41' 22"	1.0000558	15'59.58"	23° 26' 19"	-3 m 03 s
24	14° 28' 43"	0.44"	13° 19' 23"	5° 42' 19"	1.0000675	15'59.57"	23° 26' 19"	-3 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	76° 36' 53"	5° 10' 52"	74° 52' 30"	27° 55' 11"	0° 59' 21"	16' 10.30"	261° 23' 53"	0.27590
1	77° 12' 29"	5° 11' 28"	75° 32' 22"	27° 59' 23"	0° 59' 19"	16' 09.74"	261° 42' 48"	0.28020
2	77° 48' 03"	5° 12' 01"	76° 12' 15"	28° 03' 24"	0° 59' 17"	16' 09.17"	262° 1' 45"	0.28452
3	78° 23' 34"	5° 12' 32"	76° 52' 07"	28° 07' 12"	0° 59' 15"	16' 08.60"	262° 20' 43"	0.28886
4	78° 59' 03"	5° 13' 01"	77° 31' 59"	28° 10' 49"	0° 59' 12"	16' 08.03"	262° 39' 43"	0.29321
5	79° 34' 29"	5° 13' 29"	78° 11' 51"	28° 14' 14"	0° 59' 10"	16' 07.46"	262° 58' 45"	0.29757
6	80° 09' 53"	5° 13' 54"	78° 51' 42"	28° 17' 27"	0° 59' 08"	16' 06.89"	263° 17' 48"	0.30194
7	80° 45' 14"	5° 14' 17"	79° 31' 32"	28° 20' 28"	0° 59' 06"	16' 06.32"	263° 36' 51"	0.30633
8	81° 20' 32"	5° 14' 38"	80° 11' 22"	28° 23' 17"	0° 59' 04"	16' 05.74"	263° 55' 55"	0.31073
9	81° 55' 48"	5° 14' 57"	80° 51' 11"	28° 25' 55"	0° 59' 02"	16' 05.16"	264° 15' 00"	0.31514
10	82° 31' 01"	5° 15' 14"	81° 30' 59"	28° 28' 21"	0° 58' 60"	16' 04.58"	264° 34' 06"	0.31956
11	83° 06' 12"	5° 15' 29"	82° 10' 45"	28° 30' 35"	0° 58' 58"	16' 04.01"	264° 53' 12"	0.32399
12	83° 41' 20"	5° 15' 43"	82° 50' 30"	28° 32' 38"	0° 58' 56"	16' 03.43"	265° 12' 17"	0.32842
13	84° 16' 25"	5° 15' 54"	83° 30' 14"	28° 34' 28"	0° 58' 53"	16' 02.85"	265° 31' 23"	0.33287
14	84° 51' 28"	5° 16' 03"	84° 09' 56"	28° 36' 07"	0° 58' 51"	16' 02.26"	265° 50' 28"	0.33733
15	85° 26' 28"	5° 16' 10"	84° 49' 36"	28° 37' 35"	0° 58' 49"	16' 01.68"	266° 9' 33"	0.34180
16	86° 01' 26"	5° 16' 15"	85° 29' 14"	28° 38' 50"	0° 58' 47"	16' 01.10"	266° 28' 37"	0.34627
17	86° 36' 21"	5° 16' 19"	86° 08' 51"	28° 39' 54"	0° 58' 45"	16' 00.51"	266° 47' 40"	0.35075
18	87° 11' 13"	5° 16' 20"	86° 48' 24"	28° 40' 47"	0° 58' 43"	15' 59.93"	267° 6' 42"	0.35524
19	87° 46' 03"	5° 16' 19"	87° 27' 56"	28° 41' 28"	0° 58' 41"	15' 59.35"	267° 25' 43"	0.35974
20	88° 20' 50"	5° 16' 17"	88° 07' 25"	28° 41' 57"	0° 58' 38"	15' 58.76"	267° 44' 43"	0.36424
21	88° 55' 34"	5° 16' 12"	88° 46' 51"	28° 42' 15"	0° 58' 36"	15' 58.18"	268° 3' 41"	0.36874
22	89° 30' 16"	5° 16' 06"	89° 26' 14"	28° 42' 22"	0° 58' 34"	15' 57.59"	268° 22' 37"	0.37326
23	90° 04' 55"	5° 15' 58"	90° 05' 35"	28° 42' 17"	0° 58' 32"	15' 57.01"	268° 41' 31"	0.37777
24	90° 39' 31"	5° 15' 48"	90° 44' 52"	28° 42' 00"	0° 58' 30"	15' 56.42"	269° 0' 23"	0.38229

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	14° 28' 43"	0.44"	13° 19' 23"	5° 42' 19"	1.0000675	15'59.57"	23° 26' 19"	-3 m 02 s
1	14° 31' 10"	0.44"	13° 21' 40"	5° 43' 17"	1.0000791	15'59.55"	23° 26' 19"	-3 m 01 s
2	14° 33' 38"	0.44"	13° 23' 57"	5° 44' 14"	1.0000908	15'59.54"	23° 26' 19"	-3 m 01 s
3	14° 36' 06"	0.44"	13° 26' 14"	5° 45' 11"	1.0001025	15'59.53"	23° 26' 19"	-2 m 60 s
4	14° 38' 34"	0.44"	13° 28' 31"	5° 46' 08"	1.0001142	15'59.52"	23° 26' 19"	-2 m 59 s
5	14° 41' 02"	0.44"	13° 30' 48"	5° 47' 05"	1.0001258	15'59.51"	23° 26' 19"	-2 m 58 s
6	14° 43' 30"	0.44"	13° 33' 05"	5° 48' 02"	1.0001375	15'59.50"	23° 26' 19"	-2 m 58 s
7	14° 45' 57"	0.44"	13° 35' 22"	5° 48' 60"	1.0001492	15'59.49"	23° 26' 19"	-2 m 57 s
8	14° 48' 25"	0.44"	13° 37' 39"	5° 49' 57"	1.0001608	15'59.48"	23° 26' 19"	-2 m 56 s
9	14° 50' 53"	0.43"	13° 39' 56"	5° 50' 54"	1.0001725	15'59.46"	23° 26' 19"	-2 m 56 s
10	14° 53' 21"	0.43"	13° 42' 13"	5° 51' 51"	1.0001841	15'59.45"	23° 26' 19"	-2 m 55 s
11	14° 55' 49"	0.43"	13° 44' 30"	5° 52' 48"	1.0001958	15'59.44"	23° 26' 19"	-2 m 54 s
12	14° 58' 16"	0.43"	13° 46' 47"	5° 53' 45"	1.0002075	15'59.43"	23° 26' 19"	-2 m 53 s
13	15° 00' 44"	0.43"	13° 49' 04"	5° 54' 42"	1.0002191	15'59.42"	23° 26' 19"	-2 m 53 s
14	15° 03' 12"	0.43"	13° 51' 21"	5° 55' 39"	1.0002308	15'59.41"	23° 26' 19"	-2 m 52 s
15	15° 05' 40"	0.43"	13° 53' 38"	5° 56' 36"	1.0002425	15'59.40"	23° 26' 19"	-2 m 51 s
16	15° 08' 07"	0.43"	13° 55' 55"	5° 57' 34"	1.0002541	15'59.39"	23° 26' 19"	-2 m 50 s
17	15° 10' 35"	0.43"	13° 58' 13"	5° 58' 31"	1.0002658	15'59.38"	23° 26' 19"	-2 m 50 s
18	15° 13' 03"	0.43"	14° 00' 30"	5° 59' 28"	1.0002774	15'59.36"	23° 26' 19"	-2 m 49 s
19	15° 15' 31"	0.43"	14° 02' 47"	6° 00' 25"	1.0002891	15'59.35"	23° 26' 19"	-2 m 48 s
20	15° 17' 58"	0.43"	14° 05' 04"	6° 01' 22"	1.0003008	15'59.34"	23° 26' 19"	-2 m 48 s
21	15° 20' 26"	0.43"	14° 07' 21"	6° 02' 19"	1.0003124	15'59.33"	23° 26' 19"	-2 m 47 s
22	15° 22' 54"	0.43"	14° 09' 38"	6° 03' 16"	1.0003241	15'59.32"	23° 26' 19"	-2 m 46 s
23	15° 25' 22"	0.43"	14° 11' 55"	6° 04' 13"	1.0003357	15'59.31"	23° 26' 19"	-2 m 45 s
24	15° 27' 49"	0.42"	14° 14' 12"	6° 05' 10"	1.0003474	15'59.30"	23° 26' 19"	-2 m 45 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	90° 39' 31"	5° 15' 48"	90° 44' 52"	28° 42' 00"	0° 58' 30"	15' 56.42"	269° 0' 23"	0.38229
1	91° 14' 05"	5° 15' 35"	91° 24' 06"	28° 41' 33"	0° 58' 28"	15' 55.84"	269° 19' 13"	0.38682
2	91° 48' 36"	5° 15' 22"	92° 03' 17"	28° 40' 54"	0° 58' 26"	15' 55.25"	269° 38' 01"	0.39135
3	92° 23' 05"	5° 15' 06"	92° 42' 24"	28° 40' 04"	0° 58' 23"	15' 54.67"	269° 56' 45"	0.39588
4	92° 57' 31"	5° 14' 48"	93° 21' 27"	28° 39' 03"	0° 58' 21"	15' 54.08"	270° 15' 27"	0.40041
5	93° 31' 54"	5° 14' 28"	94° 00' 27"	28° 37' 51"	0° 58' 19"	15' 53.50"	270° 34' 06"	0.40495
6	94° 06' 15"	5° 14' 07"	94° 39' 23"	28° 36' 27"	0° 58' 17"	15' 52.92"	270° 52' 42"	0.40949
7	94° 40' 33"	5° 13' 44"	95° 18' 15"	28° 34' 53"	0° 58' 15"	15' 52.33"	271° 11' 15"	0.41403
8	95° 14' 48"	5° 13' 19"	95° 57' 03"	28° 33' 08"	0° 58' 13"	15' 51.75"	271° 29' 44"	0.41857
9	95° 49' 01"	5° 12' 52"	96° 35' 46"	28° 31' 12"	0° 58' 11"	15' 51.17"	271° 48' 09"	0.42311
10	96° 23' 11"	5° 12' 23"	97° 14' 25"	28° 29' 05"	0° 58' 08"	15' 50.59"	272° 6' 31"	0.42765
11	96° 57' 19"	5° 11' 52"	97° 52' 60"	28° 26' 47"	0° 58' 06"	15' 50.01"	272° 24' 49"	0.43220
12	97° 31' 24"	5° 11' 20"	98° 31' 30"	28° 24' 19"	0° 58' 04"	15' 49.43"	272° 43' 03"	0.43674
13	98° 05' 26"	5° 10' 46"	99° 09' 55"	28° 21' 40"	0° 58' 02"	15' 48.85"	273° 1' 12"	0.44128
14	98° 39' 26"	5° 10' 10"	99° 48' 16"	28° 18' 50"	0° 57' 60"	15' 48.27"	273° 19' 17"	0.44582
15	99° 13' 23"	5° 09' 32"	100° 26' 31"	28° 15' 50"	0° 57' 58"	15' 47.70"	273° 37' 18"	0.45035
16	99° 47' 18"	5° 08' 53"	101° 04' 41"	28° 12' 40"	0° 57' 56"	15' 47.12"	273° 55' 14"	0.45489
17	100° 21' 10"	5° 08' 12"	101° 42' 47"	28° 09' 19"	0° 57' 54"	15' 46.55"	274° 13' 05"	0.45942
18	100° 54' 60"	5° 07' 29"	102° 20' 47"	28° 05' 48"	0° 57' 51"	15' 45.97"	274° 30' 51"	0.46395
19	101° 28' 47"	5° 06' 44"	102° 58' 42"	28° 02' 07"	0° 57' 49"	15' 45.40"	274° 48' 32"	0.46848
20	102° 02' 31"	5° 05' 58"	103° 36' 31"	27° 58' 15"	0° 57' 47"	15' 44.83"	275° 6' 08"	0.47301
21	102° 36' 13"	5° 05' 10"	104° 14' 15"	27° 54' 14"	0° 57' 45"	15' 44.26"	275° 23' 38"	0.47753
22	103° 09' 53"	5° 04' 20"	104° 51' 53"	27° 50' 03"	0° 57' 43"	15' 43.69"	275° 41' 03"	0.48204
23	103° 43' 29"	5° 03' 29"	105° 29' 26"	27° 45' 42"	0° 57' 41"	15' 43.13"	275° 58' 22"	0.48655
24	104° 17' 04"	5° 02' 36"	106° 06' 52"	27° 41' 11"	0° 57' 39"	15' 42.56"	276° 15' 36"	0.49106

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	15° 27' 49"	0.42"	14° 14' 12"	6° 05' 10"	1.0003474	15'59.30"	23° 26' 19"	-2 m 45 s
1	15° 30' 17"	0.42"	14° 16' 29"	6° 06' 06"	1.0003590	15'59.29"	23° 26' 19"	-2 m 44 s
2	15° 32' 45"	0.42"	14° 18' 46"	6° 07' 03"	1.0003707	15'59.27"	23° 26' 19"	-2 m 43 s
3	15° 35' 13"	0.42"	14° 21' 03"	6° 08' 00"	1.0003823	15'59.26"	23° 26' 19"	-2 m 43 s
4	15° 37' 40"	0.42"	14° 23' 20"	6° 08' 57"	1.0003940	15'59.25"	23° 26' 19"	-2 m 42 s
5	15° 40' 08"	0.42"	14° 25' 38"	6° 09' 54"	1.0004056	15'59.24"	23° 26' 19"	-2 m 41 s
6	15° 42' 36"	0.42"	14° 27' 55"	6° 10' 51"	1.0004173	15'59.23"	23° 26' 19"	-2 m 40 s
7	15° 45' 03"	0.42"	14° 30' 12"	6° 11' 48"	1.0004290	15'59.22"	23° 26' 19"	-2 m 40 s
8	15° 47' 31"	0.41"	14° 32' 29"	6° 12' 45"	1.0004406	15'59.21"	23° 26' 19"	-2 m 39 s
9	15° 49' 59"	0.41"	14° 34' 46"	6° 13' 42"	1.0004523	15'59.20"	23° 26' 19"	-2 m 38 s
10	15° 52' 26"	0.41"	14° 37' 03"	6° 14' 39"	1.0004639	15'59.19"	23° 26' 19"	-2 m 38 s
11	15° 54' 54"	0.41"	14° 39' 20"	6° 15' 35"	1.0004756	15'59.17"	23° 26' 19"	-2 m 37 s
12	15° 57' 22"	0.41"	14° 41' 37"	6° 16' 32"	1.0004872	15'59.16"	23° 26' 19"	-2 m 36 s
13	15° 59' 49"	0.41"	14° 43' 54"	6° 17' 29"	1.0004989	15'59.15"	23° 26' 19"	-2 m 35 s
14	16° 02' 17"	0.40"	14° 46' 12"	6° 18' 26"	1.0005105	15'59.14"	23° 26' 19"	-2 m 35 s
15	16° 04' 45"	0.40"	14° 48' 29"	6° 19' 23"	1.0005222	15'59.13"	23° 26' 19"	-2 m 34 s
16	16° 07' 12"	0.40"	14° 50' 46"	6° 20' 19"	1.0005338	15'59.12"	23° 26' 19"	-2 m 33 s
17	16° 09' 40"	0.40"	14° 53' 03"	6° 21' 16"	1.0005455	15'59.11"	23° 26' 19"	-2 m 33 s
18	16° 12' 08"	0.40"	14° 55' 20"	6° 22' 13"	1.0005571	15'59.10"	23° 26' 19"	-2 m 32 s
19	16° 14' 35"	0.39"	14° 57' 37"	6° 23' 10"	1.0005688	15'59.08"	23° 26' 19"	-2 m 31 s
20	16° 17' 03"	0.39"	14° 59' 55"	6° 24' 06"	1.0005804	15'59.07"	23° 26' 19"	-2 m 31 s
21	16° 19' 31"	0.39"	15° 02' 12"	6° 25' 03"	1.0005921	15'59.06"	23° 26' 19"	-2 m 30 s
22	16° 21' 58"	0.39"	15° 04' 29"	6° 25' 60"	1.0006037	15'59.05"	23° 26' 19"	-2 m 29 s
23	16° 24' 26"	0.39"	15° 06' 46"	6° 26' 57"	1.0006154	15'59.04"	23° 26' 19"	-2 m 28 s
24	16° 26' 54"	0.38"	15° 09' 03"	6° 27' 53"	1.0006270	15'59.03"	23° 26' 19"	-2 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	104° 17' 04"	5° 02' 36"	106° 06' 52"	27° 41' 11"	0° 57' 39"	15' 42.56"	276° 15' 36"	0.49106
1	104° 50' 36"	5° 01' 41"	106° 44' 13"	27° 36' 30"	0° 57' 37"	15' 42.00"	276° 32' 44"	0.49556
2	105° 24' 05"	5° 00' 45"	107° 21' 28"	27° 31' 40"	0° 57' 35"	15' 41.44"	276° 49' 46"	0.50006
3	105° 57' 32"	4° 59' 47"	107° 58' 37"	27° 26' 40"	0° 57' 33"	15' 40.88"	277° 6' 42"	0.50455
4	106° 30' 56"	4° 58' 47"	108° 35' 40"	27° 21' 31"	0° 57' 31"	15' 40.32"	277° 23' 31"	0.50903
5	107° 04' 18"	4° 57' 46"	109° 12' 37"	27° 16' 12"	0° 57' 29"	15' 39.76"	277° 40' 14"	0.51351
6	107° 37' 37"	4° 56' 43"	109° 49' 28"	27° 10' 44"	0° 57' 27"	15' 39.21"	277° 56' 51"	0.51798
7	108° 10' 54"	4° 55' 39"	110° 26' 12"	27° 05' 07"	0° 57' 25"	15' 38.66"	278° 13' 22"	0.52244
8	108° 44' 09"	4° 54' 33"	111° 02' 50"	26° 59' 21"	0° 57' 23"	15' 38.11"	278° 29' 46"	0.52690
9	109° 17' 21"	4° 53' 25"	111° 39' 22"	26° 53' 25"	0° 57' 21"	15' 37.56"	278° 46' 03"	0.53134
10	109° 50' 31"	4° 52' 16"	112° 15' 48"	26° 47' 21"	0° 57' 19"	15' 37.01"	279° 2' 13"	0.53578
11	110° 23' 38"	4° 51' 05"	112° 52' 07"	26° 41' 08"	0° 57' 17"	15' 36.47"	279° 18' 16"	0.54021
12	110° 56' 43"	4° 49' 53"	113° 28' 19"	26° 34' 46"	0° 57' 15"	15' 35.92"	279° 34' 13"	0.54464
13	111° 29' 45"	4° 48' 39"	114° 04' 25"	26° 28' 15"	0° 57' 13"	15' 35.38"	279° 50' 02"	0.54905
14	112° 02' 45"	4° 47' 24"	114° 40' 24"	26° 21' 36"	0° 57' 11"	15' 34.84"	280° 5' 44"	0.55345
15	112° 35' 43"	4° 46' 07"	115° 16' 17"	26° 14' 48"	0° 57' 09"	15' 34.31"	280° 21' 19"	0.55785
16	113° 08' 39"	4° 44' 49"	115° 52' 03"	26° 07' 52"	0° 57' 07"	15' 33.77"	280° 36' 47"	0.56223
17	113° 41' 32"	4° 43' 30"	116° 27' 42"	26° 00' 48"	0° 57' 05"	15' 33.24"	280° 52' 08"	0.56660
18	114° 14' 22"	4° 42' 09"	117° 03' 15"	25° 53' 35"	0° 57' 03"	15' 32.71"	281° 7' 20"	0.57097
19	114° 47' 11"	4° 40' 46"	117° 38' 40"	25° 46' 14"	0° 57' 01"	15' 32.18"	281° 22' 26"	0.57532
20	115° 19' 57"	4° 39' 22"	118° 13' 60"	25° 38' 45"	0° 56' 59"	15' 31.66"	281° 37' 24"	0.57966
21	115° 52' 41"	4° 37' 57"	118° 49' 12"	25° 31' 08"	0° 56' 57"	15' 31.14"	281° 52' 14"	0.58399
22	116° 25' 22"	4° 36' 30"	119° 24' 17"	25° 23' 24"	0° 56' 55"	15' 30.62"	282° 6' 56"	0.58831
23	116° 58' 02"	4° 35' 02"	119° 59' 16"	25° 15' 31"	0° 56' 53"	15' 30.10"	282° 21' 31"	0.59261
24	117° 30' 39"	4° 33' 32"	120° 34' 08"	25° 07' 31"	0° 56' 51"	15' 29.58"	282° 35' 58"	0.59691

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	16° 26' 54"	0.38"	15° 09' 03"	6° 27' 53"	1.0006270	15'59.03"	23° 26' 19"	-2 m 28 s
1	16° 29' 21"	0.38"	15° 11' 21"	6° 28' 50"	1.0006387	15'59.02"	23° 26' 19"	-2 m 27 s
2	16° 31' 49"	0.38"	15° 13' 38"	6° 29' 47"	1.0006503	15'59.01"	23° 26' 19"	-2 m 26 s
3	16° 34' 17"	0.38"	15° 15' 55"	6° 30' 43"	1.0006620	15'59.00"	23° 26' 19"	-2 m 26 s
4	16° 36' 44"	0.37"	15° 18' 12"	6° 31' 40"	1.0006736	15'58.98"	23° 26' 19"	-2 m 25 s
5	16° 39' 12"	0.37"	15° 20' 29"	6° 32' 36"	1.0006853	15'58.97"	23° 26' 19"	-2 m 24 s
6	16° 41' 39"	0.37"	15° 22' 47"	6° 33' 33"	1.0006969	15'58.96"	23° 26' 19"	-2 m 23 s
7	16° 44' 07"	0.37"	15° 25' 04"	6° 34' 30"	1.0007086	15'58.95"	23° 26' 19"	-2 m 23 s
8	16° 46' 35"	0.36"	15° 27' 21"	6° 35' 26"	1.0007202	15'58.94"	23° 26' 19"	-2 m 22 s
9	16° 49' 02"	0.36"	15° 29' 38"	6° 36' 23"	1.0007319	15'58.93"	23° 26' 19"	-2 m 21 s
10	16° 51' 30"	0.36"	15° 31' 55"	6° 37' 19"	1.0007435	15'58.92"	23° 26' 19"	-2 m 21 s
11	16° 53' 57"	0.35"	15° 34' 13"	6° 38' 16"	1.0007552	15'58.91"	23° 26' 19"	-2 m 20 s
12	16° 56' 25"	0.35"	15° 36' 30"	6° 39' 13"	1.0007668	15'58.89"	23° 26' 19"	-2 m 19 s
13	16° 58' 53"	0.35"	15° 38' 47"	6° 40' 09"	1.0007785	15'58.88"	23° 26' 19"	-2 m 19 s
14	17° 01' 20"	0.35"	15° 41' 04"	6° 41' 06"	1.0007901	15'58.87"	23° 26' 19"	-2 m 18 s
15	17° 03' 48"	0.34"	15° 43' 22"	6° 42' 02"	1.0008018	15'58.86"	23° 26' 19"	-2 m 17 s
16	17° 06' 15"	0.34"	15° 45' 39"	6° 42' 59"	1.0008134	15'58.85"	23° 26' 19"	-2 m 16 s
17	17° 08' 43"	0.34"	15° 47' 56"	6° 43' 55"	1.0008251	15'58.84"	23° 26' 19"	-2 m 16 s
18	17° 11' 10"	0.33"	15° 50' 14"	6° 44' 52"	1.0008367	15'58.83"	23° 26' 19"	-2 m 15 s
19	17° 13' 38"	0.33"	15° 52' 31"	6° 45' 48"	1.0008484	15'58.82"	23° 26' 19"	-2 m 14 s
20	17° 16' 06"	0.33"	15° 54' 48"	6° 46' 44"	1.0008600	15'58.81"	23° 26' 19"	-2 m 14 s
21	17° 18' 33"	0.32"	15° 57' 05"	6° 47' 41"	1.0008717	15'58.79"	23° 26' 19"	-2 m 13 s
22	17° 21' 01"	0.32"	15° 59' 23"	6° 48' 37"	1.0008833	15'58.78"	23° 26' 19"	-2 m 12 s
23	17° 23' 28"	0.32"	16° 01' 40"	6° 49' 34"	1.0008950	15'58.77"	23° 26' 19"	-2 m 12 s
24	17° 25' 56"	0.31"	16° 03' 57"	6° 50' 30"	1.0009066	15'58.76"	23° 26' 19"	-2 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	117° 30' 39"	4° 33' 32"	120° 34' 08"	25° 07' 31"	0° 56' 51"	15' 29.58"	282° 35' 58"	0.59691
1	118° 03' 13"	4° 32' 01"	121° 08' 53"	24° 59' 23"	0° 56' 49"	15' 29.07"	282° 50' 17"	0.60119
2	118° 35' 46"	4° 30' 29"	121° 43' 31"	24° 51' 08"	0° 56' 48"	15' 28.56"	283° 4' 28"	0.60546
3	119° 08' 16"	4° 28' 55"	122° 18' 02"	24° 42' 45"	0° 56' 46"	15' 28.05"	283° 18' 31"	0.60971
4	119° 40' 44"	4° 27' 20"	122° 52' 27"	24° 34' 15"	0° 56' 44"	15' 27.55"	283° 32' 25"	0.61395
5	120° 13' 10"	4° 25' 44"	123° 26' 44"	24° 25' 37"	0° 56' 42"	15' 27.04"	283° 46' 12"	0.61818
6	120° 45' 34"	4° 24' 06"	124° 00' 55"	24° 16' 53"	0° 56' 40"	15' 26.54"	283° 59' 51"	0.62240
7	121° 17' 56"	4° 22' 27"	124° 34' 59"	24° 08' 01"	0° 56' 38"	15' 26.05"	284° 13' 22"	0.62660
8	121° 50' 15"	4° 20' 47"	125° 08' 56"	23° 59' 03"	0° 56' 37"	15' 25.55"	284° 26' 44"	0.63078
9	122° 22' 33"	4° 19' 06"	125° 42' 46"	23° 49' 57"	0° 56' 35"	15' 25.06"	284° 39' 58"	0.63496
10	122° 54' 48"	4° 17' 23"	126° 16' 30"	23° 40' 45"	0° 56' 33"	15' 24.57"	284° 53' 04"	0.63911
11	123° 27' 01"	4° 15' 39"	126° 50' 06"	23° 31' 26"	0° 56' 31"	15' 24.08"	285° 6' 01"	0.64326
12	123° 59' 12"	4° 13' 54"	127° 23' 36"	23° 22' 01"	0° 56' 29"	15' 23.60"	285° 18' 50"	0.64738
13	124° 31' 21"	4° 12' 07"	127° 56' 59"	23° 12' 28"	0° 56' 28"	15' 23.12"	285° 31' 31"	0.65149
14	125° 03' 28"	4° 10' 20"	128° 30' 15"	23° 02' 50"	0° 56' 26"	15' 22.64"	285° 44' 03"	0.65559
15	125° 35' 33"	4° 08' 31"	129° 03' 24"	22° 53' 05"	0° 56' 24"	15' 22.16"	285° 56' 26"	0.65967
16	126° 07' 36"	4° 06' 41"	129° 36' 27"	22° 43' 14"	0° 56' 22"	15' 21.69"	286° 8' 42"	0.66373
17	126° 39' 36"	4° 04' 50"	130° 09' 23"	22° 33' 16"	0° 56' 21"	15' 21.22"	286° 20' 48"	0.66778
18	127° 11' 35"	4° 02' 57"	130° 42' 13"	22° 23' 13"	0° 56' 19"	15' 20.76"	286° 32' 46"	0.67181
19	127° 43' 32"	4° 01' 04"	131° 14' 55"	22° 13' 03"	0° 56' 17"	15' 20.29"	286° 44' 36"	0.67582
20	128° 15' 27"	3° 59' 09"	131° 47' 31"	22° 02' 48"	0° 56' 16"	15' 19.83"	286° 56' 17"	0.67982
21	128° 47' 20"	3° 57' 14"	132° 20' 01"	21° 52' 27"	0° 56' 14"	15' 19.37"	287° 7' 49"	0.68379
22	129° 19' 11"	3° 55' 17"	132° 52' 24"	21° 41' 60"	0° 56' 12"	15' 18.92"	287° 19' 13"	0.68776
23	129° 50' 60"	3° 53' 19"	133° 24' 40"	21° 31' 27"	0° 56' 11"	15' 18.46"	287° 30' 28"	0.69170
24	130° 22' 47"	3° 51' 20"	133° 56' 50"	21° 20' 49"	0° 56' 09"	15' 18.01"	287° 41' 35"	0.69562

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	17° 25' 56"	0.31"	16° 03' 57"	6° 50' 30"	1.0009066	15'58.76"	23° 26' 19"	-2 m 11 s
1	17° 28' 23"	0.31"	16° 06' 15"	6° 51' 26"	1.0009183	15'58.75"	23° 26' 19"	-2 m 10 s
2	17° 30' 51"	0.31"	16° 08' 32"	6° 52' 23"	1.0009299	15'58.74"	23° 26' 19"	-2 m 09 s
3	17° 33' 18"	0.30"	16° 10' 49"	6° 53' 19"	1.0009416	15'58.73"	23° 26' 19"	-2 m 09 s
4	17° 35' 46"	0.30"	16° 13' 07"	6° 54' 16"	1.0009532	15'58.72"	23° 26' 19"	-2 m 08 s
5	17° 38' 13"	0.30"	16° 15' 24"	6° 55' 12"	1.0009649	15'58.70"	23° 26' 19"	-2 m 07 s
6	17° 40' 41"	0.29"	16° 17' 41"	6° 56' 08"	1.0009765	15'58.69"	23° 26' 19"	-2 m 07 s
7	17° 43' 08"	0.29"	16° 19' 59"	6° 57' 05"	1.0009882	15'58.68"	23° 26' 19"	-2 m 06 s
8	17° 45' 36"	0.28"	16° 22' 16"	6° 58' 01"	1.0009999	15'58.67"	23° 26' 19"	-2 m 05 s
9	17° 48' 03"	0.28"	16° 24' 33"	6° 58' 57"	1.0010115	15'58.66"	23° 26' 19"	-2 m 05 s
10	17° 50' 31"	0.28"	16° 26' 51"	6° 59' 53"	1.0010232	15'58.65"	23° 26' 19"	-2 m 04 s
11	17° 52' 58"	0.27"	16° 29' 08"	7° 00' 50"	1.0010348	15'58.64"	23° 26' 19"	-2 m 03 s
12	17° 55' 26"	0.27"	16° 31' 25"	7° 01' 46"	1.0010465	15'58.63"	23° 26' 19"	-2 m 02 s
13	17° 57' 53"	0.27"	16° 33' 43"	7° 02' 42"	1.0010581	15'58.62"	23° 26' 19"	-2 m 02 s
14	18° 00' 21"	0.26"	16° 36' 00"	7° 03' 38"	1.0010698	15'58.60"	23° 26' 19"	-2 m 01 s
15	18° 02' 48"	0.26"	16° 38' 18"	7° 04' 35"	1.0010815	15'58.59"	23° 26' 19"	-2 m 00 s
16	18° 05' 16"	0.25"	16° 40' 35"	7° 05' 31"	1.0010931	15'58.58"	23° 26' 19"	-1 m 60 s
17	18° 07' 43"	0.25"	16° 42' 52"	7° 06' 27"	1.0011048	15'58.57"	23° 26' 19"	-1 m 59 s
18	18° 10' 11"	0.25"	16° 45' 10"	7° 07' 23"	1.0011164	15'58.56"	23° 26' 19"	-1 m 58 s
19	18° 12' 38"	0.24"	16° 47' 27"	7° 08' 19"	1.0011281	15'58.55"	23° 26' 19"	-1 m 58 s
20	18° 15' 06"	0.24"	16° 49' 45"	7° 09' 15"	1.0011398	15'58.54"	23° 26' 19"	-1 m 57 s
21	18° 17' 33"	0.23"	16° 52' 02"	7° 10' 12"	1.0011514	15'58.53"	23° 26' 19"	-1 m 56 s
22	18° 20' 01"	0.23"	16° 54' 20"	7° 11' 08"	1.0011631	15'58.52"	23° 26' 19"	-1 m 56 s
23	18° 22' 28"	0.22"	16° 56' 37"	7° 12' 04"	1.0011747	15'58.50"	23° 26' 19"	-1 m 55 s
24	18° 24' 55"	0.22"	16° 58' 54"	7° 12' 60"	1.0011864	15'58.49"	23° 26' 19"	-1 m 54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	130° 22' 47"	3° 51' 20"	133° 56' 50"	21° 20' 49"	0° 56' 09"	15' 18.01"	287° 41' 35"	0.69562
1	130° 54' 32"	3° 49' 20"	134° 28' 54"	21° 10' 05"	0° 56' 07"	15' 17.57"	287° 52' 32"	0.69953
2	131° 26' 16"	3° 47' 19"	135° 00' 51"	20° 59' 16"	0° 56' 06"	15' 17.12"	288° 3' 21"	0.70342
3	131° 57' 57"	3° 45' 17"	135° 32' 42"	20° 48' 21"	0° 56' 04"	15' 16.68"	288° 14' 02"	0.70729
4	132° 29' 37"	3° 43' 13"	136° 04' 26"	20° 37' 21"	0° 56' 02"	15' 16.24"	288° 24' 33"	0.71114
5	133° 01' 15"	3° 41' 09"	136° 36' 04"	20° 26' 16"	0° 56' 01"	15' 15.81"	288° 34' 56"	0.71497
6	133° 32' 51"	3° 39' 04"	137° 07' 36"	20° 15' 06"	0° 55' 59"	15' 15.38"	288° 45' 10"	0.71879
7	134° 04' 25"	3° 36' 58"	137° 39' 02"	20° 03' 51"	0° 55' 58"	15' 14.95"	288° 55' 15"	0.72258
8	134° 35' 57"	3° 34' 50"	138° 10' 21"	19° 52' 31"	0° 55' 56"	15' 14.52"	289° 5' 12"	0.72636
9	135° 07' 28"	3° 32' 42"	138° 41' 35"	19° 41' 06"	0° 55' 55"	15' 14.10"	289° 14' 59"	0.73011
10	135° 38' 57"	3° 30' 33"	139° 12' 42"	19° 29' 36"	0° 55' 53"	15' 13.68"	289° 24' 38"	0.73384
11	136° 10' 24"	3° 28' 23"	139° 43' 44"	19° 18' 01"	0° 55' 51"	15' 13.26"	289° 34' 08"	0.73756
12	136° 41' 49"	3° 26' 12"	140° 14' 39"	19° 06' 22"	0° 55' 50"	15' 12.85"	289° 43' 29"	0.74125
13	137° 13' 13"	3° 24' 00"	140° 45' 28"	18° 54' 39"	0° 55' 48"	15' 12.44"	289° 52' 42"	0.74493
14	137° 44' 35"	3° 21' 47"	141° 16' 12"	18° 42' 50"	0° 55' 47"	15' 12.03"	290° 1' 45"	0.74858
15	138° 15' 55"	3° 19' 34"	141° 46' 50"	18° 30' 58"	0° 55' 45"	15' 11.63"	290° 10' 40"	0.75221
16	138° 47' 14"	3° 17' 19"	142° 17' 22"	18° 19' 01"	0° 55' 44"	15' 11.22"	290° 19' 26"	0.75582
17	139° 18' 30"	3° 15' 04"	142° 47' 49"	18° 06' 60"	0° 55' 42"	15' 10.82"	290° 28' 03"	0.75941
18	139° 49' 46"	3° 12' 47"	143° 18' 09"	17° 54' 55"	0° 55' 41"	15' 10.43"	290° 36' 31"	0.76298
19	140° 20' 60"	3° 10' 30"	143° 48' 25"	17° 42' 45"	0° 55' 40"	15' 10.04"	290° 44' 50"	0.76653
20	140° 52' 12"	3° 08' 12"	144° 18' 34"	17° 30' 32"	0° 55' 38"	15' 09.65"	290° 52' 60"	0.77005
21	141° 23' 22"	3° 05' 53"	144° 48' 38"	17° 18' 14"	0° 55' 37"	15' 09.26"	291° 1' 01"	0.77356
22	141° 54' 31"	3° 03' 34"	145° 18' 37"	17° 05' 53"	0° 55' 35"	15' 08.88"	291° 8' 53"	0.77704
23	142° 25' 38"	3° 01' 14"	145° 48' 31"	16° 53' 28"	0° 55' 34"	15' 08.50"	291° 16' 37"	0.78049
24	142° 56' 44"	2° 58' 52"	146° 18' 19"	16° 40' 59"	0° 55' 33"	15' 08.12"	291° 24' 11"	0.78393

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	18° 24' 55"	0.22"	16° 58' 54"	7° 12' 60"	1.0011864	15'58.49"	23° 26' 19"	-1 m 54 s
1	18° 27' 23"	0.22"	17° 01' 12"	7° 13' 56"	1.0011981	15'58.48"	23° 26' 19"	-1 m 53 s
2	18° 29' 50"	0.21"	17° 03' 29"	7° 14' 52"	1.0012097	15'58.47"	23° 26' 19"	-1 m 53 s
3	18° 32' 18"	0.21"	17° 05' 47"	7° 15' 48"	1.0012214	15'58.46"	23° 26' 19"	-1 m 52 s
4	18° 34' 45"	0.20"	17° 08' 04"	7° 16' 44"	1.0012331	15'58.45"	23° 26' 19"	-1 m 51 s
5	18° 37' 13"	0.20"	17° 10' 22"	7° 17' 40"	1.0012447	15'58.44"	23° 26' 19"	-1 m 51 s
6	18° 39' 40"	0.19"	17° 12' 39"	7° 18' 36"	1.0012564	15'58.43"	23° 26' 19"	-1 m 50 s
7	18° 42' 07"	0.19"	17° 14' 57"	7° 19' 32"	1.0012681	15'58.41"	23° 26' 19"	-1 m 49 s
8	18° 44' 35"	0.18"	17° 17' 14"	7° 20' 28"	1.0012797	15'58.40"	23° 26' 19"	-1 m 49 s
9	18° 47' 02"	0.18"	17° 19' 32"	7° 21' 24"	1.0012914	15'58.39"	23° 26' 19"	-1 m 48 s
10	18° 49' 30"	0.17"	17° 21' 49"	7° 22' 20"	1.0013031	15'58.38"	23° 26' 19"	-1 m 47 s
11	18° 51' 57"	0.17"	17° 24' 07"	7° 23' 16"	1.0013147	15'58.37"	23° 26' 19"	-1 m 47 s
12	18° 54' 24"	0.16"	17° 26' 24"	7° 24' 12"	1.0013264	15'58.36"	23° 26' 19"	-1 m 46 s
13	18° 56' 52"	0.16"	17° 28' 42"	7° 25' 08"	1.0013381	15'58.35"	23° 26' 19"	-1 m 45 s
14	18° 59' 19"	0.16"	17° 30' 59"	7° 26' 04"	1.0013497	15'58.34"	23° 26' 19"	-1 m 45 s
15	19° 01' 47"	0.15"	17° 33' 17"	7° 26' 60"	1.0013614	15'58.33"	23° 26' 19"	-1 m 44 s
16	19° 04' 14"	0.15"	17° 35' 34"	7° 27' 56"	1.0013731	15'58.31"	23° 26' 19"	-1 m 43 s
17	19° 06' 41"	0.14"	17° 37' 52"	7° 28' 51"	1.0013848	15'58.30"	23° 26' 19"	-1 m 43 s
18	19° 09' 09"	0.14"	17° 40' 09"	7° 29' 47"	1.0013964	15'58.29"	23° 26' 19"	-1 m 42 s
19	19° 11' 36"	0.13"	17° 42' 27"	7° 30' 43"	1.0014081	15'58.28"	23° 26' 19"	-1 m 41 s
20	19° 14' 03"	0.13"	17° 44' 44"	7° 31' 39"	1.0014198	15'58.27"	23° 26' 19"	-1 m 40 s
21	19° 16' 31"	0.12"	17° 47' 02"	7° 32' 35"	1.0014315	15'58.26"	23° 26' 19"	-1 m 40 s
22	19° 18' 58"	0.12"	17° 49' 20"	7° 33' 31"	1.0014431	15'58.25"	23° 26' 19"	-1 m 39 s
23	19° 21' 26"	0.11"	17° 51' 37"	7° 34' 26"	1.0014548	15'58.24"	23° 26' 19"	-1 m 38 s
24	19° 23' 53"	0.11"	17° 53' 55"	7° 35' 22"	1.0014665	15'58.22"	23° 26' 19"	-1 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	142° 56' 44"	2° 58' 52"	146° 18' 19"	16° 40' 59"	0° 55' 33"	15' 08.12"	291° 24' 11"	0.78393
1	143° 27' 49"	2° 56' 30"	146° 48' 02"	16° 28' 26"	0° 55' 31"	15' 07.74"	291° 31' 37"	0.78734
2	143° 58' 51"	2° 54' 08"	147° 17' 40"	16° 15' 50"	0° 55' 30"	15' 07.37"	291° 38' 53"	0.79074
3	144° 29' 53"	2° 51' 44"	147° 47' 12"	16° 03' 10"	0° 55' 28"	15' 07.00"	291° 46' 00"	0.79410
4	145° 00' 52"	2° 49' 20"	148° 16' 40"	15° 50' 27"	0° 55' 27"	15' 06.64"	291° 52' 59"	0.79745
5	145° 31' 51"	2° 46' 55"	148° 46' 02"	15° 37' 40"	0° 55' 26"	15' 06.28"	291° 59' 48"	0.80077
6	146° 02' 48"	2° 44' 30"	149° 15' 20"	15° 24' 50"	0° 55' 24"	15' 05.92"	292° 6' 29"	0.80407
7	146° 33' 43"	2° 42' 04"	149° 44' 33"	15° 11' 57"	0° 55' 23"	15' 05.56"	292° 12' 60"	0.80734
8	147° 04' 37"	2° 39' 37"	150° 13' 41"	14° 59' 01"	0° 55' 22"	15' 05.21"	292° 19' 22"	0.81060
9	147° 35' 30"	2° 37' 09"	150° 42' 44"	14° 46' 01"	0° 55' 21"	15' 04.86"	292° 25' 35"	0.81382
10	148° 06' 21"	2° 34' 41"	151° 11' 43"	14° 32' 58"	0° 55' 19"	15' 04.51"	292° 31' 39"	0.81703
11	148° 37' 11"	2° 32' 12"	151° 40' 37"	14° 19' 53"	0° 55' 18"	15' 04.16"	292° 37' 34"	0.82021
12	149° 07' 59"	2° 29' 43"	152° 09' 26"	14° 06' 44"	0° 55' 17"	15' 03.82"	292° 43' 20"	0.82336
13	149° 38' 46"	2° 27' 13"	152° 38' 11"	13° 53' 33"	0° 55' 16"	15' 03.48"	292° 48' 56"	0.82649
14	150° 09' 32"	2° 24' 42"	153° 06' 52"	13° 40' 18"	0° 55' 14"	15' 03.15"	292° 54' 24"	0.82960
15	150° 40' 16"	2° 22' 11"	153° 35' 28"	13° 27' 01"	0° 55' 13"	15' 02.82"	292° 59' 42"	0.83268
16	151° 10' 59"	2° 19' 39"	154° 04' 00"	13° 13' 41"	0° 55' 12"	15' 02.49"	293° 4' 50"	0.83574
17	151° 41' 41"	2° 17' 06"	154° 32' 28"	13° 00' 19"	0° 55' 11"	15' 02.16"	293° 9' 50"	0.83877
18	152° 12' 22"	2° 14' 33"	155° 00' 52"	12° 46' 54"	0° 55' 09"	15' 01.84"	293° 14' 40"	0.84178
19	152° 43' 01"	2° 11' 60"	155° 29' 11"	12° 33' 26"	0° 55' 08"	15' 01.52"	293° 19' 21"	0.84476
20	153° 13' 39"	2° 09' 26"	155° 57' 27"	12° 19' 56"	0° 55' 07"	15' 01.20"	293° 23' 52"	0.84772
21	153° 44' 16"	2° 06' 51"	156° 25' 38"	12° 06' 24"	0° 55' 06"	15' 00.89"	293° 28' 14"	0.85065
22	154° 14' 52"	2° 04' 16"	156° 53' 46"	11° 52' 49"	0° 55' 05"	15' 00.57"	293° 32' 26"	0.85355
23	154° 45' 26"	2° 01' 41"	157° 21' 50"	11° 39' 12"	0° 55' 04"	15' 00.27"	293° 36' 29"	0.85643
24	155° 15' 59"	1° 59' 05"	157° 49' 50"	11° 25' 33"	0° 55' 03"	14' 59.96"	293° 40' 22"	0.85929

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	19° 23' 53"	0.11"	17° 53' 55"	7° 35' 22"	1.0014665	15'58.22"	23° 26' 19"	-1 m 38 s
1	19° 26' 20"	0.10"	17° 56' 12"	7° 36' 18"	1.0014782	15'58.21"	23° 26' 19"	-1 m 37 s
2	19° 28' 48"	0.10"	17° 58' 30"	7° 37' 14"	1.0014899	15'58.20"	23° 26' 19"	-1 m 36 s
3	19° 31' 15"	0.09"	18° 00' 48"	7° 38' 09"	1.0015015	15'58.19"	23° 26' 19"	-1 m 36 s
4	19° 33' 42"	0.09"	18° 03' 05"	7° 39' 05"	1.0015132	15'58.18"	23° 26' 19"	-1 m 35 s
5	19° 36' 10"	0.08"	18° 05' 23"	7° 40' 01"	1.0015249	15'58.17"	23° 26' 19"	-1 m 34 s
6	19° 38' 37"	0.08"	18° 07' 40"	7° 40' 56"	1.0015366	15'58.16"	23° 26' 19"	-1 m 34 s
7	19° 41' 04"	0.07"	18° 09' 58"	7° 41' 52"	1.0015483	15'58.15"	23° 26' 19"	-1 m 33 s
8	19° 43' 32"	0.06"	18° 12' 16"	7° 42' 48"	1.0015600	15'58.14"	23° 26' 19"	-1 m 32 s
9	19° 45' 59"	0.06"	18° 14' 33"	7° 43' 43"	1.0015716	15'58.12"	23° 26' 19"	-1 m 32 s
10	19° 48' 26"	0.05"	18° 16' 51"	7° 44' 39"	1.0015833	15'58.11"	23° 26' 19"	-1 m 31 s
11	19° 50' 53"	0.05"	18° 19' 09"	7° 45' 35"	1.0015950	15'58.10"	23° 26' 19"	-1 m 30 s
12	19° 53' 21"	0.04"	18° 21' 26"	7° 46' 30"	1.0016067	15'58.09"	23° 26' 19"	-1 m 30 s
13	19° 55' 48"	0.04"	18° 23' 44"	7° 47' 26"	1.0016184	15'58.08"	23° 26' 19"	-1 m 29 s
14	19° 58' 15"	0.03"	18° 26' 02"	7° 48' 22"	1.0016301	15'58.07"	23° 26' 19"	-1 m 28 s
15	20° 00' 43"	0.03"	18° 28' 19"	7° 49' 17"	1.0016418	15'58.06"	23° 26' 19"	-1 m 28 s
16	20° 03' 10"	0.02"	18° 30' 37"	7° 50' 13"	1.0016535	15'58.05"	23° 26' 19"	-1 m 27 s
17	20° 05' 37"	0.02"	18° 32' 55"	7° 51' 08"	1.0016652	15'58.03"	23° 26' 19"	-1 m 26 s
18	20° 08' 05"	0.01"	18° 35' 12"	7° 52' 04"	1.0016768	15'58.02"	23° 26' 19"	-1 m 26 s
19	20° 10' 32"	0.01"	18° 37' 30"	7° 52' 59"	1.0016885	15'58.01"	23° 26' 19"	-1 m 25 s
20	20° 12' 59"	0.00"	18° 39' 48"	7° 53' 55"	1.0017002	15'58.00"	23° 26' 19"	-1 m 24 s
21	20° 15' 26"	-0.00"	18° 42' 06"	7° 54' 50"	1.0017119	15'57.99"	23° 26' 19"	-1 m 24 s
22	20° 17' 54"	-0.01"	18° 44' 23"	7° 55' 46"	1.0017236	15'57.98"	23° 26' 19"	-1 m 23 s
23	20° 20' 21"	-0.02"	18° 46' 41"	7° 56' 41"	1.0017353	15'57.97"	23° 26' 19"	-1 m 22 s
24	20° 22' 48"	-0.02"	18° 48' 59"	7° 57' 37"	1.0017470	15'57.96"	23° 26' 19"	-1 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	155° 15' 59"	1° 59' 05"	157° 49' 50"	11° 25' 33"	0° 55' 03"	14' 59.96"	293° 40' 22"	0.85929
1	155° 46' 31"	1° 56' 28"	158° 17' 46"	11° 11' 52"	0° 55' 01"	14' 59.66"	293° 44' 06"	0.86212
2	156° 17' 02"	1° 53' 51"	158° 45' 39"	10° 58' 08"	0° 55' 00"	14' 59.36"	293° 47' 40"	0.86492
3	156° 47' 32"	1° 51' 14"	159° 13' 28"	10° 44' 23"	0° 54' 59"	14' 59.06"	293° 51' 04"	0.86769
4	157° 18' 00"	1° 48' 36"	159° 41' 14"	10° 30' 35"	0° 54' 58"	14' 58.77"	293° 54' 18"	0.87044
5	157° 48' 28"	1° 45' 58"	160° 08' 56"	10° 16' 46"	0° 54' 57"	14' 58.47"	293° 57' 23"	0.87317
6	158° 18' 54"	1° 43' 19"	160° 36' 35"	10° 02' 54"	0° 54' 56"	14' 58.19"	294° 0' 17"	0.87586
7	158° 49' 19"	1° 40' 40"	161° 04' 11"	9° 49' 01"	0° 54' 55"	14' 57.90"	294° 3' 02"	0.87853
8	159° 19' 43"	1° 38' 01"	161° 31' 43"	9° 35' 06"	0° 54' 54"	14' 57.62"	294° 5' 36"	0.88118
9	159° 50' 06"	1° 35' 21"	161° 59' 12"	9° 21' 10"	0° 54' 53"	14' 57.34"	294° 8' 01"	0.88379
10	160° 20' 29"	1° 32' 41"	162° 26' 39"	9° 07' 11"	0° 54' 52"	14' 57.06"	294° 10' 15"	0.88638
11	160° 50' 50"	1° 30' 01"	162° 54' 02"	8° 53' 12"	0° 54' 51"	14' 56.79"	294° 12' 18"	0.88895
12	161° 21' 09"	1° 27' 20"	163° 21' 22"	8° 39' 10"	0° 54' 50"	14' 56.52"	294° 14' 11"	0.89148
13	161° 51' 28"	1° 24' 39"	163° 48' 40"	8° 25' 07"	0° 54' 49"	14' 56.25"	294° 15' 54"	0.89399
14	162° 21' 46"	1° 21' 57"	164° 15' 54"	8° 11' 03"	0° 54' 48"	14' 55.98"	294° 17' 26"	0.89647
15	162° 52' 03"	1° 19' 16"	164° 43' 06"	7° 56' 57"	0° 54' 47"	14' 55.72"	294° 18' 47"	0.89892
16	163° 22' 19"	1° 16' 34"	165° 10' 15"	7° 42' 50"	0° 54' 46"	14' 55.46"	294° 19' 57"	0.90135
17	163° 52' 34"	1° 13' 52"	165° 37' 22"	7° 28' 42"	0° 54' 45"	14' 55.20"	294° 20' 56"	0.90375
18	164° 22' 48"	1° 11' 09"	166° 04' 26"	7° 14' 32"	0° 54' 44"	14' 54.95"	294° 21' 44"	0.90612
19	164° 53' 02"	1° 08' 26"	166° 31' 27"	7° 00' 21"	0° 54' 43"	14' 54.70"	294° 22' 21"	0.90846
20	165° 23' 14"	1° 05' 43"	166° 58' 26"	6° 46' 10"	0° 54' 42"	14' 54.45"	294° 22' 46"	0.91077
21	165° 53' 25"	1° 03' 00"	167° 25' 23"	6° 31' 57"	0° 54' 41"	14' 54.20"	294° 22' 60"	0.91306
22	166° 23' 36"	1° 00' 17"	167° 52' 17"	6° 17' 43"	0° 54' 41"	14' 53.96"	294° 23' 01"	0.91532
23	166° 53' 45"	0° 57' 33"	168° 19' 10"	6° 03' 28"	0° 54' 40"	14' 53.72"	294° 22' 51"	0.91754
24	167° 23' 54"	0° 54' 50"	168° 45' 60"	5° 49' 12"	0° 54' 39"	14' 53.48"	294° 22' 29"	0.91975

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	20° 22' 48"	-0.02"	18° 48' 59"	7° 57' 37"	1.0017470	15'57.96"	23° 26' 19"	-1 m 22 s
1	20° 25' 15"	-0.03"	18° 51' 17"	7° 58' 32"	1.0017587	15'57.95"	23° 26' 19"	-1 m 21 s
2	20° 27' 43"	-0.03"	18° 53' 34"	7° 59' 27"	1.0017704	15'57.93"	23° 26' 19"	-1 m 20 s
3	20° 30' 10"	-0.04"	18° 55' 52"	8° 00' 23"	1.0017821	15'57.92"	23° 26' 19"	-1 m 20 s
4	20° 32' 37"	-0.04"	18° 58' 10"	8° 01' 18"	1.0017938	15'57.91"	23° 26' 19"	-1 m 19 s
5	20° 35' 04"	-0.05"	19° 00' 28"	8° 02' 14"	1.0018055	15'57.90"	23° 26' 19"	-1 m 18 s
6	20° 37' 32"	-0.05"	19° 02' 45"	8° 03' 09"	1.0018172	15'57.89"	23° 26' 19"	-1 m 18 s
7	20° 39' 59"	-0.06"	19° 05' 03"	8° 04' 04"	1.0018289	15'57.88"	23° 26' 19"	-1 m 17 s
8	20° 42' 26"	-0.07"	19° 07' 21"	8° 04' 60"	1.0018406	15'57.87"	23° 26' 19"	-1 m 16 s
9	20° 44' 53"	-0.07"	19° 09' 39"	8° 05' 55"	1.0018523	15'57.86"	23° 26' 19"	-1 m 16 s
10	20° 47' 21"	-0.08"	19° 11' 57"	8° 06' 50"	1.0018640	15'57.84"	23° 26' 19"	-1 m 15 s
11	20° 49' 48"	-0.08"	19° 14' 14"	8° 07' 46"	1.0018757	15'57.83"	23° 26' 19"	-1 m 14 s
12	20° 52' 15"	-0.09"	19° 16' 32"	8° 08' 41"	1.0018875	15'57.82"	23° 26' 19"	-1 m 14 s
13	20° 54' 42"	-0.09"	19° 18' 50"	8° 09' 36"	1.0018992	15'57.81"	23° 26' 19"	-1 m 13 s
14	20° 57' 09"	-0.10"	19° 21' 08"	8° 10' 31"	1.0019109	15'57.80"	23° 26' 19"	-1 m 12 s
15	20° 59' 37"	-0.10"	19° 23' 26"	8° 11' 27"	1.0019226	15'57.79"	23° 26' 19"	-1 m 12 s
16	21° 02' 04"	-0.11"	19° 25' 44"	8° 12' 22"	1.0019343	15'57.78"	23° 26' 19"	-1 m 11 s
17	21° 04' 31"	-0.12"	19° 28' 01"	8° 13' 17"	1.0019460	15'57.77"	23° 26' 19"	-1 m 10 s
18	21° 06' 58"	-0.12"	19° 30' 19"	8° 14' 12"	1.0019577	15'57.75"	23° 26' 19"	-1 m 10 s
19	21° 09' 25"	-0.13"	19° 32' 37"	8° 15' 07"	1.0019694	15'57.74"	23° 26' 19"	-1 m 09 s
20	21° 11' 53"	-0.13"	19° 34' 55"	8° 16' 02"	1.0019811	15'57.73"	23° 26' 19"	-1 m 08 s
21	21° 14' 20"	-0.14"	19° 37' 13"	8° 16' 58"	1.0019929	15'57.72"	23° 26' 19"	-1 m 08 s
22	21° 16' 47"	-0.14"	19° 39' 31"	8° 17' 53"	1.0020046	15'57.71"	23° 26' 19"	-1 m 07 s
23	21° 19' 14"	-0.15"	19° 41' 49"	8° 18' 48"	1.0020163	15'57.70"	23° 26' 19"	-1 m 06 s
24	21° 21' 41"	-0.16"	19° 44' 07"	8° 19' 43"	1.0020280	15'57.69"	23° 26' 19"	-1 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	167° 23' 54"	0° 54' 50"	168° 45' 60"	5° 49' 12"	0° 54' 39"	14' 53.48"	294° 22' 29"	0.91975
1	167° 54' 02"	0° 52' 06"	169° 12' 48"	5° 34' 55"	0° 54' 38"	14' 53.24"	294° 21' 54"	0.92192
2	168° 24' 09"	0° 49' 22"	169° 39' 34"	5° 20' 38"	0° 54' 37"	14' 53.01"	294° 21' 06"	0.92406
3	168° 54' 15"	0° 46' 37"	170° 06' 18"	5° 06' 19"	0° 54' 36"	14' 52.78"	294° 20' 06"	0.92618
4	169° 24' 20"	0° 43' 53"	170° 33' 00"	4° 52' 00"	0° 54' 35"	14' 52.56"	294° 18' 52"	0.92827
5	169° 54' 24"	0° 41' 09"	170° 59' 40"	4° 37' 40"	0° 54' 35"	14' 52.33"	294° 17' 26"	0.93032
6	170° 24' 28"	0° 38' 24"	171° 26' 19"	4° 23' 20"	0° 54' 34"	14' 52.11"	294° 15' 45"	0.93235
7	170° 54' 31"	0° 35' 39"	171° 52' 56"	4° 08' 59"	0° 54' 33"	14' 51.89"	294° 13' 51"	0.93435
8	171° 24' 33"	0° 32' 55"	172° 19' 31"	3° 54' 38"	0° 54' 32"	14' 51.67"	294° 11' 42"	0.93632
9	171° 54' 35"	0° 30' 10"	172° 46' 05"	3° 40' 16"	0° 54' 31"	14' 51.46"	294° 9' 18"	0.93827
10	172° 24' 35"	0° 27' 25"	173° 12' 37"	3° 25' 53"	0° 54' 31"	14' 51.25"	294° 6' 40"	0.94018
11	172° 54' 35"	0° 24' 40"	173° 39' 08"	3° 11' 30"	0° 54' 30"	14' 51.04"	294° 3' 46"	0.94206
12	173° 24' 34"	0° 21' 55"	174° 05' 38"	2° 57' 07"	0° 54' 29"	14' 50.83"	294° 0' 37"	0.94392
13	173° 54' 33"	0° 19' 10"	174° 32' 06"	2° 42' 44"	0° 54' 28"	14' 50.63"	293° 57' 11"	0.94574
14	174° 24' 30"	0° 16' 25"	174° 58' 33"	2° 28' 20"	0° 54' 28"	14' 50.43"	293° 53' 28"	0.94754
15	174° 54' 27"	0° 13' 40"	175° 24' 58"	2° 13' 57"	0° 54' 27"	14' 50.23"	293° 49' 29"	0.94930
16	175° 24' 24"	0° 10' 55"	175° 51' 23"	1° 59' 33"	0° 54' 26"	14' 50.04"	293° 45' 11"	0.95104
17	175° 54' 20"	0° 08' 10"	176° 17' 47"	1° 45' 09"	0° 54' 25"	14' 49.85"	293° 40' 35"	0.95275
18	176° 24' 15"	0° 05' 25"	176° 44' 09"	1° 30' 45"	0° 54' 25"	14' 49.66"	293° 35' 40"	0.95442
19	176° 54' 09"	0° 02' 40"	177° 10' 31"	1° 16' 20"	0° 54' 24"	14' 49.47"	293° 30' 25"	0.95607
20	177° 24' 03"	0° 00' -5"	177° 36' 52"	1° 01' 56"	0° 54' 23"	14' 49.28"	293° 24' 50"	0.95769
21	177° 53' 56"	0° -2' 50"	178° 03' 12"	0° 47' 32"	0° 54' 23"	14' 49.10"	293° 18' 54"	0.95928
22	178° 23' 48"	0° -5' 35"	178° 29' 31"	0° 33' 09"	0° 54' 22"	14' 48.92"	293° 12' 36"	0.96083
23	178° 53' 40"	0° -8' 19"	178° 55' 50"	0° 18' 45"	0° 54' 21"	14' 48.74"	293° 5' 54"	0.96236
24	179° 23' 32"	0°-11' 04"	179° 22' 08"	0° 04' 22"	0° 54' 21"	14' 48.57"	292° 58' 49"	0.96386

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	21° 21' 41"	-0.16"	19° 44' 07"	8° 19' 43"	1.0020280	15'57.69"	23° 26' 19"	-1 m 06 s
1	21° 24' 08"	-0.16"	19° 46' 25"	8° 20' 38"	1.0020397	15'57.68"	23° 26' 19"	-1 m 05 s
2	21° 26' 36"	-0.17"	19° 48' 43"	8° 21' 33"	1.0020514	15'57.67"	23° 26' 19"	-1 m 04 s
3	21° 29' 03"	-0.17"	19° 51' 00"	8° 22' 28"	1.0020632	15'57.65"	23° 26' 19"	-1 m 04 s
4	21° 31' 30"	-0.18"	19° 53' 18"	8° 23' 23"	1.0020749	15'57.64"	23° 26' 19"	-1 m 03 s
5	21° 33' 57"	-0.18"	19° 55' 36"	8° 24' 18"	1.0020866	15'57.63"	23° 26' 19"	-1 m 02 s
6	21° 36' 24"	-0.19"	19° 57' 54"	8° 25' 13"	1.0020983	15'57.62"	23° 26' 19"	-1 m 02 s
7	21° 38' 51"	-0.19"	20° 00' 12"	8° 26' 08"	1.0021101	15'57.61"	23° 26' 19"	-1 m 01 s
8	21° 41' 19"	-0.20"	20° 02' 30"	8° 27' 03"	1.0021218	15'57.60"	23° 26' 19"	-1 m 00 s
9	21° 43' 46"	-0.21"	20° 04' 48"	8° 27' 58"	1.0021335	15'57.59"	23° 26' 19"	0 m-60 s
10	21° 46' 13"	-0.21"	20° 07' 06"	8° 28' 53"	1.0021452	15'57.58"	23° 26' 19"	0 m-59 s
11	21° 48' 40"	-0.22"	20° 09' 24"	8° 29' 48"	1.0021570	15'57.56"	23° 26' 19"	0 m-59 s
12	21° 51' 07"	-0.22"	20° 11' 42"	8° 30' 43"	1.0021687	15'57.55"	23° 26' 19"	0 m-58 s
13	21° 53' 34"	-0.23"	20° 14' 00"	8° 31' 38"	1.0021804	15'57.54"	23° 26' 19"	0 m-57 s
14	21° 56' 01"	-0.23"	20° 16' 18"	8° 32' 33"	1.0021921	15'57.53"	23° 26' 19"	0 m-57 s
15	21° 58' 28"	-0.24"	20° 18' 36"	8° 33' 28"	1.0022039	15'57.52"	23° 26' 19"	0 m-56 s
16	22° 00' 56"	-0.24"	20° 20' 54"	8° 34' 23"	1.0022156	15'57.51"	23° 26' 19"	0 m-55 s
17	22° 03' 23"	-0.25"	20° 23' 12"	8° 35' 17"	1.0022273	15'57.50"	23° 26' 19"	0 m-55 s
18	22° 05' 50"	-0.26"	20° 25' 30"	8° 36' 12"	1.0022391	15'57.49"	23° 26' 19"	0 m-54 s
19	22° 08' 17"	-0.26"	20° 27' 48"	8° 37' 07"	1.0022508	15'57.47"	23° 26' 19"	0 m-53 s
20	22° 10' 44"	-0.27"	20° 30' 07"	8° 38' 02"	1.0022625	15'57.46"	23° 26' 19"	0 m-53 s
21	22° 13' 11"	-0.27"	20° 32' 25"	8° 38' 57"	1.0022743	15'57.45"	23° 26' 19"	0 m-52 s
22	22° 15' 38"	-0.28"	20° 34' 43"	8° 39' 51"	1.0022860	15'57.44"	23° 26' 19"	0 m-51 s
23	22° 18' 05"	-0.28"	20° 37' 01"	8° 40' 46"	1.0022977	15'57.43"	23° 26' 19"	0 m-51 s
24	22° 20' 32"	-0.29"	20° 39' 19"	8° 41' 41"	1.0023095	15'57.42"	23° 26' 19"	0 m-50 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	179° 23' 32"	0°-11' 04"	179° 22' 08"	0° 04' 22"	0° 54' 21"	14' 48.57"	292° 58' 49"	0.96386
1	179° 53' 22"	0°-13' 48"	179° 48' 26"	0°-10' 02"	0° 54' 20"	14' 48.40"	292° 51' 18"	0.96533
2	180° 23' 13"	0°-16' 32"	180° 14' 43"	0°-24' 24"	0° 54' 20"	14' 48.23"	292° 43' 22"	0.96676
3	180° 53' 02"	0°-19' 16"	180° 40' 60"	0°-38' 47"	0° 54' 19"	14' 48.06"	292° 34' 57"	0.96817
4	181° 22' 51"	0°-22' 00"	181° 07' 16"	0°-53' 09"	0° 54' 18"	14' 47.89"	292° 26' 04"	0.96955
5	181° 52' 40"	0°-24' 44"	181° 33' 32"	-1° 07' 30"	0° 54' 18"	14' 47.73"	292° 16' 40"	0.97089
6	182° 22' 28"	0°-27' 28"	181° 59' 48"	-1° 21' 51"	0° 54' 17"	14' 47.57"	292° 6' 44"	0.97221
7	182° 52' 15"	0°-30' 11"	182° 26' 04"	-1° 36' 12"	0° 54' 17"	14' 47.42"	291° 56' 14"	0.97349
8	183° 22' 02"	0°-32' 55"	182° 52' 19"	-1° 50' 32"	0° 54' 16"	14' 47.26"	291° 45' 08"	0.97475
9	183° 51' 49"	0°-35' 38"	183° 18' 35"	-2° 04' 51"	0° 54' 15"	14' 47.11"	291° 33' 24"	0.97597
10	184° 21' 35"	0°-38' 21"	183° 44' 50"	-2° 19' 09"	0° 54' 15"	14' 46.96"	291° 20' 59"	0.97717
11	184° 51' 20"	0°-41' 03"	184° 11' 06"	-2° 33' 27"	0° 54' 14"	14' 46.81"	291° 7' 51"	0.97833
12	185° 21' 05"	0°-43' 46"	184° 37' 22"	-2° 47' 44"	0° 54' 14"	14' 46.67"	290° 53' 56"	0.97946
13	185° 50' 50"	0°-46' 28"	185° 03' 38"	-3° 02' 00"	0° 54' 13"	14' 46.52"	290° 39' 11"	0.98057
14	186° 20' 34"	0°-49' 10"	185° 29' 54"	-3° 16' 16"	0° 54' 13"	14' 46.38"	290° 23' 34"	0.98164
15	186° 50' 18"	0°-51' 51"	185° 56' 11"	-3° 30' 30"	0° 54' 12"	14' 46.25"	290° 6' 58"	0.98268
16	187° 20' 01"	0°-54' 33"	186° 22' 28"	-3° 44' 43"	0° 54' 12"	14' 46.11"	289° 49' 21"	0.98369
17	187° 49' 44"	0°-57' 14"	186° 48' 46"	-3° 58' 56"	0° 54' 11"	14' 45.98"	289° 30' 36"	0.98466
18	188° 19' 26"	0°-59' 54"	187° 15' 04"	-4° 13' 07"	0° 54' 11"	14' 45.85"	289° 10' 38"	0.98561
19	188° 49' 08"	-1° 02' 35"	187° 41' 22"	-4° 27' 17"	0° 54' 10"	14' 45.72"	288° 49' 19"	0.98653
20	189° 18' 50"	-1° 05' 15"	188° 07' 41"	-4° 41' 26"	0° 54' 10"	14' 45.60"	288° 26' 34"	0.98742
21	189° 48' 31"	-1° 07' 54"	188° 34' 01"	-4° 55' 34"	0° 54' 09"	14' 45.47"	288° 2' 12"	0.98827
22	190° 18' 12"	-1° 10' 34"	189° 00' 22"	-5° 09' 41"	0° 54' 09"	14' 45.35"	287° 36' 04"	0.98910
23	190° 47' 53"	-1° 13' 13"	189° 26' 43"	-5° 23' 46"	0° 54' 09"	14' 45.24"	287° 7' 59"	0.98989
24	191° 17' 33"	-1° 15' 51"	189° 53' 06"	-5° 37' 50"	0° 54' 08"	14' 45.12"	286° 37' 43"	0.99065

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	22° 20' 32"	-0.29"	20° 39' 19"	8° 41' 41"	1.0023095	15'57.42"	23° 26' 19"	0 m-50 s
1	22° 22' 59"	-0.29"	20° 41' 37"	8° 42' 36"	1.0023212	15'57.41"	23° 26' 19"	0 m-49 s
2	22° 25' 26"	-0.30"	20° 43' 55"	8° 43' 30"	1.0023330	15'57.40"	23° 26' 19"	0 m-49 s
3	22° 27' 54"	-0.31"	20° 46' 13"	8° 44' 25"	1.0023447	15'57.39"	23° 26' 19"	0 m-48 s
4	22° 30' 21"	-0.31"	20° 48' 31"	8° 45' 20"	1.0023564	15'57.37"	23° 26' 19"	0 m-48 s
5	22° 32' 48"	-0.32"	20° 50' 49"	8° 46' 14"	1.0023682	15'57.36"	23° 26' 19"	0 m-47 s
6	22° 35' 15"	-0.32"	20° 53' 08"	8° 47' 09"	1.0023799	15'57.35"	23° 26' 19"	0 m-46 s
7	22° 37' 42"	-0.33"	20° 55' 26"	8° 48' 04"	1.0023917	15'57.34"	23° 26' 19"	0 m-46 s
8	22° 40' 09"	-0.33"	20° 57' 44"	8° 48' 58"	1.0024034	15'57.33"	23° 26' 19"	0 m-45 s
9	22° 42' 36"	-0.34"	21° 00' 02"	8° 49' 53"	1.0024151	15'57.32"	23° 26' 19"	0 m-44 s
10	22° 45' 03"	-0.34"	21° 02' 20"	8° 50' 48"	1.0024269	15'57.31"	23° 26' 19"	0 m-44 s
11	22° 47' 30"	-0.35"	21° 04' 38"	8° 51' 42"	1.0024386	15'57.30"	23° 26' 19"	0 m-43 s
12	22° 49' 57"	-0.35"	21° 06' 57"	8° 52' 37"	1.0024504	15'57.28"	23° 26' 19"	0 m-42 s
13	22° 52' 24"	-0.36"	21° 09' 15"	8° 53' 31"	1.0024621	15'57.27"	23° 26' 19"	0 m-42 s
14	22° 54' 51"	-0.36"	21° 11' 33"	8° 54' 26"	1.0024739	15'57.26"	23° 26' 19"	0 m-41 s
15	22° 57' 18"	-0.37"	21° 13' 51"	8° 55' 20"	1.0024856	15'57.25"	23° 26' 19"	0 m-41 s
16	22° 59' 45"	-0.38"	21° 16' 10"	8° 56' 15"	1.0024974	15'57.24"	23° 26' 19"	0 m-40 s
17	23° 02' 12"	-0.38"	21° 18' 28"	8° 57' 09"	1.0025091	15'57.23"	23° 26' 19"	0 m-39 s
18	23° 04' 39"	-0.39"	21° 20' 46"	8° 58' 04"	1.0025209	15'57.22"	23° 26' 19"	0 m-39 s
19	23° 07' 06"	-0.39"	21° 23' 04"	8° 58' 58"	1.0025326	15'57.21"	23° 26' 19"	0 m-38 s
20	23° 09' 33"	-0.40"	21° 25' 23"	8° 59' 53"	1.0025444	15'57.19"	23° 26' 19"	0 m-37 s
21	23° 12' 00"	-0.40"	21° 27' 41"	9° 00' 47"	1.0025561	15'57.18"	23° 26' 19"	0 m-37 s
22	23° 14' 27"	-0.41"	21° 29' 59"	9° 01' 41"	1.0025679	15'57.17"	23° 26' 19"	0 m-36 s
23	23° 16' 54"	-0.41"	21° 32' 17"	9° 02' 36"	1.0025796	15'57.16"	23° 26' 19"	0 m-35 s
24	23° 19' 21"	-0.42"	21° 34' 36"	9° 03' 30"	1.0025914	15'57.15"	23° 26' 19"	0 m-35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	191° 17' 33"	-1° 15' 51"	189° 53' 06"	-5° 37' 50"	0° 54' 08"	14' 45.12"	286° 37' 43"	0.99065
1	191° 47' 13"	-1° 18' 29"	190° 19' 29"	-5° 51' 53"	0° 54' 08"	14' 45.01"	286° 5' 02"	0.99138
2	192° 16' 53"	-1° 21' 07"	190° 45' 53"	-6° 05' 54"	0° 54' 07"	14' 44.90"	285° 29' 36"	0.99208
3	192° 46' 32"	-1° 23' 45"	191° 12' 18"	-6° 19' 53"	0° 54' 07"	14' 44.79"	284° 51' 07"	0.99275
4	193° 16' 11"	-1° 26' 22"	191° 38' 45"	-6° 33' 52"	0° 54' 07"	14' 44.68"	284° 9' 07"	0.99339
5	193° 45' 49"	-1° 28' 58"	192° 05' 12"	-6° 47' 48"	0° 54' 06"	14' 44.58"	283° 23' 09"	0.99400
6	194° 15' 28"	-1° 31' 34"	192° 31' 41"	-7° 01' 43"	0° 54' 06"	14' 44.48"	282° 32' 37"	0.99457
7	194° 45' 06"	-1° 34' 10"	192° 58' 11"	-7° 15' 36"	0° 54' 05"	14' 44.38"	281° 36' 49"	0.99512
8	195° 14' 43"	-1° 36' 45"	193° 24' 42"	-7° 29' 28"	0° 54' 05"	14' 44.28"	280° 34' 51"	0.99563
9	195° 44' 21"	-1° 39' 20"	193° 51' 15"	-7° 43' 18"	0° 54' 05"	14' 44.19"	279° 25' 42"	0.99611
10	196° 13' 58"	-1° 41' 54"	194° 17' 49"	-7° 57' 06"	0° 54' 04"	14' 44.10"	278° 8' 02"	0.99656
11	196° 43' 35"	-1° 44' 28"	194° 44' 25"	-8° 10' 52"	0° 54' 04"	14' 44.01"	276° 40' 13"	0.99698
12	197° 13' 12"	-1° 47' 01"	195° 11' 02"	-8° 24' 36"	0° 54' 04"	14' 43.92"	275° 0' 11"	0.99737
13	197° 42' 48"	-1° 49' 34"	195° 37' 41"	-8° 38' 18"	0° 54' 03"	14' 43.84"	273° 5' 20"	0.99773
14	198° 12' 25"	-1° 52' 06"	196° 04' 21"	-8° 51' 59"	0° 54' 03"	14' 43.76"	270° 52' 18"	0.99805
15	198° 42' 01"	-1° 54' 38"	196° 31' 03"	-9° 05' 37"	0° 54' 03"	14' 43.68"	268° 16' 46"	0.99835
16	199° 11' 37"	-1° 57' 09"	196° 57' 47"	-9° 19' 13"	0° 54' 03"	14' 43.60"	265° 13' 05"	0.99861
17	199° 41' 12"	-1° 59' 40"	197° 24' 33"	-9° 32' 47"	0° 54' 02"	14' 43.52"	261° 34' 03"	0.99885
18	200° 10' 48"	-2° 02' 10"	197° 51' 21"	-9° 46' 19"	0° 54' 02"	14' 43.45"	257° 10' 23"	0.99905
19	200° 40' 23"	-2° 04' 39"	198° 18' 11"	-9° 59' 49"	0° 54' 02"	14' 43.38"	251° 50' 45"	0.99922
20	201° 09' 58"	-2° 07' 08"	198° 45' 02"	-10° 13' 16"	0° 54' 02"	14' 43.32"	245° 22' 17"	0.99936
21	201° 39' 33"	-2° 09' 36"	199° 11' 56"	-10° 26' 41"	0° 54' 01"	14' 43.25"	237° 33' 02"	0.99947
22	202° 09' 08"	-2° 12' 04"	199° 38' 52"	-10° 40' 04"	0° 54' 01"	14' 43.19"	228° 17' 24"	0.99954
23	202° 38' 43"	-2° 14' 31"	200° 05' 50"	-10° 53' 24"	0° 54' 01"	14' 43.13"	217° 44' 52"	0.99959
24	203° 08' 17"	-2° 16' 57"	200° 32' 50"	-11° 06' 41"	0° 54' 01"	14' 43.07"	206° 26' 39"	0.99960

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	23° 19' 21"	-0.42"	21° 34' 36"	9° 03' 30"	1.0025914	15'57.15"	23° 26' 19"	0 m-35 s
1	23° 21' 48"	-0.42"	21° 36' 54"	9° 04' 25"	1.0026031	15'57.14"	23° 26' 19"	0 m-34 s
2	23° 24' 15"	-0.43"	21° 39' 12"	9° 05' 19"	1.0026149	15'57.13"	23° 26' 19"	0 m-34 s
3	23° 26' 42"	-0.43"	21° 41' 31"	9° 06' 13"	1.0026266	15'57.12"	23° 26' 19"	0 m-33 s
4	23° 29' 09"	-0.44"	21° 43' 49"	9° 07' 08"	1.0026384	15'57.10"	23° 26' 19"	0 m-32 s
5	23° 31' 36"	-0.44"	21° 46' 07"	9° 08' 02"	1.0026502	15'57.09"	23° 26' 19"	0 m-32 s
6	23° 34' 03"	-0.45"	21° 48' 26"	9° 08' 56"	1.0026619	15'57.08"	23° 26' 19"	0 m-31 s
7	23° 36' 30"	-0.45"	21° 50' 44"	9° 09' 50"	1.0026737	15'57.07"	23° 26' 19"	0 m-30 s
8	23° 38' 57"	-0.46"	21° 53' 02"	9° 10' 45"	1.0026854	15'57.06"	23° 26' 19"	0 m-30 s
9	23° 41' 24"	-0.46"	21° 55' 21"	9° 11' 39"	1.0026972	15'57.05"	23° 26' 19"	0 m-29 s
10	23° 43' 51"	-0.47"	21° 57' 39"	9° 12' 33"	1.0027090	15'57.04"	23° 26' 19"	0 m-29 s
11	23° 46' 18"	-0.47"	21° 59' 57"	9° 13' 27"	1.0027207	15'57.03"	23° 26' 19"	0 m-28 s
12	23° 48' 45"	-0.48"	22° 02' 16"	9° 14' 22"	1.0027325	15'57.01"	23° 26' 19"	0 m-27 s
13	23° 51' 12"	-0.48"	22° 04' 34"	9° 15' 16"	1.0027442	15'57.00"	23° 26' 19"	0 m-27 s
14	23° 53' 39"	-0.48"	22° 06' 53"	9° 16' 10"	1.0027560	15'56.99"	23° 26' 19"	0 m-26 s
15	23° 56' 06"	-0.49"	22° 09' 11"	9° 17' 04"	1.0027678	15'56.98"	23° 26' 19"	0 m-25 s
16	23° 58' 33"	-0.49"	22° 11' 29"	9° 17' 58"	1.0027795	15'56.97"	23° 26' 19"	0 m-25 s
17	24° 00' 60"	-0.50"	22° 13' 48"	9° 18' 52"	1.0027913	15'56.96"	23° 26' 19"	0 m-24 s
18	24° 03' 27"	-0.50"	22° 16' 06"	9° 19' 46"	1.0028031	15'56.95"	23° 26' 19"	0 m-24 s
19	24° 05' 54"	-0.51"	22° 18' 25"	9° 20' 40"	1.0028148	15'56.94"	23° 26' 19"	0 m-23 s
20	24° 08' 21"	-0.51"	22° 20' 43"	9° 21' 34"	1.0028266	15'56.93"	23° 26' 19"	0 m-22 s
21	24° 10' 48"	-0.52"	22° 23' 02"	9° 22' 28"	1.0028383	15'56.91"	23° 26' 19"	0 m-22 s
22	24° 13' 14"	-0.52"	22° 25' 20"	9° 23' 23"	1.0028501	15'56.90"	23° 26' 19"	0 m-21 s
23	24° 15' 41"	-0.53"	22° 27' 39"	9° 24' 17"	1.0028619	15'56.89"	23° 26' 19"	0 m-20 s
24	24° 18' 08"	-0.53"	22° 29' 57"	9° 25' 11"	1.0028736	15'56.88"	23° 26' 19"	0 m-20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	203° 08' 17"	-2° 16' 57"	200° 32' 50"	-11° 06' 41"	0° 54' 01"	14' 43.07"	206° 26' 39"	0.99960
1	203° 37' 52"	-2° 19' 23"	200° 59' 52"	-11° 19' 57"	0° 54' 00"	14' 43.02"	195° 11' 01"	0.99959
2	204° 07' 26"	-2° 21' 48"	201° 26' 57"	-11° 33' 09"	0° 54' 00"	14' 42.96"	184° 45' 08"	0.99954
3	204° 37' 00"	-2° 24' 12"	201° 54' 04"	-11° 46' 19"	0° 54' 00"	14' 42.91"	175° 37' 54"	0.99946
4	205° 06' 34"	-2° 26' 36"	202° 21' 13"	-11° 59' 27"	0° 53' 60"	14' 42.86"	167° 56' 46"	0.99935
5	205° 36' 08"	-2° 28' 59"	202° 48' 25"	-12° 12' 31"	0° 53' 60"	14' 42.82"	161° 35' 09"	0.99921
6	206° 05' 42"	-2° 31' 22"	203° 15' 40"	-12° 25' 33"	0° 53' 60"	14' 42.78"	156° 20' 46"	0.99904
7	206° 35' 16"	-2° 33' 43"	203° 42' 57"	-12° 38' 32"	0° 53' 59"	14' 42.73"	152° 0' 51"	0.99883
8	207° 04' 50"	-2° 36' 04"	204° 10' 16"	-12° 51' 28"	0° 53' 59"	14' 42.70"	148° 24' 16"	0.99860
9	207° 34' 24"	-2° 38' 25"	204° 37' 38"	-13° 04' 22"	0° 53' 59"	14' 42.66"	145° 21' 59"	0.99834
10	208° 03' 57"	-2° 40' 44"	205° 05' 03"	-13° 17' 12"	0° 53' 59"	14' 42.63"	142° 46' 57"	0.99804
11	208° 33' 31"	-2° 43' 03"	205° 32' 31"	-13° 29' 59"	0° 53' 59"	14' 42.60"	140° 33' 43"	0.99771
12	209° 03' 05"	-2° 45' 21"	206° 00' 02"	-13° 42' 43"	0° 53' 59"	14' 42.57"	138° 38' 02"	0.99736
13	209° 32' 38"	-2° 47' 38"	206° 27' 35"	-13° 55' 24"	0° 53' 59"	14' 42.54"	136° 56' 40"	0.99697
14	210° 02' 12"	-2° 49' 55"	206° 55' 11"	-14° 08' 02"	0° 53' 59"	14' 42.52"	135° 27' 03"	0.99655
15	210° 31' 45"	-2° 52' 11"	207° 22' 51"	-14° 20' 37"	0° 53' 59"	14' 42.50"	134° 7' 09"	0.99610
16	211° 01' 19"	-2° 54' 26"	207° 50' 33"	-14° 33' 08"	0° 53' 58"	14' 42.48"	132° 55' 25"	0.99562
17	211° 30' 52"	-2° 56' 40"	208° 18' 18"	-14° 45' 37"	0° 53' 58"	14' 42.46"	131° 50' 32"	0.99510
18	212° 00' 26"	-2° 58' 53"	208° 46' 07"	-14° 58' 01"	0° 53' 58"	14' 42.45"	130° 51' 29"	0.99456
19	212° 29' 60"	-3° 01' 06"	209° 13' 58"	-15° 10' 23"	0° 53' 58"	14' 42.44"	129° 57' 24"	0.99399
20	212° 59' 33"	-3° 03' 18"	209° 41' 53"	-15° 22' 40"	0° 53' 58"	14' 42.43"	129° 7' 37"	0.99339
21	213° 29' 07"	-3° 05' 29"	210° 09' 51"	-15° 34' 55"	0° 53' 58"	14' 42.43"	128° 21' 32"	0.99275
22	213° 58' 41"	-3° 07' 39"	210° 37' 52"	-15° 47' 05"	0° 53' 58"	14' 42.42"	127° 38' 40"	0.99209
23	214° 28' 15"	-3° 09' 48"	211° 05' 57"	-15° 59' 12"	0° 53' 58"	14' 42.42"	126° 58' 37"	0.99139
24	214° 57' 48"	-3° 11' 56"	211° 34' 04"	-16° 11' 16"	0° 53' 58"	14' 42.42"	126° 21' 03"	0.99066

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	24° 18' 08"	-0.53"	22° 29' 57"	9° 25' 11"	1.0028736	15'56.88"	23° 26' 19"	0 m-20 s
1	24° 20' 35"	-0.53"	22° 32' 16"	9° 26' 04"	1.0028854	15'56.87"	23° 26' 19"	0 m-19 s
2	24° 23' 02"	-0.54"	22° 34' 34"	9° 26' 58"	1.0028972	15'56.86"	23° 26' 19"	0 m-19 s
3	24° 25' 29"	-0.54"	22° 36' 53"	9° 27' 52"	1.0029090	15'56.85"	23° 26' 19"	0 m-18 s
4	24° 27' 56"	-0.55"	22° 39' 11"	9° 28' 46"	1.0029207	15'56.84"	23° 26' 19"	0 m-17 s
5	24° 30' 23"	-0.55"	22° 41' 30"	9° 29' 40"	1.0029325	15'56.82"	23° 26' 19"	0 m-17 s
6	24° 32' 50"	-0.56"	22° 43' 48"	9° 30' 34"	1.0029443	15'56.81"	23° 26' 19"	0 m-16 s
7	24° 35' 17"	-0.56"	22° 46' 07"	9° 31' 28"	1.0029560	15'56.80"	23° 26' 19"	0 m-16 s
8	24° 37' 44"	-0.56"	22° 48' 26"	9° 32' 22"	1.0029678	15'56.79"	23° 26' 19"	0 m-15 s
9	24° 40' 10"	-0.57"	22° 50' 44"	9° 33' 16"	1.0029796	15'56.78"	23° 26' 19"	0 m-14 s
10	24° 42' 37"	-0.57"	22° 53' 03"	9° 34' 10"	1.0029913	15'56.77"	23° 26' 19"	0 m-14 s
11	24° 45' 04"	-0.58"	22° 55' 21"	9° 35' 03"	1.0030031	15'56.76"	23° 26' 19"	0 m-13 s
12	24° 47' 31"	-0.58"	22° 57' 40"	9° 35' 57"	1.0030149	15'56.75"	23° 26' 19"	0 m-12 s
13	24° 49' 58"	-0.58"	22° 59' 59"	9° 36' 51"	1.0030267	15'56.73"	23° 26' 19"	0 m-12 s
14	24° 52' 25"	-0.59"	23° 02' 17"	9° 37' 45"	1.0030384	15'56.72"	23° 26' 19"	0 m-11 s
15	24° 54' 52"	-0.59"	23° 04' 36"	9° 38' 38"	1.0030502	15'56.71"	23° 26' 19"	0 m-11 s
16	24° 57' 19"	-0.60"	23° 06' 54"	9° 39' 32"	1.0030620	15'56.70"	23° 26' 19"	0 m-10 s
17	24° 59' 45"	-0.60"	23° 09' 13"	9° 40' 26"	1.0030738	15'56.69"	23° 26' 19"	0 m -9 s
18	25° 02' 12"	-0.60"	23° 11' 32"	9° 41' 20"	1.0030855	15'56.68"	23° 26' 19"	0 m -9 s
19	25° 04' 39"	-0.61"	23° 13' 50"	9° 42' 13"	1.0030973	15'56.67"	23° 26' 19"	0 m -8 s
20	25° 07' 06"	-0.61"	23° 16' 09"	9° 43' 07"	1.0031091	15'56.66"	23° 26' 19"	0 m -8 s
21	25° 09' 33"	-0.61"	23° 18' 28"	9° 44' 01"	1.0031209	15'56.64"	23° 26' 19"	0 m -7 s
22	25° 11' 60"	-0.62"	23° 20' 47"	9° 44' 54"	1.0031326	15'56.63"	23° 26' 19"	0 m -6 s
23	25° 14' 27"	-0.62"	23° 23' 05"	9° 45' 48"	1.0031444	15'56.62"	23° 26' 19"	0 m -6 s
24	25° 16' 53"	-0.62"	23° 25' 24"	9° 46' 41"	1.0031562	15'56.61"	23° 26' 19"	0 m -5 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	214° 57' 48"	-3° 11' 56"	211° 34' 04"	-16° 11' 16"	0° 53' 58"	14' 42.42"	126° 21' 03"	0.99066
1	215° 27' 22"	-3° 14' 04"	212° 02' 16"	-16° 23' 16"	0° 53' 58"	14' 42.43"	125° 45' 40"	0.98991
2	215° 56' 56"	-3° 16' 10"	212° 30' 30"	-16° 35' 11"	0° 53' 58"	14' 42.43"	125° 12' 13"	0.98912
3	216° 26' 31"	-3° 18' 16"	212° 58' 48"	-16° 47' 03"	0° 53' 58"	14' 42.44"	124° 40' 29"	0.98830
4	216° 56' 05"	-3° 20' 21"	213° 27' 10"	-16° 58' 52"	0° 53' 58"	14' 42.46"	124° 10' 17"	0.98746
5	217° 25' 39"	-3° 22' 25"	213° 55' 35"	-17° 10' 36"	0° 53' 58"	14' 42.47"	123° 41' 26"	0.98658
6	217° 55' 14"	-3° 24' 28"	214° 24' 04"	-17° 22' 16"	0° 53' 58"	14' 42.49"	123° 13' 50"	0.98567
7	218° 24' 48"	-3° 26' 30"	214° 52' 37"	-17° 33' 52"	0° 53' 59"	14' 42.51"	122° 47' 19"	0.98473
8	218° 54' 23"	-3° 28' 31"	215° 21' 13"	-17° 45' 24"	0° 53' 59"	14' 42.53"	122° 21' 48"	0.98377
9	219° 23' 58"	-3° 30' 32"	215° 49' 53"	-17° 56' 52"	0° 53' 59"	14' 42.55"	121° 57' 11"	0.98277
10	219° 53' 33"	-3° 32' 31"	216° 18' 36"	-18° 08' 16"	0° 53' 59"	14' 42.58"	121° 33' 23"	0.98174
11	220° 23' 08"	-3° 34' 29"	216° 47' 23"	-18° 19' 35"	0° 53' 59"	14' 42.61"	121° 10' 18"	0.98068
12	220° 52' 43"	-3° 36' 27"	217° 16' 15"	-18° 30' 50"	0° 53' 59"	14' 42.65"	120° 47' 53"	0.97959
13	221° 22' 19"	-3° 38' 23"	217° 45' 10"	-18° 42' 01"	0° 53' 59"	14' 42.68"	120° 26' 05"	0.97848
14	221° 51' 55"	-3° 40' 19"	218° 14' 08"	-18° 53' 07"	0° 53' 59"	14' 42.72"	120° 4' 49"	0.97733
15	222° 21' 31"	-3° 42' 13"	218° 43' 11"	-19° 04' 09"	0° 53' 59"	14' 42.76"	119° 44' 04"	0.97615
16	222° 51' 07"	-3° 44' 07"	219° 12' 18"	-19° 15' 06"	0° 53' 60"	14' 42.80"	119° 23' 46"	0.97494
17	223° 20' 43"	-3° 45' 59"	219° 41' 29"	-19° 25' 59"	0° 53' 60"	14' 42.85"	119° 3' 53"	0.97371
18	223° 50' 20"	-3° 47' 51"	220° 10' 43"	-19° 36' 47"	0° 53' 60"	14' 42.90"	118° 44' 22"	0.97244
19	224° 19' 56"	-3° 49' 41"	220° 40' 02"	-19° 47' 30"	0° 54' 00"	14' 42.95"	118° 25' 13"	0.97115
20	224° 49' 34"	-3° 51' 31"	221° 09' 25"	-19° 58' 09"	0° 54' 00"	14' 43.01"	118° 6' 22"	0.96982
21	225° 19' 11"	-3° 53' 19"	221° 38' 52"	-20° 08' 42"	0° 54' 01"	14' 43.06"	117° 47' 49"	0.96847
22	225° 48' 48"	-3° 55' 07"	222° 08' 23"	-20° 19' 11"	0° 54' 01"	14' 43.12"	117° 29' 31"	0.96708
23	226° 18' 26"	-3° 56' 53"	222° 37' 58"	-20° 29' 35"	0° 54' 01"	14' 43.19"	117° 11' 28"	0.96567
24	226° 48' 04"	-3° 58' 38"	223° 07' 37"	-20° 39' 54"	0° 54' 01"	14' 43.25"	116° 53' 38"	0.96423

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	25° 16' 53"	-0.62"	23° 25' 24"	9° 46' 41"	1.0031562	15'56.61"	23° 26' 19"	0 m -5 s
1	25° 19' 20"	-0.63"	23° 27' 43"	9° 47' 35"	1.0031680	15'56.60"	23° 26' 19"	0 m -5 s
2	25° 21' 47"	-0.63"	23° 30' 01"	9° 48' 29"	1.0031797	15'56.59"	23° 26' 19"	0 m -4 s
3	25° 24' 14"	-0.63"	23° 32' 20"	9° 49' 22"	1.0031915	15'56.58"	23° 26' 19"	0 m -3 s
4	25° 26' 41"	-0.64"	23° 34' 39"	9° 50' 16"	1.0032033	15'56.57"	23° 26' 19"	0 m -3 s
5	25° 29' 08"	-0.64"	23° 36' 58"	9° 51' 09"	1.0032151	15'56.55"	23° 26' 19"	0 m -2 s
6	25° 31' 34"	-0.64"	23° 39' 17"	9° 52' 03"	1.0032268	15'56.54"	23° 26' 19"	0 m -2 s
7	25° 34' 01"	-0.65"	23° 41' 35"	9° 52' 56"	1.0032386	15'56.53"	23° 26' 19"	0 m -1 s
8	25° 36' 28"	-0.65"	23° 43' 54"	9° 53' 50"	1.0032504	15'56.52"	23° 26' 19"	0 m -0 s
9	25° 38' 55"	-0.65"	23° 46' 13"	9° 54' 43"	1.0032622	15'56.51"	23° 26' 19"	0 m 00 s
10	25° 41' 22"	-0.66"	23° 48' 32"	9° 55' 37"	1.0032740	15'56.50"	23° 26' 19"	0 m 01 s
11	25° 43' 48"	-0.66"	23° 50' 51"	9° 56' 30"	1.0032857	15'56.49"	23° 26' 19"	0 m 01 s
12	25° 46' 15"	-0.66"	23° 53' 09"	9° 57' 23"	1.0032975	15'56.48"	23° 26' 19"	0 m 02 s
13	25° 48' 42"	-0.67"	23° 55' 28"	9° 58' 17"	1.0033093	15'56.46"	23° 26' 19"	0 m 03 s
14	25° 51' 09"	-0.67"	23° 57' 47"	9° 59' 10"	1.0033211	15'56.45"	23° 26' 19"	0 m 03 s
15	25° 53' 36"	-0.67"	24° 00' 06"	10° 00' 03"	1.0033328	15'56.44"	23° 26' 19"	0 m 04 s
16	25° 56' 02"	-0.67"	24° 02' 25"	10° 00' 57"	1.0033446	15'56.43"	23° 26' 19"	0 m 04 s
17	25° 58' 29"	-0.68"	24° 04' 44"	10° 01' 50"	1.0033564	15'56.42"	23° 26' 19"	0 m 05 s
18	26° 00' 56"	-0.68"	24° 07' 03"	10° 02' 43"	1.0033682	15'56.41"	23° 26' 19"	0 m 06 s
19	26° 03' 23"	-0.68"	24° 09' 21"	10° 03' 37"	1.0033800	15'56.40"	23° 26' 19"	0 m 06 s
20	26° 05' 50"	-0.68"	24° 11' 40"	10° 04' 30"	1.0033917	15'56.39"	23° 26' 19"	0 m 07 s
21	26° 08' 16"	-0.69"	24° 13' 59"	10° 05' 23"	1.0034035	15'56.37"	23° 26' 19"	0 m 07 s
22	26° 10' 43"	-0.69"	24° 16' 18"	10° 06' 16"	1.0034153	15'56.36"	23° 26' 19"	0 m 08 s
23	26° 13' 10"	-0.69"	24° 18' 37"	10° 07' 10"	1.0034271	15'56.35"	23° 26' 19"	0 m 08 s
24	26° 15' 37"	-0.69"	24° 20' 56"	10° 08' 03"	1.0034389	15'56.34"	23° 26' 19"	0 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	226° 48' 04"	-3° 58' 38"	223° 07' 37"	-20° 39' 54"	0° 54' 01"	14' 43.25"	116° 53' 38"	0.96423
1	227° 17' 43"	-4° 00' 22"	223° 37' 20"	-20° 50' 08"	0° 54' 02"	14' 43.32"	116° 35' 60"	0.96276
2	227° 47' 22"	-4° 02' 05"	224° 07' 08"	-21° 00' 17"	0° 54' 02"	14' 43.39"	116° 18' 33"	0.96126
3	228° 17' 01"	-4° 03' 47"	224° 36' 60"	-21° 10' 21"	0° 54' 02"	14' 43.47"	116° 1' 16"	0.95973
4	228° 46' 40"	-4° 05' 28"	225° 06' 56"	-21° 20' 19"	0° 54' 02"	14' 43.54"	115° 44' 07"	0.95817
5	229° 16' 20"	-4° 07' 08"	225° 36' 56"	-21° 30' 12"	0° 54' 03"	14' 43.62"	115° 27' 07"	0.95659
6	229° 45' 60"	-4° 08' 47"	226° 07' 01"	-21° 40' 00"	0° 54' 03"	14' 43.71"	115° 10' 15"	0.95497
7	230° 15' 40"	-4° 10' 25"	226° 37' 10"	-21° 49' 43"	0° 54' 03"	14' 43.79"	114° 53' 29"	0.95333
8	230° 45' 21"	-4° 12' 01"	227° 07' 23"	-21° 59' 20"	0° 54' 04"	14' 43.88"	114° 36' 49"	0.95166
9	231° 15' 02"	-4° 13' 37"	227° 37' 41"	-22° 08' 51"	0° 54' 04"	14' 43.97"	114° 20' 14"	0.94996
10	231° 44' 43"	-4° 15' 11"	228° 08' 03"	-22° 18' 18"	0° 54' 04"	14' 44.06"	114° 3' 44"	0.94823
11	232° 14' 25"	-4° 16' 44"	228° 38' 29"	-22° 27' 38"	0° 54' 05"	14' 44.16"	113° 47' 19"	0.94647
12	232° 44' 07"	-4° 18' 16"	229° 08' 60"	-22° 36' 53"	0° 54' 05"	14' 44.26"	113° 30' 57"	0.94469
13	233° 13' 50"	-4° 19' 47"	229° 39' 35"	-22° 46' 02"	0° 54' 05"	14' 44.37"	113° 14' 39"	0.94288
14	233° 43' 33"	-4° 21' 17"	230° 10' 15"	-22° 55' 05"	0° 54' 06"	14' 44.47"	112° 58' 24"	0.94104
15	234° 13' 16"	-4° 22' 45"	230° 40' 58"	-23° 04' 03"	0° 54' 06"	14' 44.58"	112° 42' 11"	0.93917
16	234° 43' 00"	-4° 24' 13"	231° 11' 47"	-23° 12' 55"	0° 54' 07"	14' 44.69"	112° 25' 60"	0.93727
17	235° 12' 44"	-4° 25' 39"	231° 42' 39"	-23° 21' 40"	0° 54' 07"	14' 44.81"	112° 9' 51"	0.93535
18	235° 42' 29"	-4° 27' 04"	232° 13' 36"	-23° 30' 20"	0° 54' 07"	14' 44.92"	111° 53' 44"	0.93339
19	236° 12' 14"	-4° 28' 28"	232° 44' 38"	-23° 38' 54"	0° 54' 08"	14' 45.05"	111° 37' 37"	0.93141
20	236° 42' 00"	-4° 29' 50"	233° 15' 44"	-23° 47' 22"	0° 54' 08"	14' 45.17"	111° 21' 32"	0.92941
21	237° 11' 46"	-4° 31' 12"	233° 46' 54"	-23° 55' 43"	0° 54' 09"	14' 45.30"	111° 5' 27"	0.92737
22	237° 41' 33"	-4° 32' 32"	234° 18' 09"	-24° 03' 58"	0° 54' 09"	14' 45.43"	110° 49' 23"	0.92531
23	238° 11' 20"	-4° 33' 51"	234° 49' 28"	-24° 12' 07"	0° 54' 10"	14' 45.56"	110° 33' 19"	0.92322
24	238° 41' 08"	-4° 35' 09"	235° 20' 52"	-24° 20' 10"	0° 54' 10"	14' 45.70"	110° 17' 15"	0.92111

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	26° 15' 37"	-0.69"	24° 20' 56"	10° 08' 03"	1.0034389	15'56.34"	23° 26' 19"	0 m 09 s
1	26° 18' 03"	-0.70"	24° 23' 15"	10° 08' 56"	1.0034506	15'56.33"	23° 26' 19"	0 m 10 s
2	26° 20' 30"	-0.70"	24° 25' 34"	10° 09' 49"	1.0034624	15'56.32"	23° 26' 19"	0 m 10 s
3	26° 22' 57"	-0.70"	24° 27' 53"	10° 10' 42"	1.0034742	15'56.31"	23° 26' 19"	0 m 11 s
4	26° 25' 24"	-0.70"	24° 30' 12"	10° 11' 35"	1.0034860	15'56.30"	23° 26' 19"	0 m 11 s
5	26° 27' 50"	-0.71"	24° 32' 31"	10° 12' 28"	1.0034977	15'56.29"	23° 26' 19"	0 m 12 s
6	26° 30' 17"	-0.71"	24° 34' 50"	10° 13' 22"	1.0035095	15'56.27"	23° 26' 19"	0 m 13 s
7	26° 32' 44"	-0.71"	24° 37' 09"	10° 14' 15"	1.0035213	15'56.26"	23° 26' 19"	0 m 13 s
8	26° 35' 11"	-0.71"	24° 39' 28"	10° 15' 08"	1.0035331	15'56.25"	23° 26' 19"	0 m 14 s
9	26° 37' 37"	-0.71"	24° 41' 47"	10° 16' 01"	1.0035449	15'56.24"	23° 26' 19"	0 m 14 s
10	26° 40' 04"	-0.71"	24° 44' 06"	10° 16' 54"	1.0035566	15'56.23"	23° 26' 19"	0 m 15 s
11	26° 42' 31"	-0.72"	24° 46' 25"	10° 17' 47"	1.0035684	15'56.22"	23° 26' 19"	0 m 15 s
12	26° 44' 58"	-0.72"	24° 48' 44"	10° 18' 40"	1.0035802	15'56.21"	23° 26' 19"	0 m 16 s
13	26° 47' 24"	-0.72"	24° 51' 03"	10° 19' 33"	1.0035920	15'56.20"	23° 26' 19"	0 m 17 s
14	26° 49' 51"	-0.72"	24° 53' 23"	10° 20' 26"	1.0036037	15'56.18"	23° 26' 19"	0 m 17 s
15	26° 52' 18"	-0.72"	24° 55' 42"	10° 21' 18"	1.0036155	15'56.17"	23° 26' 19"	0 m 18 s
16	26° 54' 44"	-0.73"	24° 58' 01"	10° 22' 11"	1.0036273	15'56.16"	23° 26' 19"	0 m 18 s
17	26° 57' 11"	-0.73"	25° 00' 20"	10° 23' 04"	1.0036391	15'56.15"	23° 26' 19"	0 m 19 s
18	26° 59' 38"	-0.73"	25° 02' 39"	10° 23' 57"	1.0036508	15'56.14"	23° 26' 19"	0 m 20 s
19	27° 02' 05"	-0.73"	25° 04' 58"	10° 24' 50"	1.0036626	15'56.13"	23° 26' 19"	0 m 20 s
20	27° 04' 31"	-0.73"	25° 07' 17"	10° 25' 43"	1.0036744	15'56.12"	23° 26' 19"	0 m 21 s
21	27° 06' 58"	-0.73"	25° 09' 36"	10° 26' 36"	1.0036862	15'56.11"	23° 26' 19"	0 m 21 s
22	27° 09' 25"	-0.73"	25° 11' 56"	10° 27' 29"	1.0036979	15'56.09"	23° 26' 19"	0 m 22 s
23	27° 11' 51"	-0.73"	25° 14' 15"	10° 28' 21"	1.0037097	15'56.08"	23° 26' 19"	0 m 22 s
24	27° 14' 18"	-0.74"	25° 16' 34"	10° 29' 14"	1.0037215	15'56.07"	23° 26' 19"	0 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	238° 41' 08"	-4° 35' 09"	235° 20' 52"	-24° 20' 10"	0° 54' 10"	14' 45.70"	110° 17' 15"	0.92111
1	239° 10' 56"	-4° 36' 25"	235° 52' 20"	-24° 28' 06"	0° 54' 11"	14' 45.84"	110° 1' 10"	0.91896
2	239° 40' 45"	-4° 37' 41"	236° 23' 52"	-24° 35' 56"	0° 54' 11"	14' 45.98"	109° 45' 06"	0.91679
3	240° 10' 34"	-4° 38' 55"	236° 55' 29"	-24° 43' 40"	0° 54' 12"	14' 46.13"	109° 29' 00"	0.91460
4	240° 40' 24"	-4° 40' 08"	237° 27' 10"	-24° 51' 17"	0° 54' 12"	14' 46.27"	109° 12' 54"	0.91237
5	241° 10' 14"	-4° 41' 19"	237° 58' 56"	-24° 58' 47"	0° 54' 13"	14' 46.43"	108° 56' 47"	0.91012
6	241° 40' 05"	-4° 42' 29"	238° 30' 46"	-25° 06' 11"	0° 54' 14"	14' 46.58"	108° 40' 39"	0.90785
7	242° 09' 57"	-4° 43' 38"	239° 02' 40"	-25° 13' 27"	0° 54' 14"	14' 46.74"	108° 24' 30"	0.90555
8	242° 39' 49"	-4° 44' 46"	239° 34' 39"	-25° 20' 38"	0° 54' 15"	14' 46.90"	108° 8' 20"	0.90322
9	243° 09' 42"	-4° 45' 53"	240° 06' 42"	-25° 27' 41"	0° 54' 15"	14' 47.07"	107° 52' 09"	0.90086
10	243° 39' 35"	-4° 46' 58"	240° 38' 49"	-25° 34' 38"	0° 54' 16"	14' 47.24"	107° 35' 56"	0.89848
11	244° 09' 29"	-4° 48' 02"	241° 11' 00"	-25° 41' 27"	0° 54' 17"	14' 47.41"	107° 19' 41"	0.89607
12	244° 39' 24"	-4° 49' 04"	241° 43' 16"	-25° 48' 10"	0° 54' 17"	14' 47.58"	107° 3' 25"	0.89364
13	245° 09' 19"	-4° 50' 06"	242° 15' 36"	-25° 54' 45"	0° 54' 18"	14' 47.76"	106° 47' 08"	0.89118
14	245° 39' 15"	-4° 51' 06"	242° 48' 00"	-26° 01' 14"	0° 54' 18"	14' 47.94"	106° 30' 48"	0.88870
15	246° 09' 12"	-4° 52' 05"	243° 20' 29"	-26° 07' 35"	0° 54' 19"	14' 48.13"	106° 14' 27"	0.88619
16	246° 39' 09"	-4° 53' 02"	243° 53' 01"	-26° 13' 50"	0° 54' 20"	14' 48.31"	105° 58' 04"	0.88365
17	247° 09' 08"	-4° 53' 58"	244° 25' 38"	-26° 19' 57"	0° 54' 21"	14' 48.51"	105° 41' 39"	0.88109
18	247° 39' 06"	-4° 54' 53"	244° 58' 19"	-26° 25' 56"	0° 54' 21"	14' 48.70"	105° 25' 13"	0.87851
19	248° 09' 06"	-4° 55' 46"	245° 31' 03"	-26° 31' 49"	0° 54' 22"	14' 48.90"	105° 8' 44"	0.87589
20	248° 39' 06"	-4° 56' 38"	246° 03' 52"	-26° 37' 34"	0° 54' 23"	14' 49.10"	104° 52' 13"	0.87326
21	249° 09' 07"	-4° 57' 29"	246° 36' 45"	-26° 43' 11"	0° 54' 24"	14' 49.30"	104° 35' 41"	0.87060
22	249° 39' 09"	-4° 58' 18"	247° 09' 42"	-26° 48' 41"	0° 54' 24"	14' 49.51"	104° 19' 07"	0.86791
23	250° 09' 11"	-4° 59' 06"	247° 42' 43"	-26° 54' 04"	0° 54' 25"	14' 49.72"	104° 2' 30"	0.86520
24	250° 39' 14"	-4° 59' 53"	248° 15' 47"	-26° 59' 19"	0° 54' 26"	14' 49.94"	103° 45' 52"	0.86247

17 April 2025

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	27° 14' 18"	-0.74"	25° 16' 34"	10° 29' 14"	1.0037215	15'56.07"	23° 26' 19"	0 m 23 s
1	27° 16' 45"	-0.74"	25° 18' 53"	10° 30' 07"	1.0037333	15'56.06"	23° 26' 19"	0 m 24 s
2	27° 19' 11"	-0.74"	25° 21' 12"	10° 30' 60"	1.0037450	15'56.05"	23° 26' 19"	0 m 24 s
3	27° 21' 38"	-0.74"	25° 23' 32"	10° 31' 52"	1.0037568	15'56.04"	23° 26' 19"	0 m 25 s
4	27° 24' 05"	-0.74"	25° 25' 51"	10° 32' 45"	1.0037686	15'56.03"	23° 26' 19"	0 m 25 s
5	27° 26' 31"	-0.74"	25° 28' 10"	10° 33' 38"	1.0037803	15'56.02"	23° 26' 19"	0 m 26 s
6	27° 28' 58"	-0.74"	25° 30' 29"	10° 34' 30"	1.0037921	15'56.00"	23° 26' 19"	0 m 26 s
7	27° 31' 25"	-0.74"	25° 32' 49"	10° 35' 23"	1.0038039	15'55.99"	23° 26' 19"	0 m 27 s
8	27° 33' 51"	-0.74"	25° 35' 08"	10° 36' 16"	1.0038157	15'55.98"	23° 26' 19"	0 m 28 s
9	27° 36' 18"	-0.74"	25° 37' 27"	10° 37' 08"	1.0038274	15'55.97"	23° 26' 19"	0 m 28 s
10	27° 38' 45"	-0.74"	25° 39' 46"	10° 38' 01"	1.0038392	15'55.96"	23° 26' 19"	0 m 29 s
11	27° 41' 11"	-0.75"	25° 42' 06"	10° 38' 53"	1.0038510	15'55.95"	23° 26' 19"	0 m 29 s
12	27° 43' 38"	-0.75"	25° 44' 25"	10° 39' 46"	1.0038627	15'55.94"	23° 26' 19"	0 m 30 s
13	27° 46' 05"	-0.75"	25° 46' 44"	10° 40' 38"	1.0038745	15'55.93"	23° 26' 19"	0 m 30 s
14	27° 48' 31"	-0.75"	25° 49' 04"	10° 41' 31"	1.0038863	15'55.92"	23° 26' 19"	0 m 31 s
15	27° 50' 58"	-0.75"	25° 51' 23"	10° 42' 23"	1.0038980	15'55.90"	23° 26' 19"	0 m 31 s
16	27° 53' 25"	-0.75"	25° 53' 42"	10° 43' 16"	1.0039098	15'55.89"	23° 26' 19"	0 m 32 s
17	27° 55' 51"	-0.75"	25° 56' 02"	10° 44' 08"	1.0039216	15'55.88"	23° 26' 19"	0 m 33 s
18	27° 58' 18"	-0.75"	25° 58' 21"	10° 45' 01"	1.0039333	15'55.87"	23° 26' 19"	0 m 33 s
19	28° 00' 45"	-0.75"	26° 00' 41"	10° 45' 53"	1.0039451	15'55.86"	23° 26' 19"	0 m 34 s
20	28° 03' 11"	-0.75"	26° 03' 00"	10° 46' 46"	1.0039568	15'55.85"	23° 26' 19"	0 m 34 s
21	28° 05' 38"	-0.75"	26° 05' 19"	10° 47' 38"	1.0039686	15'55.84"	23° 26' 19"	0 m 35 s
22	28° 08' 04"	-0.75"	26° 07' 39"	10° 48' 30"	1.0039804	15'55.83"	23° 26' 19"	0 m 35 s
23	28° 10' 31"	-0.75"	26° 09' 58"	10° 49' 23"	1.0039921	15'55.81"	23° 26' 19"	0 m 36 s
24	28° 12' 58"	-0.75"	26° 12' 18"	10° 50' 15"	1.0040039	15'55.80"	23° 26' 19"	0 m 37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	250° 39' 14"	-4° 59' 53"	248° 15' 47"	-26° 59' 19"	0° 54' 26"	14' 49.94"	103° 45' 52"	0.86247
1	251° 09' 19"	-5° 00' 39"	248° 48' 56"	-27° 04' 26"	0° 54' 27"	14' 50.16"	103° 29' 11"	0.85971
2	251° 39' 23"	-5° 01' 22"	249° 22' 08"	-27° 09' 26"	0° 54' 27"	14' 50.38"	103° 12' 29"	0.85693
3	252° 09' 29"	-5° 02' 05"	249° 55' 24"	-27° 14' 18"	0° 54' 28"	14' 50.61"	102° 55' 45"	0.85412
4	252° 39' 36"	-5° 02' 46"	250° 28' 44"	-27° 19' 02"	0° 54' 29"	14' 50.84"	102° 38' 58"	0.85129
5	253° 09' 43"	-5° 03' 26"	251° 02' 08"	-27° 23' 39"	0° 54' 30"	14' 51.07"	102° 22' 10"	0.84843
6	253° 39' 51"	-5° 04' 05"	251° 35' 35"	-27° 28' 07"	0° 54' 31"	14' 51.30"	102° 5' 20"	0.84555
7	254° 10' 00"	-5° 04' 42"	252° 09' 06"	-27° 32' 28"	0° 54' 32"	14' 51.54"	101° 48' 28"	0.84265
8	254° 40' 10"	-5° 05' 17"	252° 42' 40"	-27° 36' 41"	0° 54' 33"	14' 51.79"	101° 31' 34"	0.83972
9	255° 10' 21"	-5° 05' 52"	253° 16' 17"	-27° 40' 45"	0° 54' 34"	14' 52.03"	101° 14' 39"	0.83677
10	255° 40' 33"	-5° 06' 24"	253° 49' 59"	-27° 44' 42"	0° 54' 34"	14' 52.28"	100° 57' 42"	0.83380
11	256° 10' 46"	-5° 06' 56"	254° 23' 43"	-27° 48' 31"	0° 54' 35"	14' 52.54"	100° 40' 42"	0.83081
12	256° 40' 59"	-5° 07' 26"	254° 57' 31"	-27° 52' 11"	0° 54' 36"	14' 52.79"	100° 23' 42"	0.82779
13	257° 11' 14"	-5° 07' 55"	255° 31' 22"	-27° 55' 44"	0° 54' 37"	14' 53.06"	100° 6' 39"	0.82475
14	257° 41' 29"	-5° 08' 22"	256° 05' 16"	-27° 59' 08"	0° 54' 38"	14' 53.32"	99° 49' 35"	0.82168
15	258° 11' 46"	-5° 08' 48"	256° 39' 14"	-28° 02' 24"	0° 54' 39"	14' 53.59"	99° 32' 30"	0.81859
16	258° 42' 03"	-5° 09' 12"	257° 13' 14"	-28° 05' 31"	0° 54' 40"	14' 53.86"	99° 15' 23"	0.81548
17	259° 12' 22"	-5° 09' 35"	257° 47' 18"	-28° 08' 31"	0° 54' 41"	14' 54.14"	98° 58' 14"	0.81235
18	259° 42' 41"	-5° 09' 57"	258° 21' 24"	-28° 11' 22"	0° 54' 42"	14' 54.41"	98° 41' 05"	0.80920
19	260° 13' 02"	-5° 10' 17"	258° 55' 33"	-28° 14' 04"	0° 54' 43"	14' 54.70"	98° 23' 53"	0.80602
20	260° 43' 23"	-5° 10' 35"	259° 29' 46"	-28° 16' 39"	0° 54' 44"	14' 54.98"	98° 6' 41"	0.80282
21	261° 13' 46"	-5° 10' 52"	260° 04' 01"	-28° 19' 04"	0° 54' 45"	14' 55.27"	97° 49' 28"	0.79961
22	261° 44' 09"	-5° 11' 08"	260° 38' 18"	-28° 21' 22"	0° 54' 46"	14' 55.57"	97° 32' 13"	0.79636
23	262° 14' 34"	-5° 11' 22"	261° 12' 38"	-28° 23' 30"	0° 54' 48"	14' 55.87"	97° 14' 58"	0.79310
24	262° 44' 60"	-5° 11' 35"	261° 47' 01"	-28° 25' 31"	0° 54' 49"	14' 56.17"	96° 57' 41"	0.78982

18 April 2025

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	28° 12' 58"	-0.75"	26° 12' 18"	10° 50' 15"	1.0040039	15'55.80"	23° 26' 19"	0 m 37 s
1	28° 15' 24"	-0.75"	26° 14' 37"	10° 51' 07"	1.0040156	15'55.79"	23° 26' 19"	0 m 37 s
2	28° 17' 51"	-0.75"	26° 16' 57"	10° 51' 60"	1.0040274	15'55.78"	23° 26' 19"	0 m 38 s
3	28° 20' 17"	-0.75"	26° 19' 16"	10° 52' 52"	1.0040391	15'55.77"	23° 26' 19"	0 m 38 s
4	28° 22' 44"	-0.75"	26° 21' 36"	10° 53' 44"	1.0040509	15'55.76"	23° 26' 19"	0 m 39 s
5	28° 25' 11"	-0.75"	26° 23' 55"	10° 54' 37"	1.0040627	15'55.75"	23° 26' 19"	0 m 39 s
6	28° 27' 37"	-0.75"	26° 26' 15"	10° 55' 29"	1.0040744	15'55.74"	23° 26' 19"	0 m 40 s
7	28° 30' 04"	-0.75"	26° 28' 34"	10° 56' 21"	1.0040862	15'55.72"	23° 26' 19"	0 m 40 s
8	28° 32' 30"	-0.74"	26° 30' 54"	10° 57' 13"	1.0040979	15'55.71"	23° 26' 19"	0 m 41 s
9	28° 34' 57"	-0.74"	26° 33' 13"	10° 58' 05"	1.0041097	15'55.70"	23° 26' 19"	0 m 41 s
10	28° 37' 24"	-0.74"	26° 35' 33"	10° 58' 57"	1.0041214	15'55.69"	23° 26' 19"	0 m 42 s
11	28° 39' 50"	-0.74"	26° 37' 52"	10° 59' 50"	1.0041332	15'55.68"	23° 26' 19"	0 m 43 s
12	28° 42' 17"	-0.74"	26° 40' 12"	11° 00' 42"	1.0041449	15'55.67"	23° 26' 19"	0 m 43 s
13	28° 44' 43"	-0.74"	26° 42' 32"	11° 01' 34"	1.0041566	15'55.66"	23° 26' 19"	0 m 44 s
14	28° 47' 10"	-0.74"	26° 44' 51"	11° 02' 26"	1.0041684	15'55.65"	23° 26' 19"	0 m 44 s
15	28° 49' 37"	-0.74"	26° 47' 11"	11° 03' 18"	1.0041801	15'55.64"	23° 26' 19"	0 m 45 s
16	28° 52' 03"	-0.74"	26° 49' 30"	11° 04' 10"	1.0041919	15'55.62"	23° 26' 19"	0 m 45 s
17	28° 54' 30"	-0.74"	26° 51' 50"	11° 05' 02"	1.0042036	15'55.61"	23° 26' 19"	0 m 46 s
18	28° 56' 56"	-0.74"	26° 54' 10"	11° 05' 54"	1.0042154	15'55.60"	23° 26' 19"	0 m 46 s
19	28° 59' 23"	-0.74"	26° 56' 29"	11° 06' 46"	1.0042271	15'55.59"	23° 26' 19"	0 m 47 s
20	29° 01' 49"	-0.73"	26° 58' 49"	11° 07' 38"	1.0042388	15'55.58"	23° 26' 19"	0 m 47 s
21	29° 04' 16"	-0.73"	27° 01' 09"	11° 08' 30"	1.0042506	15'55.57"	23° 26' 19"	0 m 48 s
22	29° 06' 42"	-0.73"	27° 03' 28"	11° 09' 22"	1.0042623	15'55.56"	23° 26' 19"	0 m 49 s
23	29° 09' 09"	-0.73"	27° 05' 48"	11° 10' 14"	1.0042740	15'55.55"	23° 26' 19"	0 m 49 s
24	29° 11' 36"	-0.73"	27° 08' 08"	11° 11' 06"	1.0042858	15'55.53"	23° 26' 19"	0 m 50 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	262° 44' 60"	-5° 11' 35"	261° 47' 01"	-28° 25' 31"	0° 54' 49"	14' 56.17"	96° 57' 41"	0.78982
1	263° 15' 27"	-5° 11' 47"	262° 21' 27"	-28° 27' 22"	0° 54' 50"	14' 56.47"	96° 40' 24"	0.78651
2	263° 45' 55"	-5° 11' 57"	262° 55' 54"	-28° 29' 05"	0° 54' 51"	14' 56.78"	96° 23' 06"	0.78319
3	264° 16' 24"	-5° 12' 05"	263° 30' 24"	-28° 30' 40"	0° 54' 52"	14' 57.09"	96° 5' 47"	0.77984
4	264° 46' 54"	-5° 12' 12"	264° 04' 57"	-28° 32' 05"	0° 54' 53"	14' 57.41"	95° 48' 28"	0.77647
5	265° 17' 26"	-5° 12' 17"	264° 39' 31"	-28° 33' 22"	0° 54' 54"	14' 57.73"	95° 31' 08"	0.77308
6	265° 47' 59"	-5° 12' 21"	265° 14' 08"	-28° 34' 30"	0° 54' 56"	14' 58.05"	95° 13' 47"	0.76967
7	266° 18' 32"	-5° 12' 24"	265° 48' 46"	-28° 35' 30"	0° 54' 57"	14' 58.38"	94° 56' 27"	0.76624
8	266° 49' 08"	-5° 12' 25"	266° 23' 27"	-28° 36' 21"	0° 54' 58"	14' 58.71"	94° 39' 06"	0.76280
9	267° 19' 44"	-5° 12' 25"	266° 58' 10"	-28° 37' 02"	0° 54' 59"	14' 59.05"	94° 21' 45"	0.75933
10	267° 50' 21"	-5° 12' 23"	267° 32' 54"	-28° 37' 35"	0° 55' 00"	14' 59.38"	94° 4' 24"	0.75584
11	268° 21' 00"	-5° 12' 19"	268° 07' 40"	-28° 37' 60"	0° 55' 02"	14' 59.73"	93° 47' 02"	0.75233
12	268° 51' 40"	-5° 12' 15"	268° 42' 28"	-28° 38' 15"	0° 55' 03"	15' 00.07"	93° 29' 41"	0.74880
13	269° 22' 21"	-5° 12' 08"	269° 17' 17"	-28° 38' 21"	0° 55' 04"	15' 00.42"	93° 12' 21"	0.74525
14	269° 53' 04"	-5° 12' 00"	269° 52' 08"	-28° 38' 19"	0° 55' 06"	15' 00.78"	92° 55' 00"	0.74169
15	270° 23' 48"	-5° 11' 51"	270° 27' 00"	-28° 38' 08"	0° 55' 07"	15' 01.13"	92° 37' 40"	0.73810
16	270° 54' 33"	-5° 11' 40"	271° 01' 54"	-28° 37' 47"	0° 55' 08"	15' 01.49"	92° 20' 21"	0.73450
17	271° 25' 20"	-5° 11' 28"	271° 36' 49"	-28° 37' 18"	0° 55' 10"	15' 01.86"	92° 3' 02"	0.73087
18	271° 56' 08"	-5° 11' 14"	272° 11' 45"	-28° 36' 39"	0° 55' 11"	15' 02.23"	91° 45' 44"	0.72723
19	272° 26' 57"	-5° 10' 58"	272° 46' 42"	-28° 35' 52"	0° 55' 12"	15' 02.60"	91° 28' 26"	0.72357
20	272° 57' 48"	-5° 10' 41"	273° 21' 40"	-28° 34' 56"	0° 55' 14"	15' 02.98"	91° 11' 10"	0.71989
21	273° 28' 40"	-5° 10' 23"	273° 56' 39"	-28° 33' 50"	0° 55' 15"	15' 03.36"	90° 53' 55"	0.71620
22	273° 59' 33"	-5° 10' 03"	274° 31' 39"	-28° 32' 36"	0° 55' 16"	15' 03.74"	90° 36' 41"	0.71248
23	274° 30' 28"	-5° 09' 41"	275° 06' 40"	-28° 31' 13"	0° 55' 18"	15' 04.13"	90° 19' 28"	0.70875
24	275° 01' 25"	-5° 09' 19"	275° 41' 41"	-28° 29' 40"	0° 55' 19"	15' 04.52"	90° 2' 16"	0.70500

19 April 2025

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	29° 11' 36"	-0.73"	27° 08' 08"	11° 11' 06"	1.0042858	15'55.53"	23° 26' 19"	0 m 50 s
1	29° 14' 02"	-0.73"	27° 10' 27"	11° 11' 57"	1.0042975	15'55.52"	23° 26' 19"	0 m 50 s
2	29° 16' 29"	-0.73"	27° 12' 47"	11° 12' 49"	1.0043092	15'55.51"	23° 26' 19"	0 m 51 s
3	29° 18' 55"	-0.72"	27° 15' 07"	11° 13' 41"	1.0043210	15'55.50"	23° 26' 19"	0 m 51 s
4	29° 21' 22"	-0.72"	27° 17' 27"	11° 14' 33"	1.0043327	15'55.49"	23° 26' 19"	0 m 52 s
5	29° 23' 48"	-0.72"	27° 19' 46"	11° 15' 25"	1.0043444	15'55.48"	23° 26' 19"	0 m 52 s
6	29° 26' 15"	-0.72"	27° 22' 06"	11° 16' 16"	1.0043561	15'55.47"	23° 26' 19"	0 m 53 s
7	29° 28' 41"	-0.72"	27° 24' 26"	11° 17' 08"	1.0043679	15'55.46"	23° 26' 19"	0 m 53 s
8	29° 31' 08"	-0.72"	27° 26' 46"	11° 17' 60"	1.0043796	15'55.45"	23° 26' 19"	0 m 54 s
9	29° 33' 34"	-0.71"	27° 29' 06"	11° 18' 52"	1.0043913	15'55.43"	23° 26' 19"	0 m 54 s
10	29° 36' 01"	-0.71"	27° 31' 25"	11° 19' 43"	1.0044030	15'55.42"	23° 26' 19"	0 m 55 s
11	29° 38' 27"	-0.71"	27° 33' 45"	11° 20' 35"	1.0044147	15'55.41"	23° 26' 19"	0 m 56 s
12	29° 40' 54"	-0.71"	27° 36' 05"	11° 21' 27"	1.0044264	15'55.40"	23° 26' 19"	0 m 56 s
13	29° 43' 20"	-0.71"	27° 38' 25"	11° 22' 18"	1.0044382	15'55.39"	23° 26' 19"	0 m 57 s
14	29° 45' 47"	-0.70"	27° 40' 45"	11° 23' 10"	1.0044499	15'55.38"	23° 26' 19"	0 m 57 s
15	29° 48' 13"	-0.70"	27° 43' 05"	11° 24' 02"	1.0044616	15'55.37"	23° 26' 19"	0 m 58 s
16	29° 50' 40"	-0.70"	27° 45' 24"	11° 24' 53"	1.0044733	15'55.36"	23° 26' 19"	0 m 58 s
17	29° 53' 06"	-0.70"	27° 47' 44"	11° 25' 45"	1.0044850	15'55.35"	23° 26' 19"	0 m 59 s
18	29° 55' 33"	-0.70"	27° 50' 04"	11° 26' 36"	1.0044967	15'55.33"	23° 26' 19"	0 m 59 s
19	29° 57' 59"	-0.69"	27° 52' 24"	11° 27' 28"	1.0045084	15'55.32"	23° 26' 19"	0 m 60 s
20	30° 00' 26"	-0.69"	27° 54' 44"	11° 28' 19"	1.0045201	15'55.31"	23° 26' 19"	1 m 00 s
21	30° 02' 52"	-0.69"	27° 57' 04"	11° 29' 11"	1.0045318	15'55.30"	23° 26' 19"	1 m 01 s
22	30° 05' 19"	-0.69"	27° 59' 24"	11° 30' 02"	1.0045435	15'55.29"	23° 26' 19"	1 m 01 s
23	30° 07' 45"	-0.68"	28° 01' 44"	11° 30' 54"	1.0045552	15'55.28"	23° 26' 19"	1 m 02 s
24	30° 10' 12"	-0.68"	28° 04' 04"	11° 31' 45"	1.0045669	15'55.27"	23° 26' 19"	1 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	275° 01' 25"	-5° 09' 19"	275° 41' 41"	-28° 29' 40"	0° 55' 19"	15' 04.52"	90° 2' 16"	0.70500
1	275° 32' 22"	-5° 08' 54"	276° 16' 44"	-28° 27' 59"	0° 55' 21"	15' 04.92"	89° 45' 06"	0.70123
2	276° 03' 22"	-5° 08' 28"	276° 51' 46"	-28° 26' 08"	0° 55' 22"	15' 05.32"	89° 27' 58"	0.69745
3	276° 34' 22"	-5° 08' 00"	277° 26' 49"	-28° 24' 08"	0° 55' 24"	15' 05.72"	89° 10' 51"	0.69365
4	277° 05' 25"	-5° 07' 31"	278° 01' 53"	-28° 21' 59"	0° 55' 25"	15' 06.13"	88° 53' 46"	0.68983
5	277° 36' 29"	-5° 07' 01"	278° 36' 57"	-28° 19' 41"	0° 55' 27"	15' 06.54"	88° 36' 43"	0.68600
6	278° 07' 34"	-5° 06' 29"	279° 12' 01"	-28° 17' 15"	0° 55' 28"	15' 06.95"	88° 19' 42"	0.68215
7	278° 38' 41"	-5° 05' 55"	279° 47' 05"	-28° 14' 38"	0° 55' 30"	15' 07.37"	88° 2' 43"	0.67828
8	279° 09' 49"	-5° 05' 20"	280° 22' 09"	-28° 11' 53"	0° 55' 31"	15' 07.79"	87° 45' 47"	0.67440
9	279° 40' 59"	-5° 04' 43"	280° 57' 13"	-28° 08' 59"	0° 55' 33"	15' 08.22"	87° 28' 52"	0.67050
10	280° 12' 11"	-5° 04' 05"	281° 32' 17"	-28° 05' 56"	0° 55' 34"	15' 08.64"	87° 12' 01"	0.66659
11	280° 43' 24"	-5° 03' 25"	282° 07' 21"	-28° 02' 43"	0° 55' 36"	15' 09.08"	86° 55' 11"	0.66266
12	281° 14' 39"	-5° 02' 43"	282° 42' 25"	-27° 59' 22"	0° 55' 38"	15' 09.51"	86° 38' 25"	0.65871
13	281° 45' 56"	-5° 02' 01"	283° 17' 28"	-27° 55' 51"	0° 55' 39"	15' 09.95"	86° 21' 41"	0.65475
14	282° 17' 14"	-5° 01' 16"	283° 52' 31"	-27° 52' 11"	0° 55' 41"	15' 10.40"	86° 5' 01"	0.65078
15	282° 48' 34"	-5° 00' 30"	284° 27' 34"	-27° 48' 23"	0° 55' 43"	15' 10.85"	85° 48' 23"	0.64679
16	283° 19' 56"	-4° 59' 43"	285° 02' 36"	-27° 44' 25"	0° 55' 44"	15' 11.30"	85° 31' 48"	0.64279
17	283° 51' 19"	-4° 58' 54"	285° 37' 38"	-27° 40' 18"	0° 55' 46"	15' 11.75"	85° 15' 17"	0.63877
18	284° 22' 44"	-4° 58' 03"	286° 12' 38"	-27° 36' 02"	0° 55' 48"	15' 12.21"	84° 58' 49"	0.63474
19	284° 54' 11"	-4° 57' 11"	286° 47' 38"	-27° 31' 37"	0° 55' 49"	15' 12.67"	84° 42' 25"	0.63069
20	285° 25' 39"	-4° 56' 17"	287° 22' 38"	-27° 27' 03"	0° 55' 51"	15' 13.14"	84° 26' 04"	0.62663
21	285° 57' 10"	-4° 55' 22"	287° 57' 36"	-27° 22' 20"	0° 55' 53"	15' 13.61"	84° 9' 46"	0.62256
22	286° 28' 42"	-4° 54' 25"	288° 32' 33"	-27° 17' 28"	0° 55' 54"	15' 14.08"	83° 53' 33"	0.61847
23	287° 00' 16"	-4° 53' 27"	289° 07' 30"	-27° 12' 27"	0° 55' 56"	15' 14.56"	83° 37' 24"	0.61437
24	287° 31' 51"	-4° 52' 27"	289° 42' 25"	-27° 07' 17"	0° 55' 58"	15' 15.04"	83° 21' 18"	0.61026

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	30° 10' 12"	-0.68"	28° 04' 04"	11° 31' 45"	1.0045669	15'55.27"	23° 26' 19"	1 m 02 s
1	30° 12' 38"	-0.68"	28° 06' 24"	11° 32' 36"	1.0045786	15'55.26"	23° 26' 19"	1 m 03 s
2	30° 15' 05"	-0.68"	28° 08' 44"	11° 33' 28"	1.0045903	15'55.25"	23° 26' 19"	1 m 03 s
3	30° 17' 31"	-0.67"	28° 11' 04"	11° 34' 19"	1.0046019	15'55.23"	23° 26' 19"	1 m 04 s
4	30° 19' 58"	-0.67"	28° 13' 24"	11° 35' 11"	1.0046136	15'55.22"	23° 26' 19"	1 m 04 s
5	30° 22' 24"	-0.67"	28° 15' 44"	11° 36' 02"	1.0046253	15'55.21"	23° 26' 19"	1 m 05 s
6	30° 24' 51"	-0.66"	28° 18' 04"	11° 36' 53"	1.0046370	15'55.20"	23° 26' 19"	1 m 05 s
7	30° 27' 17"	-0.66"	28° 20' 24"	11° 37' 45"	1.0046487	15'55.19"	23° 26' 19"	1 m 06 s
8	30° 29' 43"	-0.66"	28° 22' 44"	11° 38' 36"	1.0046604	15'55.18"	23° 26' 19"	1 m 07 s
9	30° 32' 10"	-0.66"	28° 25' 04"	11° 39' 27"	1.0046720	15'55.17"	23° 26' 19"	1 m 07 s
10	30° 34' 36"	-0.65"	28° 27' 24"	11° 40' 18"	1.0046837	15'55.16"	23° 26' 19"	1 m 08 s
11	30° 37' 03"	-0.65"	28° 29' 45"	11° 41' 09"	1.0046954	15'55.15"	23° 26' 19"	1 m 08 s
12	30° 39' 29"	-0.65"	28° 32' 05"	11° 42' 01"	1.0047070	15'55.13"	23° 26' 19"	1 m 09 s
13	30° 41' 56"	-0.64"	28° 34' 25"	11° 42' 52"	1.0047187	15'55.12"	23° 26' 19"	1 m 09 s
14	30° 44' 22"	-0.64"	28° 36' 45"	11° 43' 43"	1.0047304	15'55.11"	23° 26' 19"	1 m 10 s
15	30° 46' 49"	-0.64"	28° 39' 05"	11° 44' 34"	1.0047420	15'55.10"	23° 26' 19"	1 m 10 s
16	30° 49' 15"	-0.63"	28° 41' 25"	11° 45' 25"	1.0047537	15'55.09"	23° 26' 19"	1 m 11 s
17	30° 51' 41"	-0.63"	28° 43' 45"	11° 46' 16"	1.0047653	15'55.08"	23° 26' 19"	1 m 11 s
18	30° 54' 08"	-0.63"	28° 46' 06"	11° 47' 07"	1.0047770	15'55.07"	23° 26' 19"	1 m 12 s
19	30° 56' 34"	-0.62"	28° 48' 26"	11° 47' 58"	1.0047886	15'55.06"	23° 26' 19"	1 m 12 s
20	30° 59' 01"	-0.62"	28° 50' 46"	11° 48' 49"	1.0048003	15'55.05"	23° 26' 19"	1 m 13 s
21	31° 01' 27"	-0.62"	28° 53' 06"	11° 49' 40"	1.0048119	15'55.03"	23° 26' 19"	1 m 13 s
22	31° 03' 54"	-0.61"	28° 55' 26"	11° 50' 31"	1.0048236	15'55.02"	23° 26' 19"	1 m 14 s
23	31° 06' 20"	-0.61"	28° 57' 47"	11° 51' 22"	1.0048352	15'55.01"	23° 26' 19"	1 m 14 s
24	31° 08' 46"	-0.61"	29° 00' 07"	11° 52' 13"	1.0048469	15'55.00"	23° 26' 19"	1 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	287° 31' 51"	-4° 52' 27"	289° 42' 25"	-27° 07' 17"	0° 55' 58"	15' 15.04"	83° 21' 18"	0.61026
1	288° 03' 29"	-4° 51' 26"	290° 17' 19"	-27° 01' 58"	0° 55' 60"	15' 15.53"	83° 5' 17"	0.60614
2	288° 35' 08"	-4° 50' 23"	290° 52' 12"	-26° 56' 30"	0° 56' 02"	15' 16.01"	82° 49' 19"	0.60200
3	289° 06' 50"	-4° 49' 18"	291° 27' 04"	-26° 50' 53"	0° 56' 03"	15' 16.50"	82° 33' 27"	0.59785
4	289° 38' 33"	-4° 48' 12"	292° 01' 54"	-26° 45' 08"	0° 56' 05"	15' 17.00"	82° 17' 38"	0.59369
5	290° 10' 18"	-4° 47' 05"	292° 36' 43"	-26° 39' 13"	0° 56' 07"	15' 17.50"	82° 1' 54"	0.58952
6	290° 42' 05"	-4° 45' 56"	293° 11' 31"	-26° 33' 10"	0° 56' 09"	15' 18.00"	81° 46' 15"	0.58534
7	291° 13' 54"	-4° 44' 45"	293° 46' 17"	-26° 26' 57"	0° 56' 11"	15' 18.50"	81° 30' 41"	0.58115
8	291° 45' 45"	-4° 43' 33"	294° 21' 02"	-26° 20' 36"	0° 56' 13"	15' 19.01"	81° 15' 11"	0.57694
9	292° 17' 38"	-4° 42' 19"	294° 55' 45"	-26° 14' 06"	0° 56' 14"	15' 19.52"	80° 59' 46"	0.57272
10	292° 49' 32"	-4° 41' 04"	295° 30' 26"	-26° 07' 28"	0° 56' 16"	15' 20.04"	80° 44' 27"	0.56850
11	293° 21' 29"	-4° 39' 47"	296° 05' 06"	-26° 00' 40"	0° 56' 18"	15' 20.56"	80° 29' 12"	0.56426
12	293° 53' 28"	-4° 38' 29"	296° 39' 44"	-25° 53' 44"	0° 56' 20"	15' 21.08"	80° 14' 03"	0.56002
13	294° 25' 29"	-4° 37' 09"	297° 14' 20"	-25° 46' 40"	0° 56' 22"	15' 21.61"	79° 58' 59"	0.55576
14	294° 57' 32"	-4° 35' 48"	297° 48' 54"	-25° 39' 26"	0° 56' 24"	15' 22.13"	79° 44' 00"	0.55150
15	295° 29' 37"	-4° 34' 25"	298° 23' 26"	-25° 32' 04"	0° 56' 26"	15' 22.67"	79° 29' 08"	0.54722
16	296° 01' 44"	-4° 33' 00"	298° 57' 57"	-25° 24' 33"	0° 56' 28"	15' 23.20"	79° 14' 20"	0.54294
17	296° 33' 53"	-4° 31' 35"	299° 32' 25"	-25° 16' 54"	0° 56' 30"	15' 23.74"	78° 59' 39"	0.53865
18	297° 06' 04"	-4° 30' 07"	300° 06' 52"	-25° 09' 06"	0° 56' 32"	15' 24.28"	78° 45' 03"	0.53435
19	297° 38' 18"	-4° 28' 38"	300° 41' 16"	-25° 01' 10"	0° 56' 34"	15' 24.82"	78° 30' 33"	0.53004
20	298° 10' 33"	-4° 27' 08"	301° 15' 39"	-24° 53' 05"	0° 56' 36"	15' 25.37"	78° 16' 09"	0.52573
21	298° 42' 51"	-4° 25' 36"	301° 49' 59"	-24° 44' 52"	0° 56' 38"	15' 25.92"	78° 1' 51"	0.52140
22	299° 15' 10"	-4° 24' 02"	302° 24' 17"	-24° 36' 30"	0° 56' 40"	15' 26.48"	77° 47' 40"	0.51707
23	299° 47' 32"	-4° 22' 27"	302° 58' 33"	-24° 28' 00"	0° 56' 42"	15' 27.03"	77° 33' 34"	0.51273
24	300° 19' 57"	-4° 20' 50"	303° 32' 47"	-24° 19' 22"	0° 56' 44"	15' 27.59"	77° 19' 35"	0.50839

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	31° 08' 46"	-0.61"	29° 00' 07"	11° 52' 13"	1.0048469	15'55.00"	23° 26' 19"	1 m 15 s
1	31° 11' 13"	-0.60"	29° 02' 27"	11° 53' 04"	1.0048585	15'54.99"	23° 26' 19"	1 m 15 s
2	31° 13' 39"	-0.60"	29° 04' 47"	11° 53' 55"	1.0048701	15'54.98"	23° 26' 19"	1 m 16 s
3	31° 16' 06"	-0.60"	29° 07' 08"	11° 54' 46"	1.0048818	15'54.97"	23° 26' 19"	1 m 16 s
4	31° 18' 32"	-0.59"	29° 09' 28"	11° 55' 37"	1.0048934	15'54.96"	23° 26' 19"	1 m 17 s
5	31° 20' 58"	-0.59"	29° 11' 48"	11° 56' 28"	1.0049050	15'54.95"	23° 26' 19"	1 m 17 s
6	31° 23' 25"	-0.58"	29° 14' 09"	11° 57' 19"	1.0049166	15'54.93"	23° 26' 19"	1 m 18 s
7	31° 25' 51"	-0.58"	29° 16' 29"	11° 58' 09"	1.0049283	15'54.92"	23° 26' 19"	1 m 18 s
8	31° 28' 18"	-0.58"	29° 18' 49"	11° 59' 00"	1.0049399	15'54.91"	23° 26' 19"	1 m 19 s
9	31° 30' 44"	-0.57"	29° 21' 10"	11° 59' 51"	1.0049515	15'54.90"	23° 26' 19"	1 m 19 s
10	31° 33' 10"	-0.57"	29° 23' 30"	12° 00' 42"	1.0049631	15'54.89"	23° 26' 19"	1 m 20 s
11	31° 35' 37"	-0.56"	29° 25' 51"	12° 01' 32"	1.0049747	15'54.88"	23° 26' 19"	1 m 20 s
12	31° 38' 03"	-0.56"	29° 28' 11"	12° 02' 23"	1.0049863	15'54.87"	23° 26' 19"	1 m 21 s
13	31° 40' 29"	-0.56"	29° 30' 31"	12° 03' 14"	1.0049979	15'54.86"	23° 26' 19"	1 m 21 s
14	31° 42' 56"	-0.55"	29° 32' 52"	12° 04' 04"	1.0050095	15'54.85"	23° 26' 19"	1 m 22 s
15	31° 45' 22"	-0.55"	29° 35' 12"	12° 04' 55"	1.0050211	15'54.84"	23° 26' 19"	1 m 22 s
16	31° 47' 49"	-0.54"	29° 37' 33"	12° 05' 46"	1.0050327	15'54.82"	23° 26' 19"	1 m 23 s
17	31° 50' 15"	-0.54"	29° 39' 53"	12° 06' 36"	1.0050443	15'54.81"	23° 26' 19"	1 m 23 s
18	31° 52' 41"	-0.54"	29° 42' 14"	12° 07' 27"	1.0050559	15'54.80"	23° 26' 19"	1 m 24 s
19	31° 55' 08"	-0.53"	29° 44' 34"	12° 08' 17"	1.0050675	15'54.79"	23° 26' 19"	1 m 24 s
20	31° 57' 34"	-0.53"	29° 46' 55"	12° 09' 08"	1.0050791	15'54.78"	23° 26' 19"	1 m 25 s
21	32° 00' 00"	-0.52"	29° 49' 15"	12° 09' 59"	1.0050906	15'54.77"	23° 26' 19"	1 m 25 s
22	32° 02' 27"	-0.52"	29° 51' 36"	12° 10' 49"	1.0051022	15'54.76"	23° 26' 19"	1 m 26 s
23	32° 04' 53"	-0.51"	29° 53' 56"	12° 11' 40"	1.0051138	15'54.75"	23° 26' 19"	1 m 26 s
24	32° 07' 19"	-0.51"	29° 56' 17"	12° 12' 30"	1.0051253	15'54.74"	23° 26' 19"	1 m 27 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	300° 19' 57"	-4° 20' 50"	303° 32' 47"	-24° 19' 22"	0° 56' 44"	15' 27.59"	77° 19' 35"	0.50839
1	300° 52' 23"	-4° 19' 12"	304° 06' 59"	-24° 10' 35"	0° 56' 46"	15' 28.16"	77° 5' 43"	0.50404
2	301° 24' 52"	-4° 17' 33"	304° 41' 08"	-24° 01' 40"	0° 56' 48"	15' 28.72"	76° 51' 57"	0.49968
3	301° 57' 22"	-4° 15' 52"	305° 15' 15"	-23° 52' 37"	0° 56' 50"	15' 29.29"	76° 38' 17"	0.49532
4	302° 29' 56"	-4° 14' 09"	305° 49' 20"	-23° 43' 26"	0° 56' 52"	15' 29.86"	76° 24' 45"	0.49095
5	303° 02' 31"	-4° 12' 25"	306° 23' 23"	-23° 34' 06"	0° 56' 54"	15' 30.43"	76° 11' 19"	0.48658
6	303° 35' 09"	-4° 10' 40"	306° 57' 23"	-23° 24' 39"	0° 56' 57"	15' 31.01"	75° 57' 60"	0.48220
7	304° 07' 49"	-4° 08' 53"	307° 31' 20"	-23° 15' 03"	0° 56' 59"	15' 31.59"	75° 44' 48"	0.47782
8	304° 40' 31"	-4° 07' 04"	308° 05' 16"	-23° 05' 20"	0° 57' 01"	15' 32.17"	75° 31' 43"	0.47343
9	305° 13' 15"	-4° 05' 14"	308° 39' 09"	-22° 55' 28"	0° 57' 03"	15' 32.76"	75° 18' 45"	0.46904
10	305° 46' 02"	-4° 03' 23"	309° 12' 60"	-22° 45' 29"	0° 57' 05"	15' 33.34"	75° 5' 54"	0.46465
11	306° 18' 52"	-4° 01' 30"	309° 46' 48"	-22° 35' 21"	0° 57' 07"	15' 33.93"	74° 53' 10"	0.46025
12	306° 51' 43"	-3° 59' 36"	310° 20' 34"	-22° 25' 06"	0° 57' 09"	15' 34.52"	74° 40' 34"	0.45585
13	307° 24' 37"	-3° 57' 40"	310° 54' 17"	-22° 14' 43"	0° 57' 12"	15' 35.12"	74° 28' 05"	0.45145
14	307° 57' 34"	-3° 55' 43"	311° 27' 58"	-22° 04' 12"	0° 57' 14"	15' 35.71"	74° 15' 44"	0.44704
15	308° 30' 33"	-3° 53' 44"	312° 01' 37"	-21° 53' 33"	0° 57' 16"	15' 36.31"	74° 3' 30"	0.44263
16	309° 03' 34"	-3° 51' 44"	312° 35' 13"	-21° 42' 47"	0° 57' 18"	15' 36.92"	73° 51' 24"	0.43822
17	309° 36' 37"	-3° 49' 42"	313° 08' 47"	-21° 31' 53"	0° 57' 20"	15' 37.52"	73° 39' 26"	0.43381
18	310° 09' 44"	-3° 47' 39"	313° 42' 18"	-21° 20' 52"	0° 57' 23"	15' 38.12"	73° 27' 35"	0.42940
19	310° 42' 52"	-3° 45' 35"	314° 15' 47"	-21° 09' 43"	0° 57' 25"	15' 38.73"	73° 15' 53"	0.42499
20	311° 16' 03"	-3° 43' 29"	314° 49' 14"	-20° 58' 27"	0° 57' 27"	15' 39.34"	73° 4' 18"	0.42057
21	311° 49' 17"	-3° 41' 22"	315° 22' 38"	-20° 47' 03"	0° 57' 29"	15' 39.95"	72° 52' 51"	0.41616
22	312° 22' 33"	-3° 39' 13"	315° 55' 59"	-20° 35' 32"	0° 57' 32"	15' 40.57"	72° 41' 32"	0.41175
23	312° 55' 51"	-3° 37' 03"	316° 29' 19"	-20° 23' 54"	0° 57' 34"	15' 41.18"	72° 30' 22"	0.40734
24	313° 29' 12"	-3° 34' 51"	317° 02' 35"	-20° 12' 08"	0° 57' 36"	15' 41.80"	72° 19' 19"	0.40292

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	32° 07' 19"	-0.51"	29° 56' 17"	12° 12' 30"	1.0051253	15'54.74"	23° 26' 19"	1 m 27 s
1	32° 09' 46"	-0.50"	29° 58' 37"	12° 13' 20"	1.0051369	15'54.73"	23° 26' 19"	1 m 27 s
2	32° 12' 12"	-0.50"	30° 00' 58"	12° 14' 11"	1.0051485	15'54.71"	23° 26' 19"	1 m 28 s
3	32° 14' 38"	-0.50"	30° 03' 18"	12° 15' 01"	1.0051600	15'54.70"	23° 26' 19"	1 m 28 s
4	32° 17' 05"	-0.49"	30° 05' 39"	12° 15' 52"	1.0051716	15'54.69"	23° 26' 19"	1 m 28 s
5	32° 19' 31"	-0.49"	30° 07' 60"	12° 16' 42"	1.0051831	15'54.68"	23° 26' 19"	1 m 29 s
6	32° 21' 57"	-0.48"	30° 10' 20"	12° 17' 32"	1.0051947	15'54.67"	23° 26' 19"	1 m 29 s
7	32° 24' 24"	-0.48"	30° 12' 41"	12° 18' 23"	1.0052062	15'54.66"	23° 26' 19"	1 m 30 s
8	32° 26' 50"	-0.47"	30° 15' 01"	12° 19' 13"	1.0052178	15'54.65"	23° 26' 19"	1 m 30 s
9	32° 29' 16"	-0.47"	30° 17' 22"	12° 20' 03"	1.0052293	15'54.64"	23° 26' 19"	1 m 31 s
10	32° 31' 43"	-0.46"	30° 19' 43"	12° 20' 53"	1.0052408	15'54.63"	23° 26' 19"	1 m 31 s
11	32° 34' 09"	-0.46"	30° 22' 03"	12° 21' 44"	1.0052524	15'54.62"	23° 26' 19"	1 m 32 s
12	32° 36' 35"	-0.45"	30° 24' 24"	12° 22' 34"	1.0052639	15'54.61"	23° 26' 19"	1 m 32 s
13	32° 39' 02"	-0.45"	30° 26' 45"	12° 23' 24"	1.0052754	15'54.59"	23° 26' 19"	1 m 33 s
14	32° 41' 28"	-0.44"	30° 29' 06"	12° 24' 14"	1.0052869	15'54.58"	23° 26' 19"	1 m 33 s
15	32° 43' 54"	-0.44"	30° 31' 26"	12° 25' 04"	1.0052985	15'54.57"	23° 26' 19"	1 m 34 s
16	32° 46' 20"	-0.43"	30° 33' 47"	12° 25' 54"	1.0053100	15'54.56"	23° 26' 19"	1 m 34 s
17	32° 48' 47"	-0.43"	30° 36' 08"	12° 26' 45"	1.0053215	15'54.55"	23° 26' 19"	1 m 35 s
18	32° 51' 13"	-0.42"	30° 38' 28"	12° 27' 35"	1.0053330	15'54.54"	23° 26' 19"	1 m 35 s
19	32° 53' 39"	-0.42"	30° 40' 49"	12° 28' 25"	1.0053445	15'54.53"	23° 26' 19"	1 m 36 s
20	32° 56' 06"	-0.41"	30° 43' 10"	12° 29' 15"	1.0053560	15'54.52"	23° 26' 19"	1 m 36 s
21	32° 58' 32"	-0.41"	30° 45' 31"	12° 30' 05"	1.0053675	15'54.51"	23° 26' 19"	1 m 37 s
22	33° 00' 58"	-0.40"	30° 47' 52"	12° 30' 55"	1.0053790	15'54.50"	23° 26' 19"	1 m 37 s
23	33° 03' 24"	-0.40"	30° 50' 13"	12° 31' 45"	1.0053904	15'54.48"	23° 26' 19"	1 m 37 s
24	33° 05' 51"	-0.39"	30° 52' 33"	12° 32' 35"	1.0054019	15'54.47"	23° 26' 19"	1 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	313° 29' 12"	-3° 34' 51"	317° 02' 35"	-20° 12' 08"	0° 57' 36"	15' 41.80"	72° 19' 19"	0.40292
1	314° 02' 36"	-3° 32' 38"	317° 35' 50"	-20° 00' 15"	0° 57' 38"	15' 42.42"	72° 8' 25"	0.39851
2	314° 36' 02"	-3° 30' 24"	318° 09' 02"	-19° 48' 15"	0° 57' 41"	15' 43.04"	71° 57' 40"	0.39411
3	315° 09' 31"	-3° 28' 09"	318° 42' 12"	-19° 36' 08"	0° 57' 43"	15' 43.66"	71° 47' 02"	0.38970
4	315° 43' 02"	-3° 25' 52"	319° 15' 20"	-19° 23' 54"	0° 57' 45"	15' 44.28"	71° 36' 34"	0.38530
5	316° 16' 36"	-3° 23' 33"	319° 48' 25"	-19° 11' 32"	0° 57' 48"	15' 44.91"	71° 26' 13"	0.38090
6	316° 50' 12"	-3° 21' 14"	320° 21' 28"	-18° 59' 04"	0° 57' 50"	15' 45.54"	71° 16' 02"	0.37650
7	317° 23' 51"	-3° 18' 53"	320° 54' 28"	-18° 46' 29"	0° 57' 52"	15' 46.16"	71° 5' 59"	0.37211
8	317° 57' 32"	-3° 16' 30"	321° 27' 27"	-18° 33' 47"	0° 57' 54"	15' 46.79"	70° 56' 05"	0.36772
9	318° 31' 17"	-3° 14' 07"	322° 00' 23"	-18° 20' 59"	0° 57' 57"	15' 47.42"	70° 46' 19"	0.36333
10	319° 05' 03"	-3° 11' 42"	322° 33' 17"	-18° 08' 03"	0° 57' 59"	15' 48.05"	70° 36' 43"	0.35895
11	319° 38' 53"	-3° 09' 15"	323° 06' 09"	-17° 55' 02"	0° 58' 01"	15' 48.69"	70° 27' 16"	0.35458
12	320° 12' 45"	-3° 06' 48"	323° 38' 58"	-17° 41' 53"	0° 58' 04"	15' 49.32"	70° 17' 57"	0.35021
13	320° 46' 39"	-3° 04' 19"	324° 11' 46"	-17° 28' 38"	0° 58' 06"	15' 49.96"	70° 8' 48"	0.34584
14	321° 20' 37"	-3° 01' 49"	324° 44' 32"	-17° 15' 16"	0° 58' 08"	15' 50.59"	69° 59' 48"	0.34149
15	321° 54' 37"	-2° 59' 17"	325° 17' 15"	-17° 01' 49"	0° 58' 11"	15' 51.23"	69° 50' 57"	0.33714
16	322° 28' 39"	-2° 56' 45"	325° 49' 56"	-16° 48' 14"	0° 58' 13"	15' 51.86"	69° 42' 15"	0.33280
17	323° 02' 45"	-2° 54' 11"	326° 22' 36"	-16° 34' 34"	0° 58' 15"	15' 52.50"	69° 33' 43"	0.32846
18	323° 36' 53"	-2° 51' 36"	326° 55' 14"	-16° 20' 47"	0° 58' 18"	15' 53.14"	69° 25' 20"	0.32413
19	324° 11' 04"	-2° 48' 59"	327° 27' 49"	-16° 06' 54"	0° 58' 20"	15' 53.78"	69° 17' 07"	0.31981
20	324° 45' 17"	-2° 46' 22"	328° 00' 23"	-15° 52' 55"	0° 58' 22"	15' 54.41"	69° 9' 03"	0.31551
21	325° 19' 33"	-2° 43' 43"	328° 32' 55"	-15° 38' 50"	0° 58' 25"	15' 55.05"	69° 1' 09"	0.31121
22	325° 53' 52"	-2° 41' 03"	329° 05' 25"	-15° 24' 39"	0° 58' 27"	15' 55.69"	68° 53' 25"	0.30692
23	326° 28' 14"	-2° 38' 22"	329° 37' 54"	-15° 10' 22"	0° 58' 29"	15' 56.33"	68° 45' 51"	0.30264
24	327° 02' 38"	-2° 35' 39"	330° 10' 20"	-14° 55' 59"	0° 58' 32"	15' 56.97"	68° 38' 26"	0.29837

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	33° 05' 51"	-0.39"	30° 52' 33"	12° 32' 35"	1.0054019	15'54.47"	23° 26' 19"	1 m 38 s
1	33° 08' 17"	-0.39"	30° 54' 54"	12° 33' 25"	1.0054134	15'54.46"	23° 26' 19"	1 m 38 s
2	33° 10' 43"	-0.38"	30° 57' 15"	12° 34' 15"	1.0054249	15'54.45"	23° 26' 19"	1 m 39 s
3	33° 13' 10"	-0.38"	30° 59' 36"	12° 35' 04"	1.0054363	15'54.44"	23° 26' 19"	1 m 39 s
4	33° 15' 36"	-0.37"	31° 01' 57"	12° 35' 54"	1.0054478	15'54.43"	23° 26' 19"	1 m 40 s
5	33° 18' 02"	-0.37"	31° 04' 18"	12° 36' 44"	1.0054593	15'54.42"	23° 26' 19"	1 m 40 s
6	33° 20' 28"	-0.36"	31° 06' 39"	12° 37' 34"	1.0054707	15'54.41"	23° 26' 19"	1 m 41 s
7	33° 22' 55"	-0.36"	31° 08' 60"	12° 38' 24"	1.0054822	15'54.40"	23° 26' 19"	1 m 41 s
8	33° 25' 21"	-0.35"	31° 11' 20"	12° 39' 14"	1.0054936	15'54.39"	23° 26' 19"	1 m 42 s
9	33° 27' 47"	-0.35"	31° 13' 41"	12° 40' 03"	1.0055051	15'54.38"	23° 26' 19"	1 m 42 s
10	33° 30' 13"	-0.34"	31° 16' 02"	12° 40' 53"	1.0055165	15'54.37"	23° 26' 19"	1 m 43 s
11	33° 32' 40"	-0.34"	31° 18' 23"	12° 41' 43"	1.0055279	15'54.35"	23° 26' 19"	1 m 43 s
12	33° 35' 06"	-0.33"	31° 20' 44"	12° 42' 32"	1.0055394	15'54.34"	23° 26' 19"	1 m 43 s
13	33° 37' 32"	-0.33"	31° 23' 05"	12° 43' 22"	1.0055508	15'54.33"	23° 26' 19"	1 m 44 s
14	33° 39' 58"	-0.32"	31° 25' 26"	12° 44' 12"	1.0055622	15'54.32"	23° 26' 19"	1 m 44 s
15	33° 42' 24"	-0.32"	31° 27' 47"	12° 45' 01"	1.0055736	15'54.31"	23° 26' 19"	1 m 45 s
16	33° 44' 51"	-0.31"	31° 30' 08"	12° 45' 51"	1.0055851	15'54.30"	23° 26' 19"	1 m 45 s
17	33° 47' 17"	-0.31"	31° 32' 29"	12° 46' 41"	1.0055965	15'54.29"	23° 26' 19"	1 m 46 s
18	33° 49' 43"	-0.30"	31° 34' 51"	12° 47' 30"	1.0056079	15'54.28"	23° 26' 19"	1 m 46 s
19	33° 52' 09"	-0.30"	31° 37' 12"	12° 48' 20"	1.0056193	15'54.27"	23° 26' 19"	1 m 47 s
20	33° 54' 36"	-0.29"	31° 39' 33"	12° 49' 09"	1.0056307	15'54.26"	23° 26' 19"	1 m 47 s
21	33° 57' 02"	-0.28"	31° 41' 54"	12° 49' 59"	1.0056421	15'54.25"	23° 26' 19"	1 m 48 s
22	33° 59' 28"	-0.28"	31° 44' 15"	12° 50' 48"	1.0056534	15'54.24"	23° 26' 19"	1 m 48 s
23	34° 01' 54"	-0.27"	31° 46' 36"	12° 51' 38"	1.0056648	15'54.22"	23° 26' 19"	1 m 48 s
24	34° 04' 20"	-0.27"	31° 48' 57"	12° 52' 27"	1.0056762	15'54.21"	23° 26' 19"	1 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	327° 02' 38"	-2° 35' 39"	330° 10' 20"	-14° 55' 59"	0° 58' 32"	15' 56.97"	68° 38' 26"	0.29837
1	327° 37' 05"	-2° 32' 56"	330° 42' 46"	-14° 41' 31"	0° 58' 34"	15' 57.61"	68° 31' 11"	0.29411
2	328° 11' 34"	-2° 30' 11"	331° 15' 09"	-14° 26' 56"	0° 58' 37"	15' 58.25"	68° 24' 07"	0.28986
3	328° 46' 07"	-2° 27' 26"	331° 47' 31"	-14° 12' 16"	0° 58' 39"	15' 58.89"	68° 17' 12"	0.28563
4	329° 20' 42"	-2° 24' 39"	332° 19' 52"	-13° 57' 31"	0° 58' 41"	15' 59.52"	68° 10' 28"	0.28140
5	329° 55' 20"	-2° 21' 51"	332° 52' 11"	-13° 42' 40"	0° 58' 44"	16' 00.16"	68° 3' 53"	0.27720
6	330° 30' 01"	-2° 19' 02"	333° 24' 28"	-13° 27' 44"	0° 58' 46"	16' 00.80"	67° 57' 30"	0.27300
7	331° 04' 44"	-2° 16' 12"	333° 56' 44"	-13° 12' 42"	0° 58' 48"	16' 01.44"	67° 51' 16"	0.26882
8	331° 39' 30"	-2° 13' 20"	334° 28' 59"	-12° 57' 35"	0° 58' 51"	16' 02.07"	67° 45' 13"	0.26465
9	332° 14' 19"	-2° 10' 28"	335° 01' 13"	-12° 42' 23"	0° 58' 53"	16' 02.71"	67° 39' 21"	0.26050
10	332° 49' 11"	-2° 07' 35"	335° 33' 26"	-12° 27' 05"	0° 58' 55"	16' 03.34"	67° 33' 39"	0.25636
11	333° 24' 05"	-2° 04' 40"	336° 05' 37"	-12° 11' 43"	0° 58' 58"	16' 03.97"	67° 28' 08"	0.25224
12	333° 59' 03"	-2° 01' 45"	336° 37' 47"	-11° 56' 15"	0° 58' 60"	16' 04.60"	67° 22' 48"	0.24813
13	334° 34' 03"	-1° 58' 49"	337° 09' 56"	-11° 40' 43"	0° 59' 02"	16' 05.24"	67° 17' 39"	0.24404
14	335° 09' 05"	-1° 55' 52"	337° 42' 05"	-11° 25' 06"	0° 59' 04"	16' 05.86"	67° 12' 40"	0.23997
15	335° 44' 11"	-1° 52' 53"	338° 14' 12"	-11° 09' 24"	0° 59' 07"	16' 06.49"	67° 7' 53"	0.23592
16	336° 19' 19"	-1° 49' 54"	338° 46' 19"	-10° 53' 37"	0° 59' 09"	16' 07.12"	67° 3' 17"	0.23188
17	336° 54' 30"	-1° 46' 54"	339° 18' 24"	-10° 37' 46"	0° 59' 11"	16' 07.74"	66° 58' 53"	0.22786
18	337° 29' 44"	-1° 43' 53"	339° 50' 29"	-10° 21' 50"	0° 59' 14"	16' 08.37"	66° 54' 40"	0.22386
19	338° 05' 00"	-1° 40' 51"	340° 22' 34"	-10° 05' 50"	0° 59' 16"	16' 08.99"	66° 50' 38"	0.21989
20	338° 40' 19"	-1° 37' 48"	340° 54' 37"	-9° 49' 45"	0° 59' 18"	16' 09.61"	66° 46' 48"	0.21593
21	339° 15' 41"	-1° 34' 45"	341° 26' 41"	-9° 33' 36"	0° 59' 20"	16' 10.22"	66° 43' 10"	0.21199
22	339° 51' 06"	-1° 31' 40"	341° 58' 43"	-9° 17' 23"	0° 59' 23"	16' 10.84"	66° 39' 43"	0.20807
23	340° 26' 33"	-1° 28' 35"	342° 30' 46"	-9° 01' 05"	0° 59' 25"	16' 11.45"	66° 36' 29"	0.20417
24	341° 02' 03"	-1° 25' 29"	343° 02' 48"	-8° 44' 44"	0° 59' 27"	16' 12.06"	66° 33' 26"	0.20030

24 April 2025

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	34° 04' 20"	-0.27"	31° 48' 57"	12° 52' 27"	1.0056762	15'54.21"	23° 26' 19"	1 m 49 s
1	34° 06' 47"	-0.26"	31° 51' 18"	12° 53' 16"	1.0056876	15'54.20"	23° 26' 19"	1 m 49 s
2	34° 09' 13"	-0.26"	31° 53' 40"	12° 54' 06"	1.0056989	15'54.19"	23° 26' 19"	1 m 50 s
3	34° 11' 39"	-0.25"	31° 56' 01"	12° 54' 55"	1.0057103	15'54.18"	23° 26' 19"	1 m 50 s
4	34° 14' 05"	-0.25"	31° 58' 22"	12° 55' 45"	1.0057217	15'54.17"	23° 26' 19"	1 m 51 s
5	34° 16' 31"	-0.24"	32° 00' 43"	12° 56' 34"	1.0057330	15'54.16"	23° 26' 19"	1 m 51 s
6	34° 18' 58"	-0.24"	32° 03' 04"	12° 57' 23"	1.0057444	15'54.15"	23° 26' 19"	1 m 52 s
7	34° 21' 24"	-0.23"	32° 05' 26"	12° 58' 13"	1.0057557	15'54.14"	23° 26' 19"	1 m 52 s
8	34° 23' 50"	-0.23"	32° 07' 47"	12° 59' 02"	1.0057671	15'54.13"	23° 26' 19"	1 m 52 s
9	34° 26' 16"	-0.22"	32° 10' 08"	12° 59' 51"	1.0057784	15'54.12"	23° 26' 19"	1 m 53 s
10	34° 28' 42"	-0.21"	32° 12' 29"	13° 00' 40"	1.0057897	15'54.11"	23° 26' 19"	1 m 53 s
11	34° 31' 09"	-0.21"	32° 14' 51"	13° 01' 29"	1.0058010	15'54.10"	23° 26' 19"	1 m 54 s
12	34° 33' 35"	-0.20"	32° 17' 12"	13° 02' 19"	1.0058124	15'54.08"	23° 26' 19"	1 m 54 s
13	34° 36' 01"	-0.20"	32° 19' 33"	13° 03' 08"	1.0058237	15'54.07"	23° 26' 19"	1 m 55 s
14	34° 38' 27"	-0.19"	32° 21' 54"	13° 03' 57"	1.0058350	15'54.06"	23° 26' 19"	1 m 55 s
15	34° 40' 53"	-0.19"	32° 24' 16"	13° 04' 46"	1.0058463	15'54.05"	23° 26' 19"	1 m 56 s
16	34° 43' 19"	-0.18"	32° 26' 37"	13° 05' 35"	1.0058576	15'54.04"	23° 26' 19"	1 m 56 s
17	34° 45' 46"	-0.18"	32° 28' 59"	13° 06' 24"	1.0058689	15'54.03"	23° 26' 19"	1 m 56 s
18	34° 48' 12"	-0.17"	32° 31' 20"	13° 07' 13"	1.0058802	15'54.02"	23° 26' 19"	1 m 57 s
19	34° 50' 38"	-0.17"	32° 33' 41"	13° 08' 02"	1.0058915	15'54.01"	23° 26' 19"	1 m 57 s
20	34° 53' 04"	-0.16"	32° 36' 03"	13° 08' 51"	1.0059027	15'54.00"	23° 26' 19"	1 m 58 s
21	34° 55' 30"	-0.16"	32° 38' 24"	13° 09' 40"	1.0059140	15'53.99"	23° 26' 19"	1 m 58 s
22	34° 57' 56"	-0.15"	32° 40' 45"	13° 10' 29"	1.0059253	15'53.98"	23° 26' 19"	1 m 59 s
23	35° 00' 22"	-0.14"	32° 43' 07"	13° 11' 18"	1.0059365	15'53.97"	23° 26' 19"	1 m 59 s
24	35° 02' 49"	-0.14"	32° 45' 28"	13° 12' 07"	1.0059478	15'53.96"	23° 26' 19"	1 m 59 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	341° 02' 03"	-1° 25' 29"	343° 02' 48"	-8° 44' 44"	0° 59' 27"	16' 12.06"	66° 33' 26"	0.20030
1	341° 37' 36"	-1° 22' 22"	343° 34' 50"	-8° 28' 19"	0° 59' 29"	16' 12.67"	66° 30' 36"	0.19645
2	342° 13' 12"	-1° 19' 14"	344° 06' 51"	-8° 11' 49"	0° 59' 32"	16' 13.27"	66° 27' 59"	0.19262
3	342° 48' 50"	-1° 16' 06"	344° 38' 52"	-7° 55' 16"	0° 59' 34"	16' 13.88"	66° 25' 33"	0.18882
4	343° 24' 31"	-1° 12' 57"	345° 10' 54"	-7° 38' 39"	0° 59' 36"	16' 14.48"	66° 23' 21"	0.18503
5	344° 00' 15"	-1° 09' 47"	345° 42' 55"	-7° 21' 59"	0° 59' 38"	16' 15.07"	66° 21' 21"	0.18128
6	344° 36' 01"	-1° 06' 37"	346° 14' 56"	-7° 05' 15"	0° 59' 40"	16' 15.67"	66° 19' 34"	0.17755
7	345° 11' 50"	-1° 03' 25"	346° 46' 58"	-6° 48' 27"	0° 59' 43"	16' 16.26"	66° 18' 00"	0.17384
8	345° 47' 42"	-1° 00' 14"	347° 18' 60"	-6° 31' 36"	0° 59' 45"	16' 16.84"	66° 16' 39"	0.17016
9	346° 23' 37"	0°-57' 01"	347° 51' 02"	-6° 14' 42"	0° 59' 47"	16' 17.43"	66° 15' 32"	0.16651
10	346° 59' 34"	0°-53' 48"	348° 23' 04"	-5° 57' 45"	0° 59' 49"	16' 18.01"	66° 14' 39"	0.16288
11	347° 35' 33"	0°-50' 35"	348° 55' 07"	-5° 40' 44"	0° 59' 51"	16' 18.58"	66° 13' 59"	0.15928
12	348° 11' 36"	0°-47' 20"	349° 27' 10"	-5° 23' 40"	0° 59' 53"	16' 19.16"	66° 13' 33"	0.15571
13	348° 47' 41"	0°-44' 06"	349° 59' 14"	-5° 06' 34"	0° 59' 55"	16' 19.73"	66° 13' 22"	0.15217
14	349° 23' 48"	0°-40' 50"	350° 31' 19"	-4° 49' 24"	0° 59' 57"	16' 20.29"	66° 13' 25"	0.14866
15	349° 59' 59"	0°-37' 37"	351° 03' 25"	-4° 32' 14"	0° 59' 59"	16' 20.85"	66° 13' 39"	0.14518
16	350° 36' 11"	0°-34' 21"	351° 35' 31"	-4° 14' 60"	1° 00' 02"	16' 21.41"	66° 14' 12"	0.14172
17	351° 12' 27"	0°-31' 04"	352° 07' 38"	-3° 57' 42"	1° 00' 04"	16' 21.96"	66° 14' 59"	0.13830
18	351° 48' 45"	0°-27' 47"	352° 39' 46"	-3° 40' 23"	1° 00' 06"	16' 22.51"	66° 16' 02"	0.13491
19	352° 25' 05"	0°-24' 29"	353° 11' 55"	-3° 23' 00"	1° 00' 08"	16' 23.06"	66° 17' 20"	0.13155
20	353° 01' 28"	0°-21' 12"	353° 44' 06"	-3° 05' 36"	1° 00' 10"	16' 23.59"	66° 18' 54"	0.12822
21	353° 37' 54"	0°-17' 53"	354° 16' 17"	-2° 48' 09"	1° 00' 12"	16' 24.13"	66° 20' 44"	0.12492
22	354° 14' 22"	0°-14' 35"	354° 48' 29"	-2° 30' 40"	1° 00' 13"	16' 24.66"	66° 22' 51"	0.12166
23	354° 50' 52"	0°-11' 16"	355° 20' 43"	-2° 13' 10"	1° 00' 15"	16' 25.18"	66° 25' 14"	0.11843
24	355° 27' 25"	0° -7' 57"	355° 52' 59"	-1° 55' 37"	1° 00' 17"	16' 25.70"	66° 27' 55"	0.11524

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	35° 02' 49"	-0.14"	32° 45' 28"	13° 12' 07"	1.0059478	15'53.96"	23° 26' 19"	1 m 59 s
1	35° 05' 15"	-0.13"	32° 47' 50"	13° 12' 56"	1.0059591	15'53.95"	23° 26' 19"	1 m 60 s
2	35° 07' 41"	-0.13"	32° 50' 11"	13° 13' 45"	1.0059703	15'53.93"	23° 26' 19"	2 m 00 s
3	35° 10' 07"	-0.12"	32° 52' 33"	13° 14' 33"	1.0059815	15'53.92"	23° 26' 19"	2 m 01 s
4	35° 12' 33"	-0.12"	32° 54' 54"	13° 15' 22"	1.0059928	15'53.91"	23° 26' 19"	2 m 01 s
5	35° 14' 59"	-0.11"	32° 57' 16"	13° 16' 11"	1.0060040	15'53.90"	23° 26' 19"	2 m 02 s
6	35° 17' 25"	-0.11"	32° 59' 37"	13° 16' 60"	1.0060152	15'53.89"	23° 26' 19"	2 m 02 s
7	35° 19' 52"	-0.10"	33° 01' 59"	13° 17' 48"	1.0060265	15'53.88"	23° 26' 19"	2 m 02 s
8	35° 22' 18"	-0.10"	33° 04' 20"	13° 18' 37"	1.0060377	15'53.87"	23° 26' 19"	2 m 03 s
9	35° 24' 44"	-0.09"	33° 06' 42"	13° 19' 26"	1.0060489	15'53.86"	23° 26' 19"	2 m 03 s
10	35° 27' 10"	-0.09"	33° 09' 04"	13° 20' 15"	1.0060601	15'53.85"	23° 26' 19"	2 m 04 s
11	35° 29' 36"	-0.08"	33° 11' 25"	13° 21' 03"	1.0060713	15'53.84"	23° 26' 19"	2 m 04 s
12	35° 32' 02"	-0.07"	33° 13' 47"	13° 21' 52"	1.0060825	15'53.83"	23° 26' 19"	2 m 04 s
13	35° 34' 28"	-0.07"	33° 16' 08"	13° 22' 40"	1.0060937	15'53.82"	23° 26' 19"	2 m 05 s
14	35° 36' 54"	-0.06"	33° 18' 30"	13° 23' 29"	1.0061049	15'53.81"	23° 26' 19"	2 m 05 s
15	35° 39' 20"	-0.06"	33° 20' 52"	13° 24' 18"	1.0061160	15'53.80"	23° 26' 19"	2 m 06 s
16	35° 41' 46"	-0.05"	33° 23' 13"	13° 25' 06"	1.0061272	15'53.79"	23° 26' 19"	2 m 06 s
17	35° 44' 13"	-0.05"	33° 25' 35"	13° 25' 55"	1.0061384	15'53.78"	23° 26' 19"	2 m 07 s
18	35° 46' 39"	-0.04"	33° 27' 57"	13° 26' 43"	1.0061495	15'53.76"	23° 26' 19"	2 m 07 s
19	35° 49' 05"	-0.04"	33° 30' 18"	13° 27' 32"	1.0061607	15'53.75"	23° 26' 19"	2 m 07 s
20	35° 51' 31"	-0.03"	33° 32' 40"	13° 28' 20"	1.0061718	15'53.74"	23° 26' 19"	2 m 08 s
21	35° 53' 57"	-0.03"	33° 35' 02"	13° 29' 08"	1.0061830	15'53.73"	23° 26' 19"	2 m 08 s
22	35° 56' 23"	-0.02"	33° 37' 23"	13° 29' 57"	1.0061941	15'53.72"	23° 26' 19"	2 m 09 s
23	35° 58' 49"	-0.02"	33° 39' 45"	13° 30' 45"	1.0062053	15'53.71"	23° 26' 19"	2 m 09 s
24	36° 01' 15"	-0.01"	33° 42' 07"	13° 31' 34"	1.0062164	15'53.70"	23° 26' 19"	2 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	355° 27' 25"	0° -7' 57"	355° 52' 59"	-1° 55' 37"	1° 00' 17"	16' 25.70"	66° 27' 55"	0.11524
1	356° 04' 01"	0° -4' 37"	356° 25' 16"	-1° 38' 03"	1° 00' 19"	16' 26.22"	66° 30' 53"	0.11208
2	356° 40' 38"	0° -1' 17"	356° 57' 34"	-1° 20' 27"	1° 00' 21"	16' 26.73"	66° 34' 09"	0.10895
3	357° 17' 19"	0° 02' 03"	357° 29' 54"	-1° 02' 49"	1° 00' 23"	16' 27.23"	66° 37' 44"	0.10587
4	357° 54' 01"	0° 05' 23"	358° 02' 16"	0°-45' 10"	1° 00' 25"	16' 27.73"	66° 41' 37"	0.10281
5	358° 30' 46"	0° 08' 43"	358° 34' 40"	0°-27' 30"	1° 00' 27"	16' 28.22"	66° 45' 49"	0.09980
6	359° 07' 34"	0° 12' 03"	359° 07' 05"	0° -9' 48"	1° 00' 28"	16' 28.71"	66° 50' 21"	0.09682
7	359° 44' 23"	0° 15' 24"	359° 39' 33"	0° 07' 55"	1° 00' 30"	16' 29.19"	66° 55' 13"	0.09387
8	0° 21' 15"	0° 18' 44"	0° 12' 03"	0° 25' 39"	1° 00' 32"	16' 29.66"	67° 0' 25"	0.09097
9	0° 58' 09"	0° 22' 05"	0° 44' 35"	0° 43' 24"	1° 00' 34"	16' 30.13"	67° 5' 59"	0.08810
10	1° 35' 06"	0° 25' 26"	1° 17' 09"	1° 01' 09"	1° 00' 35"	16' 30.59"	67° 11' 55"	0.08528
11	2° 12' 05"	0° 28' 47"	1° 49' 45"	1° 18' 56"	1° 00' 37"	16' 31.05"	67° 18' 13"	0.08249
12	2° 49' 06"	0° 32' 07"	2° 22' 24"	1° 36' 43"	1° 00' 39"	16' 31.50"	67° 24' 54"	0.07974
13	3° 26' 09"	0° 35' 28"	2° 55' 05"	1° 54' 30"	1° 00' 40"	16' 31.94"	67° 31' 59"	0.07703
14	4° 03' 14"	0° 38' 49"	3° 27' 49"	2° 12' 18"	1° 00' 42"	16' 32.38"	67° 39' 29"	0.07437
15	4° 40' 22"	0° 42' 09"	4° 00' 35"	2° 30' 06"	1° 00' 43"	16' 32.81"	67° 47' 25"	0.07174
16	5° 17' 31"	0° 45' 29"	4° 33' 24"	2° 47' 55"	1° 00' 45"	16' 33.24"	67° 55' 46"	0.06916
17	5° 54' 43"	0° 48' 50"	5° 06' 16"	3° 05' 43"	1° 00' 46"	16' 33.65"	68° 4' 36"	0.06661
18	6° 31' 57"	0° 52' 10"	5° 39' 11"	3° 23' 31"	1° 00' 48"	16' 34.06"	68° 13' 54"	0.06411
19	7° 09' 12"	0° 55' 29"	6° 12' 08"	3° 41' 19"	1° 00' 49"	16' 34.46"	68° 23' 41"	0.06166
20	7° 46' 30"	0° 58' 49"	6° 45' 09"	3° 59' 07"	1° 00' 51"	16' 34.86"	68° 33' 60"	0.05924
21	8° 23' 50"	1° 02' 08"	7° 18' 13"	4° 16' 54"	1° 00' 52"	16' 35.25"	68° 44' 50"	0.05687
22	9° 01' 11"	1° 05' 27"	7° 51' 20"	4° 34' 41"	1° 00' 54"	16' 35.63"	68° 56' 14"	0.05455
23	9° 38' 35"	1° 08' 46"	8° 24' 30"	4° 52' 27"	1° 00' 55"	16' 36.00"	69° 8' 14"	0.05227
24	10° 16' 00"	1° 12' 04"	8° 57' 44"	5° 10' 12"	1° 00' 56"	16' 36.37"	69° 20' 50"	0.05003

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	36° 01' 15"	-0.01"	33° 42' 07"	13° 31' 34"	1.0062164	15'53.70"	23° 26' 19"	2 m 09 s
1	36° 03' 41"	-0.01"	33° 44' 29"	13° 32' 22"	1.0062275	15'53.69"	23° 26' 19"	2 m 10 s
2	36° 06' 07"	-0.00"	33° 46' 51"	13° 33' 10"	1.0062386	15'53.68"	23° 26' 19"	2 m 10 s
3	36° 08' 33"	0.00"	33° 49' 12"	13° 33' 59"	1.0062497	15'53.67"	23° 26' 19"	2 m 11 s
4	36° 10' 59"	0.01"	33° 51' 34"	13° 34' 47"	1.0062608	15'53.66"	23° 26' 19"	2 m 11 s
5	36° 13' 25"	0.01"	33° 53' 56"	13° 35' 35"	1.0062719	15'53.65"	23° 26' 19"	2 m 11 s
6	36° 15' 51"	0.02"	33° 56' 18"	13° 36' 23"	1.0062830	15'53.64"	23° 26' 19"	2 m 12 s
7	36° 18' 18"	0.02"	33° 58' 40"	13° 37' 11"	1.0062941	15'53.63"	23° 26' 19"	2 m 12 s
8	36° 20' 44"	0.03"	34° 01' 02"	13° 37' 60"	1.0063052	15'53.62"	23° 26' 19"	2 m 13 s
9	36° 23' 10"	0.03"	34° 03' 23"	13° 38' 48"	1.0063163	15'53.61"	23° 26' 19"	2 m 13 s
10	36° 25' 36"	0.04"	34° 05' 45"	13° 39' 36"	1.0063273	15'53.60"	23° 26' 19"	2 m 13 s
11	36° 28' 02"	0.04"	34° 08' 07"	13° 40' 24"	1.0063384	15'53.59"	23° 26' 19"	2 m 14 s
12	36° 30' 28"	0.05"	34° 10' 29"	13° 41' 12"	1.0063494	15'53.58"	23° 26' 19"	2 m 14 s
13	36° 32' 54"	0.05"	34° 12' 51"	13° 42' 00"	1.0063605	15'53.56"	23° 26' 19"	2 m 15 s
14	36° 35' 20"	0.06"	34° 15' 13"	13° 42' 48"	1.0063715	15'53.55"	23° 26' 19"	2 m 15 s
15	36° 37' 46"	0.06"	34° 17' 35"	13° 43' 36"	1.0063826	15'53.54"	23° 26' 19"	2 m 15 s
16	36° 40' 12"	0.07"	34° 19' 57"	13° 44' 24"	1.0063936	15'53.53"	23° 26' 19"	2 m 16 s
17	36° 42' 38"	0.07"	34° 22' 19"	13° 45' 12"	1.0064046	15'53.52"	23° 26' 19"	2 m 16 s
18	36° 45' 04"	0.08"	34° 24' 41"	13° 45' 60"	1.0064157	15'53.51"	23° 26' 19"	2 m 17 s
19	36° 47' 30"	0.08"	34° 27' 03"	13° 46' 48"	1.0064267	15'53.50"	23° 26' 19"	2 m 17 s
20	36° 49' 56"	0.09"	34° 29' 25"	13° 47' 36"	1.0064377	15'53.49"	23° 26' 19"	2 m 17 s
21	36° 52' 22"	0.09"	34° 31' 47"	13° 48' 24"	1.0064487	15'53.48"	23° 26' 19"	2 m 18 s
22	36° 54' 48"	0.10"	34° 34' 09"	13° 49' 11"	1.0064597	15'53.47"	23° 26' 19"	2 m 18 s
23	36° 57' 14"	0.10"	34° 36' 31"	13° 49' 59"	1.0064707	15'53.46"	23° 26' 19"	2 m 19 s
24	36° 59' 40"	0.11"	34° 38' 53"	13° 50' 47"	1.0064817	15'53.45"	23° 26' 19"	2 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	10° 16' 00"	1° 12' 04"	8° 57' 44"	5° 10' 12"	1° 00' 56"	16' 36.37"	69° 20' 50"	0.05003
1	10° 53' 28"	1° 15' 22"	9° 31' 01"	5° 27' 57"	1° 00' 58"	16' 36.72"	69° 34' 06"	0.04784
2	11° 30' 57"	1° 18' 40"	10° 04' 22"	5° 45' 40"	1° 00' 59"	16' 37.07"	69° 48' 02"	0.04570
3	12° 08' 27"	1° 21' 57"	10° 37' 46"	6° 03' 22"	1° 01' 00"	16' 37.42"	70° 2' 41"	0.04360
4	12° 46' 00"	1° 25' 14"	11° 11' 14"	6° 21' 03"	1° 01' 01"	16' 37.75"	70° 18' 05"	0.04155
5	13° 23' 34"	1° 28' 30"	11° 44' 45"	6° 38' 43"	1° 01' 03"	16' 38.08"	70° 34' 18"	0.03954
6	14° 01' 10"	1° 31' 46"	12° 18' 21"	6° 56' 20"	1° 01' 04"	16' 38.39"	70° 51' 22"	0.03758
7	14° 38' 48"	1° 35' 01"	12° 52' 00"	7° 13' 57"	1° 01' 05"	16' 38.70"	71° 9' 21"	0.03567
8	15° 16' 27"	1° 38' 16"	13° 25' 43"	7° 31' 31"	1° 01' 06"	16' 39.01"	71° 28' 17"	0.03381
9	15° 54' 08"	1° 41' 30"	13° 59' 31"	7° 49' 04"	1° 01' 07"	16' 39.30"	71° 48' 16"	0.03200
10	16° 31' 50"	1° 44' 43"	14° 33' 22"	8° 06' 34"	1° 01' 08"	16' 39.58"	72° 9' 21"	0.03023
11	17° 09' 34"	1° 47' 56"	15° 07' 18"	8° 24' 03"	1° 01' 09"	16' 39.86"	72° 31' 38"	0.02852
12	17° 47' 19"	1° 51' 08"	15° 41' 18"	8° 41' 29"	1° 01' 10"	16' 40.13"	72° 55' 13"	0.02685
13	18° 25' 06"	1° 54' 19"	16° 15' 22"	8° 58' 52"	1° 01' 11"	16' 40.39"	73° 20' 11"	0.02523
14	19° 02' 54"	1° 57' 29"	16° 49' 30"	9° 16' 13"	1° 01' 12"	16' 40.64"	73° 46' 40"	0.02366
15	19° 40' 44"	2° 00' 39"	17° 23' 44"	9° 33' 31"	1° 01' 13"	16' 40.88"	74° 14' 47"	0.02214
16	20° 18' 35"	2° 03' 48"	17° 58' 01"	9° 50' 47"	1° 01' 14"	16' 41.11"	74° 44' 43"	0.02068
17	20° 56' 27"	2° 06' 56"	18° 32' 23"	10° 07' 59"	1° 01' 15"	16' 41.34"	75° 16' 38"	0.01926
18	21° 34' 20"	2° 10' 04"	19° 06' 50"	10° 25' 09"	1° 01' 15"	16' 41.55"	75° 50' 44"	0.01789
19	22° 12' 14"	2° 13' 10"	19° 41' 22"	10° 42' 15"	1° 01' 16"	16' 41.76"	76° 27' 14"	0.01658
20	22° 50' 10"	2° 16' 16"	20° 15' 58"	10° 59' 18"	1° 01' 17"	16' 41.95"	77° 6' 25"	0.01532
21	23° 28' 07"	2° 19' 20"	20° 50' 40"	11° 16' 17"	1° 01' 18"	16' 42.14"	77° 48' 36"	0.01411
22	24° 06' 05"	2° 22' 24"	21° 25' 26"	11° 33' 12"	1° 01' 18"	16' 42.32"	78° 34' 09"	0.01295
23	24° 44' 03"	2° 25' 27"	22° 00' 17"	11° 50' 04"	1° 01' 19"	16' 42.49"	79° 23' 29"	0.01184
24	25° 22' 03"	2° 28' 28"	22° 35' 13"	12° 06' 52"	1° 01' 19"	16' 42.65"	80° 17' 07"	0.01078

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	36° 59' 40"	0.11"	34° 38' 53"	13° 50' 47"	1.0064817	15'53.45"	23° 26' 19"	2 m 19 s
1	37° 02' 06"	0.11"	34° 41' 15"	13° 51' 35"	1.0064926	15'53.44"	23° 26' 19"	2 m 19 s
2	37° 04' 32"	0.11"	34° 43' 37"	13° 52' 23"	1.0065036	15'53.43"	23° 26' 19"	2 m 20 s
3	37° 06' 58"	0.12"	34° 45' 60"	13° 53' 10"	1.0065146	15'53.42"	23° 26' 19"	2 m 20 s
4	37° 09' 24"	0.12"	34° 48' 22"	13° 53' 58"	1.0065255	15'53.41"	23° 26' 19"	2 m 20 s
5	37° 11' 50"	0.13"	34° 50' 44"	13° 54' 46"	1.0065365	15'53.40"	23° 26' 19"	2 m 21 s
6	37° 14' 16"	0.13"	34° 53' 06"	13° 55' 33"	1.0065474	15'53.39"	23° 26' 19"	2 m 21 s
7	37° 16' 42"	0.14"	34° 55' 28"	13° 56' 21"	1.0065584	15'53.38"	23° 26' 19"	2 m 22 s
8	37° 19' 08"	0.14"	34° 57' 50"	13° 57' 08"	1.0065693	15'53.37"	23° 26' 19"	2 m 22 s
9	37° 21' 34"	0.15"	35° 00' 12"	13° 57' 56"	1.0065803	15'53.36"	23° 26' 19"	2 m 22 s
10	37° 23' 60"	0.15"	35° 02' 35"	13° 58' 44"	1.0065912	15'53.35"	23° 26' 19"	2 m 23 s
11	37° 26' 26"	0.15"	35° 04' 57"	13° 59' 31"	1.0066021	15'53.34"	23° 26' 19"	2 m 23 s
12	37° 28' 52"	0.16"	35° 07' 19"	14° 00' 19"	1.0066130	15'53.33"	23° 26' 19"	2 m 24 s
13	37° 31' 18"	0.16"	35° 09' 41"	14° 01' 06"	1.0066239	15'53.32"	23° 26' 19"	2 m 24 s
14	37° 33' 44"	0.17"	35° 12' 04"	14° 01' 54"	1.0066348	15'53.31"	23° 26' 19"	2 m 24 s
15	37° 36' 10"	0.17"	35° 14' 26"	14° 02' 41"	1.0066457	15'53.29"	23° 26' 19"	2 m 25 s
16	37° 38' 35"	0.18"	35° 16' 48"	14° 03' 28"	1.0066566	15'53.28"	23° 26' 19"	2 m 25 s
17	37° 41' 01"	0.18"	35° 19' 11"	14° 04' 16"	1.0066675	15'53.27"	23° 26' 19"	2 m 25 s
18	37° 43' 27"	0.18"	35° 21' 33"	14° 05' 03"	1.0066783	15'53.26"	23° 26' 19"	2 m 26 s
19	37° 45' 53"	0.19"	35° 23' 55"	14° 05' 50"	1.0066892	15'53.25"	23° 26' 19"	2 m 26 s
20	37° 48' 19"	0.19"	35° 26' 18"	14° 06' 38"	1.0067001	15'53.24"	23° 26' 19"	2 m 26 s
21	37° 50' 45"	0.20"	35° 28' 40"	14° 07' 25"	1.0067109	15'53.23"	23° 26' 19"	2 m 27 s
22	37° 53' 11"	0.20"	35° 31' 02"	14° 08' 12"	1.0067218	15'53.22"	23° 26' 19"	2 m 27 s
23	37° 55' 37"	0.20"	35° 33' 25"	14° 08' 60"	1.0067326	15'53.21"	23° 26' 19"	2 m 28 s
24	37° 58' 03"	0.21"	35° 35' 47"	14° 09' 47"	1.0067435	15'53.20"	23° 26' 19"	2 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	25° 22' 03"	2° 28' 28"	22° 35' 13"	12° 06' 52"	1° 01' 19"	16' 42.65"	80° 17' 07"	0.01078
1	26° 00' 04"	2° 31' 29"	23° 10' 15"	12° 23' 36"	1° 01' 20"	16' 42.80"	81° 15' 39"	0.00978
2	26° 38' 06"	2° 34' 28"	23° 45' 21"	12° 40' 16"	1° 01' 21"	16' 42.94"	82° 19' 48"	0.00883
3	27° 16' 08"	2° 37' 27"	24° 20' 33"	12° 56' 51"	1° 01' 21"	16' 43.08"	83° 30' 28"	0.00793
4	27° 54' 12"	2° 40' 24"	24° 55' 50"	13° 13' 22"	1° 01' 21"	16' 43.20"	84° 48' 42"	0.00709
5	28° 32' 16"	2° 43' 20"	25° 31' 13"	13° 29' 48"	1° 01' 22"	16' 43.31"	86° 15' 48"	0.00630
6	29° 10' 21"	2° 46' 15"	26° 06' 40"	13° 46' 09"	1° 01' 22"	16' 43.42"	87° 53' 23"	0.00556
7	29° 48' 26"	2° 49' 09"	26° 42' 14"	14° 02' 26"	1° 01' 23"	16' 43.51"	89° 43' 25"	0.00488
8	30° 26' 32"	2° 52' 01"	27° 17' 52"	14° 18' 38"	1° 01' 23"	16' 43.60"	91° 48' 24"	0.00425
9	31° 04' 39"	2° 54' 53"	27° 53' 36"	14° 34' 44"	1° 01' 23"	16' 43.67"	94° 11' 27"	0.00367
10	31° 42' 46"	2° 57' 43"	28° 29' 26"	14° 50' 45"	1° 01' 23"	16' 43.74"	96° 56' 30"	0.00315
11	32° 20' 54"	3° 00' 31"	29° 05' 22"	15° 06' 41"	1° 01' 24"	16' 43.79"	100° 8' 29"	0.00268
12	32° 58' 60"	3° 03' 19"	29° 41' 20"	15° 22' 29"	1° 01' 24"	16' 43.84"	103° 53' 16"	0.00226
13	33° 37' 08"	3° 06' 05"	30° 17' 27"	15° 38' 14"	1° 01' 24"	16' 43.88"	108° 18' 53"	0.00190
14	34° 15' 17"	3° 08' 49"	30° 53' 39"	15° 53' 52"	1° 01' 24"	16' 43.90"	113° 33' 45"	0.00160
15	34° 53' 27"	3° 11' 32"	31° 29' 57"	16° 09' 25"	1° 01' 24"	16' 43.92"	119° 47' 02"	0.00134
16	35° 31' 36"	3° 14' 14"	32° 06' 21"	16° 24' 51"	1° 01' 24"	16' 43.93"	127° 6' 21"	0.00115
17	36° 09' 44"	3° 16' 54"	32° 42' 49"	16° 40' 10"	1° 01' 24"	16' 43.93"	135° 33' 33"	0.00100
18	36° 47' 54"	3° 19' 33"	33° 19' 24"	16° 55' 23"	1° 01' 24"	16' 43.92"	145° 1' 37"	0.00091
19	37° 26' 05"	3° 22' 11"	33° 56' 05"	17° 10' 30"	1° 01' 24"	16' 43.89"	155° 8' 12"	0.00088
20	38° 04' 15"	3° 24' 46"	34° 32' 53"	17° 25' 31"	1° 01' 24"	16' 43.86"	165° 19' 52"	0.00090
21	38° 42' 25"	3° 27' 21"	35° 09' 46"	17° 40' 24"	1° 01' 24"	16' 43.82"	175° 1' 37"	0.00097
22	39° 20' 35"	3° 29' 54"	35° 46' 45"	17° 55' 10"	1° 01' 24"	16' 43.77"	183° 47' 50"	0.00110
23	39° 58' 46"	3° 32' 25"	36° 23' 49"	18° 09' 50"	1° 01' 23"	16' 43.71"	191° 26' 57"	0.00128
24	40° 36' 56"	3° 34' 54"	37° 01' 00"	18° 24' 22"	1° 01' 23"	16' 43.64"	197° 59' 02"	0.00151

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	37° 58' 03"	0.21"	35° 35' 47"	14° 09' 47"	1.0067435	15'53.20"	23° 26' 19"	2 m 28 s
1	38° 00' 29"	0.21"	35° 38' 09"	14° 10' 34"	1.0067543	15'53.19"	23° 26' 19"	2 m 28 s
2	38° 02' 55"	0.21"	35° 40' 32"	14° 11' 21"	1.0067651	15'53.18"	23° 26' 19"	2 m 29 s
3	38° 05' 21"	0.22"	35° 42' 54"	14° 12' 08"	1.0067759	15'53.17"	23° 26' 19"	2 m 29 s
4	38° 07' 47"	0.22"	35° 45' 17"	14° 12' 55"	1.0067867	15'53.16"	23° 26' 19"	2 m 29 s
5	38° 10' 13"	0.23"	35° 47' 39"	14° 13' 42"	1.0067976	15'53.15"	23° 26' 19"	2 m 30 s
6	38° 12' 38"	0.23"	35° 50' 02"	14° 14' 29"	1.0068084	15'53.14"	23° 26' 19"	2 m 30 s
7	38° 15' 04"	0.23"	35° 52' 24"	14° 15' 17"	1.0068191	15'53.13"	23° 26' 19"	2 m 30 s
8	38° 17' 30"	0.24"	35° 54' 47"	14° 16' 04"	1.0068299	15'53.12"	23° 26' 19"	2 m 31 s
9	38° 19' 56"	0.24"	35° 57' 09"	14° 16' 51"	1.0068407	15'53.11"	23° 26' 19"	2 m 31 s
10	38° 22' 22"	0.24"	35° 59' 32"	14° 17' 37"	1.0068515	15'53.10"	23° 26' 19"	2 m 32 s
11	38° 24' 48"	0.25"	36° 01' 54"	14° 18' 24"	1.0068623	15'53.09"	23° 26' 19"	2 m 32 s
12	38° 27' 14"	0.25"	36° 04' 17"	14° 19' 11"	1.0068730	15'53.08"	23° 26' 19"	2 m 32 s
13	38° 29' 40"	0.25"	36° 06' 40"	14° 19' 58"	1.0068838	15'53.07"	23° 26' 19"	2 m 33 s
14	38° 32' 06"	0.26"	36° 09' 02"	14° 20' 45"	1.0068945	15'53.06"	23° 26' 19"	2 m 33 s
15	38° 34' 31"	0.26"	36° 11' 25"	14° 21' 32"	1.0069053	15'53.05"	23° 26' 19"	2 m 33 s
16	38° 36' 57"	0.26"	36° 13' 47"	14° 22' 19"	1.0069160	15'53.04"	23° 26' 19"	2 m 34 s
17	38° 39' 23"	0.27"	36° 16' 10"	14° 23' 06"	1.0069267	15'53.03"	23° 26' 19"	2 m 34 s
18	38° 41' 49"	0.27"	36° 18' 33"	14° 23' 52"	1.0069375	15'53.02"	23° 26' 19"	2 m 34 s
19	38° 44' 15"	0.27"	36° 20' 55"	14° 24' 39"	1.0069482	15'53.01"	23° 26' 19"	2 m 35 s
20	38° 46' 41"	0.27"	36° 23' 18"	14° 25' 26"	1.0069589	15'53.00"	23° 26' 19"	2 m 35 s
21	38° 49' 07"	0.28"	36° 25' 41"	14° 26' 12"	1.0069696	15'52.99"	23° 26' 19"	2 m 35 s
22	38° 51' 32"	0.28"	36° 28' 03"	14° 26' 59"	1.0069803	15'52.98"	23° 26' 19"	2 m 36 s
23	38° 53' 58"	0.28"	36° 30' 26"	14° 27' 46"	1.0069910	15'52.97"	23° 26' 19"	2 m 36 s
24	38° 56' 24"	0.29"	36° 32' 49"	14° 28' 32"	1.0070017	15'52.96"	23° 26' 19"	2 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	40° 36' 56"	3° 34' 54"	37° 01' 00"	18° 24' 22"	1° 01' 23"	16' 43.64"	197° 59' 02"	0.00151
1	41° 15' 06"	3° 37' 22"	37° 38' 17"	18° 38' 46"	1° 01' 23"	16' 43.57"	203° 30' 44"	0.00180
2	41° 53' 16"	3° 39' 49"	38° 15' 40"	18° 53' 04"	1° 01' 23"	16' 43.48"	208° 11' 04"	0.00215
3	42° 31' 25"	3° 42' 13"	38° 53' 08"	19° 07' 13"	1° 01' 22"	16' 43.38"	212° 8' 56"	0.00255
4	43° 09' 34"	3° 44' 36"	39° 30' 43"	19° 21' 15"	1° 01' 22"	16' 43.27"	215° 32' 12"	0.00300
5	43° 47' 43"	3° 46' 57"	40° 08' 23"	19° 35' 08"	1° 01' 21"	16' 43.16"	218° 27' 21"	0.00350
6	44° 25' 52"	3° 49' 17"	40° 46' 09"	19° 48' 54"	1° 01' 21"	16' 43.03"	220° 59' 39"	0.00406
7	45° 04' 00"	3° 51' 35"	41° 24' 01"	20° 02' 31"	1° 01' 20"	16' 42.89"	223° 13' 16"	0.00468
8	45° 42' 08"	3° 53' 51"	42° 01' 59"	20° 16' 00"	1° 01' 20"	16' 42.75"	225° 11' 31"	0.00534
9	46° 20' 15"	3° 56' 05"	42° 40' 03"	20° 29' 21"	1° 01' 19"	16' 42.59"	226° 57' 03"	0.00606
10	46° 58' 21"	3° 58' 17"	43° 18' 13"	20° 42' 33"	1° 01' 19"	16' 42.43"	228° 31' 59"	0.00683
11	47° 36' 27"	4° 00' 28"	43° 56' 28"	20° 55' 36"	1° 01' 18"	16' 42.26"	229° 57' 60"	0.00766
12	48° 14' 33"	4° 02' 37"	44° 34' 50"	21° 08' 31"	1° 01' 17"	16' 42.07"	231° 16' 29"	0.00854
13	48° 52' 37"	4° 04' 44"	45° 13' 17"	21° 21' 16"	1° 01' 17"	16' 41.88"	232° 28' 32"	0.00947
14	49° 30' 41"	4° 06' 49"	45° 51' 50"	21° 33' 52"	1° 01' 16"	16' 41.68"	233° 35' 06"	0.01045
15	50° 08' 44"	4° 08' 52"	46° 30' 28"	21° 46' 19"	1° 01' 15"	16' 41.47"	234° 36' 56"	0.01149
16	50° 46' 46"	4° 10' 53"	47° 09' 12"	21° 58' 37"	1° 01' 14"	16' 41.25"	235° 34' 39"	0.01258
17	51° 24' 48"	4° 12' 52"	47° 48' 02"	22° 10' 45"	1° 01' 14"	16' 41.02"	236° 28' 48"	0.01372
18	52° 02' 48"	4° 14' 50"	48° 26' 57"	22° 22' 44"	1° 01' 13"	16' 40.79"	237° 19' 50"	0.01491
19	52° 40' 47"	4° 16' 45"	49° 05' 57"	22° 34' 33"	1° 01' 12"	16' 40.54"	238° 8' 07"	0.01615
20	53° 18' 46"	4° 18' 39"	49° 45' 03"	22° 46' 12"	1° 01' 11"	16' 40.28"	238° 53' 59"	0.01745
21	53° 56' 43"	4° 20' 31"	50° 24' 15"	22° 57' 41"	1° 01' 10"	16' 40.02"	239° 37' 42"	0.01879
22	54° 34' 39"	4° 22' 20"	51° 03' 31"	23° 09' 00"	1° 01' 09"	16' 39.75"	240° 19' 30"	0.02019
23	55° 12' 34"	4° 24' 08"	51° 42' 53"	23° 20' 09"	1° 01' 08"	16' 39.47"	240° 59' 38"	0.02163
24	55° 50' 28"	4° 25' 53"	52° 22' 20"	23° 31' 08"	1° 01' 07"	16' 39.18"	241° 38' 14"	0.02313

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	38° 56' 24"	0.29"	36° 32' 49"	14° 28' 32"	1.0070017	15'52.96"	23° 26' 19"	2 m 36 s
1	38° 58' 50"	0.29"	36° 35' 11"	14° 29' 19"	1.0070124	15'52.95"	23° 26' 19"	2 m 37 s
2	39° 01' 16"	0.29"	36° 37' 34"	14° 30' 06"	1.0070230	15'52.94"	23° 26' 19"	2 m 37 s
3	39° 03' 42"	0.29"	36° 39' 57"	14° 30' 52"	1.0070337	15'52.93"	23° 26' 19"	2 m 37 s
4	39° 06' 07"	0.30"	36° 42' 20"	14° 31' 39"	1.0070444	15'52.92"	23° 26' 19"	2 m 38 s
5	39° 08' 33"	0.30"	36° 44' 43"	14° 32' 25"	1.0070550	15'52.91"	23° 26' 19"	2 m 38 s
6	39° 10' 59"	0.30"	36° 47' 05"	14° 33' 12"	1.0070657	15'52.90"	23° 26' 19"	2 m 39 s
7	39° 13' 25"	0.31"	36° 49' 28"	14° 33' 58"	1.0070763	15'52.89"	23° 26' 19"	2 m 39 s
8	39° 15' 51"	0.31"	36° 51' 51"	14° 34' 44"	1.0070870	15'52.88"	23° 26' 19"	2 m 39 s
9	39° 18' 17"	0.31"	36° 54' 14"	14° 35' 31"	1.0070976	15'52.87"	23° 26' 19"	2 m 40 s
10	39° 20' 42"	0.31"	36° 56' 37"	14° 36' 17"	1.0071082	15'52.86"	23° 26' 19"	2 m 40 s
11	39° 23' 08"	0.31"	36° 58' 60"	14° 37' 04"	1.0071188	15'52.85"	23° 26' 19"	2 m 40 s
12	39° 25' 34"	0.32"	37° 01' 22"	14° 37' 50"	1.0071294	15'52.84"	23° 26' 19"	2 m 41 s
13	39° 27' 60"	0.32"	37° 03' 45"	14° 38' 36"	1.0071401	15'52.83"	23° 26' 19"	2 m 41 s
14	39° 30' 26"	0.32"	37° 06' 08"	14° 39' 22"	1.0071507	15'52.82"	23° 26' 19"	2 m 41 s
15	39° 32' 51"	0.32"	37° 08' 31"	14° 40' 09"	1.0071612	15'52.81"	23° 26' 19"	2 m 42 s
16	39° 35' 17"	0.33"	37° 10' 54"	14° 40' 55"	1.0071718	15'52.80"	23° 26' 19"	2 m 42 s
17	39° 37' 43"	0.33"	37° 13' 17"	14° 41' 41"	1.0071824	15'52.79"	23° 26' 19"	2 m 42 s
18	39° 40' 09"	0.33"	37° 15' 40"	14° 42' 27"	1.0071930	15'52.78"	23° 26' 19"	2 m 42 s
19	39° 42' 35"	0.33"	37° 18' 03"	14° 43' 13"	1.0072036	15'52.77"	23° 26' 19"	2 m 43 s
20	39° 45' 00"	0.33"	37° 20' 26"	14° 43' 60"	1.0072141	15'52.76"	23° 26' 19"	2 m 43 s
21	39° 47' 26"	0.34"	37° 22' 49"	14° 44' 46"	1.0072247	15'52.75"	23° 26' 19"	2 m 43 s
22	39° 49' 52"	0.34"	37° 25' 12"	14° 45' 32"	1.0072352	15'52.74"	23° 26' 19"	2 m 44 s
23	39° 52' 18"	0.34"	37° 27' 35"	14° 46' 18"	1.0072458	15'52.73"	23° 26' 19"	2 m 44 s
24	39° 54' 43"	0.34"	37° 29' 58"	14° 47' 04"	1.0072563	15'52.72"	23° 26' 19"	2 m 44 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	55° 50' 28"	4° 25' 53"	52° 22' 20"	23° 31' 08"	1° 01' 07"	16' 39.18"	241° 38' 14"	0.02313
1	56° 28' 21"	4° 27' 37"	53° 01' 52"	23° 41' 56"	1° 01' 06"	16' 38.88"	242° 15' 28"	0.02467
2	57° 06' 12"	4° 29' 19"	53° 41' 29"	23° 52' 34"	1° 01' 05"	16' 38.57"	242° 51' 29"	0.02627
3	57° 44' 02"	4° 30' 58"	54° 21' 11"	24° 03' 01"	1° 01' 03"	16' 38.26"	243° 26' 24"	0.02791
4	58° 21' 50"	4° 32' 36"	55° 00' 58"	24° 13' 18"	1° 01' 02"	16' 37.94"	244° 0' 20"	0.02960
5	58° 59' 38"	4° 34' 11"	55° 40' 49"	24° 23' 24"	1° 01' 01"	16' 37.61"	244° 33' 21"	0.03135
6	59° 37' 23"	4° 35' 44"	56° 20' 45"	24° 33' 18"	1° 00' 60"	16' 37.27"	245° 5' 33"	0.03313
7	60° 15' 07"	4° 37' 16"	57° 00' 46"	24° 43' 02"	1° 00' 58"	16' 36.92"	245° 37' 01"	0.03497
8	60° 52' 50"	4° 38' 45"	57° 40' 50"	24° 52' 35"	1° 00' 57"	16' 36.56"	246° 7' 49"	0.03686
9	61° 30' 31"	4° 40' 12"	58° 20' 60"	25° 01' 56"	1° 00' 56"	16' 36.20"	246° 37' 59"	0.03879
10	62° 08' 11"	4° 41' 37"	59° 01' 13"	25° 11' 07"	1° 00' 54"	16' 35.83"	247° 7' 36"	0.04077
11	62° 45' 49"	4° 43' 00"	59° 41' 30"	25° 20' 06"	1° 00' 53"	16' 35.45"	247° 36' 42"	0.04279
12	63° 23' 25"	4° 44' 21"	60° 21' 52"	25° 28' 53"	1° 00' 52"	16' 35.07"	248° 5' 20"	0.04486
13	64° 00' 59"	4° 45' 40"	61° 02' 17"	25° 37' 29"	1° 00' 50"	16' 34.67"	248° 33' 32"	0.04698
14	64° 38' 32"	4° 46' 56"	61° 42' 46"	25° 45' 54"	1° 00' 49"	16' 34.27"	249° 1' 19"	0.04914
15	65° 16' 02"	4° 48' 11"	62° 23' 18"	25° 54' 06"	1° 00' 47"	16' 33.86"	249° 28' 45"	0.05135
16	65° 53' 31"	4° 49' 23"	63° 03' 54"	26° 02' 07"	1° 00' 46"	16' 33.45"	249° 55' 51"	0.05360
17	66° 30' 58"	4° 50' 33"	63° 44' 34"	26° 09' 57"	1° 00' 44"	16' 33.03"	250° 22' 37"	0.05590
18	67° 08' 23"	4° 51' 41"	64° 25' 16"	26° 17' 34"	1° 00' 43"	16' 32.60"	250° 49' 07"	0.05824
19	67° 45' 47"	4° 52' 47"	65° 06' 01"	26° 24' 59"	1° 00' 41"	16' 32.16"	251° 15' 20"	0.06062
20	68° 23' 08"	4° 53' 51"	65° 46' 50"	26° 32' 13"	1° 00' 39"	16' 31.72"	251° 41' 19"	0.06304
21	69° 00' 27"	4° 54' 53"	66° 27' 41"	26° 39' 14"	1° 00' 38"	16' 31.27"	252° 7' 03"	0.06551
22	69° 37' 44"	4° 55' 52"	67° 08' 34"	26° 46' 04"	1° 00' 36"	16' 30.81"	252° 32' 35"	0.06802
23	70° 14' 59"	4° 56' 49"	67° 49' 30"	26° 52' 41"	1° 00' 34"	16' 30.35"	252° 57' 54"	0.07057
24	70° 52' 12"	4° 57' 45"	68° 30' 28"	26° 59' 06"	1° 00' 33"	16' 29.88"	253° 23' 02"	0.07316

30 April 2025

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	39° 54' 43"	0.34"	37° 29' 58"	14° 47' 04"	1.0072563	15'52.72"	23° 26' 19"	2 m 44 s
1	39° 57' 09"	0.34"	37° 32' 21"	14° 47' 50"	1.0072669	15'52.71"	23° 26' 19"	2 m 45 s
2	39° 59' 35"	0.34"	37° 34' 44"	14° 48' 36"	1.0072774	15'52.70"	23° 26' 19"	2 m 45 s
3	40° 02' 01"	0.34"	37° 37' 07"	14° 49' 22"	1.0072879	15'52.69"	23° 26' 19"	2 m 45 s
4	40° 04' 26"	0.35"	37° 39' 31"	14° 50' 08"	1.0072984	15'52.68"	23° 26' 19"	2 m 46 s
5	40° 06' 52"	0.35"	37° 41' 54"	14° 50' 53"	1.0073089	15'52.67"	23° 26' 19"	2 m 46 s
6	40° 09' 18"	0.35"	37° 44' 17"	14° 51' 39"	1.0073194	15'52.66"	23° 26' 19"	2 m 46 s
7	40° 11' 44"	0.35"	37° 46' 40"	14° 52' 25"	1.0073299	15'52.65"	23° 26' 19"	2 m 47 s
8	40° 14' 09"	0.35"	37° 49' 03"	14° 53' 11"	1.0073404	15'52.64"	23° 26' 19"	2 m 47 s
9	40° 16' 35"	0.35"	37° 51' 26"	14° 53' 57"	1.0073509	15'52.63"	23° 26' 19"	2 m 47 s
10	40° 19' 01"	0.35"	37° 53' 49"	14° 54' 42"	1.0073614	15'52.62"	23° 26' 19"	2 m 48 s
11	40° 21' 27"	0.36"	37° 56' 13"	14° 55' 28"	1.0073718	15'52.61"	23° 26' 19"	2 m 48 s
12	40° 23' 52"	0.36"	37° 58' 36"	14° 56' 14"	1.0073823	15'52.60"	23° 26' 19"	2 m 48 s
13	40° 26' 18"	0.36"	38° 00' 59"	14° 56' 60"	1.0073928	15'52.59"	23° 26' 19"	2 m 49 s
14	40° 28' 44"	0.36"	38° 03' 22"	14° 57' 45"	1.0074032	15'52.58"	23° 26' 19"	2 m 49 s
15	40° 31' 10"	0.36"	38° 05' 46"	14° 58' 31"	1.0074137	15'52.57"	23° 26' 19"	2 m 49 s
16	40° 33' 35"	0.36"	38° 08' 09"	14° 59' 16"	1.0074241	15'52.56"	23° 26' 19"	2 m 49 s
17	40° 36' 01"	0.36"	38° 10' 32"	15° 00' 02"	1.0074346	15'52.55"	23° 26' 19"	2 m 50 s
18	40° 38' 27"	0.36"	38° 12' 55"	15° 00' 48"	1.0074450	15'52.54"	23° 26' 19"	2 m 50 s
19	40° 40' 52"	0.36"	38° 15' 19"	15° 01' 33"	1.0074554	15'52.53"	23° 26' 19"	2 m 50 s
20	40° 43' 18"	0.36"	38° 17' 42"	15° 02' 19"	1.0074658	15'52.52"	23° 26' 19"	2 m 51 s
21	40° 45' 44"	0.36"	38° 20' 05"	15° 03' 04"	1.0074762	15'52.51"	23° 26' 19"	2 m 51 s
22	40° 48' 09"	0.36"	38° 22' 29"	15° 03' 50"	1.0074867	15'52.50"	23° 26' 19"	2 m 51 s
23	40° 50' 35"	0.36"	38° 24' 52"	15° 04' 35"	1.0074971	15'52.49"	23° 26' 19"	2 m 52 s
24	40° 53' 01"	0.36"	38° 27' 15"	15° 05' 20"	1.0075075	15'52.48"	23° 26' 19"	2 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	70° 52' 12"	4° 57' 45"	68° 30' 28"	26° 59' 06"	1° 00' 33"	16' 29.88"	253° 23' 02"	0.07316
1	71° 29' 22"	4° 58' 38"	69° 11' 29"	27° 05' 18"	1° 00' 31"	16' 29.40"	253° 48' 00"	0.07580
2	72° 06' 31"	4° 59' 29"	69° 52' 31"	27° 11' 18"	1° 00' 29"	16' 28.92"	254° 12' 48"	0.07847
3	72° 43' 37"	5° 00' 17"	70° 33' 35"	27° 17' 06"	1° 00' 27"	16' 28.43"	254° 37' 26"	0.08118
4	73° 20' 41"	5° 01' 04"	71° 14' 41"	27° 22' 42"	1° 00' 25"	16' 27.94"	255° 1' 55"	0.08393
5	73° 57' 43"	5° 01' 48"	71° 55' 48"	27° 28' 05"	1° 00' 24"	16' 27.44"	255° 26' 16"	0.08673
6	74° 34' 42"	5° 02' 31"	72° 36' 56"	27° 33' 16"	1° 00' 22"	16' 26.93"	255° 50' 29"	0.08955
7	75° 11' 39"	5° 03' 11"	73° 18' 06"	27° 38' 14"	1° 00' 20"	16' 26.42"	256° 14' 34"	0.09242
8	75° 48' 34"	5° 03' 49"	73° 59' 16"	27° 43' 00"	1° 00' 18"	16' 25.91"	256° 38' 31"	0.09533
9	76° 25' 26"	5° 04' 25"	74° 40' 27"	27° 47' 33"	1° 00' 16"	16' 25.38"	257° 2' 22"	0.09827
10	77° 02' 16"	5° 04' 58"	75° 21' 39"	27° 51' 54"	1° 00' 14"	16' 24.86"	257° 26' 06"	0.10125
11	77° 39' 03"	5° 05' 30"	76° 02' 51"	27° 56' 02"	1° 00' 12"	16' 24.32"	257° 49' 44"	0.10426
12	78° 15' 48"	5° 05' 59"	76° 44' 03"	27° 59' 58"	1° 00' 10"	16' 23.79"	258° 13' 15"	0.10731
13	78° 52' 30"	5° 06' 27"	77° 25' 16"	28° 03' 41"	1° 00' 08"	16' 23.24"	258° 36' 40"	0.11039
14	79° 29' 10"	5° 06' 52"	78° 06' 28"	28° 07' 12"	1° 00' 06"	16' 22.70"	258° 59' 59"	0.11351
15	80° 05' 47"	5° 07' 15"	78° 47' 40"	28° 10' 29"	1° 00' 04"	16' 22.15"	259° 23' 13"	0.11667
16	80° 42' 22"	5° 07' 36"	79° 28' 51"	28° 13' 35"	1° 00' 02"	16' 21.59"	259° 46' 20"	0.11985
17	81° 18' 54"	5° 07' 54"	80° 10' 02"	28° 16' 28"	1° 00' 00"	16' 21.03"	260° 9' 22"	0.12307
18	81° 55' 23"	5° 08' 11"	80° 51' 12"	28° 19' 08"	0° 59' 58"	16' 20.46"	260° 32' 19"	0.12633
19	82° 31' 50"	5° 08' 26"	81° 32' 21"	28° 21' 36"	0° 59' 56"	16' 19.89"	260° 55' 10"	0.12961
20	83° 08' 14"	5° 08' 38"	82° 13' 28"	28° 23' 51"	0° 59' 54"	16' 19.32"	261° 17' 55"	0.13293
21	83° 44' 35"	5° 08' 49"	82° 54' 35"	28° 25' 53"	0° 59' 52"	16' 18.74"	261° 40' 35"	0.13627
22	84° 20' 54"	5° 08' 57"	83° 35' 39"	28° 27' 43"	0° 59' 50"	16' 18.16"	262° 3' 10"	0.13965
23	84° 57' 10"	5° 09' 03"	84° 16' 42"	28° 29' 21"	0° 59' 47"	16' 17.57"	262° 25' 39"	0.14306
24	85° 33' 23"	5° 09' 07"	84° 57' 43"	28° 30' 46"	0° 59' 45"	16' 16.98"	262° 48' 03"	0.14650

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	40° 53' 01"	0.36"	38° 27' 15"	15° 05' 20"	1.0075075	15'52.48"	23° 26' 19"	2 m 52 s
1	40° 55' 27"	0.37"	38° 29' 39"	15° 06' 06"	1.0075178	15'52.47"	23° 26' 19"	2 m 52 s
2	40° 57' 52"	0.37"	38° 32' 02"	15° 06' 51"	1.0075282	15'52.46"	23° 26' 19"	2 m 53 s
3	41° 00' 18"	0.37"	38° 34' 26"	15° 07' 36"	1.0075386	15'52.45"	23° 26' 19"	2 m 53 s
4	41° 02' 44"	0.37"	38° 36' 49"	15° 08' 22"	1.0075490	15'52.44"	23° 26' 19"	2 m 53 s
5	41° 05' 09"	0.37"	38° 39' 13"	15° 09' 07"	1.0075593	15'52.43"	23° 26' 19"	2 m 53 s
6	41° 07' 35"	0.37"	38° 41' 36"	15° 09' 52"	1.0075697	15'52.42"	23° 26' 19"	2 m 54 s
7	41° 10' 01"	0.37"	38° 43' 60"	15° 10' 37"	1.0075801	15'52.41"	23° 26' 19"	2 m 54 s
8	41° 12' 26"	0.37"	38° 46' 23"	15° 11' 23"	1.0075904	15'52.40"	23° 26' 19"	2 m 54 s
9	41° 14' 52"	0.37"	38° 48' 46"	15° 12' 08"	1.0076008	15'52.39"	23° 26' 19"	2 m 55 s
10	41° 17' 17"	0.37"	38° 51' 10"	15° 12' 53"	1.0076111	15'52.38"	23° 26' 19"	2 m 55 s
11	41° 19' 43"	0.37"	38° 53' 34"	15° 13' 38"	1.0076214	15'52.37"	23° 26' 19"	2 m 55 s
12	41° 22' 09"	0.37"	38° 55' 57"	15° 14' 23"	1.0076318	15'52.36"	23° 26' 19"	2 m 55 s
13	41° 24' 34"	0.37"	38° 58' 21"	15° 15' 08"	1.0076421	15'52.35"	23° 26' 19"	2 m 56 s
14	41° 27' 00"	0.37"	39° 00' 44"	15° 15' 53"	1.0076524	15'52.34"	23° 26' 19"	2 m 56 s
15	41° 29' 26"	0.36"	39° 03' 08"	15° 16' 38"	1.0076627	15'52.33"	23° 26' 19"	2 m 56 s
16	41° 31' 51"	0.36"	39° 05' 31"	15° 17' 23"	1.0076730	15'52.32"	23° 26' 19"	2 m 57 s
17	41° 34' 17"	0.36"	39° 07' 55"	15° 18' 08"	1.0076833	15'52.31"	23° 26' 19"	2 m 57 s
18	41° 36' 43"	0.36"	39° 10' 19"	15° 18' 53"	1.0076936	15'52.30"	23° 26' 19"	2 m 57 s
19	41° 39' 08"	0.36"	39° 12' 42"	15° 19' 38"	1.0077039	15'52.29"	23° 26' 19"	2 m 57 s
20	41° 41' 34"	0.36"	39° 15' 06"	15° 20' 23"	1.0077142	15'52.28"	23° 26' 19"	2 m 58 s
21	41° 43' 59"	0.36"	39° 17' 30"	15° 21' 08"	1.0077244	15'52.27"	23° 26' 19"	2 m 58 s
22	41° 46' 25"	0.36"	39° 19' 53"	15° 21' 52"	1.0077347	15'52.26"	23° 26' 19"	2 m 58 s
23	41° 48' 51"	0.36"	39° 22' 17"	15° 22' 37"	1.0077450	15'52.25"	23° 26' 19"	2 m 59 s
24	41° 51' 16"	0.36"	39° 24' 41"	15° 23' 22"	1.0077552	15'52.25"	23° 26' 19"	2 m 59 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	85° 33' 23"	5° 09' 07"	84° 57' 43"	28° 30' 46"	0° 59' 45"	16' 16.98"	262° 48' 03"	0.14650
1	86° 09' 33"	5° 09' 09"	85° 38' 42"	28° 31' 59"	0° 59' 43"	16' 16.39"	263° 10' 21"	0.14997
2	86° 45' 41"	5° 09' 09"	86° 19' 38"	28° 32' 60"	0° 59' 41"	16' 15.79"	263° 32' 34"	0.15346
3	87° 21' 45"	5° 09' 07"	87° 00' 32"	28° 33' 48"	0° 59' 39"	16' 15.19"	263° 54' 42"	0.15698
4	87° 57' 47"	5° 09' 03"	87° 41' 23"	28° 34' 23"	0° 59' 37"	16' 14.59"	264° 16' 44"	0.16054
5	88° 33' 46"	5° 08' 57"	88° 22' 12"	28° 34' 47"	0° 59' 34"	16' 13.99"	264° 38' 40"	0.16411
6	89° 09' 42"	5° 08' 49"	89° 02' 57"	28° 34' 58"	0° 59' 32"	16' 13.38"	265° 0' 31"	0.16772
7	89° 45' 36"	5° 08' 39"	89° 43' 40"	28° 34' 57"	0° 59' 30"	16' 12.76"	265° 22' 16"	0.17135
8	90° 21' 26"	5° 08' 27"	90° 24' 19"	28° 34' 44"	0° 59' 28"	16' 12.15"	265° 43' 55"	0.17501
9	90° 57' 14"	5° 08' 13"	91° 04' 54"	28° 34' 19"	0° 59' 25"	16' 11.53"	266° 5' 28"	0.17869
10	91° 32' 58"	5° 07' 57"	91° 45' 26"	28° 33' 42"	0° 59' 23"	16' 10.91"	266° 26' 56"	0.18240
11	92° 08' 40"	5° 07' 39"	92° 25' 54"	28° 32' 52"	0° 59' 21"	16' 10.29"	266° 48' 17"	0.18613
12	92° 44' 19"	5° 07' 19"	93° 06' 18"	28° 31' 51"	0° 59' 18"	16' 09.66"	267° 9' 33"	0.18988
13	93° 19' 54"	5° 06' 57"	93° 46' 37"	28° 30' 38"	0° 59' 16"	16' 09.04"	267° 30' 42"	0.19366
14	93° 55' 27"	5° 06' 33"	94° 26' 53"	28° 29' 14"	0° 59' 14"	16' 08.41"	267° 51' 45"	0.19746
15	94° 30' 57"	5° 06' 07"	95° 07' 04"	28° 27' 37"	0° 59' 11"	16' 07.78"	268° 12' 42"	0.20128
16	95° 06' 24"	5° 05' 39"	95° 47' 10"	28° 25' 49"	0° 59' 09"	16' 07.14"	268° 33' 33"	0.20513
17	95° 41' 48"	5° 05' 10"	96° 27' 12"	28° 23' 49"	0° 59' 07"	16' 06.51"	268° 54' 17"	0.20899
18	96° 17' 09"	5° 04' 38"	97° 07' 09"	28° 21' 38"	0° 59' 05"	16' 05.87"	269° 14' 54"	0.21288
19	96° 52' 26"	5° 04' 05"	97° 47' 00"	28° 19' 15"	0° 59' 02"	16' 05.23"	269° 35' 24"	0.21678
20	97° 27' 41"	5° 03' 29"	98° 26' 47"	28° 16' 41"	0° 58' 60"	16' 04.59"	269° 55' 48"	0.22071
21	98° 02' 53"	5° 02' 52"	99° 06' 28"	28° 13' 56"	0° 58' 57"	16' 03.95"	270° 16' 05"	0.22466
22	98° 38' 02"	5° 02' 13"	99° 46' 04"	28° 10' 60"	0° 58' 55"	16' 03.31"	270° 36' 15"	0.22862
23	99° 13' 08"	5° 01' 32"	100° 25' 34"	28° 07' 52"	0° 58' 53"	16' 02.67"	270° 56' 18"	0.23260
24	99° 48' 11"	5° 00' 49"	101° 04' 58"	28° 04' 33"	0° 58' 50"	16' 02.02"	271° 16' 14"	0.23660

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	41° 51' 16"	0.36"	39° 24' 41"	15° 23' 22"	1.0077552	15'52.25"	23° 26' 19"	2 m 59 s
1	41° 53' 42"	0.36"	39° 27' 04"	15° 24' 07"	1.0077655	15'52.24"	23° 26' 19"	2 m 59 s
2	41° 56' 07"	0.36"	39° 29' 28"	15° 24' 51"	1.0077757	15'52.23"	23° 26' 19"	2 m 59 s
3	41° 58' 33"	0.36"	39° 31' 52"	15° 25' 36"	1.0077860	15'52.22"	23° 26' 19"	2 m 60 s
4	42° 00' 59"	0.36"	39° 34' 16"	15° 26' 21"	1.0077962	15'52.21"	23° 26' 19"	2 m 60 s
5	42° 03' 24"	0.35"	39° 36' 39"	15° 27' 05"	1.0078065	15'52.20"	23° 26' 19"	3 m 00 s
6	42° 05' 50"	0.35"	39° 39' 03"	15° 27' 50"	1.0078167	15'52.19"	23° 26' 19"	3 m 00 s
7	42° 08' 15"	0.35"	39° 41' 27"	15° 28' 34"	1.0078269	15'52.18"	23° 26' 19"	3 m 01 s
8	42° 10' 41"	0.35"	39° 43' 51"	15° 29' 19"	1.0078371	15'52.17"	23° 26' 19"	3 m 01 s
9	42° 13' 06"	0.35"	39° 46' 15"	15° 30' 03"	1.0078473	15'52.16"	23° 26' 19"	3 m 01 s
10	42° 15' 32"	0.35"	39° 48' 38"	15° 30' 48"	1.0078575	15'52.15"	23° 26' 19"	3 m 02 s
11	42° 17' 58"	0.35"	39° 51' 02"	15° 31' 32"	1.0078677	15'52.14"	23° 26' 19"	3 m 02 s
12	42° 20' 23"	0.34"	39° 53' 26"	15° 32' 17"	1.0078779	15'52.13"	23° 26' 19"	3 m 02 s
13	42° 22' 49"	0.34"	39° 55' 50"	15° 33' 01"	1.0078881	15'52.12"	23° 26' 19"	3 m 02 s
14	42° 25' 14"	0.34"	39° 58' 14"	15° 33' 46"	1.0078983	15'52.11"	23° 26' 19"	3 m 03 s
15	42° 27' 40"	0.34"	40° 00' 38"	15° 34' 30"	1.0079085	15'52.10"	23° 26' 19"	3 m 03 s
16	42° 30' 05"	0.34"	40° 03' 02"	15° 35' 14"	1.0079187	15'52.09"	23° 26' 19"	3 m 03 s
17	42° 32' 31"	0.34"	40° 05' 26"	15° 35' 59"	1.0079288	15'52.08"	23° 26' 19"	3 m 03 s
18	42° 34' 56"	0.34"	40° 07' 50"	15° 36' 43"	1.0079390	15'52.07"	23° 26' 19"	3 m 04 s
19	42° 37' 22"	0.33"	40° 10' 14"	15° 37' 27"	1.0079492	15'52.06"	23° 26' 19"	3 m 04 s
20	42° 39' 48"	0.33"	40° 12' 38"	15° 38' 11"	1.0079593	15'52.05"	23° 26' 19"	3 m 04 s
21	42° 42' 13"	0.33"	40° 15' 02"	15° 38' 56"	1.0079695	15'52.04"	23° 26' 19"	3 m 04 s
22	42° 44' 39"	0.33"	40° 17' 26"	15° 39' 40"	1.0079796	15'52.03"	23° 26' 19"	3 m 05 s
23	42° 47' 04"	0.33"	40° 19' 50"	15° 40' 24"	1.0079898	15'52.02"	23° 26' 19"	3 m 05 s
24	42° 49' 30"	0.32"	40° 22' 14"	15° 41' 08"	1.0079999	15'52.01"	23° 26' 19"	3 m 05 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	99° 48' 11"	5° 00' 49"	101° 04' 58"	28° 04' 33"	0° 58' 50"	16' 02.02"	271° 16' 14"	0.23660
1	100° 23' 10"	5° 00' 05"	101° 44' 17"	28° 01' 04"	0° 58' 48"	16' 01.38"	271° 36' 02"	0.24062
2	100° 58' 07"	4° 59' 19"	102° 23' 30"	27° 57' 23"	0° 58' 46"	16' 00.73"	271° 55' 43"	0.24466
3	101° 33' 01"	4° 58' 31"	103° 02' 36"	27° 53' 32"	0° 58' 43"	16' 00.08"	272° 15' 17"	0.24871
4	102° 07' 51"	4° 57' 41"	103° 41' 37"	27° 49' 30"	0° 58' 41"	15' 59.44"	272° 34' 43"	0.25277
5	102° 42' 39"	4° 56' 49"	104° 20' 31"	27° 45' 17"	0° 58' 39"	15' 58.79"	272° 54' 02"	0.25686
6	103° 17' 23"	4° 55' 56"	104° 59' 19"	27° 40' 54"	0° 58' 36"	15' 58.14"	273° 13' 13"	0.26096
7	103° 52' 05"	4° 55' 00"	105° 38' 00"	27° 36' 21"	0° 58' 34"	15' 57.49"	273° 32' 16"	0.26507
8	104° 26' 43"	4° 54' 04"	106° 16' 35"	27° 31' 37"	0° 58' 31"	15' 56.84"	273° 51' 11"	0.26919
9	105° 01' 18"	4° 53' 05"	106° 55' 03"	27° 26' 43"	0° 58' 29"	15' 56.19"	274° 9' 58"	0.27334
10	105° 35' 51"	4° 52' 05"	107° 33' 25"	27° 21' 39"	0° 58' 27"	15' 55.54"	274° 28' 37"	0.27749
11	106° 10' 20"	4° 51' 03"	108° 11' 39"	27° 16' 25"	0° 58' 24"	15' 54.89"	274° 47' 08"	0.28166
12	106° 44' 46"	4° 49' 59"	108° 49' 47"	27° 11' 01"	0° 58' 22"	15' 54.24"	275° 5' 31"	0.28583
13	107° 19' 09"	4° 48' 54"	109° 27' 48"	27° 05' 27"	0° 58' 19"	15' 53.59"	275° 23' 46"	0.29003
14	107° 53' 29"	4° 47' 47"	110° 05' 41"	26° 59' 44"	0° 58' 17"	15' 52.94"	275° 41' 52"	0.29423
15	108° 27' 47"	4° 46' 39"	110° 43' 28"	26° 53' 50"	0° 58' 15"	15' 52.29"	275° 59' 50"	0.29844
16	109° 02' 01"	4° 45' 29"	111° 21' 07"	26° 47' 48"	0° 58' 12"	15' 51.64"	276° 17' 39"	0.30267
17	109° 36' 12"	4° 44' 17"	111° 58' 39"	26° 41' 36"	0° 58' 10"	15' 50.99"	276° 35' 20"	0.30690
18	110° 10' 20"	4° 43' 04"	112° 36' 04"	26° 35' 14"	0° 58' 08"	15' 50.34"	276° 52' 52"	0.31114
19	110° 44' 25"	4° 41' 49"	113° 13' 21"	26° 28' 44"	0° 58' 05"	15' 49.70"	277° 10' 15"	0.31540
20	111° 18' 27"	4° 40' 32"	113° 50' 31"	26° 22' 04"	0° 58' 03"	15' 49.05"	277° 27' 30"	0.31966
21	111° 52' 26"	4° 39' 14"	114° 27' 34"	26° 15' 15"	0° 58' 00"	15' 48.41"	277° 44' 36"	0.32393
22	112° 26' 21"	4° 37' 55"	115° 04' 29"	26° 08' 17"	0° 57' 58"	15' 47.76"	278° 1' 33"	0.32821
23	113° 00' 14"	4° 36' 34"	115° 41' 16"	26° 01' 11"	0° 57' 56"	15' 47.12"	278° 18' 21"	0.33250
24	113° 34' 04"	4° 35' 11"	116° 17' 56"	25° 53' 56"	0° 57' 53"	15' 46.48"	278° 35' 00"	0.33679

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	42° 49' 30"	0.32"	40° 22' 14"	15° 41' 08"	1.0079999	15'52.01"	23° 26' 19"	3 m 05 s
1	42° 51' 55"	0.32"	40° 24' 38"	15° 41' 52"	1.0080100	15'52.00"	23° 26' 19"	3 m 05 s
2	42° 54' 21"	0.32"	40° 27' 02"	15° 42' 36"	1.0080201	15'51.99"	23° 26' 19"	3 m 06 s
3	42° 56' 46"	0.32"	40° 29' 26"	15° 43' 20"	1.0080303	15'51.99"	23° 26' 19"	3 m 06 s
4	42° 59' 12"	0.31"	40° 31' 50"	15° 44' 04"	1.0080404	15'51.98"	23° 26' 19"	3 m 06 s
5	43° 01' 37"	0.31"	40° 34' 14"	15° 44' 48"	1.0080505	15'51.97"	23° 26' 19"	3 m 06 s
6	43° 04' 03"	0.31"	40° 36' 38"	15° 45' 32"	1.0080606	15'51.96"	23° 26' 19"	3 m 07 s
7	43° 06' 28"	0.31"	40° 39' 02"	15° 46' 16"	1.0080707	15'51.95"	23° 26' 19"	3 m 07 s
8	43° 08' 54"	0.30"	40° 41' 26"	15° 46' 60"	1.0080808	15'51.94"	23° 26' 19"	3 m 07 s
9	43° 11' 19"	0.30"	40° 43' 51"	15° 47' 44"	1.0080909	15'51.93"	23° 26' 19"	3 m 07 s
10	43° 13' 45"	0.30"	40° 46' 15"	15° 48' 28"	1.0081010	15'51.92"	23° 26' 19"	3 m 08 s
11	43° 16' 10"	0.30"	40° 48' 39"	15° 49' 11"	1.0081110	15'51.91"	23° 26' 19"	3 m 08 s
12	43° 18' 36"	0.29"	40° 51' 03"	15° 49' 55"	1.0081211	15'51.90"	23° 26' 19"	3 m 08 s
13	43° 21' 01"	0.29"	40° 53' 27"	15° 50' 39"	1.0081312	15'51.89"	23° 26' 19"	3 m 08 s
14	43° 23' 27"	0.29"	40° 55' 52"	15° 51' 23"	1.0081412	15'51.88"	23° 26' 19"	3 m 09 s
15	43° 25' 52"	0.29"	40° 58' 16"	15° 52' 06"	1.0081513	15'51.87"	23° 26' 19"	3 m 09 s
16	43° 28' 17"	0.28"	41° 00' 40"	15° 52' 50"	1.0081614	15'51.86"	23° 26' 19"	3 m 09 s
17	43° 30' 43"	0.28"	41° 03' 04"	15° 53' 34"	1.0081714	15'51.85"	23° 26' 19"	3 m 09 s
18	43° 33' 08"	0.28"	41° 05' 29"	15° 54' 17"	1.0081815	15'51.84"	23° 26' 19"	3 m 10 s
19	43° 35' 34"	0.27"	41° 07' 53"	15° 55' 01"	1.0081915	15'51.83"	23° 26' 19"	3 m 10 s
20	43° 37' 59"	0.27"	41° 10' 17"	15° 55' 44"	1.0082015	15'51.82"	23° 26' 19"	3 m 10 s
21	43° 40' 25"	0.27"	41° 12' 42"	15° 56' 28"	1.0082116	15'51.81"	23° 26' 19"	3 m 10 s
22	43° 42' 50"	0.27"	41° 15' 06"	15° 57' 12"	1.0082216	15'51.80"	23° 26' 19"	3 m 11 s
23	43° 45' 16"	0.26"	41° 17' 30"	15° 57' 55"	1.0082316	15'51.80"	23° 26' 19"	3 m 11 s
24	43° 47' 41"	0.26"	41° 19' 55"	15° 58' 38"	1.0082416	15'51.79"	23° 26' 19"	3 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	113° 34' 04"	4° 35' 11"	116° 17' 56"	25° 53' 56"	0° 57' 53"	15' 46.48"	278° 35' 00"	0.33679
1	114° 07' 51"	4° 33' 47"	116° 54' 28"	25° 46' 32"	0° 57' 51"	15' 45.83"	278° 51' 31"	0.34109
2	114° 41' 35"	4° 32' 22"	117° 30' 52"	25° 39' 00"	0° 57' 49"	15' 45.19"	279° 7' 52"	0.34540
3	115° 15' 17"	4° 30' 55"	118° 07' 09"	25° 31' 20"	0° 57' 46"	15' 44.56"	279° 24' 04"	0.34971
4	115° 48' 55"	4° 29' 27"	118° 43' 18"	25° 23' 31"	0° 57' 44"	15' 43.92"	279° 40' 07"	0.35403
5	116° 22' 30"	4° 27' 57"	119° 19' 20"	25° 15' 34"	0° 57' 42"	15' 43.28"	279° 56' 01"	0.35836
6	116° 56' 02"	4° 26' 26"	119° 55' 13"	25° 07' 29"	0° 57' 39"	15' 42.65"	280° 11' 45"	0.36269
7	117° 29' 31"	4° 24' 53"	120° 30' 59"	24° 59' 16"	0° 57' 37"	15' 42.01"	280° 27' 21"	0.36702
8	118° 02' 58"	4° 23' 19"	121° 06' 37"	24° 50' 55"	0° 57' 35"	15' 41.38"	280° 42' 47"	0.37136
9	118° 36' 21"	4° 21' 44"	121° 42' 08"	24° 42' 27"	0° 57' 32"	15' 40.75"	280° 58' 03"	0.37571
10	119° 09' 42"	4° 20' 08"	122° 17' 30"	24° 33' 51"	0° 57' 30"	15' 40.13"	281° 13' 11"	0.38005
11	119° 42' 60"	4° 18' 30"	122° 52' 45"	24° 25' 07"	0° 57' 28"	15' 39.50"	281° 28' 09"	0.38440
12	120° 16' 14"	4° 16' 50"	123° 27' 52"	24° 16' 16"	0° 57' 25"	15' 38.88"	281° 42' 58"	0.38875
13	120° 49' 26"	4° 15' 10"	124° 02' 51"	24° 07' 18"	0° 57' 23"	15' 38.25"	281° 57' 37"	0.39311
14	121° 22' 36"	4° 13' 28"	124° 37' 43"	23° 58' 12"	0° 57' 21"	15' 37.63"	282° 12' 07"	0.39746
15	121° 55' 42"	4° 11' 45"	125° 12' 26"	23° 48' 60"	0° 57' 19"	15' 37.02"	282° 26' 27"	0.40182
16	122° 28' 45"	4° 10' 00"	125° 47' 02"	23° 39' 40"	0° 57' 16"	15' 36.40"	282° 40' 39"	0.40618
17	123° 01' 46"	4° 08' 15"	126° 21' 30"	23° 30' 13"	0° 57' 14"	15' 35.79"	282° 54' 40"	0.41054
18	123° 34' 44"	4° 06' 28"	126° 55' 51"	23° 20' 40"	0° 57' 12"	15' 35.18"	283° 8' 32"	0.41490
19	124° 07' 39"	4° 04' 40"	127° 30' 04"	23° 10' 60"	0° 57' 10"	15' 34.57"	283° 22' 15"	0.41927
20	124° 40' 31"	4° 02' 50"	128° 04' 09"	23° 01' 13"	0° 57' 07"	15' 33.96"	283° 35' 48"	0.42363
21	125° 13' 21"	4° 00' 60"	128° 38' 06"	22° 51' 20"	0° 57' 05"	15' 33.36"	283° 49' 12"	0.42799
22	125° 46' 08"	3° 59' 08"	129° 11' 56"	22° 41' 21"	0° 57' 03"	15' 32.76"	284° 2' 26"	0.43235
23	126° 18' 52"	3° 57' 16"	129° 45' 38"	22° 31' 15"	0° 57' 01"	15' 32.16"	284° 15' 31"	0.43671
24	126° 51' 33"	3° 55' 22"	130° 19' 13"	22° 21' 03"	0° 56' 59"	15' 31.56"	284° 28' 26"	0.44107

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	43° 47' 41"	0.26"	41° 19' 55"	15° 58' 38"	1.0082416	15'51.79"	23° 26' 19"	3 m 11 s
1	43° 50' 06"	0.26"	41° 22' 19"	15° 59' 22"	1.0082517	15'51.78"	23° 26' 19"	3 m 11 s
2	43° 52' 32"	0.25"	41° 24' 43"	16° 00' 05"	1.0082617	15'51.77"	23° 26' 19"	3 m 12 s
3	43° 54' 57"	0.25"	41° 27' 08"	16° 00' 49"	1.0082717	15'51.76"	23° 26' 19"	3 m 12 s
4	43° 57' 23"	0.25"	41° 29' 32"	16° 01' 32"	1.0082817	15'51.75"	23° 26' 19"	3 m 12 s
5	43° 59' 48"	0.24"	41° 31' 57"	16° 02' 15"	1.0082917	15'51.74"	23° 26' 19"	3 m 12 s
6	44° 02' 14"	0.24"	41° 34' 21"	16° 02' 59"	1.0083017	15'51.73"	23° 26' 19"	3 m 12 s
7	44° 04' 39"	0.23"	41° 36' 46"	16° 03' 42"	1.0083116	15'51.72"	23° 26' 19"	3 m 13 s
8	44° 07' 04"	0.23"	41° 39' 10"	16° 04' 25"	1.0083216	15'51.71"	23° 26' 19"	3 m 13 s
9	44° 09' 30"	0.23"	41° 41' 35"	16° 05' 08"	1.0083316	15'51.70"	23° 26' 19"	3 m 13 s
10	44° 11' 55"	0.22"	41° 43' 59"	16° 05' 51"	1.0083416	15'51.69"	23° 26' 19"	3 m 13 s
11	44° 14' 21"	0.22"	41° 46' 24"	16° 06' 35"	1.0083515	15'51.68"	23° 26' 19"	3 m 14 s
12	44° 16' 46"	0.22"	41° 48' 48"	16° 07' 18"	1.0083615	15'51.67"	23° 26' 19"	3 m 14 s
13	44° 19' 11"	0.21"	41° 51' 13"	16° 08' 01"	1.0083715	15'51.66"	23° 26' 19"	3 m 14 s
14	44° 21' 37"	0.21"	41° 53' 37"	16° 08' 44"	1.0083814	15'51.65"	23° 26' 19"	3 m 14 s
15	44° 24' 02"	0.21"	41° 56' 02"	16° 09' 27"	1.0083914	15'51.64"	23° 26' 19"	3 m 14 s
16	44° 26' 28"	0.20"	41° 58' 26"	16° 10' 10"	1.0084013	15'51.64"	23° 26' 19"	3 m 15 s
17	44° 28' 53"	0.20"	42° 00' 51"	16° 10' 53"	1.0084113	15'51.63"	23° 26' 19"	3 m 15 s
18	44° 31' 18"	0.19"	42° 03' 16"	16° 11' 36"	1.0084212	15'51.62"	23° 26' 19"	3 m 15 s
19	44° 33' 44"	0.19"	42° 05' 40"	16° 12' 19"	1.0084311	15'51.61"	23° 26' 19"	3 m 15 s
20	44° 36' 09"	0.19"	42° 08' 05"	16° 13' 02"	1.0084411	15'51.60"	23° 26' 19"	3 m 15 s
21	44° 38' 34"	0.18"	42° 10' 30"	16° 13' 44"	1.0084510	15'51.59"	23° 26' 19"	3 m 16 s
22	44° 40' 60"	0.18"	42° 12' 54"	16° 14' 27"	1.0084609	15'51.58"	23° 26' 19"	3 m 16 s
23	44° 43' 25"	0.17"	42° 15' 19"	16° 15' 10"	1.0084708	15'51.57"	23° 26' 19"	3 m 16 s
24	44° 45' 50"	0.17"	42° 17' 44"	16° 15' 53"	1.0084807	15'51.56"	23° 26' 19"	3 m 16 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	126° 51' 33"	3° 55' 22"	130° 19' 13"	22° 21' 03"	0° 56' 59"	15' 31.56"	284° 28' 26"	0.44107
1	127° 24' 12"	3° 53' 27"	130° 52' 40"	22° 10' 45"	0° 56' 56"	15' 30.97"	284° 41' 12"	0.44542
2	127° 56' 48"	3° 51' 30"	131° 25' 59"	22° 00' 20"	0° 56' 54"	15' 30.38"	284° 53' 48"	0.44978
3	128° 29' 22"	3° 49' 33"	131° 59' 11"	21° 49' 50"	0° 56' 52"	15' 29.79"	285° 6' 14"	0.45413
4	129° 01' 53"	3° 47' 35"	132° 32' 16"	21° 39' 15"	0° 56' 50"	15' 29.20"	285° 18' 32"	0.45848
5	129° 34' 21"	3° 45' 35"	133° 05' 13"	21° 28' 33"	0° 56' 48"	15' 28.62"	285° 30' 39"	0.46283
6	130° 06' 46"	3° 43' 35"	133° 38' 03"	21° 17' 46"	0° 56' 46"	15' 28.04"	285° 42' 38"	0.46717
7	130° 39' 09"	3° 41' 33"	134° 10' 46"	21° 06' 53"	0° 56' 44"	15' 27.46"	285° 54' 26"	0.47151
8	131° 11' 30"	3° 39' 31"	134° 43' 21"	20° 55' 55"	0° 56' 41"	15' 26.89"	286° 6' 06"	0.47584
9	131° 43' 47"	3° 37' 27"	135° 15' 49"	20° 44' 51"	0° 56' 39"	15' 26.32"	286° 17' 35"	0.48018
10	132° 16' 03"	3° 35' 23"	135° 48' 10"	20° 33' 43"	0° 56' 37"	15' 25.75"	286° 28' 56"	0.48450
11	132° 48' 15"	3° 33' 17"	136° 20' 24"	20° 22' 29"	0° 56' 35"	15' 25.19"	286° 40' 07"	0.48883
12	133° 20' 26"	3° 31' 11"	136° 52' 31"	20° 11' 10"	0° 56' 33"	15' 24.62"	286° 51' 08"	0.49314
13	133° 52' 33"	3° 29' 03"	137° 24' 31"	19° 59' 46"	0° 56' 31"	15' 24.07"	287° 2' 01"	0.49746
14	134° 24' 39"	3° 26' 55"	137° 56' 24"	19° 48' 17"	0° 56' 29"	15' 23.51"	287° 12' 43"	0.50176
15	134° 56' 42"	3° 24' 46"	138° 28' 10"	19° 36' 43"	0° 56' 27"	15' 22.96"	287° 23' 17"	0.50606
16	135° 28' 42"	3° 22' 36"	138° 59' 49"	19° 25' 05"	0° 56' 25"	15' 22.41"	287° 33' 41"	0.51036
17	136° 00' 40"	3° 20' 24"	139° 31' 21"	19° 13' 22"	0° 56' 23"	15' 21.86"	287° 43' 55"	0.51465
18	136° 32' 36"	3° 18' 13"	140° 02' 47"	19° 01' 34"	0° 56' 21"	15' 21.32"	287° 54' 01"	0.51893
19	137° 04' 29"	3° 15' 60"	140° 34' 06"	18° 49' 42"	0° 56' 19"	15' 20.78"	288° 3' 57"	0.52320
20	137° 36' 20"	3° 13' 46"	141° 05' 18"	18° 37' 46"	0° 56' 17"	15' 20.25"	288° 13' 44"	0.52747
21	138° 08' 08"	3° 11' 31"	141° 36' 24"	18° 25' 45"	0° 56' 15"	15' 19.72"	288° 23' 21"	0.53173
22	138° 39' 54"	3° 09' 16"	142° 07' 24"	18° 13' 40"	0° 56' 13"	15' 19.19"	288° 32' 49"	0.53599
23	139° 11' 38"	3° 06' 60"	142° 38' 17"	18° 01' 31"	0° 56' 11"	15' 18.66"	288° 42' 08"	0.54023
24	139° 43' 20"	3° 04' 43"	143° 09' 03"	17° 49' 18"	0° 56' 09"	15' 18.14"	288° 51' 18"	0.54447

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	44° 45' 50"	0.17"	42° 17' 44"	16° 15' 53"	1.0084807	15'51.56"	23° 26' 19"	3 m 16 s
1	44° 48' 16"	0.16"	42° 20' 08"	16° 16' 36"	1.0084906	15'51.55"	23° 26' 19"	3 m 17 s
2	44° 50' 41"	0.16"	42° 22' 33"	16° 17' 18"	1.0085005	15'51.54"	23° 26' 19"	3 m 17 s
3	44° 53' 06"	0.16"	42° 24' 58"	16° 18' 01"	1.0085104	15'51.53"	23° 26' 19"	3 m 17 s
4	44° 55' 32"	0.15"	42° 27' 23"	16° 18' 44"	1.0085203	15'51.52"	23° 26' 19"	3 m 17 s
5	44° 57' 57"	0.15"	42° 29' 47"	16° 19' 26"	1.0085302	15'51.51"	23° 26' 19"	3 m 17 s
6	45° 00' 22"	0.14"	42° 32' 12"	16° 20' 09"	1.0085401	15'51.50"	23° 26' 19"	3 m 18 s
7	45° 02' 48"	0.14"	42° 34' 37"	16° 20' 51"	1.0085500	15'51.49"	23° 26' 19"	3 m 18 s
8	45° 05' 13"	0.13"	42° 37' 02"	16° 21' 34"	1.0085599	15'51.49"	23° 26' 19"	3 m 18 s
9	45° 07' 38"	0.13"	42° 39' 27"	16° 22' 17"	1.0085698	15'51.48"	23° 26' 19"	3 m 18 s
10	45° 10' 04"	0.13"	42° 41' 51"	16° 22' 59"	1.0085796	15'51.47"	23° 26' 19"	3 m 18 s
11	45° 12' 29"	0.12"	42° 44' 16"	16° 23' 42"	1.0085895	15'51.46"	23° 26' 19"	3 m 19 s
12	45° 14' 54"	0.12"	42° 46' 41"	16° 24' 24"	1.0085994	15'51.45"	23° 26' 19"	3 m 19 s
13	45° 17' 20"	0.11"	42° 49' 06"	16° 25' 06"	1.0086092	15'51.44"	23° 26' 19"	3 m 19 s
14	45° 19' 45"	0.11"	42° 51' 31"	16° 25' 49"	1.0086191	15'51.43"	23° 26' 19"	3 m 19 s
15	45° 22' 10"	0.10"	42° 53' 56"	16° 26' 31"	1.0086289	15'51.42"	23° 26' 19"	3 m 19 s
16	45° 24' 36"	0.10"	42° 56' 21"	16° 27' 13"	1.0086388	15'51.41"	23° 26' 19"	3 m 20 s
17	45° 27' 01"	0.09"	42° 58' 46"	16° 27' 56"	1.0086486	15'51.40"	23° 26' 19"	3 m 20 s
18	45° 29' 26"	0.09"	43° 01' 11"	16° 28' 38"	1.0086584	15'51.39"	23° 26' 19"	3 m 20 s
19	45° 31' 51"	0.08"	43° 03' 36"	16° 29' 20"	1.0086683	15'51.38"	23° 26' 19"	3 m 20 s
20	45° 34' 17"	0.08"	43° 06' 01"	16° 30' 02"	1.0086781	15'51.37"	23° 26' 19"	3 m 20 s
21	45° 36' 42"	0.07"	43° 08' 26"	16° 30' 45"	1.0086879	15'51.36"	23° 26' 19"	3 m 20 s
22	45° 39' 07"	0.07"	43° 10' 51"	16° 31' 27"	1.0086978	15'51.36"	23° 26' 19"	3 m 21 s
23	45° 41' 33"	0.06"	43° 13' 16"	16° 32' 09"	1.0087076	15'51.35"	23° 26' 19"	3 m 21 s
24	45° 43' 58"	0.06"	43° 15' 41"	16° 32' 51"	1.0087174	15'51.34"	23° 26' 19"	3 m 21 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	139° 43' 20"	3° 04' 43"	143° 09' 03"	17° 49' 18"	0° 56' 09"	15' 18.14"	288° 51' 18"	0.54447
1	140° 14' 59"	3° 02' 25"	143° 39' 44"	17° 37' 01"	0° 56' 07"	15' 17.62"	289° 0' 19"	0.54869
2	140° 46' 37"	3° 00' 07"	144° 10' 18"	17° 24' 40"	0° 56' 06"	15' 17.11"	289° 9' 10"	0.55291
3	141° 18' 11"	2° 57' 47"	144° 40' 46"	17° 12' 15"	0° 56' 04"	15' 16.60"	289° 17' 52"	0.55712
4	141° 49' 44"	2° 55' 27"	145° 11' 07"	16° 59' 47"	0° 56' 02"	15' 16.09"	289° 26' 26"	0.56133
5	142° 21' 15"	2° 53' 07"	145° 41' 23"	16° 47' 14"	0° 55' 60"	15' 15.59"	289° 34' 50"	0.56552
6	142° 52' 43"	2° 50' 45"	146° 11' 33"	16° 34' 39"	0° 55' 58"	15' 15.09"	289° 43' 05"	0.56970
7	143° 24' 09"	2° 48' 23"	146° 41' 37"	16° 21' 59"	0° 55' 56"	15' 14.59"	289° 51' 10"	0.57387
8	143° 55' 33"	2° 46' 00"	147° 11' 35"	16° 09' 16"	0° 55' 54"	15' 14.10"	289° 59' 07"	0.57803
9	144° 26' 55"	2° 43' 37"	147° 41' 28"	15° 56' 30"	0° 55' 53"	15' 13.61"	290° 6' 55"	0.58218
10	144° 58' 15"	2° 41' 12"	148° 11' 15"	15° 43' 41"	0° 55' 51"	15' 13.13"	290° 14' 34"	0.58633
11	145° 29' 33"	2° 38' 48"	148° 40' 56"	15° 30' 48"	0° 55' 49"	15' 12.64"	290° 22' 03"	0.59046
12	146° 00' 49"	2° 36' 22"	149° 10' 32"	15° 17' 52"	0° 55' 47"	15' 12.17"	290° 29' 24"	0.59457
13	146° 32' 03"	2° 33' 56"	149° 40' 02"	15° 04' 53"	0° 55' 46"	15' 11.69"	290° 36' 36"	0.59868
14	147° 03' 15"	2° 31' 29"	150° 09' 27"	14° 51' 51"	0° 55' 44"	15' 11.22"	290° 43' 39"	0.60278
15	147° 34' 25"	2° 29' 02"	150° 38' 46"	14° 38' 47"	0° 55' 42"	15' 10.76"	290° 50' 33"	0.60686
16	148° 05' 32"	2° 26' 34"	151° 08' 01"	14° 25' 39"	0° 55' 41"	15' 10.30"	290° 57' 18"	0.61093
17	148° 36' 38"	2° 24' 06"	151° 37' 10"	14° 12' 28"	0° 55' 39"	15' 09.84"	291° 3' 54"	0.61499
18	149° 07' 42"	2° 21' 37"	152° 06' 14"	13° 59' 15"	0° 55' 37"	15' 09.38"	291° 10' 22"	0.61904
19	149° 38' 45"	2° 19' 07"	152° 35' 13"	13° 45' 59"	0° 55' 36"	15' 08.93"	291° 16' 40"	0.62308
20	150° 09' 45"	2° 16' 37"	153° 04' 07"	13° 32' 40"	0° 55' 34"	15' 08.49"	291° 22' 50"	0.62710
21	150° 40' 43"	2° 14' 06"	153° 32' 57"	13° 19' 19"	0° 55' 32"	15' 08.04"	291° 28' 51"	0.63111
22	151° 11' 40"	2° 11' 35"	154° 01' 41"	13° 05' 55"	0° 55' 31"	15' 07.60"	291° 34' 43"	0.63511
23	151° 42' 35"	2° 09' 04"	154° 30' 21"	12° 52' 29"	0° 55' 29"	15' 07.17"	291° 40' 26"	0.63909
24	152° 13' 28"	2° 06' 32"	154° 58' 56"	12° 39' 01"	0° 55' 27"	15' 06.74"	291° 46' 01"	0.64306

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	45° 43' 58"	0.06"	43° 15' 41"	16° 32' 51"	1.0087174	15'51.34"	23° 26' 19"	3 m 21 s
1	45° 46' 23"	0.05"	43° 18' 06"	16° 33' 33"	1.0087272	15'51.33"	23° 26' 19"	3 m 21 s
2	45° 48' 48"	0.05"	43° 20' 31"	16° 34' 15"	1.0087370	15'51.32"	23° 26' 19"	3 m 21 s
3	45° 51' 14"	0.04"	43° 22' 56"	16° 34' 57"	1.0087468	15'51.31"	23° 26' 19"	3 m 22 s
4	45° 53' 39"	0.04"	43° 25' 21"	16° 35' 39"	1.0087566	15'51.30"	23° 26' 19"	3 m 22 s
5	45° 56' 04"	0.03"	43° 27' 46"	16° 36' 21"	1.0087664	15'51.29"	23° 26' 19"	3 m 22 s
6	45° 58' 29"	0.03"	43° 30' 11"	16° 37' 03"	1.0087762	15'51.28"	23° 26' 19"	3 m 22 s
7	46° 00' 55"	0.02"	43° 32' 36"	16° 37' 45"	1.0087860	15'51.27"	23° 26' 19"	3 m 22 s
8	46° 03' 20"	0.02"	43° 35' 02"	16° 38' 27"	1.0087958	15'51.26"	23° 26' 19"	3 m 22 s
9	46° 05' 45"	0.01"	43° 37' 27"	16° 39' 08"	1.0088056	15'51.25"	23° 26' 19"	3 m 23 s
10	46° 08' 10"	0.01"	43° 39' 52"	16° 39' 50"	1.0088153	15'51.24"	23° 26' 19"	3 m 23 s
11	46° 10' 36"	0.00"	43° 42' 17"	16° 40' 32"	1.0088251	15'51.24"	23° 26' 19"	3 m 23 s
12	46° 13' 01"	-0.00"	43° 44' 42"	16° 41' 14"	1.0088349	15'51.23"	23° 26' 19"	3 m 23 s
13	46° 15' 26"	-0.01"	43° 47' 08"	16° 41' 55"	1.0088446	15'51.22"	23° 26' 19"	3 m 23 s
14	46° 17' 51"	-0.01"	43° 49' 33"	16° 42' 37"	1.0088544	15'51.21"	23° 26' 19"	3 m 24 s
15	46° 20' 16"	-0.02"	43° 51' 58"	16° 43' 19"	1.0088642	15'51.20"	23° 26' 19"	3 m 24 s
16	46° 22' 42"	-0.02"	43° 54' 23"	16° 44' 00"	1.0088739	15'51.19"	23° 26' 19"	3 m 24 s
17	46° 25' 07"	-0.03"	43° 56' 49"	16° 44' 42"	1.0088837	15'51.18"	23° 26' 19"	3 m 24 s
18	46° 27' 32"	-0.03"	43° 59' 14"	16° 45' 24"	1.0088934	15'51.17"	23° 26' 19"	3 m 24 s
19	46° 29' 57"	-0.04"	44° 01' 39"	16° 46' 05"	1.0089032	15'51.16"	23° 26' 19"	3 m 24 s
20	46° 32' 23"	-0.05"	44° 04' 05"	16° 46' 47"	1.0089129	15'51.15"	23° 26' 19"	3 m 25 s
21	46° 34' 48"	-0.05"	44° 06' 30"	16° 47' 28"	1.0089226	15'51.14"	23° 26' 19"	3 m 25 s
22	46° 37' 13"	-0.06"	44° 08' 55"	16° 48' 10"	1.0089324	15'51.13"	23° 26' 19"	3 m 25 s
23	46° 39' 38"	-0.06"	44° 11' 21"	16° 48' 51"	1.0089421	15'51.12"	23° 26' 19"	3 m 25 s
24	46° 42' 03"	-0.07"	44° 13' 46"	16° 49' 32"	1.0089518	15'51.12"	23° 26' 19"	3 m 25 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	152° 13' 28"	2° 06' 32"	154° 58' 56"	12° 39' 01"	0° 55' 27"	15' 06.74"	291° 46' 01"	0.64306
1	152° 44' 19"	2° 03' 59"	155° 27' 27"	12° 25' 30"	0° 55' 26"	15' 06.31"	291° 51' 27"	0.64701
2	153° 15' 08"	2° 01' 26"	155° 55' 53"	12° 11' 57"	0° 55' 24"	15' 05.89"	291° 56' 44"	0.65095
3	153° 45' 56"	1° 58' 53"	156° 24' 15"	11° 58' 22"	0° 55' 23"	15' 05.47"	292° 1' 52"	0.65488
4	154° 16' 42"	1° 56' 19"	156° 52' 32"	11° 44' 44"	0° 55' 21"	15' 05.06"	292° 6' 52"	0.65879
5	154° 47' 27"	1° 53' 44"	157° 20' 45"	11° 31' 05"	0° 55' 20"	15' 04.64"	292° 11' 43"	0.66269
6	155° 18' 09"	1° 51' 10"	157° 48' 54"	11° 17' 23"	0° 55' 18"	15' 04.24"	292° 16' 25"	0.66658
7	155° 48' 50"	1° 48' 35"	158° 16' 59"	11° 03' 40"	0° 55' 17"	15' 03.83"	292° 20' 59"	0.67044
8	156° 19' 30"	1° 45' 59"	158° 44' 60"	10° 49' 55"	0° 55' 15"	15' 03.44"	292° 25' 24"	0.67430
9	156° 50' 08"	1° 43' 23"	159° 12' 57"	10° 36' 08"	0° 55' 14"	15' 03.04"	292° 29' 40"	0.67814
10	157° 20' 44"	1° 40' 47"	159° 40' 50"	10° 22' 19"	0° 55' 12"	15' 02.65"	292° 33' 48"	0.68196
11	157° 51' 18"	1° 38' 10"	160° 08' 39"	10° 08' 28"	0° 55' 11"	15' 02.26"	292° 37' 47"	0.68576
12	158° 21' 52"	1° 35' 34"	160° 36' 25"	9° 54' 36"	0° 55' 10"	15' 01.88"	292° 41' 37"	0.68956
13	158° 52' 23"	1° 32' 56"	161° 04' 06"	9° 40' 42"	0° 55' 08"	15' 01.50"	292° 45' 19"	0.69333
14	159° 22' 53"	1° 30' 19"	161° 31' 45"	9° 26' 47"	0° 55' 07"	15' 01.13"	292° 48' 52"	0.69709
15	159° 53' 22"	1° 27' 41"	161° 59' 19"	9° 12' 50"	0° 55' 06"	15' 00.75"	292° 52' 17"	0.70083
16	160° 23' 49"	1° 25' 03"	162° 26' 51"	8° 58' 51"	0° 55' 04"	15' 00.39"	292° 55' 33"	0.70456
17	160° 54' 15"	1° 22' 25"	162° 54' 19"	8° 44' 52"	0° 55' 03"	15' 00.03"	292° 58' 40"	0.70826
18	161° 24' 39"	1° 19' 46"	163° 21' 43"	8° 30' 50"	0° 55' 02"	14' 59.67"	293° 1' 39"	0.71196
19	161° 55' 02"	1° 17' 07"	163° 49' 05"	8° 16' 48"	0° 55' 00"	14' 59.31"	293° 4' 29"	0.71563
20	162° 25' 24"	1° 14' 28"	164° 16' 23"	8° 02' 44"	0° 54' 59"	14' 58.96"	293° 7' 11"	0.71929
21	162° 55' 44"	1° 11' 49"	164° 43' 38"	7° 48' 39"	0° 54' 58"	14' 58.61"	293° 9' 44"	0.72293
22	163° 26' 03"	1° 09' 09"	165° 10' 51"	7° 34' 33"	0° 54' 56"	14' 58.27"	293° 12' 08"	0.72655
23	163° 56' 21"	1° 06' 29"	165° 38' 00"	7° 20' 26"	0° 54' 55"	14' 57.93"	293° 14' 24"	0.73015
24	164° 26' 37"	1° 03' 49"	166° 05' 07"	7° 06' 18"	0° 54' 54"	14' 57.60"	293° 16' 31"	0.73374

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	46° 42' 03"	-0.07"	44° 13' 46"	16° 49' 32"	1.0089518	15'51.12"	23° 26' 19"	3 m 25 s
1	46° 44' 28"	-0.07"	44° 16' 11"	16° 50' 14"	1.0089616	15'51.11"	23° 26' 19"	3 m 25 s
2	46° 46' 54"	-0.08"	44° 18' 37"	16° 50' 55"	1.0089713	15'51.10"	23° 26' 19"	3 m 26 s
3	46° 49' 19"	-0.08"	44° 21' 02"	16° 51' 36"	1.0089810	15'51.09"	23° 26' 19"	3 m 26 s
4	46° 51' 44"	-0.09"	44° 23' 28"	16° 52' 18"	1.0089907	15'51.08"	23° 26' 19"	3 m 26 s
5	46° 54' 09"	-0.09"	44° 25' 53"	16° 52' 59"	1.0090004	15'51.07"	23° 26' 19"	3 m 26 s
6	46° 56' 34"	-0.10"	44° 28' 19"	16° 53' 40"	1.0090101	15'51.06"	23° 26' 19"	3 m 26 s
7	46° 58' 60"	-0.11"	44° 30' 44"	16° 54' 21"	1.0090198	15'51.05"	23° 26' 19"	3 m 26 s
8	47° 01' 25"	-0.11"	44° 33' 10"	16° 55' 02"	1.0090295	15'51.04"	23° 26' 19"	3 m 26 s
9	47° 03' 50"	-0.12"	44° 35' 35"	16° 55' 44"	1.0090392	15'51.03"	23° 26' 19"	3 m 27 s
10	47° 06' 15"	-0.12"	44° 38' 01"	16° 56' 25"	1.0090489	15'51.02"	23° 26' 19"	3 m 27 s
11	47° 08' 40"	-0.13"	44° 40' 26"	16° 57' 06"	1.0090586	15'51.02"	23° 26' 19"	3 m 27 s
12	47° 11' 05"	-0.13"	44° 42' 52"	16° 57' 47"	1.0090683	15'51.01"	23° 26' 19"	3 m 27 s
13	47° 13' 30"	-0.14"	44° 45' 17"	16° 58' 28"	1.0090780	15'51.00"	23° 26' 19"	3 m 27 s
14	47° 15' 56"	-0.14"	44° 47' 43"	16° 59' 09"	1.0090876	15'50.99"	23° 26' 19"	3 m 27 s
15	47° 18' 21"	-0.15"	44° 50' 08"	16° 59' 50"	1.0090973	15'50.98"	23° 26' 19"	3 m 28 s
16	47° 20' 46"	-0.16"	44° 52' 34"	17° 00' 31"	1.0091070	15'50.97"	23° 26' 19"	3 m 28 s
17	47° 23' 11"	-0.16"	44° 54' 60"	17° 01' 11"	1.0091166	15'50.96"	23° 26' 19"	3 m 28 s
18	47° 25' 36"	-0.17"	44° 57' 25"	17° 01' 52"	1.0091263	15'50.95"	23° 26' 19"	3 m 28 s
19	47° 28' 01"	-0.17"	44° 59' 51"	17° 02' 33"	1.0091360	15'50.94"	23° 26' 19"	3 m 28 s
20	47° 30' 26"	-0.18"	45° 02' 17"	17° 03' 14"	1.0091456	15'50.93"	23° 26' 19"	3 m 28 s
21	47° 32' 52"	-0.18"	45° 04' 42"	17° 03' 55"	1.0091553	15'50.92"	23° 26' 19"	3 m 28 s
22	47° 35' 17"	-0.19"	45° 07' 08"	17° 04' 35"	1.0091649	15'50.91"	23° 26' 19"	3 m 29 s
23	47° 37' 42"	-0.20"	45° 09' 34"	17° 05' 16"	1.0091746	15'50.91"	23° 26' 19"	3 m 29 s
24	47° 40' 07"	-0.20"	45° 11' 59"	17° 05' 57"	1.0091842	15'50.90"	23° 26' 19"	3 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	164° 26' 37"	1° 03' 49"	166° 05' 07"	7° 06' 18"	0° 54' 54"	14' 57.60"	293° 16' 31"	0.73374
1	164° 56' 52"	1° 01' 09"	166° 32' 11"	6° 52' 09"	0° 54' 53"	14' 57.27"	293° 18' 29"	0.73731
2	165° 27' 06"	0° 58' 29"	166° 59' 12"	6° 37' 59"	0° 54' 52"	14' 56.94"	293° 20' 19"	0.74086
3	165° 57' 18"	0° 55' 48"	167° 26' 10"	6° 23' 48"	0° 54' 50"	14' 56.62"	293° 22' 00"	0.74439
4	166° 27' 30"	0° 53' 08"	167° 53' 06"	6° 09' 36"	0° 54' 49"	14' 56.30"	293° 23' 32"	0.74790
5	166° 57' 40"	0° 50' 27"	168° 19' 60"	5° 55' 24"	0° 54' 48"	14' 55.98"	293° 24' 56"	0.75140
6	167° 27' 49"	0° 47' 46"	168° 46' 51"	5° 41' 10"	0° 54' 47"	14' 55.67"	293° 26' 11"	0.75487
7	167° 57' 56"	0° 45' 05"	169° 13' 40"	5° 26' 56"	0° 54' 46"	14' 55.37"	293° 27' 18"	0.75833
8	168° 28' 03"	0° 42' 24"	169° 40' 27"	5° 12' 41"	0° 54' 45"	14' 55.06"	293° 28' 15"	0.76177
9	168° 58' 09"	0° 39' 43"	170° 07' 11"	4° 58' 26"	0° 54' 44"	14' 54.76"	293° 29' 04"	0.76518
10	169° 28' 13"	0° 37' 02"	170° 33' 53"	4° 44' 10"	0° 54' 42"	14' 54.47"	293° 29' 44"	0.76858
11	169° 58' 17"	0° 34' 20"	171° 00' 34"	4° 29' 54"	0° 54' 41"	14' 54.18"	293° 30' 15"	0.77196
12	170° 28' 19"	0° 31' 39"	171° 27' 12"	4° 15' 37"	0° 54' 40"	14' 53.89"	293° 30' 37"	0.77532
13	170° 58' 20"	0° 28' 58"	171° 53' 49"	4° 01' 20"	0° 54' 39"	14' 53.61"	293° 30' 51"	0.77866
14	171° 28' 21"	0° 26' 16"	172° 20' 23"	3° 47' 02"	0° 54' 38"	14' 53.33"	293° 30' 56"	0.78198
15	171° 58' 20"	0° 23' 35"	172° 46' 56"	3° 32' 44"	0° 54' 37"	14' 53.05"	293° 30' 51"	0.78528
16	172° 28' 18"	0° 20' 53"	173° 13' 28"	3° 18' 26"	0° 54' 36"	14' 52.78"	293° 30' 38"	0.78855
17	172° 58' 16"	0° 18' 12"	173° 39' 57"	3° 04' 07"	0° 54' 35"	14' 52.51"	293° 30' 16"	0.79181
18	173° 28' 12"	0° 15' 31"	174° 06' 25"	2° 49' 48"	0° 54' 34"	14' 52.25"	293° 29' 45"	0.79505
19	173° 58' 07"	0° 12' 49"	174° 32' 52"	2° 35' 29"	0° 54' 33"	14' 51.99"	293° 29' 04"	0.79826
20	174° 28' 02"	0° 10' 08"	174° 59' 18"	2° 21' 10"	0° 54' 32"	14' 51.73"	293° 28' 15"	0.80146
21	174° 57' 56"	0° 07' 26"	175° 25' 42"	2° 06' 51"	0° 54' 31"	14' 51.48"	293° 27' 16"	0.80463
22	175° 27' 49"	0° 04' 45"	175° 52' 04"	1° 52' 32"	0° 54' 31"	14' 51.23"	293° 26' 08"	0.80779
23	175° 57' 41"	0° 02' 04"	176° 18' 26"	1° 38' 13"	0° 54' 30"	14' 50.99"	293° 24' 51"	0.81092
24	176° 27' 32"	0° 00'-37"	176° 44' 47"	1° 23' 54"	0° 54' 29"	14' 50.75"	293° 23' 25"	0.81403

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	47° 40' 07"	-0.20"	45° 11' 59"	17° 05' 57"	1.0091842	15'50.90"	23° 26' 19"	3 m 29 s
1	47° 42' 32"	-0.21"	45° 14' 25"	17° 06' 38"	1.0091939	15'50.89"	23° 26' 19"	3 m 29 s
2	47° 44' 57"	-0.21"	45° 16' 51"	17° 07' 18"	1.0092035	15'50.88"	23° 26' 19"	3 m 29 s
3	47° 47' 22"	-0.22"	45° 19' 17"	17° 07' 59"	1.0092131	15'50.87"	23° 26' 19"	3 m 29 s
4	47° 49' 47"	-0.22"	45° 21' 43"	17° 08' 39"	1.0092228	15'50.86"	23° 26' 19"	3 m 29 s
5	47° 52' 12"	-0.23"	45° 24' 08"	17° 09' 20"	1.0092324	15'50.85"	23° 26' 19"	3 m 29 s
6	47° 54' 38"	-0.23"	45° 26' 34"	17° 10' 00"	1.0092420	15'50.84"	23° 26' 19"	3 m 30 s
7	47° 57' 03"	-0.24"	45° 28' 60"	17° 10' 41"	1.0092516	15'50.83"	23° 26' 19"	3 m 30 s
8	47° 59' 28"	-0.25"	45° 31' 26"	17° 11' 21"	1.0092612	15'50.82"	23° 26' 19"	3 m 30 s
9	48° 01' 53"	-0.25"	45° 33' 52"	17° 12' 02"	1.0092709	15'50.82"	23° 26' 19"	3 m 30 s
10	48° 04' 18"	-0.26"	45° 36' 18"	17° 12' 42"	1.0092805	15'50.81"	23° 26' 19"	3 m 30 s
11	48° 06' 43"	-0.26"	45° 38' 43"	17° 13' 22"	1.0092901	15'50.80"	23° 26' 19"	3 m 30 s
12	48° 09' 08"	-0.27"	45° 41' 09"	17° 14' 03"	1.0092997	15'50.79"	23° 26' 19"	3 m 30 s
13	48° 11' 33"	-0.27"	45° 43' 35"	17° 14' 43"	1.0093093	15'50.78"	23° 26' 19"	3 m 31 s
14	48° 13' 58"	-0.28"	45° 46' 01"	17° 15' 23"	1.0093189	15'50.77"	23° 26' 19"	3 m 31 s
15	48° 16' 23"	-0.29"	45° 48' 27"	17° 16' 03"	1.0093285	15'50.76"	23° 26' 19"	3 m 31 s
16	48° 18' 48"	-0.29"	45° 50' 53"	17° 16' 44"	1.0093381	15'50.75"	23° 26' 19"	3 m 31 s
17	48° 21' 13"	-0.30"	45° 53' 19"	17° 17' 24"	1.0093477	15'50.74"	23° 26' 19"	3 m 31 s
18	48° 23' 38"	-0.30"	45° 55' 45"	17° 18' 04"	1.0093572	15'50.73"	23° 26' 19"	3 m 31 s
19	48° 26' 03"	-0.31"	45° 58' 11"	17° 18' 44"	1.0093668	15'50.72"	23° 26' 19"	3 m 31 s
20	48° 28' 28"	-0.31"	46° 00' 37"	17° 19' 24"	1.0093764	15'50.72"	23° 26' 19"	3 m 31 s
21	48° 30' 54"	-0.32"	46° 03' 03"	17° 20' 04"	1.0093860	15'50.71"	23° 26' 19"	3 m 31 s
22	48° 33' 19"	-0.32"	46° 05' 29"	17° 20' 44"	1.0093955	15'50.70"	23° 26' 19"	3 m 32 s
23	48° 35' 44"	-0.33"	46° 07' 55"	17° 21' 24"	1.0094051	15'50.69"	23° 26' 19"	3 m 32 s
24	48° 38' 09"	-0.34"	46° 10' 21"	17° 22' 04"	1.0094147	15'50.68"	23° 26' 19"	3 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	176° 27' 32"	0° 00'-37"	176° 44' 47"	1° 23' 54"	0° 54' 29"	14' 50.75"	293° 23' 25"	0.81403
1	176° 57' 22"	0° -3' 18"	177° 11' 06"	1° 09' 35"	0° 54' 28"	14' 50.51"	293° 21' 49"	0.81711
2	177° 27' 12"	0° -5' 59"	177° 37' 25"	0° 55' 16"	0° 54' 27"	14' 50.28"	293° 20' 04"	0.82018
3	177° 57' 01"	0° -8' 40"	178° 03' 42"	0° 40' 58"	0° 54' 26"	14' 50.05"	293° 18' 09"	0.82322
4	178° 26' 49"	0°-11' 21"	178° 29' 59"	0° 26' 39"	0° 54' 25"	14' 49.82"	293° 16' 05"	0.82625
5	178° 56' 36"	0°-14' 01"	178° 56' 15"	0° 12' 21"	0° 54' 25"	14' 49.60"	293° 13' 51"	0.82925
6	179° 26' 23"	0°-16' 42"	179° 22' 31"	0° -1' 57"	0° 54' 24"	14' 49.38"	293° 11' 27"	0.83222
7	179° 56' 09"	0°-19' 22"	179° 48' 45"	0°-16' 14"	0° 54' 23"	14' 49.17"	293° 8' 54"	0.83518
8	180° 25' 54"	0°-22' 02"	180° 14' 60"	0°-30' 31"	0° 54' 22"	14' 48.96"	293° 6' 10"	0.83811
9	180° 55' 38"	0°-24' 42"	180° 41' 13"	0°-44' 48"	0° 54' 21"	14' 48.75"	293° 3' 17"	0.84102
10	181° 25' 22"	0°-27' 22"	181° 07' 27"	0°-59' 04"	0° 54' 21"	14' 48.55"	293° 0' 14"	0.84391
11	181° 55' 06"	0°-30' 01"	181° 33' 40"	-1° 13' 19"	0° 54' 20"	14' 48.35"	292° 57' 01"	0.84677
12	182° 24' 48"	0°-32' 41"	181° 59' 52"	-1° 27' 34"	0° 54' 19"	14' 48.15"	292° 53' 37"	0.84961
13	182° 54' 30"	0°-35' 20"	182° 26' 05"	-1° 41' 49"	0° 54' 19"	14' 47.96"	292° 50' 03"	0.85243
14	183° 24' 12"	0°-37' 59"	182° 52' 17"	-1° 56' 02"	0° 54' 18"	14' 47.77"	292° 46' 19"	0.85522
15	183° 53' 53"	0°-40' 38"	183° 18' 30"	-2° 10' 15"	0° 54' 17"	14' 47.58"	292° 42' 24"	0.85799
16	184° 23' 33"	0°-43' 16"	183° 44' 42"	-2° 24' 27"	0° 54' 17"	14' 47.40"	292° 38' 19"	0.86074
17	184° 53' 13"	0°-45' 54"	184° 10' 54"	-2° 38' 39"	0° 54' 16"	14' 47.22"	292° 34' 03"	0.86346
18	185° 22' 52"	0°-48' 32"	184° 37' 06"	-2° 52' 49"	0° 54' 15"	14' 47.05"	292° 29' 36"	0.86616
19	185° 52' 31"	0°-51' 10"	185° 03' 19"	-3° 06' 59"	0° 54' 15"	14' 46.88"	292° 24' 58"	0.86884
20	186° 22' 09"	0°-53' 47"	185° 29' 32"	-3° 21' 08"	0° 54' 14"	14' 46.71"	292° 20' 09"	0.87149
21	186° 51' 47"	0°-56' 24"	185° 55' 45"	-3° 35' 16"	0° 54' 13"	14' 46.55"	292° 15' 08"	0.87411
22	187° 21' 25"	0°-59' 01"	186° 21' 59"	-3° 49' 23"	0° 54' 13"	14' 46.39"	292° 9' 56"	0.87672
23	187° 51' 02"	-1° 01' 37"	186° 48' 13"	-4° 03' 29"	0° 54' 12"	14' 46.23"	292° 4' 32"	0.87929
24	188° 20' 38"	-1° 04' 13"	187° 14' 27"	-4° 17' 33"	0° 54' 12"	14' 46.08"	291° 58' 57"	0.88185

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	48° 38' 09"	-0.34"	46° 10' 21"	17° 22' 04"	1.0094147	15'50.68"	23° 26' 19"	3 m 32 s
1	48° 40' 34"	-0.34"	46° 12' 47"	17° 22' 44"	1.0094242	15'50.67"	23° 26' 19"	3 m 32 s
2	48° 42' 59"	-0.35"	46° 15' 13"	17° 23' 24"	1.0094338	15'50.66"	23° 26' 19"	3 m 32 s
3	48° 45' 24"	-0.35"	46° 17' 40"	17° 24' 04"	1.0094434	15'50.65"	23° 26' 19"	3 m 32 s
4	48° 47' 49"	-0.36"	46° 20' 06"	17° 24' 44"	1.0094529	15'50.64"	23° 26' 19"	3 m 32 s
5	48° 50' 14"	-0.36"	46° 22' 32"	17° 25' 23"	1.0094625	15'50.63"	23° 26' 19"	3 m 32 s
6	48° 52' 39"	-0.37"	46° 24' 58"	17° 26' 03"	1.0094720	15'50.63"	23° 26' 19"	3 m 33 s
7	48° 55' 04"	-0.37"	46° 27' 24"	17° 26' 43"	1.0094815	15'50.62"	23° 26' 19"	3 m 33 s
8	48° 57' 29"	-0.38"	46° 29' 50"	17° 27' 23"	1.0094911	15'50.61"	23° 26' 19"	3 m 33 s
9	48° 59' 54"	-0.39"	46° 32' 17"	17° 28' 02"	1.0095006	15'50.60"	23° 26' 19"	3 m 33 s
10	49° 02' 19"	-0.39"	46° 34' 43"	17° 28' 42"	1.0095102	15'50.59"	23° 26' 19"	3 m 33 s
11	49° 04' 44"	-0.40"	46° 37' 09"	17° 29' 22"	1.0095197	15'50.58"	23° 26' 19"	3 m 33 s
12	49° 07' 09"	-0.40"	46° 39' 35"	17° 30' 01"	1.0095292	15'50.57"	23° 26' 19"	3 m 33 s
13	49° 09' 34"	-0.41"	46° 42' 02"	17° 30' 41"	1.0095387	15'50.56"	23° 26' 19"	3 m 33 s
14	49° 11' 59"	-0.41"	46° 44' 28"	17° 31' 20"	1.0095483	15'50.55"	23° 26' 19"	3 m 33 s
15	49° 14' 24"	-0.42"	46° 46' 54"	17° 31' 60"	1.0095578	15'50.54"	23° 26' 19"	3 m 33 s
16	49° 16' 49"	-0.42"	46° 49' 20"	17° 32' 39"	1.0095673	15'50.54"	23° 26' 19"	3 m 34 s
17	49° 19' 14"	-0.43"	46° 51' 47"	17° 33' 19"	1.0095768	15'50.53"	23° 26' 19"	3 m 34 s
18	49° 21' 39"	-0.43"	46° 54' 13"	17° 33' 58"	1.0095863	15'50.52"	23° 26' 19"	3 m 34 s
19	49° 24' 04"	-0.44"	46° 56' 40"	17° 34' 38"	1.0095958	15'50.51"	23° 26' 19"	3 m 34 s
20	49° 26' 29"	-0.44"	46° 59' 06"	17° 35' 17"	1.0096053	15'50.50"	23° 26' 19"	3 m 34 s
21	49° 28' 54"	-0.45"	47° 01' 32"	17° 35' 56"	1.0096148	15'50.49"	23° 26' 19"	3 m 34 s
22	49° 31' 19"	-0.46"	47° 03' 59"	17° 36' 36"	1.0096243	15'50.48"	23° 26' 19"	3 m 34 s
23	49° 33' 44"	-0.46"	47° 06' 25"	17° 37' 15"	1.0096338	15'50.47"	23° 26' 19"	3 m 34 s
24	49° 36' 09"	-0.47"	47° 08' 52"	17° 37' 54"	1.0096433	15'50.46"	23° 26' 19"	3 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	188° 20' 38"	-1° 04' 13"	187° 14' 27"	-4° 17' 33"	0° 54' 12"	14' 46.08"	291° 58' 57"	0.88185
1	188° 50' 14"	-1° 06' 49"	187° 40' 42"	-4° 31' 37"	0° 54' 11"	14' 45.93"	291° 53' 10"	0.88438
2	189° 19' 50"	-1° 09' 24"	188° 06' 58"	-4° 45' 39"	0° 54' 11"	14' 45.78"	291° 47' 10"	0.88688
3	189° 49' 25"	-1° 11' 59"	188° 33' 14"	-4° 59' 41"	0° 54' 10"	14' 45.64"	291° 40' 59"	0.88936
4	190° 19' 00"	-1° 14' 34"	188° 59' 31"	-5° 13' 40"	0° 54' 10"	14' 45.50"	291° 34' 34"	0.89181
5	190° 48' 35"	-1° 17' 08"	189° 25' 49"	-5° 27' 39"	0° 54' 09"	14' 45.37"	291° 27' 57"	0.89424
6	191° 18' 09"	-1° 19' 42"	189° 52' 08"	-5° 41' 36"	0° 54' 09"	14' 45.23"	291° 21' 07"	0.89664
7	191° 47' 44"	-1° 22' 15"	190° 18' 28"	-5° 55' 32"	0° 54' 08"	14' 45.10"	291° 14' 04"	0.89902
8	192° 17' 17"	-1° 24' 48"	190° 44' 49"	-6° 09' 27"	0° 54' 08"	14' 44.98"	291° 6' 48"	0.90137
9	192° 46' 51"	-1° 27' 21"	191° 11' 11"	-6° 23' 20"	0° 54' 07"	14' 44.86"	290° 59' 17"	0.90370
10	193° 16' 24"	-1° 29' 53"	191° 37' 34"	-6° 37' 11"	0° 54' 07"	14' 44.74"	290° 51' 33"	0.90600
11	193° 45' 57"	-1° 32' 25"	192° 03' 58"	-6° 51' 01"	0° 54' 06"	14' 44.62"	290° 43' 35"	0.90828
12	194° 15' 30"	-1° 34' 56"	192° 30' 24"	-7° 04' 50"	0° 54' 06"	14' 44.51"	290° 35' 22"	0.91053
13	194° 45' 02"	-1° 37' 27"	192° 56' 51"	-7° 18' 36"	0° 54' 05"	14' 44.40"	290° 26' 54"	0.91275
14	195° 14' 34"	-1° 39' 57"	193° 23' 19"	-7° 32' 21"	0° 54' 05"	14' 44.29"	290° 18' 11"	0.91495
15	195° 44' 06"	-1° 42' 27"	193° 49' 48"	-7° 46' 05"	0° 54' 05"	14' 44.19"	290° 9' 12"	0.91712
16	196° 13' 38"	-1° 44' 57"	194° 16' 20"	-7° 59' 46"	0° 54' 04"	14' 44.09"	289° 59' 58"	0.91926
17	196° 43' 10"	-1° 47' 25"	194° 42' 52"	-8° 13' 26"	0° 54' 04"	14' 43.99"	289° 50' 27"	0.92138
18	197° 12' 41"	-1° 49' 54"	195° 09' 27"	-8° 27' 04"	0° 54' 04"	14' 43.90"	289° 40' 40"	0.92347
19	197° 42' 13"	-1° 52' 22"	195° 36' 03"	-8° 40' 39"	0° 54' 03"	14' 43.81"	289° 30' 35"	0.92553
20	198° 11' 44"	-1° 54' 49"	196° 02' 40"	-8° 54' 13"	0° 54' 03"	14' 43.73"	289° 20' 13"	0.92757
21	198° 41' 15"	-1° 57' 16"	196° 29' 20"	-9° 07' 45"	0° 54' 03"	14' 43.64"	289° 9' 33"	0.92958
22	199° 10' 46"	-1° 59' 42"	196° 56' 01"	-9° 21' 15"	0° 54' 02"	14' 43.56"	288° 58' 34"	0.93157
23	199° 40' 17"	-2° 02' 07"	197° 22' 45"	-9° 34' 43"	0° 54' 02"	14' 43.48"	288° 47' 16"	0.93352
24	200° 09' 48"	-2° 04' 32"	197° 49' 30"	-9° 48' 08"	0° 54' 02"	14' 43.41"	288° 35' 39"	0.93545

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	49° 36' 09"	-0.47"	47° 08' 52"	17° 37' 54"	1.0096433	15'50.46"	23° 26' 19"	3 m 34 s
1	49° 38' 34"	-0.47"	47° 11' 18"	17° 38' 33"	1.0096528	15'50.46"	23° 26' 19"	3 m 34 s
2	49° 40' 59"	-0.48"	47° 13' 44"	17° 39' 12"	1.0096623	15'50.45"	23° 26' 19"	3 m 34 s
3	49° 43' 24"	-0.48"	47° 16' 11"	17° 39' 51"	1.0096717	15'50.44"	23° 26' 19"	3 m 35 s
4	49° 45' 48"	-0.49"	47° 18' 37"	17° 40' 31"	1.0096812	15'50.43"	23° 26' 19"	3 m 35 s
5	49° 48' 13"	-0.49"	47° 21' 04"	17° 41' 10"	1.0096907	15'50.42"	23° 26' 19"	3 m 35 s
6	49° 50' 38"	-0.50"	47° 23' 30"	17° 41' 49"	1.0097002	15'50.41"	23° 26' 19"	3 m 35 s
7	49° 53' 03"	-0.50"	47° 25' 57"	17° 42' 28"	1.0097096	15'50.40"	23° 26' 19"	3 m 35 s
8	49° 55' 28"	-0.51"	47° 28' 23"	17° 43' 07"	1.0097191	15'50.39"	23° 26' 19"	3 m 35 s
9	49° 57' 53"	-0.51"	47° 30' 50"	17° 43' 46"	1.0097286	15'50.38"	23° 26' 19"	3 m 35 s
10	50° 00' 18"	-0.52"	47° 33' 17"	17° 44' 25"	1.0097380	15'50.38"	23° 26' 19"	3 m 35 s
11	50° 02' 43"	-0.52"	47° 35' 43"	17° 45' 03"	1.0097475	15'50.37"	23° 26' 19"	3 m 35 s
12	50° 05' 08"	-0.53"	47° 38' 10"	17° 45' 42"	1.0097569	15'50.36"	23° 26' 19"	3 m 35 s
13	50° 07' 33"	-0.53"	47° 40' 36"	17° 46' 21"	1.0097664	15'50.35"	23° 26' 19"	3 m 35 s
14	50° 09' 58"	-0.54"	47° 43' 03"	17° 46' 60"	1.0097758	15'50.34"	23° 26' 19"	3 m 35 s
15	50° 12' 23"	-0.54"	47° 45' 30"	17° 47' 39"	1.0097853	15'50.33"	23° 26' 19"	3 m 36 s
16	50° 14' 48"	-0.55"	47° 47' 56"	17° 48' 17"	1.0097947	15'50.32"	23° 26' 19"	3 m 36 s
17	50° 17' 13"	-0.55"	47° 50' 23"	17° 48' 56"	1.0098041	15'50.31"	23° 26' 19"	3 m 36 s
18	50° 19' 37"	-0.56"	47° 52' 50"	17° 49' 35"	1.0098136	15'50.30"	23° 26' 19"	3 m 36 s
19	50° 22' 02"	-0.56"	47° 55' 16"	17° 50' 13"	1.0098230	15'50.30"	23° 26' 19"	3 m 36 s
20	50° 24' 27"	-0.56"	47° 57' 43"	17° 50' 52"	1.0098324	15'50.29"	23° 26' 19"	3 m 36 s
21	50° 26' 52"	-0.57"	48° 00' 10"	17° 51' 31"	1.0098419	15'50.28"	23° 26' 19"	3 m 36 s
22	50° 29' 17"	-0.57"	48° 02' 37"	17° 52' 09"	1.0098513	15'50.27"	23° 26' 19"	3 m 36 s
23	50° 31' 42"	-0.58"	48° 05' 03"	17° 52' 48"	1.0098607	15'50.26"	23° 26' 19"	3 m 36 s
24	50° 34' 07"	-0.58"	48° 07' 30"	17° 53' 26"	1.0098701	15'50.25"	23° 26' 19"	3 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	200° 09' 48"	-2° 04' 32"	197° 49' 30"	-9° 48' 08"	0° 54' 02"	14' 43.41"	288° 35' 39"	0.93545
1	200° 39' 19"	-2° 06' 57"	198° 16' 17"	-10° 01' 32"	0° 54' 02"	14' 43.34"	288° 23' 41"	0.93736
2	201° 08' 50"	-2° 09' 21"	198° 43' 07"	-10° 14' 53"	0° 54' 01"	14' 43.27"	288° 11' 23"	0.93923
3	201° 38' 20"	-2° 11' 44"	199° 09' 58"	-10° 28' 12"	0° 54' 01"	14' 43.21"	287° 58' 42"	0.94108
4	202° 07' 51"	-2° 14' 07"	199° 36' 52"	-10° 41' 29"	0° 54' 01"	14' 43.14"	287° 45' 40"	0.94290
5	202° 37' 22"	-2° 16' 29"	200° 03' 48"	-10° 54' 43"	0° 54' 01"	14' 43.09"	287° 32' 14"	0.94469
6	203° 06' 52"	-2° 18' 50"	200° 30' 46"	-11° 07' 55"	0° 54' 00"	14' 43.03"	287° 18' 25"	0.94645
7	203° 36' 23"	-2° 21' 11"	200° 57' 47"	-11° 21' 04"	0° 54' 00"	14' 42.98"	287° 4' 10"	0.94819
8	204° 05' 53"	-2° 23' 31"	201° 24' 50"	-11° 34' 11"	0° 54' 00"	14' 42.93"	286° 49' 30"	0.94990
9	204° 35' 24"	-2° 25' 51"	201° 51' 56"	-11° 47' 15"	0° 53' 60"	14' 42.88"	286° 34' 23"	0.95158
10	205° 04' 55"	-2° 28' 09"	202° 19' 04"	-12° 00' 16"	0° 53' 60"	14' 42.84"	286° 18' 48"	0.95323
11	205° 34' 26"	-2° 30' 27"	202° 46' 14"	-12° 13' 15"	0° 53' 60"	14' 42.80"	286° 2' 45"	0.95486
12	206° 03' 56"	-2° 32' 45"	203° 13' 28"	-12° 26' 12"	0° 53' 59"	14' 42.76"	285° 46' 11"	0.95645
13	206° 33' 27"	-2° 35' 02"	203° 40' 44"	-12° 39' 05"	0° 53' 59"	14' 42.72"	285° 29' 06"	0.95802
14	207° 02' 58"	-2° 37' 18"	204° 08' 02"	-12° 51' 56"	0° 53' 59"	14' 42.69"	285° 11' 27"	0.95956
15	207° 32' 29"	-2° 39' 33"	204° 35' 24"	-13° 04' 44"	0° 53' 59"	14' 42.66"	284° 53' 14"	0.96107
16	208° 02' 01"	-2° 41' 48"	205° 02' 48"	-13° 17' 29"	0° 53' 59"	14' 42.64"	284° 34' 25"	0.96255
17	208° 31' 32"	-2° 44' 01"	205° 30' 16"	-13° 30' 11"	0° 53' 59"	14' 42.61"	284° 14' 59"	0.96401
18	209° 01' 03"	-2° 46' 15"	205° 57' 46"	-13° 42' 50"	0° 53' 59"	14' 42.59"	283° 54' 52"	0.96543
19	209° 30' 35"	-2° 48' 27"	206° 25' 19"	-13° 55' 26"	0° 53' 59"	14' 42.58"	283° 34' 03"	0.96683
20	210° 00' 07"	-2° 50' 38"	206° 52' 55"	-14° 07' 58"	0° 53' 59"	14' 42.56"	283° 12' 31"	0.96819
21	210° 29' 39"	-2° 52' 49"	207° 20' 34"	-14° 20' 28"	0° 53' 59"	14' 42.55"	282° 50' 11"	0.96953
22	210° 59' 11"	-2° 54' 59"	207° 48' 17"	-14° 32' 54"	0° 53' 59"	14' 42.54"	282° 27' 03"	0.97084
23	211° 28' 43"	-2° 57' 09"	208° 16' 03"	-14° 45' 18"	0° 53' 59"	14' 42.53"	282° 3' 02"	0.97212
24	211° 58' 15"	-2° 59' 17"	208° 43' 51"	-14° 57' 38"	0° 53' 59"	14' 42.53"	281° 38' 06"	0.97337

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	50° 34' 07"	-0.58"	48° 07' 30"	17° 53' 26"	1.0098701	15'50.25"	23° 26' 19"	3 m 36 s
1	50° 36' 32"	-0.59"	48° 09' 57"	17° 54' 05"	1.0098795	15'50.24"	23° 26' 19"	3 m 36 s
2	50° 38' 57"	-0.59"	48° 12' 24"	17° 54' 43"	1.0098889	15'50.23"	23° 26' 19"	3 m 36 s
3	50° 41' 22"	-0.60"	48° 14' 51"	17° 55' 21"	1.0098984	15'50.22"	23° 26' 19"	3 m 36 s
4	50° 43' 46"	-0.60"	48° 17' 17"	17° 55' 60"	1.0099078	15'50.22"	23° 26' 19"	3 m 36 s
5	50° 46' 11"	-0.61"	48° 19' 44"	17° 56' 38"	1.0099172	15'50.21"	23° 26' 19"	3 m 37 s
6	50° 48' 36"	-0.61"	48° 22' 11"	17° 57' 16"	1.0099266	15'50.20"	23° 26' 19"	3 m 37 s
7	50° 51' 01"	-0.61"	48° 24' 38"	17° 57' 55"	1.0099360	15'50.19"	23° 26' 19"	3 m 37 s
8	50° 53' 26"	-0.62"	48° 27' 05"	17° 58' 33"	1.0099453	15'50.18"	23° 26' 19"	3 m 37 s
9	50° 55' 51"	-0.62"	48° 29' 32"	17° 59' 11"	1.0099547	15'50.17"	23° 26' 19"	3 m 37 s
10	50° 58' 16"	-0.63"	48° 31' 59"	17° 59' 49"	1.0099641	15'50.16"	23° 26' 19"	3 m 37 s
11	51° 00' 41"	-0.63"	48° 34' 26"	18° 00' 27"	1.0099735	15'50.15"	23° 26' 19"	3 m 37 s
12	51° 03' 05"	-0.64"	48° 36' 53"	18° 01' 05"	1.0099829	15'50.14"	23° 26' 19"	3 m 37 s
13	51° 05' 30"	-0.64"	48° 39' 20"	18° 01' 43"	1.0099923	15'50.14"	23° 26' 19"	3 m 37 s
14	51° 07' 55"	-0.64"	48° 41' 47"	18° 02' 22"	1.0100016	15'50.13"	23° 26' 19"	3 m 37 s
15	51° 10' 20"	-0.65"	48° 44' 14"	18° 02' 60"	1.0100110	15'50.12"	23° 26' 19"	3 m 37 s
16	51° 12' 45"	-0.65"	48° 46' 41"	18° 03' 38"	1.0100204	15'50.11"	23° 26' 19"	3 m 37 s
17	51° 15' 10"	-0.66"	48° 49' 08"	18° 04' 15"	1.0100297	15'50.10"	23° 26' 19"	3 m 37 s
18	51° 17' 34"	-0.66"	48° 51' 35"	18° 04' 53"	1.0100391	15'50.09"	23° 26' 19"	3 m 37 s
19	51° 19' 59"	-0.66"	48° 54' 02"	18° 05' 31"	1.0100485	15'50.08"	23° 26' 19"	3 m 37 s
20	51° 22' 24"	-0.67"	48° 56' 29"	18° 06' 09"	1.0100578	15'50.07"	23° 26' 19"	3 m 37 s
21	51° 24' 49"	-0.67"	48° 58' 56"	18° 06' 47"	1.0100672	15'50.07"	23° 26' 19"	3 m 37 s
22	51° 27' 14"	-0.67"	49° 01' 23"	18° 07' 25"	1.0100765	15'50.06"	23° 26' 19"	3 m 37 s
23	51° 29' 39"	-0.68"	49° 03' 50"	18° 08' 02"	1.0100859	15'50.05"	23° 26' 19"	3 m 37 s
24	51° 32' 03"	-0.68"	49° 06' 17"	18° 08' 40"	1.0100952	15'50.04"	23° 26' 19"	3 m 37 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	211° 58' 15"	-2° 59' 17"	208° 43' 51"	-14° 57' 38"	0° 53' 59"	14' 42.53"	281° 38' 06"	0.97337
1	212° 27' 48"	-3° 01' 25"	209° 11' 44"	-15° 09' 54"	0° 53' 59"	14' 42.53"	281° 12' 11"	0.97459
2	212° 57' 21"	-3° 03' 31"	209° 39' 39"	-15° 22' 07"	0° 53' 59"	14' 42.53"	280° 45' 13"	0.97578
3	213° 26' 54"	-3° 05' 37"	210° 07' 38"	-15° 34' 17"	0° 53' 59"	14' 42.54"	280° 17' 09"	0.97694
4	213° 56' 27"	-3° 07' 43"	210° 35' 40"	-15° 46' 23"	0° 53' 59"	14' 42.54"	279° 47' 54"	0.97807
5	214° 26' 00"	-3° 09' 47"	211° 03' 46"	-15° 58' 26"	0° 53' 59"	14' 42.55"	279° 17' 22"	0.97918
6	214° 55' 34"	-3° 11' 50"	211° 31' 55"	-16° 10' 25"	0° 53' 59"	14' 42.57"	278° 45' 29"	0.98025
7	215° 25' 08"	-3° 13' 53"	212° 00' 08"	-16° 22' 20"	0° 53' 59"	14' 42.58"	278° 12' 07"	0.98129
8	215° 54' 42"	-3° 15' 55"	212° 28' 25"	-16° 34' 11"	0° 53' 59"	14' 42.60"	277° 37' 11"	0.98230
9	216° 24' 17"	-3° 17' 56"	212° 56' 45"	-16° 45' 59"	0° 53' 59"	14' 42.62"	277° 0' 33"	0.98329
10	216° 53' 52"	-3° 19' 56"	213° 25' 08"	-16° 57' 43"	0° 53' 59"	14' 42.64"	276° 22' 03"	0.98424
11	217° 23' 27"	-3° 21' 55"	213° 53' 36"	-17° 09' 23"	0° 53' 59"	14' 42.67"	275° 41' 34"	0.98517
12	217° 53' 02"	-3° 23' 53"	214° 22' 07"	-17° 20' 59"	0° 53' 59"	14' 42.70"	274° 58' 55"	0.98606
13	218° 22' 38"	-3° 25' 50"	214° 50' 42"	-17° 32' 31"	0° 53' 59"	14' 42.73"	274° 13' 53"	0.98692
14	218° 52' 14"	-3° 27' 46"	215° 19' 21"	-17° 43' 59"	0° 53' 59"	14' 42.76"	273° 26' 16"	0.98775
15	219° 21' 50"	-3° 29' 42"	215° 48' 03"	-17° 55' 23"	0° 53' 60"	14' 42.80"	272° 35' 48"	0.98856
16	219° 51' 27"	-3° 31' 36"	216° 16' 50"	-18° 06' 43"	0° 53' 60"	14' 42.84"	271° 42' 13"	0.98933
17	220° 21' 04"	-3° 33' 30"	216° 45' 40"	-18° 17' 59"	0° 53' 60"	14' 42.88"	270° 45' 11"	0.99007
18	220° 50' 42"	-3° 35' 22"	217° 14' 35"	-18° 29' 10"	0° 54' 00"	14' 42.93"	269° 44' 21"	0.99078
19	221° 20' 19"	-3° 37' 14"	217° 43' 33"	-18° 40' 17"	0° 54' 00"	14' 42.97"	268° 39' 19"	0.99146
20	221° 49' 57"	-3° 39' 05"	218° 12' 36"	-18° 51' 20"	0° 54' 00"	14' 43.02"	267° 29' 34"	0.99212
21	222° 19' 36"	-3° 40' 54"	218° 41' 42"	-19° 02' 18"	0° 54' 01"	14' 43.07"	266° 14' 36"	0.99274
22	222° 49' 15"	-3° 42' 43"	219° 10' 53"	-19° 13' 11"	0° 54' 01"	14' 43.13"	264° 53' 47"	0.99332
23	223° 18' 54"	-3° 44' 30"	219° 40' 08"	-19° 24' 01"	0° 54' 01"	14' 43.19"	263° 26' 23"	0.99388
24	223° 48' 34"	-3° 46' 17"	220° 09' 27"	-19° 34' 45"	0° 54' 01"	14' 43.25"	261° 51' 36"	0.99441

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	51° 32' 03"	-0.68"	49° 06' 17"	18° 08' 40"	1.0100952	15'50.04"	23° 26' 19"	3 m 37 s
1	51° 34' 28"	-0.69"	49° 08' 45"	18° 09' 18"	1.0101045	15'50.03"	23° 26' 19"	3 m 38 s
2	51° 36' 53"	-0.69"	49° 11' 12"	18° 09' 56"	1.0101139	15'50.02"	23° 26' 19"	3 m 38 s
3	51° 39' 18"	-0.69"	49° 13' 39"	18° 10' 33"	1.0101232	15'50.01"	23° 26' 19"	3 m 38 s
4	51° 41' 43"	-0.70"	49° 16' 06"	18° 11' 11"	1.0101325	15'50.00"	23° 26' 19"	3 m 38 s
5	51° 44' 08"	-0.70"	49° 18' 33"	18° 11' 48"	1.0101419	15'50.00"	23° 26' 19"	3 m 38 s
6	51° 46' 32"	-0.70"	49° 21' 01"	18° 12' 26"	1.0101512	15'49.99"	23° 26' 19"	3 m 38 s
7	51° 48' 57"	-0.71"	49° 23' 28"	18° 13' 03"	1.0101605	15'49.98"	23° 26' 19"	3 m 38 s
8	51° 51' 22"	-0.71"	49° 25' 55"	18° 13' 41"	1.0101698	15'49.97"	23° 26' 19"	3 m 38 s
9	51° 53' 47"	-0.71"	49° 28' 22"	18° 14' 18"	1.0101792	15'49.96"	23° 26' 19"	3 m 38 s
10	51° 56' 12"	-0.72"	49° 30' 50"	18° 14' 56"	1.0101885	15'49.95"	23° 26' 19"	3 m 38 s
11	51° 58' 36"	-0.72"	49° 33' 17"	18° 15' 33"	1.0101978	15'49.94"	23° 26' 19"	3 m 38 s
12	52° 01' 01"	-0.72"	49° 35' 44"	18° 16' 10"	1.0102071	15'49.93"	23° 26' 18"	3 m 38 s
13	52° 03' 26"	-0.73"	49° 38' 12"	18° 16' 48"	1.0102164	15'49.93"	23° 26' 18"	3 m 38 s
14	52° 05' 51"	-0.73"	49° 40' 39"	18° 17' 25"	1.0102257	15'49.92"	23° 26' 18"	3 m 38 s
15	52° 08' 16"	-0.73"	49° 43' 06"	18° 18' 02"	1.0102350	15'49.91"	23° 26' 18"	3 m 38 s
16	52° 10' 40"	-0.74"	49° 45' 34"	18° 18' 39"	1.0102443	15'49.90"	23° 26' 18"	3 m 38 s
17	52° 13' 05"	-0.74"	49° 48' 01"	18° 19' 17"	1.0102536	15'49.89"	23° 26' 18"	3 m 38 s
18	52° 15' 30"	-0.74"	49° 50' 29"	18° 19' 54"	1.0102629	15'49.88"	23° 26' 18"	3 m 38 s
19	52° 17' 55"	-0.74"	49° 52' 56"	18° 20' 31"	1.0102721	15'49.87"	23° 26' 18"	3 m 38 s
20	52° 20' 19"	-0.75"	49° 55' 23"	18° 21' 08"	1.0102814	15'49.86"	23° 26' 18"	3 m 38 s
21	52° 22' 44"	-0.75"	49° 57' 51"	18° 21' 45"	1.0102907	15'49.86"	23° 26' 18"	3 m 38 s
22	52° 25' 09"	-0.75"	50° 00' 18"	18° 22' 22"	1.0103000	15'49.85"	23° 26' 18"	3 m 38 s
23	52° 27' 34"	-0.75"	50° 02' 46"	18° 22' 59"	1.0103092	15'49.84"	23° 26' 18"	3 m 38 s
24	52° 29' 59"	-0.76"	50° 05' 13"	18° 23' 36"	1.0103185	15'49.83"	23° 26' 18"	3 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	223° 48' 34"	-3° 46' 17"	220° 09' 27"	-19° 34' 45"	0° 54' 01"	14' 43.25"	261° 51' 36"	0.99441
1	224° 18' 14"	-3° 48' 03"	220° 38' 50"	-19° 45' 25"	0° 54' 01"	14' 43.31"	260° 8' 28"	0.99491
2	224° 47' 54"	-3° 49' 47"	221° 08' 17"	-19° 55' 60"	0° 54' 02"	14' 43.37"	258° 15' 54"	0.99537
3	225° 17' 35"	-3° 51' 31"	221° 37' 49"	-20° 06' 30"	0° 54' 02"	14' 43.44"	256° 12' 38"	0.99581
4	225° 47' 17"	-3° 53' 13"	222° 07' 25"	-20° 16' 56"	0° 54' 02"	14' 43.51"	253° 57' 15"	0.99621
5	226° 16' 58"	-3° 54' 55"	222° 37' 05"	-20° 27' 16"	0° 54' 02"	14' 43.58"	251° 28' 08"	0.99659
6	226° 46' 40"	-3° 56' 35"	223° 06' 50"	-20° 37' 32"	0° 54' 03"	14' 43.66"	248° 43' 27"	0.99693
7	227° 16' 23"	-3° 58' 15"	223° 36' 38"	-20° 47' 43"	0° 54' 03"	14' 43.73"	245° 41' 14"	0.99724
8	227° 46' 06"	-3° 59' 53"	224° 06' 32"	-20° 57' 48"	0° 54' 03"	14' 43.81"	242° 19' 21"	0.99752
9	228° 15' 50"	-4° 01' 30"	224° 36' 29"	-21° 07' 49"	0° 54' 04"	14' 43.89"	238° 35' 43"	0.99777
10	228° 45' 34"	-4° 03' 07"	225° 06' 31"	-21° 17' 44"	0° 54' 04"	14' 43.98"	234° 28' 21"	0.99799
11	229° 15' 18"	-4° 04' 42"	225° 36' 38"	-21° 27' 34"	0° 54' 04"	14' 44.06"	229° 55' 46"	0.99818
12	229° 45' 03"	-4° 06' 16"	226° 06' 48"	-21° 37' 19"	0° 54' 05"	14' 44.15"	224° 57' 16"	0.99833
13	230° 14' 49"	-4° 07' 48"	226° 37' 04"	-21° 46' 58"	0° 54' 05"	14' 44.25"	219° 33' 28"	0.99846
14	230° 44' 35"	-4° 09' 20"	227° 07' 23"	-21° 56' 32"	0° 54' 05"	14' 44.34"	213° 46' 45"	0.99855
15	231° 14' 22"	-4° 10' 51"	227° 37' 48"	-22° 06' 01"	0° 54' 06"	14' 44.44"	207° 41' 33"	0.99861
16	231° 44' 09"	-4° 12' 20"	228° 08' 16"	-22° 15' 23"	0° 54' 06"	14' 44.53"	201° 24' 18"	0.99865
17	232° 13' 56"	-4° 13' 49"	228° 38' 49"	-22° 24' 41"	0° 54' 06"	14' 44.64"	195° 2' 55"	0.99864
18	232° 43' 44"	-4° 15' 16"	229° 09' 27"	-22° 33' 52"	0° 54' 07"	14' 44.74"	188° 45' 52"	0.99861
19	233° 13' 33"	-4° 16' 42"	229° 40' 09"	-22° 42' 58"	0° 54' 07"	14' 44.84"	182° 41' 02"	0.99855
20	233° 43' 22"	-4° 18' 07"	230° 10' 56"	-22° 51' 59"	0° 54' 08"	14' 44.95"	176° 54' 44"	0.99846
21	234° 13' 12"	-4° 19' 31"	230° 41' 47"	-23° 00' 53"	0° 54' 08"	14' 45.06"	171° 31' 18"	0.99833
22	234° 43' 02"	-4° 20' 53"	231° 12' 43"	-23° 09' 42"	0° 54' 08"	14' 45.18"	166° 33' 02"	0.99817
23	235° 12' 53"	-4° 22' 15"	231° 43' 43"	-23° 18' 24"	0° 54' 09"	14' 45.29"	162° 0' 28"	0.99798
24	235° 42' 44"	-4° 23' 35"	232° 14' 48"	-23° 27' 01"	0° 54' 09"	14' 45.41"	157° 52' 51"	0.99776

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	52° 29' 59"	-0.76"	50° 05' 13"	18° 23' 36"	1.0103185	15'49.83"	23° 26' 18"	3 m 38 s
1	52° 32' 23"	-0.76"	50° 07' 41"	18° 24' 13"	1.0103278	15'49.82"	23° 26' 18"	3 m 38 s
2	52° 34' 48"	-0.76"	50° 10' 08"	18° 24' 50"	1.0103370	15'49.81"	23° 26' 18"	3 m 38 s
3	52° 37' 13"	-0.77"	50° 12' 36"	18° 25' 27"	1.0103463	15'49.80"	23° 26' 18"	3 m 38 s
4	52° 39' 38"	-0.77"	50° 15' 03"	18° 26' 03"	1.0103556	15'49.79"	23° 26' 18"	3 m 38 s
5	52° 42' 02"	-0.77"	50° 17' 31"	18° 26' 40"	1.0103648	15'49.79"	23° 26' 18"	3 m 38 s
6	52° 44' 27"	-0.77"	50° 19' 59"	18° 27' 17"	1.0103741	15'49.78"	23° 26' 18"	3 m 38 s
7	52° 46' 52"	-0.77"	50° 22' 26"	18° 27' 54"	1.0103833	15'49.77"	23° 26' 18"	3 m 38 s
8	52° 49' 17"	-0.78"	50° 24' 54"	18° 28' 30"	1.0103926	15'49.76"	23° 26' 18"	3 m 38 s
9	52° 51' 41"	-0.78"	50° 27' 21"	18° 29' 07"	1.0104018	15'49.75"	23° 26' 18"	3 m 38 s
10	52° 54' 06"	-0.78"	50° 29' 49"	18° 29' 44"	1.0104110	15'49.74"	23° 26' 18"	3 m 38 s
11	52° 56' 31"	-0.78"	50° 32' 17"	18° 30' 20"	1.0104203	15'49.73"	23° 26' 18"	3 m 38 s
12	52° 58' 55"	-0.79"	50° 34' 44"	18° 30' 57"	1.0104295	15'49.72"	23° 26' 18"	3 m 38 s
13	53° 01' 20"	-0.79"	50° 37' 12"	18° 31' 33"	1.0104387	15'49.72"	23° 26' 18"	3 m 38 s
14	53° 03' 45"	-0.79"	50° 39' 40"	18° 32' 10"	1.0104480	15'49.71"	23° 26' 18"	3 m 38 s
15	53° 06' 10"	-0.79"	50° 42' 08"	18° 32' 46"	1.0104572	15'49.70"	23° 26' 18"	3 m 38 s
16	53° 08' 34"	-0.79"	50° 44' 35"	18° 33' 23"	1.0104664	15'49.69"	23° 26' 18"	3 m 38 s
17	53° 10' 59"	-0.79"	50° 47' 03"	18° 33' 59"	1.0104756	15'49.68"	23° 26' 18"	3 m 38 s
18	53° 13' 24"	-0.80"	50° 49' 31"	18° 34' 36"	1.0104848	15'49.67"	23° 26' 18"	3 m 38 s
19	53° 15' 49"	-0.80"	50° 51' 59"	18° 35' 12"	1.0104940	15'49.66"	23° 26' 18"	3 m 38 s
20	53° 18' 13"	-0.80"	50° 54' 26"	18° 35' 48"	1.0105032	15'49.66"	23° 26' 18"	3 m 38 s
21	53° 20' 38"	-0.80"	50° 56' 54"	18° 36' 25"	1.0105124	15'49.65"	23° 26' 18"	3 m 38 s
22	53° 23' 03"	-0.80"	50° 59' 22"	18° 37' 01"	1.0105216	15'49.64"	23° 26' 18"	3 m 38 s
23	53° 25' 27"	-0.80"	51° 01' 50"	18° 37' 37"	1.0105308	15'49.63"	23° 26' 18"	3 m 38 s
24	53° 27' 52"	-0.81"	51° 04' 18"	18° 38' 13"	1.0105400	15'49.62"	23° 26' 18"	3 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	235° 42' 44"	-4° 23' 35"	232° 14' 48"	-23° 27' 01"	0° 54' 09"	14' 45.41"	157° 52' 51"	0.99776
1	236° 12' 36"	-4° 24' 54"	232° 45' 57"	-23° 35' 31"	0° 54' 10"	14' 45.53"	154° 8' 40"	0.99751
2	236° 42' 29"	-4° 26' 12"	233° 17' 11"	-23° 43' 56"	0° 54' 10"	14' 45.65"	150° 45' 56"	0.99723
3	237° 12' 22"	-4° 27' 28"	233° 48' 29"	-23° 52' 14"	0° 54' 11"	14' 45.78"	147° 42' 33"	0.99691
4	237° 42' 15"	-4° 28' 44"	234° 19' 52"	-24° 00' 26"	0° 54' 11"	14' 45.91"	144° 56' 23"	0.99657
5	238° 12' 10"	-4° 29' 58"	234° 51' 20"	-24° 08' 32"	0° 54' 11"	14' 46.03"	142° 25' 29"	0.99619
6	238° 42' 04"	-4° 31' 11"	235° 22' 51"	-24° 16' 31"	0° 54' 12"	14' 46.17"	140° 8' 02"	0.99578
7	239° 11' 60"	-4° 32' 23"	235° 54' 28"	-24° 24' 24"	0° 54' 12"	14' 46.30"	138° 2' 26"	0.99534
8	239° 41' 56"	-4° 33' 33"	236° 26' 09"	-24° 32' 10"	0° 54' 13"	14' 46.44"	136° 7' 14"	0.99486
9	240° 11' 53"	-4° 34' 43"	236° 57' 54"	-24° 39' 50"	0° 54' 13"	14' 46.58"	134° 21' 13"	0.99436
10	240° 41' 50"	-4° 35' 51"	237° 29' 44"	-24° 47' 24"	0° 54' 14"	14' 46.72"	132° 43' 18"	0.99383
11	241° 11' 48"	-4° 36' 57"	238° 01' 38"	-24° 54' 50"	0° 54' 15"	14' 46.86"	131° 12' 31"	0.99326
12	241° 41' 47"	-4° 38' 03"	238° 33' 36"	-25° 02' 11"	0° 54' 15"	14' 47.01"	129° 48' 05"	0.99266
13	242° 11' 46"	-4° 39' 07"	239° 05' 39"	-25° 09' 24"	0° 54' 16"	14' 47.16"	128° 29' 15"	0.99203
14	242° 41' 46"	-4° 40' 10"	239° 37' 46"	-25° 16' 30"	0° 54' 16"	14' 47.31"	127° 15' 25"	0.99137
15	243° 11' 47"	-4° 41' 12"	240° 09' 58"	-25° 23' 30"	0° 54' 17"	14' 47.46"	126° 6' 04"	0.99067
16	243° 41' 48"	-4° 42' 12"	240° 42' 14"	-25° 30' 23"	0° 54' 17"	14' 47.61"	125° 0' 42"	0.98995
17	244° 11' 50"	-4° 43' 11"	241° 14' 34"	-25° 37' 09"	0° 54' 18"	14' 47.77"	123° 58' 56"	0.98919
18	244° 41' 52"	-4° 44' 09"	241° 46' 59"	-25° 43' 47"	0° 54' 18"	14' 47.93"	123° 0' 23"	0.98840
19	245° 11' 55"	-4° 45' 06"	242° 19' 28"	-25° 50' 19"	0° 54' 19"	14' 48.09"	122° 4' 45"	0.98759
20	245° 41' 59"	-4° 46' 01"	242° 52' 01"	-25° 56' 43"	0° 54' 20"	14' 48.26"	121° 11' 44"	0.98673
21	246° 12' 04"	-4° 46' 55"	243° 24' 38"	-26° 03' 01"	0° 54' 20"	14' 48.43"	120° 21' 07"	0.98585
22	246° 42' 09"	-4° 47' 48"	243° 57' 19"	-26° 09' 11"	0° 54' 21"	14' 48.60"	119° 32' 40"	0.98494
23	247° 12' 15"	-4° 48' 39"	244° 30' 05"	-26° 15' 14"	0° 54' 22"	14' 48.77"	118° 46' 11"	0.98399
24	247° 42' 22"	-4° 49' 29"	245° 02' 54"	-26° 21' 09"	0° 54' 22"	14' 48.94"	118° 1' 31"	0.98302

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	53° 27' 52"	-0.81"	51° 04' 18"	18° 38' 13"	1.0105400	15'49.62"	23° 26' 18"	3 m 38 s
1	53° 30' 17"	-0.81"	51° 06' 46"	18° 38' 49"	1.0105492	15'49.61"	23° 26' 18"	3 m 38 s
2	53° 32' 41"	-0.81"	51° 09' 13"	18° 39' 26"	1.0105584	15'49.60"	23° 26' 18"	3 m 38 s
3	53° 35' 06"	-0.81"	51° 11' 41"	18° 40' 02"	1.0105676	15'49.60"	23° 26' 18"	3 m 38 s
4	53° 37' 31"	-0.81"	51° 14' 09"	18° 40' 38"	1.0105768	15'49.59"	23° 26' 18"	3 m 38 s
5	53° 39' 55"	-0.81"	51° 16' 37"	18° 41' 14"	1.0105859	15'49.58"	23° 26' 18"	3 m 38 s
6	53° 42' 20"	-0.81"	51° 19' 05"	18° 41' 50"	1.0105951	15'49.57"	23° 26' 18"	3 m 38 s
7	53° 44' 45"	-0.81"	51° 21' 33"	18° 42' 26"	1.0106043	15'49.56"	23° 26' 18"	3 m 38 s
8	53° 47' 10"	-0.82"	51° 24' 01"	18° 43' 02"	1.0106134	15'49.55"	23° 26' 18"	3 m 38 s
9	53° 49' 34"	-0.82"	51° 26' 29"	18° 43' 37"	1.0106226	15'49.54"	23° 26' 18"	3 m 38 s
10	53° 51' 59"	-0.82"	51° 28' 57"	18° 44' 13"	1.0106318	15'49.53"	23° 26' 18"	3 m 38 s
11	53° 54' 24"	-0.82"	51° 31' 25"	18° 44' 49"	1.0106409	15'49.53"	23° 26' 18"	3 m 38 s
12	53° 56' 48"	-0.82"	51° 33' 53"	18° 45' 25"	1.0106501	15'49.52"	23° 26' 18"	3 m 38 s
13	53° 59' 13"	-0.82"	51° 36' 21"	18° 46' 01"	1.0106592	15'49.51"	23° 26' 18"	3 m 38 s
14	54° 01' 38"	-0.82"	51° 38' 49"	18° 46' 36"	1.0106684	15'49.50"	23° 26' 18"	3 m 38 s
15	54° 04' 02"	-0.82"	51° 41' 17"	18° 47' 12"	1.0106775	15'49.49"	23° 26' 18"	3 m 38 s
16	54° 06' 27"	-0.82"	51° 43' 45"	18° 47' 48"	1.0106867	15'49.48"	23° 26' 18"	3 m 38 s
17	54° 08' 52"	-0.82"	51° 46' 14"	18° 48' 23"	1.0106958	15'49.47"	23° 26' 18"	3 m 38 s
18	54° 11' 16"	-0.82"	51° 48' 42"	18° 48' 59"	1.0107049	15'49.47"	23° 26' 18"	3 m 38 s
19	54° 13' 41"	-0.82"	51° 51' 10"	18° 49' 34"	1.0107141	15'49.46"	23° 26' 18"	3 m 38 s
20	54° 16' 06"	-0.82"	51° 53' 38"	18° 50' 10"	1.0107232	15'49.45"	23° 26' 18"	3 m 38 s
21	54° 18' 30"	-0.82"	51° 56' 06"	18° 50' 45"	1.0107323	15'49.44"	23° 26' 18"	3 m 38 s
22	54° 20' 55"	-0.82"	51° 58' 34"	18° 51' 21"	1.0107414	15'49.43"	23° 26' 18"	3 m 38 s
23	54° 23' 19"	-0.82"	52° 01' 03"	18° 51' 56"	1.0107506	15'49.42"	23° 26' 18"	3 m 38 s
24	54° 25' 44"	-0.82"	52° 03' 31"	18° 52' 32"	1.0107597	15'49.41"	23° 26' 18"	3 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	247° 42' 22"	-4° 49' 29"	245° 02' 54"	-26° 21' 09"	0° 54' 22"	14' 48.94"	118° 1' 31"	0.98302
1	248° 12' 30"	-4° 50' 17"	245° 35' 48"	-26° 26' 57"	0° 54' 23"	14' 49.12"	117° 18' 29"	0.98201
2	248° 42' 38"	-4° 51' 05"	246° 08' 45"	-26° 32' 38"	0° 54' 23"	14' 49.30"	116° 36' 58"	0.98097
3	249° 12' 47"	-4° 51' 51"	246° 41' 47"	-26° 38' 11"	0° 54' 24"	14' 49.48"	115° 56' 49"	0.97990
4	249° 42' 56"	-4° 52' 35"	247° 14' 52"	-26° 43' 37"	0° 54' 25"	14' 49.66"	115° 17' 58"	0.97880
5	250° 13' 07"	-4° 53' 18"	247° 48' 02"	-26° 48' 55"	0° 54' 25"	14' 49.85"	114° 40' 17"	0.97766
6	250° 43' 18"	-4° 54' 00"	248° 21' 15"	-26° 54' 05"	0° 54' 26"	14' 50.03"	114° 3' 40"	0.97650
7	251° 13' 29"	-4° 54' 41"	248° 54' 32"	-26° 59' 08"	0° 54' 27"	14' 50.22"	113° 28' 04"	0.97530
8	251° 43' 42"	-4° 55' 20"	249° 27' 52"	-27° 04' 03"	0° 54' 28"	14' 50.42"	112° 53' 24"	0.97408
9	252° 13' 55"	-4° 55' 58"	250° 01' 16"	-27° 08' 50"	0° 54' 28"	14' 50.61"	112° 19' 35"	0.97282
10	252° 44' 09"	-4° 56' 34"	250° 34' 44"	-27° 13' 29"	0° 54' 29"	14' 50.81"	111° 46' 34"	0.97153
11	253° 14' 24"	-4° 57' 09"	251° 08' 16"	-27° 18' 01"	0° 54' 30"	14' 51.01"	111° 14' 18"	0.97021
12	253° 44' 40"	-4° 57' 43"	251° 41' 51"	-27° 22' 24"	0° 54' 30"	14' 51.21"	110° 42' 43"	0.96886
13	254° 14' 56"	-4° 58' 15"	252° 15' 29"	-27° 26' 40"	0° 54' 31"	14' 51.42"	110° 11' 47"	0.96748
14	254° 45' 14"	-4° 58' 46"	252° 49' 11"	-27° 30' 47"	0° 54' 32"	14' 51.62"	109° 41' 27"	0.96606
15	255° 15' 32"	-4° 59' 16"	253° 22' 56"	-27° 34' 47"	0° 54' 33"	14' 51.83"	109° 11' 41"	0.96462
16	255° 45' 51"	-4° 59' 44"	253° 56' 44"	-27° 38' 38"	0° 54' 34"	14' 52.04"	108° 42' 26"	0.96315
17	256° 16' 10"	-5° 00' 10"	254° 30' 35"	-27° 42' 22"	0° 54' 34"	14' 52.26"	108° 13' 42"	0.96164
18	256° 46' 31"	-5° 00' 36"	255° 04' 30"	-27° 45' 57"	0° 54' 35"	14' 52.47"	107° 45' 25"	0.96010
19	257° 16' 52"	-5° 00' 60"	255° 38' 28"	-27° 49' 24"	0° 54' 36"	14' 52.69"	107° 17' 35"	0.95854
20	257° 47' 14"	-5° 01' 22"	256° 12' 29"	-27° 52' 42"	0° 54' 37"	14' 52.91"	106° 50' 09"	0.95694
21	258° 17' 37"	-5° 01' 43"	256° 46' 32"	-27° 55' 53"	0° 54' 38"	14' 53.14"	106° 23' 06"	0.95531
22	258° 48' 01"	-5° 02' 03"	257° 20' 39"	-27° 58' 55"	0° 54' 38"	14' 53.36"	105° 56' 26"	0.95365
23	259° 18' 25"	-5° 02' 21"	257° 54' 48"	-28° 01' 48"	0° 54' 39"	14' 53.59"	105° 30' 06"	0.95196
24	259° 48' 51"	-5° 02' 38"	258° 29' 00"	-28° 04' 33"	0° 54' 40"	14' 53.82"	105° 4' 06"	0.95024

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	54° 25' 44"	-0.82"	52° 03' 31"	18° 52' 32"	1.0107597	15'49.41"	23° 26' 18"	3 m 38 s
1	54° 28' 09"	-0.82"	52° 05' 59"	18° 53' 07"	1.0107688	15'49.41"	23° 26' 18"	3 m 38 s
2	54° 30' 33"	-0.82"	52° 08' 27"	18° 53' 42"	1.0107779	15'49.40"	23° 26' 18"	3 m 38 s
3	54° 32' 58"	-0.82"	52° 10' 56"	18° 54' 18"	1.0107870	15'49.39"	23° 26' 18"	3 m 38 s
4	54° 35' 23"	-0.82"	52° 13' 24"	18° 54' 53"	1.0107961	15'49.38"	23° 26' 18"	3 m 38 s
5	54° 37' 47"	-0.82"	52° 15' 52"	18° 55' 28"	1.0108052	15'49.37"	23° 26' 18"	3 m 38 s
6	54° 40' 12"	-0.82"	52° 18' 20"	18° 56' 03"	1.0108143	15'49.36"	23° 26' 18"	3 m 38 s
7	54° 42' 37"	-0.82"	52° 20' 49"	18° 56' 39"	1.0108234	15'49.35"	23° 26' 18"	3 m 38 s
8	54° 45' 01"	-0.82"	52° 23' 17"	18° 57' 14"	1.0108324	15'49.35"	23° 26' 18"	3 m 38 s
9	54° 47' 26"	-0.82"	52° 25' 45"	18° 57' 49"	1.0108415	15'49.34"	23° 26' 18"	3 m 38 s
10	54° 49' 50"	-0.82"	52° 28' 14"	18° 58' 24"	1.0108506	15'49.33"	23° 26' 18"	3 m 38 s
11	54° 52' 15"	-0.82"	52° 30' 42"	18° 58' 59"	1.0108597	15'49.32"	23° 26' 18"	3 m 38 s
12	54° 54' 40"	-0.82"	52° 33' 11"	18° 59' 34"	1.0108687	15'49.31"	23° 26' 18"	3 m 38 s
13	54° 57' 04"	-0.82"	52° 35' 39"	19° 00' 09"	1.0108778	15'49.30"	23° 26' 18"	3 m 38 s
14	54° 59' 29"	-0.82"	52° 38' 07"	19° 00' 44"	1.0108869	15'49.30"	23° 26' 18"	3 m 38 s
15	55° 01' 53"	-0.82"	52° 40' 36"	19° 01' 19"	1.0108959	15'49.29"	23° 26' 18"	3 m 37 s
16	55° 04' 18"	-0.82"	52° 43' 04"	19° 01' 53"	1.0109050	15'49.28"	23° 26' 18"	3 m 37 s
17	55° 06' 43"	-0.82"	52° 45' 33"	19° 02' 28"	1.0109140	15'49.27"	23° 26' 18"	3 m 37 s
18	55° 09' 07"	-0.82"	52° 48' 01"	19° 03' 03"	1.0109231	15'49.26"	23° 26' 18"	3 m 37 s
19	55° 11' 32"	-0.82"	52° 50' 30"	19° 03' 38"	1.0109321	15'49.25"	23° 26' 18"	3 m 37 s
20	55° 13' 56"	-0.82"	52° 52' 58"	19° 04' 13"	1.0109412	15'49.24"	23° 26' 18"	3 m 37 s
21	55° 16' 21"	-0.82"	52° 55' 27"	19° 04' 47"	1.0109502	15'49.24"	23° 26' 18"	3 m 37 s
22	55° 18' 46"	-0.81"	52° 57' 55"	19° 05' 22"	1.0109593	15'49.23"	23° 26' 18"	3 m 37 s
23	55° 21' 10"	-0.81"	53° 00' 24"	19° 05' 57"	1.0109683	15'49.22"	23° 26' 18"	3 m 37 s
24	55° 23' 35"	-0.81"	53° 02' 52"	19° 06' 31"	1.0109773	15'49.21"	23° 26' 18"	3 m 37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	259° 48' 51"	-5° 02' 38"	258° 29' 00"	-28° 04' 33"	0° 54' 40"	14' 53.82"	105° 4' 06"	0.95024
1	260° 19' 17"	-5° 02' 53"	259° 03' 15"	-28° 07' 10"	0° 54' 41"	14' 54.06"	104° 38' 24"	0.94849
2	260° 49' 44"	-5° 03' 07"	259° 37' 32"	-28° 09' 39"	0° 54' 42"	14' 54.29"	104° 13' 00"	0.94671
3	261° 20' 12"	-5° 03' 19"	260° 11' 52"	-28° 11' 58"	0° 54' 43"	14' 54.53"	103° 47' 53"	0.94490
4	261° 50' 41"	-5° 03' 31"	260° 46' 14"	-28° 14' 10"	0° 54' 44"	14' 54.77"	103° 23' 02"	0.94306
5	262° 21' 11"	-5° 03' 40"	261° 20' 38"	-28° 16' 12"	0° 54' 44"	14' 55.01"	102° 58' 26"	0.94119
6	262° 51' 41"	-5° 03' 48"	261° 55' 05"	-28° 18' 06"	0° 54' 45"	14' 55.26"	102° 34' 04"	0.93929
7	263° 22' 13"	-5° 03' 55"	262° 29' 34"	-28° 19' 52"	0° 54' 46"	14' 55.51"	102° 9' 57"	0.93735
8	263° 52' 45"	-5° 04' 00"	263° 04' 05"	-28° 21' 29"	0° 54' 47"	14' 55.76"	101° 46' 02"	0.93539
9	264° 23' 19"	-5° 04' 04"	263° 38' 38"	-28° 22' 57"	0° 54' 48"	14' 56.01"	101° 22' 20"	0.93340
10	264° 53' 53"	-5° 04' 06"	264° 13' 13"	-28° 24' 17"	0° 54' 49"	14' 56.26"	100° 58' 50"	0.93138
11	265° 24' 28"	-5° 04' 07"	264° 47' 50"	-28° 25' 27"	0° 54' 50"	14' 56.52"	100° 35' 32"	0.92933
12	265° 55' 04"	-5° 04' 07"	265° 22' 28"	-28° 26' 29"	0° 54' 51"	14' 56.78"	100° 12' 25"	0.92725
13	266° 25' 41"	-5° 04' 05"	265° 57' 09"	-28° 27' 23"	0° 54' 52"	14' 57.04"	99° 49' 29"	0.92514
14	266° 56' 19"	-5° 04' 01"	266° 31' 51"	-28° 28' 07"	0° 54' 53"	14' 57.31"	99° 26' 43"	0.92300
15	267° 26' 58"	-5° 03' 56"	267° 06' 34"	-28° 28' 43"	0° 54' 54"	14' 57.58"	99° 4' 08"	0.92083
16	267° 57' 38"	-5° 03' 50"	267° 41' 19"	-28° 29' 09"	0° 54' 55"	14' 57.85"	98° 41' 42"	0.91864
17	268° 28' 19"	-5° 03' 42"	268° 16' 05"	-28° 29' 27"	0° 54' 56"	14' 58.12"	98° 19' 25"	0.91641
18	268° 59' 01"	-5° 03' 33"	268° 50' 53"	-28° 29' 37"	0° 54' 57"	14' 58.39"	97° 57' 17"	0.91415
19	269° 29' 44"	-5° 03' 22"	269° 25' 41"	-28° 29' 37"	0° 54' 58"	14' 58.67"	97° 35' 19"	0.91187
20	270° 00' 27"	-5° 03' 10"	270° 00' 31"	-28° 29' 28"	0° 54' 59"	14' 58.95"	97° 13' 29"	0.90955
21	270° 31' 12"	-5° 02' 56"	270° 35' 22"	-28° 29' 11"	0° 54' 60"	14' 59.23"	96° 51' 47"	0.90721
22	271° 01' 58"	-5° 02' 41"	271° 10' 13"	-28° 28' 44"	0° 55' 01"	14' 59.52"	96° 30' 13"	0.90484
23	271° 32' 45"	-5° 02' 24"	271° 45' 06"	-28° 28' 09"	0° 55' 02"	14' 59.81"	96° 8' 48"	0.90244
24	272° 03' 32"	-5° 02' 06"	272° 19' 59"	-28° 27' 24"	0° 55' 03"	15' 00.10"	95° 47' 30"	0.90001

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	55° 23' 35"	-0.81"	53° 02' 52"	19° 06' 31"	1.0109773	15'49.21"	23° 26' 18"	3 m 37 s
1	55° 25' 59"	-0.81"	53° 05' 21"	19° 07' 06"	1.0109863	15'49.20"	23° 26' 18"	3 m 37 s
2	55° 28' 24"	-0.81"	53° 07' 50"	19° 07' 40"	1.0109954	15'49.19"	23° 26' 18"	3 m 37 s
3	55° 30' 49"	-0.81"	53° 10' 18"	19° 08' 15"	1.0110044	15'49.18"	23° 26' 18"	3 m 37 s
4	55° 33' 13"	-0.81"	53° 12' 47"	19° 08' 49"	1.0110134	15'49.18"	23° 26' 18"	3 m 37 s
5	55° 35' 38"	-0.81"	53° 15' 16"	19° 09' 24"	1.0110224	15'49.17"	23° 26' 18"	3 m 37 s
6	55° 38' 02"	-0.80"	53° 17' 44"	19° 09' 58"	1.0110314	15'49.16"	23° 26' 18"	3 m 37 s
7	55° 40' 27"	-0.80"	53° 20' 13"	19° 10' 32"	1.0110404	15'49.15"	23° 26' 18"	3 m 37 s
8	55° 42' 51"	-0.80"	53° 22' 42"	19° 11' 07"	1.0110494	15'49.14"	23° 26' 18"	3 m 37 s
9	55° 45' 16"	-0.80"	53° 25' 10"	19° 11' 41"	1.0110584	15'49.13"	23° 26' 18"	3 m 37 s
10	55° 47' 41"	-0.80"	53° 27' 39"	19° 12' 15"	1.0110674	15'49.13"	23° 26' 18"	3 m 37 s
11	55° 50' 05"	-0.80"	53° 30' 08"	19° 12' 49"	1.0110764	15'49.12"	23° 26' 18"	3 m 36 s
12	55° 52' 30"	-0.79"	53° 32' 37"	19° 13' 24"	1.0110854	15'49.11"	23° 26' 18"	3 m 36 s
13	55° 54' 54"	-0.79"	53° 35' 05"	19° 13' 58"	1.0110943	15'49.10"	23° 26' 18"	3 m 36 s
14	55° 57' 19"	-0.79"	53° 37' 34"	19° 14' 32"	1.0111033	15'49.09"	23° 26' 18"	3 m 36 s
15	55° 59' 43"	-0.79"	53° 40' 03"	19° 15' 06"	1.0111123	15'49.08"	23° 26' 18"	3 m 36 s
16	56° 02' 08"	-0.79"	53° 42' 32"	19° 15' 40"	1.0111212	15'49.08"	23° 26' 18"	3 m 36 s
17	56° 04' 32"	-0.79"	53° 45' 01"	19° 16' 14"	1.0111302	15'49.07"	23° 26' 18"	3 m 36 s
18	56° 06' 57"	-0.78"	53° 47' 29"	19° 16' 48"	1.0111392	15'49.06"	23° 26' 18"	3 m 36 s
19	56° 09' 21"	-0.78"	53° 49' 58"	19° 17' 22"	1.0111481	15'49.05"	23° 26' 18"	3 m 36 s
20	56° 11' 46"	-0.78"	53° 52' 27"	19° 17' 56"	1.0111571	15'49.04"	23° 26' 18"	3 m 36 s
21	56° 14' 11"	-0.78"	53° 54' 56"	19° 18' 30"	1.0111660	15'49.03"	23° 26' 18"	3 m 36 s
22	56° 16' 35"	-0.77"	53° 57' 25"	19° 19' 04"	1.0111750	15'49.02"	23° 26' 18"	3 m 36 s
23	56° 18' 60"	-0.77"	53° 59' 54"	19° 19' 37"	1.0111839	15'49.02"	23° 26' 18"	3 m 36 s
24	56° 21' 24"	-0.77"	54° 02' 23"	19° 20' 11"	1.0111928	15'49.01"	23° 26' 18"	3 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	272° 03' 32"	-5° 02' 06"	272° 19' 59"	-28° 27' 24"	0° 55' 03"	15' 00.10"	95° 47' 30"	0.90001
1	272° 34' 21"	-5° 01' 46"	272° 54' 53"	-28° 26' 31"	0° 55' 04"	15' 00.39"	95° 26' 20"	0.89755
2	273° 05' 11"	-5° 01' 25"	273° 29' 47"	-28° 25' 29"	0° 55' 05"	15' 00.68"	95° 5' 18"	0.89507
3	273° 36' 02"	-5° 01' 03"	274° 04' 42"	-28° 24' 17"	0° 55' 06"	15' 00.98"	94° 44' 23"	0.89255
4	274° 06' 54"	-5° 00' 38"	274° 39' 38"	-28° 22' 57"	0° 55' 07"	15' 01.28"	94° 23' 35"	0.89001
5	274° 37' 47"	-5° 00' 13"	275° 14' 33"	-28° 21' 28"	0° 55' 09"	15' 01.58"	94° 2' 54"	0.88744
6	275° 08' 41"	-4° 59' 46"	275° 49' 29"	-28° 19' 50"	0° 55' 10"	15' 01.89"	93° 42' 20"	0.88484
7	275° 39' 36"	-4° 59' 17"	276° 24' 25"	-28° 18' 03"	0° 55' 11"	15' 02.20"	93° 21' 54"	0.88221
8	276° 10' 32"	-4° 58' 47"	276° 59' 21"	-28° 16' 07"	0° 55' 12"	15' 02.51"	93° 1' 34"	0.87956
9	276° 41' 29"	-4° 58' 16"	277° 34' 17"	-28° 14' 02"	0° 55' 13"	15' 02.82"	92° 41' 21"	0.87688
10	277° 12' 27"	-4° 57' 43"	278° 09' 13"	-28° 11' 48"	0° 55' 14"	15' 03.14"	92° 21' 15"	0.87417
11	277° 43' 27"	-4° 57' 08"	278° 44' 08"	-28° 09' 25"	0° 55' 15"	15' 03.46"	92° 1' 16"	0.87143
12	278° 14' 27"	-4° 56' 32"	279° 19' 03"	-28° 06' 53"	0° 55' 17"	15' 03.78"	91° 41' 23"	0.86867
13	278° 45' 29"	-4° 55' 55"	279° 53' 58"	-28° 04' 12"	0° 55' 18"	15' 04.10"	91° 21' 37"	0.86588
14	279° 16' 32"	-4° 55' 16"	280° 28' 53"	-28° 01' 22"	0° 55' 19"	15' 04.43"	91° 1' 57"	0.86306
15	279° 47' 36"	-4° 54' 36"	281° 03' 47"	-27° 58' 23"	0° 55' 20"	15' 04.75"	90° 42' 24"	0.86021
16	280° 18' 41"	-4° 53' 54"	281° 38' 40"	-27° 55' 15"	0° 55' 21"	15' 05.09"	90° 22' 58"	0.85734
17	280° 49' 47"	-4° 53' 10"	282° 13' 33"	-27° 51' 58"	0° 55' 23"	15' 05.42"	90° 3' 38"	0.85444
18	281° 20' 54"	-4° 52' 26"	282° 48' 24"	-27° 48' 33"	0° 55' 24"	15' 05.76"	89° 44' 25"	0.85152
19	281° 52' 03"	-4° 51' 39"	283° 23' 15"	-27° 44' 58"	0° 55' 25"	15' 06.10"	89° 25' 18"	0.84857
20	282° 23' 13"	-4° 50' 52"	283° 58' 05"	-27° 41' 15"	0° 55' 26"	15' 06.44"	89° 6' 17"	0.84559
21	282° 54' 23"	-4° 50' 02"	284° 32' 54"	-27° 37' 23"	0° 55' 28"	15' 06.78"	88° 47' 23"	0.84259
22	283° 25' 36"	-4° 49' 12"	285° 07' 42"	-27° 33' 21"	0° 55' 29"	15' 07.13"	88° 28' 36"	0.83956
23	283° 56' 49"	-4° 48' 19"	285° 42' 29"	-27° 29' 11"	0° 55' 30"	15' 07.48"	88° 9' 55"	0.83650
24	284° 28' 03"	-4° 47' 26"	286° 17' 15"	-27° 24' 52"	0° 55' 31"	15' 07.83"	87° 51' 21"	0.83342

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	56° 21' 24"	-0.77"	54° 02' 23"	19° 20' 11"	1.0111928	15'49.01"	23° 26' 18"	3 m 36 s
1	56° 23' 49"	-0.77"	54° 04' 52"	19° 20' 45"	1.0112018	15'49.00"	23° 26' 18"	3 m 35 s
2	56° 26' 13"	-0.77"	54° 07' 21"	19° 21' 19"	1.0112107	15'48.99"	23° 26' 18"	3 m 35 s
3	56° 28' 38"	-0.76"	54° 09' 50"	19° 21' 52"	1.0112196	15'48.98"	23° 26' 18"	3 m 35 s
4	56° 31' 02"	-0.76"	54° 12' 19"	19° 22' 26"	1.0112285	15'48.97"	23° 26' 18"	3 m 35 s
5	56° 33' 27"	-0.76"	54° 14' 48"	19° 22' 60"	1.0112374	15'48.97"	23° 26' 18"	3 m 35 s
6	56° 35' 51"	-0.75"	54° 17' 17"	19° 23' 33"	1.0112463	15'48.96"	23° 26' 18"	3 m 35 s
7	56° 38' 16"	-0.75"	54° 19' 46"	19° 24' 07"	1.0112552	15'48.95"	23° 26' 18"	3 m 35 s
8	56° 40' 40"	-0.75"	54° 22' 15"	19° 24' 40"	1.0112642	15'48.94"	23° 26' 18"	3 m 35 s
9	56° 43' 05"	-0.75"	54° 24' 44"	19° 25' 14"	1.0112730	15'48.93"	23° 26' 18"	3 m 35 s
10	56° 45' 29"	-0.74"	54° 27' 13"	19° 25' 47"	1.0112819	15'48.92"	23° 26' 18"	3 m 35 s
11	56° 47' 54"	-0.74"	54° 29' 42"	19° 26' 21"	1.0112908	15'48.92"	23° 26' 18"	3 m 35 s
12	56° 50' 18"	-0.74"	54° 32' 11"	19° 26' 54"	1.0112997	15'48.91"	23° 26' 18"	3 m 35 s
13	56° 52' 43"	-0.74"	54° 34' 40"	19° 27' 27"	1.0113086	15'48.90"	23° 26' 18"	3 m 34 s
14	56° 55' 07"	-0.73"	54° 37' 09"	19° 28' 01"	1.0113175	15'48.89"	23° 26' 18"	3 m 34 s
15	56° 57' 32"	-0.73"	54° 39' 38"	19° 28' 34"	1.0113263	15'48.88"	23° 26' 18"	3 m 34 s
16	56° 59' 56"	-0.73"	54° 42' 08"	19° 29' 07"	1.0113352	15'48.87"	23° 26' 18"	3 m 34 s
17	57° 02' 21"	-0.72"	54° 44' 37"	19° 29' 40"	1.0113441	15'48.87"	23° 26' 18"	3 m 34 s
18	57° 04' 45"	-0.72"	54° 47' 06"	19° 30' 13"	1.0113529	15'48.86"	23° 26' 18"	3 m 34 s
19	57° 07' 10"	-0.72"	54° 49' 35"	19° 30' 47"	1.0113618	15'48.85"	23° 26' 18"	3 m 34 s
20	57° 09' 34"	-0.71"	54° 52' 04"	19° 31' 20"	1.0113706	15'48.84"	23° 26' 18"	3 m 34 s
21	57° 11' 59"	-0.71"	54° 54' 34"	19° 31' 53"	1.0113795	15'48.83"	23° 26' 18"	3 m 34 s
22	57° 14' 23"	-0.71"	54° 57' 03"	19° 32' 26"	1.0113883	15'48.82"	23° 26' 18"	3 m 34 s
23	57° 16' 48"	-0.70"	54° 59' 32"	19° 32' 59"	1.0113971	15'48.82"	23° 26' 18"	3 m 34 s
24	57° 19' 12"	-0.70"	55° 02' 02"	19° 33' 32"	1.0114060	15'48.81"	23° 26' 18"	3 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	284° 28' 03"	-4° 47' 26"	286° 17' 15"	-27° 24' 52"	0° 55' 31"	15' 07.83"	87° 51' 21"	0.83342
1	284° 59' 19"	-4° 46' 30"	286° 51' 59"	-27° 20' 25"	0° 55' 33"	15' 08.19"	87° 32' 53"	0.83031
2	285° 30' 36"	-4° 45' 34"	287° 26' 42"	-27° 15' 48"	0° 55' 34"	15' 08.54"	87° 14' 32"	0.82718
3	286° 01' 54"	-4° 44' 36"	288° 01' 23"	-27° 11' 03"	0° 55' 35"	15' 08.90"	86° 56' 18"	0.82402
4	286° 33' 14"	-4° 43' 36"	288° 36' 03"	-27° 06' 09"	0° 55' 37"	15' 09.27"	86° 38' 10"	0.82084
5	287° 04' 34"	-4° 42' 35"	289° 10' 41"	-27° 01' 06"	0° 55' 38"	15' 09.63"	86° 20' 08"	0.81763
6	287° 35' 56"	-4° 41' 33"	289° 45' 18"	-26° 55' 55"	0° 55' 39"	15' 10.00"	86° 2' 13"	0.81440
7	288° 07' 20"	-4° 40' 29"	290° 19' 53"	-26° 50' 35"	0° 55' 41"	15' 10.37"	85° 44' 25"	0.81114
8	288° 38' 44"	-4° 39' 23"	290° 54' 26"	-26° 45' 06"	0° 55' 42"	15' 10.74"	85° 26' 44"	0.80786
9	289° 10' 10"	-4° 38' 16"	291° 28' 57"	-26° 39' 29"	0° 55' 44"	15' 11.12"	85° 9' 10"	0.80455
10	289° 41' 37"	-4° 37' 08"	292° 03' 26"	-26° 33' 43"	0° 55' 45"	15' 11.50"	84° 51' 42"	0.80122
11	290° 13' 06"	-4° 35' 58"	292° 37' 54"	-26° 27' 48"	0° 55' 46"	15' 11.88"	84° 34' 21"	0.79787
12	290° 44' 36"	-4° 34' 47"	293° 12' 19"	-26° 21' 45"	0° 55' 48"	15' 12.26"	84° 17' 07"	0.79449
13	291° 16' 07"	-4° 33' 34"	293° 46' 43"	-26° 15' 34"	0° 55' 49"	15' 12.65"	83° 59' 60"	0.79109
14	291° 47' 40"	-4° 32' 20"	294° 21' 04"	-26° 09' 13"	0° 55' 51"	15' 13.04"	83° 42' 59"	0.78766
15	292° 19' 13"	-4° 31' 05"	294° 55' 23"	-26° 02' 45"	0° 55' 52"	15' 13.43"	83° 26' 06"	0.78421
16	292° 50' 49"	-4° 29' 48"	295° 29' 40"	-25° 56' 08"	0° 55' 54"	15' 13.83"	83° 9' 20"	0.78074
17	293° 22' 25"	-4° 28' 29"	296° 03' 55"	-25° 49' 22"	0° 55' 55"	15' 14.22"	82° 52' 40"	0.77724
18	293° 54' 04"	-4° 27' 09"	296° 38' 07"	-25° 42' 29"	0° 55' 56"	15' 14.62"	82° 36' 08"	0.77372
19	294° 25' 43"	-4° 25' 48"	297° 12' 17"	-25° 35' 27"	0° 55' 58"	15' 15.03"	82° 19' 43"	0.77018
20	294° 57' 24"	-4° 24' 25"	297° 46' 25"	-25° 28' 16"	0° 55' 59"	15' 15.43"	82° 3' 25"	0.76661
21	295° 29' 06"	-4° 23' 01"	298° 20' 30"	-25° 20' 58"	0° 56' 01"	15' 15.84"	81° 47' 14"	0.76303
22	296° 00' 50"	-4° 21' 35"	298° 54' 32"	-25° 13' 31"	0° 56' 02"	15' 16.25"	81° 31' 11"	0.75942
23	296° 32' 35"	-4° 20' 08"	299° 28' 32"	-25° 05' 56"	0° 56' 04"	15' 16.66"	81° 15' 15"	0.75579
24	297° 04' 22"	-4° 18' 40"	300° 02' 30"	-24° 58' 13"	0° 56' 05"	15' 17.08"	80° 59' 26"	0.75213

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	57° 19' 12"	-0.70"	55° 02' 02"	19° 33' 32"	1.0114060	15'48.81"	23° 26' 18"	3 m 33 s
1	57° 21' 37"	-0.70"	55° 04' 31"	19° 34' 05"	1.0114148	15'48.80"	23° 26' 18"	3 m 33 s
2	57° 24' 01"	-0.69"	55° 07' 00"	19° 34' 37"	1.0114236	15'48.79"	23° 26' 18"	3 m 33 s
3	57° 26' 26"	-0.69"	55° 09' 29"	19° 35' 10"	1.0114324	15'48.78"	23° 26' 18"	3 m 33 s
4	57° 28' 50"	-0.69"	55° 11' 59"	19° 35' 43"	1.0114413	15'48.77"	23° 26' 18"	3 m 33 s
5	57° 31' 15"	-0.68"	55° 14' 28"	19° 36' 16"	1.0114501	15'48.77"	23° 26' 18"	3 m 33 s
6	57° 33' 39"	-0.68"	55° 16' 58"	19° 36' 49"	1.0114589	15'48.76"	23° 26' 18"	3 m 33 s
7	57° 36' 04"	-0.68"	55° 19' 27"	19° 37' 21"	1.0114677	15'48.75"	23° 26' 18"	3 m 33 s
8	57° 38' 28"	-0.67"	55° 21' 56"	19° 37' 54"	1.0114765	15'48.74"	23° 26' 18"	3 m 33 s
9	57° 40' 53"	-0.67"	55° 24' 26"	19° 38' 27"	1.0114852	15'48.73"	23° 26' 18"	3 m 33 s
10	57° 43' 17"	-0.66"	55° 26' 55"	19° 38' 59"	1.0114940	15'48.73"	23° 26' 18"	3 m 32 s
11	57° 45' 42"	-0.66"	55° 29' 25"	19° 39' 32"	1.0115028	15'48.72"	23° 26' 18"	3 m 32 s
12	57° 48' 06"	-0.66"	55° 31' 54"	19° 40' 04"	1.0115116	15'48.71"	23° 26' 18"	3 m 32 s
13	57° 50' 30"	-0.65"	55° 34' 24"	19° 40' 37"	1.0115203	15'48.70"	23° 26' 18"	3 m 32 s
14	57° 52' 55"	-0.65"	55° 36' 53"	19° 41' 09"	1.0115291	15'48.69"	23° 26' 18"	3 m 32 s
15	57° 55' 19"	-0.64"	55° 39' 23"	19° 41' 42"	1.0115379	15'48.68"	23° 26' 18"	3 m 32 s
16	57° 57' 44"	-0.64"	55° 41' 52"	19° 42' 14"	1.0115466	15'48.68"	23° 26' 18"	3 m 32 s
17	58° 00' 08"	-0.64"	55° 44' 22"	19° 42' 47"	1.0115554	15'48.67"	23° 26' 18"	3 m 32 s
18	58° 02' 33"	-0.63"	55° 46' 51"	19° 43' 19"	1.0115641	15'48.66"	23° 26' 18"	3 m 32 s
19	58° 04' 57"	-0.63"	55° 49' 21"	19° 43' 51"	1.0115729	15'48.65"	23° 26' 18"	3 m 31 s
20	58° 07' 22"	-0.62"	55° 51' 50"	19° 44' 24"	1.0115816	15'48.64"	23° 26' 18"	3 m 31 s
21	58° 09' 46"	-0.62"	55° 54' 20"	19° 44' 56"	1.0115903	15'48.64"	23° 26' 18"	3 m 31 s
22	58° 12' 10"	-0.62"	55° 56' 50"	19° 45' 28"	1.0115991	15'48.63"	23° 26' 18"	3 m 31 s
23	58° 14' 35"	-0.61"	55° 59' 19"	19° 46' 00"	1.0116078	15'48.62"	23° 26' 18"	3 m 31 s
24	58° 16' 59"	-0.61"	56° 01' 49"	19° 46' 32"	1.0116165	15'48.61"	23° 26' 18"	3 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	297° 04' 22"	-4° 18' 40"	300° 02' 30"	-24° 58' 13"	0° 56' 05"	15' 17.08"	80° 59' 26"	0.75213
1	297° 36' 10"	-4° 17' 10"	300° 36' 25"	-24° 50' 22"	0° 56' 07"	15' 17.50"	80° 43' 44"	0.74846
2	298° 07' 60"	-4° 15' 39"	301° 10' 17"	-24° 42' 22"	0° 56' 09"	15' 17.92"	80° 28' 10"	0.74476
3	298° 39' 51"	-4° 14' 06"	301° 44' 07"	-24° 34' 15"	0° 56' 10"	15' 18.34"	80° 12' 44"	0.74105
4	299° 11' 44"	-4° 12' 32"	302° 17' 54"	-24° 25' 60"	0° 56' 12"	15' 18.77"	79° 57' 24"	0.73731
5	299° 43' 38"	-4° 10' 57"	302° 51' 38"	-24° 17' 37"	0° 56' 13"	15' 19.20"	79° 42' 13"	0.73355
6	300° 15' 34"	-4° 09' 20"	303° 25' 20"	-24° 09' 06"	0° 56' 15"	15' 19.63"	79° 27' 09"	0.72977
7	300° 47' 31"	-4° 07' 42"	303° 58' 59"	-24° 00' 27"	0° 56' 16"	15' 20.06"	79° 12' 12"	0.72597
8	301° 19' 30"	-4° 06' 02"	304° 32' 35"	-23° 51' 40"	0° 56' 18"	15' 20.50"	78° 57' 24"	0.72215
9	301° 51' 30"	-4° 04' 21"	305° 06' 08"	-23° 42' 45"	0° 56' 20"	15' 20.94"	78° 42' 43"	0.71831
10	302° 23' 32"	-4° 02' 39"	305° 39' 39"	-23° 33' 43"	0° 56' 21"	15' 21.38"	78° 28' 09"	0.71444
11	302° 55' 36"	-4° 00' 55"	306° 13' 06"	-23° 24' 33"	0° 56' 23"	15' 21.82"	78° 13' 44"	0.71056
12	303° 27' 41"	-3° 59' 10"	306° 46' 31"	-23° 15' 16"	0° 56' 24"	15' 22.27"	77° 59' 26"	0.70666
13	303° 59' 48"	-3° 57' 24"	307° 19' 53"	-23° 05' 51"	0° 56' 26"	15' 22.72"	77° 45' 16"	0.70274
14	304° 31' 56"	-3° 55' 36"	307° 53' 12"	-22° 56' 18"	0° 56' 28"	15' 23.17"	77° 31' 15"	0.69881
15	305° 04' 06"	-3° 53' 47"	308° 26' 28"	-22° 46' 38"	0° 56' 29"	15' 23.62"	77° 17' 21"	0.69485
16	305° 36' 18"	-3° 51' 57"	308° 59' 41"	-22° 36' 50"	0° 56' 31"	15' 24.08"	77° 3' 35"	0.69087
17	306° 08' 32"	-3° 50' 05"	309° 32' 51"	-22° 26' 55"	0° 56' 33"	15' 24.53"	76° 49' 57"	0.68688
18	306° 40' 47"	-3° 48' 12"	310° 05' 59"	-22° 16' 53"	0° 56' 34"	15' 25.00"	76° 36' 27"	0.68287
19	307° 13' 03"	-3° 46' 17"	310° 39' 03"	-22° 06' 44"	0° 56' 36"	15' 25.46"	76° 23' 05"	0.67884
20	307° 45' 22"	-3° 44' 22"	311° 12' 05"	-21° 56' 27"	0° 56' 38"	15' 25.92"	76° 9' 51"	0.67479
21	308° 17' 42"	-3° 42' 25"	311° 45' 04"	-21° 46' 03"	0° 56' 40"	15' 26.39"	75° 56' 46"	0.67072
22	308° 50' 04"	-3° 40' 26"	312° 17' 60"	-21° 35' 32"	0° 56' 41"	15' 26.86"	75° 43' 48"	0.66664
23	309° 22' 28"	-3° 38' 27"	312° 50' 52"	-21° 24' 53"	0° 56' 43"	15' 27.34"	75° 30' 59"	0.66254
24	309° 54' 53"	-3° 36' 26"	313° 23' 42"	-21° 14' 08"	0° 56' 45"	15' 27.81"	75° 18' 19"	0.65842

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	58° 16' 59"	-0.61"	56° 01' 49"	19° 46' 32"	1.0116165	15'48.61"	23° 26' 18"	3 m 31 s
1	58° 19' 24"	-0.60"	56° 04' 19"	19° 47' 04"	1.0116252	15'48.60"	23° 26' 18"	3 m 31 s
2	58° 21' 48"	-0.60"	56° 06' 48"	19° 47' 36"	1.0116339	15'48.59"	23° 26' 18"	3 m 31 s
3	58° 24' 13"	-0.59"	56° 09' 18"	19° 48' 08"	1.0116426	15'48.59"	23° 26' 18"	3 m 30 s
4	58° 26' 37"	-0.59"	56° 11' 48"	19° 48' 40"	1.0116513	15'48.58"	23° 26' 18"	3 m 30 s
5	58° 29' 01"	-0.59"	56° 14' 17"	19° 49' 12"	1.0116600	15'48.57"	23° 26' 18"	3 m 30 s
6	58° 31' 26"	-0.58"	56° 16' 47"	19° 49' 44"	1.0116687	15'48.56"	23° 26' 18"	3 m 30 s
7	58° 33' 50"	-0.58"	56° 19' 17"	19° 50' 16"	1.0116773	15'48.55"	23° 26' 18"	3 m 30 s
8	58° 36' 15"	-0.57"	56° 21' 47"	19° 50' 48"	1.0116860	15'48.55"	23° 26' 18"	3 m 30 s
9	58° 38' 39"	-0.57"	56° 24' 16"	19° 51' 20"	1.0116947	15'48.54"	23° 26' 18"	3 m 30 s
10	58° 41' 04"	-0.56"	56° 26' 46"	19° 51' 52"	1.0117034	15'48.53"	23° 26' 18"	3 m 30 s
11	58° 43' 28"	-0.56"	56° 29' 16"	19° 52' 23"	1.0117120	15'48.52"	23° 26' 18"	3 m 29 s
12	58° 45' 52"	-0.55"	56° 31' 46"	19° 52' 55"	1.0117207	15'48.51"	23° 26' 18"	3 m 29 s
13	58° 48' 17"	-0.55"	56° 34' 16"	19° 53' 27"	1.0117293	15'48.50"	23° 26' 18"	3 m 29 s
14	58° 50' 41"	-0.54"	56° 36' 45"	19° 53' 58"	1.0117379	15'48.50"	23° 26' 18"	3 m 29 s
15	58° 53' 06"	-0.54"	56° 39' 15"	19° 54' 30"	1.0117466	15'48.49"	23° 26' 18"	3 m 29 s
16	58° 55' 30"	-0.53"	56° 41' 45"	19° 55' 01"	1.0117552	15'48.48"	23° 26' 18"	3 m 29 s
17	58° 57' 54"	-0.53"	56° 44' 15"	19° 55' 33"	1.0117638	15'48.47"	23° 26' 18"	3 m 29 s
18	59° 00' 19"	-0.53"	56° 46' 45"	19° 56' 04"	1.0117725	15'48.46"	23° 26' 18"	3 m 29 s
19	59° 02' 43"	-0.52"	56° 49' 15"	19° 56' 36"	1.0117811	15'48.46"	23° 26' 18"	3 m 28 s
20	59° 05' 08"	-0.52"	56° 51' 45"	19° 57' 07"	1.0117897	15'48.45"	23° 26' 18"	3 m 28 s
21	59° 07' 32"	-0.51"	56° 54' 15"	19° 57' 39"	1.0117983	15'48.44"	23° 26' 18"	3 m 28 s
22	59° 09' 56"	-0.51"	56° 56' 45"	19° 58' 10"	1.0118069	15'48.43"	23° 26' 18"	3 m 28 s
23	59° 12' 21"	-0.50"	56° 59' 15"	19° 58' 41"	1.0118155	15'48.42"	23° 26' 18"	3 m 28 s
24	59° 14' 45"	-0.50"	57° 01' 45"	19° 59' 13"	1.0118240	15'48.42"	23° 26' 18"	3 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	309° 54' 53"	-3° 36' 26"	313° 23' 42"	-21° 14' 08"	0° 56' 45"	15' 27.81"	75° 18' 19"	0.65842
1	310° 27' 20"	-3° 34' 24"	313° 56' 30"	-21° 03' 16"	0° 56' 47"	15' 28.29"	75° 5' 46"	0.65429
2	310° 59' 49"	-3° 32' 20"	314° 29' 14"	-20° 52' 17"	0° 56' 48"	15' 28.77"	74° 53' 22"	0.65014
3	311° 32' 20"	-3° 30' 15"	315° 01' 55"	-20° 41' 11"	0° 56' 50"	15' 29.25"	74° 41' 06"	0.64598
4	312° 04' 52"	-3° 28' 09"	315° 34' 34"	-20° 29' 58"	0° 56' 52"	15' 29.73"	74° 28' 59"	0.64180
5	312° 37' 27"	-3° 26' 02"	316° 07' 09"	-20° 18' 38"	0° 56' 54"	15' 30.22"	74° 17' 00"	0.63760
6	313° 10' 03"	-3° 23' 54"	316° 39' 42"	-20° 07' 12"	0° 56' 55"	15' 30.71"	74° 5' 10"	0.63339
7	313° 42' 41"	-3° 21' 44"	317° 12' 12"	-19° 55' 39"	0° 56' 57"	15' 31.20"	73° 53' 28"	0.62916
8	314° 15' 21"	-3° 19' 33"	317° 44' 40"	-19° 43' 59"	0° 56' 59"	15' 31.69"	73° 41' 54"	0.62492
9	314° 48' 03"	-3° 17' 21"	318° 17' 04"	-19° 32' 13"	0° 57' 01"	15' 32.19"	73° 30' 30"	0.62066
10	315° 20' 46"	-3° 15' 07"	318° 49' 26"	-19° 20' 20"	0° 57' 03"	15' 32.69"	73° 19' 13"	0.61639
11	315° 53' 32"	-3° 12' 53"	319° 21' 45"	-19° 08' 21"	0° 57' 05"	15' 33.18"	73° 8' 06"	0.61211
12	316° 26' 19"	-3° 10' 37"	319° 54' 01"	-18° 56' 15"	0° 57' 06"	15' 33.69"	72° 57' 07"	0.60781
13	316° 59' 08"	-3° 08' 20"	320° 26' 15"	-18° 44' 03"	0° 57' 08"	15' 34.19"	72° 46' 17"	0.60350
14	317° 31' 59"	-3° 06' 02"	320° 58' 26"	-18° 31' 45"	0° 57' 10"	15' 34.69"	72° 35' 35"	0.59918
15	318° 04' 53"	-3° 03' 43"	321° 30' 35"	-18° 19' 21"	0° 57' 12"	15' 35.20"	72° 25' 03"	0.59484
16	318° 37' 48"	-3° 01' 22"	322° 02' 40"	-18° 06' 50"	0° 57' 14"	15' 35.71"	72° 14' 39"	0.59049
17	319° 10' 45"	-2° 59' 01"	322° 34' 44"	-17° 54' 13"	0° 57' 16"	15' 36.22"	72° 4' 24"	0.58613
18	319° 43' 44"	-2° 56' 38"	323° 06' 44"	-17° 41' 31"	0° 57' 18"	15' 36.73"	71° 54' 17"	0.58176
19	320° 16' 45"	-2° 54' 14"	323° 38' 43"	-17° 28' 42"	0° 57' 19"	15' 37.25"	71° 44' 20"	0.57737
20	320° 49' 48"	-2° 51' 49"	324° 10' 38"	-17° 15' 47"	0° 57' 21"	15' 37.77"	71° 34' 32"	0.57298
21	321° 22' 53"	-2° 49' 23"	324° 42' 32"	-17° 02' 47"	0° 57' 23"	15' 38.28"	71° 24' 52"	0.56857
22	321° 55' 60"	-2° 46' 56"	325° 14' 23"	-16° 49' 40"	0° 57' 25"	15' 38.80"	71° 15' 22"	0.56415
23	322° 29' 09"	-2° 44' 27"	325° 46' 11"	-16° 36' 28"	0° 57' 27"	15' 39.33"	71° 6' 00"	0.55972
24	323° 02' 20"	-2° 41' 58"	326° 17' 58"	-16° 23' 10"	0° 57' 29"	15' 39.85"	70° 56' 48"	0.55528

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	59° 14' 45"	-0.50"	57° 01' 45"	19° 59' 13"	1.0118240	15'48.42"	23° 26' 18"	3 m 28 s
1	59° 17' 10"	-0.49"	57° 04' 15"	19° 59' 44"	1.0118326	15'48.41"	23° 26' 18"	3 m 28 s
2	59° 19' 34"	-0.49"	57° 06' 45"	20° 00' 15"	1.0118412	15'48.40"	23° 26' 18"	3 m 27 s
3	59° 21' 58"	-0.48"	57° 09' 15"	20° 00' 46"	1.0118498	15'48.39"	23° 26' 18"	3 m 27 s
4	59° 24' 23"	-0.48"	57° 11' 45"	20° 01' 17"	1.0118583	15'48.38"	23° 26' 18"	3 m 27 s
5	59° 26' 47"	-0.47"	57° 14' 15"	20° 01' 49"	1.0118669	15'48.38"	23° 26' 18"	3 m 27 s
6	59° 29' 12"	-0.47"	57° 16' 45"	20° 02' 20"	1.0118754	15'48.37"	23° 26' 18"	3 m 27 s
7	59° 31' 36"	-0.46"	57° 19' 15"	20° 02' 51"	1.0118840	15'48.36"	23° 26' 18"	3 m 27 s
8	59° 34' 00"	-0.46"	57° 21' 45"	20° 03' 22"	1.0118925	15'48.35"	23° 26' 18"	3 m 26 s
9	59° 36' 25"	-0.45"	57° 24' 15"	20° 03' 53"	1.0119010	15'48.34"	23° 26' 18"	3 m 26 s
10	59° 38' 49"	-0.45"	57° 26' 45"	20° 04' 24"	1.0119096	15'48.34"	23° 26' 18"	3 m 26 s
11	59° 41' 13"	-0.44"	57° 29' 16"	20° 04' 54"	1.0119181	15'48.33"	23° 26' 18"	3 m 26 s
12	59° 43' 38"	-0.43"	57° 31' 46"	20° 05' 25"	1.0119266	15'48.32"	23° 26' 18"	3 m 26 s
13	59° 46' 02"	-0.43"	57° 34' 16"	20° 05' 56"	1.0119351	15'48.31"	23° 26' 18"	3 m 26 s
14	59° 48' 27"	-0.42"	57° 36' 46"	20° 06' 27"	1.0119436	15'48.30"	23° 26' 18"	3 m 26 s
15	59° 50' 51"	-0.42"	57° 39' 16"	20° 06' 58"	1.0119521	15'48.30"	23° 26' 18"	3 m 25 s
16	59° 53' 15"	-0.41"	57° 41' 47"	20° 07' 28"	1.0119606	15'48.29"	23° 26' 18"	3 m 25 s
17	59° 55' 40"	-0.41"	57° 44' 17"	20° 07' 59"	1.0119691	15'48.28"	23° 26' 18"	3 m 25 s
18	59° 58' 04"	-0.40"	57° 46' 47"	20° 08' 30"	1.0119776	15'48.27"	23° 26' 18"	3 m 25 s
19	60° 00' 28"	-0.40"	57° 49' 17"	20° 09' 00"	1.0119860	15'48.26"	23° 26' 18"	3 m 25 s
20	60° 02' 53"	-0.39"	57° 51' 48"	20° 09' 31"	1.0119945	15'48.26"	23° 26' 18"	3 m 25 s
21	60° 05' 17"	-0.39"	57° 54' 18"	20° 10' 01"	1.0120029	15'48.25"	23° 26' 18"	3 m 24 s
22	60° 07' 41"	-0.38"	57° 56' 48"	20° 10' 32"	1.0120114	15'48.24"	23° 26' 18"	3 m 24 s
23	60° 10' 06"	-0.38"	57° 59' 18"	20° 11' 02"	1.0120198	15'48.23"	23° 26' 18"	3 m 24 s
24	60° 12' 30"	-0.37"	58° 01' 49"	20° 11' 33"	1.0120283	15'48.22"	23° 26' 18"	3 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	323° 02' 20"	-2° 41' 58"	326° 17' 58"	-16° 23' 10"	0° 57' 29"	15' 39.85"	70° 56' 48"	0.55528
1	323° 35' 33"	-2° 39' 27"	326° 49' 42"	-16° 09' 47"	0° 57' 31"	15' 40.37"	70° 47' 44"	0.55084
2	324° 08' 48"	-2° 36' 56"	327° 21' 24"	-15° 56' 18"	0° 57' 33"	15' 40.90"	70° 38' 50"	0.54638
3	324° 42' 05"	-2° 34' 23"	327° 53' 04"	-15° 42' 43"	0° 57' 35"	15' 41.43"	70° 30' 04"	0.54191
4	325° 15' 25"	-2° 31' 50"	328° 24' 41"	-15° 29' 03"	0° 57' 37"	15' 41.96"	70° 21' 28"	0.53744
5	325° 48' 46"	-2° 29' 15"	328° 56' 17"	-15° 15' 17"	0° 57' 39"	15' 42.49"	70° 13' 01"	0.53295
6	326° 22' 10"	-2° 26' 39"	329° 27' 50"	-15° 01' 27"	0° 57' 41"	15' 43.02"	70° 4' 44"	0.52846
7	326° 55' 35"	-2° 24' 03"	329° 59' 22"	-14° 47' 30"	0° 57' 43"	15' 43.55"	69° 56' 35"	0.52396
8	327° 29' 03"	-2° 21' 25"	330° 30' 51"	-14° 33' 29"	0° 57' 45"	15' 44.09"	69° 48' 36"	0.51945
9	328° 02' 33"	-2° 18' 46"	331° 02' 19"	-14° 19' 23"	0° 57' 47"	15' 44.62"	69° 40' 46"	0.51494
10	328° 36' 05"	-2° 16' 07"	331° 33' 45"	-14° 05' 11"	0° 57' 49"	15' 45.16"	69° 33' 05"	0.51041
11	329° 09' 39"	-2° 13' 26"	332° 05' 09"	-13° 50' 54"	0° 57' 50"	15' 45.70"	69° 25' 34"	0.50589
12	329° 43' 16"	-2° 10' 45"	332° 36' 31"	-13° 36' 33"	0° 57' 52"	15' 46.24"	69° 18' 12"	0.50135
13	330° 16' 54"	-2° 08' 02"	333° 07' 52"	-13° 22' 06"	0° 57' 54"	15' 46.78"	69° 10' 59"	0.49681
14	330° 50' 35"	-2° 05' 19"	333° 39' 11"	-13° 07' 35"	0° 57' 56"	15' 47.32"	69° 3' 56"	0.49227
15	331° 24' 18"	-2° 02' 34"	334° 10' 28"	-12° 52' 59"	0° 57' 58"	15' 47.87"	68° 57' 03"	0.48772
16	331° 58' 03"	-1° 59' 49"	334° 41' 44"	-12° 38' 18"	0° 58' 00"	15' 48.41"	68° 50' 19"	0.48316
17	332° 31' 51"	-1° 57' 03"	335° 12' 59"	-12° 23' 32"	0° 58' 02"	15' 48.95"	68° 43' 44"	0.47860
18	333° 05' 40"	-1° 54' 16"	335° 44' 12"	-12° 08' 42"	0° 58' 04"	15' 49.50"	68° 37' 19"	0.47404
19	333° 39' 32"	-1° 51' 28"	336° 15' 24"	-11° 53' 48"	0° 58' 06"	15' 50.05"	68° 31' 04"	0.46947
20	334° 13' 27"	-1° 48' 40"	336° 46' 35"	-11° 38' 48"	0° 58' 08"	15' 50.59"	68° 24' 58"	0.46490
21	334° 47' 23"	-1° 45' 50"	337° 17' 44"	-11° 23' 45"	0° 58' 10"	15' 51.14"	68° 19' 02"	0.46033
22	335° 21' 22"	-1° 42' 60"	337° 48' 52"	-11° 08' 37"	0° 58' 12"	15' 51.69"	68° 13' 15"	0.45575
23	335° 55' 23"	-1° 40' 09"	338° 19' 60"	-10° 53' 25"	0° 58' 14"	15' 52.24"	68° 7' 39"	0.45117
24	336° 29' 26"	-1° 37' 17"	338° 51' 06"	-10° 38' 09"	0° 58' 16"	15' 52.79"	68° 2' 12"	0.44659

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	60° 12' 30"	-0.37"	58° 01' 49"	20° 11' 33"	1.0120283	15'48.22"	23° 26' 18"	3 m 24 s
1	60° 14' 54"	-0.37"	58° 04' 19"	20° 12' 03"	1.0120367	15'48.22"	23° 26' 18"	3 m 24 s
2	60° 17' 19"	-0.36"	58° 06' 50"	20° 12' 33"	1.0120451	15'48.21"	23° 26' 18"	3 m 24 s
3	60° 19' 43"	-0.36"	58° 09' 20"	20° 13' 04"	1.0120536	15'48.20"	23° 26' 18"	3 m 23 s
4	60° 22' 07"	-0.35"	58° 11' 50"	20° 13' 34"	1.0120620	15'48.19"	23° 26' 18"	3 m 23 s
5	60° 24' 32"	-0.34"	58° 14' 21"	20° 14' 04"	1.0120704	15'48.19"	23° 26' 18"	3 m 23 s
6	60° 26' 56"	-0.34"	58° 16' 51"	20° 14' 35"	1.0120788	15'48.18"	23° 26' 18"	3 m 23 s
7	60° 29' 20"	-0.33"	58° 19' 22"	20° 15' 05"	1.0120872	15'48.17"	23° 26' 18"	3 m 23 s
8	60° 31' 45"	-0.33"	58° 21' 52"	20° 15' 35"	1.0120956	15'48.16"	23° 26' 18"	3 m 23 s
9	60° 34' 09"	-0.32"	58° 24' 23"	20° 16' 05"	1.0121039	15'48.15"	23° 26' 18"	3 m 22 s
10	60° 36' 33"	-0.32"	58° 26' 53"	20° 16' 35"	1.0121123	15'48.15"	23° 26' 18"	3 m 22 s
11	60° 38' 58"	-0.31"	58° 29' 24"	20° 17' 05"	1.0121207	15'48.14"	23° 26' 18"	3 m 22 s
12	60° 41' 22"	-0.31"	58° 31' 54"	20° 17' 35"	1.0121290	15'48.13"	23° 26' 18"	3 m 22 s
13	60° 43' 46"	-0.30"	58° 34' 25"	20° 18' 05"	1.0121374	15'48.12"	23° 26' 18"	3 m 22 s
14	60° 46' 11"	-0.30"	58° 36' 55"	20° 18' 35"	1.0121457	15'48.11"	23° 26' 18"	3 m 22 s
15	60° 48' 35"	-0.29"	58° 39' 26"	20° 19' 05"	1.0121541	15'48.11"	23° 26' 18"	3 m 21 s
16	60° 50' 59"	-0.29"	58° 41' 56"	20° 19' 35"	1.0121624	15'48.10"	23° 26' 18"	3 m 21 s
17	60° 53' 24"	-0.28"	58° 44' 27"	20° 20' 04"	1.0121707	15'48.09"	23° 26' 18"	3 m 21 s
18	60° 55' 48"	-0.27"	58° 46' 57"	20° 20' 34"	1.0121790	15'48.08"	23° 26' 18"	3 m 21 s
19	60° 58' 12"	-0.27"	58° 49' 28"	20° 21' 04"	1.0121874	15'48.08"	23° 26' 18"	3 m 21 s
20	61° 00' 37"	-0.26"	58° 51' 59"	20° 21' 34"	1.0121957	15'48.07"	23° 26' 18"	3 m 20 s
21	61° 03' 01"	-0.26"	58° 54' 29"	20° 22' 03"	1.0122040	15'48.06"	23° 26' 18"	3 m 20 s
22	61° 05' 25"	-0.25"	58° 56' 60"	20° 22' 33"	1.0122122	15'48.05"	23° 26' 18"	3 m 20 s
23	61° 07' 50"	-0.25"	58° 59' 31"	20° 23' 03"	1.0122205	15'48.04"	23° 26' 18"	3 m 20 s
24	61° 10' 14"	-0.24"	59° 02' 01"	20° 23' 32"	1.0122288	15'48.04"	23° 26' 18"	3 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	336° 29' 26"	-1° 37' 17"	338° 51' 06"	-10° 38' 09"	0° 58' 16"	15' 52.79"	68° 2' 12"	0.44659
1	337° 03' 31"	-1° 34' 24"	339° 22' 11"	-10° 22' 48"	0° 58' 18"	15' 53.34"	67° 56' 55"	0.44201
2	337° 37' 39"	-1° 31' 31"	339° 53' 16"	-10° 07' 24"	0° 58' 21"	15' 53.89"	67° 51' 48"	0.43743
3	338° 11' 49"	-1° 28' 37"	340° 24' 19"	-9° 51' 55"	0° 58' 23"	15' 54.44"	67° 46' 50"	0.43285
4	338° 46' 02"	-1° 25' 42"	340° 55' 22"	-9° 36' 23"	0° 58' 25"	15' 54.99"	67° 42' 03"	0.42827
5	339° 20' 17"	-1° 22' 46"	341° 26' 24"	-9° 20' 47"	0° 58' 27"	15' 55.54"	67° 37' 26"	0.42369
6	339° 54' 34"	-1° 19' 50"	341° 57' 26"	-9° 05' 06"	0° 58' 29"	15' 56.09"	67° 32' 58"	0.41911
7	340° 28' 53"	-1° 16' 53"	342° 28' 27"	-8° 49' 23"	0° 58' 31"	15' 56.64"	67° 28' 41"	0.41453
8	341° 03' 15"	-1° 13' 55"	342° 59' 28"	-8° 33' 35"	0° 58' 33"	15' 57.19"	67° 24' 34"	0.40995
9	341° 37' 39"	-1° 10' 57"	343° 30' 28"	-8° 17' 44"	0° 58' 35"	15' 57.74"	67° 20' 37"	0.40537
10	342° 12' 06"	-1° 07' 58"	344° 01' 28"	-8° 01' 50"	0° 58' 37"	15' 58.29"	67° 16' 50"	0.40080
11	342° 46' 34"	-1° 04' 59"	344° 32' 27"	-7° 45' 52"	0° 58' 39"	15' 58.84"	67° 13' 13"	0.39623
12	343° 21' 06"	-1° 01' 58"	345° 03' 27"	-7° 29' 50"	0° 58' 41"	15' 59.39"	67° 9' 47"	0.39166
13	343° 55' 39"	0°-58' 58"	345° 34' 26"	-7° 13' 46"	0° 58' 43"	15' 59.94"	67° 6' 30"	0.38709
14	344° 30' 15"	0°-55' 56"	346° 05' 26"	-6° 57' 38"	0° 58' 45"	16' 00.49"	67° 3' 25"	0.38253
15	345° 04' 54"	0°-52' 55"	346° 36' 25"	-6° 41' 27"	0° 58' 47"	16' 01.04"	67° 0' 30"	0.37798
16	345° 39' 34"	0°-49' 52"	347° 07' 25"	-6° 25' 13"	0° 58' 49"	16' 01.59"	66° 57' 45"	0.37343
17	346° 14' 18"	0°-46' 49"	347° 38' 25"	-6° 08' 55"	0° 58' 51"	16' 02.13"	66° 55' 10"	0.36888
18	346° 49' 03"	0°-43' 46"	348° 09' 25"	-5° 52' 35"	0° 58' 53"	16' 02.68"	66° 52' 47"	0.36434
19	347° 23' 51"	0°-40' 42"	348° 40' 25"	-5° 36' 12"	0° 58' 55"	16' 03.23"	66° 50' 34"	0.35981
20	347° 58' 42"	0°-37' 40"	349° 11' 27"	-5° 19' 49"	0° 58' 57"	16' 03.77"	66° 48' 31"	0.35529
21	348° 33' 34"	0°-34' 36"	349° 42' 28"	-5° 03' 21"	0° 58' 59"	16' 04.32"	66° 46' 39"	0.35077
22	349° 08' 30"	0°-31' 31"	350° 13' 30"	-4° 46' 50"	0° 59' 01"	16' 04.86"	66° 44' 58"	0.34626
23	349° 43' 27"	0°-28' 25"	350° 44' 33"	-4° 30' 16"	0° 59' 03"	16' 05.40"	66° 43' 28"	0.34175
24	350° 18' 27"	0°-25' 19"	351° 15' 37"	-4° 13' 40"	0° 59' 05"	16' 05.94"	66° 42' 09"	0.33726

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	61° 10' 14"	-0.24"	59° 02' 01"	20° 23' 32"	1.0122288	15'48.04"	23° 26' 18"	3 m 20 s
1	61° 12' 38"	-0.24"	59° 04' 32"	20° 24' 02"	1.0122371	15'48.03"	23° 26' 18"	3 m 20 s
2	61° 15' 02"	-0.23"	59° 07' 03"	20° 24' 31"	1.0122453	15'48.02"	23° 26' 18"	3 m 19 s
3	61° 17' 27"	-0.23"	59° 09' 33"	20° 25' 01"	1.0122536	15'48.01"	23° 26' 18"	3 m 19 s
4	61° 19' 51"	-0.22"	59° 12' 04"	20° 25' 30"	1.0122618	15'48.01"	23° 26' 18"	3 m 19 s
5	61° 22' 15"	-0.21"	59° 14' 35"	20° 25' 59"	1.0122701	15'48.00"	23° 26' 18"	3 m 19 s
6	61° 24' 40"	-0.21"	59° 17' 06"	20° 26' 29"	1.0122783	15'47.99"	23° 26' 18"	3 m 19 s
7	61° 27' 04"	-0.20"	59° 19' 36"	20° 26' 58"	1.0122865	15'47.98"	23° 26' 18"	3 m 18 s
8	61° 29' 28"	-0.20"	59° 22' 07"	20° 27' 27"	1.0122947	15'47.97"	23° 26' 18"	3 m 18 s
9	61° 31' 53"	-0.19"	59° 24' 38"	20° 27' 56"	1.0123030	15'47.97"	23° 26' 18"	3 m 18 s
10	61° 34' 17"	-0.19"	59° 27' 09"	20° 28' 26"	1.0123112	15'47.96"	23° 26' 18"	3 m 18 s
11	61° 36' 41"	-0.18"	59° 29' 40"	20° 28' 55"	1.0123194	15'47.95"	23° 26' 18"	3 m 18 s
12	61° 39' 05"	-0.18"	59° 32' 11"	20° 29' 24"	1.0123275	15'47.94"	23° 26' 18"	3 m 17 s
13	61° 41' 30"	-0.17"	59° 34' 41"	20° 29' 53"	1.0123357	15'47.94"	23° 26' 18"	3 m 17 s
14	61° 43' 54"	-0.17"	59° 37' 12"	20° 30' 22"	1.0123439	15'47.93"	23° 26' 18"	3 m 17 s
15	61° 46' 18"	-0.16"	59° 39' 43"	20° 30' 51"	1.0123521	15'47.92"	23° 26' 18"	3 m 17 s
16	61° 48' 43"	-0.16"	59° 42' 14"	20° 31' 20"	1.0123602	15'47.91"	23° 26' 18"	3 m 17 s
17	61° 51' 07"	-0.15"	59° 44' 45"	20° 31' 49"	1.0123684	15'47.91"	23° 26' 18"	3 m 16 s
18	61° 53' 31"	-0.14"	59° 47' 16"	20° 32' 18"	1.0123765	15'47.90"	23° 26' 18"	3 m 16 s
19	61° 55' 55"	-0.14"	59° 49' 47"	20° 32' 47"	1.0123846	15'47.89"	23° 26' 18"	3 m 16 s
20	61° 58' 20"	-0.13"	59° 52' 18"	20° 33' 16"	1.0123928	15'47.88"	23° 26' 18"	3 m 16 s
21	62° 00' 44"	-0.13"	59° 54' 49"	20° 33' 44"	1.0124009	15'47.88"	23° 26' 18"	3 m 16 s
22	62° 03' 08"	-0.12"	59° 57' 20"	20° 34' 13"	1.0124090	15'47.87"	23° 26' 18"	3 m 15 s
23	62° 05' 32"	-0.12"	59° 59' 51"	20° 34' 42"	1.0124171	15'47.86"	23° 26' 18"	3 m 15 s
24	62° 07' 57"	-0.11"	60° 02' 22"	20° 35' 10"	1.0124252	15'47.85"	23° 26' 18"	3 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	350° 18' 27"	0°-25' 19"	351° 15' 37"	-4° 13' 40"	0° 59' 05"	16' 05.94"	66° 42' 09"	0.33726
1	350° 53' 30"	0°-22' 13"	351° 46' 41"	-3° 57' 02"	0° 59' 07"	16' 06.48"	66° 41' 01"	0.33277
2	351° 28' 34"	0°-19' 06"	352° 17' 46"	-3° 40' 21"	0° 59' 09"	16' 07.02"	66° 40' 04"	0.32830
3	352° 03' 42"	0°-15' 59"	352° 48' 52"	-3° 23' 38"	0° 59' 11"	16' 07.55"	66° 39' 19"	0.32383
4	352° 38' 51"	0°-12' 52"	353° 19' 59"	-3° 06' 53"	0° 59' 13"	16' 08.09"	66° 38' 44"	0.31938
5	353° 14' 03"	0° -9' 44"	353° 51' 08"	-2° 50' 06"	0° 59' 15"	16' 08.62"	66° 38' 21"	0.31493
6	353° 49' 18"	0° -6' 36"	354° 22' 18"	-2° 33' 17"	0° 59' 17"	16' 09.15"	66° 38' 09"	0.31050
7	354° 24' 35"	0° -3' 28"	354° 53' 29"	-2° 16' 26"	0° 59' 18"	16' 09.68"	66° 38' 08"	0.30608
8	354° 59' 54"	0° 00'-20"	355° 24' 41"	-1° 59' 33"	0° 59' 20"	16' 10.21"	66° 38' 19"	0.30167
9	355° 35' 16"	0° 02' 49"	355° 55' 55"	-1° 42' 38"	0° 59' 22"	16' 10.74"	66° 38' 42"	0.29728
10	356° 10' 40"	0° 05' 57"	356° 27' 10"	-1° 25' 42"	0° 59' 24"	16' 11.26"	66° 39' 16"	0.29290
11	356° 46' 06"	0° 09' 06"	356° 58' 28"	-1° 08' 44"	0° 59' 26"	16' 11.78"	66° 40' 02"	0.28853
12	357° 21' 35"	0° 12' 15"	357° 29' 47"	0°-51' 45"	0° 59' 28"	16' 12.30"	66° 41' 00"	0.28418
13	357° 57' 07"	0° 15' 24"	358° 01' 07"	0°-34' 44"	0° 59' 30"	16' 12.82"	66° 42' 10"	0.27984
14	358° 32' 41"	0° 18' 34"	358° 32' 30"	0°-17' 42"	0° 59' 32"	16' 13.33"	66° 43' 32"	0.27551
15	359° 08' 17"	0° 21' 43"	359° 03' 55"	0° 00'-39"	0° 59' 34"	16' 13.85"	66° 45' 06"	0.27121
16	359° 43' 55"	0° 24' 52"	359° 35' 21"	0° 16' 25"	0° 59' 36"	16' 14.36"	66° 46' 52"	0.26692
17	0° 19' 36"	0° 28' 02"	0° 06' 50"	0° 33' 31"	0° 59' 38"	16' 14.86"	66° 48' 51"	0.26264
18	0° 55' 20"	0° 31' 11"	0° 38' 21"	0° 50' 37"	0° 59' 39"	16' 15.37"	66° 51' 02"	0.25838
19	1° 31' 05"	0° 34' 21"	1° 09' 55"	1° 07' 44"	0° 59' 41"	16' 15.87"	66° 53' 26"	0.25415
20	2° 06' 53"	0° 37' 30"	1° 41' 31"	1° 24' 52"	0° 59' 43"	16' 16.37"	66° 56' 02"	0.24993
21	2° 42' 44"	0° 40' 39"	2° 13' 09"	1° 42' 01"	0° 59' 45"	16' 16.86"	66° 58' 51"	0.24572
22	3° 18' 37"	0° 43' 49"	2° 44' 51"	1° 59' 10"	0° 59' 47"	16' 17.35"	67° 1' 53"	0.24154
23	3° 54' 32"	0° 46' 58"	3° 16' 34"	2° 16' 20"	0° 59' 48"	16' 17.84"	67° 5' 08"	0.23738
24	4° 30' 29"	0° 50' 07"	3° 48' 21"	2° 33' 30"	0° 59' 50"	16' 18.33"	67° 8' 36"	0.23324

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	62° 07' 57"	-0.11"	60° 02' 22"	20° 35' 10"	1.0124252	15'47.85"	23° 26' 18"	3 m 15 s
1	62° 10' 21"	-0.11"	60° 04' 53"	20° 35' 39"	1.0124333	15'47.85"	23° 26' 18"	3 m 15 s
2	62° 12' 45"	-0.10"	60° 07' 24"	20° 36' 08"	1.0124414	15'47.84"	23° 26' 18"	3 m 15 s
3	62° 15' 09"	-0.10"	60° 09' 55"	20° 36' 36"	1.0124494	15'47.83"	23° 26' 18"	3 m 14 s
4	62° 17' 34"	-0.09"	60° 12' 26"	20° 37' 05"	1.0124575	15'47.82"	23° 26' 18"	3 m 14 s
5	62° 19' 58"	-0.09"	60° 14' 57"	20° 37' 33"	1.0124656	15'47.81"	23° 26' 18"	3 m 14 s
6	62° 22' 22"	-0.08"	60° 17' 28"	20° 38' 02"	1.0124736	15'47.81"	23° 26' 18"	3 m 14 s
7	62° 24' 46"	-0.08"	60° 19' 59"	20° 38' 30"	1.0124817	15'47.80"	23° 26' 18"	3 m 13 s
8	62° 27' 11"	-0.07"	60° 22' 31"	20° 38' 59"	1.0124897	15'47.79"	23° 26' 18"	3 m 13 s
9	62° 29' 35"	-0.07"	60° 25' 02"	20° 39' 27"	1.0124977	15'47.78"	23° 26' 18"	3 m 13 s
10	62° 31' 59"	-0.06"	60° 27' 33"	20° 39' 55"	1.0125057	15'47.78"	23° 26' 18"	3 m 13 s
11	62° 34' 23"	-0.06"	60° 30' 04"	20° 40' 24"	1.0125137	15'47.77"	23° 26' 18"	3 m 13 s
12	62° 36' 48"	-0.05"	60° 32' 35"	20° 40' 52"	1.0125217	15'47.76"	23° 26' 18"	3 m 12 s
13	62° 39' 12"	-0.05"	60° 35' 06"	20° 41' 20"	1.0125297	15'47.75"	23° 26' 18"	3 m 12 s
14	62° 41' 36"	-0.04"	60° 37' 38"	20° 41' 48"	1.0125377	15'47.75"	23° 26' 18"	3 m 12 s
15	62° 44' 00"	-0.04"	60° 40' 09"	20° 42' 16"	1.0125457	15'47.74"	23° 26' 18"	3 m 12 s
16	62° 46' 25"	-0.03"	60° 42' 40"	20° 42' 44"	1.0125537	15'47.73"	23° 26' 18"	3 m 11 s
17	62° 48' 49"	-0.03"	60° 45' 11"	20° 43' 12"	1.0125616	15'47.73"	23° 26' 18"	3 m 11 s
18	62° 51' 13"	-0.02"	60° 47' 43"	20° 43' 40"	1.0125696	15'47.72"	23° 26' 18"	3 m 11 s
19	62° 53' 37"	-0.02"	60° 50' 14"	20° 44' 08"	1.0125775	15'47.71"	23° 26' 18"	3 m 11 s
20	62° 56' 02"	-0.01"	60° 52' 45"	20° 44' 36"	1.0125855	15'47.70"	23° 26' 18"	3 m 11 s
21	62° 58' 26"	-0.01"	60° 55' 17"	20° 45' 04"	1.0125934	15'47.70"	23° 26' 18"	3 m 10 s
22	63° 00' 50"	-0.00"	60° 57' 48"	20° 45' 32"	1.0126013	15'47.69"	23° 26' 18"	3 m 10 s
23	63° 03' 14"	0.00"	61° 00' 19"	20° 45' 60"	1.0126092	15'47.68"	23° 26' 18"	3 m 10 s
24	63° 05' 38"	0.01"	61° 02' 51"	20° 46' 28"	1.0126171	15'47.67"	23° 26' 18"	3 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	4° 30' 29"	0° 50' 07"	3° 48' 21"	2° 33' 30"	0° 59' 50"	16' 18.33"	67° 8' 36"	0.23324
1	5° 06' 29"	0° 53' 16"	4° 20' 10"	2° 50' 40"	0° 59' 52"	16' 18.81"	67° 12' 17"	0.22912
2	5° 42' 31"	0° 56' 25"	4° 52' 03"	3° 07' 51"	0° 59' 54"	16' 19.29"	67° 16' 12"	0.22502
3	6° 18' 36"	0° 59' 33"	5° 23' 58"	3° 25' 01"	0° 59' 55"	16' 19.76"	67° 20' 20"	0.22094
4	6° 54' 42"	1° 02' 41"	5° 55' 57"	3° 42' 12"	0° 59' 57"	16' 20.23"	67° 24' 42"	0.21689
5	7° 30' 51"	1° 05' 50"	6° 27' 59"	3° 59' 22"	0° 59' 59"	16' 20.70"	67° 29' 18"	0.21286
6	8° 07' 03"	1° 08' 57"	7° 00' 04"	4° 16' 33"	1° 00' 01"	16' 21.16"	67° 34' 08"	0.20885
7	8° 43' 16"	1° 12' 05"	7° 32' 12"	4° 33' 43"	1° 00' 02"	16' 21.62"	67° 39' 12"	0.20487
8	9° 19' 32"	1° 15' 12"	8° 04' 24"	4° 50' 52"	1° 00' 04"	16' 22.08"	67° 44' 30"	0.20091
9	9° 55' 50"	1° 18' 19"	8° 36' 39"	5° 08' 01"	1° 00' 06"	16' 22.53"	67° 50' 03"	0.19697
10	10° 32' 11"	1° 21' 26"	9° 08' 59"	5° 25' 10"	1° 00' 07"	16' 22.97"	67° 55' 50"	0.19306
11	11° 08' 33"	1° 24' 32"	9° 41' 21"	5° 42' 17"	1° 00' 09"	16' 23.42"	68° 1' 53"	0.18918
12	11° 44' 58"	1° 27' 38"	10° 13' 48"	5° 59' 24"	1° 00' 11"	16' 23.85"	68° 8' 10"	0.18532
13	12° 21' 25"	1° 30' 43"	10° 46' 19"	6° 16' 30"	1° 00' 12"	16' 24.29"	68° 14' 43"	0.18150
14	12° 57' 54"	1° 33' 48"	11° 18' 53"	6° 33' 35"	1° 00' 14"	16' 24.72"	68° 21' 31"	0.17769
15	13° 34' 25"	1° 36' 52"	11° 51' 32"	6° 50' 38"	1° 00' 15"	16' 25.14"	68° 28' 35"	0.17392
16	14° 10' 59"	1° 39' 56"	12° 24' 15"	7° 07' 41"	1° 00' 17"	16' 25.56"	68° 35' 54"	0.17018
17	14° 47' 34"	1° 42' 60"	12° 57' 02"	7° 24' 42"	1° 00' 18"	16' 25.97"	68° 43' 30"	0.16646
18	15° 24' 12"	1° 46' 02"	13° 29' 53"	7° 41' 41"	1° 00' 20"	16' 26.38"	68° 51' 22"	0.16278
19	16° 00' 51"	1° 49' 05"	14° 02' 49"	7° 58' 39"	1° 00' 21"	16' 26.78"	68° 59' 31"	0.15912
20	16° 37' 33"	1° 52' 06"	14° 35' 49"	8° 15' 35"	1° 00' 23"	16' 27.18"	69° 7' 57"	0.15550
21	17° 14' 17"	1° 55' 07"	15° 08' 54"	8° 32' 30"	1° 00' 24"	16' 27.58"	69° 16' 40"	0.15190
22	17° 51' 03"	1° 58' 08"	15° 42' 03"	8° 49' 22"	1° 00' 26"	16' 27.96"	69° 25' 40"	0.14834
23	18° 27' 51"	2° 01' 07"	16° 15' 18"	9° 06' 12"	1° 00' 27"	16' 28.34"	69° 34' 58"	0.14481
24	19° 04' 40"	2° 04' 07"	16° 48' 37"	9° 23' 00"	1° 00' 28"	16' 28.72"	69° 44' 35"	0.14132

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	63° 05' 38"	0.01"	61° 02' 51"	20° 46' 28"	1.0126171	15'47.67"	23° 26' 18"	3 m 10 s
1	63° 08' 03"	0.01"	61° 05' 22"	20° 46' 55"	1.0126250	15'47.67"	23° 26' 18"	3 m 09 s
2	63° 10' 27"	0.02"	61° 07' 53"	20° 47' 23"	1.0126329	15'47.66"	23° 26' 18"	3 m 09 s
3	63° 12' 51"	0.02"	61° 10' 25"	20° 47' 51"	1.0126408	15'47.65"	23° 26' 18"	3 m 09 s
4	63° 15' 15"	0.03"	61° 12' 56"	20° 48' 18"	1.0126486	15'47.64"	23° 26' 18"	3 m 09 s
5	63° 17' 39"	0.03"	61° 15' 27"	20° 48' 46"	1.0126565	15'47.64"	23° 26' 18"	3 m 09 s
6	63° 20' 04"	0.04"	61° 17' 59"	20° 49' 14"	1.0126643	15'47.63"	23° 26' 18"	3 m 08 s
7	63° 22' 28"	0.04"	61° 20' 30"	20° 49' 41"	1.0126722	15'47.62"	23° 26' 18"	3 m 08 s
8	63° 24' 52"	0.04"	61° 23' 02"	20° 50' 09"	1.0126800	15'47.61"	23° 26' 18"	3 m 08 s
9	63° 27' 16"	0.05"	61° 25' 33"	20° 50' 36"	1.0126879	15'47.61"	23° 26' 18"	3 m 08 s
10	63° 29' 41"	0.05"	61° 28' 05"	20° 51' 04"	1.0126957	15'47.60"	23° 26' 18"	3 m 07 s
11	63° 32' 05"	0.06"	61° 30' 36"	20° 51' 31"	1.0127035	15'47.59"	23° 26' 18"	3 m 07 s
12	63° 34' 29"	0.06"	61° 33' 08"	20° 51' 58"	1.0127113	15'47.58"	23° 26' 18"	3 m 07 s
13	63° 36' 53"	0.07"	61° 35' 39"	20° 52' 26"	1.0127191	15'47.58"	23° 26' 18"	3 m 07 s
14	63° 39' 17"	0.07"	61° 38' 11"	20° 52' 53"	1.0127269	15'47.57"	23° 26' 18"	3 m 06 s
15	63° 41' 41"	0.08"	61° 40' 42"	20° 53' 20"	1.0127346	15'47.56"	23° 26' 18"	3 m 06 s
16	63° 44' 06"	0.08"	61° 43' 14"	20° 53' 47"	1.0127424	15'47.56"	23° 26' 18"	3 m 06 s
17	63° 46' 30"	0.08"	61° 45' 46"	20° 54' 14"	1.0127501	15'47.55"	23° 26' 18"	3 m 06 s
18	63° 48' 54"	0.09"	61° 48' 17"	20° 54' 42"	1.0127579	15'47.54"	23° 26' 18"	3 m 05 s
19	63° 51' 18"	0.09"	61° 50' 49"	20° 55' 09"	1.0127656	15'47.53"	23° 26' 18"	3 m 05 s
20	63° 53' 42"	0.10"	61° 53' 20"	20° 55' 36"	1.0127734	15'47.53"	23° 26' 18"	3 m 05 s
21	63° 56' 07"	0.10"	61° 55' 52"	20° 56' 03"	1.0127811	15'47.52"	23° 26' 18"	3 m 05 s
22	63° 58' 31"	0.11"	61° 58' 24"	20° 56' 30"	1.0127888	15'47.51"	23° 26' 18"	3 m 04 s
23	64° 00' 55"	0.11"	62° 00' 55"	20° 56' 57"	1.0127965	15'47.51"	23° 26' 18"	3 m 04 s
24	64° 03' 19"	0.11"	62° 03' 27"	20° 57' 23"	1.0128042	15'47.50"	23° 26' 18"	3 m 04 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	19° 04' 40"	2° 04' 07"	16° 48' 37"	9° 23' 00"	1° 00' 28"	16' 28.72"	69° 44' 35"	0.14132
1	19° 41' 32"	2° 07' 05"	17° 22' 00"	9° 39' 46"	1° 00' 30"	16' 29.09"	69° 54' 29"	0.13785
2	20° 18' 26"	2° 10' 02"	17° 55' 29"	9° 56' 30"	1° 00' 31"	16' 29.46"	70° 4' 42"	0.13442
3	20° 55' 22"	2° 12' 59"	18° 29' 03"	10° 13' 10"	1° 00' 32"	16' 29.81"	70° 15' 15"	0.13103
4	21° 32' 19"	2° 15' 55"	19° 02' 42"	10° 29' 49"	1° 00' 34"	16' 30.17"	70° 26' 07"	0.12767
5	22° 09' 18"	2° 18' 50"	19° 36' 26"	10° 46' 24"	1° 00' 35"	16' 30.51"	70° 37' 19"	0.12434
6	22° 46' 20"	2° 21' 44"	20° 10' 16"	11° 02' 56"	1° 00' 36"	16' 30.86"	70° 48' 51"	0.12105
7	23° 23' 23"	2° 24' 38"	20° 44' 11"	11° 19' 26"	1° 00' 37"	16' 31.19"	71° 0' 44"	0.11779
8	24° 00' 28"	2° 27' 30"	21° 18' 11"	11° 35' 52"	1° 00' 39"	16' 31.52"	71° 12' 58"	0.11458
9	24° 37' 34"	2° 30' 22"	21° 52' 17"	11° 52' 15"	1° 00' 40"	16' 31.84"	71° 25' 34"	0.11140
10	25° 14' 43"	2° 33' 13"	22° 26' 28"	12° 08' 34"	1° 00' 41"	16' 32.15"	71° 38' 32"	0.10825
11	25° 51' 53"	2° 36' 02"	23° 00' 45"	12° 24' 50"	1° 00' 42"	16' 32.46"	71° 51' 53"	0.10515
12	26° 29' 05"	2° 38' 51"	23° 35' 07"	12° 41' 03"	1° 00' 43"	16' 32.76"	72° 5' 37"	0.10208
13	27° 06' 18"	2° 41' 39"	24° 09' 36"	12° 57' 11"	1° 00' 44"	16' 33.06"	72° 19' 45"	0.09905
14	27° 43' 33"	2° 44' 25"	24° 44' 10"	13° 13' 16"	1° 00' 45"	16' 33.35"	72° 34' 18"	0.09607
15	28° 20' 50"	2° 47' 11"	25° 18' 50"	13° 29' 16"	1° 00' 46"	16' 33.63"	72° 49' 16"	0.09312
16	28° 58' 08"	2° 49' 55"	25° 53' 36"	13° 45' 13"	1° 00' 47"	16' 33.90"	73° 4' 40"	0.09021
17	29° 35' 28"	2° 52' 38"	26° 28' 28"	14° 01' 05"	1° 00' 48"	16' 34.17"	73° 20' 31"	0.08734
18	30° 12' 49"	2° 55' 21"	27° 03' 26"	14° 16' 52"	1° 00' 49"	16' 34.43"	73° 36' 49"	0.08451
19	30° 50' 12"	2° 58' 02"	27° 38' 30"	14° 32' 35"	1° 00' 50"	16' 34.68"	73° 53' 37"	0.08173
20	31° 27' 36"	3° 00' 41"	28° 13' 41"	14° 48' 13"	1° 00' 51"	16' 34.93"	74° 10' 53"	0.07898
21	32° 05' 02"	3° 03' 20"	28° 48' 58"	15° 03' 47"	1° 00' 52"	16' 35.17"	74° 28' 40"	0.07628
22	32° 42' 29"	3° 05' 57"	29° 24' 21"	15° 19' 15"	1° 00' 53"	16' 35.40"	74° 46' 59"	0.07362
23	33° 19' 57"	3° 08' 33"	29° 59' 50"	15° 34' 38"	1° 00' 54"	16' 35.62"	75° 5' 51"	0.07101
24	33° 57' 27"	3° 11' 08"	30° 35' 25"	15° 49' 56"	1° 00' 54"	16' 35.84"	75° 25' 16"	0.06844

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	64° 03' 19"	0.11"	62° 03' 27"	20° 57' 23"	1.0128042	15'47.50"	23° 26' 18"	3 m 04 s
1	64° 05' 43"	0.12"	62° 05' 59"	20° 57' 50"	1.0128119	15'47.49"	23° 26' 18"	3 m 04 s
2	64° 08' 07"	0.12"	62° 08' 30"	20° 58' 17"	1.0128196	15'47.48"	23° 26' 18"	3 m 03 s
3	64° 10' 32"	0.13"	62° 11' 02"	20° 58' 44"	1.0128272	15'47.48"	23° 26' 18"	3 m 03 s
4	64° 12' 56"	0.13"	62° 13' 34"	20° 59' 11"	1.0128349	15'47.47"	23° 26' 18"	3 m 03 s
5	64° 15' 20"	0.13"	62° 16' 06"	20° 59' 37"	1.0128425	15'47.46"	23° 26' 18"	3 m 03 s
6	64° 17' 44"	0.14"	62° 18' 37"	21° 00' 04"	1.0128502	15'47.46"	23° 26' 18"	3 m 02 s
7	64° 20' 08"	0.14"	62° 21' 09"	21° 00' 31"	1.0128578	15'47.45"	23° 26' 18"	3 m 02 s
8	64° 22' 32"	0.14"	62° 23' 41"	21° 00' 57"	1.0128654	15'47.44"	23° 26' 18"	3 m 02 s
9	64° 24' 57"	0.15"	62° 26' 13"	21° 01' 24"	1.0128731	15'47.43"	23° 26' 18"	3 m 02 s
10	64° 27' 21"	0.15"	62° 28' 44"	21° 01' 50"	1.0128807	15'47.43"	23° 26' 18"	3 m 01 s
11	64° 29' 45"	0.16"	62° 31' 16"	21° 02' 17"	1.0128883	15'47.42"	23° 26' 18"	3 m 01 s
12	64° 32' 09"	0.16"	62° 33' 48"	21° 02' 43"	1.0128958	15'47.41"	23° 26' 18"	3 m 01 s
13	64° 34' 33"	0.16"	62° 36' 20"	21° 03' 10"	1.0129034	15'47.41"	23° 26' 18"	3 m 01 s
14	64° 36' 57"	0.17"	62° 38' 52"	21° 03' 36"	1.0129110	15'47.40"	23° 26' 18"	3 m 00 s
15	64° 39' 22"	0.17"	62° 41' 24"	21° 04' 02"	1.0129186	15'47.39"	23° 26' 18"	3 m 00 s
16	64° 41' 46"	0.17"	62° 43' 56"	21° 04' 29"	1.0129261	15'47.38"	23° 26' 18"	2 m 60 s
17	64° 44' 10"	0.18"	62° 46' 27"	21° 04' 55"	1.0129337	15'47.38"	23° 26' 18"	2 m 59 s
18	64° 46' 34"	0.18"	62° 48' 59"	21° 05' 21"	1.0129412	15'47.37"	23° 26' 18"	2 m 59 s
19	64° 48' 58"	0.18"	62° 51' 31"	21° 05' 47"	1.0129487	15'47.36"	23° 26' 18"	2 m 59 s
20	64° 51' 22"	0.19"	62° 54' 03"	21° 06' 13"	1.0129562	15'47.36"	23° 26' 18"	2 m 59 s
21	64° 53' 46"	0.19"	62° 56' 35"	21° 06' 39"	1.0129637	15'47.35"	23° 26' 18"	2 m 58 s
22	64° 56' 10"	0.19"	62° 59' 07"	21° 07' 06"	1.0129712	15'47.34"	23° 26' 18"	2 m 58 s
23	64° 58' 35"	0.20"	63° 01' 39"	21° 07' 32"	1.0129787	15'47.33"	23° 26' 18"	2 m 58 s
24	65° 00' 59"	0.20"	63° 04' 11"	21° 07' 58"	1.0129862	15'47.33"	23° 26' 18"	2 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	33° 57' 27"	3° 11' 08"	30° 35' 25"	15° 49' 56"	1° 00' 54"	16' 35.84"	75° 25' 16"	0.06844
1	34° 34' 58"	3° 13' 42"	31° 11' 08"	16° 05' 09"	1° 00' 55"	16' 36.04"	75° 45' 17"	0.06591
2	35° 12' 27"	3° 16' 14"	31° 46' 53"	16° 20' 15"	1° 00' 56"	16' 36.24"	76° 5' 53"	0.06343
3	35° 50' 00"	3° 18' 44"	32° 22' 48"	16° 35' 16"	1° 00' 57"	16' 36.44"	76° 27' 08"	0.06099
4	36° 27' 35"	3° 21' 14"	32° 58' 50"	16° 50' 12"	1° 00' 57"	16' 36.62"	76° 49' 04"	0.05860
5	37° 05' 11"	3° 23' 42"	33° 34' 58"	17° 05' 01"	1° 00' 58"	16' 36.80"	77° 11' 42"	0.05625
6	37° 42' 47"	3° 26' 08"	34° 11' 13"	17° 19' 45"	1° 00' 59"	16' 36.97"	77° 35' 03"	0.05394
7	38° 20' 25"	3° 28' 34"	34° 47' 34"	17° 34' 22"	1° 00' 59"	16' 37.13"	77° 59' 11"	0.05169
8	38° 58' 04"	3° 30' 57"	35° 24' 03"	17° 48' 53"	1° 00' 60"	16' 37.28"	78° 24' 06"	0.04948
9	39° 35' 44"	3° 33' 19"	36° 00' 37"	18° 03' 18"	1° 01' 00"	16' 37.43"	78° 49' 53"	0.04731
10	40° 13' 25"	3° 35' 40"	36° 37' 19"	18° 17' 36"	1° 01' 01"	16' 37.56"	79° 16' 33"	0.04520
11	40° 51' 07"	3° 37' 59"	37° 14' 07"	18° 31' 47"	1° 01' 01"	16' 37.69"	79° 44' 10"	0.04313
12	41° 28' 49"	3° 40' 17"	37° 51' 02"	18° 45' 51"	1° 01' 02"	16' 37.81"	80° 12' 46"	0.04111
13	42° 06' 33"	3° 42' 33"	38° 28' 04"	18° 59' 48"	1° 01' 02"	16' 37.92"	80° 42' 27"	0.03913
14	42° 44' 17"	3° 44' 47"	39° 05' 13"	19° 13' 38"	1° 01' 03"	16' 38.03"	81° 13' 14"	0.03721
15	43° 22' 02"	3° 47' 00"	39° 42' 28"	19° 27' 20"	1° 01' 03"	16' 38.12"	81° 45' 14"	0.03533
16	43° 59' 48"	3° 49' 11"	40° 19' 51"	19° 40' 56"	1° 01' 03"	16' 38.21"	82° 18' 31"	0.03350
17	44° 37' 34"	3° 51' 21"	40° 57' 20"	19° 54' 23"	1° 01' 03"	16' 38.29"	82° 53' 10"	0.03172
18	45° 15' 21"	3° 53' 29"	41° 34' 55"	20° 07' 43"	1° 01' 04"	16' 38.36"	83° 29' 17"	0.02999
19	45° 53' 08"	3° 55' 35"	42° 12' 38"	20° 20' 55"	1° 01' 04"	16' 38.42"	84° 6' 60"	0.02831
20	46° 30' 56"	3° 57' 40"	42° 50' 27"	20° 33' 59"	1° 01' 04"	16' 38.47"	84° 46' 25"	0.02668
21	47° 08' 45"	3° 59' 42"	43° 28' 24"	20° 46' 54"	1° 01' 04"	16' 38.51"	85° 27' 41"	0.02510
22	47° 46' 34"	4° 01' 43"	44° 06' 26"	20° 59' 42"	1° 01' 04"	16' 38.55"	86° 10' 58"	0.02357
23	48° 24' 24"	4° 03' 43"	44° 44' 36"	21° 12' 21"	1° 01' 05"	16' 38.58"	86° 56' 25"	0.02209
24	49° 02' 13"	4° 05' 40"	45° 22' 52"	21° 24' 51"	1° 01' 05"	16' 38.60"	87° 44' 15"	0.02067

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	65° 00' 59"	0.20"	63° 04' 11"	21° 07' 58"	1.0129862	15'47.33"	23° 26' 18"	2 m 58 s
1	65° 03' 23"	0.20"	63° 06' 43"	21° 08' 23"	1.0129937	15'47.32"	23° 26' 18"	2 m 57 s
2	65° 05' 47"	0.20"	63° 09' 15"	21° 08' 49"	1.0130011	15'47.31"	23° 26' 18"	2 m 57 s
3	65° 08' 11"	0.21"	63° 11' 47"	21° 09' 15"	1.0130086	15'47.31"	23° 26' 18"	2 m 57 s
4	65° 10' 35"	0.21"	63° 14' 19"	21° 09' 41"	1.0130160	15'47.30"	23° 26' 18"	2 m 57 s
5	65° 12' 59"	0.21"	63° 16' 51"	21° 10' 07"	1.0130235	15'47.29"	23° 26' 18"	2 m 56 s
6	65° 15' 23"	0.22"	63° 19' 23"	21° 10' 33"	1.0130309	15'47.29"	23° 26' 18"	2 m 56 s
7	65° 17' 48"	0.22"	63° 21' 55"	21° 10' 58"	1.0130383	15'47.28"	23° 26' 18"	2 m 56 s
8	65° 20' 12"	0.22"	63° 24' 28"	21° 11' 24"	1.0130457	15'47.27"	23° 26' 18"	2 m 55 s
9	65° 22' 36"	0.22"	63° 26' 60"	21° 11' 50"	1.0130531	15'47.27"	23° 26' 18"	2 m 55 s
10	65° 24' 60"	0.23"	63° 29' 32"	21° 12' 15"	1.0130605	15'47.26"	23° 26' 18"	2 m 55 s
11	65° 27' 24"	0.23"	63° 32' 04"	21° 12' 41"	1.0130679	15'47.25"	23° 26' 18"	2 m 55 s
12	65° 29' 48"	0.23"	63° 34' 36"	21° 13' 06"	1.0130752	15'47.24"	23° 26' 18"	2 m 54 s
13	65° 32' 12"	0.23"	63° 37' 08"	21° 13' 32"	1.0130826	15'47.24"	23° 26' 18"	2 m 54 s
14	65° 34' 36"	0.24"	63° 39' 40"	21° 13' 57"	1.0130899	15'47.23"	23° 26' 18"	2 m 54 s
15	65° 37' 00"	0.24"	63° 42' 13"	21° 14' 23"	1.0130973	15'47.22"	23° 26' 18"	2 m 53 s
16	65° 39' 25"	0.24"	63° 44' 45"	21° 14' 48"	1.0131046	15'47.22"	23° 26' 18"	2 m 53 s
17	65° 41' 49"	0.24"	63° 47' 17"	21° 15' 13"	1.0131119	15'47.21"	23° 26' 18"	2 m 53 s
18	65° 44' 13"	0.25"	63° 49' 49"	21° 15' 39"	1.0131193	15'47.20"	23° 26' 18"	2 m 53 s
19	65° 46' 37"	0.25"	63° 52' 21"	21° 16' 04"	1.0131266	15'47.20"	23° 26' 18"	2 m 52 s
20	65° 49' 01"	0.25"	63° 54' 54"	21° 16' 29"	1.0131338	15'47.19"	23° 26' 18"	2 m 52 s
21	65° 51' 25"	0.25"	63° 57' 26"	21° 16' 54"	1.0131411	15'47.18"	23° 26' 18"	2 m 52 s
22	65° 53' 49"	0.25"	63° 59' 58"	21° 17' 20"	1.0131484	15'47.18"	23° 26' 18"	2 m 51 s
23	65° 56' 13"	0.26"	64° 02' 30"	21° 17' 45"	1.0131557	15'47.17"	23° 26' 18"	2 m 51 s
24	65° 58' 37"	0.26"	64° 05' 03"	21° 18' 10"	1.0131629	15'47.16"	23° 26' 18"	2 m 51 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	49° 02' 13"	4° 05' 40"	45° 22' 52"	21° 24' 51"	1° 01' 05"	16' 38.60"	87° 44' 15"	0.02067
1	49° 40' 04"	4° 07' 36"	46° 01' 15"	21° 37' 13"	1° 01' 05"	16' 38.61"	88° 34' 43"	0.01929
2	50° 17' 54"	4° 09' 30"	46° 39' 45"	21° 49' 26"	1° 01' 05"	16' 38.61"	89° 28' 02"	0.01796
3	50° 55' 45"	4° 11' 22"	47° 18' 21"	22° 01' 30"	1° 01' 05"	16' 38.60"	90° 24' 30"	0.01669
4	51° 33' 36"	4° 13' 12"	47° 57' 04"	22° 13' 25"	1° 01' 05"	16' 38.58"	91° 24' 29"	0.01546
5	52° 11' 27"	4° 15' 00"	48° 35' 54"	22° 25' 10"	1° 01' 04"	16' 38.56"	92° 28' 20"	0.01429
6	52° 49' 18"	4° 16' 47"	49° 14' 49"	22° 36' 47"	1° 01' 04"	16' 38.52"	93° 36' 32"	0.01317
7	53° 27' 09"	4° 18' 31"	49° 53' 52"	22° 48' 13"	1° 01' 04"	16' 38.48"	94° 49' 34"	0.01210
8	54° 05' 00"	4° 20' 14"	50° 33' 00"	22° 59' 31"	1° 01' 04"	16' 38.43"	96° 8' 02"	0.01108
9	54° 42' 51"	4° 21' 55"	51° 12' 15"	23° 10' 38"	1° 01' 04"	16' 38.37"	97° 32' 39"	0.01012
10	55° 20' 42"	4° 23' 33"	51° 51' 36"	23° 21' 36"	1° 01' 04"	16' 38.30"	99° 4' 13"	0.00921
11	55° 58' 33"	4° 25' 10"	52° 31' 04"	23° 32' 24"	1° 01' 03"	16' 38.22"	100° 43' 41"	0.00835
12	56° 36' 24"	4° 26' 45"	53° 10' 37"	23° 43' 01"	1° 01' 03"	16' 38.13"	102° 32' 11"	0.00754
13	57° 14' 15"	4° 28' 18"	53° 50' 17"	23° 53' 29"	1° 01' 03"	16' 38.04"	104° 31' 01"	0.00679
14	57° 52' 05"	4° 29' 49"	54° 30' 02"	24° 03' 46"	1° 01' 02"	16' 37.93"	106° 41' 44"	0.00608
15	58° 29' 55"	4° 31' 18"	55° 09' 53"	24° 13' 52"	1° 01' 02"	16' 37.82"	109° 6' 09"	0.00543
16	59° 07' 45"	4° 32' 45"	55° 49' 50"	24° 23' 48"	1° 01' 01"	16' 37.70"	111° 46' 20"	0.00484
17	59° 45' 34"	4° 34' 10"	56° 29' 53"	24° 33' 34"	1° 01' 01"	16' 37.57"	114° 44' 45"	0.00429
18	60° 23' 23"	4° 35' 33"	57° 10' 01"	24° 43' 08"	1° 01' 00"	16' 37.43"	118° 4' 07"	0.00380
19	61° 01' 12"	4° 36' 54"	57° 50' 15"	24° 52' 32"	1° 00' 60"	16' 37.28"	121° 47' 27"	0.00336
20	61° 38' 60"	4° 38' 12"	58° 30' 34"	25° 01' 45"	1° 00' 59"	16' 37.13"	125° 57' 53"	0.00297
21	62° 16' 47"	4° 39' 29"	59° 10' 59"	25° 10' 46"	1° 00' 59"	16' 36.96"	130° 38' 26"	0.00264
22	62° 54' 34"	4° 40' 44"	59° 51' 28"	25° 19' 37"	1° 00' 58"	16' 36.79"	135° 51' 28"	0.00236
23	63° 32' 20"	4° 41' 56"	60° 32' 03"	25° 28' 16"	1° 00' 57"	16' 36.61"	141° 38' 06"	0.00213
24	64° 10' 05"	4° 43' 07"	61° 12' 42"	25° 36' 44"	1° 00' 57"	16' 36.42"	147° 57' 12"	0.00195

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	65° 58' 37"	0.26"	64° 05' 03"	21° 18' 10"	1.0131629	15'47.16"	23° 26' 18"	2 m 51 s
1	66° 01' 01"	0.26"	64° 07' 35"	21° 18' 35"	1.0131702	15'47.16"	23° 26' 18"	2 m 51 s
2	66° 03' 25"	0.26"	64° 10' 07"	21° 18' 60"	1.0131774	15'47.15"	23° 26' 18"	2 m 50 s
3	66° 05' 49"	0.26"	64° 12' 40"	21° 19' 25"	1.0131847	15'47.14"	23° 26' 18"	2 m 50 s
4	66° 08' 14"	0.27"	64° 15' 12"	21° 19' 50"	1.0131919	15'47.14"	23° 26' 18"	2 m 50 s
5	66° 10' 38"	0.27"	64° 17' 44"	21° 20' 14"	1.0131991	15'47.13"	23° 26' 18"	2 m 49 s
6	66° 13' 02"	0.27"	64° 20' 17"	21° 20' 39"	1.0132063	15'47.12"	23° 26' 18"	2 m 49 s
7	66° 15' 26"	0.27"	64° 22' 49"	21° 21' 04"	1.0132135	15'47.12"	23° 26' 18"	2 m 49 s
8	66° 17' 50"	0.27"	64° 25' 21"	21° 21' 29"	1.0132207	15'47.11"	23° 26' 18"	2 m 49 s
9	66° 20' 14"	0.27"	64° 27' 54"	21° 21' 54"	1.0132278	15'47.10"	23° 26' 18"	2 m 48 s
10	66° 22' 38"	0.28"	64° 30' 26"	21° 22' 18"	1.0132350	15'47.10"	23° 26' 18"	2 m 48 s
11	66° 25' 02"	0.28"	64° 32' 59"	21° 22' 43"	1.0132422	15'47.09"	23° 26' 18"	2 m 48 s
12	66° 27' 26"	0.28"	64° 35' 31"	21° 23' 08"	1.0132493	15'47.08"	23° 26' 18"	2 m 47 s
13	66° 29' 50"	0.28"	64° 38' 04"	21° 23' 32"	1.0132564	15'47.08"	23° 26' 18"	2 m 47 s
14	66° 32' 14"	0.28"	64° 40' 36"	21° 23' 57"	1.0132636	15'47.07"	23° 26' 18"	2 m 47 s
15	66° 34' 38"	0.28"	64° 43' 09"	21° 24' 21"	1.0132707	15'47.06"	23° 26' 18"	2 m 46 s
16	66° 37' 02"	0.28"	64° 45' 41"	21° 24' 46"	1.0132778	15'47.06"	23° 26' 18"	2 m 46 s
17	66° 39' 26"	0.28"	64° 48' 14"	21° 25' 10"	1.0132849	15'47.05"	23° 26' 18"	2 m 46 s
18	66° 41' 50"	0.29"	64° 50' 46"	21° 25' 34"	1.0132920	15'47.04"	23° 26' 18"	2 m 45 s
19	66° 44' 14"	0.29"	64° 53' 19"	21° 25' 59"	1.0132991	15'47.04"	23° 26' 18"	2 m 45 s
20	66° 46' 38"	0.29"	64° 55' 51"	21° 26' 23"	1.0133061	15'47.03"	23° 26' 18"	2 m 45 s
21	66° 49' 02"	0.29"	64° 58' 24"	21° 26' 47"	1.0133132	15'47.02"	23° 26' 18"	2 m 45 s
22	66° 51' 26"	0.29"	65° 00' 56"	21° 27' 11"	1.0133202	15'47.02"	23° 26' 18"	2 m 44 s
23	66° 53' 51"	0.29"	65° 03' 29"	21° 27' 36"	1.0133273	15'47.01"	23° 26' 18"	2 m 44 s
24	66° 56' 15"	0.29"	65° 06' 01"	21° 27' 60"	1.0133343	15'47.00"	23° 26' 18"	2 m 44 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	64° 10' 05"	4° 43' 07"	61° 12' 42"	25° 36' 44"	1° 00' 57"	16' 36.42"	147° 57' 12"	0.00195
1	64° 47' 50"	4° 44' 15"	61° 53' 26"	25° 45' 00"	1° 00' 56"	16' 36.22"	154° 44' 39"	0.00183
2	65° 25' 34"	4° 45' 22"	62° 34' 15"	25° 53' 05"	1° 00' 55"	16' 36.01"	161° 52' 49"	0.00176
3	66° 03' 17"	4° 46' 26"	63° 15' 08"	26° 00' 58"	1° 00' 54"	16' 35.80"	169° 11' 02"	0.00174
4	66° 40' 59"	4° 47' 28"	63° 56' 06"	26° 08' 39"	1° 00' 54"	16' 35.57"	176° 26' 57"	0.00178
5	67° 18' 38"	4° 48' 28"	64° 37' 06"	26° 16' 08"	1° 00' 53"	16' 35.34"	183° 28' 18"	0.00187
6	67° 56' 18"	4° 49' 26"	65° 18' 12"	26° 23' 26"	1° 00' 52"	16' 35.10"	190° 6' 09"	0.00200
7	68° 33' 57"	4° 50' 21"	65° 59' 22"	26° 30' 31"	1° 00' 51"	16' 34.85"	196° 13' 53"	0.00220
8	69° 11' 36"	4° 51' 15"	66° 40' 35"	26° 37' 25"	1° 00' 50"	16' 34.59"	201° 48' 38"	0.00244
9	69° 49' 12"	4° 52' 07"	67° 21' 52"	26° 44' 06"	1° 00' 49"	16' 34.33"	206° 50' 15"	0.00274
10	70° 26' 48"	4° 52' 56"	68° 03' 13"	26° 50' 35"	1° 00' 48"	16' 34.05"	211° 20' 24"	0.00308
11	71° 04' 23"	4° 53' 43"	68° 44' 37"	26° 56' 52"	1° 00' 47"	16' 33.77"	215° 21' 47"	0.00348
12	71° 41' 56"	4° 54' 28"	69° 26' 03"	27° 02' 56"	1° 00' 46"	16' 33.48"	218° 57' 30"	0.00393
13	72° 19' 29"	4° 55' 11"	70° 07' 33"	27° 08' 49"	1° 00' 45"	16' 33.18"	222° 10' 40"	0.00443
14	72° 56' 59"	4° 55' 52"	70° 49' 06"	27° 14' 28"	1° 00' 44"	16' 32.88"	225° 4' 12"	0.00499
15	73° 34' 29"	4° 56' 30"	71° 30' 41"	27° 19' 55"	1° 00' 42"	16' 32.57"	227° 40' 43"	0.00559
16	74° 11' 57"	4° 57' 07"	72° 12' 18"	27° 25' 10"	1° 00' 41"	16' 32.24"	230° 2' 30"	0.00625
17	74° 49' 24"	4° 57' 41"	72° 53' 58"	27° 30' 12"	1° 00' 40"	16' 31.92"	232° 11' 33"	0.00695
18	75° 26' 49"	4° 58' 13"	73° 35' 40"	27° 35' 01"	1° 00' 39"	16' 31.58"	234° 9' 34"	0.00771
19	76° 04' 12"	4° 58' 43"	74° 17' 23"	27° 39' 38"	1° 00' 38"	16' 31.24"	235° 57' 60"	0.00852
20	76° 41' 34"	4° 59' 11"	74° 59' 08"	27° 44' 02"	1° 00' 36"	16' 30.89"	237° 38' 04"	0.00937
21	77° 18' 55"	4° 59' 37"	75° 40' 55"	27° 48' 13"	1° 00' 35"	16' 30.53"	239° 10' 50"	0.01028
22	77° 56' 14"	5° 00' 00"	76° 22' 43"	27° 52' 11"	1° 00' 34"	16' 30.16"	240° 37' 11"	0.01124
23	78° 33' 31"	5° 00' 21"	77° 04' 32"	27° 55' 57"	1° 00' 32"	16' 29.79"	241° 57' 53"	0.01224
24	79° 10' 46"	5° 00' 41"	77° 46' 21"	27° 59' 30"	1° 00' 31"	16' 29.41"	243° 13' 36"	0.01330

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	66° 56' 15"	0.29"	65° 06' 01"	21° 27' 60"	1.0133343	15'47.00"	23° 26' 18"	2 m 44 s
1	66° 58' 39"	0.29"	65° 08' 34"	21° 28' 24"	1.0133413	15'47.00"	23° 26' 18"	2 m 43 s
2	67° 01' 03"	0.29"	65° 11' 07"	21° 28' 48"	1.0133484	15'46.99"	23° 26' 18"	2 m 43 s
3	67° 03' 27"	0.29"	65° 13' 39"	21° 29' 12"	1.0133554	15'46.98"	23° 26' 18"	2 m 43 s
4	67° 05' 51"	0.29"	65° 16' 12"	21° 29' 36"	1.0133624	15'46.98"	23° 26' 18"	2 m 42 s
5	67° 08' 15"	0.29"	65° 18' 44"	21° 29' 60"	1.0133693	15'46.97"	23° 26' 18"	2 m 42 s
6	67° 10' 39"	0.29"	65° 21' 17"	21° 30' 24"	1.0133763	15'46.96"	23° 26' 18"	2 m 42 s
7	67° 13' 03"	0.29"	65° 23' 50"	21° 30' 48"	1.0133833	15'46.96"	23° 26' 18"	2 m 41 s
8	67° 15' 27"	0.29"	65° 26' 22"	21° 31' 11"	1.0133903	15'46.95"	23° 26' 18"	2 m 41 s
9	67° 17' 51"	0.29"	65° 28' 55"	21° 31' 35"	1.0133972	15'46.94"	23° 26' 18"	2 m 41 s
10	67° 20' 15"	0.29"	65° 31' 28"	21° 31' 59"	1.0134041	15'46.94"	23° 26' 18"	2 m 40 s
11	67° 22' 39"	0.30"	65° 34' 00"	21° 32' 23"	1.0134111	15'46.93"	23° 26' 18"	2 m 40 s
12	67° 25' 03"	0.30"	65° 36' 33"	21° 32' 46"	1.0134180	15'46.92"	23° 26' 18"	2 m 40 s
13	67° 27' 27"	0.30"	65° 39' 06"	21° 33' 10"	1.0134249	15'46.92"	23° 26' 18"	2 m 40 s
14	67° 29' 51"	0.30"	65° 41' 39"	21° 33' 34"	1.0134318	15'46.91"	23° 26' 18"	2 m 39 s
15	67° 32' 15"	0.30"	65° 44' 11"	21° 33' 57"	1.0134387	15'46.90"	23° 26' 18"	2 m 39 s
16	67° 34' 39"	0.29"	65° 46' 44"	21° 34' 21"	1.0134456	15'46.90"	23° 26' 18"	2 m 39 s
17	67° 37' 03"	0.29"	65° 49' 17"	21° 34' 44"	1.0134525	15'46.89"	23° 26' 18"	2 m 38 s
18	67° 39' 27"	0.29"	65° 51' 50"	21° 35' 08"	1.0134593	15'46.89"	23° 26' 18"	2 m 38 s
19	67° 41' 51"	0.29"	65° 54' 23"	21° 35' 31"	1.0134662	15'46.88"	23° 26' 18"	2 m 38 s
20	67° 44' 15"	0.29"	65° 56' 55"	21° 35' 54"	1.0134731	15'46.87"	23° 26' 18"	2 m 37 s
21	67° 46' 39"	0.29"	65° 59' 28"	21° 36' 18"	1.0134799	15'46.87"	23° 26' 18"	2 m 37 s
22	67° 49' 03"	0.29"	66° 02' 01"	21° 36' 41"	1.0134867	15'46.86"	23° 26' 18"	2 m 37 s
23	67° 51' 27"	0.29"	66° 04' 34"	21° 37' 04"	1.0134935	15'46.85"	23° 26' 18"	2 m 36 s
24	67° 53' 51"	0.29"	66° 07' 07"	21° 37' 27"	1.0135004	15'46.85"	23° 26' 18"	2 m 36 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	79° 10' 46"	5° 00' 41"	77° 46' 21"	27° 59' 30"	1° 00' 31"	16' 29.41"	243° 13' 36"	0.01330
1	79° 47' 60"	5° 00' 58"	78° 28' 12"	28° 02' 49"	1° 00' 29"	16' 29.02"	244° 24' 52"	0.01440
2	80° 25' 12"	5° 01' 13"	79° 10' 03"	28° 05' 56"	1° 00' 28"	16' 28.63"	245° 32' 12"	0.01555
3	81° 02' 22"	5° 01' 25"	79° 51' 54"	28° 08' 51"	1° 00' 27"	16' 28.22"	246° 36' 00"	0.01675
4	81° 39' 30"	5° 01' 36"	80° 33' 45"	28° 11' 32"	1° 00' 25"	16' 27.82"	247° 36' 38"	0.01800
5	82° 16' 36"	5° 01' 45"	81° 15' 36"	28° 14' 00"	1° 00' 24"	16' 27.40"	248° 34' 26"	0.01930
6	82° 53' 40"	5° 01' 51"	81° 57' 27"	28° 16' 16"	1° 00' 22"	16' 26.98"	249° 29' 38"	0.02064
7	83° 30' 42"	5° 01' 55"	82° 39' 17"	28° 18' 18"	1° 00' 20"	16' 26.55"	250° 22' 32"	0.02203
8	84° 07' 43"	5° 01' 57"	83° 21' 06"	28° 20' 08"	1° 00' 19"	16' 26.12"	251° 13' 18"	0.02347
9	84° 44' 41"	5° 01' 57"	84° 02' 54"	28° 21' 45"	1° 00' 17"	16' 25.67"	252° 2' 08"	0.02496
10	85° 21' 37"	5° 01' 55"	84° 44' 41"	28° 23' 09"	1° 00' 16"	16' 25.23"	252° 49' 13"	0.02649
11	85° 58' 31"	5° 01' 51"	85° 26' 27"	28° 24' 20"	1° 00' 14"	16' 24.77"	253° 34' 40"	0.02806
12	86° 35' 23"	5° 01' 45"	86° 08' 11"	28° 25' 18"	1° 00' 12"	16' 24.31"	254° 18' 39"	0.02969
13	87° 12' 12"	5° 01' 37"	86° 49' 54"	28° 26' 04"	1° 00' 10"	16' 23.85"	255° 1' 15"	0.03135
14	87° 48' 60"	5° 01' 26"	87° 31' 34"	28° 26' 37"	1° 00' 09"	16' 23.38"	255° 42' 35"	0.03307
15	88° 25' 45"	5° 01' 14"	88° 13' 13"	28° 26' 57"	1° 00' 07"	16' 22.90"	256° 22' 45"	0.03482
16	89° 02' 28"	5° 00' 59"	88° 54' 48"	28° 27' 04"	1° 00' 05"	16' 22.41"	257° 1' 50"	0.03663
17	89° 39' 08"	5° 00' 42"	89° 36' 22"	28° 26' 59"	1° 00' 03"	16' 21.92"	257° 39' 54"	0.03847
18	90° 15' 46"	5° 00' 24"	90° 17' 52"	28° 26' 41"	1° 00' 02"	16' 21.43"	258° 17' 01"	0.04036
19	90° 52' 22"	5° 00' 03"	90° 59' 20"	28° 26' 10"	0° 59' 60"	16' 20.93"	258° 53' 16"	0.04229
20	91° 28' 56"	4° 59' 40"	91° 40' 44"	28° 25' 27"	0° 59' 58"	16' 20.42"	259° 28' 40"	0.04427
21	92° 05' 27"	4° 59' 16"	92° 22' 05"	28° 24' 32"	0° 59' 56"	16' 19.91"	260° 3' 18"	0.04629
22	92° 41' 55"	4° 58' 49"	93° 03' 23"	28° 23' 24"	0° 59' 54"	16' 19.40"	260° 37' 12"	0.04835
23	93° 18' 21"	4° 58' 20"	93° 44' 37"	28° 22' 03"	0° 59' 52"	16' 18.88"	261° 10' 24"	0.05045
24	93° 54' 45"	4° 57' 49"	94° 25' 47"	28° 20' 31"	0° 59' 50"	16' 18.35"	261° 42' 57"	0.05259

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	67° 53' 51"	0.29"	66° 07' 07"	21° 37' 27"	1.0135004	15'46.85"	23° 26' 18"	2 m 36 s
1	67° 56' 15"	0.29"	66° 09' 40"	21° 37' 51"	1.0135072	15'46.84"	23° 26' 18"	2 m 36 s
2	67° 58' 39"	0.29"	66° 12' 13"	21° 38' 14"	1.0135140	15'46.83"	23° 26' 18"	2 m 35 s
3	68° 01' 03"	0.29"	66° 14' 45"	21° 38' 37"	1.0135207	15'46.83"	23° 26' 18"	2 m 35 s
4	68° 03' 27"	0.29"	66° 17' 18"	21° 38' 60"	1.0135275	15'46.82"	23° 26' 18"	2 m 35 s
5	68° 05' 51"	0.29"	66° 19' 51"	21° 39' 23"	1.0135343	15'46.82"	23° 26' 18"	2 m 34 s
6	68° 08' 14"	0.29"	66° 22' 24"	21° 39' 46"	1.0135410	15'46.81"	23° 26' 18"	2 m 34 s
7	68° 10' 38"	0.29"	66° 24' 57"	21° 40' 09"	1.0135478	15'46.80"	23° 26' 18"	2 m 34 s
8	68° 13' 02"	0.29"	66° 27' 30"	21° 40' 32"	1.0135545	15'46.80"	23° 26' 18"	2 m 33 s
9	68° 15' 26"	0.28"	66° 30' 03"	21° 40' 55"	1.0135613	15'46.79"	23° 26' 18"	2 m 33 s
10	68° 17' 50"	0.28"	66° 32' 36"	21° 41' 17"	1.0135680	15'46.78"	23° 26' 18"	2 m 33 s
11	68° 20' 14"	0.28"	66° 35' 09"	21° 41' 40"	1.0135747	15'46.78"	23° 26' 18"	2 m 32 s
12	68° 22' 38"	0.28"	66° 37' 42"	21° 42' 03"	1.0135814	15'46.77"	23° 26' 18"	2 m 32 s
13	68° 25' 02"	0.28"	66° 40' 15"	21° 42' 26"	1.0135881	15'46.77"	23° 26' 18"	2 m 32 s
14	68° 27' 26"	0.28"	66° 42' 48"	21° 42' 48"	1.0135948	15'46.76"	23° 26' 18"	2 m 31 s
15	68° 29' 50"	0.28"	66° 45' 21"	21° 43' 11"	1.0136015	15'46.75"	23° 26' 18"	2 m 31 s
16	68° 32' 14"	0.28"	66° 47' 54"	21° 43' 33"	1.0136081	15'46.75"	23° 26' 18"	2 m 31 s
17	68° 34' 38"	0.27"	66° 50' 27"	21° 43' 56"	1.0136148	15'46.74"	23° 26' 18"	2 m 30 s
18	68° 37' 02"	0.27"	66° 53' 00"	21° 44' 18"	1.0136214	15'46.73"	23° 26' 18"	2 m 30 s
19	68° 39' 26"	0.27"	66° 55' 33"	21° 44' 41"	1.0136281	15'46.73"	23° 26' 18"	2 m 30 s
20	68° 41' 50"	0.27"	66° 58' 06"	21° 45' 03"	1.0136347	15'46.72"	23° 26' 18"	2 m 29 s
21	68° 44' 14"	0.27"	67° 00' 39"	21° 45' 26"	1.0136413	15'46.72"	23° 26' 18"	2 m 29 s
22	68° 46' 38"	0.27"	67° 03' 12"	21° 45' 48"	1.0136479	15'46.71"	23° 26' 18"	2 m 29 s
23	68° 49' 02"	0.27"	67° 05' 46"	21° 46' 10"	1.0136545	15'46.70"	23° 26' 18"	2 m 28 s
24	68° 51' 25"	0.26"	67° 08' 19"	21° 46' 33"	1.0136611	15'46.70"	23° 26' 18"	2 m 28 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	93° 54' 45"	4° 57' 49"	94° 25' 47"	28° 20' 31"	0° 59' 50"	16' 18.35"	261° 42' 57"	0.05259
1	94° 31' 06"	4° 57' 17"	95° 06' 53"	28° 18' 46"	0° 59' 48"	16' 17.82"	262° 14' 53"	0.05477
2	95° 07' 24"	4° 56' 42"	95° 47' 54"	28° 16' 49"	0° 59' 46"	16' 17.28"	262° 46' 14"	0.05700
3	95° 43' 40"	4° 56' 05"	96° 28' 51"	28° 14' 40"	0° 59' 44"	16' 16.74"	263° 17' 01"	0.05926
4	96° 19' 54"	4° 55' 27"	97° 09' 44"	28° 12' 19"	0° 59' 42"	16' 16.20"	263° 47' 16"	0.06157
5	96° 56' 04"	4° 54' 46"	97° 50' 32"	28° 09' 45"	0° 59' 40"	16' 15.65"	264° 17' 00"	0.06391
6	97° 32' 12"	4° 54' 04"	98° 31' 15"	28° 07' 00"	0° 59' 38"	16' 15.09"	264° 46' 15"	0.06629
7	98° 08' 17"	4° 53' 19"	99° 11' 52"	28° 04' 03"	0° 59' 36"	16' 14.54"	265° 15' 02"	0.06871
8	98° 44' 20"	4° 52' 33"	99° 52' 25"	28° 00' 55"	0° 59' 34"	16' 13.97"	265° 43' 22"	0.07117
9	99° 20' 20"	4° 51' 45"	100° 32' 52"	27° 57' 34"	0° 59' 32"	16' 13.41"	266° 11' 16"	0.07366
10	99° 56' 17"	4° 50' 55"	101° 13' 14"	27° 54' 03"	0° 59' 30"	16' 12.84"	266° 38' 45"	0.07620
11	100° 32' 11"	4° 50' 03"	101° 53' 29"	27° 50' 19"	0° 59' 28"	16' 12.26"	267° 5' 50"	0.07877
12	101° 08' 03"	4° 49' 09"	102° 33' 39"	27° 46' 24"	0° 59' 26"	16' 11.69"	267° 32' 31"	0.08137
13	101° 43' 52"	4° 48' 14"	103° 13' 43"	27° 42' 18"	0° 59' 24"	16' 11.10"	267° 58' 50"	0.08402
14	102° 19' 38"	4° 47' 17"	103° 53' 41"	27° 38' 01"	0° 59' 22"	16' 10.52"	268° 24' 47"	0.08669
15	102° 55' 21"	4° 46' 17"	104° 33' 33"	27° 33' 33"	0° 59' 19"	16' 09.93"	268° 50' 23"	0.08941
16	103° 31' 01"	4° 45' 16"	105° 13' 18"	27° 28' 53"	0° 59' 17"	16' 09.34"	269° 15' 38"	0.09215
17	104° 06' 38"	4° 44' 14"	105° 52' 57"	27° 24' 03"	0° 59' 15"	16' 08.75"	269° 40' 33"	0.09494
18	104° 42' 13"	4° 43' 09"	106° 32' 29"	27° 19' 02"	0° 59' 13"	16' 08.15"	270° 5' 08"	0.09775
19	105° 17' 45"	4° 42' 03"	107° 11' 55"	27° 13' 50"	0° 59' 11"	16' 07.55"	270° 29' 24"	0.10060
20	105° 53' 13"	4° 40' 55"	107° 51' 13"	27° 08' 28"	0° 59' 08"	16' 06.94"	270° 53' 21"	0.10348
21	106° 28' 39"	4° 39' 45"	108° 30' 25"	27° 02' 55"	0° 59' 06"	16' 06.34"	271° 16' 60"	0.10639
22	107° 04' 02"	4° 38' 34"	109° 09' 30"	26° 57' 12"	0° 59' 04"	16' 05.73"	271° 40' 21"	0.10934
23	107° 39' 22"	4° 37' 21"	109° 48' 27"	26° 51' 18"	0° 59' 02"	16' 05.12"	272° 3' 24"	0.11232
24	108° 14' 39"	4° 36' 06"	110° 27' 17"	26° 45' 14"	0° 58' 59"	16' 04.50"	272° 26' 10"	0.11533

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	68° 51' 25"	0.26"	67° 08' 19"	21° 46' 33"	1.0136611	15'46.70"	23° 26' 18"	2 m 28 s
1	68° 53' 49"	0.26"	67° 10' 52"	21° 46' 55"	1.0136677	15'46.69"	23° 26' 18"	2 m 28 s
2	68° 56' 13"	0.26"	67° 13' 25"	21° 47' 17"	1.0136743	15'46.68"	23° 26' 18"	2 m 27 s
3	68° 58' 37"	0.26"	67° 15' 58"	21° 47' 39"	1.0136809	15'46.68"	23° 26' 18"	2 m 27 s
4	69° 01' 01"	0.26"	67° 18' 31"	21° 48' 01"	1.0136874	15'46.67"	23° 26' 18"	2 m 26 s
5	69° 03' 25"	0.25"	67° 21' 04"	21° 48' 23"	1.0136940	15'46.67"	23° 26' 18"	2 m 26 s
6	69° 05' 49"	0.25"	67° 23' 38"	21° 48' 45"	1.0137005	15'46.66"	23° 26' 18"	2 m 26 s
7	69° 08' 13"	0.25"	67° 26' 11"	21° 49' 07"	1.0137071	15'46.65"	23° 26' 18"	2 m 25 s
8	69° 10' 37"	0.25"	67° 28' 44"	21° 49' 29"	1.0137136	15'46.65"	23° 26' 18"	2 m 25 s
9	69° 13' 01"	0.24"	67° 31' 17"	21° 49' 51"	1.0137201	15'46.64"	23° 26' 18"	2 m 25 s
10	69° 15' 25"	0.24"	67° 33' 51"	21° 50' 13"	1.0137266	15'46.64"	23° 26' 18"	2 m 24 s
11	69° 17' 48"	0.24"	67° 36' 24"	21° 50' 35"	1.0137331	15'46.63"	23° 26' 18"	2 m 24 s
12	69° 20' 12"	0.24"	67° 38' 57"	21° 50' 57"	1.0137396	15'46.62"	23° 26' 18"	2 m 24 s
13	69° 22' 36"	0.24"	67° 41' 30"	21° 51' 18"	1.0137461	15'46.62"	23° 26' 18"	2 m 23 s
14	69° 25' 00"	0.23"	67° 44' 04"	21° 51' 40"	1.0137526	15'46.61"	23° 26' 18"	2 m 23 s
15	69° 27' 24"	0.23"	67° 46' 37"	21° 52' 02"	1.0137590	15'46.61"	23° 26' 18"	2 m 23 s
16	69° 29' 48"	0.23"	67° 49' 10"	21° 52' 23"	1.0137655	15'46.60"	23° 26' 18"	2 m 22 s
17	69° 32' 12"	0.23"	67° 51' 43"	21° 52' 45"	1.0137719	15'46.59"	23° 26' 18"	2 m 22 s
18	69° 34' 36"	0.22"	67° 54' 17"	21° 53' 06"	1.0137784	15'46.59"	23° 26' 18"	2 m 21 s
19	69° 36' 60"	0.22"	67° 56' 50"	21° 53' 28"	1.0137848	15'46.58"	23° 26' 18"	2 m 21 s
20	69° 39' 23"	0.22"	67° 59' 23"	21° 53' 49"	1.0137912	15'46.58"	23° 26' 18"	2 m 21 s
21	69° 41' 47"	0.21"	68° 01' 57"	21° 54' 11"	1.0137976	15'46.57"	23° 26' 18"	2 m 20 s
22	69° 44' 11"	0.21"	68° 04' 30"	21° 54' 32"	1.0138040	15'46.56"	23° 26' 18"	2 m 20 s
23	69° 46' 35"	0.21"	68° 07' 03"	21° 54' 54"	1.0138104	15'46.56"	23° 26' 18"	2 m 20 s
24	69° 48' 59"	0.21"	68° 09' 37"	21° 55' 15"	1.0138168	15'46.55"	23° 26' 18"	2 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	108° 14' 39"	4° 36' 06"	110° 27' 17"	26° 45' 14"	0° 58' 59"	16' 04.50"	272° 26' 10"	0.11533
1	108° 49' 53"	4° 34' 50"	111° 06' 00"	26° 39' 00"	0° 58' 57"	16' 03.89"	272° 48' 39"	0.11837
2	109° 25' 04"	4° 33' 32"	111° 44' 36"	26° 32' 36"	0° 58' 55"	16' 03.27"	273° 10' 51"	0.12144
3	110° 00' 12"	4° 32' 12"	112° 23' 04"	26° 26' 03"	0° 58' 53"	16' 02.65"	273° 32' 47"	0.12453
4	110° 35' 17"	4° 30' 51"	113° 01' 24"	26° 19' 19"	0° 58' 50"	16' 02.03"	273° 54' 27"	0.12766
5	111° 10' 19"	4° 29' 28"	113° 39' 37"	26° 12' 26"	0° 58' 48"	16' 01.40"	274° 15' 51"	0.13082
6	111° 45' 18"	4° 28' 04"	114° 17' 42"	26° 05' 24"	0° 58' 46"	16' 00.78"	274° 36' 59"	0.13401
7	112° 20' 14"	4° 26' 38"	114° 55' 39"	25° 58' 12"	0° 58' 43"	16' 00.15"	274° 57' 52"	0.13722
8	112° 55' 06"	4° 25' 11"	115° 33' 28"	25° 50' 51"	0° 58' 41"	15' 59.52"	275° 18' 29"	0.14046
9	113° 29' 56"	4° 23' 42"	116° 11' 10"	25° 43' 20"	0° 58' 39"	15' 58.89"	275° 38' 51"	0.14373
10	114° 04' 43"	4° 22' 11"	116° 48' 44"	25° 35' 41"	0° 58' 37"	15' 58.26"	275° 58' 58"	0.14702
11	114° 39' 27"	4° 20' 39"	117° 26' 09"	25° 27' 52"	0° 58' 34"	15' 57.62"	276° 18' 51"	0.15035
12	115° 14' 08"	4° 19' 06"	118° 03' 27"	25° 19' 55"	0° 58' 32"	15' 56.99"	276° 38' 29"	0.15369
13	115° 48' 45"	4° 17' 31"	118° 40' 36"	25° 11' 49"	0° 58' 30"	15' 56.35"	276° 57' 52"	0.15707
14	116° 23' 20"	4° 15' 54"	119° 17' 38"	25° 03' 35"	0° 58' 27"	15' 55.71"	277° 17' 02"	0.16046
15	116° 57' 51"	4° 14' 16"	119° 54' 31"	24° 55' 12"	0° 58' 25"	15' 55.08"	277° 35' 57"	0.16388
16	117° 32' 20"	4° 12' 37"	120° 31' 16"	24° 46' 41"	0° 58' 23"	15' 54.44"	277° 54' 38"	0.16733
17	118° 06' 45"	4° 10' 57"	121° 07' 53"	24° 38' 01"	0° 58' 20"	15' 53.80"	278° 13' 05"	0.17080
18	118° 41' 08"	4° 09' 15"	121° 44' 22"	24° 29' 14"	0° 58' 18"	15' 53.16"	278° 31' 18"	0.17429
19	119° 15' 27"	4° 07' 31"	122° 20' 42"	24° 20' 18"	0° 58' 16"	15' 52.52"	278° 49' 18"	0.17781
20	119° 49' 43"	4° 05' 47"	122° 56' 54"	24° 11' 15"	0° 58' 13"	15' 51.88"	279° 7' 04"	0.18135
21	120° 23' 56"	4° 04' 00"	123° 32' 58"	24° 02' 03"	0° 58' 11"	15' 51.24"	279° 24' 37"	0.18491
22	120° 58' 06"	4° 02' 13"	124° 08' 54"	23° 52' 45"	0° 58' 08"	15' 50.60"	279° 41' 56"	0.18849
23	121° 32' 13"	4° 00' 25"	124° 44' 42"	23° 43' 18"	0° 58' 06"	15' 49.96"	279° 59' 02"	0.19209
24	122° 06' 17"	3° 58' 35"	125° 20' 21"	23° 33' 44"	0° 58' 04"	15' 49.31"	280° 15' 56"	0.19571

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	69° 48' 59"	0.21"	68° 09' 37"	21° 55' 15"	1.0138168	15'46.55"	23° 26' 18"	2 m 19 s
1	69° 51' 23"	0.20"	68° 12' 10"	21° 55' 36"	1.0138232	15'46.55"	23° 26' 18"	2 m 19 s
2	69° 53' 47"	0.20"	68° 14' 44"	21° 55' 57"	1.0138296	15'46.54"	23° 26' 18"	2 m 19 s
3	69° 56' 11"	0.20"	68° 17' 17"	21° 56' 19"	1.0138359	15'46.53"	23° 26' 18"	2 m 18 s
4	69° 58' 34"	0.19"	68° 19' 50"	21° 56' 40"	1.0138423	15'46.53"	23° 26' 18"	2 m 18 s
5	70° 00' 58"	0.19"	68° 22' 24"	21° 57' 01"	1.0138486	15'46.52"	23° 26' 18"	2 m 17 s
6	70° 03' 22"	0.19"	68° 24' 57"	21° 57' 22"	1.0138550	15'46.52"	23° 26' 18"	2 m 17 s
7	70° 05' 46"	0.18"	68° 27' 31"	21° 57' 43"	1.0138613	15'46.51"	23° 26' 18"	2 m 17 s
8	70° 08' 10"	0.18"	68° 30' 04"	21° 58' 04"	1.0138676	15'46.50"	23° 26' 18"	2 m 16 s
9	70° 10' 34"	0.18"	68° 32' 38"	21° 58' 25"	1.0138739	15'46.50"	23° 26' 18"	2 m 16 s
10	70° 12' 58"	0.17"	68° 35' 11"	21° 58' 46"	1.0138802	15'46.49"	23° 26' 18"	2 m 16 s
11	70° 15' 21"	0.17"	68° 37' 45"	21° 59' 07"	1.0138865	15'46.49"	23° 26' 18"	2 m 15 s
12	70° 17' 45"	0.17"	68° 40' 18"	21° 59' 27"	1.0138928	15'46.48"	23° 26' 18"	2 m 15 s
13	70° 20' 09"	0.16"	68° 42' 52"	21° 59' 48"	1.0138991	15'46.47"	23° 26' 18"	2 m 15 s
14	70° 22' 33"	0.16"	68° 45' 25"	22° 00' 09"	1.0139054	15'46.47"	23° 26' 18"	2 m 14 s
15	70° 24' 57"	0.16"	68° 47' 59"	22° 00' 30"	1.0139116	15'46.46"	23° 26' 18"	2 m 14 s
16	70° 27' 21"	0.15"	68° 50' 32"	22° 00' 50"	1.0139179	15'46.46"	23° 26' 18"	2 m 13 s
17	70° 29' 44"	0.15"	68° 53' 06"	22° 01' 11"	1.0139241	15'46.45"	23° 26' 18"	2 m 13 s
18	70° 32' 08"	0.15"	68° 55' 39"	22° 01' 32"	1.0139304	15'46.45"	23° 26' 18"	2 m 13 s
19	70° 34' 32"	0.14"	68° 58' 13"	22° 01' 52"	1.0139366	15'46.44"	23° 26' 18"	2 m 12 s
20	70° 36' 56"	0.14"	69° 00' 46"	22° 02' 13"	1.0139428	15'46.43"	23° 26' 18"	2 m 12 s
21	70° 39' 20"	0.13"	69° 03' 20"	22° 02' 33"	1.0139490	15'46.43"	23° 26' 18"	2 m 11 s
22	70° 41' 44"	0.13"	69° 05' 54"	22° 02' 54"	1.0139552	15'46.42"	23° 26' 18"	2 m 11 s
23	70° 44' 07"	0.13"	69° 08' 27"	22° 03' 14"	1.0139614	15'46.42"	23° 26' 18"	2 m 11 s
24	70° 46' 31"	0.12"	69° 11' 01"	22° 03' 34"	1.0139676	15'46.41"	23° 26' 18"	2 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	122° 06' 17"	3° 58' 35"	125° 20' 21"	23° 33' 44"	0° 58' 04"	15' 49.31"	280° 15' 56"	0.19571
1	122° 40' 18"	3° 56' 43"	125° 55' 52"	23° 24' 03"	0° 58' 01"	15' 48.67"	280° 32' 36"	0.19935
2	123° 14' 16"	3° 54' 51"	126° 31' 15"	23° 14' 15"	0° 57' 59"	15' 48.03"	280° 49' 03"	0.20302
3	123° 48' 11"	3° 52' 57"	127° 06' 29"	23° 04' 20"	0° 57' 57"	15' 47.39"	281° 5' 17"	0.20670
4	124° 22' 02"	3° 51' 03"	127° 41' 35"	22° 54' 17"	0° 57' 54"	15' 46.75"	281° 21' 19"	0.21040
5	124° 55' 51"	3° 49' 07"	128° 16' 33"	22° 44' 08"	0° 57' 52"	15' 46.11"	281° 37' 08"	0.21412
6	125° 29' 37"	3° 47' 09"	128° 51' 23"	22° 33' 53"	0° 57' 50"	15' 45.47"	281° 52' 44"	0.21785
7	126° 03' 19"	3° 45' 11"	129° 26' 05"	22° 23' 30"	0° 57' 47"	15' 44.83"	282° 8' 08"	0.22161
8	126° 36' 59"	3° 43' 12"	130° 00' 38"	22° 13' 01"	0° 57' 45"	15' 44.20"	282° 23' 20"	0.22538
9	127° 10' 36"	3° 41' 11"	130° 35' 04"	22° 02' 26"	0° 57' 43"	15' 43.56"	282° 38' 19"	0.22917
10	127° 44' 09"	3° 39' 09"	131° 09' 21"	21° 51' 44"	0° 57' 40"	15' 42.92"	282° 53' 06"	0.23298
11	128° 17' 40"	3° 37' 06"	131° 43' 30"	21° 40' 57"	0° 57' 38"	15' 42.29"	283° 7' 41"	0.23680
12	128° 51' 07"	3° 35' 03"	132° 17' 31"	21° 30' 03"	0° 57' 36"	15' 41.65"	283° 22' 03"	0.24063
13	129° 24' 32"	3° 32' 58"	132° 51' 25"	21° 19' 03"	0° 57' 33"	15' 41.02"	283° 36' 14"	0.24449
14	129° 57' 53"	3° 30' 52"	133° 25' 10"	21° 07' 57"	0° 57' 31"	15' 40.39"	283° 50' 13"	0.24835
15	130° 31' 12"	3° 28' 45"	133° 58' 47"	20° 56' 46"	0° 57' 29"	15' 39.75"	284° 4' 00"	0.25224
16	131° 04' 28"	3° 26' 37"	134° 32' 17"	20° 45' 29"	0° 57' 26"	15' 39.12"	284° 17' 35"	0.25613
17	131° 37' 40"	3° 24' 28"	135° 05' 38"	20° 34' 07"	0° 57' 24"	15' 38.50"	284° 30' 59"	0.26004
18	132° 10' 50"	3° 22' 18"	135° 38' 52"	20° 22' 39"	0° 57' 22"	15' 37.87"	284° 44' 11"	0.26396
19	132° 43' 57"	3° 20' 07"	136° 11' 58"	20° 11' 06"	0° 57' 19"	15' 37.24"	284° 57' 11"	0.26790
20	133° 17' 01"	3° 17' 55"	136° 44' 57"	19° 59' 27"	0° 57' 17"	15' 36.62"	285° 9' 60"	0.27185
21	133° 50' 02"	3° 15' 42"	137° 17' 47"	19° 47' 44"	0° 57' 15"	15' 36.00"	285° 22' 37"	0.27581
22	134° 22' 60"	3° 13' 29"	137° 50' 30"	19° 35' 55"	0° 57' 13"	15' 35.38"	285° 35' 03"	0.27978
23	134° 55' 55"	3° 11' 14"	138° 23' 06"	19° 24' 02"	0° 57' 10"	15' 34.76"	285° 47' 18"	0.28376
24	135° 28' 47"	3° 08' 59"	138° 55' 34"	19° 12' 04"	0° 57' 08"	15' 34.14"	285° 59' 22"	0.28776

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	70° 46' 31"	0.12"	69° 11' 01"	22° 03' 34"	1.0139676	15'46.41"	23° 26' 18"	2 m 10 s
1	70° 48' 55"	0.12"	69° 13' 34"	22° 03' 55"	1.0139738	15'46.41"	23° 26' 18"	2 m 10 s
2	70° 51' 19"	0.11"	69° 16' 08"	22° 04' 15"	1.0139800	15'46.40"	23° 26' 18"	2 m 10 s
3	70° 53' 43"	0.11"	69° 18' 42"	22° 04' 35"	1.0139862	15'46.39"	23° 26' 18"	2 m 09 s
4	70° 56' 06"	0.11"	69° 21' 15"	22° 04' 55"	1.0139923	15'46.39"	23° 26' 18"	2 m 09 s
5	70° 58' 30"	0.10"	69° 23' 49"	22° 05' 15"	1.0139985	15'46.38"	23° 26' 18"	2 m 08 s
6	71° 00' 54"	0.10"	69° 26' 23"	22° 05' 36"	1.0140046	15'46.38"	23° 26' 18"	2 m 08 s
7	71° 03' 18"	0.09"	69° 28' 56"	22° 05' 56"	1.0140107	15'46.37"	23° 26' 18"	2 m 08 s
8	71° 05' 42"	0.09"	69° 31' 30"	22° 06' 16"	1.0140169	15'46.36"	23° 26' 18"	2 m 07 s
9	71° 08' 05"	0.08"	69° 34' 04"	22° 06' 36"	1.0140230	15'46.36"	23° 26' 18"	2 m 07 s
10	71° 10' 29"	0.08"	69° 36' 38"	22° 06' 56"	1.0140291	15'46.35"	23° 26' 18"	2 m 07 s
11	71° 12' 53"	0.08"	69° 39' 11"	22° 07' 15"	1.0140352	15'46.35"	23° 26' 18"	2 m 06 s
12	71° 15' 17"	0.07"	69° 41' 45"	22° 07' 35"	1.0140413	15'46.34"	23° 26' 18"	2 m 06 s
13	71° 17' 41"	0.07"	69° 44' 19"	22° 07' 55"	1.0140474	15'46.34"	23° 26' 18"	2 m 05 s
14	71° 20' 04"	0.06"	69° 46' 52"	22° 08' 15"	1.0140534	15'46.33"	23° 26' 18"	2 m 05 s
15	71° 22' 28"	0.06"	69° 49' 26"	22° 08' 35"	1.0140595	15'46.33"	23° 26' 18"	2 m 05 s
16	71° 24' 52"	0.05"	69° 51' 60"	22° 08' 54"	1.0140656	15'46.32"	23° 26' 18"	2 m 04 s
17	71° 27' 16"	0.05"	69° 54' 34"	22° 09' 14"	1.0140716	15'46.31"	23° 26' 18"	2 m 04 s
18	71° 29' 39"	0.04"	69° 57' 08"	22° 09' 34"	1.0140777	15'46.31"	23° 26' 18"	2 m 03 s
19	71° 32' 03"	0.04"	69° 59' 41"	22° 09' 53"	1.0140837	15'46.30"	23° 26' 18"	2 m 03 s
20	71° 34' 27"	0.04"	70° 02' 15"	22° 10' 13"	1.0140897	15'46.30"	23° 26' 18"	2 m 03 s
21	71° 36' 51"	0.03"	70° 04' 49"	22° 10' 32"	1.0140958	15'46.29"	23° 26' 18"	2 m 02 s
22	71° 39' 15"	0.03"	70° 07' 23"	22° 10' 52"	1.0141018	15'46.29"	23° 26' 18"	2 m 02 s
23	71° 41' 38"	0.02"	70° 09' 57"	22° 11' 11"	1.0141078	15'46.28"	23° 26' 18"	2 m 01 s
24	71° 44' 02"	0.02"	70° 12' 30"	22° 11' 31"	1.0141138	15'46.27"	23° 26' 18"	2 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	135° 28' 47"	3° 08' 59"	138° 55' 34"	19° 12' 04"	0° 57' 08"	15' 34.14"	285° 59' 22"	0.28776
1	136° 01' 37"	3° 06' 42"	139° 27' 55"	19° 00' 01"	0° 57' 06"	15' 33.53"	286° 11' 14"	0.29176
2	136° 34' 24"	3° 04' 25"	140° 00' 09"	18° 47' 53"	0° 57' 04"	15' 32.92"	286° 22' 55"	0.29578
3	137° 07' 07"	3° 02' 07"	140° 32' 15"	18° 35' 41"	0° 57' 01"	15' 32.31"	286° 34' 26"	0.29980
4	137° 39' 48"	2° 59' 48"	141° 04' 14"	18° 23' 25"	0° 56' 59"	15' 31.70"	286° 45' 45"	0.30384
5	138° 12' 27"	2° 57' 29"	141° 36' 05"	18° 11' 04"	0° 56' 57"	15' 31.09"	286° 56' 54"	0.30788
6	138° 45' 02"	2° 55' 08"	142° 07' 50"	17° 58' 39"	0° 56' 55"	15' 30.49"	287° 7' 51"	0.31194
7	139° 17' 35"	2° 52' 47"	142° 39' 28"	17° 46' 10"	0° 56' 52"	15' 29.89"	287° 18' 38"	0.31600
8	139° 50' 05"	2° 50' 25"	143° 10' 58"	17° 33' 36"	0° 56' 50"	15' 29.29"	287° 29' 15"	0.32007
9	140° 22' 32"	2° 48' 03"	143° 42' 22"	17° 20' 59"	0° 56' 48"	15' 28.69"	287° 39' 40"	0.32415
10	140° 54' 56"	2° 45' 40"	144° 13' 39"	17° 08' 18"	0° 56' 46"	15' 28.10"	287° 49' 55"	0.32823
11	141° 27' 18"	2° 43' 16"	144° 44' 49"	16° 55' 33"	0° 56' 44"	15' 27.51"	288° 0' 00"	0.33232
12	141° 59' 37"	2° 40' 51"	145° 15' 52"	16° 42' 44"	0° 56' 42"	15' 26.92"	288° 9' 54"	0.33642
13	142° 31' 53"	2° 38' 26"	145° 46' 49"	16° 29' 52"	0° 56' 39"	15' 26.34"	288° 19' 38"	0.34053
14	143° 04' 07"	2° 35' 60"	146° 17' 39"	16° 16' 56"	0° 56' 37"	15' 25.75"	288° 29' 12"	0.34464
15	143° 36' 18"	2° 33' 33"	146° 48' 23"	16° 03' 57"	0° 56' 35"	15' 25.17"	288° 38' 35"	0.34876
16	144° 08' 26"	2° 31' 06"	147° 19' 01"	15° 50' 55"	0° 56' 33"	15' 24.60"	288° 47' 48"	0.35288
17	144° 40' 32"	2° 28' 38"	147° 49' 32"	15° 37' 49"	0° 56' 31"	15' 24.02"	288° 56' 51"	0.35701
18	145° 12' 36"	2° 26' 09"	148° 19' 57"	15° 24' 40"	0° 56' 29"	15' 23.45"	289° 5' 44"	0.36114
19	145° 44' 36"	2° 23' 40"	148° 50' 15"	15° 11' 28"	0° 56' 27"	15' 22.88"	289° 14' 26"	0.36528
20	146° 16' 34"	2° 21' 11"	149° 20' 28"	14° 58' 12"	0° 56' 25"	15' 22.32"	289° 22' 59"	0.36943
21	146° 48' 30"	2° 18' 41"	149° 50' 34"	14° 44' 54"	0° 56' 23"	15' 21.76"	289° 31' 22"	0.37357
22	147° 20' 23"	2° 16' 10"	150° 20' 35"	14° 31' 33"	0° 56' 21"	15' 21.20"	289° 39' 35"	0.37772
23	147° 52' 14"	2° 13' 39"	150° 50' 29"	14° 18' 09"	0° 56' 19"	15' 20.64"	289° 47' 39"	0.38187
24	148° 24' 02"	2° 11' 07"	151° 20' 18"	14° 04' 43"	0° 56' 16"	15' 20.09"	289° 55' 32"	0.38603

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	71° 44' 02"	0.02"	70° 12' 30"	22° 11' 31"	1.0141138	15'46.27"	23° 26' 18"	2 m 01 s
1	71° 46' 26"	0.01"	70° 15' 04"	22° 11' 50"	1.0141198	15'46.27"	23° 26' 18"	2 m 01 s
2	71° 48' 50"	0.01"	70° 17' 38"	22° 12' 09"	1.0141258	15'46.26"	23° 26' 18"	2 m 00 s
3	71° 51' 13"	0.00"	70° 20' 12"	22° 12' 28"	1.0141317	15'46.26"	23° 26' 18"	1 m 60 s
4	71° 53' 37"	-0.00"	70° 22' 46"	22° 12' 48"	1.0141377	15'46.25"	23° 26' 18"	1 m 59 s
5	71° 56' 01"	-0.01"	70° 25' 20"	22° 13' 07"	1.0141437	15'46.25"	23° 26' 18"	1 m 59 s
6	71° 58' 25"	-0.01"	70° 27' 54"	22° 13' 26"	1.0141496	15'46.24"	23° 26' 18"	1 m 59 s
7	72° 00' 48"	-0.02"	70° 30' 28"	22° 13' 45"	1.0141556	15'46.24"	23° 26' 18"	1 m 58 s
8	72° 03' 12"	-0.02"	70° 33' 02"	22° 14' 04"	1.0141615	15'46.23"	23° 26' 18"	1 m 58 s
9	72° 05' 36"	-0.03"	70° 35' 35"	22° 14' 23"	1.0141675	15'46.22"	23° 26' 18"	1 m 57 s
10	72° 07' 60"	-0.03"	70° 38' 09"	22° 14' 42"	1.0141734	15'46.22"	23° 26' 18"	1 m 57 s
11	72° 10' 23"	-0.04"	70° 40' 43"	22° 15' 01"	1.0141793	15'46.21"	23° 26' 18"	1 m 57 s
12	72° 12' 47"	-0.04"	70° 43' 17"	22° 15' 20"	1.0141852	15'46.21"	23° 26' 18"	1 m 56 s
13	72° 15' 11"	-0.05"	70° 45' 51"	22° 15' 39"	1.0141911	15'46.20"	23° 26' 18"	1 m 56 s
14	72° 17' 35"	-0.05"	70° 48' 25"	22° 15' 58"	1.0141970	15'46.20"	23° 26' 18"	1 m 55 s
15	72° 19' 58"	-0.06"	70° 50' 59"	22° 16' 16"	1.0142029	15'46.19"	23° 26' 18"	1 m 55 s
16	72° 22' 22"	-0.06"	70° 53' 33"	22° 16' 35"	1.0142088	15'46.19"	23° 26' 18"	1 m 55 s
17	72° 24' 46"	-0.07"	70° 56' 07"	22° 16' 54"	1.0142146	15'46.18"	23° 26' 18"	1 m 54 s
18	72° 27' 09"	-0.07"	70° 58' 41"	22° 17' 12"	1.0142205	15'46.17"	23° 26' 18"	1 m 54 s
19	72° 29' 33"	-0.08"	71° 01' 15"	22° 17' 31"	1.0142264	15'46.17"	23° 26' 18"	1 m 53 s
20	72° 31' 57"	-0.08"	71° 03' 49"	22° 17' 50"	1.0142322	15'46.16"	23° 26' 18"	1 m 53 s
21	72° 34' 21"	-0.09"	71° 06' 23"	22° 18' 08"	1.0142381	15'46.16"	23° 26' 18"	1 m 53 s
22	72° 36' 44"	-0.09"	71° 08' 57"	22° 18' 27"	1.0142439	15'46.15"	23° 26' 18"	1 m 52 s
23	72° 39' 08"	-0.10"	71° 11' 31"	22° 18' 45"	1.0142497	15'46.15"	23° 26' 18"	1 m 52 s
24	72° 41' 32"	-0.11"	71° 14' 05"	22° 19' 03"	1.0142555	15'46.14"	23° 26' 18"	1 m 51 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	148° 24' 02"	2° 11' 07"	151° 20' 18"	14° 04' 43"	0° 56' 16"	15' 20.09"	289° 55' 32"	0.38603
1	148° 55' 47"	2° 08' 35"	151° 50' 02"	13° 51' 14"	0° 56' 14"	15' 19.54"	290° 3' 16"	0.39019
2	149° 27' 31"	2° 06' 02"	152° 19' 39"	13° 37' 42"	0° 56' 12"	15' 19.00"	290° 10' 50"	0.39435
3	149° 59' 11"	2° 03' 29"	152° 49' 11"	13° 24' 07"	0° 56' 10"	15' 18.46"	290° 18' 15"	0.39851
4	150° 30' 50"	2° 00' 55"	153° 18' 38"	13° 10' 31"	0° 56' 09"	15' 17.92"	290° 25' 30"	0.40268
5	151° 02' 26"	1° 58' 21"	153° 47' 59"	12° 56' 51"	0° 56' 07"	15' 17.38"	290° 32' 36"	0.40685
6	151° 33' 59"	1° 55' 47"	154° 17' 15"	12° 43' 10"	0° 56' 05"	15' 16.85"	290° 39' 32"	0.41102
7	152° 05' 31"	1° 53' 12"	154° 46' 25"	12° 29' 26"	0° 56' 03"	15' 16.33"	290° 46' 19"	0.41518
8	152° 36' 60"	1° 50' 37"	155° 15' 31"	12° 15' 40"	0° 56' 01"	15' 15.80"	290° 52' 56"	0.41935
9	153° 08' 27"	1° 48' 01"	155° 44' 31"	12° 01' 52"	0° 55' 59"	15' 15.28"	290° 59' 25"	0.42352
10	153° 39' 51"	1° 45' 25"	156° 13' 27"	11° 48' 02"	0° 55' 57"	15' 14.76"	291° 5' 44"	0.42770
11	154° 11' 13"	1° 42' 49"	156° 42' 17"	11° 34' 11"	0° 55' 55"	15' 14.25"	291° 11' 53"	0.43187
12	154° 42' 33"	1° 40' 12"	157° 11' 03"	11° 20' 17"	0° 55' 53"	15' 13.74"	291° 17' 54"	0.43604
13	155° 13' 51"	1° 37' 35"	157° 39' 44"	11° 06' 21"	0° 55' 51"	15' 13.24"	291° 23' 46"	0.44021
14	155° 45' 07"	1° 34' 58"	158° 08' 20"	10° 52' 24"	0° 55' 49"	15' 12.74"	291° 29' 28"	0.44437
15	156° 16' 20"	1° 32' 20"	158° 36' 52"	10° 38' 24"	0° 55' 48"	15' 12.24"	291° 35' 02"	0.44854
16	156° 47' 31"	1° 29' 42"	159° 05' 19"	10° 24' 24"	0° 55' 46"	15' 11.75"	291° 40' 26"	0.45271
17	157° 18' 40"	1° 27' 04"	159° 33' 42"	10° 10' 21"	0° 55' 44"	15' 11.26"	291° 45' 42"	0.45687
18	157° 49' 47"	1° 24' 26"	160° 01' 60"	9° 56' 17"	0° 55' 42"	15' 10.77"	291° 50' 49"	0.46103
19	158° 20' 52"	1° 21' 47"	160° 30' 14"	9° 42' 12"	0° 55' 41"	15' 10.29"	291° 55' 46"	0.46519
20	158° 51' 55"	1° 19' 08"	160° 58' 24"	9° 28' 05"	0° 55' 39"	15' 09.81"	292° 0' 36"	0.46935
21	159° 22' 56"	1° 16' 29"	161° 26' 30"	9° 13' 57"	0° 55' 37"	15' 09.34"	292° 5' 16"	0.47351
22	159° 53' 55"	1° 13' 50"	161° 54' 32"	8° 59' 47"	0° 55' 35"	15' 08.87"	292° 9' 47"	0.47766
23	160° 24' 52"	1° 11' 10"	162° 22' 30"	8° 45' 37"	0° 55' 34"	15' 08.40"	292° 14' 10"	0.48181
24	160° 55' 47"	1° 08' 30"	162° 50' 24"	8° 31' 25"	0° 55' 32"	15' 07.94"	292° 18' 25"	0.48595

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	72° 41' 32"	-0.11"	71° 14' 05"	22° 19' 03"	1.0142555	15'46.14"	23° 26' 18"	1 m 51 s
1	72° 43' 55"	-0.11"	71° 16' 40"	22° 19' 22"	1.0142614	15'46.14"	23° 26' 18"	1 m 51 s
2	72° 46' 19"	-0.12"	71° 19' 14"	22° 19' 40"	1.0142672	15'46.13"	23° 26' 18"	1 m 50 s
3	72° 48' 43"	-0.12"	71° 21' 48"	22° 19' 58"	1.0142730	15'46.13"	23° 26' 18"	1 m 50 s
4	72° 51' 07"	-0.13"	71° 24' 22"	22° 20' 17"	1.0142788	15'46.12"	23° 26' 18"	1 m 50 s
5	72° 53' 30"	-0.13"	71° 26' 56"	22° 20' 35"	1.0142845	15'46.12"	23° 26' 18"	1 m 49 s
6	72° 55' 54"	-0.14"	71° 29' 30"	22° 20' 53"	1.0142903	15'46.11"	23° 26' 18"	1 m 49 s
7	72° 58' 18"	-0.14"	71° 32' 04"	22° 21' 11"	1.0142961	15'46.10"	23° 26' 18"	1 m 48 s
8	73° 00' 41"	-0.15"	71° 34' 38"	22° 21' 29"	1.0143019	15'46.10"	23° 26' 18"	1 m 48 s
9	73° 03' 05"	-0.15"	71° 37' 12"	22° 21' 47"	1.0143076	15'46.09"	23° 26' 18"	1 m 48 s
10	73° 05' 29"	-0.16"	71° 39' 47"	22° 22' 05"	1.0143134	15'46.09"	23° 26' 18"	1 m 47 s
11	73° 07' 52"	-0.16"	71° 42' 21"	22° 22' 23"	1.0143191	15'46.08"	23° 26' 18"	1 m 47 s
12	73° 10' 16"	-0.17"	71° 44' 55"	22° 22' 41"	1.0143249	15'46.08"	23° 26' 18"	1 m 46 s
13	73° 12' 40"	-0.18"	71° 47' 29"	22° 22' 59"	1.0143306	15'46.07"	23° 26' 18"	1 m 46 s
14	73° 15' 03"	-0.18"	71° 50' 03"	22° 23' 17"	1.0143363	15'46.07"	23° 26' 18"	1 m 45 s
15	73° 17' 27"	-0.19"	71° 52' 37"	22° 23' 35"	1.0143420	15'46.06"	23° 26' 18"	1 m 45 s
16	73° 19' 51"	-0.19"	71° 55' 12"	22° 23' 52"	1.0143477	15'46.06"	23° 26' 18"	1 m 45 s
17	73° 22' 14"	-0.20"	71° 57' 46"	22° 24' 10"	1.0143534	15'46.05"	23° 26' 18"	1 m 44 s
18	73° 24' 38"	-0.20"	72° 00' 20"	22° 24' 28"	1.0143591	15'46.05"	23° 26' 18"	1 m 44 s
19	73° 27' 02"	-0.21"	72° 02' 54"	22° 24' 45"	1.0143648	15'46.04"	23° 26' 18"	1 m 43 s
20	73° 29' 25"	-0.21"	72° 05' 28"	22° 25' 03"	1.0143705	15'46.04"	23° 26' 18"	1 m 43 s
21	73° 31' 49"	-0.22"	72° 08' 03"	22° 25' 21"	1.0143762	15'46.03"	23° 26' 18"	1 m 42 s
22	73° 34' 13"	-0.23"	72° 10' 37"	22° 25' 38"	1.0143818	15'46.02"	23° 26' 18"	1 m 42 s
23	73° 36' 36"	-0.23"	72° 13' 11"	22° 25' 55"	1.0143875	15'46.02"	23° 26' 18"	1 m 42 s
24	73° 39' 00"	-0.24"	72° 15' 46"	22° 26' 13"	1.0143931	15'46.01"	23° 26' 18"	1 m 41 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	160° 55' 47"	1° 08' 30"	162° 50' 24"	8° 31' 25"	0° 55' 32"	15' 07.94"	292° 18' 25"	0.48595
1	161° 26' 40"	1° 05' 51"	163° 18' 14"	8° 17' 12"	0° 55' 30"	15' 07.48"	292° 22' 30"	0.49009
2	161° 57' 31"	1° 03' 10"	163° 46' 01"	8° 02' 58"	0° 55' 29"	15' 07.03"	292° 26' 27"	0.49423
3	162° 28' 20"	1° 00' 30"	164° 13' 44"	7° 48' 43"	0° 55' 27"	15' 06.58"	292° 30' 16"	0.49836
4	162° 59' 08"	0° 57' 50"	164° 41' 23"	7° 34' 27"	0° 55' 25"	15' 06.14"	292° 33' 56"	0.50249
5	163° 29' 53"	0° 55' 10"	165° 08' 59"	7° 20' 10"	0° 55' 24"	15' 05.70"	292° 37' 27"	0.50662
6	164° 00' 37"	0° 52' 29"	165° 36' 32"	7° 05' 52"	0° 55' 22"	15' 05.26"	292° 40' 50"	0.51074
7	164° 31' 19"	0° 49' 48"	166° 04' 01"	6° 51' 34"	0° 55' 20"	15' 04.83"	292° 44' 05"	0.51485
8	165° 01' 59"	0° 47' 08"	166° 31' 27"	6° 37' 14"	0° 55' 19"	15' 04.40"	292° 47' 11"	0.51896
9	165° 32' 37"	0° 44' 27"	166° 58' 50"	6° 22' 54"	0° 55' 17"	15' 03.98"	292° 50' 09"	0.52306
10	166° 03' 13"	0° 41' 46"	167° 26' 10"	6° 08' 34"	0° 55' 16"	15' 03.56"	292° 52' 58"	0.52716
11	166° 33' 48"	0° 39' 05"	167° 53' 27"	5° 54' 12"	0° 55' 14"	15' 03.15"	292° 55' 39"	0.53125
12	167° 04' 21"	0° 36' 24"	168° 20' 42"	5° 39' 51"	0° 55' 13"	15' 02.74"	292° 58' 12"	0.53534
13	167° 34' 53"	0° 33' 43"	168° 47' 53"	5° 25' 28"	0° 55' 11"	15' 02.33"	293° 0' 37"	0.53942
14	168° 05' 23"	0° 31' 02"	169° 15' 02"	5° 11' 06"	0° 55' 10"	15' 01.93"	293° 2' 53"	0.54349
15	168° 35' 51"	0° 28' 21"	169° 42' 07"	4° 56' 42"	0° 55' 08"	15' 01.53"	293° 5' 01"	0.54756
16	169° 06' 18"	0° 25' 40"	170° 09' 11"	4° 42' 19"	0° 55' 07"	15' 01.14"	293° 7' 01"	0.55161
17	169° 36' 43"	0° 22' 59"	170° 36' 12"	4° 27' 55"	0° 55' 06"	15' 00.75"	293° 8' 53"	0.55566
18	170° 07' 06"	0° 20' 18"	171° 03' 10"	4° 13' 31"	0° 55' 04"	15' 00.37"	293° 10' 36"	0.55971
19	170° 37' 28"	0° 17' 37"	171° 30' 06"	3° 59' 07"	0° 55' 03"	14' 59.99"	293° 12' 12"	0.56374
20	171° 07' 49"	0° 14' 56"	171° 57' 00"	3° 44' 42"	0° 55' 01"	14' 59.62"	293° 13' 39"	0.56777
21	171° 38' 08"	0° 12' 16"	172° 23' 52"	3° 30' 18"	0° 54' 60"	14' 59.25"	293° 14' 58"	0.57179
22	172° 08' 25"	0° 09' 35"	172° 50' 41"	3° 15' 53"	0° 54' 59"	14' 58.88"	293° 16' 09"	0.57580
23	172° 38' 41"	0° 06' 54"	173° 17' 29"	3° 01' 28"	0° 54' 57"	14' 58.52"	293° 17' 12"	0.57981
24	173° 08' 56"	0° 04' 14"	173° 44' 15"	2° 47' 04"	0° 54' 56"	14' 58.16"	293° 18' 07"	0.58380

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	73° 39' 00"	-0.24"	72° 15' 46"	22° 26' 13"	1.0143931	15'46.01"	23° 26' 18"	1 m 41 s
1	73° 41' 24"	-0.24"	72° 18' 20"	22° 26' 30"	1.0143988	15'46.01"	23° 26' 18"	1 m 41 s
2	73° 43' 47"	-0.25"	72° 20' 54"	22° 26' 48"	1.0144044	15'46.00"	23° 26' 18"	1 m 40 s
3	73° 46' 11"	-0.25"	72° 23' 28"	22° 27' 05"	1.0144101	15'46.00"	23° 26' 18"	1 m 40 s
4	73° 48' 35"	-0.26"	72° 26' 03"	22° 27' 22"	1.0144157	15'45.99"	23° 26' 18"	1 m 39 s
5	73° 50' 58"	-0.26"	72° 28' 37"	22° 27' 39"	1.0144213	15'45.99"	23° 26' 18"	1 m 39 s
6	73° 53' 22"	-0.27"	72° 31' 11"	22° 27' 57"	1.0144269	15'45.98"	23° 26' 18"	1 m 39 s
7	73° 55' 46"	-0.28"	72° 33' 46"	22° 28' 14"	1.0144325	15'45.98"	23° 26' 18"	1 m 38 s
8	73° 58' 09"	-0.28"	72° 36' 20"	22° 28' 31"	1.0144381	15'45.97"	23° 26' 18"	1 m 38 s
9	74° 00' 33"	-0.29"	72° 38' 54"	22° 28' 48"	1.0144437	15'45.97"	23° 26' 18"	1 m 37 s
10	74° 02' 56"	-0.29"	72° 41' 29"	22° 29' 05"	1.0144493	15'45.96"	23° 26' 18"	1 m 37 s
11	74° 05' 20"	-0.30"	72° 44' 03"	22° 29' 22"	1.0144549	15'45.96"	23° 26' 18"	1 m 36 s
12	74° 07' 44"	-0.30"	72° 46' 37"	22° 29' 39"	1.0144604	15'45.95"	23° 26' 18"	1 m 36 s
13	74° 10' 07"	-0.31"	72° 49' 12"	22° 29' 56"	1.0144660	15'45.95"	23° 26' 18"	1 m 36 s
14	74° 12' 31"	-0.31"	72° 51' 46"	22° 30' 13"	1.0144716	15'45.94"	23° 26' 18"	1 m 35 s
15	74° 14' 55"	-0.32"	72° 54' 21"	22° 30' 29"	1.0144771	15'45.94"	23° 26' 18"	1 m 35 s
16	74° 17' 18"	-0.33"	72° 56' 55"	22° 30' 46"	1.0144827	15'45.93"	23° 26' 18"	1 m 34 s
17	74° 19' 42"	-0.33"	72° 59' 29"	22° 31' 03"	1.0144882	15'45.93"	23° 26' 18"	1 m 34 s
18	74° 22' 05"	-0.34"	73° 02' 04"	22° 31' 19"	1.0144937	15'45.92"	23° 26' 18"	1 m 33 s
19	74° 24' 29"	-0.34"	73° 04' 38"	22° 31' 36"	1.0144993	15'45.91"	23° 26' 18"	1 m 33 s
20	74° 26' 53"	-0.35"	73° 07' 13"	22° 31' 53"	1.0145048	15'45.91"	23° 26' 18"	1 m 33 s
21	74° 29' 16"	-0.35"	73° 09' 47"	22° 32' 09"	1.0145103	15'45.90"	23° 26' 18"	1 m 32 s
22	74° 31' 40"	-0.36"	73° 12' 22"	22° 32' 26"	1.0145158	15'45.90"	23° 26' 18"	1 m 32 s
23	74° 34' 04"	-0.37"	73° 14' 56"	22° 32' 42"	1.0145213	15'45.89"	23° 26' 18"	1 m 31 s
24	74° 36' 27"	-0.37"	73° 17' 30"	22° 32' 59"	1.0145268	15'45.89"	23° 26' 18"	1 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	173° 08' 56"	0° 04' 14"	173° 44' 15"	2° 47' 04"	0° 54' 56"	14' 58.16"	293° 18' 07"	0.58380
1	173° 39' 09"	0° 01' 33"	174° 10' 58"	2° 32' 39"	0° 54' 55"	14' 57.81"	293° 18' 54"	0.58779
2	174° 09' 21"	0° -1' 07"	174° 37' 40"	2° 18' 15"	0° 54' 53"	14' 57.46"	293° 19' 33"	0.59176
3	174° 39' 32"	0° -3' 47"	175° 04' 20"	2° 03' 50"	0° 54' 52"	14' 57.12"	293° 20' 04"	0.59573
4	175° 09' 41"	0° -6' 27"	175° 30' 59"	1° 49' 26"	0° 54' 51"	14' 56.78"	293° 20' 27"	0.59969
5	175° 39' 49"	0° -9' 07"	175° 57' 36"	1° 35' 02"	0° 54' 50"	14' 56.45"	293° 20' 42"	0.60363
6	176° 09' 56"	0°-11' 47"	176° 24' 11"	1° 20' 38"	0° 54' 49"	14' 56.12"	293° 20' 49"	0.60757
7	176° 40' 02"	0°-14' 27"	176° 50' 46"	1° 06' 15"	0° 54' 47"	14' 55.79"	293° 20' 48"	0.61150
8	177° 10' 06"	0°-17' 06"	177° 17' 18"	0° 51' 52"	0° 54' 46"	14' 55.47"	293° 20' 38"	0.61542
9	177° 40' 09"	0°-19' 45"	177° 43' 50"	0° 37' 29"	0° 54' 45"	14' 55.16"	293° 20' 21"	0.61932
10	178° 10' 11"	0°-22' 24"	178° 10' 20"	0° 23' 07"	0° 54' 44"	14' 54.85"	293° 19' 56"	0.62322
11	178° 40' 12"	0°-25' 03"	178° 36' 49"	0° 08' 46"	0° 54' 43"	14' 54.54"	293° 19' 23"	0.62711
12	179° 10' 11"	0°-27' 41"	179° 03' 17"	0° -5' 36"	0° 54' 42"	14' 54.24"	293° 18' 42"	0.63098
13	179° 40' 10"	0°-30' 20"	179° 29' 44"	0°-19' 56"	0° 54' 41"	14' 53.94"	293° 17' 53"	0.63484
14	180° 10' 07"	0°-32' 58"	179° 56' 11"	0°-34' 16"	0° 54' 39"	14' 53.65"	293° 16' 56"	0.63870
15	180° 40' 04"	0°-35' 36"	180° 22' 36"	0°-48' 36"	0° 54' 38"	14' 53.36"	293° 15' 52"	0.64254
16	181° 09' 59"	0°-38' 13"	180° 49' 01"	-1° 02' 54"	0° 54' 37"	14' 53.08"	293° 14' 39"	0.64636
17	181° 39' 53"	0°-40' 50"	181° 15' 25"	-1° 17' 12"	0° 54' 36"	14' 52.80"	293° 13' 18"	0.65018
18	182° 09' 47"	0°-43' 27"	181° 41' 48"	-1° 31' 29"	0° 54' 35"	14' 52.52"	293° 11' 49"	0.65399
19	182° 39' 39"	0°-46' 04"	182° 08' 11"	-1° 45' 46"	0° 54' 34"	14' 52.25"	293° 10' 12"	0.65778
20	183° 09' 31"	0°-48' 41"	182° 34' 33"	-2° 00' 01"	0° 54' 33"	14' 51.99"	293° 8' 27"	0.66156
21	183° 39' 21"	0°-51' 17"	183° 00' 55"	-2° 14' 16"	0° 54' 32"	14' 51.73"	293° 6' 35"	0.66532
22	184° 09' 11"	0°-53' 52"	183° 27' 17"	-2° 28' 29"	0° 54' 31"	14' 51.47"	293° 4' 34"	0.66908
23	184° 38' 59"	0°-56' 28"	183° 53' 38"	-2° 42' 42"	0° 54' 31"	14' 51.22"	293° 2' 25"	0.67282
24	185° 08' 47"	0°-59' 03"	184° 19' 59"	-2° 56' 54"	0° 54' 30"	14' 50.97"	293° 0' 08"	0.67655

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	74° 36' 27"	-0.37"	73° 17' 30"	22° 32' 59"	1.0145268	15'45.89"	23° 26' 18"	1 m 31 s
1	74° 38' 51"	-0.38"	73° 20' 05"	22° 33' 15"	1.0145323	15'45.88"	23° 26' 18"	1 m 30 s
2	74° 41' 14"	-0.38"	73° 22' 39"	22° 33' 31"	1.0145378	15'45.88"	23° 26' 18"	1 m 30 s
3	74° 43' 38"	-0.39"	73° 25' 14"	22° 33' 48"	1.0145432	15'45.87"	23° 26' 18"	1 m 29 s
4	74° 46' 02"	-0.39"	73° 27' 48"	22° 34' 04"	1.0145487	15'45.87"	23° 26' 18"	1 m 29 s
5	74° 48' 25"	-0.40"	73° 30' 23"	22° 34' 20"	1.0145542	15'45.86"	23° 26' 18"	1 m 29 s
6	74° 50' 49"	-0.40"	73° 32' 57"	22° 34' 36"	1.0145596	15'45.86"	23° 26' 18"	1 m 28 s
7	74° 53' 12"	-0.41"	73° 35' 32"	22° 34' 53"	1.0145651	15'45.85"	23° 26' 18"	1 m 28 s
8	74° 55' 36"	-0.41"	73° 38' 06"	22° 35' 09"	1.0145705	15'45.85"	23° 26' 18"	1 m 27 s
9	74° 57' 60"	-0.42"	73° 40' 41"	22° 35' 25"	1.0145759	15'45.84"	23° 26' 18"	1 m 27 s
10	75° 00' 23"	-0.43"	73° 43' 16"	22° 35' 41"	1.0145814	15'45.84"	23° 26' 18"	1 m 26 s
11	75° 02' 47"	-0.43"	73° 45' 50"	22° 35' 57"	1.0145868	15'45.83"	23° 26' 18"	1 m 26 s
12	75° 05' 10"	-0.44"	73° 48' 25"	22° 36' 13"	1.0145922	15'45.83"	23° 26' 18"	1 m 25 s
13	75° 07' 34"	-0.44"	73° 50' 59"	22° 36' 29"	1.0145976	15'45.82"	23° 26' 18"	1 m 25 s
14	75° 09' 57"	-0.45"	73° 53' 34"	22° 36' 44"	1.0146030	15'45.82"	23° 26' 18"	1 m 25 s
15	75° 12' 21"	-0.45"	73° 56' 08"	22° 37' 00"	1.0146084	15'45.81"	23° 26' 18"	1 m 24 s
16	75° 14' 45"	-0.46"	73° 58' 43"	22° 37' 16"	1.0146138	15'45.81"	23° 26' 18"	1 m 24 s
17	75° 17' 08"	-0.46"	74° 01' 18"	22° 37' 32"	1.0146192	15'45.80"	23° 26' 18"	1 m 23 s
18	75° 19' 32"	-0.47"	74° 03' 52"	22° 37' 48"	1.0146246	15'45.80"	23° 26' 18"	1 m 23 s
19	75° 21' 55"	-0.47"	74° 06' 27"	22° 38' 03"	1.0146299	15'45.79"	23° 26' 18"	1 m 22 s
20	75° 24' 19"	-0.48"	74° 09' 01"	22° 38' 19"	1.0146353	15'45.79"	23° 26' 18"	1 m 22 s
21	75° 26' 42"	-0.49"	74° 11' 36"	22° 38' 34"	1.0146407	15'45.78"	23° 26' 18"	1 m 21 s
22	75° 29' 06"	-0.49"	74° 14' 11"	22° 38' 50"	1.0146460	15'45.78"	23° 26' 18"	1 m 21 s
23	75° 31' 30"	-0.50"	74° 16' 45"	22° 39' 05"	1.0146514	15'45.77"	23° 26' 18"	1 m 20 s
24	75° 33' 53"	-0.50"	74° 19' 20"	22° 39' 21"	1.0146567	15'45.77"	23° 26' 18"	1 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	185° 08' 47"	0°-59' 03"	184° 19' 59"	-2° 56' 54"	0° 54' 30"	14' 50.97"	293° 0' 08"	0.67655
1	185° 38' 34"	-1° 01' 38"	184° 46' 21"	-3° 11' 04"	0° 54' 29"	14' 50.73"	292° 57' 43"	0.68026
2	186° 08' 20"	-1° 04' 12"	185° 12' 42"	-3° 25' 14"	0° 54' 28"	14' 50.49"	292° 55' 10"	0.68396
3	186° 38' 06"	-1° 06' 46"	185° 39' 03"	-3° 39' 22"	0° 54' 27"	14' 50.26"	292° 52' 29"	0.68765
4	187° 07' 50"	-1° 09' 20"	186° 05' 24"	-3° 53' 29"	0° 54' 26"	14' 50.03"	292° 49' 40"	0.69132
5	187° 37' 34"	-1° 11' 53"	186° 31' 45"	-4° 07' 35"	0° 54' 25"	14' 49.80"	292° 46' 43"	0.69498
6	188° 07' 17"	-1° 14' 26"	186° 58' 07"	-4° 21' 40"	0° 54' 25"	14' 49.58"	292° 43' 38"	0.69863
7	188° 36' 60"	-1° 16' 58"	187° 24' 29"	-4° 35' 44"	0° 54' 24"	14' 49.37"	292° 40' 24"	0.70226
8	189° 06' 42"	-1° 19' 30"	187° 50' 51"	-4° 49' 46"	0° 54' 23"	14' 49.16"	292° 37' 02"	0.70588
9	189° 36' 23"	-1° 22' 02"	188° 17' 14"	-5° 03' 47"	0° 54' 22"	14' 48.95"	292° 33' 33"	0.70948
10	190° 06' 03"	-1° 24' 33"	188° 43' 38"	-5° 17' 46"	0° 54' 21"	14' 48.75"	292° 29' 55"	0.71306
11	190° 35' 43"	-1° 27' 04"	189° 10' 01"	-5° 31' 44"	0° 54' 21"	14' 48.55"	292° 26' 08"	0.71664
12	191° 05' 22"	-1° 29' 34"	189° 36' 26"	-5° 45' 40"	0° 54' 20"	14' 48.36"	292° 22' 14"	0.72019
13	191° 35' 01"	-1° 32' 04"	190° 02' 51"	-5° 59' 35"	0° 54' 19"	14' 48.17"	292° 18' 11"	0.72373
14	192° 04' 39"	-1° 34' 33"	190° 29' 17"	-6° 13' 29"	0° 54' 19"	14' 47.98"	292° 13' 60"	0.72726
15	192° 34' 17"	-1° 37' 02"	190° 55' 44"	-6° 27' 20"	0° 54' 18"	14' 47.80"	292° 9' 40"	0.73077
16	193° 03' 54"	-1° 39' 30"	191° 22' 12"	-6° 41' 10"	0° 54' 17"	14' 47.63"	292° 5' 13"	0.73426
17	193° 33' 30"	-1° 41' 58"	191° 48' 41"	-6° 54' 59"	0° 54' 17"	14' 47.46"	292° 0' 36"	0.73774
18	194° 03' 06"	-1° 44' 25"	192° 15' 11"	-7° 08' 45"	0° 54' 16"	14' 47.29"	291° 55' 52"	0.74120
19	194° 32' 42"	-1° 46' 52"	192° 41' 42"	-7° 22' 30"	0° 54' 16"	14' 47.13"	291° 50' 58"	0.74465
20	195° 02' 17"	-1° 49' 19"	193° 08' 14"	-7° 36' 13"	0° 54' 15"	14' 46.97"	291° 45' 57"	0.74808
21	195° 31' 52"	-1° 51' 44"	193° 34' 48"	-7° 49' 54"	0° 54' 14"	14' 46.81"	291° 40' 46"	0.75149
22	196° 01' 26"	-1° 54' 09"	194° 01' 23"	-8° 03' 34"	0° 54' 14"	14' 46.66"	291° 35' 28"	0.75489
23	196° 31' 00"	-1° 56' 34"	194° 27' 59"	-8° 17' 11"	0° 54' 13"	14' 46.52"	291° 30' 00"	0.75826
24	197° 00' 34"	-1° 58' 58"	194° 54' 37"	-8° 30' 46"	0° 54' 13"	14' 46.38"	291° 24' 24"	0.76163

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	75° 33' 53"	-0.50"	74° 19' 20"	22° 39' 21"	1.0146567	15'45.77"	23° 26' 18"	1 m 20 s
1	75° 36' 17"	-0.51"	74° 21' 55"	22° 39' 36"	1.0146620	15'45.76"	23° 26' 18"	1 m 20 s
2	75° 38' 40"	-0.51"	74° 24' 29"	22° 39' 52"	1.0146674	15'45.76"	23° 26' 18"	1 m 19 s
3	75° 41' 04"	-0.52"	74° 27' 04"	22° 40' 07"	1.0146727	15'45.75"	23° 26' 18"	1 m 19 s
4	75° 43' 27"	-0.52"	74° 29' 39"	22° 40' 22"	1.0146780	15'45.75"	23° 26' 18"	1 m 18 s
5	75° 45' 51"	-0.53"	74° 32' 13"	22° 40' 37"	1.0146833	15'45.74"	23° 26' 18"	1 m 18 s
6	75° 48' 14"	-0.53"	74° 34' 48"	22° 40' 53"	1.0146886	15'45.74"	23° 26' 18"	1 m 17 s
7	75° 50' 38"	-0.54"	74° 37' 23"	22° 41' 08"	1.0146939	15'45.73"	23° 26' 18"	1 m 17 s
8	75° 53' 01"	-0.54"	74° 39' 58"	22° 41' 23"	1.0146992	15'45.73"	23° 26' 18"	1 m 16 s
9	75° 55' 25"	-0.55"	74° 42' 32"	22° 41' 38"	1.0147045	15'45.72"	23° 26' 18"	1 m 16 s
10	75° 57' 49"	-0.55"	74° 45' 07"	22° 41' 53"	1.0147098	15'45.72"	23° 26' 18"	1 m 15 s
11	76° 00' 12"	-0.56"	74° 47' 42"	22° 42' 08"	1.0147150	15'45.71"	23° 26' 18"	1 m 15 s
12	76° 02' 36"	-0.56"	74° 50' 16"	22° 42' 23"	1.0147203	15'45.71"	23° 26' 18"	1 m 15 s
13	76° 04' 59"	-0.57"	74° 52' 51"	22° 42' 38"	1.0147256	15'45.70"	23° 26' 18"	1 m 14 s
14	76° 07' 23"	-0.57"	74° 55' 26"	22° 42' 53"	1.0147308	15'45.70"	23° 26' 18"	1 m 14 s
15	76° 09' 46"	-0.58"	74° 58' 01"	22° 43' 07"	1.0147361	15'45.69"	23° 26' 18"	1 m 13 s
16	76° 12' 10"	-0.58"	75° 00' 36"	22° 43' 22"	1.0147413	15'45.69"	23° 26' 18"	1 m 13 s
17	76° 14' 33"	-0.59"	75° 03' 10"	22° 43' 37"	1.0147465	15'45.68"	23° 26' 18"	1 m 12 s
18	76° 16' 57"	-0.59"	75° 05' 45"	22° 43' 52"	1.0147518	15'45.68"	23° 26' 18"	1 m 12 s
19	76° 19' 20"	-0.60"	75° 08' 20"	22° 44' 06"	1.0147570	15'45.67"	23° 26' 18"	1 m 11 s
20	76° 21' 44"	-0.60"	75° 10' 55"	22° 44' 21"	1.0147622	15'45.67"	23° 26' 18"	1 m 11 s
21	76° 24' 07"	-0.61"	75° 13' 30"	22° 44' 36"	1.0147674	15'45.66"	23° 26' 18"	1 m 10 s
22	76° 26' 31"	-0.61"	75° 16' 04"	22° 44' 50"	1.0147726	15'45.66"	23° 26' 18"	1 m 10 s
23	76° 28' 54"	-0.62"	75° 18' 39"	22° 45' 05"	1.0147778	15'45.66"	23° 26' 18"	1 m 09 s
24	76° 31' 18"	-0.62"	75° 21' 14"	22° 45' 19"	1.0147830	15'45.65"	23° 26' 18"	1 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	197° 00' 34"	-1° 58' 58"	194° 54' 37"	-8° 30' 46"	0° 54' 13"	14' 46.38"	291° 24' 24"	0.76163
1	197° 30' 07"	-2° 01' 22"	195° 21' 16"	-8° 44' 20"	0° 54' 12"	14' 46.24"	291° 18' 39"	0.76497
2	197° 59' 40"	-2° 03' 44"	195° 47' 56"	-8° 57' 51"	0° 54' 12"	14' 46.11"	291° 12' 45"	0.76830
3	198° 29' 13"	-2° 06' 07"	196° 14' 39"	-9° 11' 20"	0° 54' 11"	14' 45.98"	291° 6' 43"	0.77161
4	198° 58' 45"	-2° 08' 28"	196° 41' 23"	-9° 24' 47"	0° 54' 11"	14' 45.86"	291° 0' 31"	0.77490
5	199° 28' 18"	-2° 10' 50"	197° 08' 09"	-9° 38' 12"	0° 54' 10"	14' 45.74"	290° 54' 11"	0.77817
6	199° 57' 50"	-2° 13' 10"	197° 34' 57"	-9° 51' 35"	0° 54' 10"	14' 45.62"	290° 47' 42"	0.78143
7	200° 27' 21"	-2° 15' 30"	198° 01' 46"	-10° 04' 55"	0° 54' 10"	14' 45.51"	290° 41' 03"	0.78466
8	200° 56' 53"	-2° 17' 49"	198° 28' 38"	-10° 18' 13"	0° 54' 09"	14' 45.40"	290° 34' 16"	0.78788
9	201° 26' 24"	-2° 20' 08"	198° 55' 31"	-10° 31' 29"	0° 54' 09"	14' 45.30"	290° 27' 19"	0.79108
10	201° 55' 55"	-2° 22' 26"	199° 22' 27"	-10° 44' 42"	0° 54' 08"	14' 45.20"	290° 20' 13"	0.79426
11	202° 25' 26"	-2° 24' 43"	199° 49' 25"	-10° 57' 53"	0° 54' 08"	14' 45.11"	290° 12' 58"	0.79743
12	202° 54' 57"	-2° 26' 59"	200° 16' 25"	-11° 11' 02"	0° 54' 08"	14' 45.02"	290° 5' 33"	0.80057
13	203° 24' 28"	-2° 29' 15"	200° 43' 27"	-11° 24' 07"	0° 54' 07"	14' 44.93"	289° 57' 59"	0.80369
14	203° 53' 59"	-2° 31' 30"	201° 10' 32"	-11° 37' 11"	0° 54' 07"	14' 44.85"	289° 50' 15"	0.80680
15	204° 23' 29"	-2° 33' 45"	201° 37' 39"	-11° 50' 11"	0° 54' 07"	14' 44.77"	289° 42' 22"	0.80989
16	204° 53' 00"	-2° 35' 59"	202° 04' 48"	-12° 03' 09"	0° 54' 07"	14' 44.70"	289° 34' 19"	0.81295
17	205° 22' 31"	-2° 38' 12"	202° 32' 00"	-12° 16' 05"	0° 54' 06"	14' 44.63"	289° 26' 07"	0.81600
18	205° 52' 01"	-2° 40' 24"	202° 59' 15"	-12° 28' 57"	0° 54' 06"	14' 44.56"	289° 17' 44"	0.81902
19	206° 21' 32"	-2° 42' 36"	203° 26' 32"	-12° 41' 47"	0° 54' 06"	14' 44.50"	289° 9' 12"	0.82203
20	206° 51' 02"	-2° 44' 47"	203° 53' 51"	-12° 54' 34"	0° 54' 06"	14' 44.44"	289° 0' 29"	0.82502
21	207° 20' 33"	-2° 46' 57"	204° 21' 14"	-13° 07' 18"	0° 54' 05"	14' 44.39"	288° 51' 37"	0.82798
22	207° 50' 03"	-2° 49' 06"	204° 48' 39"	-13° 19' 59"	0° 54' 05"	14' 44.33"	288° 42' 34"	0.83093
23	208° 19' 34"	-2° 51' 15"	205° 16' 07"	-13° 32' 37"	0° 54' 05"	14' 44.29"	288° 33' 21"	0.83385
24	208° 49' 05"	-2° 53' 22"	205° 43' 38"	-13° 45' 12"	0° 54' 05"	14' 44.25"	288° 23' 57"	0.83676

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	76° 31' 18"	-0.62"	75° 21' 14"	22° 45' 19"	1.0147830	15'45.65"	23° 26' 18"	1 m 09 s
1	76° 33' 41"	-0.62"	75° 23' 49"	22° 45' 33"	1.0147882	15'45.65"	23° 26' 18"	1 m 08 s
2	76° 36' 05"	-0.63"	75° 26' 24"	22° 45' 48"	1.0147934	15'45.64"	23° 26' 18"	1 m 08 s
3	76° 38' 28"	-0.63"	75° 28' 59"	22° 46' 02"	1.0147986	15'45.64"	23° 26' 18"	1 m 08 s
4	76° 40' 52"	-0.64"	75° 31' 33"	22° 46' 16"	1.0148037	15'45.63"	23° 26' 18"	1 m 07 s
5	76° 43' 15"	-0.64"	75° 34' 08"	22° 46' 31"	1.0148089	15'45.63"	23° 26' 18"	1 m 07 s
6	76° 45' 39"	-0.65"	75° 36' 43"	22° 46' 45"	1.0148141	15'45.62"	23° 26' 18"	1 m 06 s
7	76° 48' 02"	-0.65"	75° 39' 18"	22° 46' 59"	1.0148192	15'45.62"	23° 26' 18"	1 m 06 s
8	76° 50' 26"	-0.66"	75° 41' 53"	22° 47' 13"	1.0148244	15'45.61"	23° 26' 18"	1 m 05 s
9	76° 52' 49"	-0.66"	75° 44' 28"	22° 47' 27"	1.0148295	15'45.61"	23° 26' 18"	1 m 05 s
10	76° 55' 13"	-0.66"	75° 47' 03"	22° 47' 41"	1.0148346	15'45.60"	23° 26' 18"	1 m 04 s
11	76° 57' 36"	-0.67"	75° 49' 38"	22° 47' 55"	1.0148398	15'45.60"	23° 26' 18"	1 m 04 s
12	76° 59' 60"	-0.67"	75° 52' 13"	22° 48' 09"	1.0148449	15'45.59"	23° 26' 18"	1 m 03 s
13	77° 02' 23"	-0.68"	75° 54' 47"	22° 48' 23"	1.0148500	15'45.59"	23° 26' 18"	1 m 03 s
14	77° 04' 47"	-0.68"	75° 57' 22"	22° 48' 37"	1.0148551	15'45.58"	23° 26' 18"	1 m 02 s
15	77° 07' 10"	-0.69"	75° 59' 57"	22° 48' 51"	1.0148602	15'45.58"	23° 26' 18"	1 m 02 s
16	77° 09' 34"	-0.69"	76° 02' 32"	22° 49' 05"	1.0148653	15'45.57"	23° 26' 18"	1 m 01 s
17	77° 11' 57"	-0.69"	76° 05' 07"	22° 49' 18"	1.0148704	15'45.57"	23° 26' 18"	1 m 01 s
18	77° 14' 21"	-0.70"	76° 07' 42"	22° 49' 32"	1.0148755	15'45.56"	23° 26' 18"	1 m 00 s
19	77° 16' 44"	-0.70"	76° 10' 17"	22° 49' 46"	1.0148806	15'45.56"	23° 26' 18"	0 m 60 s
20	77° 19' 08"	-0.71"	76° 12' 52"	22° 49' 59"	1.0148857	15'45.55"	23° 26' 18"	0 m 60 s
21	77° 21' 31"	-0.71"	76° 15' 27"	22° 50' 13"	1.0148907	15'45.55"	23° 26' 18"	0 m 59 s
22	77° 23' 55"	-0.71"	76° 18' 02"	22° 50' 26"	1.0148958	15'45.55"	23° 26' 18"	0 m 59 s
23	77° 26' 18"	-0.72"	76° 20' 37"	22° 50' 40"	1.0149008	15'45.54"	23° 26' 18"	0 m 58 s
24	77° 28' 42"	-0.72"	76° 23' 12"	22° 50' 53"	1.0149059	15'45.54"	23° 26' 18"	0 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	208° 49' 05"	-2° 53' 22"	205° 43' 38"	-13° 45' 12"	0° 54' 05"	14' 44.25"	288° 23' 57"	0.83676
1	209° 18' 36"	-2° 55' 30"	206° 11' 12"	-13° 57' 44"	0° 54' 05"	14' 44.21"	288° 14' 23"	0.83964
2	209° 48' 07"	-2° 57' 36"	206° 38' 49"	-14° 10' 13"	0° 54' 05"	14' 44.17"	288° 4' 38"	0.84250
3	210° 17' 38"	-2° 59' 41"	207° 06' 29"	-14° 22' 38"	0° 54' 05"	14' 44.14"	287° 54' 43"	0.84534
4	210° 47' 09"	-3° 01' 46"	207° 34' 12"	-14° 35' 01"	0° 54' 04"	14' 44.11"	287° 44' 36"	0.84816
5	211° 16' 41"	-3° 03' 50"	208° 01' 59"	-14° 47' 20"	0° 54' 04"	14' 44.09"	287° 34' 19"	0.85096
6	211° 46' 12"	-3° 05' 53"	208° 29' 48"	-14° 59' 36"	0° 54' 04"	14' 44.07"	287° 23' 50"	0.85373
7	212° 15' 44"	-3° 07' 55"	208° 57' 41"	-15° 11' 48"	0° 54' 04"	14' 44.06"	287° 13' 10"	0.85648
8	212° 45' 16"	-3° 09' 56"	209° 25' 37"	-15° 23' 57"	0° 54' 04"	14' 44.04"	287° 2' 19"	0.85922
9	213° 14' 48"	-3° 11' 57"	209° 53' 37"	-15° 36' 03"	0° 54' 04"	14' 44.04"	286° 51' 16"	0.86192
10	213° 44' 21"	-3° 13' 56"	210° 21' 40"	-15° 48' 05"	0° 54' 04"	14' 44.03"	286° 40' 01"	0.86461
11	214° 13' 54"	-3° 15' 55"	210° 49' 46"	-16° 00' 03"	0° 54' 04"	14' 44.03"	286° 28' 35"	0.86728
12	214° 43' 27"	-3° 17' 53"	211° 17' 56"	-16° 11' 58"	0° 54' 04"	14' 44.03"	286° 16' 56"	0.86992
13	215° 13' 00"	-3° 19' 50"	211° 46' 09"	-16° 23' 49"	0° 54' 04"	14' 44.04"	286° 5' 05"	0.87254
14	215° 42' 34"	-3° 21' 46"	212° 14' 26"	-16° 35' 37"	0° 54' 04"	14' 44.05"	285° 53' 02"	0.87513
15	216° 12' 08"	-3° 23' 41"	212° 42' 47"	-16° 47' 21"	0° 54' 04"	14' 44.06"	285° 40' 46"	0.87771
16	216° 41' 42"	-3° 25' 35"	213° 11' 12"	-16° 59' 00"	0° 54' 04"	14' 44.08"	285° 28' 17"	0.88026
17	217° 11' 16"	-3° 27' 29"	213° 39' 40"	-17° 10' 37"	0° 54' 04"	14' 44.10"	285° 15' 35"	0.88278
18	217° 40' 51"	-3° 29' 21"	214° 08' 12"	-17° 22' 09"	0° 54' 04"	14' 44.12"	285° 2' 40"	0.88529
19	218° 10' 27"	-3° 31' 13"	214° 36' 48"	-17° 33' 37"	0° 54' 05"	14' 44.15"	284° 49' 32"	0.88777
20	218° 40' 02"	-3° 33' 03"	215° 05' 27"	-17° 45' 01"	0° 54' 05"	14' 44.18"	284° 36' 09"	0.89022
21	219° 09' 38"	-3° 34' 53"	215° 34' 11"	-17° 56' 21"	0° 54' 05"	14' 44.22"	284° 22' 33"	0.89265
22	219° 39' 15"	-3° 36' 41"	216° 02' 59"	-18° 07' 37"	0° 54' 05"	14' 44.26"	284° 8' 43"	0.89506
23	220° 08' 52"	-3° 38' 29"	216° 31' 50"	-18° 18' 48"	0° 54' 05"	14' 44.30"	283° 54' 38"	0.89744
24	220° 38' 29"	-3° 40' 16"	217° 00' 46"	-18° 29' 56"	0° 54' 05"	14' 44.34"	283° 40' 18"	0.89980

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	77° 28' 42"	-0.72"	76° 23' 12"	22° 50' 53"	1.0149059	15'45.54"	23° 26' 18"	0 m 58 s
1	77° 31' 05"	-0.73"	76° 25' 47"	22° 51' 07"	1.0149110	15'45.53"	23° 26' 18"	0 m 57 s
2	77° 33' 29"	-0.73"	76° 28' 22"	22° 51' 20"	1.0149160	15'45.53"	23° 26' 18"	0 m 57 s
3	77° 35' 52"	-0.73"	76° 30' 57"	22° 51' 33"	1.0149210	15'45.52"	23° 26' 18"	0 m 56 s
4	77° 38' 16"	-0.74"	76° 33' 32"	22° 51' 47"	1.0149261	15'45.52"	23° 26' 18"	0 m 56 s
5	77° 40' 39"	-0.74"	76° 36' 07"	22° 51' 60"	1.0149311	15'45.51"	23° 26' 18"	0 m 55 s
6	77° 43' 02"	-0.74"	76° 38' 42"	22° 52' 13"	1.0149361	15'45.51"	23° 26' 18"	0 m 55 s
7	77° 45' 26"	-0.75"	76° 41' 17"	22° 52' 26"	1.0149411	15'45.50"	23° 26' 18"	0 m 54 s
8	77° 47' 49"	-0.75"	76° 43' 52"	22° 52' 39"	1.0149461	15'45.50"	23° 26' 18"	0 m 54 s
9	77° 50' 13"	-0.75"	76° 46' 27"	22° 52' 52"	1.0149511	15'45.49"	23° 26' 18"	0 m 53 s
10	77° 52' 36"	-0.76"	76° 49' 02"	22° 53' 05"	1.0149561	15'45.49"	23° 26' 18"	0 m 53 s
11	77° 54' 60"	-0.76"	76° 51' 37"	22° 53' 18"	1.0149611	15'45.48"	23° 26' 18"	0 m 52 s
12	77° 57' 23"	-0.76"	76° 54' 13"	22° 53' 31"	1.0149661	15'45.48"	23° 26' 18"	0 m 52 s
13	77° 59' 47"	-0.77"	76° 56' 48"	22° 53' 44"	1.0149711	15'45.48"	23° 26' 18"	0 m 51 s
14	78° 02' 10"	-0.77"	76° 59' 23"	22° 53' 57"	1.0149760	15'45.47"	23° 26' 18"	0 m 51 s
15	78° 04' 33"	-0.77"	77° 01' 58"	22° 54' 10"	1.0149810	15'45.47"	23° 26' 18"	0 m 50 s
16	78° 06' 57"	-0.78"	77° 04' 33"	22° 54' 23"	1.0149860	15'45.46"	23° 26' 18"	0 m 50 s
17	78° 09' 20"	-0.78"	77° 07' 08"	22° 54' 35"	1.0149909	15'45.46"	23° 26' 18"	0 m 49 s
18	78° 11' 44"	-0.78"	77° 09' 43"	22° 54' 48"	1.0149959	15'45.45"	23° 26' 18"	0 m 49 s
19	78° 14' 07"	-0.79"	77° 12' 18"	22° 55' 01"	1.0150008	15'45.45"	23° 26' 18"	0 m 48 s
20	78° 16' 31"	-0.79"	77° 14' 53"	22° 55' 13"	1.0150058	15'45.44"	23° 26' 18"	0 m 48 s
21	78° 18' 54"	-0.79"	77° 17' 29"	22° 55' 26"	1.0150107	15'45.44"	23° 26' 18"	0 m 47 s
22	78° 21' 18"	-0.80"	77° 20' 04"	22° 55' 38"	1.0150156	15'45.43"	23° 26' 18"	0 m 47 s
23	78° 23' 41"	-0.80"	77° 22' 39"	22° 55' 51"	1.0150206	15'45.43"	23° 26' 18"	0 m 46 s
24	78° 26' 04"	-0.80"	77° 25' 14"	22° 56' 03"	1.0150255	15'45.42"	23° 26' 18"	0 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	220° 38' 29"	-3° 40' 16"	217° 00' 46"	-18° 29' 56"	0° 54' 05"	14' 44.34"	283° 40' 18"	0.89980
1	221° 08' 07"	-3° 42' 02"	217° 29' 46"	-18° 40' 59"	0° 54' 05"	14' 44.39"	283° 25' 44"	0.90214
2	221° 37' 45"	-3° 43' 46"	217° 58' 49"	-18° 51' 58"	0° 54' 06"	14' 44.44"	283° 10' 54"	0.90445
3	222° 07' 24"	-3° 45' 30"	218° 27' 57"	-19° 02' 52"	0° 54' 06"	14' 44.50"	282° 55' 48"	0.90673
4	222° 37' 03"	-3° 47' 13"	218° 57' 10"	-19° 13' 42"	0° 54' 06"	14' 44.56"	282° 40' 26"	0.90899
5	223° 06' 43"	-3° 48' 55"	219° 26' 26"	-19° 24' 27"	0° 54' 06"	14' 44.62"	282° 24' 48"	0.91123
6	223° 36' 23"	-3° 50' 35"	219° 55' 47"	-19° 35' 08"	0° 54' 07"	14' 44.68"	282° 8' 53"	0.91344
7	224° 06' 04"	-3° 52' 15"	220° 25' 12"	-19° 45' 44"	0° 54' 07"	14' 44.75"	281° 52' 41"	0.91562
8	224° 35' 46"	-3° 53' 54"	220° 54' 41"	-19° 56' 16"	0° 54' 07"	14' 44.82"	281° 36' 11"	0.91778
9	225° 05' 27"	-3° 55' 31"	221° 24' 15"	-20° 06' 43"	0° 54' 07"	14' 44.89"	281° 19' 24"	0.91992
10	225° 35' 10"	-3° 57' 08"	221° 53' 53"	-20° 17' 05"	0° 54' 08"	14' 44.97"	281° 2' 18"	0.92203
11	226° 04' 53"	-3° 58' 43"	222° 23' 35"	-20° 27' 22"	0° 54' 08"	14' 45.05"	280° 44' 52"	0.92411
12	226° 34' 36"	-4° 00' 18"	222° 53' 22"	-20° 37' 34"	0° 54' 08"	14' 45.14"	280° 27' 08"	0.92616
13	227° 04' 21"	-4° 01' 51"	223° 23' 14"	-20° 47' 41"	0° 54' 09"	14' 45.22"	280° 9' 03"	0.92819
14	227° 34' 05"	-4° 03' 23"	223° 53' 09"	-20° 57' 43"	0° 54' 09"	14' 45.31"	279° 50' 38"	0.93020
15	228° 03' 51"	-4° 04' 55"	224° 23' 10"	-21° 07' 40"	0° 54' 09"	14' 45.41"	279° 31' 52"	0.93217
16	228° 33' 37"	-4° 06' 25"	224° 53' 15"	-21° 17' 32"	0° 54' 10"	14' 45.50"	279° 12' 43"	0.93412
17	229° 03' 23"	-4° 07' 54"	225° 23' 24"	-21° 27' 19"	0° 54' 10"	14' 45.60"	278° 53' 12"	0.93605
18	229° 33' 11"	-4° 09' 22"	225° 53' 38"	-21° 37' 00"	0° 54' 10"	14' 45.70"	278° 33' 18"	0.93794
19	230° 02' 59"	-4° 10' 48"	226° 23' 57"	-21° 46' 36"	0° 54' 11"	14' 45.81"	278° 12' 60"	0.93981
20	230° 32' 47"	-4° 12' 14"	226° 54' 20"	-21° 56' 07"	0° 54' 11"	14' 45.92"	277° 52' 16"	0.94166
21	231° 02' 37"	-4° 13' 39"	227° 24' 48"	-22° 05' 32"	0° 54' 11"	14' 46.03"	277° 31' 07"	0.94347
22	231° 32' 27"	-4° 15' 02"	227° 55' 21"	-22° 14' 52"	0° 54' 12"	14' 46.14"	277° 9' 32"	0.94526
23	232° 02' 17"	-4° 16' 24"	228° 25' 58"	-22° 24' 06"	0° 54' 12"	14' 46.26"	276° 47' 28"	0.94702
24	232° 32' 09"	-4° 17' 45"	228° 56' 40"	-22° 33' 15"	0° 54' 13"	14' 46.38"	276° 24' 56"	0.94875

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	78° 26' 04"	-0.80"	77° 25' 14"	22° 56' 03"	1.0150255	15'45.42"	23° 26' 18"	0 m 46 s
1	78° 28' 28"	-0.80"	77° 27' 49"	22° 56' 16"	1.0150304	15'45.42"	23° 26' 18"	0 m 46 s
2	78° 30' 51"	-0.81"	77° 30' 24"	22° 56' 28"	1.0150353	15'45.42"	23° 26' 18"	0 m 45 s
3	78° 33' 15"	-0.81"	77° 32' 59"	22° 56' 40"	1.0150402	15'45.41"	23° 26' 18"	0 m 45 s
4	78° 35' 38"	-0.81"	77° 35' 35"	22° 56' 53"	1.0150451	15'45.41"	23° 26' 18"	0 m 44 s
5	78° 38' 02"	-0.81"	77° 38' 10"	22° 57' 05"	1.0150500	15'45.40"	23° 26' 18"	0 m 44 s
6	78° 40' 25"	-0.82"	77° 40' 45"	22° 57' 17"	1.0150549	15'45.40"	23° 26' 18"	0 m 43 s
7	78° 42' 48"	-0.82"	77° 43' 20"	22° 57' 29"	1.0150597	15'45.39"	23° 26' 18"	0 m 43 s
8	78° 45' 12"	-0.82"	77° 45' 55"	22° 57' 41"	1.0150646	15'45.39"	23° 26' 18"	0 m 42 s
9	78° 47' 35"	-0.82"	77° 48' 31"	22° 57' 54"	1.0150695	15'45.38"	23° 26' 18"	0 m 42 s
10	78° 49' 59"	-0.83"	77° 51' 06"	22° 58' 06"	1.0150743	15'45.38"	23° 26' 18"	0 m 41 s
11	78° 52' 22"	-0.83"	77° 53' 41"	22° 58' 18"	1.0150792	15'45.37"	23° 26' 18"	0 m 41 s
12	78° 54' 45"	-0.83"	77° 56' 16"	22° 58' 29"	1.0150840	15'45.37"	23° 26' 18"	0 m 40 s
13	78° 57' 09"	-0.83"	77° 58' 51"	22° 58' 41"	1.0150889	15'45.37"	23° 26' 18"	0 m 40 s
14	78° 59' 32"	-0.84"	78° 01' 27"	22° 58' 53"	1.0150937	15'45.36"	23° 26' 18"	0 m 39 s
15	79° 01' 56"	-0.84"	78° 04' 02"	22° 59' 05"	1.0150986	15'45.36"	23° 26' 18"	0 m 39 s
16	79° 04' 19"	-0.84"	78° 06' 37"	22° 59' 17"	1.0151034	15'45.35"	23° 26' 18"	0 m 38 s
17	79° 06' 42"	-0.84"	78° 09' 12"	22° 59' 28"	1.0151082	15'45.35"	23° 26' 18"	0 m 38 s
18	79° 09' 06"	-0.84"	78° 11' 48"	22° 59' 40"	1.0151130	15'45.34"	23° 26' 18"	0 m 37 s
19	79° 11' 29"	-0.85"	78° 14' 23"	22° 59' 52"	1.0151178	15'45.34"	23° 26' 18"	0 m 37 s
20	79° 13' 53"	-0.85"	78° 16' 58"	23° 00' 03"	1.0151226	15'45.33"	23° 26' 18"	0 m 36 s
21	79° 16' 16"	-0.85"	78° 19' 34"	23° 00' 15"	1.0151274	15'45.33"	23° 26' 18"	0 m 36 s
22	79° 18' 39"	-0.85"	78° 22' 09"	23° 00' 27"	1.0151322	15'45.33"	23° 26' 18"	0 m 35 s
23	79° 21' 03"	-0.85"	78° 24' 44"	23° 00' 38"	1.0151370	15'45.32"	23° 26' 18"	0 m 35 s
24	79° 23' 26"	-0.85"	78° 27' 19"	23° 00' 49"	1.0151418	15'45.32"	23° 26' 18"	0 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	232° 32' 09"	-4° 17' 45"	228° 56' 40"	-22° 33' 15"	0° 54' 13"	14' 46.38"	276° 24' 56"	0.94875
1	233° 02' 01"	-4° 19' 05"	229° 27' 26"	-22° 42' 18"	0° 54' 13"	14' 46.50"	276° 1' 54"	0.95046
2	233° 31' 53"	-4° 20' 24"	229° 58' 18"	-22° 51' 15"	0° 54' 14"	14' 46.62"	275° 38' 20"	0.95214
3	234° 01' 47"	-4° 21' 42"	230° 29' 14"	-23° 00' 07"	0° 54' 14"	14' 46.75"	275° 14' 14"	0.95379
4	234° 31' 41"	-4° 22' 58"	231° 00' 14"	-23° 08' 52"	0° 54' 15"	14' 46.88"	274° 49' 34"	0.95541
5	235° 01' 36"	-4° 24' 13"	231° 31' 20"	-23° 17' 32"	0° 54' 15"	14' 47.02"	274° 24' 19"	0.95700
6	235° 31' 32"	-4° 25' 27"	232° 02' 30"	-23° 26' 05"	0° 54' 16"	14' 47.15"	273° 58' 27"	0.95857
7	236° 01' 29"	-4° 26' 40"	232° 33' 45"	-23° 34' 33"	0° 54' 16"	14' 47.29"	273° 31' 56"	0.96010
8	236° 31' 26"	-4° 27' 52"	233° 05' 04"	-23° 42' 55"	0° 54' 17"	14' 47.43"	273° 4' 44"	0.96161
9	237° 01' 24"	-4° 29' 02"	233° 36' 29"	-23° 51' 10"	0° 54' 17"	14' 47.58"	272° 36' 50"	0.96309
10	237° 31' 23"	-4° 30' 12"	234° 07' 58"	-23° 59' 19"	0° 54' 18"	14' 47.72"	272° 8' 10"	0.96454
11	238° 01' 23"	-4° 31' 20"	234° 39' 31"	-24° 07' 22"	0° 54' 18"	14' 47.87"	271° 38' 43"	0.96596
12	238° 31' 23"	-4° 32' 26"	235° 11' 10"	-24° 15' 18"	0° 54' 19"	14' 48.02"	271° 8' 27"	0.96735
13	239° 01' 24"	-4° 33' 32"	235° 42' 53"	-24° 23' 09"	0° 54' 19"	14' 48.18"	270° 37' 17"	0.96871
14	239° 31' 26"	-4° 34' 36"	236° 14' 41"	-24° 30' 52"	0° 54' 20"	14' 48.34"	270° 5' 12"	0.97005
15	240° 01' 29"	-4° 35' 39"	236° 46' 33"	-24° 38' 29"	0° 54' 21"	14' 48.49"	269° 32' 08"	0.97135
16	240° 31' 33"	-4° 36' 41"	237° 18' 30"	-24° 46' 00"	0° 54' 21"	14' 48.66"	268° 58' 01"	0.97262
17	241° 01' 38"	-4° 37' 41"	237° 50' 32"	-24° 53' 24"	0° 54' 22"	14' 48.82"	268° 22' 48"	0.97387
18	241° 31' 43"	-4° 38' 40"	238° 22' 38"	-25° 00' 41"	0° 54' 22"	14' 48.99"	267° 46' 23"	0.97508
19	242° 01' 49"	-4° 39' 38"	238° 54' 49"	-25° 07' 52"	0° 54' 23"	14' 49.16"	267° 8' 43"	0.97627
20	242° 31' 57"	-4° 40' 35"	239° 27' 05"	-25° 14' 56"	0° 54' 24"	14' 49.33"	266° 29' 41"	0.97742
21	243° 02' 05"	-4° 41' 30"	239° 59' 25"	-25° 21' 52"	0° 54' 24"	14' 49.50"	265° 49' 13"	0.97855
22	243° 32' 14"	-4° 42' 25"	240° 31' 50"	-25° 28' 42"	0° 54' 25"	14' 49.68"	265° 7' 12"	0.97964
23	244° 02' 23"	-4° 43' 17"	241° 04' 19"	-25° 35' 25"	0° 54' 26"	14' 49.86"	264° 23' 31"	0.98070
24	244° 32' 34"	-4° 44' 09"	241° 36' 53"	-25° 42' 01"	0° 54' 26"	14' 50.04"	263° 38' 02"	0.98174

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	79° 23' 26"	-0.85"	78° 27' 19"	23° 00' 49"	1.0151418	15'45.32"	23° 26' 18"	0 m 34 s
1	79° 25' 50"	-0.86"	78° 29' 55"	23° 01' 01"	1.0151466	15'45.31"	23° 26' 18"	0 m 34 s
2	79° 28' 13"	-0.86"	78° 32' 30"	23° 01' 12"	1.0151514	15'45.31"	23° 26' 18"	0 m 33 s
3	79° 30' 36"	-0.86"	78° 35' 05"	23° 01' 23"	1.0151561	15'45.30"	23° 26' 18"	0 m 33 s
4	79° 32' 60"	-0.86"	78° 37' 41"	23° 01' 35"	1.0151609	15'45.30"	23° 26' 18"	0 m 32 s
5	79° 35' 23"	-0.86"	78° 40' 16"	23° 01' 46"	1.0151656	15'45.29"	23° 26' 18"	0 m 32 s
6	79° 37' 47"	-0.86"	78° 42' 51"	23° 01' 57"	1.0151704	15'45.29"	23° 26' 18"	0 m 31 s
7	79° 40' 10"	-0.86"	78° 45' 27"	23° 02' 08"	1.0151751	15'45.29"	23° 26' 18"	0 m 31 s
8	79° 42' 33"	-0.87"	78° 48' 02"	23° 02' 19"	1.0151799	15'45.28"	23° 26' 18"	0 m 30 s
9	79° 44' 57"	-0.87"	78° 50' 37"	23° 02' 30"	1.0151846	15'45.28"	23° 26' 18"	0 m 30 s
10	79° 47' 20"	-0.87"	78° 53' 13"	23° 02' 41"	1.0151893	15'45.27"	23° 26' 18"	0 m 29 s
11	79° 49' 43"	-0.87"	78° 55' 48"	23° 02' 52"	1.0151941	15'45.27"	23° 26' 18"	0 m 29 s
12	79° 52' 07"	-0.87"	78° 58' 23"	23° 03' 03"	1.0151988	15'45.26"	23° 26' 18"	0 m 28 s
13	79° 54' 30"	-0.87"	79° 00' 59"	23° 03' 14"	1.0152035	15'45.26"	23° 26' 18"	0 m 28 s
14	79° 56' 54"	-0.87"	79° 03' 34"	23° 03' 25"	1.0152082	15'45.25"	23° 26' 18"	0 m 27 s
15	79° 59' 17"	-0.87"	79° 06' 10"	23° 03' 36"	1.0152129	15'45.25"	23° 26' 18"	0 m 27 s
16	80° 01' 40"	-0.87"	79° 08' 45"	23° 03' 47"	1.0152176	15'45.25"	23° 26' 18"	0 m 26 s
17	80° 04' 04"	-0.87"	79° 11' 20"	23° 03' 57"	1.0152223	15'45.24"	23° 26' 18"	0 m 26 s
18	80° 06' 27"	-0.87"	79° 13' 56"	23° 04' 08"	1.0152270	15'45.24"	23° 26' 18"	0 m 25 s
19	80° 08' 50"	-0.87"	79° 16' 31"	23° 04' 19"	1.0152317	15'45.23"	23° 26' 18"	0 m 25 s
20	80° 11' 14"	-0.88"	79° 19' 07"	23° 04' 29"	1.0152363	15'45.23"	23° 26' 18"	0 m 24 s
21	80° 13' 37"	-0.88"	79° 21' 42"	23° 04' 40"	1.0152410	15'45.22"	23° 26' 18"	0 m 24 s
22	80° 16' 00"	-0.88"	79° 24' 17"	23° 04' 50"	1.0152457	15'45.22"	23° 26' 18"	0 m 23 s
23	80° 18' 24"	-0.88"	79° 26' 53"	23° 05' 01"	1.0152503	15'45.22"	23° 26' 18"	0 m 23 s
24	80° 20' 47"	-0.88"	79° 29' 28"	23° 05' 11"	1.0152550	15'45.21"	23° 26' 18"	0 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	244° 32' 34"	-4° 44' 09"	241° 36' 53"	-25° 42' 01"	0° 54' 26"	14' 50.04"	263° 38' 02"	0.98174
1	245° 02' 46"	-4° 44' 59"	242° 09' 31"	-25° 48' 30"	0° 54' 27"	14' 50.22"	262° 50' 37"	0.98274
2	245° 32' 58"	-4° 45' 48"	242° 42' 14"	-25° 54' 52"	0° 54' 28"	14' 50.41"	262° 1' 06"	0.98371
3	246° 03' 11"	-4° 46' 35"	243° 15' 01"	-26° 01' 06"	0° 54' 28"	14' 50.60"	261° 9' 19"	0.98465
4	246° 33' 26"	-4° 47' 21"	243° 47' 52"	-26° 07' 13"	0° 54' 29"	14' 50.79"	260° 15' 04"	0.98556
5	247° 03' 41"	-4° 48' 06"	244° 20' 48"	-26° 13' 13"	0° 54' 30"	14' 50.98"	259° 18' 07"	0.98644
6	247° 33' 57"	-4° 48' 50"	244° 53' 48"	-26° 19' 06"	0° 54' 30"	14' 51.17"	258° 18' 14"	0.98729
7	248° 04' 14"	-4° 49' 32"	245° 26' 52"	-26° 24' 51"	0° 54' 31"	14' 51.37"	257° 15' 08"	0.98810
8	248° 34' 32"	-4° 50' 13"	246° 00' 01"	-26° 30' 28"	0° 54' 32"	14' 51.57"	256° 8' 31"	0.98889
9	249° 04' 51"	-4° 50' 52"	246° 33' 14"	-26° 35' 58"	0° 54' 33"	14' 51.77"	254° 58' 01"	0.98964
10	249° 35' 11"	-4° 51' 30"	247° 06' 31"	-26° 41' 21"	0° 54' 33"	14' 51.97"	253° 43' 16"	0.99037
11	250° 05' 31"	-4° 52' 07"	247° 39' 51"	-26° 46' 35"	0° 54' 34"	14' 52.18"	252° 23' 47"	0.99106
12	250° 35' 53"	-4° 52' 43"	248° 13' 16"	-26° 51' 43"	0° 54' 35"	14' 52.39"	250° 59' 06"	0.99172
13	251° 06' 16"	-4° 53' 17"	248° 46' 45"	-26° 56' 42"	0° 54' 36"	14' 52.60"	249° 28' 38"	0.99234
14	251° 36' 39"	-4° 53' 49"	249° 20' 18"	-27° 01' 33"	0° 54' 36"	14' 52.81"	247° 51' 43"	0.99294
15	252° 07' 04"	-4° 54' 21"	249° 53' 55"	-27° 06' 17"	0° 54' 37"	14' 53.02"	246° 7' 39"	0.99350
16	252° 37' 29"	-4° 54' 50"	250° 27' 36"	-27° 10' 53"	0° 54' 38"	14' 53.24"	244° 15' 36"	0.99403
17	253° 07' 56"	-4° 55' 19"	251° 01' 20"	-27° 15' 21"	0° 54' 39"	14' 53.45"	242° 14' 38"	0.99453
18	253° 38' 23"	-4° 55' 46"	251° 35' 08"	-27° 19' 41"	0° 54' 40"	14' 53.67"	240° 3' 45"	0.99500
19	254° 08' 52"	-4° 56' 12"	252° 08' 60"	-27° 23' 53"	0° 54' 40"	14' 53.90"	237° 41' 46"	0.99544
20	254° 39' 21"	-4° 56' 36"	252° 42' 55"	-27° 27' 56"	0° 54' 41"	14' 54.12"	235° 7' 27"	0.99584
21	255° 09' 52"	-4° 56' 59"	253° 16' 54"	-27° 31' 52"	0° 54' 42"	14' 54.34"	232° 19' 27"	0.99621
22	255° 40' 23"	-4° 57' 20"	253° 50' 56"	-27° 35' 39"	0° 54' 43"	14' 54.57"	229° 16' 22"	0.99654
23	256° 10' 56"	-4° 57' 40"	254° 25' 02"	-27° 39' 19"	0° 54' 44"	14' 54.80"	225° 56' 47"	0.99685
24	256° 41' 29"	-4° 57' 59"	254° 59' 11"	-27° 42' 49"	0° 54' 45"	14' 55.03"	222° 19' 25"	0.99712

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	80° 20' 47"	-0.88"	79° 29' 28"	23° 05' 11"	1.0152550	15'45.21"	23° 26' 18"	0 m 22 s
1	80° 23' 11"	-0.88"	79° 32' 04"	23° 05' 22"	1.0152596	15'45.21"	23° 26' 18"	0 m 22 s
2	80° 25' 34"	-0.88"	79° 34' 39"	23° 05' 32"	1.0152643	15'45.20"	23° 26' 18"	0 m 21 s
3	80° 27' 57"	-0.88"	79° 37' 15"	23° 05' 42"	1.0152689	15'45.20"	23° 26' 18"	0 m 21 s
4	80° 30' 21"	-0.88"	79° 39' 50"	23° 05' 52"	1.0152735	15'45.19"	23° 26' 18"	0 m 20 s
5	80° 32' 44"	-0.88"	79° 42' 25"	23° 06' 03"	1.0152782	15'45.19"	23° 26' 18"	0 m 20 s
6	80° 35' 07"	-0.88"	79° 45' 01"	23° 06' 13"	1.0152828	15'45.18"	23° 26' 18"	0 m 19 s
7	80° 37' 31"	-0.88"	79° 47' 36"	23° 06' 23"	1.0152874	15'45.18"	23° 26' 18"	0 m 19 s
8	80° 39' 54"	-0.88"	79° 50' 12"	23° 06' 33"	1.0152920	15'45.18"	23° 26' 18"	0 m 18 s
9	80° 42' 17"	-0.88"	79° 52' 47"	23° 06' 43"	1.0152966	15'45.17"	23° 26' 18"	0 m 18 s
10	80° 44' 41"	-0.88"	79° 55' 23"	23° 06' 53"	1.0153012	15'45.17"	23° 26' 18"	0 m 17 s
11	80° 47' 04"	-0.88"	79° 57' 58"	23° 07' 03"	1.0153058	15'45.16"	23° 26' 18"	0 m 16 s
12	80° 49' 27"	-0.88"	80° 00' 34"	23° 07' 13"	1.0153104	15'45.16"	23° 26' 18"	0 m 16 s
13	80° 51' 51"	-0.88"	80° 03' 09"	23° 07' 23"	1.0153150	15'45.15"	23° 26' 18"	0 m 15 s
14	80° 54' 14"	-0.88"	80° 05' 45"	23° 07' 33"	1.0153196	15'45.15"	23° 26' 18"	0 m 15 s
15	80° 56' 37"	-0.88"	80° 08' 20"	23° 07' 42"	1.0153241	15'45.15"	23° 26' 18"	0 m 14 s
16	80° 59' 01"	-0.88"	80° 10' 56"	23° 07' 52"	1.0153287	15'45.14"	23° 26' 18"	0 m 14 s
17	81° 01' 24"	-0.88"	80° 13' 31"	23° 08' 02"	1.0153333	15'45.14"	23° 26' 18"	0 m 13 s
18	81° 03' 47"	-0.87"	80° 16' 07"	23° 08' 11"	1.0153378	15'45.13"	23° 26' 18"	0 m 13 s
19	81° 06' 11"	-0.87"	80° 18' 42"	23° 08' 21"	1.0153424	15'45.13"	23° 26' 18"	0 m 12 s
20	81° 08' 34"	-0.87"	80° 21' 18"	23° 08' 31"	1.0153469	15'45.13"	23° 26' 18"	0 m 12 s
21	81° 10' 57"	-0.87"	80° 23' 53"	23° 08' 40"	1.0153515	15'45.12"	23° 26' 18"	0 m 11 s
22	81° 13' 21"	-0.87"	80° 26' 29"	23° 08' 50"	1.0153560	15'45.12"	23° 26' 18"	0 m 11 s
23	81° 15' 44"	-0.87"	80° 29' 05"	23° 08' 59"	1.0153605	15'45.11"	23° 26' 18"	0 m 10 s
24	81° 18' 07"	-0.87"	80° 31' 40"	23° 09' 09"	1.0153650	15'45.11"	23° 26' 18"	0 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	256° 41' 29"	-4° 57' 59"	254° 59' 11"	-27° 42' 49"	0° 54' 45"	14' 55.03"	222° 19' 25"	0.99712
1	257° 12' 03"	-4° 58' 16"	255° 33' 23"	-27° 46' 12"	0° 54' 45"	14' 55.26"	218° 23' 09"	0.99736
2	257° 42' 39"	-4° 58' 32"	256° 07' 38"	-27° 49' 26"	0° 54' 46"	14' 55.50"	214° 7' 19"	0.99757
3	258° 13' 15"	-4° 58' 46"	256° 41' 57"	-27° 52' 32"	0° 54' 47"	14' 55.74"	209° 31' 52"	0.99774
4	258° 43' 53"	-4° 58' 59"	257° 16' 18"	-27° 55' 30"	0° 54' 48"	14' 55.97"	204° 37' 39"	0.99788
5	259° 14' 31"	-4° 59' 11"	257° 50' 43"	-27° 58' 19"	0° 54' 49"	14' 56.21"	199° 26' 34"	0.99799
6	259° 45' 10"	-4° 59' 21"	258° 25' 10"	-28° 00' 59"	0° 54' 50"	14' 56.46"	194° 1' 47"	0.99806
7	260° 15' 51"	-4° 59' 29"	258° 59' 40"	-28° 03' 31"	0° 54' 51"	14' 56.70"	188° 27' 36"	0.99810
8	260° 46' 32"	-4° 59' 36"	259° 34' 13"	-28° 05' 54"	0° 54' 52"	14' 56.95"	182° 49' 12"	0.99811
9	261° 17' 15"	-4° 59' 42"	260° 08' 49"	-28° 08' 09"	0° 54' 52"	14' 57.19"	177° 12' 11"	0.99809
10	261° 47' 58"	-4° 59' 46"	260° 43' 27"	-28° 10' 15"	0° 54' 53"	14' 57.44"	171° 42' 01"	0.99803
11	262° 18' 43"	-4° 59' 49"	261° 18' 07"	-28° 12' 13"	0° 54' 54"	14' 57.69"	166° 23' 30"	0.99793
12	262° 49' 28"	-4° 59' 51"	261° 52' 50"	-28° 14' 01"	0° 54' 55"	14' 57.94"	161° 20' 20"	0.99781
13	263° 20' 15"	-4° 59' 50"	262° 27' 35"	-28° 15' 41"	0° 54' 56"	14' 58.20"	156° 35' 04"	0.99765
14	263° 51' 03"	-4° 59' 49"	263° 02' 23"	-28° 17' 12"	0° 54' 57"	14' 58.45"	152° 9' 02"	0.99746
15	264° 21' 51"	-4° 59' 46"	263° 37' 12"	-28° 18' 35"	0° 54' 58"	14' 58.71"	148° 2' 37"	0.99723
16	264° 52' 41"	-4° 59' 41"	264° 12' 04"	-28° 19' 48"	0° 54' 59"	14' 58.97"	144° 15' 25"	0.99697
17	265° 23' 32"	-4° 59' 35"	264° 46' 57"	-28° 20' 53"	0° 54' 60"	14' 59.23"	140° 46' 30"	0.99668
18	265° 54' 24"	-4° 59' 28"	265° 21' 53"	-28° 21' 49"	0° 55' 01"	14' 59.49"	137° 34' 40"	0.99635
19	266° 25' 16"	-4° 59' 19"	265° 56' 50"	-28° 22' 36"	0° 55' 02"	14' 59.76"	134° 38' 31"	0.99599
20	266° 56' 10"	-4° 59' 09"	266° 31' 48"	-28° 23' 14"	0° 55' 03"	15' 00.02"	131° 56' 40"	0.99559
21	267° 27' 05"	-4° 58' 57"	267° 06' 49"	-28° 23' 43"	0° 55' 04"	15' 00.29"	129° 27' 44"	0.99516
22	267° 58' 01"	-4° 58' 43"	267° 41' 51"	-28° 24' 03"	0° 55' 05"	15' 00.56"	127° 10' 24"	0.99470
23	268° 28' 58"	-4° 58' 28"	268° 16' 54"	-28° 24' 14"	0° 55' 06"	15' 00.83"	125° 3' 29"	0.99420
24	268° 59' 56"	-4° 58' 12"	268° 51' 58"	-28° 24' 16"	0° 55' 07"	15' 01.10"	123° 5' 53"	0.99367

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	81° 18' 07"	-0.87"	80° 31' 40"	23° 09' 09"	1.0153650	15'45.11"	23° 26' 18"	0 m 10 s
1	81° 20' 31"	-0.87"	80° 34' 16"	23° 09' 18"	1.0153696	15'45.10"	23° 26' 18"	0 m 09 s
2	81° 22' 54"	-0.87"	80° 36' 51"	23° 09' 27"	1.0153741	15'45.10"	23° 26' 18"	0 m 09 s
3	81° 25' 17"	-0.87"	80° 39' 27"	23° 09' 36"	1.0153786	15'45.10"	23° 26' 18"	0 m 08 s
4	81° 27' 41"	-0.87"	80° 42' 02"	23° 09' 46"	1.0153831	15'45.09"	23° 26' 18"	0 m 08 s
5	81° 30' 04"	-0.86"	80° 44' 38"	23° 09' 55"	1.0153876	15'45.09"	23° 26' 18"	0 m 07 s
6	81° 32' 27"	-0.86"	80° 47' 13"	23° 10' 04"	1.0153921	15'45.08"	23° 26' 18"	0 m 07 s
7	81° 34' 51"	-0.86"	80° 49' 49"	23° 10' 13"	1.0153966	15'45.08"	23° 26' 18"	0 m 06 s
8	81° 37' 14"	-0.86"	80° 52' 25"	23° 10' 22"	1.0154010	15'45.07"	23° 26' 18"	0 m 06 s
9	81° 39' 37"	-0.86"	80° 55' 00"	23° 10' 31"	1.0154055	15'45.07"	23° 26' 18"	0 m 05 s
10	81° 42' 01"	-0.86"	80° 57' 36"	23° 10' 40"	1.0154100	15'45.07"	23° 26' 18"	0 m 05 s
11	81° 44' 24"	-0.86"	81° 00' 11"	23° 10' 49"	1.0154144	15'45.06"	23° 26' 18"	0 m 04 s
12	81° 46' 47"	-0.85"	81° 02' 47"	23° 10' 58"	1.0154189	15'45.06"	23° 26' 18"	0 m 04 s
13	81° 49' 10"	-0.85"	81° 05' 23"	23° 11' 07"	1.0154234	15'45.05"	23° 26' 18"	0 m 03 s
14	81° 51' 34"	-0.85"	81° 07' 58"	23° 11' 16"	1.0154278	15'45.05"	23° 26' 18"	0 m 03 s
15	81° 53' 57"	-0.85"	81° 10' 34"	23° 11' 25"	1.0154322	15'45.05"	23° 26' 18"	0 m 02 s
16	81° 56' 20"	-0.85"	81° 13' 09"	23° 11' 33"	1.0154367	15'45.04"	23° 26' 18"	0 m 02 s
17	81° 58' 44"	-0.85"	81° 15' 45"	23° 11' 42"	1.0154411	15'45.04"	23° 26' 18"	0 m 01 s
18	82° 01' 07"	-0.84"	81° 18' 21"	23° 11' 51"	1.0154455	15'45.03"	23° 26' 18"	0 m 00 s
19	82° 03' 30"	-0.84"	81° 20' 56"	23° 11' 59"	1.0154500	15'45.03"	23° 26' 18"	0 m -0 s
20	82° 05' 54"	-0.84"	81° 23' 32"	23° 12' 08"	1.0154544	15'45.03"	23° 26' 18"	0 m -1 s
21	82° 08' 17"	-0.84"	81° 26' 08"	23° 12' 16"	1.0154588	15'45.02"	23° 26' 18"	0 m -1 s
22	82° 10' 40"	-0.84"	81° 28' 43"	23° 12' 25"	1.0154632	15'45.02"	23° 26' 18"	0 m -2 s
23	82° 13' 03"	-0.83"	81° 31' 19"	23° 12' 33"	1.0154676	15'45.01"	23° 26' 18"	0 m -2 s
24	82° 15' 27"	-0.83"	81° 33' 55"	23° 12' 41"	1.0154720	15'45.01"	23° 26' 18"	0 m -3 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	268° 59' 56"	-4° 58' 12"	268° 51' 58"	-28° 24' 16"	0° 55' 07"	15' 01.10"	123° 5' 53"	0.99367
1	269° 30' 55"	-4° 57' 54"	269° 27' 04"	-28° 24' 09"	0° 55' 08"	15' 01.37"	121° 16' 38"	0.99310
2	270° 01' 56"	-4° 57' 35"	270° 02' 11"	-28° 23' 53"	0° 55' 09"	15' 01.65"	119° 34' 52"	0.99251
3	270° 32' 57"	-4° 57' 14"	270° 37' 19"	-28° 23' 28"	0° 55' 10"	15' 01.92"	117° 59' 48"	0.99187
4	271° 03' 59"	-4° 56' 52"	271° 12' 28"	-28° 22' 54"	0° 55' 11"	15' 02.20"	116° 30' 45"	0.99121
5	271° 35' 03"	-4° 56' 28"	271° 47' 37"	-28° 22' 11"	0° 55' 12"	15' 02.48"	115° 7' 07"	0.99050
6	272° 06' 07"	-4° 56' 03"	272° 22' 47"	-28° 21' 19"	0° 55' 13"	15' 02.76"	113° 48' 22"	0.98977
7	272° 37' 13"	-4° 55' 36"	272° 57' 58"	-28° 20' 17"	0° 55' 14"	15' 03.04"	112° 34' 01"	0.98900
8	273° 08' 19"	-4° 55' 08"	273° 33' 10"	-28° 19' 07"	0° 55' 15"	15' 03.32"	111° 23' 40"	0.98819
9	273° 39' 27"	-4° 54' 39"	274° 08' 22"	-28° 17' 47"	0° 55' 16"	15' 03.61"	110° 16' 56"	0.98736
10	274° 10' 36"	-4° 54' 07"	274° 43' 34"	-28° 16' 19"	0° 55' 17"	15' 03.89"	109° 13' 29"	0.98648
11	274° 41' 45"	-4° 53' 35"	275° 18' 46"	-28° 14' 41"	0° 55' 18"	15' 04.18"	108° 13' 03"	0.98558
12	275° 12' 56"	-4° 53' 01"	275° 53' 59"	-28° 12' 54"	0° 55' 19"	15' 04.47"	107° 15' 20"	0.98464
13	275° 44' 08"	-4° 52' 25"	276° 29' 12"	-28° 10' 58"	0° 55' 20"	15' 04.76"	106° 20' 08"	0.98366
14	276° 15' 21"	-4° 51' 48"	277° 04' 24"	-28° 08' 53"	0° 55' 21"	15' 05.05"	105° 27' 14"	0.98265
15	276° 46' 35"	-4° 51' 09"	277° 39' 37"	-28° 06' 39"	0° 55' 22"	15' 05.35"	104° 36' 28"	0.98161
16	277° 17' 51"	-4° 50' 29"	278° 14' 49"	-28° 04' 16"	0° 55' 23"	15' 05.64"	103° 47' 38"	0.98053
17	277° 49' 07"	-4° 49' 48"	278° 50' 01"	-28° 01' 44"	0° 55' 25"	15' 05.94"	103° 0' 36"	0.97942
18	278° 20' 24"	-4° 49' 05"	279° 25' 12"	-27° 59' 02"	0° 55' 26"	15' 06.23"	102° 15' 14"	0.97827
19	278° 51' 43"	-4° 48' 20"	280° 00' 23"	-27° 56' 12"	0° 55' 27"	15' 06.53"	101° 31' 25"	0.97709
20	279° 23' 02"	-4° 47' 34"	280° 35' 34"	-27° 53' 12"	0° 55' 28"	15' 06.83"	100° 49' 02"	0.97588
21	279° 54' 23"	-4° 46' 47"	281° 10' 43"	-27° 50' 04"	0° 55' 29"	15' 07.13"	100° 7' 60"	0.97463
22	280° 25' 44"	-4° 45' 58"	281° 45' 52"	-27° 46' 46"	0° 55' 30"	15' 07.43"	99° 28' 12"	0.97335
23	280° 57' 07"	-4° 45' 07"	282° 21' 00"	-27° 43' 19"	0° 55' 31"	15' 07.74"	98° 49' 34"	0.97203
24	281° 28' 31"	-4° 44' 15"	282° 56' 07"	-27° 39' 43"	0° 55' 32"	15' 08.04"	98° 12' 02"	0.97068

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	82° 15' 27"	-0.83"	81° 33' 55"	23° 12' 41"	1.0154720	15'45.01"	23° 26' 18"	0 m -3 s
1	82° 17' 50"	-0.83"	81° 36' 30"	23° 12' 50"	1.0154764	15'45.00"	23° 26' 18"	0 m -3 s
2	82° 20' 13"	-0.83"	81° 39' 06"	23° 12' 58"	1.0154808	15'45.00"	23° 26' 18"	0 m -4 s
3	82° 22' 37"	-0.83"	81° 41' 42"	23° 13' 06"	1.0154851	15'45.00"	23° 26' 18"	0 m -4 s
4	82° 24' 60"	-0.82"	81° 44' 17"	23° 13' 15"	1.0154895	15'44.99"	23° 26' 18"	0 m -5 s
5	82° 27' 23"	-0.82"	81° 46' 53"	23° 13' 23"	1.0154939	15'44.99"	23° 26' 18"	0 m -5 s
6	82° 29' 47"	-0.82"	81° 49' 29"	23° 13' 31"	1.0154982	15'44.98"	23° 26' 18"	0 m -6 s
7	82° 32' 10"	-0.82"	81° 52' 04"	23° 13' 39"	1.0155026	15'44.98"	23° 26' 18"	0 m -6 s
8	82° 34' 33"	-0.81"	81° 54' 40"	23° 13' 47"	1.0155069	15'44.98"	23° 26' 18"	0 m -7 s
9	82° 36' 56"	-0.81"	81° 57' 16"	23° 13' 55"	1.0155113	15'44.97"	23° 26' 18"	0 m -7 s
10	82° 39' 20"	-0.81"	81° 59' 51"	23° 14' 03"	1.0155156	15'44.97"	23° 26' 18"	0 m -8 s
11	82° 41' 43"	-0.81"	82° 02' 27"	23° 14' 11"	1.0155199	15'44.96"	23° 26' 18"	0 m -8 s
12	82° 44' 06"	-0.80"	82° 05' 03"	23° 14' 19"	1.0155243	15'44.96"	23° 26' 18"	0 m -9 s
13	82° 46' 30"	-0.80"	82° 07' 39"	23° 14' 27"	1.0155286	15'44.96"	23° 26' 18"	0 m -9 s
14	82° 48' 53"	-0.80"	82° 10' 14"	23° 14' 34"	1.0155329	15'44.95"	23° 26' 18"	0 m-10 s
15	82° 51' 16"	-0.79"	82° 12' 50"	23° 14' 42"	1.0155372	15'44.95"	23° 26' 18"	0 m-11 s
16	82° 53' 39"	-0.79"	82° 15' 26"	23° 14' 50"	1.0155415	15'44.94"	23° 26' 18"	0 m-11 s
17	82° 56' 03"	-0.79"	82° 18' 01"	23° 14' 58"	1.0155458	15'44.94"	23° 26' 18"	0 m-12 s
18	82° 58' 26"	-0.79"	82° 20' 37"	23° 15' 05"	1.0155501	15'44.94"	23° 26' 18"	0 m-12 s
19	83° 00' 49"	-0.78"	82° 23' 13"	23° 15' 13"	1.0155544	15'44.93"	23° 26' 18"	0 m-13 s
20	83° 03' 13"	-0.78"	82° 25' 49"	23° 15' 20"	1.0155587	15'44.93"	23° 26' 18"	0 m-13 s
21	83° 05' 36"	-0.78"	82° 28' 24"	23° 15' 28"	1.0155630	15'44.92"	23° 26' 18"	0 m-14 s
22	83° 07' 59"	-0.77"	82° 31' 00"	23° 15' 35"	1.0155672	15'44.92"	23° 26' 18"	0 m-14 s
23	83° 10' 22"	-0.77"	82° 33' 36"	23° 15' 43"	1.0155715	15'44.92"	23° 26' 18"	0 m-15 s
24	83° 12' 46"	-0.77"	82° 36' 12"	23° 15' 50"	1.0155758	15'44.91"	23° 26' 18"	0 m-15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	281° 28' 31"	-4° 44' 15"	282° 56' 07"	-27° 39' 43"	0° 55' 32"	15' 08.04"	98° 12' 02"	0.97068
1	281° 59' 56"	-4° 43' 22"	283° 31' 13"	-27° 35' 59"	0° 55' 33"	15' 08.35"	97° 35' 31"	0.96930
2	282° 31' 22"	-4° 42' 27"	284° 06' 18"	-27° 32' 05"	0° 55' 35"	15' 08.66"	96° 59' 57"	0.96788
3	283° 02' 49"	-4° 41' 31"	284° 41' 22"	-27° 28' 02"	0° 55' 36"	15' 08.97"	96° 25' 18"	0.96642
4	283° 34' 18"	-4° 40' 33"	285° 16' 24"	-27° 23' 51"	0° 55' 37"	15' 09.28"	95° 51' 30"	0.96494
5	284° 05' 47"	-4° 39' 33"	285° 51' 25"	-27° 19' 30"	0° 55' 38"	15' 09.59"	95° 18' 31"	0.96342
6	284° 37' 18"	-4° 38' 33"	286° 26' 25"	-27° 15' 00"	0° 55' 39"	15' 09.90"	94° 46' 17"	0.96186
7	285° 08' 49"	-4° 37' 30"	287° 01' 23"	-27° 10' 22"	0° 55' 40"	15' 10.21"	94° 14' 47"	0.96027
8	285° 40' 22"	-4° 36' 27"	287° 36' 19"	-27° 05' 35"	0° 55' 41"	15' 10.53"	93° 43' 58"	0.95865
9	286° 11' 56"	-4° 35' 22"	288° 11' 14"	-27° 00' 39"	0° 55' 43"	15' 10.84"	93° 13' 47"	0.95700
10	286° 43' 31"	-4° 34' 15"	288° 46' 07"	-26° 55' 34"	0° 55' 44"	15' 11.16"	92° 44' 14"	0.95531
11	287° 15' 07"	-4° 33' 07"	289° 20' 58"	-26° 50' 20"	0° 55' 45"	15' 11.48"	92° 15' 16"	0.95358
12	287° 46' 44"	-4° 31' 58"	289° 55' 47"	-26° 44' 58"	0° 55' 46"	15' 11.80"	91° 46' 53"	0.95182
13	288° 18' 22"	-4° 30' 47"	290° 30' 34"	-26° 39' 26"	0° 55' 47"	15' 12.12"	91° 19' 01"	0.95003
14	288° 50' 01"	-4° 29' 34"	291° 05' 19"	-26° 33' 46"	0° 55' 48"	15' 12.44"	90° 51' 41"	0.94821
15	289° 21' 42"	-4° 28' 21"	291° 40' 02"	-26° 27' 58"	0° 55' 50"	15' 12.77"	90° 24' 50"	0.94635
16	289° 53' 23"	-4° 27' 05"	292° 14' 42"	-26° 22' 01"	0° 55' 51"	15' 13.09"	89° 58' 27"	0.94446
17	290° 25' 06"	-4° 25' 49"	292° 49' 21"	-26° 15' 55"	0° 55' 52"	15' 13.42"	89° 32' 32"	0.94253
18	290° 56' 50"	-4° 24' 31"	293° 23' 57"	-26° 09' 40"	0° 55' 53"	15' 13.75"	89° 7' 04"	0.94058
19	291° 28' 35"	-4° 23' 11"	293° 58' 31"	-26° 03' 18"	0° 55' 54"	15' 14.07"	88° 42' 01"	0.93859
20	292° 00' 21"	-4° 21' 50"	294° 33' 02"	-25° 56' 46"	0° 55' 56"	15' 14.40"	88° 17' 22"	0.93656
21	292° 32' 08"	-4° 20' 28"	295° 07' 30"	-25° 50' 06"	0° 55' 57"	15' 14.73"	87° 53' 07"	0.93450
22	293° 03' 57"	-4° 19' 04"	295° 41' 57"	-25° 43' 18"	0° 55' 58"	15' 15.07"	87° 29' 15"	0.93241
23	293° 35' 46"	-4° 17' 39"	296° 16' 20"	-25° 36' 21"	0° 55' 59"	15' 15.40"	87° 5' 44"	0.93029
24	294° 07' 37"	-4° 16' 12"	296° 50' 41"	-25° 29' 16"	0° 56' 00"	15' 15.73"	86° 42' 36"	0.92813

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	83° 12' 46"	-0.77"	82° 36' 12"	23° 15' 50"	1.0155758	15'44.91"	23° 26' 18"	0 m-15 s
1	83° 15' 09"	-0.76"	82° 38' 47"	23° 15' 57"	1.0155800	15'44.91"	23° 26' 18"	0 m-16 s
2	83° 17' 32"	-0.76"	82° 41' 23"	23° 16' 05"	1.0155843	15'44.90"	23° 26' 18"	0 m-16 s
3	83° 19' 55"	-0.76"	82° 43' 59"	23° 16' 12"	1.0155885	15'44.90"	23° 26' 18"	0 m-17 s
4	83° 22' 19"	-0.75"	82° 46' 35"	23° 16' 19"	1.0155927	15'44.90"	23° 26' 18"	0 m-17 s
5	83° 24' 42"	-0.75"	82° 49' 10"	23° 16' 26"	1.0155970	15'44.89"	23° 26' 18"	0 m-18 s
6	83° 27' 05"	-0.75"	82° 51' 46"	23° 16' 33"	1.0156012	15'44.89"	23° 26' 18"	0 m-18 s
7	83° 29' 29"	-0.74"	82° 54' 22"	23° 16' 40"	1.0156054	15'44.88"	23° 26' 18"	0 m-19 s
8	83° 31' 52"	-0.74"	82° 56' 58"	23° 16' 47"	1.0156096	15'44.88"	23° 26' 18"	0 m-19 s
9	83° 34' 15"	-0.74"	82° 59' 34"	23° 16' 54"	1.0156138	15'44.88"	23° 26' 18"	0 m-20 s
10	83° 36' 38"	-0.73"	83° 02' 09"	23° 17' 01"	1.0156180	15'44.87"	23° 26' 18"	0 m-21 s
11	83° 39' 02"	-0.73"	83° 04' 45"	23° 17' 08"	1.0156222	15'44.87"	23° 26' 18"	0 m-21 s
12	83° 41' 25"	-0.72"	83° 07' 21"	23° 17' 15"	1.0156264	15'44.87"	23° 26' 18"	0 m-22 s
13	83° 43' 48"	-0.72"	83° 09' 57"	23° 17' 22"	1.0156306	15'44.86"	23° 26' 18"	0 m-22 s
14	83° 46' 11"	-0.72"	83° 12' 32"	23° 17' 29"	1.0156348	15'44.86"	23° 26' 18"	0 m-23 s
15	83° 48' 35"	-0.71"	83° 15' 08"	23° 17' 35"	1.0156390	15'44.85"	23° 26' 18"	0 m-23 s
16	83° 50' 58"	-0.71"	83° 17' 44"	23° 17' 42"	1.0156431	15'44.85"	23° 26' 18"	0 m-24 s
17	83° 53' 21"	-0.70"	83° 20' 20"	23° 17' 49"	1.0156473	15'44.85"	23° 26' 18"	0 m-24 s
18	83° 55' 44"	-0.70"	83° 22' 56"	23° 17' 55"	1.0156514	15'44.84"	23° 26' 18"	0 m-25 s
19	83° 58' 08"	-0.70"	83° 25' 32"	23° 18' 02"	1.0156556	15'44.84"	23° 26' 18"	0 m-25 s
20	84° 00' 31"	-0.69"	83° 28' 07"	23° 18' 08"	1.0156597	15'44.83"	23° 26' 18"	0 m-26 s
21	84° 02' 54"	-0.69"	83° 30' 43"	23° 18' 15"	1.0156639	15'44.83"	23° 26' 18"	0 m-26 s
22	84° 05' 17"	-0.68"	83° 33' 19"	23° 18' 21"	1.0156680	15'44.83"	23° 26' 18"	0 m-27 s
23	84° 07' 41"	-0.68"	83° 35' 55"	23° 18' 28"	1.0156721	15'44.82"	23° 26' 18"	0 m-27 s
24	84° 10' 04"	-0.68"	83° 38' 31"	23° 18' 34"	1.0156762	15'44.82"	23° 26' 18"	0 m-28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	294° 07' 37"	-4° 16' 12"	296° 50' 41"	-25° 29' 16"	0° 56' 00"	15' 15.73"	86° 42' 36"	0.92813
1	294° 39' 29"	-4° 14' 44"	297° 24' 59"	-25° 22' 03"	0° 56' 02"	15' 16.07"	86° 19' 48"	0.92594
2	295° 11' 22"	-4° 13' 15"	297° 59' 14"	-25° 14' 42"	0° 56' 03"	15' 16.40"	85° 57' 21"	0.92372
3	295° 43' 16"	-4° 11' 44"	298° 33' 27"	-25° 07' 12"	0° 56' 04"	15' 16.74"	85° 35' 13"	0.92147
4	296° 15' 11"	-4° 10' 12"	299° 07' 37"	-24° 59' 34"	0° 56' 05"	15' 17.08"	85° 13' 24"	0.91918
5	296° 47' 08"	-4° 08' 39"	299° 41' 43"	-24° 51' 48"	0° 56' 07"	15' 17.42"	84° 51' 55"	0.91686
6	297° 19' 05"	-4° 07' 04"	300° 15' 47"	-24° 43' 54"	0° 56' 08"	15' 17.76"	84° 30' 43"	0.91451
7	297° 51' 04"	-4° 05' 28"	300° 49' 48"	-24° 35' 52"	0° 56' 09"	15' 18.10"	84° 9' 49"	0.91213
8	298° 23' 04"	-4° 03' 50"	301° 23' 46"	-24° 27' 42"	0° 56' 10"	15' 18.45"	83° 49' 12"	0.90971
9	298° 55' 05"	-4° 02' 11"	301° 57' 40"	-24° 19' 24"	0° 56' 12"	15' 18.79"	83° 28' 53"	0.90726
10	299° 27' 07"	-4° 00' 31"	302° 31' 32"	-24° 10' 58"	0° 56' 13"	15' 19.14"	83° 8' 50"	0.90478
11	299° 59' 10"	-3° 58' 49"	303° 05' 20"	-24° 02' 24"	0° 56' 14"	15' 19.48"	82° 49' 03"	0.90227
12	300° 31' 15"	-3° 57' 06"	303° 39' 05"	-23° 53' 43"	0° 56' 16"	15' 19.83"	82° 29' 33"	0.89973
13	301° 03' 21"	-3° 55' 22"	304° 12' 48"	-23° 44' 53"	0° 56' 17"	15' 20.18"	82° 10' 18"	0.89715
14	301° 35' 28"	-3° 53' 36"	304° 46' 26"	-23° 35' 57"	0° 56' 18"	15' 20.53"	81° 51' 19"	0.89455
15	302° 07' 36"	-3° 51' 49"	305° 20' 02"	-23° 26' 52"	0° 56' 19"	15' 20.88"	81° 32' 34"	0.89191
16	302° 39' 45"	-3° 50' 01"	305° 53' 34"	-23° 17' 40"	0° 56' 21"	15' 21.23"	81° 14' 05"	0.88924
17	303° 11' 55"	-3° 48' 12"	306° 27' 03"	-23° 08' 20"	0° 56' 22"	15' 21.59"	80° 55' 50"	0.88654
18	303° 44' 07"	-3° 46' 21"	307° 00' 29"	-22° 58' 53"	0° 56' 23"	15' 21.94"	80° 37' 49"	0.88381
19	304° 16' 20"	-3° 44' 29"	307° 33' 52"	-22° 49' 19"	0° 56' 25"	15' 22.30"	80° 20' 03"	0.88105
20	304° 48' 34"	-3° 42' 35"	308° 07' 11"	-22° 39' 37"	0° 56' 26"	15' 22.65"	80° 2' 31"	0.87826
21	305° 20' 49"	-3° 40' 41"	308° 40' 26"	-22° 29' 47"	0° 56' 27"	15' 23.01"	79° 45' 12"	0.87544
22	305° 53' 06"	-3° 38' 45"	309° 13' 39"	-22° 19' 51"	0° 56' 29"	15' 23.37"	79° 28' 08"	0.87258
23	306° 25' 24"	-3° 36' 48"	309° 46' 48"	-22° 09' 47"	0° 56' 30"	15' 23.73"	79° 11' 16"	0.86970
24	306° 57' 43"	-3° 34' 49"	310° 19' 54"	-21° 59' 37"	0° 56' 31"	15' 24.09"	78° 54' 38"	0.86679

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	84° 10' 04"	-0.68"	83° 38' 31"	23° 18' 34"	1.0156762	15'44.82"	23° 26' 18"	0 m-28 s
1	84° 12' 27"	-0.67"	83° 41' 07"	23° 18' 40"	1.0156804	15'44.81"	23° 26' 18"	0 m-29 s
2	84° 14' 50"	-0.67"	83° 43' 42"	23° 18' 46"	1.0156845	15'44.81"	23° 26' 18"	0 m-29 s
3	84° 17' 14"	-0.66"	83° 46' 18"	23° 18' 53"	1.0156886	15'44.81"	23° 26' 18"	0 m-30 s
4	84° 19' 37"	-0.66"	83° 48' 54"	23° 18' 59"	1.0156927	15'44.80"	23° 26' 18"	0 m-30 s
5	84° 22' 00"	-0.65"	83° 51' 30"	23° 19' 05"	1.0156968	15'44.80"	23° 26' 18"	0 m-31 s
6	84° 24' 23"	-0.65"	83° 54' 06"	23° 19' 11"	1.0157008	15'44.80"	23° 26' 18"	0 m-31 s
7	84° 26' 47"	-0.65"	83° 56' 42"	23° 19' 17"	1.0157049	15'44.79"	23° 26' 18"	0 m-32 s
8	84° 29' 10"	-0.64"	83° 59' 17"	23° 19' 23"	1.0157090	15'44.79"	23° 26' 18"	0 m-32 s
9	84° 31' 33"	-0.64"	84° 01' 53"	23° 19' 29"	1.0157130	15'44.78"	23° 26' 18"	0 m-33 s
10	84° 33' 56"	-0.63"	84° 04' 29"	23° 19' 35"	1.0157171	15'44.78"	23° 26' 18"	0 m-33 s
11	84° 36' 20"	-0.63"	84° 07' 05"	23° 19' 41"	1.0157212	15'44.78"	23° 26' 18"	0 m-34 s
12	84° 38' 43"	-0.62"	84° 09' 41"	23° 19' 47"	1.0157252	15'44.77"	23° 26' 18"	0 m-34 s
13	84° 41' 06"	-0.62"	84° 12' 17"	23° 19' 52"	1.0157292	15'44.77"	23° 26' 18"	0 m-35 s
14	84° 43' 29"	-0.61"	84° 14' 53"	23° 19' 58"	1.0157333	15'44.77"	23° 26' 18"	0 m-35 s
15	84° 45' 53"	-0.61"	84° 17' 29"	23° 20' 04"	1.0157373	15'44.76"	23° 26' 18"	0 m-36 s
16	84° 48' 16"	-0.60"	84° 20' 04"	23° 20' 09"	1.0157413	15'44.76"	23° 26' 18"	0 m-37 s
17	84° 50' 39"	-0.60"	84° 22' 40"	23° 20' 15"	1.0157453	15'44.75"	23° 26' 18"	0 m-37 s
18	84° 53' 02"	-0.60"	84° 25' 16"	23° 20' 21"	1.0157494	15'44.75"	23° 26' 18"	0 m-38 s
19	84° 55' 26"	-0.59"	84° 27' 52"	23° 20' 26"	1.0157534	15'44.75"	23° 26' 18"	0 m-38 s
20	84° 57' 49"	-0.59"	84° 30' 28"	23° 20' 32"	1.0157574	15'44.74"	23° 26' 18"	0 m-39 s
21	85° 00' 12"	-0.58"	84° 33' 04"	23° 20' 37"	1.0157613	15'44.74"	23° 26' 18"	0 m-39 s
22	85° 02' 35"	-0.58"	84° 35' 40"	23° 20' 42"	1.0157653	15'44.74"	23° 26' 18"	0 m-40 s
23	85° 04' 59"	-0.57"	84° 38' 16"	23° 20' 48"	1.0157693	15'44.73"	23° 26' 18"	0 m-40 s
24	85° 07' 22"	-0.57"	84° 40' 52"	23° 20' 53"	1.0157733	15'44.73"	23° 26' 18"	0 m-41 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	306° 57' 43"	-3° 34' 49"	310° 19' 54"	-21° 59' 37"	0° 56' 31"	15' 24.09"	78° 54' 38"	0.86679
1	307° 30' 03"	-3° 32' 50"	310° 52' 56"	-21° 49' 19"	0° 56' 32"	15' 24.45"	78° 38' 13"	0.86384
2	308° 02' 24"	-3° 30' 49"	311° 25' 55"	-21° 38' 54"	0° 56' 34"	15' 24.81"	78° 22' 01"	0.86087
3	308° 34' 47"	-3° 28' 47"	311° 58' 50"	-21° 28' 22"	0° 56' 35"	15' 25.18"	78° 6' 02"	0.85787
4	309° 07' 11"	-3° 26' 43"	312° 31' 42"	-21° 17' 43"	0° 56' 36"	15' 25.54"	77° 50' 16"	0.85483
5	309° 39' 36"	-3° 24' 39"	313° 04' 31"	-21° 06' 58"	0° 56' 38"	15' 25.91"	77° 34' 42"	0.85177
6	310° 12' 02"	-3° 22' 33"	313° 37' 16"	-20° 56' 05"	0° 56' 39"	15' 26.27"	77° 19' 20"	0.84868
7	310° 44' 30"	-3° 20' 26"	314° 09' 58"	-20° 45' 06"	0° 56' 41"	15' 26.64"	77° 4' 11"	0.84556
8	311° 16' 59"	-3° 18' 18"	314° 42' 37"	-20° 34' 01"	0° 56' 42"	15' 27.01"	76° 49' 14"	0.84241
9	311° 49' 29"	-3° 16' 09"	315° 15' 12"	-20° 22' 48"	0° 56' 43"	15' 27.38"	76° 34' 30"	0.83924
10	312° 22' 00"	-3° 13' 58"	315° 47' 44"	-20° 11' 29"	0° 56' 45"	15' 27.75"	76° 19' 57"	0.83603
11	312° 54' 33"	-3° 11' 47"	316° 20' 12"	-20° 00' 04"	0° 56' 46"	15' 28.12"	76° 5' 36"	0.83280
12	313° 27' 07"	-3° 09' 34"	316° 52' 38"	-19° 48' 32"	0° 56' 47"	15' 28.50"	75° 51' 28"	0.82953
13	313° 59' 42"	-3° 07' 20"	317° 24' 60"	-19° 36' 54"	0° 56' 49"	15' 28.87"	75° 37' 30"	0.82624
14	314° 32' 19"	-3° 05' 05"	317° 57' 18"	-19° 25' 10"	0° 56' 50"	15' 29.25"	75° 23' 45"	0.82292
15	315° 04' 57"	-3° 02' 49"	318° 29' 34"	-19° 13' 19"	0° 56' 51"	15' 29.62"	75° 10' 11"	0.81958
16	315° 37' 36"	-3° 00' 32"	319° 01' 46"	-19° 01' 22"	0° 56' 53"	15' 30.00"	74° 56' 49"	0.81621
17	316° 10' 16"	-2° 58' 14"	319° 33' 54"	-18° 49' 19"	0° 56' 54"	15' 30.38"	74° 43' 38"	0.81280
18	316° 42' 58"	-2° 55' 54"	320° 06' 00"	-18° 37' 10"	0° 56' 56"	15' 30.76"	74° 30' 38"	0.80938
19	317° 15' 41"	-2° 53' 34"	320° 38' 03"	-18° 24' 55"	0° 56' 57"	15' 31.14"	74° 17' 50"	0.80592
20	317° 48' 25"	-2° 51' 12"	321° 10' 02"	-18° 12' 34"	0° 56' 58"	15' 31.52"	74° 5' 13"	0.80244
21	318° 21' 11"	-2° 48' 50"	321° 41' 58"	-18° 00' 07"	0° 56' 60"	15' 31.90"	73° 52' 47"	0.79893
22	318° 53' 58"	-2° 46' 26"	322° 13' 51"	-17° 47' 34"	0° 57' 01"	15' 32.28"	73° 40' 33"	0.79540
23	319° 26' 46"	-2° 44' 01"	322° 45' 41"	-17° 34' 56"	0° 57' 03"	15' 32.66"	73° 28' 29"	0.79184
24	319° 59' 36"	-2° 41' 36"	323° 17' 28"	-17° 22' 12"	0° 57' 04"	15' 33.05"	73° 16' 37"	0.78825

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	85° 07' 22"	-0.57"	84° 40' 52"	23° 20' 53"	1.0157733	15'44.73"	23° 26' 18"	0 m-41 s
1	85° 09' 45"	-0.56"	84° 43' 28"	23° 20' 58"	1.0157772	15'44.72"	23° 26' 18"	0 m-41 s
2	85° 12' 08"	-0.56"	84° 46' 03"	23° 21' 04"	1.0157812	15'44.72"	23° 26' 18"	0 m-42 s
3	85° 14' 32"	-0.55"	84° 48' 39"	23° 21' 09"	1.0157852	15'44.72"	23° 26' 18"	0 m-42 s
4	85° 16' 55"	-0.55"	84° 51' 15"	23° 21' 14"	1.0157891	15'44.71"	23° 26' 18"	0 m-43 s
5	85° 19' 18"	-0.54"	84° 53' 51"	23° 21' 19"	1.0157930	15'44.71"	23° 26' 18"	0 m-44 s
6	85° 21' 41"	-0.54"	84° 56' 27"	23° 21' 24"	1.0157970	15'44.71"	23° 26' 18"	0 m-44 s
7	85° 24' 04"	-0.53"	84° 59' 03"	23° 21' 29"	1.0158009	15'44.70"	23° 26' 18"	0 m-45 s
8	85° 26' 28"	-0.53"	85° 01' 39"	23° 21' 34"	1.0158048	15'44.70"	23° 26' 18"	0 m-45 s
9	85° 28' 51"	-0.52"	85° 04' 15"	23° 21' 39"	1.0158087	15'44.70"	23° 26' 18"	0 m-46 s
10	85° 31' 14"	-0.52"	85° 06' 51"	23° 21' 44"	1.0158126	15'44.69"	23° 26' 18"	0 m-46 s
11	85° 33' 37"	-0.51"	85° 09' 27"	23° 21' 49"	1.0158165	15'44.69"	23° 26' 18"	0 m-47 s
12	85° 36' 01"	-0.51"	85° 12' 03"	23° 21' 53"	1.0158204	15'44.68"	23° 26' 18"	0 m-47 s
13	85° 38' 24"	-0.50"	85° 14' 39"	23° 21' 58"	1.0158243	15'44.68"	23° 26' 18"	0 m-48 s
14	85° 40' 47"	-0.50"	85° 17' 15"	23° 22' 03"	1.0158282	15'44.68"	23° 26' 18"	0 m-48 s
15	85° 43' 10"	-0.49"	85° 19' 51"	23° 22' 08"	1.0158321	15'44.67"	23° 26' 18"	0 m-49 s
16	85° 45' 34"	-0.48"	85° 22' 26"	23° 22' 12"	1.0158359	15'44.67"	23° 26' 18"	0 m-49 s
17	85° 47' 57"	-0.48"	85° 25' 02"	23° 22' 17"	1.0158398	15'44.67"	23° 26' 18"	0 m-50 s
18	85° 50' 20"	-0.47"	85° 27' 38"	23° 22' 21"	1.0158437	15'44.66"	23° 26' 18"	0 m-51 s
19	85° 52' 43"	-0.47"	85° 30' 14"	23° 22' 26"	1.0158475	15'44.66"	23° 26' 18"	0 m-51 s
20	85° 55' 06"	-0.46"	85° 32' 50"	23° 22' 30"	1.0158513	15'44.66"	23° 26' 18"	0 m-52 s
21	85° 57' 30"	-0.46"	85° 35' 26"	23° 22' 35"	1.0158552	15'44.65"	23° 26' 18"	0 m-52 s
22	85° 59' 53"	-0.45"	85° 38' 02"	23° 22' 39"	1.0158590	15'44.65"	23° 26' 18"	0 m-53 s
23	86° 02' 16"	-0.45"	85° 40' 38"	23° 22' 43"	1.0158628	15'44.65"	23° 26' 18"	0 m-53 s
24	86° 04' 39"	-0.44"	85° 43' 14"	23° 22' 48"	1.0158666	15'44.64"	23° 26' 18"	0 m-54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	319° 59' 36"	-2° 41' 36"	323° 17' 28"	-17° 22' 12"	0° 57' 04"	15' 33.05"	73° 16' 37"	0.78825
1	320° 32' 27"	-2° 39' 09"	323° 49' 12"	-17° 09' 22"	0° 57' 05"	15' 33.43"	73° 4' 55"	0.78464
2	321° 05' 20"	-2° 36' 41"	324° 20' 53"	-16° 56' 27"	0° 57' 07"	15' 33.82"	72° 53' 24"	0.78101
3	321° 38' 13"	-2° 34' 13"	324° 52' 31"	-16° 43' 27"	0° 57' 08"	15' 34.21"	72° 42' 04"	0.77735
4	322° 11' 09"	-2° 31' 43"	325° 24' 06"	-16° 30' 21"	0° 57' 10"	15' 34.60"	72° 30' 55"	0.77366
5	322° 44' 05"	-2° 29' 13"	325° 55' 39"	-16° 17' 09"	0° 57' 11"	15' 34.98"	72° 19' 57"	0.76995
6	323° 17' 03"	-2° 26' 41"	326° 27' 08"	-16° 03' 52"	0° 57' 13"	15' 35.37"	72° 9' 10"	0.76621
7	323° 50' 02"	-2° 24' 09"	326° 58' 35"	-15° 50' 30"	0° 57' 14"	15' 35.76"	71° 58' 33"	0.76245
8	324° 23' 03"	-2° 21' 35"	327° 29' 59"	-15° 37' 03"	0° 57' 15"	15' 36.16"	71° 48' 07"	0.75867
9	324° 56' 05"	-2° 19' 01"	328° 01' 20"	-15° 23' 31"	0° 57' 17"	15' 36.55"	71° 37' 51"	0.75486
10	325° 29' 09"	-2° 16' 26"	328° 32' 39"	-15° 09' 54"	0° 57' 18"	15' 36.94"	71° 27' 46"	0.75103
11	326° 02' 14"	-2° 13' 49"	329° 03' 55"	-14° 56' 12"	0° 57' 20"	15' 37.33"	71° 17' 52"	0.74717
12	326° 35' 20"	-2° 11' 12"	329° 35' 09"	-14° 42' 25"	0° 57' 21"	15' 37.73"	71° 8' 08"	0.74329
13	327° 08' 28"	-2° 08' 35"	330° 06' 20"	-14° 28' 33"	0° 57' 23"	15' 38.12"	70° 58' 34"	0.73939
14	327° 41' 37"	-2° 05' 56"	330° 37' 28"	-14° 14' 36"	0° 57' 24"	15' 38.52"	70° 49' 12"	0.73547
15	328° 14' 48"	-2° 03' 16"	331° 08' 34"	-14° 00' 35"	0° 57' 26"	15' 38.92"	70° 39' 59"	0.73152
16	328° 47' 60"	-2° 00' 36"	331° 39' 38"	-13° 46' 29"	0° 57' 27"	15' 39.32"	70° 30' 57"	0.72756
17	329° 21' 14"	-1° 57' 55"	332° 10' 40"	-13° 32' 18"	0° 57' 29"	15' 39.71"	70° 22' 05"	0.72357
18	329° 54' 29"	-1° 55' 13"	332° 41' 39"	-13° 18' 03"	0° 57' 30"	15' 40.11"	70° 13' 24"	0.71956
19	330° 27' 45"	-1° 52' 30"	333° 12' 36"	-13° 03' 44"	0° 57' 31"	15' 40.51"	70° 4' 53"	0.71552
20	331° 01' 03"	-1° 49' 46"	333° 43' 31"	-12° 49' 20"	0° 57' 33"	15' 40.91"	69° 56' 32"	0.71147
21	331° 34' 23"	-1° 47' 02"	334° 14' 24"	-12° 34' 52"	0° 57' 34"	15' 41.31"	69° 48' 21"	0.70740
22	332° 07' 44"	-1° 44' 17"	334° 45' 15"	-12° 20' 19"	0° 57' 36"	15' 41.71"	69° 40' 21"	0.70330
23	332° 41' 06"	-1° 41' 31"	335° 16' 04"	-12° 05' 43"	0° 57' 37"	15' 42.12"	69° 32' 31"	0.69919
24	333° 14' 30"	-1° 38' 45"	335° 46' 51"	-11° 51' 02"	0° 57' 39"	15' 42.52"	69° 24' 51"	0.69505

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	86° 04' 39"	-0.44"	85° 43' 14"	23° 22' 48"	1.0158666	15'44.64"	23° 26' 18"	0 m-54 s
1	86° 07' 03"	-0.44"	85° 45' 50"	23° 22' 52"	1.0158704	15'44.64"	23° 26' 18"	0 m-54 s
2	86° 09' 26"	-0.43"	85° 48' 26"	23° 22' 56"	1.0158742	15'44.63"	23° 26' 18"	0 m-55 s
3	86° 11' 49"	-0.43"	85° 51' 02"	23° 23' 00"	1.0158780	15'44.63"	23° 26' 18"	0 m-55 s
4	86° 14' 12"	-0.42"	85° 53' 38"	23° 23' 04"	1.0158818	15'44.63"	23° 26' 18"	0 m-56 s
5	86° 16' 35"	-0.42"	85° 56' 14"	23° 23' 08"	1.0158856	15'44.62"	23° 26' 18"	0 m-56 s
6	86° 18' 59"	-0.41"	85° 58' 50"	23° 23' 12"	1.0158894	15'44.62"	23° 26' 18"	0 m-57 s
7	86° 21' 22"	-0.40"	86° 01' 26"	23° 23' 16"	1.0158931	15'44.62"	23° 26' 18"	0 m-58 s
8	86° 23' 45"	-0.40"	86° 04' 02"	23° 23' 20"	1.0158969	15'44.61"	23° 26' 18"	0 m-58 s
9	86° 26' 08"	-0.39"	86° 06' 38"	23° 23' 24"	1.0159006	15'44.61"	23° 26' 18"	0 m-59 s
10	86° 28' 32"	-0.39"	86° 09' 14"	23° 23' 28"	1.0159044	15'44.61"	23° 26' 18"	0 m-59 s
11	86° 30' 55"	-0.38"	86° 11' 50"	23° 23' 32"	1.0159081	15'44.60"	23° 26' 18"	0 m-60 s
12	86° 33' 18"	-0.38"	86° 14' 26"	23° 23' 36"	1.0159118	15'44.60"	23° 26' 18"	-1 m 00 s
13	86° 35' 41"	-0.37"	86° 17' 02"	23° 23' 39"	1.0159156	15'44.60"	23° 26' 18"	-1 m 01 s
14	86° 38' 04"	-0.37"	86° 19' 38"	23° 23' 43"	1.0159193	15'44.59"	23° 26' 18"	-1 m 01 s
15	86° 40' 28"	-0.36"	86° 22' 14"	23° 23' 47"	1.0159230	15'44.59"	23° 26' 18"	-1 m 02 s
16	86° 42' 51"	-0.36"	86° 24' 50"	23° 23' 50"	1.0159267	15'44.59"	23° 26' 18"	-1 m 02 s
17	86° 45' 14"	-0.35"	86° 27' 26"	23° 23' 54"	1.0159304	15'44.58"	23° 26' 18"	-1 m 03 s
18	86° 47' 37"	-0.34"	86° 30' 02"	23° 23' 57"	1.0159341	15'44.58"	23° 26' 18"	-1 m 04 s
19	86° 50' 01"	-0.34"	86° 32' 38"	23° 24' 01"	1.0159377	15'44.58"	23° 26' 18"	-1 m 04 s
20	86° 52' 24"	-0.33"	86° 35' 14"	23° 24' 04"	1.0159414	15'44.57"	23° 26' 18"	-1 m 05 s
21	86° 54' 47"	-0.33"	86° 37' 50"	23° 24' 08"	1.0159451	15'44.57"	23° 26' 18"	-1 m 05 s
22	86° 57' 10"	-0.32"	86° 40' 26"	23° 24' 11"	1.0159487	15'44.57"	23° 26' 18"	-1 m 06 s
23	86° 59' 33"	-0.32"	86° 43' 02"	23° 24' 14"	1.0159524	15'44.56"	23° 26' 18"	-1 m 06 s
24	87° 01' 57"	-0.31"	86° 45' 38"	23° 24' 17"	1.0159560	15'44.56"	23° 26' 18"	-1 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	333° 14' 30"	-1° 38' 45"	335° 46' 51"	-11° 51' 02"	0° 57' 39"	15' 42.52"	69° 24' 51"	0.69505
1	333° 47' 55"	-1° 35' 58"	336° 17' 36"	-11° 36' 17"	0° 57' 40"	15' 42.92"	69° 17' 22"	0.69090
2	334° 21' 22"	-1° 33' 10"	336° 48' 19"	-11° 21' 29"	0° 57' 42"	15' 43.33"	69° 10' 02"	0.68673
3	334° 54' 51"	-1° 30' 21"	337° 19' 01"	-11° 06' 36"	0° 57' 43"	15' 43.73"	69° 2' 53"	0.68253
4	335° 28' 21"	-1° 27' 32"	337° 49' 41"	-10° 51' 40"	0° 57' 45"	15' 44.14"	68° 55' 54"	0.67832
5	336° 01' 53"	-1° 24' 42"	338° 20' 20"	-10° 36' 39"	0° 57' 46"	15' 44.54"	68° 49' 05"	0.67409
6	336° 35' 26"	-1° 21' 51"	338° 50' 56"	-10° 21' 36"	0° 57' 48"	15' 44.95"	68° 42' 26"	0.66985
7	337° 09' 01"	-1° 19' 00"	339° 21' 32"	-10° 06' 28"	0° 57' 49"	15' 45.35"	68° 35' 58"	0.66558
8	337° 42' 37"	-1° 16' 09"	339° 52' 06"	-9° 51' 17"	0° 57' 51"	15' 45.76"	68° 29' 39"	0.66130
9	338° 16' 15"	-1° 13' 16"	340° 22' 39"	-9° 36' 02"	0° 57' 52"	15' 46.17"	68° 23' 31"	0.65700
10	338° 49' 54"	-1° 10' 23"	340° 53' 10"	-9° 20' 44"	0° 57' 54"	15' 46.57"	68° 17' 32"	0.65268
11	339° 23' 35"	-1° 07' 30"	341° 23' 40"	-9° 05' 23"	0° 57' 55"	15' 46.98"	68° 11' 44"	0.64834
12	339° 57' 18"	-1° 04' 36"	341° 54' 10"	-8° 49' 58"	0° 57' 57"	15' 47.39"	68° 6' 06"	0.64399
13	340° 31' 02"	-1° 01' 41"	342° 24' 38"	-8° 34' 30"	0° 57' 58"	15' 47.80"	68° 0' 38"	0.63963
14	341° 04' 48"	0°-58' 46"	342° 55' 05"	-8° 18' 59"	0° 57' 60"	15' 48.21"	67° 55' 20"	0.63525
15	341° 38' 35"	0°-55' 51"	343° 25' 31"	-8° 03' 25"	0° 58' 01"	15' 48.62"	67° 50' 12"	0.63085
16	342° 12' 24"	0°-52' 55"	343° 55' 56"	-7° 47' 48"	0° 58' 03"	15' 49.03"	67° 45' 14"	0.62644
17	342° 46' 15"	0°-49' 58"	344° 26' 21"	-7° 32' 08"	0° 58' 04"	15' 49.44"	67° 40' 26"	0.62201
18	343° 20' 07"	0°-47' 02"	344° 56' 45"	-7° 16' 25"	0° 58' 06"	15' 49.85"	67° 35' 48"	0.61757
19	343° 54' 01"	0°-44' 04"	345° 27' 08"	-7° 00' 39"	0° 58' 07"	15' 50.26"	67° 31' 20"	0.61311
20	344° 27' 57"	0°-41' 07"	345° 57' 31"	-6° 44' 50"	0° 58' 09"	15' 50.67"	67° 27' 03"	0.60865
21	345° 01' 54"	0°-38' 08"	346° 27' 53"	-6° 28' 59"	0° 58' 10"	15' 51.08"	67° 22' 55"	0.60416
22	345° 35' 53"	0°-35' 10"	346° 58' 15"	-6° 13' 05"	0° 58' 12"	15' 51.49"	67° 18' 58"	0.59967
23	346° 09' 53"	0°-32' 11"	347° 28' 36"	-5° 57' 09"	0° 58' 13"	15' 51.90"	67° 15' 10"	0.59516
24	346° 43' 55"	0°-29' 12"	347° 58' 58"	-5° 41' 10"	0° 58' 15"	15' 52.31"	67° 11' 33"	0.59064

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	87° 01' 57"	-0.31"	86° 45' 38"	23° 24' 17"	1.0159560	15'44.56"	23° 26' 18"	-1 m 07 s
1	87° 04' 20"	-0.31"	86° 48' 14"	23° 24' 21"	1.0159596	15'44.56"	23° 26' 18"	-1 m 07 s
2	87° 06' 43"	-0.30"	86° 50' 50"	23° 24' 24"	1.0159633	15'44.55"	23° 26' 18"	-1 m 08 s
3	87° 09' 06"	-0.29"	86° 53' 26"	23° 24' 27"	1.0159669	15'44.55"	23° 26' 18"	-1 m 08 s
4	87° 11' 29"	-0.29"	86° 56' 02"	23° 24' 30"	1.0159705	15'44.55"	23° 26' 18"	-1 m 09 s
5	87° 13' 53"	-0.28"	86° 58' 38"	23° 24' 33"	1.0159741	15'44.54"	23° 26' 18"	-1 m 10 s
6	87° 16' 16"	-0.28"	87° 01' 14"	23° 24' 36"	1.0159777	15'44.54"	23° 26' 18"	-1 m 10 s
7	87° 18' 39"	-0.27"	87° 03' 50"	23° 24' 39"	1.0159813	15'44.54"	23° 26' 18"	-1 m 11 s
8	87° 21' 02"	-0.27"	87° 06' 26"	23° 24' 42"	1.0159849	15'44.53"	23° 26' 18"	-1 m 11 s
9	87° 23' 25"	-0.26"	87° 09' 02"	23° 24' 45"	1.0159884	15'44.53"	23° 26' 18"	-1 m 12 s
10	87° 25' 49"	-0.26"	87° 11' 38"	23° 24' 48"	1.0159920	15'44.53"	23° 26' 18"	-1 m 12 s
11	87° 28' 12"	-0.25"	87° 14' 14"	23° 24' 50"	1.0159955	15'44.52"	23° 26' 18"	-1 m 13 s
12	87° 30' 35"	-0.24"	87° 16' 50"	23° 24' 53"	1.0159991	15'44.52"	23° 26' 18"	-1 m 13 s
13	87° 32' 58"	-0.24"	87° 19' 26"	23° 24' 56"	1.0160026	15'44.52"	23° 26' 18"	-1 m 14 s
14	87° 35' 22"	-0.23"	87° 22' 02"	23° 24' 58"	1.0160062	15'44.51"	23° 26' 18"	-1 m 14 s
15	87° 37' 45"	-0.23"	87° 24' 38"	23° 25' 01"	1.0160097	15'44.51"	23° 26' 18"	-1 m 15 s
16	87° 40' 08"	-0.22"	87° 27' 14"	23° 25' 04"	1.0160132	15'44.51"	23° 26' 18"	-1 m 15 s
17	87° 42' 31"	-0.22"	87° 29' 50"	23° 25' 06"	1.0160167	15'44.50"	23° 26' 18"	-1 m 16 s
18	87° 44' 54"	-0.21"	87° 32' 26"	23° 25' 09"	1.0160202	15'44.50"	23° 26' 18"	-1 m 17 s
19	87° 47' 18"	-0.21"	87° 35' 02"	23° 25' 11"	1.0160237	15'44.50"	23° 26' 18"	-1 m 17 s
20	87° 49' 41"	-0.20"	87° 37' 38"	23° 25' 13"	1.0160272	15'44.49"	23° 26' 18"	-1 m 18 s
21	87° 52' 04"	-0.20"	87° 40' 14"	23° 25' 16"	1.0160307	15'44.49"	23° 26' 18"	-1 m 18 s
22	87° 54' 27"	-0.19"	87° 42' 50"	23° 25' 18"	1.0160341	15'44.49"	23° 26' 18"	-1 m 19 s
23	87° 56' 50"	-0.18"	87° 45' 26"	23° 25' 20"	1.0160376	15'44.48"	23° 26' 18"	-1 m 19 s
24	87° 59' 14"	-0.18"	87° 48' 03"	23° 25' 22"	1.0160410	15'44.48"	23° 26' 18"	-1 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	346° 43' 55"	0°-29' 12"	347° 58' 58"	-5° 41' 10"	0° 58' 15"	15' 52.31"	67° 11' 33"	0.59064
1	347° 17' 59"	0°-26' 15"	348° 29' 20"	-5° 25' 11"	0° 58' 16"	15' 52.72"	67° 8' 06"	0.58611
2	347° 52' 05"	0°-23' 15"	348° 59' 41"	-5° 09' 07"	0° 58' 18"	15' 53.13"	67° 4' 49"	0.58156
3	348° 26' 12"	0°-20' 15"	349° 30' 02"	-4° 53' 02"	0° 58' 19"	15' 53.54"	67° 1' 41"	0.57701
4	349° 00' 21"	0°-17' 15"	350° 00' 23"	-4° 36' 54"	0° 58' 21"	15' 53.95"	66° 58' 44"	0.57244
5	349° 34' 32"	0°-14' 14"	350° 30' 44"	-4° 20' 43"	0° 58' 22"	15' 54.35"	66° 55' 58"	0.56787
6	350° 08' 44"	0°-11' 13"	351° 01' 06"	-4° 04' 31"	0° 58' 24"	15' 54.76"	66° 53' 21"	0.56328
7	350° 42' 58"	0° -8' 12"	351° 31' 27"	-3° 48' 17"	0° 58' 25"	15' 55.17"	66° 50' 54"	0.55869
8	351° 17' 14"	0° -5' 11"	352° 01' 49"	-3° 32' 01"	0° 58' 27"	15' 55.58"	66° 48' 38"	0.55408
9	351° 51' 31"	0° -2' 09"	352° 32' 12"	-3° 15' 43"	0° 58' 28"	15' 55.99"	66° 46' 31"	0.54947
10	352° 25' 51"	0° 00' 53"	353° 02' 35"	-2° 59' 24"	0° 58' 30"	15' 56.40"	66° 44' 35"	0.54485
11	353° 00' 11"	0° 03' 54"	353° 32' 59"	-2° 43' 03"	0° 58' 31"	15' 56.81"	66° 42' 49"	0.54022
12	353° 34' 34"	0° 06' 56"	354° 03' 23"	-2° 26' 40"	0° 58' 33"	15' 57.21"	66° 41' 14"	0.53558
13	354° 08' 59"	0° 09' 58"	354° 33' 49"	-2° 10' 16"	0° 58' 34"	15' 57.62"	66° 39' 48"	0.53093
14	354° 43' 25"	0° 13' 01"	355° 04' 15"	-1° 53' 50"	0° 58' 36"	15' 58.03"	66° 38' 33"	0.52628
15	355° 17' 53"	0° 16' 03"	355° 34' 42"	-1° 37' 23"	0° 58' 37"	15' 58.43"	66° 37' 28"	0.52162
16	355° 52' 22"	0° 19' 05"	356° 05' 10"	-1° 20' 54"	0° 58' 39"	15' 58.84"	66° 36' 33"	0.51695
17	356° 26' 54"	0° 22' 07"	356° 35' 39"	-1° 04' 25"	0° 58' 40"	15' 59.24"	66° 35' 49"	0.51228
18	357° 01' 27"	0° 25' 10"	357° 06' 10"	0°-47' 54"	0° 58' 42"	15' 59.65"	66° 35' 15"	0.50760
19	357° 36' 02"	0° 28' 12"	357° 36' 41"	0°-31' 22"	0° 58' 43"	16' 00.05"	66° 34' 51"	0.50292
20	358° 10' 39"	0° 31' 14"	358° 07' 14"	0°-14' 50"	0° 58' 45"	16' 00.45"	66° 34' 38"	0.49824
21	358° 45' 17"	0° 34' 17"	358° 37' 49"	0° 01' 44"	0° 58' 46"	16' 00.85"	66° 34' 35"	0.49355
22	359° 19' 57"	0° 37' 19"	359° 08' 25"	0° 18' 19"	0° 58' 48"	16' 01.25"	66° 34' 43"	0.48885
23	359° 54' 39"	0° 40' 21"	359° 39' 03"	0° 34' 54"	0° 58' 49"	16' 01.65"	66° 35' 01"	0.48415
24	0° 29' 23"	0° 43' 23"	0° 09' 42"	0° 51' 30"	0° 58' 50"	16' 02.05"	66° 35' 29"	0.47945

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	87° 59' 14"	-0.18"	87° 48' 03"	23° 25' 22"	1.0160410	15'44.48"	23° 26' 18"	-1 m 20 s
1	88° 01' 37"	-0.17"	87° 50' 39"	23° 25' 25"	1.0160445	15'44.48"	23° 26' 18"	-1 m 20 s
2	88° 03' 60"	-0.17"	87° 53' 15"	23° 25' 27"	1.0160479	15'44.47"	23° 26' 18"	-1 m 21 s
3	88° 06' 23"	-0.16"	87° 55' 51"	23° 25' 29"	1.0160514	15'44.47"	23° 26' 18"	-1 m 21 s
4	88° 08' 46"	-0.16"	87° 58' 27"	23° 25' 31"	1.0160548	15'44.47"	23° 26' 18"	-1 m 22 s
5	88° 11' 10"	-0.15"	88° 01' 03"	23° 25' 33"	1.0160582	15'44.46"	23° 26' 18"	-1 m 23 s
6	88° 13' 33"	-0.15"	88° 03' 39"	23° 25' 35"	1.0160616	15'44.46"	23° 26' 18"	-1 m 23 s
7	88° 15' 56"	-0.14"	88° 06' 15"	23° 25' 37"	1.0160650	15'44.46"	23° 26' 18"	-1 m 24 s
8	88° 18' 19"	-0.14"	88° 08' 51"	23° 25' 39"	1.0160684	15'44.45"	23° 26' 18"	-1 m 24 s
9	88° 20' 42"	-0.13"	88° 11' 27"	23° 25' 40"	1.0160717	15'44.45"	23° 26' 18"	-1 m 25 s
10	88° 23' 06"	-0.13"	88° 14' 03"	23° 25' 42"	1.0160751	15'44.45"	23° 26' 18"	-1 m 25 s
11	88° 25' 29"	-0.12"	88° 16' 39"	23° 25' 44"	1.0160785	15'44.44"	23° 26' 18"	-1 m 26 s
12	88° 27' 52"	-0.12"	88° 19' 15"	23° 25' 46"	1.0160818	15'44.44"	23° 26' 18"	-1 m 26 s
13	88° 30' 15"	-0.11"	88° 21' 51"	23° 25' 47"	1.0160852	15'44.44"	23° 26' 18"	-1 m 27 s
14	88° 32' 38"	-0.11"	88° 24' 27"	23° 25' 49"	1.0160885	15'44.44"	23° 26' 18"	-1 m 27 s
15	88° 35' 02"	-0.10"	88° 27' 03"	23° 25' 50"	1.0160918	15'44.43"	23° 26' 18"	-1 m 28 s
16	88° 37' 25"	-0.10"	88° 29' 39"	23° 25' 52"	1.0160951	15'44.43"	23° 26' 18"	-1 m 29 s
17	88° 39' 48"	-0.09"	88° 32' 15"	23° 25' 53"	1.0160985	15'44.43"	23° 26' 18"	-1 m 29 s
18	88° 42' 11"	-0.08"	88° 34' 51"	23° 25' 55"	1.0161018	15'44.42"	23° 26' 18"	-1 m 30 s
19	88° 44' 34"	-0.08"	88° 37' 28"	23° 25' 56"	1.0161050	15'44.42"	23° 26' 18"	-1 m 30 s
20	88° 46' 58"	-0.07"	88° 40' 04"	23° 25' 58"	1.0161083	15'44.42"	23° 26' 18"	-1 m 31 s
21	88° 49' 21"	-0.07"	88° 42' 40"	23° 25' 59"	1.0161116	15'44.41"	23° 26' 18"	-1 m 31 s
22	88° 51' 44"	-0.06"	88° 45' 16"	23° 26' 00"	1.0161149	15'44.41"	23° 26' 18"	-1 m 32 s
23	88° 54' 07"	-0.06"	88° 47' 52"	23° 26' 01"	1.0161181	15'44.41"	23° 26' 18"	-1 m 32 s
24	88° 56' 30"	-0.05"	88° 50' 28"	23° 26' 03"	1.0161214	15'44.40"	23° 26' 18"	-1 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	0° 29' 23"	0° 43' 23"	0° 09' 42"	0° 51' 30"	0° 58' 50"	16' 02.05"	66° 35' 29"	0.47945
1	1° 04' 09"	0° 46' 25"	0° 40' 24"	1° 08' 06"	0° 58' 52"	16' 02.45"	66° 36' 08"	0.47475
2	1° 38' 56"	0° 49' 27"	1° 11' 07"	1° 24' 43"	0° 58' 53"	16' 02.85"	66° 36' 58"	0.47004
3	2° 13' 46"	0° 52' 29"	1° 41' 52"	1° 41' 21"	0° 58' 55"	16' 03.24"	66° 37' 58"	0.46534
4	2° 48' 36"	0° 55' 30"	2° 12' 39"	1° 57' 58"	0° 58' 56"	16' 03.64"	66° 39' 09"	0.46063
5	3° 23' 29"	0° 58' 31"	2° 43' 28"	2° 14' 36"	0° 58' 58"	16' 04.03"	66° 40' 30"	0.45592
6	3° 58' 24"	1° 01' 33"	3° 14' 20"	2° 31' 15"	0° 58' 59"	16' 04.42"	66° 42' 02"	0.45121
7	4° 33' 20"	1° 04' 33"	3° 45' 14"	2° 47' 53"	0° 59' 01"	16' 04.81"	66° 43' 45"	0.44650
8	5° 08' 18"	1° 07' 34"	4° 16' 10"	3° 04' 31"	0° 59' 02"	16' 05.20"	66° 45' 39"	0.44179
9	5° 43' 18"	1° 10' 34"	4° 47' 09"	3° 21' 09"	0° 59' 03"	16' 05.59"	66° 47' 43"	0.43709
10	6° 18' 20"	1° 13' 34"	5° 18' 10"	3° 37' 48"	0° 59' 05"	16' 05.98"	66° 49' 58"	0.43238
11	6° 53' 24"	1° 16' 34"	5° 49' 14"	3° 54' 25"	0° 59' 06"	16' 06.36"	66° 52' 25"	0.42768
12	7° 28' 29"	1° 19' 33"	6° 20' 21"	4° 11' 03"	0° 59' 08"	16' 06.74"	66° 55' 02"	0.42298
13	8° 03' 36"	1° 22' 32"	6° 51' 31"	4° 27' 40"	0° 59' 09"	16' 07.13"	66° 57' 50"	0.41828
14	8° 38' 45"	1° 25' 31"	7° 22' 43"	4° 44' 16"	0° 59' 11"	16' 07.51"	67° 0' 49"	0.41358
15	9° 13' 56"	1° 28' 29"	7° 53' 59"	5° 00' 52"	0° 59' 12"	16' 07.88"	67° 3' 59"	0.40889
16	9° 49' 09"	1° 31' 27"	8° 25' 17"	5° 17' 27"	0° 59' 13"	16' 08.26"	67° 7' 20"	0.40420
17	10° 24' 23"	1° 34' 25"	8° 56' 39"	5° 34' 02"	0° 59' 15"	16' 08.63"	67° 10' 53"	0.39952
18	10° 59' 39"	1° 37' 21"	9° 28' 04"	5° 50' 35"	0° 59' 16"	16' 09.01"	67° 14' 36"	0.39484
19	11° 34' 57"	1° 40' 18"	9° 59' 33"	6° 07' 08"	0° 59' 17"	16' 09.38"	67° 18' 31"	0.39017
20	12° 10' 17"	1° 43' 14"	10° 31' 05"	6° 23' 40"	0° 59' 19"	16' 09.75"	67° 22' 37"	0.38550
21	12° 45' 38"	1° 46' 09"	11° 02' 40"	6° 40' 10"	0° 59' 20"	16' 10.11"	67° 26' 54"	0.38084
22	13° 21' 01"	1° 49' 04"	11° 34' 19"	6° 56' 39"	0° 59' 21"	16' 10.48"	67° 31' 23"	0.37619
23	13° 56' 26"	1° 51' 58"	12° 06' 02"	7° 13' 07"	0° 59' 23"	16' 10.84"	67° 36' 04"	0.37154
24	14° 31' 53"	1° 54' 52"	12° 37' 49"	7° 29' 34"	0° 59' 24"	16' 11.20"	67° 40' 56"	0.36691

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	88° 56' 30"	-0.05"	88° 50' 28"	23° 26' 03"	1.0161214	15'44.40"	23° 26' 18"	-1 m 33 s
1	88° 58' 54"	-0.05"	88° 53' 04"	23° 26' 04"	1.0161246	15'44.40"	23° 26' 18"	-1 m 33 s
2	89° 01' 17"	-0.04"	88° 55' 40"	23° 26' 05"	1.0161279	15'44.40"	23° 26' 18"	-1 m 34 s
3	89° 03' 40"	-0.04"	88° 58' 16"	23° 26' 06"	1.0161311	15'44.40"	23° 26' 18"	-1 m 35 s
4	89° 06' 03"	-0.04"	89° 00' 52"	23° 26' 07"	1.0161343	15'44.39"	23° 26' 18"	-1 m 35 s
5	89° 08' 26"	-0.03"	89° 03' 28"	23° 26' 08"	1.0161375	15'44.39"	23° 26' 18"	-1 m 36 s
6	89° 10' 50"	-0.03"	89° 06' 04"	23° 26' 09"	1.0161407	15'44.39"	23° 26' 18"	-1 m 36 s
7	89° 13' 13"	-0.02"	89° 08' 40"	23° 26' 10"	1.0161439	15'44.38"	23° 26' 18"	-1 m 37 s
8	89° 15' 36"	-0.02"	89° 11' 16"	23° 26' 10"	1.0161470	15'44.38"	23° 26' 18"	-1 m 37 s
9	89° 17' 59"	-0.01"	89° 13' 52"	23° 26' 11"	1.0161502	15'44.38"	23° 26' 18"	-1 m 38 s
10	89° 20' 22"	-0.01"	89° 16' 28"	23° 26' 12"	1.0161534	15'44.38"	23° 26' 18"	-1 m 38 s
11	89° 22' 45"	-0.00"	89° 19' 05"	23° 26' 13"	1.0161565	15'44.37"	23° 26' 18"	-1 m 39 s
12	89° 25' 09"	0.00"	89° 21' 41"	23° 26' 13"	1.0161597	15'44.37"	23° 26' 18"	-1 m 39 s
13	89° 27' 32"	0.01"	89° 24' 17"	23° 26' 14"	1.0161628	15'44.37"	23° 26' 18"	-1 m 40 s
14	89° 29' 55"	0.01"	89° 26' 53"	23° 26' 15"	1.0161659	15'44.36"	23° 26' 18"	-1 m 41 s
15	89° 32' 18"	0.02"	89° 29' 29"	23° 26' 15"	1.0161690	15'44.36"	23° 26' 18"	-1 m 41 s
16	89° 34' 41"	0.02"	89° 32' 05"	23° 26' 16"	1.0161721	15'44.36"	23° 26' 18"	-1 m 42 s
17	89° 37' 05"	0.03"	89° 34' 41"	23° 26' 16"	1.0161752	15'44.35"	23° 26' 18"	-1 m 42 s
18	89° 39' 28"	0.03"	89° 37' 17"	23° 26' 16"	1.0161783	15'44.35"	23° 26' 18"	-1 m 43 s
19	89° 41' 51"	0.03"	89° 39' 53"	23° 26' 17"	1.0161814	15'44.35"	23° 26' 18"	-1 m 43 s
20	89° 44' 14"	0.04"	89° 42' 29"	23° 26' 17"	1.0161845	15'44.35"	23° 26' 18"	-1 m 44 s
21	89° 46' 37"	0.04"	89° 45' 05"	23° 26' 17"	1.0161875	15'44.34"	23° 26' 18"	-1 m 44 s
22	89° 49' 01"	0.05"	89° 47' 41"	23° 26' 18"	1.0161906	15'44.34"	23° 26' 18"	-1 m 45 s
23	89° 51' 24"	0.05"	89° 50' 17"	23° 26' 18"	1.0161936	15'44.34"	23° 26' 18"	-1 m 45 s
24	89° 53' 47"	0.06"	89° 52' 53"	23° 26' 18"	1.0161966	15'44.33"	23° 26' 18"	-1 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	14° 31' 53"	1° 54' 52"	12° 37' 49"	7° 29' 34"	0° 59' 24"	16' 11.20"	67° 40' 56"	0.36691
1	15° 07' 22"	1° 57' 45"	13° 09' 40"	7° 45' 58"	0° 59' 25"	16' 11.56"	67° 45' 59"	0.36228
2	15° 42' 52"	2° 00' 38"	13° 41' 34"	8° 02' 22"	0° 59' 27"	16' 11.91"	67° 51' 14"	0.35766
3	16° 18' 24"	2° 03' 30"	14° 13' 33"	8° 18' 43"	0° 59' 28"	16' 12.27"	67° 56' 41"	0.35305
4	16° 53' 58"	2° 06' 21"	14° 45' 35"	8° 35' 03"	0° 59' 29"	16' 12.62"	68° 2' 19"	0.34845
5	17° 29' 34"	2° 09' 11"	15° 17' 42"	8° 51' 21"	0° 59' 31"	16' 12.97"	68° 8' 10"	0.34386
6	18° 05' 11"	2° 12' 01"	15° 49' 53"	9° 07' 37"	0° 59' 32"	16' 13.31"	68° 14' 12"	0.33928
7	18° 40' 51"	2° 14' 50"	16° 22' 09"	9° 23' 50"	0° 59' 33"	16' 13.65"	68° 20' 26"	0.33471
8	19° 16' 31"	2° 17' 38"	16° 54' 29"	9° 40' 02"	0° 59' 34"	16' 13.99"	68° 26' 52"	0.33015
9	19° 52' 14"	2° 20' 26"	17° 26' 54"	9° 56' 11"	0° 59' 36"	16' 14.33"	68° 33' 30"	0.32561
10	20° 27' 58"	2° 23' 13"	17° 59' 23"	10° 12' 18"	0° 59' 37"	16' 14.66"	68° 40' 21"	0.32108
11	21° 03' 44"	2° 25' 59"	18° 31' 57"	10° 28' 22"	0° 59' 38"	16' 15.00"	68° 47' 23"	0.31656
12	21° 39' 32"	2° 28' 44"	19° 04' 36"	10° 44' 23"	0° 59' 39"	16' 15.32"	68° 54' 38"	0.31205
13	22° 15' 21"	2° 31' 28"	19° 37' 19"	11° 00' 22"	0° 59' 40"	16' 15.65"	69° 2' 05"	0.30756
14	22° 51' 13"	2° 34' 11"	20° 10' 08"	11° 16' 18"	0° 59' 42"	16' 15.97"	69° 9' 45"	0.30309
15	23° 27' 05"	2° 36' 54"	20° 43' 02"	11° 32' 11"	0° 59' 43"	16' 16.29"	69° 17' 37"	0.29863
16	24° 02' 60"	2° 39' 35"	21° 16' 00"	11° 48' 01"	0° 59' 44"	16' 16.61"	69° 25' 42"	0.29419
17	24° 38' 56"	2° 42' 16"	21° 49' 04"	12° 03' 48"	0° 59' 45"	16' 16.92"	69° 33' 59"	0.28976
18	25° 14' 54"	2° 44' 55"	22° 22' 14"	12° 19' 32"	0° 59' 46"	16' 17.23"	69° 42' 29"	0.28535
19	25° 50' 53"	2° 47' 34"	22° 55' 28"	12° 35' 12"	0° 59' 47"	16' 17.53"	69° 51' 12"	0.28095
20	26° 26' 54"	2° 50' 12"	23° 28' 48"	12° 50' 49"	0° 59' 48"	16' 17.83"	70° 0' 08"	0.27658
21	27° 02' 57"	2° 52' 48"	24° 02' 14"	13° 06' 22"	0° 59' 50"	16' 18.13"	70° 9' 17"	0.27222
22	27° 39' 01"	2° 55' 24"	24° 35' 45"	13° 21' 51"	0° 59' 51"	16' 18.43"	70° 18' 39"	0.26788
23	28° 15' 07"	2° 57' 58"	25° 09' 21"	13° 37' 17"	0° 59' 52"	16' 18.72"	70° 28' 14"	0.26356
24	28° 51' 14"	3° 00' 32"	25° 43' 04"	13° 52' 39"	0° 59' 53"	16' 19.00"	70° 38' 02"	0.25926

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	89° 53' 47"	0.06"	89° 52' 53"	23° 26' 18"	1.0161966	15'44.33"	23° 26' 18"	-1 m 46 s
1	89° 56' 10"	0.06"	89° 55' 29"	23° 26' 18"	1.0161997	15'44.33"	23° 26' 18"	-1 m 47 s
2	89° 58' 33"	0.07"	89° 58' 06"	23° 26' 18"	1.0162027	15'44.33"	23° 26' 18"	-1 m 47 s
3	90° 00' 57"	0.07"	90° 00' 42"	23° 26' 18"	1.0162057	15'44.33"	23° 26' 18"	-1 m 48 s
4	90° 03' 20"	0.07"	90° 03' 18"	23° 26' 18"	1.0162087	15'44.32"	23° 26' 18"	-1 m 48 s
5	90° 05' 43"	0.08"	90° 05' 54"	23° 26' 18"	1.0162116	15'44.32"	23° 26' 18"	-1 m 49 s
6	90° 08' 06"	0.08"	90° 08' 30"	23° 26' 18"	1.0162146	15'44.32"	23° 26' 18"	-1 m 49 s
7	90° 10' 29"	0.09"	90° 11' 06"	23° 26' 18"	1.0162176	15'44.32"	23° 26' 18"	-1 m 50 s
8	90° 12' 52"	0.09"	90° 13' 42"	23° 26' 18"	1.0162205	15'44.31"	23° 26' 18"	-1 m 50 s
9	90° 15' 16"	0.09"	90° 16' 18"	23° 26' 17"	1.0162235	15'44.31"	23° 26' 18"	-1 m 51 s
10	90° 17' 39"	0.10"	90° 18' 54"	23° 26' 17"	1.0162264	15'44.31"	23° 26' 18"	-1 m 51 s
11	90° 20' 02"	0.10"	90° 21' 30"	23° 26' 17"	1.0162293	15'44.30"	23° 26' 18"	-1 m 52 s
12	90° 22' 25"	0.11"	90° 24' 06"	23° 26' 16"	1.0162322	15'44.30"	23° 26' 18"	-1 m 52 s
13	90° 24' 48"	0.11"	90° 26' 42"	23° 26' 16"	1.0162351	15'44.30"	23° 26' 18"	-1 m 53 s
14	90° 27' 12"	0.11"	90° 29' 18"	23° 26' 15"	1.0162380	15'44.30"	23° 26' 18"	-1 m 54 s
15	90° 29' 35"	0.12"	90° 31' 54"	23° 26' 15"	1.0162409	15'44.29"	23° 26' 18"	-1 m 54 s
16	90° 31' 58"	0.12"	90° 34' 30"	23° 26' 14"	1.0162438	15'44.29"	23° 26' 18"	-1 m 55 s
17	90° 34' 21"	0.12"	90° 37' 06"	23° 26' 14"	1.0162467	15'44.29"	23° 26' 18"	-1 m 55 s
18	90° 36' 44"	0.13"	90° 39' 43"	23° 26' 13"	1.0162495	15'44.29"	23° 26' 18"	-1 m 56 s
19	90° 39' 07"	0.13"	90° 42' 19"	23° 26' 12"	1.0162524	15'44.28"	23° 26' 18"	-1 m 56 s
20	90° 41' 31"	0.14"	90° 44' 55"	23° 26' 12"	1.0162552	15'44.28"	23° 26' 18"	-1 m 57 s
21	90° 43' 54"	0.14"	90° 47' 31"	23° 26' 11"	1.0162580	15'44.28"	23° 26' 18"	-1 m 57 s
22	90° 46' 17"	0.14"	90° 50' 07"	23° 26' 10"	1.0162608	15'44.28"	23° 26' 18"	-1 m 58 s
23	90° 48' 40"	0.15"	90° 52' 43"	23° 26' 09"	1.0162637	15'44.27"	23° 26' 18"	-1 m 58 s
24	90° 51' 03"	0.15"	90° 55' 19"	23° 26' 08"	1.0162664	15'44.27"	23° 26' 18"	-1 m 59 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	28° 51' 14"	3° 00' 32"	25° 43' 04"	13° 52' 39"	0° 59' 53"	16' 19.00"	70° 38' 02"	0.25926
1	29° 27' 23"	3° 03' 04"	26° 16' 52"	14° 07' 56"	0° 59' 54"	16' 19.29"	70° 48' 04"	0.25498
2	30° 03' 33"	3° 05' 35"	26° 50' 46"	14° 23' 10"	0° 59' 55"	16' 19.57"	70° 58' 19"	0.25072
3	30° 39' 45"	3° 08' 05"	27° 24' 46"	14° 38' 19"	0° 59' 56"	16' 19.84"	71° 8' 48"	0.24648
4	31° 15' 59"	3° 10' 34"	27° 58' 51"	14° 53' 23"	0° 59' 57"	16' 20.11"	71° 19' 31"	0.24227
5	31° 52' 14"	3° 13' 01"	28° 33' 03"	15° 08' 24"	0° 59' 58"	16' 20.38"	71° 30' 27"	0.23807
6	32° 28' 31"	3° 15' 28"	29° 07' 21"	15° 23' 19"	0° 59' 59"	16' 20.64"	71° 41' 37"	0.23390
7	33° 04' 49"	3° 17' 53"	29° 41' 45"	15° 38' 10"	0° 59' 60"	16' 20.90"	71° 53' 01"	0.22976
8	33° 41' 08"	3° 20' 17"	30° 16' 15"	15° 52' 56"	1° 00' 01"	16' 21.16"	72° 4' 39"	0.22563
9	34° 17' 29"	3° 22' 40"	30° 50' 52"	16° 07' 37"	1° 00' 02"	16' 21.41"	72° 16' 31"	0.22153
10	34° 53' 51"	3° 25' 01"	31° 25' 35"	16° 22' 13"	1° 00' 02"	16' 21.65"	72° 28' 38"	0.21746
11	35° 30' 15"	3° 27' 21"	32° 00' 24"	16° 36' 44"	1° 00' 03"	16' 21.89"	72° 40' 59"	0.21341
12	36° 06' 40"	3° 29' 40"	32° 35' 20"	16° 51' 09"	1° 00' 04"	16' 22.13"	72° 53' 34"	0.20938
13	36° 43' 06"	3° 31' 57"	33° 10' 22"	17° 05' 29"	1° 00' 05"	16' 22.36"	73° 6' 24"	0.20538
14	37° 19' 34"	3° 34' 13"	33° 45' 30"	17° 19' 43"	1° 00' 06"	16' 22.59"	73° 19' 29"	0.20141
15	37° 56' 00"	3° 36' 28"	34° 20' 42"	17° 33' 50"	1° 00' 07"	16' 22.81"	73° 32' 48"	0.19747
16	38° 32' 30"	3° 38' 41"	34° 56' 04"	17° 47' 53"	1° 00' 07"	16' 23.03"	73° 46' 23"	0.19356
17	39° 09' 02"	3° 40' 53"	35° 31' 32"	18° 01' 50"	1° 00' 08"	16' 23.24"	74° 0' 13"	0.18967
18	39° 45' 35"	3° 43' 03"	36° 07' 07"	18° 15' 40"	1° 00' 09"	16' 23.45"	74° 14' 19"	0.18581
19	40° 22' 09"	3° 45' 12"	36° 42' 49"	18° 29' 25"	1° 00' 10"	16' 23.65"	74° 28' 40"	0.18198
20	40° 58' 45"	3° 47' 19"	37° 18' 38"	18° 43' 03"	1° 00' 10"	16' 23.85"	74° 43' 17"	0.17817
21	41° 35' 22"	3° 49' 25"	37° 54' 33"	18° 56' 34"	1° 00' 11"	16' 24.04"	74° 58' 09"	0.17440
22	42° 11' 59"	3° 51' 30"	38° 30' 35"	19° 09' 59"	1° 00' 12"	16' 24.23"	75° 13' 18"	0.17066
23	42° 48' 38"	3° 53' 33"	39° 06' 44"	19° 23' 18"	1° 00' 13"	16' 24.41"	75° 28' 43"	0.16695
24	43° 25' 19"	3° 55' 34"	39° 42' 59"	19° 36' 29"	1° 00' 13"	16' 24.59"	75° 44' 24"	0.16327

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	90° 51' 03"	0.15"	90° 55' 19"	23° 26' 08"	1.0162664	15'44.27"	23° 26' 18"	-1 m 59 s
1	90° 53' 27"	0.15"	90° 57' 55"	23° 26' 07"	1.0162692	15'44.27"	23° 26' 18"	-1 m 60 s
2	90° 55' 50"	0.16"	91° 00' 31"	23° 26' 06"	1.0162720	15'44.26"	23° 26' 18"	-2 m 00 s
3	90° 58' 13"	0.16"	91° 03' 07"	23° 26' 05"	1.0162748	15'44.26"	23° 26' 18"	-2 m 01 s
4	91° 00' 36"	0.16"	91° 05' 43"	23° 26' 04"	1.0162775	15'44.26"	23° 26' 18"	-2 m 01 s
5	91° 02' 59"	0.17"	91° 08' 19"	23° 26' 03"	1.0162803	15'44.26"	23° 26' 18"	-2 m 02 s
6	91° 05' 22"	0.17"	91° 10' 55"	23° 26' 02"	1.0162830	15'44.25"	23° 26' 18"	-2 m 02 s
7	91° 07' 46"	0.17"	91° 13' 31"	23° 26' 01"	1.0162857	15'44.25"	23° 26' 18"	-2 m 03 s
8	91° 10' 09"	0.17"	91° 16' 07"	23° 25' 60"	1.0162885	15'44.25"	23° 26' 18"	-2 m 03 s
9	91° 12' 32"	0.18"	91° 18' 43"	23° 25' 58"	1.0162912	15'44.25"	23° 26' 18"	-2 m 04 s
10	91° 14' 55"	0.18"	91° 21' 19"	23° 25' 57"	1.0162939	15'44.24"	23° 26' 18"	-2 m 04 s
11	91° 17' 18"	0.18"	91° 23' 55"	23° 25' 56"	1.0162965	15'44.24"	23° 26' 18"	-2 m 05 s
12	91° 19' 42"	0.19"	91° 26' 31"	23° 25' 54"	1.0162992	15'44.24"	23° 26' 18"	-2 m 06 s
13	91° 22' 05"	0.19"	91° 29' 07"	23° 25' 53"	1.0163019	15'44.24"	23° 26' 18"	-2 m 06 s
14	91° 24' 28"	0.19"	91° 31' 44"	23° 25' 51"	1.0163045	15'44.23"	23° 26' 18"	-2 m 07 s
15	91° 26' 51"	0.19"	91° 34' 20"	23° 25' 50"	1.0163072	15'44.23"	23° 26' 18"	-2 m 07 s
16	91° 29' 14"	0.20"	91° 36' 56"	23° 25' 48"	1.0163098	15'44.23"	23° 26' 18"	-2 m 08 s
17	91° 31' 37"	0.20"	91° 39' 32"	23° 25' 47"	1.0163124	15'44.23"	23° 26' 18"	-2 m 08 s
18	91° 34' 01"	0.20"	91° 42' 08"	23° 25' 45"	1.0163151	15'44.22"	23° 26' 18"	-2 m 09 s
19	91° 36' 24"	0.20"	91° 44' 44"	23° 25' 43"	1.0163177	15'44.22"	23° 26' 18"	-2 m 09 s
20	91° 38' 47"	0.21"	91° 47' 20"	23° 25' 41"	1.0163203	15'44.22"	23° 26' 18"	-2 m 10 s
21	91° 41' 10"	0.21"	91° 49' 56"	23° 25' 40"	1.0163228	15'44.22"	23° 26' 18"	-2 m 10 s
22	91° 43' 33"	0.21"	91° 52' 32"	23° 25' 38"	1.0163254	15'44.22"	23° 26' 18"	-2 m 11 s
23	91° 45' 56"	0.21"	91° 55' 08"	23° 25' 36"	1.0163280	15'44.21"	23° 26' 18"	-2 m 11 s
24	91° 48' 20"	0.22"	91° 57' 44"	23° 25' 34"	1.0163305	15'44.21"	23° 26' 18"	-2 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	43° 25' 19"	3° 55' 34"	39° 42' 59"	19° 36' 29"	1° 00' 13"	16' 24.59"	75° 44' 24"	0.16327
1	44° 01' 60"	3° 57' 34"	40° 19' 22"	19° 49' 34"	1° 00' 14"	16' 24.76"	76° 0' 22"	0.15962
2	44° 38' 42"	3° 59' 32"	40° 55' 51"	20° 02' 31"	1° 00' 14"	16' 24.93"	76° 16' 36"	0.15601
3	45° 15' 25"	4° 01' 28"	41° 32' 28"	20° 15' 22"	1° 00' 15"	16' 25.09"	76° 33' 08"	0.15243
4	45° 52' 10"	4° 03' 23"	42° 09' 11"	20° 28' 04"	1° 00' 16"	16' 25.24"	76° 49' 56"	0.14888
5	46° 28' 55"	4° 05' 16"	42° 46' 01"	20° 40' 40"	1° 00' 16"	16' 25.39"	77° 7' 02"	0.14536
6	47° 05' 42"	4° 07' 08"	43° 22' 58"	20° 53' 08"	1° 00' 17"	16' 25.54"	77° 24' 26"	0.14188
7	47° 42' 29"	4° 08' 58"	44° 00' 02"	21° 05' 28"	1° 00' 17"	16' 25.67"	77° 42' 07"	0.13843
8	48° 19' 17"	4° 10' 46"	44° 37' 13"	21° 17' 40"	1° 00' 18"	16' 25.81"	78° 0' 07"	0.13502
9	48° 56' 06"	4° 12' 33"	45° 14' 31"	21° 29' 44"	1° 00' 18"	16' 25.93"	78° 18' 25"	0.13164
10	49° 32' 56"	4° 14' 18"	45° 51' 55"	21° 41' 41"	1° 00' 19"	16' 26.05"	78° 37' 02"	0.12830
11	50° 09' 47"	4° 16' 01"	46° 29' 27"	21° 53' 29"	1° 00' 19"	16' 26.17"	78° 55' 58"	0.12500
12	50° 46' 39"	4° 17' 42"	47° 07' 05"	22° 05' 08"	1° 00' 19"	16' 26.28"	79° 15' 13"	0.12173
13	51° 23' 32"	4° 19' 22"	47° 44' 50"	22° 16' 40"	1° 00' 20"	16' 26.38"	79° 34' 48"	0.11850
14	52° 00' 25"	4° 20' 60"	48° 22' 42"	22° 28' 02"	1° 00' 20"	16' 26.48"	79° 54' 42"	0.11530
15	52° 37' 19"	4° 22' 36"	49° 00' 41"	22° 39' 16"	1° 00' 20"	16' 26.57"	80° 14' 57"	0.11214
16	53° 14' 13"	4° 24' 10"	49° 38' 46"	22° 50' 21"	1° 00' 21"	16' 26.65"	80° 35' 33"	0.10903
17	53° 51' 09"	4° 25' 42"	50° 16' 59"	23° 01' 17"	1° 00' 21"	16' 26.73"	80° 56' 31"	0.10595
18	54° 28' 05"	4° 27' 13"	50° 55' 18"	23° 12' 04"	1° 00' 21"	16' 26.81"	81° 17' 49"	0.10291
19	55° 05' 01"	4° 28' 42"	51° 33' 43"	23° 22' 42"	1° 00' 22"	16' 26.87"	81° 39' 30"	0.09990
20	55° 41' 59"	4° 30' 08"	52° 12' 15"	23° 33' 11"	1° 00' 22"	16' 26.93"	82° 1' 34"	0.09694
21	56° 18' 56"	4° 31' 33"	52° 50' 54"	23° 43' 30"	1° 00' 22"	16' 26.99"	82° 24' 01"	0.09402
22	56° 55' 55"	4° 32' 57"	53° 29' 39"	23° 53' 40"	1° 00' 22"	16' 27.03"	82° 46' 51"	0.09114
23	57° 32' 53"	4° 34' 18"	54° 08' 30"	24° 03' 40"	1° 00' 22"	16' 27.07"	83° 10' 06"	0.08830
24	58° 09' 52"	4° 35' 37"	54° 47' 28"	24° 13' 30"	1° 00' 22"	16' 27.11"	83° 33' 46"	0.08550

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	91° 48' 20"	0.22"	91° 57' 44"	23° 25' 34"	1.0163305	15'44.21"	23° 26' 18"	-2 m 12 s
1	91° 50' 43"	0.22"	92° 00' 20"	23° 25' 32"	1.0163331	15'44.21"	23° 26' 18"	-2 m 13 s
2	91° 53' 06"	0.22"	92° 02' 56"	23° 25' 30"	1.0163356	15'44.21"	23° 26' 18"	-2 m 13 s
3	91° 55' 29"	0.22"	92° 05' 32"	23° 25' 28"	1.0163381	15'44.20"	23° 26' 18"	-2 m 14 s
4	91° 57' 52"	0.23"	92° 08' 08"	23° 25' 26"	1.0163406	15'44.20"	23° 26' 18"	-2 m 14 s
5	92° 00' 15"	0.23"	92° 10' 44"	23° 25' 24"	1.0163431	15'44.20"	23° 26' 18"	-2 m 15 s
6	92° 02' 39"	0.23"	92° 13' 20"	23° 25' 22"	1.0163456	15'44.20"	23° 26' 18"	-2 m 15 s
7	92° 05' 02"	0.23"	92° 15' 56"	23° 25' 19"	1.0163481	15'44.19"	23° 26' 18"	-2 m 16 s
8	92° 07' 25"	0.23"	92° 18' 32"	23° 25' 17"	1.0163506	15'44.19"	23° 26' 18"	-2 m 16 s
9	92° 09' 48"	0.24"	92° 21' 08"	23° 25' 15"	1.0163530	15'44.19"	23° 26' 18"	-2 m 17 s
10	92° 12' 11"	0.24"	92° 23' 44"	23° 25' 12"	1.0163555	15'44.19"	23° 26' 18"	-2 m 17 s
11	92° 14' 35"	0.24"	92° 26' 20"	23° 25' 10"	1.0163579	15'44.19"	23° 26' 18"	-2 m 18 s
12	92° 16' 58"	0.24"	92° 28' 56"	23° 25' 08"	1.0163603	15'44.18"	23° 26' 18"	-2 m 18 s
13	92° 19' 21"	0.24"	92° 31' 32"	23° 25' 05"	1.0163627	15'44.18"	23° 26' 18"	-2 m 19 s
14	92° 21' 44"	0.24"	92° 34' 08"	23° 25' 02"	1.0163651	15'44.18"	23° 26' 18"	-2 m 20 s
15	92° 24' 07"	0.25"	92° 36' 44"	23° 24' 60"	1.0163675	15'44.18"	23° 26' 18"	-2 m 20 s
16	92° 26' 30"	0.25"	92° 39' 20"	23° 24' 57"	1.0163699	15'44.17"	23° 26' 18"	-2 m 21 s
17	92° 28' 54"	0.25"	92° 41' 56"	23° 24' 55"	1.0163723	15'44.17"	23° 26' 18"	-2 m 21 s
18	92° 31' 17"	0.25"	92° 44' 32"	23° 24' 52"	1.0163747	15'44.17"	23° 26' 18"	-2 m 22 s
19	92° 33' 40"	0.25"	92° 47' 08"	23° 24' 49"	1.0163770	15'44.17"	23° 26' 18"	-2 m 22 s
20	92° 36' 03"	0.25"	92° 49' 44"	23° 24' 46"	1.0163793	15'44.17"	23° 26' 18"	-2 m 23 s
21	92° 38' 26"	0.25"	92° 52' 20"	23° 24' 44"	1.0163817	15'44.16"	23° 26' 18"	-2 m 23 s
22	92° 40' 49"	0.25"	92° 54' 56"	23° 24' 41"	1.0163840	15'44.16"	23° 26' 18"	-2 m 24 s
23	92° 43' 13"	0.26"	92° 57' 32"	23° 24' 38"	1.0163863	15'44.16"	23° 26' 18"	-2 m 24 s
24	92° 45' 36"	0.26"	93° 00' 08"	23° 24' 35"	1.0163886	15'44.16"	23° 26' 18"	-2 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	58° 09' 52"	4° 35' 37"	54° 47' 28"	24° 13' 30"	1° 00' 22"	16' 27.11"	83° 33' 46"	0.08550
1	58° 46' 52"	4° 36' 55"	55° 26' 32"	24° 23' 10"	1° 00' 23"	16' 27.14"	83° 57' 52"	0.08274
2	59° 23' 52"	4° 38' 10"	56° 05' 43"	24° 32' 40"	1° 00' 23"	16' 27.16"	84° 22' 24"	0.08003
3	60° 00' 52"	4° 39' 23"	56° 44' 59"	24° 42' 00"	1° 00' 23"	16' 27.17"	84° 47' 24"	0.07735
4	60° 37' 53"	4° 40' 35"	57° 24' 22"	24° 51' 10"	1° 00' 23"	16' 27.18"	85° 12' 52"	0.07472
5	61° 14' 54"	4° 41' 45"	58° 03' 50"	25° 00' 10"	1° 00' 23"	16' 27.18"	85° 38' 49"	0.07213
6	61° 51' 55"	4° 42' 52"	58° 43' 25"	25° 08' 59"	1° 00' 23"	16' 27.18"	86° 5' 16"	0.06959
7	62° 28' 56"	4° 43' 58"	59° 23' 05"	25° 17' 38"	1° 00' 23"	16' 27.17"	86° 32' 14"	0.06709
8	63° 05' 58"	4° 45' 02"	60° 02' 51"	25° 26' 06"	1° 00' 23"	16' 27.15"	86° 59' 45"	0.06463
9	63° 42' 59"	4° 46' 03"	60° 42' 42"	25° 34' 23"	1° 00' 22"	16' 27.12"	87° 27' 50"	0.06221
10	64° 20' 01"	4° 47' 03"	61° 22' 39"	25° 42' 29"	1° 00' 22"	16' 27.09"	87° 56' 30"	0.05984
11	64° 57' 03"	4° 48' 01"	62° 02' 41"	25° 50' 25"	1° 00' 22"	16' 27.05"	88° 25' 46"	0.05752
12	65° 34' 05"	4° 48' 56"	62° 42' 48"	25° 58' 09"	1° 00' 22"	16' 27.01"	88° 55' 41"	0.05524
13	66° 11' 07"	4° 49' 50"	63° 23' 01"	26° 05' 42"	1° 00' 22"	16' 26.96"	89° 26' 16"	0.05300
14	66° 48' 09"	4° 50' 42"	64° 03' 19"	26° 13' 04"	1° 00' 22"	16' 26.90"	89° 57' 33"	0.05081
15	67° 25' 11"	4° 51' 31"	64° 43' 41"	26° 20' 15"	1° 00' 21"	16' 26.83"	90° 29' 34"	0.04867
16	68° 02' 12"	4° 52' 19"	65° 24' 08"	26° 27' 15"	1° 00' 21"	16' 26.76"	91° 2' 21"	0.04657
17	68° 39' 14"	4° 53' 04"	66° 04' 40"	26° 34' 03"	1° 00' 21"	16' 26.68"	91° 35' 58"	0.04452
18	69° 16' 15"	4° 53' 47"	66° 45' 16"	26° 40' 39"	1° 00' 21"	16' 26.60"	92° 10' 26"	0.04251
19	69° 53' 16"	4° 54' 29"	67° 25' 57"	26° 47' 04"	1° 00' 20"	16' 26.50"	92° 45' 49"	0.04055
20	70° 30' 17"	4° 55' 08"	68° 06' 41"	26° 53' 17"	1° 00' 20"	16' 26.40"	93° 22' 11"	0.03864
21	71° 07' 18"	4° 55' 45"	68° 47' 30"	26° 59' 18"	1° 00' 19"	16' 26.30"	93° 59' 34"	0.03677
22	71° 44' 18"	4° 56' 20"	69° 28' 23"	27° 05' 07"	1° 00' 19"	16' 26.18"	94° 38' 03"	0.03495
23	72° 21' 18"	4° 56' 53"	70° 09' 19"	27° 10' 44"	1° 00' 19"	16' 26.06"	95° 17' 43"	0.03318
24	72° 58' 18"	4° 57' 24"	70° 50' 19"	27° 16' 10"	1° 00' 18"	16' 25.94"	95° 58' 38"	0.03146

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	92° 45' 36"	0.26"	93° 00' 08"	23° 24' 35"	1.0163886	15'44.16"	23° 26' 18"	-2 m 25 s
1	92° 47' 59"	0.26"	93° 02' 44"	23° 24' 32"	1.0163909	15'44.15"	23° 26' 18"	-2 m 25 s
2	92° 50' 22"	0.26"	93° 05' 20"	23° 24' 29"	1.0163932	15'44.15"	23° 26' 18"	-2 m 26 s
3	92° 52' 45"	0.26"	93° 07' 56"	23° 24' 26"	1.0163954	15'44.15"	23° 26' 18"	-2 m 26 s
4	92° 55' 08"	0.26"	93° 10' 32"	23° 24' 23"	1.0163977	15'44.15"	23° 26' 18"	-2 m 27 s
5	92° 57' 31"	0.26"	93° 13' 08"	23° 24' 19"	1.0163999	15'44.15"	23° 26' 18"	-2 m 28 s
6	92° 59' 55"	0.26"	93° 15' 44"	23° 24' 16"	1.0164022	15'44.14"	23° 26' 18"	-2 m 28 s
7	93° 02' 18"	0.26"	93° 18' 20"	23° 24' 13"	1.0164044	15'44.14"	23° 26' 18"	-2 m 29 s
8	93° 04' 41"	0.26"	93° 20' 56"	23° 24' 10"	1.0164066	15'44.14"	23° 26' 18"	-2 m 29 s
9	93° 07' 04"	0.26"	93° 23' 32"	23° 24' 06"	1.0164088	15'44.14"	23° 26' 18"	-2 m 30 s
10	93° 09' 27"	0.27"	93° 26' 08"	23° 24' 03"	1.0164110	15'44.14"	23° 26' 18"	-2 m 30 s
11	93° 11' 50"	0.27"	93° 28' 44"	23° 23' 59"	1.0164132	15'44.13"	23° 26' 18"	-2 m 31 s
12	93° 14' 14"	0.27"	93° 31' 19"	23° 23' 56"	1.0164153	15'44.13"	23° 26' 18"	-2 m 31 s
13	93° 16' 37"	0.27"	93° 33' 55"	23° 23' 52"	1.0164175	15'44.13"	23° 26' 18"	-2 m 32 s
14	93° 18' 60"	0.27"	93° 36' 31"	23° 23' 49"	1.0164197	15'44.13"	23° 26' 18"	-2 m 32 s
15	93° 21' 23"	0.27"	93° 39' 07"	23° 23' 45"	1.0164218	15'44.13"	23° 26' 18"	-2 m 33 s
16	93° 23' 46"	0.27"	93° 41' 43"	23° 23' 42"	1.0164239	15'44.12"	23° 26' 18"	-2 m 33 s
17	93° 26' 09"	0.27"	93° 44' 19"	23° 23' 38"	1.0164260	15'44.12"	23° 26' 18"	-2 m 34 s
18	93° 28' 33"	0.27"	93° 46' 55"	23° 23' 34"	1.0164281	15'44.12"	23° 26' 18"	-2 m 35 s
19	93° 30' 56"	0.27"	93° 49' 31"	23° 23' 30"	1.0164302	15'44.12"	23° 26' 18"	-2 m 35 s
20	93° 33' 19"	0.27"	93° 52' 07"	23° 23' 27"	1.0164323	15'44.12"	23° 26' 18"	-2 m 36 s
21	93° 35' 42"	0.27"	93° 54' 43"	23° 23' 23"	1.0164344	15'44.11"	23° 26' 18"	-2 m 36 s
22	93° 38' 05"	0.27"	93° 57' 19"	23° 23' 19"	1.0164365	15'44.11"	23° 26' 18"	-2 m 37 s
23	93° 40' 28"	0.27"	93° 59' 55"	23° 23' 15"	1.0164385	15'44.11"	23° 26' 18"	-2 m 37 s
24	93° 42' 51"	0.27"	94° 02' 31"	23° 23' 11"	1.0164405	15'44.11"	23° 26' 18"	-2 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	72° 58' 18"	4° 57' 24"	70° 50' 19"	27° 16' 10"	1° 00' 18"	16' 25.94"	95° 58' 38"	0.03146
1	73° 35' 17"	4° 57' 53"	71° 31' 22"	27° 21' 23"	1° 00' 18"	16' 25.80"	96° 40' 55"	0.02978
2	74° 12' 15"	4° 58' 20"	72° 12' 29"	27° 26' 24"	1° 00' 17"	16' 25.66"	97° 24' 39"	0.02815
3	74° 49' 14"	4° 58' 44"	72° 53' 39"	27° 31' 13"	1° 00' 17"	16' 25.52"	98° 9' 56"	0.02657
4	75° 26' 11"	4° 59' 07"	73° 34' 51"	27° 35' 50"	1° 00' 16"	16' 25.36"	98° 56' 56"	0.02504
5	76° 03' 08"	4° 59' 27"	74° 16' 06"	27° 40' 15"	1° 00' 15"	16' 25.20"	99° 45' 47"	0.02356
6	76° 40' 05"	4° 59' 46"	74° 57' 24"	27° 44' 27"	1° 00' 15"	16' 25.03"	100° 36' 37"	0.02212
7	77° 17' 00"	5° 00' 02"	75° 38' 44"	27° 48' 27"	1° 00' 14"	16' 24.86"	101° 29' 39"	0.02073
8	77° 53' 55"	5° 00' 16"	76° 20' 06"	27° 52' 14"	1° 00' 14"	16' 24.68"	102° 25' 05"	0.01939
9	78° 30' 50"	5° 00' 28"	77° 01' 30"	27° 55' 49"	1° 00' 13"	16' 24.49"	103° 23' 08"	0.01810
10	79° 07' 43"	5° 00' 38"	77° 42' 56"	27° 59' 12"	1° 00' 12"	16' 24.29"	104° 24' 04"	0.01686
11	79° 44' 36"	5° 00' 46"	78° 24' 24"	28° 02' 22"	1° 00' 11"	16' 24.09"	105° 28' 12"	0.01567
12	80° 21' 28"	5° 00' 52"	79° 05' 52"	28° 05' 19"	1° 00' 11"	16' 23.88"	106° 35' 52"	0.01453
13	80° 58' 19"	5° 00' 56"	79° 47' 23"	28° 08' 04"	1° 00' 10"	16' 23.67"	107° 47' 29"	0.01343
14	81° 35' 09"	5° 00' 57"	80° 28' 54"	28° 10' 36"	1° 00' 09"	16' 23.45"	109° 3' 29"	0.01239
15	82° 11' 58"	5° 00' 57"	81° 10' 26"	28° 12' 56"	1° 00' 08"	16' 23.22"	110° 24' 23"	0.01139
16	82° 48' 46"	5° 00' 54"	81° 51' 58"	28° 15' 03"	1° 00' 07"	16' 22.98"	111° 50' 48"	0.01045
17	83° 25' 33"	5° 00' 50"	82° 33' 31"	28° 16' 57"	1° 00' 06"	16' 22.74"	113° 23' 27"	0.00955
18	84° 02' 19"	5° 00' 43"	83° 15' 05"	28° 18' 39"	1° 00' 06"	16' 22.49"	115° 3' 07"	0.00870
19	84° 39' 04"	5° 00' 34"	83° 56' 38"	28° 20' 08"	1° 00' 05"	16' 22.24"	116° 50' 47"	0.00791
20	85° 15' 48"	5° 00' 24"	84° 38' 11"	28° 21' 24"	1° 00' 04"	16' 21.98"	118° 47' 31"	0.00716
21	85° 52' 31"	5° 00' 11"	85° 19' 44"	28° 22' 28"	1° 00' 03"	16' 21.71"	120° 54' 37"	0.00646
22	86° 29' 12"	4° 59' 56"	86° 01' 16"	28° 23' 19"	1° 00' 02"	16' 21.44"	123° 13' 34"	0.00581
23	87° 05' 53"	4° 59' 39"	86° 42' 47"	28° 23' 57"	1° 00' 01"	16' 21.16"	125° 46' 05"	0.00521
24	87° 42' 32"	4° 59' 20"	87° 24' 17"	28° 24' 23"	0° 59' 60"	16' 20.87"	128° 34' 07"	0.00466

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	93° 42' 51"	0.27"	94° 02' 31"	23° 23' 11"	1.0164405	15'44.11"	23° 26' 18"	-2 m 38 s
1	93° 45' 15"	0.27"	94° 05' 07"	23° 23' 07"	1.0164426	15'44.11"	23° 26' 18"	-2 m 38 s
2	93° 47' 38"	0.27"	94° 07' 42"	23° 23' 03"	1.0164446	15'44.10"	23° 26' 18"	-2 m 39 s
3	93° 50' 01"	0.27"	94° 10' 18"	23° 22' 59"	1.0164466	15'44.10"	23° 26' 18"	-2 m 39 s
4	93° 52' 24"	0.27"	94° 12' 54"	23° 22' 54"	1.0164486	15'44.10"	23° 26' 18"	-2 m 40 s
5	93° 54' 47"	0.27"	94° 15' 30"	23° 22' 50"	1.0164506	15'44.10"	23° 26' 18"	-2 m 40 s
6	93° 57' 10"	0.27"	94° 18' 06"	23° 22' 46"	1.0164526	15'44.10"	23° 26' 18"	-2 m 41 s
7	93° 59' 33"	0.26"	94° 20' 42"	23° 22' 42"	1.0164545	15'44.10"	23° 26' 18"	-2 m 41 s
8	94° 01' 57"	0.26"	94° 23' 18"	23° 22' 37"	1.0164565	15'44.09"	23° 26' 18"	-2 m 42 s
9	94° 04' 20"	0.26"	94° 25' 54"	23° 22' 33"	1.0164584	15'44.09"	23° 26' 18"	-2 m 42 s
10	94° 06' 43"	0.26"	94° 28' 30"	23° 22' 29"	1.0164604	15'44.09"	23° 26' 18"	-2 m 43 s
11	94° 09' 06"	0.26"	94° 31' 05"	23° 22' 24"	1.0164623	15'44.09"	23° 26' 18"	-2 m 44 s
12	94° 11' 29"	0.26"	94° 33' 41"	23° 22' 20"	1.0164642	15'44.09"	23° 26' 18"	-2 m 44 s
13	94° 13' 52"	0.26"	94° 36' 17"	23° 22' 15"	1.0164661	15'44.08"	23° 26' 18"	-2 m 45 s
14	94° 16' 16"	0.26"	94° 38' 53"	23° 22' 10"	1.0164680	15'44.08"	23° 26' 18"	-2 m 45 s
15	94° 18' 39"	0.26"	94° 41' 29"	23° 22' 06"	1.0164699	15'44.08"	23° 26' 18"	-2 m 46 s
16	94° 21' 02"	0.26"	94° 44' 05"	23° 22' 01"	1.0164717	15'44.08"	23° 26' 18"	-2 m 46 s
17	94° 23' 25"	0.26"	94° 46' 41"	23° 21' 56"	1.0164736	15'44.08"	23° 26' 18"	-2 m 47 s
18	94° 25' 48"	0.26"	94° 49' 16"	23° 21' 52"	1.0164754	15'44.08"	23° 26' 18"	-2 m 47 s
19	94° 28' 11"	0.25"	94° 51' 52"	23° 21' 47"	1.0164773	15'44.07"	23° 26' 18"	-2 m 48 s
20	94° 30' 34"	0.25"	94° 54' 28"	23° 21' 42"	1.0164791	15'44.07"	23° 26' 18"	-2 m 48 s
21	94° 32' 57"	0.25"	94° 57' 04"	23° 21' 37"	1.0164809	15'44.07"	23° 26' 18"	-2 m 49 s
22	94° 35' 21"	0.25"	94° 59' 40"	23° 21' 32"	1.0164827	15'44.07"	23° 26' 18"	-2 m 49 s
23	94° 37' 44"	0.25"	95° 02' 16"	23° 21' 27"	1.0164845	15'44.07"	23° 26' 18"	-2 m 50 s
24	94° 40' 07"	0.25"	95° 04' 52"	23° 21' 22"	1.0164863	15'44.07"	23° 26' 18"	-2 m 50 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	87° 42' 32"	4° 59' 20"	87° 24' 17"	28° 24' 23"	0° 59' 60"	16' 20.87"	128° 34' 07"	0.00466
1	88° 19' 09"	4° 58' 58"	88° 05' 47"	28° 24' 36"	0° 59' 58"	16' 20.58"	131° 39' 53"	0.00415
2	88° 55' 46"	4° 58' 35"	88° 47' 14"	28° 24' 37"	0° 59' 57"	16' 20.28"	135° 5' 50"	0.00370
3	89° 32' 21"	4° 58' 10"	89° 28' 41"	28° 24' 25"	0° 59' 56"	16' 19.97"	138° 54' 30"	0.00330
4	90° 08' 54"	4° 57' 43"	90° 10' 05"	28° 24' 00"	0° 59' 55"	16' 19.66"	143° 8' 28"	0.00294
5	90° 45' 26"	4° 57' 14"	90° 51' 28"	28° 23' 23"	0° 59' 54"	16' 19.34"	147° 49' 58"	0.00264
6	91° 21' 57"	4° 56' 42"	91° 32' 48"	28° 22' 34"	0° 59' 53"	16' 19.02"	153° 0' 33"	0.00238
7	91° 58' 26"	4° 56' 09"	92° 14' 06"	28° 21' 32"	0° 59' 52"	16' 18.69"	158° 40' 24"	0.00218
8	92° 34' 54"	4° 55' 34"	92° 55' 21"	28° 20' 17"	0° 59' 50"	16' 18.35"	164° 47' 47"	0.00202
9	93° 11' 20"	4° 54' 57"	93° 36' 34"	28° 18' 51"	0° 59' 49"	16' 18.01"	171° 18' 25"	0.00191
10	93° 47' 44"	4° 54' 17"	94° 17' 43"	28° 17' 12"	0° 59' 48"	16' 17.66"	178° 5' 17"	0.00185
11	94° 24' 07"	4° 53' 36"	94° 58' 50"	28° 15' 20"	0° 59' 46"	16' 17.31"	184° 59' 13"	0.00184
12	95° 00' 28"	4° 52' 53"	95° 39' 53"	28° 13' 17"	0° 59' 45"	16' 16.95"	191° 49' 57"	0.00187
13	95° 36' 47"	4° 52' 08"	96° 20' 53"	28° 11' 01"	0° 59' 44"	16' 16.58"	198° 27' 43"	0.00196
14	96° 13' 05"	4° 51' 21"	97° 01' 49"	28° 08' 33"	0° 59' 42"	16' 16.21"	204° 44' 35"	0.00209
15	96° 49' 21"	4° 50' 32"	97° 42' 41"	28° 05' 53"	0° 59' 41"	16' 15.84"	210° 35' 11"	0.00227
16	97° 25' 35"	4° 49' 41"	98° 23' 30"	28° 03' 01"	0° 59' 40"	16' 15.45"	215° 56' 50"	0.00250
17	98° 01' 47"	4° 48' 49"	99° 04' 14"	27° 59' 58"	0° 59' 38"	16' 15.07"	220° 49' 03"	0.00278
18	98° 37' 57"	4° 47' 54"	99° 44' 52"	27° 56' 42"	0° 59' 37"	16' 14.67"	225° 12' 45"	0.00311
19	99° 14' 05"	4° 46' 57"	100° 25' 27"	27° 53' 15"	0° 59' 35"	16' 14.27"	229° 10' 19"	0.00348
20	99° 50' 12"	4° 45' 59"	101° 05' 57"	27° 49' 35"	0° 59' 34"	16' 13.87"	232° 44' 03"	0.00390
21	100° 26' 17"	4° 44' 59"	101° 46' 23"	27° 45' 45"	0° 59' 32"	16' 13.46"	235° 56' 33"	0.00437
22	101° 02' 19"	4° 43' 57"	102° 26' 43"	27° 41' 42"	0° 59' 31"	16' 13.05"	238° 50' 17"	0.00488
23	101° 38' 20"	4° 42' 53"	103° 06' 59"	27° 37' 28"	0° 59' 29"	16' 12.63"	241° 27' 35"	0.00544
24	102° 14' 19"	4° 41' 47"	103° 47' 09"	27° 33' 03"	0° 59' 28"	16' 12.21"	243° 50' 30"	0.00605

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	94° 40' 07"	0.25"	95° 04' 52"	23° 21' 22"	1.0164863	15'44.07"	23° 26' 18"	-2 m 50 s
1	94° 42' 30"	0.25"	95° 07' 27"	23° 21' 17"	1.0164880	15'44.06"	23° 26' 18"	-2 m 51 s
2	94° 44' 53"	0.24"	95° 10' 03"	23° 21' 12"	1.0164898	15'44.06"	23° 26' 18"	-2 m 51 s
3	94° 47' 16"	0.24"	95° 12' 39"	23° 21' 07"	1.0164916	15'44.06"	23° 26' 18"	-2 m 52 s
4	94° 49' 39"	0.24"	95° 15' 15"	23° 21' 02"	1.0164933	15'44.06"	23° 26' 18"	-2 m 52 s
5	94° 52' 03"	0.24"	95° 17' 51"	23° 20' 56"	1.0164950	15'44.06"	23° 26' 18"	-2 m 53 s
6	94° 54' 26"	0.24"	95° 20' 26"	23° 20' 51"	1.0164967	15'44.06"	23° 26' 18"	-2 m 54 s
7	94° 56' 49"	0.24"	95° 23' 02"	23° 20' 46"	1.0164985	15'44.05"	23° 26' 18"	-2 m 54 s
8	94° 59' 12"	0.23"	95° 25' 38"	23° 20' 40"	1.0165001	15'44.05"	23° 26' 18"	-2 m 55 s
9	95° 01' 35"	0.23"	95° 28' 14"	23° 20' 35"	1.0165018	15'44.05"	23° 26' 18"	-2 m 55 s
10	95° 03' 58"	0.23"	95° 30' 50"	23° 20' 30"	1.0165035	15'44.05"	23° 26' 18"	-2 m 56 s
11	95° 06' 21"	0.23"	95° 33' 25"	23° 20' 24"	1.0165052	15'44.05"	23° 26' 18"	-2 m 56 s
12	95° 08' 45"	0.23"	95° 36' 01"	23° 20' 19"	1.0165068	15'44.05"	23° 26' 18"	-2 m 57 s
13	95° 11' 08"	0.22"	95° 38' 37"	23° 20' 13"	1.0165085	15'44.05"	23° 26' 18"	-2 m 57 s
14	95° 13' 31"	0.22"	95° 41' 13"	23° 20' 07"	1.0165101	15'44.04"	23° 26' 18"	-2 m 58 s
15	95° 15' 54"	0.22"	95° 43' 48"	23° 20' 02"	1.0165117	15'44.04"	23° 26' 18"	-2 m 58 s
16	95° 18' 17"	0.22"	95° 46' 24"	23° 19' 56"	1.0165133	15'44.04"	23° 26' 18"	-2 m 59 s
17	95° 20' 40"	0.22"	95° 48' 60"	23° 19' 50"	1.0165149	15'44.04"	23° 26' 18"	-2 m 59 s
18	95° 23' 03"	0.21"	95° 51' 36"	23° 19' 44"	1.0165165	15'44.04"	23° 26' 18"	-2 m 60 s
19	95° 25' 26"	0.21"	95° 54' 11"	23° 19' 39"	1.0165181	15'44.04"	23° 26' 18"	-3 m 00 s
20	95° 27' 50"	0.21"	95° 56' 47"	23° 19' 33"	1.0165197	15'44.03"	23° 26' 18"	-3 m 01 s
21	95° 30' 13"	0.21"	95° 59' 23"	23° 19' 27"	1.0165212	15'44.03"	23° 26' 18"	-3 m 01 s
22	95° 32' 36"	0.20"	96° 01' 59"	23° 19' 21"	1.0165228	15'44.03"	23° 26' 18"	-3 m 02 s
23	95° 34' 59"	0.20"	96° 04' 34"	23° 19' 15"	1.0165243	15'44.03"	23° 26' 18"	-3 m 02 s
24	95° 37' 22"	0.20"	96° 07' 10"	23° 19' 09"	1.0165258	15'44.03"	23° 26' 18"	-3 m 03 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	102° 14' 19"	4° 41' 47"	103° 47' 09"	27° 33' 03"	0° 59' 28"	16' 12.21"	243° 50' 30"	0.00605
1	102° 50' 15"	4° 40' 39"	104° 27' 14"	27° 28' 27"	0° 59' 26"	16' 11.78"	246° 0' 50"	0.00670
2	103° 26' 10"	4° 39' 30"	105° 07' 13"	27° 23' 39"	0° 59' 25"	16' 11.34"	248° 0' 10"	0.00740
3	104° 02' 03"	4° 38' 19"	105° 47' 06"	27° 18' 40"	0° 59' 23"	16' 10.90"	249° 49' 52"	0.00815
4	104° 37' 53"	4° 37' 06"	106° 26' 53"	27° 13' 30"	0° 59' 21"	16' 10.46"	251° 31' 06"	0.00894
5	105° 13' 41"	4° 35' 51"	107° 06' 35"	27° 08' 09"	0° 59' 20"	16' 10.01"	253° 4' 51"	0.00978
6	105° 49' 27"	4° 34' 35"	107° 46' 10"	27° 02' 38"	0° 59' 18"	16' 09.56"	254° 32' 01"	0.01066
7	106° 25' 11"	4° 33' 17"	108° 25' 39"	26° 56' 55"	0° 59' 16"	16' 09.10"	255° 53' 19"	0.01159
8	107° 00' 53"	4° 31' 57"	109° 05' 02"	26° 51' 02"	0° 59' 15"	16' 08.64"	257° 9' 25"	0.01257
9	107° 36' 32"	4° 30' 35"	109° 44' 18"	26° 44' 59"	0° 59' 13"	16' 08.18"	258° 20' 51"	0.01358
10	108° 12' 09"	4° 29' 12"	110° 23' 28"	26° 38' 44"	0° 59' 11"	16' 07.71"	259° 28' 06"	0.01465
11	108° 47' 44"	4° 27' 47"	111° 02' 30"	26° 32' 20"	0° 59' 10"	16' 07.23"	260° 31' 37"	0.01575
12	109° 23' 17"	4° 26' 21"	111° 41' 27"	26° 25' 45"	0° 59' 08"	16' 06.75"	261° 31' 43"	0.01690
13	109° 58' 47"	4° 24' 53"	112° 20' 16"	26° 19' 01"	0° 59' 06"	16' 06.27"	262° 28' 46"	0.01810
14	110° 34' 15"	4° 23' 23"	112° 58' 58"	26° 12' 06"	0° 59' 04"	16' 05.79"	263° 23' 00"	0.01933
15	111° 09' 40"	4° 21' 51"	113° 37' 33"	26° 05' 01"	0° 59' 02"	16' 05.30"	264° 14' 42"	0.02061
16	111° 45' 03"	4° 20' 19"	114° 16' 01"	25° 57' 47"	0° 59' 01"	16' 04.80"	265° 4' 05"	0.02194
17	112° 20' 24"	4° 18' 44"	114° 54' 22"	25° 50' 22"	0° 58' 59"	16' 04.30"	265° 51' 19"	0.02330
18	112° 55' 42"	4° 17' 08"	115° 32' 35"	25° 42' 49"	0° 58' 57"	16' 03.80"	266° 36' 36"	0.02471
19	113° 30' 58"	4° 15' 30"	116° 10' 41"	25° 35' 05"	0° 58' 55"	16' 03.30"	267° 20' 04"	0.02616
20	114° 06' 12"	4° 13' 51"	116° 48' 40"	25° 27' 13"	0° 58' 53"	16' 02.79"	268° 1' 52"	0.02765
21	114° 41' 22"	4° 12' 10"	117° 26' 31"	25° 19' 11"	0° 58' 51"	16' 02.28"	268° 42' 06"	0.02918
22	115° 16' 31"	4° 10' 28"	118° 04' 14"	25° 11' 00"	0° 58' 49"	16' 01.76"	269° 20' 54"	0.03076
23	115° 51' 37"	4° 08' 45"	118° 41' 50"	25° 02' 40"	0° 58' 48"	16' 01.24"	269° 58' 22"	0.03237
24	116° 26' 40"	4° 06' 60"	119° 19' 18"	24° 54' 11"	0° 58' 46"	16' 00.72"	270° 34' 34"	0.03402

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	95° 37' 22"	0.20"	96° 07' 10"	23° 19' 09"	1.0165258	15'44.03"	23° 26' 18"	-3 m 03 s
1	95° 39' 45"	0.20"	96° 09' 46"	23° 19' 03"	1.0165273	15'44.03"	23° 26' 18"	-3 m 03 s
2	95° 42' 08"	0.19"	96° 12' 22"	23° 18' 57"	1.0165289	15'44.03"	23° 26' 18"	-3 m 04 s
3	95° 44' 31"	0.19"	96° 14' 57"	23° 18' 50"	1.0165303	15'44.02"	23° 26' 18"	-3 m 04 s
4	95° 46' 55"	0.19"	96° 17' 33"	23° 18' 44"	1.0165318	15'44.02"	23° 26' 18"	-3 m 05 s
5	95° 49' 18"	0.18"	96° 20' 09"	23° 18' 38"	1.0165333	15'44.02"	23° 26' 18"	-3 m 05 s
6	95° 51' 41"	0.18"	96° 22' 44"	23° 18' 32"	1.0165348	15'44.02"	23° 26' 18"	-3 m 06 s
7	95° 54' 04"	0.18"	96° 25' 20"	23° 18' 25"	1.0165362	15'44.02"	23° 26' 18"	-3 m 07 s
8	95° 56' 27"	0.18"	96° 27' 56"	23° 18' 19"	1.0165377	15'44.02"	23° 26' 18"	-3 m 07 s
9	95° 58' 50"	0.17"	96° 30' 31"	23° 18' 12"	1.0165391	15'44.02"	23° 26' 18"	-3 m 08 s
10	96° 01' 13"	0.17"	96° 33' 07"	23° 18' 06"	1.0165405	15'44.02"	23° 26' 18"	-3 m 08 s
11	96° 03' 36"	0.17"	96° 35' 43"	23° 17' 59"	1.0165419	15'44.01"	23° 26' 18"	-3 m 09 s
12	96° 05' 59"	0.16"	96° 38' 18"	23° 17' 53"	1.0165433	15'44.01"	23° 26' 18"	-3 m 09 s
13	96° 08' 23"	0.16"	96° 40' 54"	23° 17' 46"	1.0165447	15'44.01"	23° 26' 18"	-3 m 10 s
14	96° 10' 46"	0.16"	96° 43' 30"	23° 17' 40"	1.0165461	15'44.01"	23° 26' 18"	-3 m 10 s
15	96° 13' 09"	0.15"	96° 46' 05"	23° 17' 33"	1.0165475	15'44.01"	23° 26' 18"	-3 m 11 s
16	96° 15' 32"	0.15"	96° 48' 41"	23° 17' 26"	1.0165488	15'44.01"	23° 26' 18"	-3 m 11 s
17	96° 17' 55"	0.15"	96° 51' 17"	23° 17' 19"	1.0165502	15'44.01"	23° 26' 18"	-3 m 12 s
18	96° 20' 18"	0.14"	96° 53' 52"	23° 17' 13"	1.0165515	15'44.01"	23° 26' 18"	-3 m 12 s
19	96° 22' 41"	0.14"	96° 56' 28"	23° 17' 06"	1.0165528	15'44.00"	23° 26' 18"	-3 m 13 s
20	96° 25' 04"	0.14"	96° 59' 03"	23° 16' 59"	1.0165541	15'44.00"	23° 26' 18"	-3 m 13 s
21	96° 27' 27"	0.13"	97° 01' 39"	23° 16' 52"	1.0165554	15'44.00"	23° 26' 18"	-3 m 14 s
22	96° 29' 51"	0.13"	97° 04' 15"	23° 16' 45"	1.0165567	15'44.00"	23° 26' 18"	-3 m 14 s
23	96° 32' 14"	0.13"	97° 06' 50"	23° 16' 38"	1.0165580	15'44.00"	23° 26' 18"	-3 m 15 s
24	96° 34' 37"	0.12"	97° 09' 26"	23° 16' 31"	1.0165593	15'44.00"	23° 26' 18"	-3 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	116° 26' 40"	4° 06' 60"	119° 19' 18"	24° 54' 11"	0° 58' 46"	16' 00.72"	270° 34' 34"	0.03402
1	117° 01' 41"	4° 05' 13"	119° 56' 39"	24° 45' 34"	0° 58' 44"	16' 00.20"	271° 9' 35"	0.03572
2	117° 36' 39"	4° 03' 25"	120° 33' 51"	24° 36' 48"	0° 58' 42"	15' 59.67"	271° 43' 31"	0.03745
3	118° 11' 35"	4° 01' 36"	121° 10' 56"	24° 27' 53"	0° 58' 40"	15' 59.14"	272° 16' 24"	0.03923
4	118° 46' 28"	3° 59' 45"	121° 47' 53"	24° 18' 50"	0° 58' 38"	15' 58.61"	272° 48' 19"	0.04104
5	119° 21' 18"	3° 57' 53"	122° 24' 42"	24° 09' 38"	0° 58' 36"	15' 58.07"	273° 19' 18"	0.04289
6	119° 56' 06"	3° 55' 59"	123° 01' 23"	24° 00' 18"	0° 58' 34"	15' 57.53"	273° 49' 25"	0.04478
7	120° 30' 51"	3° 54' 05"	123° 37' 56"	23° 50' 51"	0° 58' 32"	15' 56.99"	274° 18' 43"	0.04671
8	121° 05' 34"	3° 52' 09"	124° 14' 22"	23° 41' 15"	0° 58' 30"	15' 56.45"	274° 47' 14"	0.04867
9	121° 40' 14"	3° 50' 11"	124° 50' 39"	23° 31' 32"	0° 58' 28"	15' 55.90"	275° 14' 59"	0.05068
10	122° 14' 51"	3° 48' 12"	125° 26' 48"	23° 21' 40"	0° 58' 26"	15' 55.36"	275° 42' 03"	0.05272
11	122° 49' 26"	3° 46' 13"	126° 02' 49"	23° 11' 42"	0° 58' 24"	15' 54.81"	276° 8' 25"	0.05479
12	123° 23' 58"	3° 44' 11"	126° 38' 42"	23° 01' 36"	0° 58' 22"	15' 54.26"	276° 34' 09"	0.05691
13	123° 58' 27"	3° 42' 09"	127° 14' 28"	22° 51' 22"	0° 58' 20"	15' 53.70"	276° 59' 16"	0.05906
14	124° 32' 54"	3° 40' 05"	127° 50' 05"	22° 41' 01"	0° 58' 18"	15' 53.15"	277° 23' 47"	0.06124
15	125° 07' 17"	3° 38' 01"	128° 25' 34"	22° 30' 33"	0° 58' 16"	15' 52.59"	277° 47' 44"	0.06346
16	125° 41' 39"	3° 35' 55"	129° 00' 55"	22° 19' 59"	0° 58' 14"	15' 52.03"	278° 11' 08"	0.06572
17	126° 15' 57"	3° 33' 47"	129° 36' 08"	22° 09' 17"	0° 58' 12"	15' 51.47"	278° 34' 00"	0.06801
18	126° 50' 13"	3° 31' 39"	130° 11' 13"	21° 58' 28"	0° 58' 10"	15' 50.90"	278° 56' 22"	0.07033
19	127° 24' 26"	3° 29' 30"	130° 46' 10"	21° 47' 33"	0° 58' 08"	15' 50.34"	279° 18' 15"	0.07269
20	127° 58' 36"	3° 27' 19"	131° 20' 59"	21° 36' 32"	0° 58' 05"	15' 49.77"	279° 39' 39"	0.07508
21	128° 32' 44"	3° 25' 08"	131° 55' 40"	21° 25' 24"	0° 58' 03"	15' 49.21"	280° 0' 36"	0.07751
22	129° 06' 49"	3° 22' 55"	132° 30' 13"	21° 14' 09"	0° 58' 01"	15' 48.64"	280° 21' 06"	0.07996
23	129° 40' 51"	3° 20' 41"	133° 04' 39"	21° 02' 49"	0° 57' 59"	15' 48.07"	280° 41' 11"	0.08245
24	130° 14' 50"	3° 18' 27"	133° 38' 56"	20° 51' 22"	0° 57' 57"	15' 47.50"	281° 0' 51"	0.08497

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	96° 34' 37"	0.12"	97° 09' 26"	23° 16' 31"	1.0165593	15'44.00"	23° 26' 18"	-3 m 15 s
1	96° 36' 60"	0.12"	97° 12' 02"	23° 16' 24"	1.0165606	15'44.00"	23° 26' 18"	-3 m 16 s
2	96° 39' 23"	0.11"	97° 14' 37"	23° 16' 17"	1.0165618	15'44.00"	23° 26' 18"	-3 m 16 s
3	96° 41' 46"	0.11"	97° 17' 13"	23° 16' 09"	1.0165631	15'43.99"	23° 26' 18"	-3 m 17 s
4	96° 44' 09"	0.11"	97° 19' 48"	23° 16' 02"	1.0165643	15'43.99"	23° 26' 18"	-3 m 17 s
5	96° 46' 32"	0.10"	97° 22' 24"	23° 15' 55"	1.0165655	15'43.99"	23° 26' 18"	-3 m 18 s
6	96° 48' 55"	0.10"	97° 24' 59"	23° 15' 47"	1.0165667	15'43.99"	23° 26' 18"	-3 m 18 s
7	96° 51' 19"	0.09"	97° 27' 35"	23° 15' 40"	1.0165679	15'43.99"	23° 26' 18"	-3 m 19 s
8	96° 53' 42"	0.09"	97° 30' 11"	23° 15' 33"	1.0165691	15'43.99"	23° 26' 18"	-3 m 19 s
9	96° 56' 05"	0.09"	97° 32' 46"	23° 15' 25"	1.0165703	15'43.99"	23° 26' 18"	-3 m 20 s
10	96° 58' 28"	0.08"	97° 35' 22"	23° 15' 18"	1.0165715	15'43.99"	23° 26' 18"	-3 m 20 s
11	97° 00' 51"	0.08"	97° 37' 57"	23° 15' 10"	1.0165727	15'43.99"	23° 26' 18"	-3 m 21 s
12	97° 03' 14"	0.07"	97° 40' 33"	23° 15' 03"	1.0165738	15'43.98"	23° 26' 18"	-3 m 21 s
13	97° 05' 37"	0.07"	97° 43' 08"	23° 14' 55"	1.0165750	15'43.98"	23° 26' 18"	-3 m 22 s
14	97° 08' 00"	0.07"	97° 45' 44"	23° 14' 47"	1.0165761	15'43.98"	23° 26' 18"	-3 m 22 s
15	97° 10' 23"	0.06"	97° 48' 19"	23° 14' 40"	1.0165772	15'43.98"	23° 26' 18"	-3 m 23 s
16	97° 12' 46"	0.06"	97° 50' 55"	23° 14' 32"	1.0165783	15'43.98"	23° 26' 18"	-3 m 23 s
17	97° 15' 10"	0.05"	97° 53' 30"	23° 14' 24"	1.0165794	15'43.98"	23° 26' 18"	-3 m 24 s
18	97° 17' 33"	0.05"	97° 56' 06"	23° 14' 16"	1.0165805	15'43.98"	23° 26' 18"	-3 m 24 s
19	97° 19' 56"	0.04"	97° 58' 41"	23° 14' 08"	1.0165816	15'43.98"	23° 26' 18"	-3 m 25 s
20	97° 22' 19"	0.04"	98° 01' 17"	23° 14' 00"	1.0165827	15'43.98"	23° 26' 18"	-3 m 25 s
21	97° 24' 42"	0.04"	98° 03' 52"	23° 13' 52"	1.0165837	15'43.98"	23° 26' 18"	-3 m 26 s
22	97° 27' 05"	0.03"	98° 06' 28"	23° 13' 44"	1.0165848	15'43.97"	23° 26' 18"	-3 m 26 s
23	97° 29' 28"	0.03"	98° 09' 03"	23° 13' 36"	1.0165858	15'43.97"	23° 26' 18"	-3 m 27 s
24	97° 31' 51"	0.02"	98° 11' 39"	23° 13' 28"	1.0165869	15'43.97"	23° 26' 18"	-3 m 27 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	130° 14' 50"	3° 18' 27"	133° 38' 56"	20° 51' 22"	0° 57' 57"	15' 47.50"	281° 0' 51"	0.08497
1	130° 48' 47"	3° 16' 11"	134° 13' 06"	20° 39' 50"	0° 57' 55"	15' 46.93"	281° 20' 06"	0.08753
2	131° 22' 40"	3° 13' 54"	134° 47' 07"	20° 28' 12"	0° 57' 53"	15' 46.36"	281° 38' 58"	0.09011
3	131° 56' 31"	3° 11' 37"	135° 21' 01"	20° 16' 28"	0° 57' 51"	15' 45.78"	281° 57' 27"	0.09273
4	132° 30' 20"	3° 09' 18"	135° 54' 47"	20° 04' 38"	0° 57' 49"	15' 45.21"	282° 15' 34"	0.09538
5	133° 04' 05"	3° 06' 58"	136° 28' 26"	19° 52' 43"	0° 57' 47"	15' 44.64"	282° 33' 19"	0.09805
6	133° 37' 48"	3° 04' 38"	137° 01' 57"	19° 40' 42"	0° 57' 44"	15' 44.06"	282° 50' 43"	0.10076
7	134° 11' 28"	3° 02' 17"	137° 35' 20"	19° 28' 37"	0° 57' 42"	15' 43.49"	283° 7' 47"	0.10349
8	134° 45' 05"	2° 59' 54"	138° 08' 36"	19° 16' 26"	0° 57' 40"	15' 42.91"	283° 24' 30"	0.10626
9	135° 18' 40"	2° 57' 31"	138° 41' 44"	19° 04' 10"	0° 57' 38"	15' 42.34"	283° 40' 54"	0.10905
10	135° 52' 12"	2° 55' 07"	139° 14' 44"	18° 51' 49"	0° 57' 36"	15' 41.76"	283° 56' 58"	0.11188
11	136° 25' 41"	2° 52' 42"	139° 47' 37"	18° 39' 23"	0° 57' 34"	15' 41.19"	284° 12' 44"	0.11473
12	136° 59' 07"	2° 50' 17"	140° 20' 23"	18° 26' 52"	0° 57' 32"	15' 40.61"	284° 28' 11"	0.11761
13	137° 32' 31"	2° 47' 50"	140° 53' 02"	18° 14' 17"	0° 57' 30"	15' 40.03"	284° 43' 20"	0.12051
14	138° 05' 51"	2° 45' 23"	141° 25' 33"	18° 01' 37"	0° 57' 28"	15' 39.46"	284° 58' 11"	0.12344
15	138° 39' 09"	2° 42' 55"	141° 57' 57"	17° 48' 53"	0° 57' 25"	15' 38.88"	285° 12' 46"	0.12640
16	139° 12' 25"	2° 40' 26"	142° 30' 13"	17° 36' 04"	0° 57' 23"	15' 38.31"	285° 27' 03"	0.12939
17	139° 45' 37"	2° 37' 57"	143° 02' 23"	17° 23' 12"	0° 57' 21"	15' 37.73"	285° 41' 03"	0.13240
18	140° 18' 47"	2° 35' 27"	143° 34' 26"	17° 10' 15"	0° 57' 19"	15' 37.16"	285° 54' 47"	0.13543
19	140° 51' 54"	2° 32' 56"	144° 06' 21"	16° 57' 14"	0° 57' 17"	15' 36.58"	286° 8' 16"	0.13850
20	141° 24' 59"	2° 30' 25"	144° 38' 10"	16° 44' 09"	0° 57' 15"	15' 36.01"	286° 21' 28"	0.14158
21	141° 58' 01"	2° 27' 52"	145° 09' 52"	16° 31' 00"	0° 57' 13"	15' 35.44"	286° 34' 25"	0.14469
22	142° 30' 60"	2° 25' 20"	145° 41' 27"	16° 17' 48"	0° 57' 11"	15' 34.87"	286° 47' 06"	0.14783
23	143° 03' 56"	2° 22' 46"	146° 12' 55"	16° 04' 31"	0° 57' 09"	15' 34.30"	286° 59' 33"	0.15098
24	143° 36' 50"	2° 20' 12"	146° 44' 17"	15° 51' 12"	0° 57' 07"	15' 33.73"	287° 11' 44"	0.15417

29 Juni 2025

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	97° 31' 51"	0.02"	98° 11' 39"	23° 13' 28"	1.0165869	15'43.97"	23° 26' 18"	-3 m 27 s
1	97° 34' 14"	0.02"	98° 14' 14"	23° 13' 20"	1.0165879	15'43.97"	23° 26' 18"	-3 m 28 s
2	97° 36' 37"	0.01"	98° 16' 50"	23° 13' 12"	1.0165889	15'43.97"	23° 26' 18"	-3 m 28 s
3	97° 39' 00"	0.01"	98° 19' 25"	23° 13' 04"	1.0165899	15'43.97"	23° 26' 18"	-3 m 29 s
4	97° 41' 24"	0.00"	98° 22' 00"	23° 12' 56"	1.0165909	15'43.97"	23° 26' 18"	-3 m 29 s
5	97° 43' 47"	-0.00"	98° 24' 36"	23° 12' 47"	1.0165919	15'43.97"	23° 26' 18"	-3 m 30 s
6	97° 46' 10"	-0.01"	98° 27' 11"	23° 12' 39"	1.0165929	15'43.97"	23° 26' 18"	-3 m 30 s
7	97° 48' 33"	-0.01"	98° 29' 47"	23° 12' 30"	1.0165938	15'43.97"	23° 26' 18"	-3 m 31 s
8	97° 50' 56"	-0.01"	98° 32' 22"	23° 12' 22"	1.0165948	15'43.97"	23° 26' 18"	-3 m 31 s
9	97° 53' 19"	-0.02"	98° 34' 58"	23° 12' 14"	1.0165957	15'43.96"	23° 26' 18"	-3 m 32 s
10	97° 55' 42"	-0.02"	98° 37' 33"	23° 12' 05"	1.0165967	15'43.96"	23° 26' 18"	-3 m 32 s
11	97° 58' 05"	-0.03"	98° 40' 08"	23° 11' 56"	1.0165976	15'43.96"	23° 26' 18"	-3 m 33 s
12	98° 00' 28"	-0.03"	98° 42' 44"	23° 11' 48"	1.0165985	15'43.96"	23° 26' 18"	-3 m 33 s
13	98° 02' 51"	-0.04"	98° 45' 19"	23° 11' 39"	1.0165994	15'43.96"	23° 26' 18"	-3 m 34 s
14	98° 05' 14"	-0.04"	98° 47' 54"	23° 11' 31"	1.0166003	15'43.96"	23° 26' 18"	-3 m 34 s
15	98° 07' 37"	-0.05"	98° 50' 30"	23° 11' 22"	1.0166012	15'43.96"	23° 26' 18"	-3 m 35 s
16	98° 10' 01"	-0.05"	98° 53' 05"	23° 11' 13"	1.0166021	15'43.96"	23° 26' 18"	-3 m 35 s
17	98° 12' 24"	-0.06"	98° 55' 41"	23° 11' 04"	1.0166029	15'43.96"	23° 26' 18"	-3 m 36 s
18	98° 14' 47"	-0.06"	98° 58' 16"	23° 10' 55"	1.0166038	15'43.96"	23° 26' 18"	-3 m 36 s
19	98° 17' 10"	-0.07"	99° 00' 51"	23° 10' 46"	1.0166046	15'43.96"	23° 26' 18"	-3 m 37 s
20	98° 19' 33"	-0.07"	99° 03' 27"	23° 10' 38"	1.0166055	15'43.96"	23° 26' 18"	-3 m 37 s
21	98° 21' 56"	-0.08"	99° 06' 02"	23° 10' 29"	1.0166063	15'43.95"	23° 26' 18"	-3 m 38 s
22	98° 24' 19"	-0.08"	99° 08' 37"	23° 10' 20"	1.0166071	15'43.95"	23° 26' 18"	-3 m 38 s
23	98° 26' 42"	-0.09"	99° 11' 13"	23° 10' 10"	1.0166079	15'43.95"	23° 26' 18"	-3 m 39 s
24	98° 29' 05"	-0.09"	99° 13' 48"	23° 10' 01"	1.0166087	15'43.95"	23° 26' 18"	-3 m 39 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	143° 36' 50"	2° 20' 12"	146° 44' 17"	15° 51' 12"	0° 57' 07"	15' 33.73"	287° 11' 44"	0.15417
1	144° 09' 41"	2° 17' 38"	147° 15' 32"	15° 37' 49"	0° 57' 04"	15' 33.16"	287° 23' 41"	0.15737
2	144° 42' 29"	2° 15' 03"	147° 46' 41"	15° 24' 22"	0° 57' 02"	15' 32.59"	287° 35' 24"	0.16060
3	145° 15' 15"	2° 12' 27"	148° 17' 43"	15° 10' 52"	0° 57' 00"	15' 32.02"	287° 46' 53"	0.16385
4	145° 47' 58"	2° 09' 51"	148° 48' 38"	14° 57' 19"	0° 56' 58"	15' 31.46"	287° 58' 08"	0.16712
5	146° 20' 38"	2° 07' 14"	149° 19' 28"	14° 43' 43"	0° 56' 56"	15' 30.89"	288° 9' 09"	0.17041
6	146° 53' 16"	2° 04' 37"	149° 50' 11"	14° 30' 04"	0° 56' 54"	15' 30.33"	288° 19' 56"	0.17372
7	147° 25' 51"	2° 01' 59"	150° 20' 48"	14° 16' 21"	0° 56' 52"	15' 29.77"	288° 30' 30"	0.17706
8	147° 58' 23"	1° 59' 21"	150° 51' 19"	14° 02' 36"	0° 56' 50"	15' 29.21"	288° 40' 51"	0.18041
9	148° 30' 53"	1° 56' 42"	151° 21' 44"	13° 48' 49"	0° 56' 48"	15' 28.65"	288° 50' 59"	0.18379
10	149° 03' 20"	1° 54' 03"	151° 52' 03"	13° 34' 58"	0° 56' 46"	15' 28.09"	289° 0' 54"	0.18718
11	149° 35' 45"	1° 51' 23"	152° 22' 16"	13° 21' 05"	0° 56' 44"	15' 27.54"	289° 10' 37"	0.19059
12	150° 08' 07"	1° 48' 43"	152° 52' 24"	13° 07' 09"	0° 56' 42"	15' 26.98"	289° 20' 07"	0.19403
13	150° 40' 27"	1° 46' 03"	153° 22' 25"	12° 53' 11"	0° 56' 40"	15' 26.43"	289° 29' 24"	0.19748
14	151° 12' 44"	1° 43' 22"	153° 52' 21"	12° 39' 11"	0° 56' 38"	15' 25.88"	289° 38' 30"	0.20095
15	151° 44' 58"	1° 40' 41"	154° 22' 12"	12° 25' 08"	0° 56' 36"	15' 25.33"	289° 47' 23"	0.20444
16	152° 17' 10"	1° 37' 60"	154° 51' 57"	12° 11' 03"	0° 56' 34"	15' 24.79"	289° 56' 04"	0.20794
17	152° 49' 20"	1° 35' 18"	155° 21' 37"	11° 56' 56"	0° 56' 32"	15' 24.24"	290° 4' 34"	0.21146
18	153° 21' 27"	1° 32' 36"	155° 51' 11"	11° 42' 47"	0° 56' 30"	15' 23.70"	290° 12' 52"	0.21500
19	153° 53' 32"	1° 29' 54"	156° 20' 40"	11° 28' 36"	0° 56' 28"	15' 23.16"	290° 20' 58"	0.21856
20	154° 25' 34"	1° 27' 11"	156° 50' 04"	11° 14' 23"	0° 56' 26"	15' 22.63"	290° 28' 53"	0.22213
21	154° 57' 33"	1° 24' 28"	157° 19' 23"	11° 00' 08"	0° 56' 24"	15' 22.09"	290° 36' 37"	0.22572
22	155° 29' 30"	1° 21' 45"	157° 48' 37"	10° 45' 52"	0° 56' 22"	15' 21.56"	290° 44' 09"	0.22933
23	156° 01' 25"	1° 19' 02"	158° 17' 46"	10° 31' 34"	0° 56' 20"	15' 21.03"	290° 51' 31"	0.23295
24	156° 33' 18"	1° 16' 18"	158° 46' 50"	10° 17' 14"	0° 56' 18"	15' 20.50"	290° 58' 41"	0.23658

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	98° 29' 05"	-0.09"	99° 13' 48"	23° 10' 01"	1.0166087	15'43.95"	23° 26' 18"	-3 m 39 s
1	98° 31' 28"	-0.10"	99° 16' 23"	23° 09' 52"	1.0166095	15'43.95"	23° 26' 18"	-3 m 40 s
2	98° 33' 51"	-0.10"	99° 18' 58"	23° 09' 43"	1.0166103	15'43.95"	23° 26' 18"	-3 m 40 s
3	98° 36' 14"	-0.11"	99° 21' 34"	23° 09' 34"	1.0166111	15'43.95"	23° 26' 18"	-3 m 41 s
4	98° 38' 37"	-0.11"	99° 24' 09"	23° 09' 24"	1.0166118	15'43.95"	23° 26' 18"	-3 m 41 s
5	98° 41' 01"	-0.12"	99° 26' 44"	23° 09' 15"	1.0166126	15'43.95"	23° 26' 18"	-3 m 42 s
6	98° 43' 24"	-0.12"	99° 29' 20"	23° 09' 06"	1.0166133	15'43.95"	23° 26' 18"	-3 m 42 s
7	98° 45' 47"	-0.13"	99° 31' 55"	23° 08' 56"	1.0166141	15'43.95"	23° 26' 18"	-3 m 43 s
8	98° 48' 10"	-0.14"	99° 34' 30"	23° 08' 47"	1.0166148	15'43.95"	23° 26' 18"	-3 m 43 s
9	98° 50' 33"	-0.14"	99° 37' 05"	23° 08' 37"	1.0166155	15'43.95"	23° 26' 18"	-3 m 44 s
10	98° 52' 56"	-0.15"	99° 39' 41"	23° 08' 28"	1.0166162	15'43.95"	23° 26' 18"	-3 m 44 s
11	98° 55' 19"	-0.15"	99° 42' 16"	23° 08' 18"	1.0166169	15'43.94"	23° 26' 18"	-3 m 45 s
12	98° 57' 42"	-0.16"	99° 44' 51"	23° 08' 09"	1.0166176	15'43.94"	23° 26' 18"	-3 m 45 s
13	99° 00' 05"	-0.16"	99° 47' 26"	23° 07' 59"	1.0166183	15'43.94"	23° 26' 18"	-3 m 46 s
14	99° 02' 28"	-0.17"	99° 50' 01"	23° 07' 49"	1.0166190	15'43.94"	23° 26' 18"	-3 m 46 s
15	99° 04' 51"	-0.17"	99° 52' 37"	23° 07' 40"	1.0166196	15'43.94"	23° 26' 18"	-3 m 47 s
16	99° 07' 14"	-0.18"	99° 55' 12"	23° 07' 30"	1.0166203	15'43.94"	23° 26' 18"	-3 m 47 s
17	99° 09' 37"	-0.18"	99° 57' 47"	23° 07' 20"	1.0166209	15'43.94"	23° 26' 18"	-3 m 48 s
18	99° 12' 00"	-0.19"	100° 00' 22"	23° 07' 10"	1.0166215	15'43.94"	23° 26' 18"	-3 m 48 s
19	99° 14' 23"	-0.19"	100° 02' 57"	23° 07' 00"	1.0166222	15'43.94"	23° 26' 18"	-3 m 49 s
20	99° 16' 46"	-0.20"	100° 05' 33"	23° 06' 50"	1.0166228	15'43.94"	23° 26' 18"	-3 m 49 s
21	99° 19' 10"	-0.21"	100° 08' 08"	23° 06' 40"	1.0166234	15'43.94"	23° 26' 18"	-3 m 50 s
22	99° 21' 33"	-0.21"	100° 10' 43"	23° 06' 30"	1.0166240	15'43.94"	23° 26' 18"	-3 m 50 s
23	99° 23' 56"	-0.22"	100° 13' 18"	23° 06' 20"	1.0166246	15'43.94"	23° 26' 18"	-3 m 51 s
24	99° 26' 19"	-0.22"	100° 15' 53"	23° 06' 10"	1.0166251	15'43.94"	23° 26' 18"	-3 m 51 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	156° 33' 18"	1° 16' 18"	158° 46' 50"	10° 17' 14"	0° 56' 18"	15' 20.50"	290° 58' 41"	0.23658
1	157° 05' 08"	1° 13' 34"	159° 15' 49"	10° 02' 52"	0° 56' 16"	15' 19.98"	291° 5' 41"	0.24023
2	157° 36' 55"	1° 10' 50"	159° 44' 44"	9° 48' 29"	0° 56' 14"	15' 19.46"	291° 12' 30"	0.24389
3	158° 08' 40"	1° 08' 06"	160° 13' 34"	9° 34' 05"	0° 56' 12"	15' 18.94"	291° 19' 08"	0.24757
4	158° 40' 23"	1° 05' 22"	160° 42' 19"	9° 19' 39"	0° 56' 10"	15' 18.42"	291° 25' 36"	0.25126
5	159° 12' 04"	1° 02' 37"	161° 11' 00"	9° 05' 12"	0° 56' 08"	15' 17.91"	291° 31' 53"	0.25497
6	159° 43' 42"	0° 59' 53"	161° 39' 37"	8° 50' 44"	0° 56' 07"	15' 17.40"	291° 37' 60"	0.25869
7	160° 15' 18"	0° 57' 08"	162° 08' 10"	8° 36' 15"	0° 56' 05"	15' 16.89"	291° 43' 56"	0.26242
8	160° 46' 52"	0° 54' 23"	162° 36' 38"	8° 21' 44"	0° 56' 03"	15' 16.38"	291° 49' 43"	0.26616
9	161° 18' 23"	0° 51' 38"	163° 05' 02"	8° 07' 13"	0° 56' 01"	15' 15.88"	291° 55' 19"	0.26992
10	161° 49' 53"	0° 48' 53"	163° 33' 22"	7° 52' 40"	0° 55' 59"	15' 15.38"	292° 0' 46"	0.27369
11	162° 21' 20"	0° 46' 08"	164° 01' 39"	7° 38' 07"	0° 55' 57"	15' 14.89"	292° 6' 02"	0.27747
12	162° 52' 44"	0° 43' 23"	164° 29' 51"	7° 23' 33"	0° 55' 56"	15' 14.39"	292° 11' 09"	0.28126
13	163° 24' 07"	0° 40' 38"	164° 57' 60"	7° 08' 58"	0° 55' 54"	15' 13.90"	292° 16' 06"	0.28506
14	163° 55' 28"	0° 37' 52"	165° 26' 04"	6° 54' 22"	0° 55' 52"	15' 13.42"	292° 20' 53"	0.28887
15	164° 26' 46"	0° 35' 07"	165° 54' 06"	6° 39' 46"	0° 55' 50"	15' 12.94"	292° 25' 31"	0.29269
16	164° 58' 02"	0° 32' 22"	166° 22' 03"	6° 25' 09"	0° 55' 48"	15' 12.46"	292° 29' 59"	0.29653
17	165° 29' 16"	0° 29' 37"	166° 49' 57"	6° 10' 32"	0° 55' 47"	15' 11.98"	292° 34' 17"	0.30037
18	166° 00' 28"	0° 26' 52"	167° 17' 48"	5° 55' 54"	0° 55' 45"	15' 11.51"	292° 38' 27"	0.30422
19	166° 31' 38"	0° 24' 06"	167° 45' 36"	5° 41' 15"	0° 55' 43"	15' 11.04"	292° 42' 27"	0.30808
20	167° 02' 46"	0° 21' 21"	168° 13' 20"	5° 26' 36"	0° 55' 42"	15' 10.57"	292° 46' 17"	0.31195
21	167° 33' 52"	0° 18' 36"	168° 41' 01"	5° 11' 57"	0° 55' 40"	15' 10.11"	292° 49' 59"	0.31583
22	168° 04' 56"	0° 15' 51"	169° 08' 39"	4° 57' 18"	0° 55' 38"	15' 09.65"	292° 53' 31"	0.31972
23	168° 35' 58"	0° 13' 06"	169° 36' 15"	4° 42' 38"	0° 55' 37"	15' 09.20"	292° 56' 54"	0.32362
24	169° 06' 58"	0° 10' 22"	170° 03' 47"	4° 27' 58"	0° 55' 35"	15' 08.75"	293° 0' 09"	0.32752

1 Juli 2025

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	99° 26' 19"	-0.22"	100° 15' 53"	23° 06' 10"	1.0166251	15'43.94"	23° 26' 18"	-3 m 51 s
1	99° 28' 42"	-0.23"	100° 18' 28"	23° 05' 60"	1.0166257	15'43.94"	23° 26' 18"	-3 m 52 s
2	99° 31' 05"	-0.23"	100° 21' 03"	23° 05' 50"	1.0166263	15'43.94"	23° 26' 18"	-3 m 52 s
3	99° 33' 28"	-0.24"	100° 23' 39"	23° 05' 39"	1.0166268	15'43.94"	23° 26' 18"	-3 m 53 s
4	99° 35' 51"	-0.24"	100° 26' 14"	23° 05' 29"	1.0166274	15'43.93"	23° 26' 18"	-3 m 53 s
5	99° 38' 14"	-0.25"	100° 28' 49"	23° 05' 19"	1.0166279	15'43.93"	23° 26' 18"	-3 m 54 s
6	99° 40' 37"	-0.25"	100° 31' 24"	23° 05' 08"	1.0166284	15'43.93"	23° 26' 18"	-3 m 54 s
7	99° 43' 00"	-0.26"	100° 33' 59"	23° 04' 58"	1.0166289	15'43.93"	23° 26' 18"	-3 m 54 s
8	99° 45' 23"	-0.27"	100° 36' 34"	23° 04' 48"	1.0166295	15'43.93"	23° 26' 18"	-3 m 55 s
9	99° 47' 46"	-0.27"	100° 39' 09"	23° 04' 37"	1.0166299	15'43.93"	23° 26' 18"	-3 m 55 s
10	99° 50' 09"	-0.28"	100° 41' 44"	23° 04' 26"	1.0166304	15'43.93"	23° 26' 18"	-3 m 56 s
11	99° 52' 32"	-0.28"	100° 44' 19"	23° 04' 16"	1.0166309	15'43.93"	23° 26' 18"	-3 m 56 s
12	99° 54' 55"	-0.29"	100° 46' 54"	23° 04' 05"	1.0166314	15'43.93"	23° 26' 18"	-3 m 57 s
13	99° 57' 18"	-0.29"	100° 49' 29"	23° 03' 55"	1.0166318	15'43.93"	23° 26' 18"	-3 m 57 s
14	99° 59' 41"	-0.30"	100° 52' 04"	23° 03' 44"	1.0166323	15'43.93"	23° 26' 18"	-3 m 58 s
15	100° 02' 04"	-0.30"	100° 54' 39"	23° 03' 33"	1.0166327	15'43.93"	23° 26' 18"	-3 m 58 s
16	100° 04' 28"	-0.31"	100° 57' 14"	23° 03' 22"	1.0166332	15'43.93"	23° 26' 18"	-3 m 59 s
17	100° 06' 51"	-0.31"	100° 59' 49"	23° 03' 12"	1.0166336	15'43.93"	23° 26' 18"	-3 m 59 s
18	100° 09' 14"	-0.32"	101° 02' 24"	23° 03' 01"	1.0166340	15'43.93"	23° 26' 18"	-3 m 60 s
19	100° 11' 37"	-0.33"	101° 04' 59"	23° 02' 50"	1.0166344	15'43.93"	23° 26' 18"	-4 m 00 s
20	100° 13' 60"	-0.33"	101° 07' 34"	23° 02' 39"	1.0166348	15'43.93"	23° 26' 18"	-4 m 01 s
21	100° 16' 23"	-0.34"	101° 10' 09"	23° 02' 28"	1.0166352	15'43.93"	23° 26' 18"	-4 m 01 s
22	100° 18' 46"	-0.34"	101° 12' 44"	23° 02' 17"	1.0166356	15'43.93"	23° 26' 18"	-4 m 02 s
23	100° 21' 09"	-0.35"	101° 15' 19"	23° 02' 06"	1.0166360	15'43.93"	23° 26' 18"	-4 m 02 s
24	100° 23' 32"	-0.35"	101° 17' 54"	23° 01' 54"	1.0166364	15'43.93"	23° 26' 18"	-4 m 03 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	169° 06' 58"	0° 10' 22"	170° 03' 47"	4° 27' 58"	0° 55' 35"	15' 08.75"	293° 0' 09"	0.32752
1	169° 37' 56"	0° 07' 37"	170° 31' 16"	4° 13' 18"	0° 55' 33"	15' 08.30"	293° 3' 14"	0.33143
2	170° 08' 52"	0° 04' 52"	170° 58' 43"	3° 58' 38"	0° 55' 32"	15' 07.85"	293° 6' 11"	0.33535
3	170° 39' 46"	0° 02' 08"	171° 26' 07"	3° 43' 58"	0° 55' 30"	15' 07.41"	293° 8' 58"	0.33927
4	171° 10' 38"	0° 00'-36"	171° 53' 28"	3° 29' 18"	0° 55' 28"	15' 06.98"	293° 11' 37"	0.34321
5	171° 41' 29"	0° -3' 20"	172° 20' 47"	3° 14' 38"	0° 55' 27"	15' 06.55"	293° 14' 07"	0.34714
6	172° 12' 17"	0° -6' 04"	172° 48' 04"	2° 59' 59"	0° 55' 25"	15' 06.12"	293° 16' 28"	0.35109
7	172° 43' 04"	0° -8' 48"	173° 15' 18"	2° 45' 19"	0° 55' 24"	15' 05.69"	293° 18' 41"	0.35504
8	173° 13' 49"	0°-11' 32"	173° 42' 30"	2° 30' 40"	0° 55' 22"	15' 05.27"	293° 20' 45"	0.35900
9	173° 44' 32"	0°-14' 15"	174° 09' 39"	2° 16' 01"	0° 55' 21"	15' 04.86"	293° 22' 41"	0.36296
10	174° 15' 13"	0°-16' 58"	174° 36' 47"	2° 01' 22"	0° 55' 19"	15' 04.44"	293° 24' 28"	0.36693
11	174° 45' 53"	0°-19' 41"	175° 03' 52"	1° 46' 44"	0° 55' 18"	15' 04.04"	293° 26' 07"	0.37090
12	175° 16' 31"	0°-22' 24"	175° 30' 56"	1° 32' 06"	0° 55' 16"	15' 03.63"	293° 27' 37"	0.37487
13	175° 47' 07"	0°-25' 06"	175° 57' 57"	1° 17' 28"	0° 55' 15"	15' 03.23"	293° 28' 59"	0.37885
14	176° 17' 42"	0°-27' 48"	176° 24' 57"	1° 02' 51"	0° 55' 13"	15' 02.84"	293° 30' 13"	0.38284
15	176° 48' 15"	0°-30' 30"	176° 51' 55"	0° 48' 15"	0° 55' 12"	15' 02.45"	293° 31' 18"	0.38683
16	177° 18' 46"	0°-33' 12"	177° 18' 52"	0° 33' 39"	0° 55' 10"	15' 02.06"	293° 32' 15"	0.39082
17	177° 49' 16"	0°-35' 53"	177° 45' 47"	0° 19' 04"	0° 55' 09"	15' 01.68"	293° 33' 04"	0.39482
18	178° 19' 44"	0°-38' 34"	178° 12' 40"	0° 04' 29"	0° 55' 08"	15' 01.30"	293° 33' 44"	0.39882
19	178° 50' 11"	0°-41' 15"	178° 39' 32"	0°-10' 04"	0° 55' 06"	15' 00.92"	293° 34' 17"	0.40282
20	179° 20' 36"	0°-43' 55"	179° 06' 23"	0°-24' 37"	0° 55' 05"	15' 00.55"	293° 34' 41"	0.40683
21	179° 50' 59"	0°-46' 35"	179° 33' 12"	0°-39' 09"	0° 55' 03"	15' 00.19"	293° 34' 57"	0.41083
22	180° 21' 21"	0°-49' 15"	180° 00' 00"	0°-53' 40"	0° 55' 02"	14' 59.82"	293° 35' 05"	0.41484
23	180° 51' 42"	0°-51' 54"	180° 26' 47"	-1° 08' 11"	0° 55' 01"	14' 59.47"	293° 35' 06"	0.41886
24	181° 22' 01"	0°-54' 33"	180° 53' 33"	-1° 22' 40"	0° 54' 60"	14' 59.11"	293° 34' 58"	0.42287

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	100° 23' 32"	-0.35"	101° 17' 54"	23° 01' 54"	1.0166364	15'43.93"	23° 26' 18"	-4 m 03 s
1	100° 25' 55"	-0.36"	101° 20' 29"	23° 01' 43"	1.0166367	15'43.93"	23° 26' 18"	-4 m 03 s
2	100° 28' 18"	-0.36"	101° 23' 04"	23° 01' 32"	1.0166371	15'43.93"	23° 26' 18"	-4 m 04 s
3	100° 30' 41"	-0.37"	101° 25' 39"	23° 01' 21"	1.0166374	15'43.93"	23° 26' 18"	-4 m 04 s
4	100° 33' 04"	-0.38"	101° 28' 14"	23° 01' 10"	1.0166377	15'43.93"	23° 26' 18"	-4 m 04 s
5	100° 35' 27"	-0.38"	101° 30' 49"	23° 00' 58"	1.0166381	15'43.92"	23° 26' 18"	-4 m 05 s
6	100° 37' 50"	-0.39"	101° 33' 24"	23° 00' 47"	1.0166384	15'43.92"	23° 26' 18"	-4 m 05 s
7	100° 40' 13"	-0.39"	101° 35' 59"	23° 00' 35"	1.0166387	15'43.92"	23° 26' 18"	-4 m 06 s
8	100° 42' 36"	-0.40"	101° 38' 34"	23° 00' 24"	1.0166390	15'43.92"	23° 26' 18"	-4 m 06 s
9	100° 44' 59"	-0.40"	101° 41' 09"	23° 00' 12"	1.0166393	15'43.92"	23° 26' 18"	-4 m 07 s
10	100° 47' 22"	-0.41"	101° 43' 43"	23° 00' 01"	1.0166396	15'43.92"	23° 26' 18"	-4 m 07 s
11	100° 49' 45"	-0.41"	101° 46' 18"	22° 59' 49"	1.0166398	15'43.92"	23° 26' 18"	-4 m 08 s
12	100° 52' 08"	-0.42"	101° 48' 53"	22° 59' 38"	1.0166401	15'43.92"	23° 26' 18"	-4 m 08 s
13	100° 54' 31"	-0.42"	101° 51' 28"	22° 59' 26"	1.0166404	15'43.92"	23° 26' 18"	-4 m 09 s
14	100° 56' 54"	-0.43"	101° 54' 03"	22° 59' 14"	1.0166406	15'43.92"	23° 26' 18"	-4 m 09 s
15	100° 59' 17"	-0.43"	101° 56' 38"	22° 59' 02"	1.0166408	15'43.92"	23° 26' 18"	-4 m 10 s
16	101° 01' 40"	-0.44"	101° 59' 13"	22° 58' 51"	1.0166411	15'43.92"	23° 26' 18"	-4 m 10 s
17	101° 04' 04"	-0.45"	102° 01' 47"	22° 58' 39"	1.0166413	15'43.92"	23° 26' 18"	-4 m 11 s
18	101° 06' 27"	-0.45"	102° 04' 22"	22° 58' 27"	1.0166415	15'43.92"	23° 26' 18"	-4 m 11 s
19	101° 08' 50"	-0.46"	102° 06' 57"	22° 58' 15"	1.0166417	15'43.92"	23° 26' 18"	-4 m 11 s
20	101° 11' 13"	-0.46"	102° 09' 32"	22° 58' 03"	1.0166419	15'43.92"	23° 26' 18"	-4 m 12 s
21	101° 13' 36"	-0.47"	102° 12' 07"	22° 57' 51"	1.0166421	15'43.92"	23° 26' 18"	-4 m 12 s
22	101° 15' 59"	-0.47"	102° 14' 41"	22° 57' 39"	1.0166423	15'43.92"	23° 26' 18"	-4 m 13 s
23	101° 18' 22"	-0.48"	102° 17' 16"	22° 57' 27"	1.0166425	15'43.92"	23° 26' 18"	-4 m 13 s
24	101° 20' 45"	-0.48"	102° 19' 51"	22° 57' 15"	1.0166426	15'43.92"	23° 26' 18"	-4 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	181° 22' 01"	0°-54' 33"	180° 53' 33"	-1° 22' 40"	0° 54' 60"	14' 59.11"	293° 34' 58"	0.42287
1	181° 52' 19"	0°-57' 11"	181° 20' 18"	-1° 37' 09"	0° 54' 58"	14' 58.77"	293° 34' 42"	0.42689
2	182° 22' 35"	0°-59' 50"	181° 47' 03"	-1° 51' 36"	0° 54' 57"	14' 58.42"	293° 34' 18"	0.43090
3	182° 52' 50"	-1° 02' 27"	182° 13' 46"	-2° 06' 02"	0° 54' 56"	14' 58.08"	293° 33' 47"	0.43492
4	183° 23' 04"	-1° 05' 05"	182° 40' 29"	-2° 20' 27"	0° 54' 54"	14' 57.75"	293° 33' 07"	0.43894
5	183° 53' 16"	-1° 07' 42"	183° 07' 10"	-2° 34' 51"	0° 54' 53"	14' 57.42"	293° 32' 20"	0.44296
6	184° 23' 27"	-1° 10' 18"	183° 33' 52"	-2° 49' 14"	0° 54' 52"	14' 57.09"	293° 31' 24"	0.44698
7	184° 53' 37"	-1° 12' 54"	184° 00' 33"	-3° 03' 35"	0° 54' 51"	14' 56.77"	293° 30' 21"	0.45100
8	185° 23' 45"	-1° 15' 30"	184° 27' 13"	-3° 17' 56"	0° 54' 50"	14' 56.46"	293° 29' 10"	0.45502
9	185° 53' 53"	-1° 18' 05"	184° 53' 53"	-3° 32' 15"	0° 54' 49"	14' 56.14"	293° 27' 52"	0.45904
10	186° 23' 59"	-1° 20' 40"	185° 20' 33"	-3° 46' 32"	0° 54' 47"	14' 55.84"	293° 26' 25"	0.46306
11	186° 54' 03"	-1° 23' 14"	185° 47' 12"	-4° 00' 48"	0° 54' 46"	14' 55.53"	293° 24' 51"	0.46707
12	187° 24' 07"	-1° 25' 48"	186° 13' 51"	-4° 15' 03"	0° 54' 45"	14' 55.24"	293° 23' 09"	0.47109
13	187° 54' 10"	-1° 28' 21"	186° 40' 30"	-4° 29' 16"	0° 54' 44"	14' 54.94"	293° 21' 19"	0.47511
14	188° 24' 11"	-1° 30' 54"	187° 07' 10"	-4° 43' 28"	0° 54' 43"	14' 54.65"	293° 19' 22"	0.47912
15	188° 54' 11"	-1° 33' 26"	187° 33' 49"	-4° 57' 38"	0° 54' 42"	14' 54.37"	293° 17' 17"	0.48314
16	189° 24' 10"	-1° 35' 58"	188° 00' 28"	-5° 11' 46"	0° 54' 41"	14' 54.09"	293° 15' 04"	0.48715
17	189° 54' 09"	-1° 38' 29"	188° 27' 08"	-5° 25' 53"	0° 54' 40"	14' 53.82"	293° 12' 43"	0.49116
18	190° 24' 06"	-1° 40' 60"	188° 53' 47"	-5° 39' 58"	0° 54' 39"	14' 53.55"	293° 10' 15"	0.49516
19	190° 54' 02"	-1° 43' 30"	189° 20' 28"	-5° 54' 02"	0° 54' 38"	14' 53.28"	293° 7' 40"	0.49917
20	191° 23' 57"	-1° 45' 59"	189° 47' 08"	-6° 08' 03"	0° 54' 37"	14' 53.02"	293° 4' 56"	0.50317
21	191° 53' 51"	-1° 48' 28"	190° 13' 49"	-6° 22' 03"	0° 54' 36"	14' 52.77"	293° 2' 05"	0.50717
22	192° 23' 45"	-1° 50' 57"	190° 40' 31"	-6° 36' 01"	0° 54' 35"	14' 52.52"	292° 59' 06"	0.51117
23	192° 53' 37"	-1° 53' 24"	191° 07' 13"	-6° 49' 58"	0° 54' 34"	14' 52.27"	292° 56' 00"	0.51516
24	193° 23' 28"	-1° 55' 52"	191° 33' 56"	-7° 03' 52"	0° 54' 33"	14' 52.03"	292° 52' 46"	0.51915

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	101° 20' 45"	-0.48"	102° 19' 51"	22° 57' 15"	1.0166426	15'43.92"	23° 26' 18"	-4 m 14 s
1	101° 23' 08"	-0.49"	102° 22' 26"	22° 57' 03"	1.0166428	15'43.92"	23° 26' 18"	-4 m 14 s
2	101° 25' 31"	-0.49"	102° 25' 00"	22° 56' 50"	1.0166429	15'43.92"	23° 26' 18"	-4 m 15 s
3	101° 27' 54"	-0.50"	102° 27' 35"	22° 56' 38"	1.0166431	15'43.92"	23° 26' 18"	-4 m 15 s
4	101° 30' 17"	-0.50"	102° 30' 10"	22° 56' 26"	1.0166432	15'43.92"	23° 26' 18"	-4 m 16 s
5	101° 32' 40"	-0.51"	102° 32' 45"	22° 56' 13"	1.0166433	15'43.92"	23° 26' 18"	-4 m 16 s
6	101° 35' 03"	-0.51"	102° 35' 19"	22° 56' 01"	1.0166434	15'43.92"	23° 26' 18"	-4 m 17 s
7	101° 37' 26"	-0.52"	102° 37' 54"	22° 55' 49"	1.0166436	15'43.92"	23° 26' 18"	-4 m 17 s
8	101° 39' 49"	-0.52"	102° 40' 29"	22° 55' 36"	1.0166437	15'43.92"	23° 26' 18"	-4 m 17 s
9	101° 42' 12"	-0.53"	102° 43' 03"	22° 55' 24"	1.0166437	15'43.92"	23° 26' 18"	-4 m 18 s
10	101° 44' 35"	-0.53"	102° 45' 38"	22° 55' 11"	1.0166438	15'43.92"	23° 26' 18"	-4 m 18 s
11	101° 46' 58"	-0.54"	102° 48' 13"	22° 54' 59"	1.0166439	15'43.92"	23° 26' 18"	-4 m 19 s
12	101° 49' 21"	-0.54"	102° 50' 47"	22° 54' 46"	1.0166440	15'43.92"	23° 26' 18"	-4 m 19 s
13	101° 51' 44"	-0.55"	102° 53' 22"	22° 54' 33"	1.0166440	15'43.92"	23° 26' 18"	-4 m 20 s
14	101° 54' 07"	-0.55"	102° 55' 57"	22° 54' 21"	1.0166441	15'43.92"	23° 26' 18"	-4 m 20 s
15	101° 56' 30"	-0.56"	102° 58' 31"	22° 54' 08"	1.0166441	15'43.92"	23° 26' 18"	-4 m 21 s
16	101° 58' 53"	-0.56"	103° 01' 06"	22° 53' 55"	1.0166442	15'43.92"	23° 26' 18"	-4 m 21 s
17	102° 01' 16"	-0.57"	103° 03' 41"	22° 53' 42"	1.0166442	15'43.92"	23° 26' 18"	-4 m 22 s
18	102° 03' 39"	-0.57"	103° 06' 15"	22° 53' 29"	1.0166442	15'43.92"	23° 26' 18"	-4 m 22 s
19	102° 06' 02"	-0.58"	103° 08' 50"	22° 53' 16"	1.0166442	15'43.92"	23° 26' 18"	-4 m 22 s
20	102° 08' 25"	-0.58"	103° 11' 24"	22° 53' 03"	1.0166442	15'43.92"	23° 26' 18"	-4 m 23 s
21	102° 10' 48"	-0.59"	103° 13' 59"	22° 52' 50"	1.0166442	15'43.92"	23° 26' 18"	-4 m 23 s
22	102° 13' 11"	-0.59"	103° 16' 34"	22° 52' 37"	1.0166442	15'43.92"	23° 26' 18"	-4 m 24 s
23	102° 15' 34"	-0.60"	103° 19' 08"	22° 52' 24"	1.0166442	15'43.92"	23° 26' 18"	-4 m 24 s
24	102° 17' 57"	-0.60"	103° 21' 43"	22° 52' 11"	1.0166442	15'43.92"	23° 26' 18"	-4 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	193° 23' 28"	-1° 55' 52"	191° 33' 56"	-7° 03' 52"	0° 54' 33"	14' 52.03"	292° 52' 46"	0.51915
1	193° 53' 19"	-1° 58' 18"	192° 00' 39"	-7° 17' 44"	0° 54' 33"	14' 51.79"	292° 49' 25"	0.52314
2	194° 23' 09"	-2° 00' 44"	192° 27' 24"	-7° 31' 34"	0° 54' 32"	14' 51.56"	292° 45' 56"	0.52712
3	194° 52' 58"	-2° 03' 10"	192° 54' 09"	-7° 45' 22"	0° 54' 31"	14' 51.33"	292° 42' 19"	0.53110
4	195° 22' 46"	-2° 05' 34"	193° 20' 56"	-7° 59' 09"	0° 54' 30"	14' 51.11"	292° 38' 35"	0.53508
5	195° 52' 33"	-2° 07' 58"	193° 47' 43"	-8° 12' 53"	0° 54' 29"	14' 50.89"	292° 34' 43"	0.53905
6	196° 22' 20"	-2° 10' 22"	194° 14' 31"	-8° 26' 34"	0° 54' 29"	14' 50.68"	292° 30' 43"	0.54301
7	196° 52' 06"	-2° 12' 45"	194° 41' 21"	-8° 40' 14"	0° 54' 28"	14' 50.47"	292° 26' 36"	0.54697
8	197° 21' 51"	-2° 15' 07"	195° 08' 12"	-8° 53' 51"	0° 54' 27"	14' 50.27"	292° 22' 22"	0.55093
9	197° 51' 36"	-2° 17' 28"	195° 35' 04"	-9° 07' 27"	0° 54' 26"	14' 50.07"	292° 17' 59"	0.55488
10	198° 21' 20"	-2° 19' 49"	196° 01' 57"	-9° 20' 59"	0° 54' 26"	14' 49.88"	292° 13' 30"	0.55883
11	198° 51' 03"	-2° 22' 09"	196° 28' 52"	-9° 34' 30"	0° 54' 25"	14' 49.69"	292° 8' 52"	0.56277
12	199° 20' 46"	-2° 24' 29"	196° 55' 49"	-9° 47' 58"	0° 54' 24"	14' 49.51"	292° 4' 07"	0.56670
13	199° 50' 28"	-2° 26' 47"	197° 22' 47"	-10° 01' 23"	0° 54' 24"	14' 49.33"	291° 59' 15"	0.57063
14	200° 20' 09"	-2° 29' 05"	197° 49' 46"	-10° 14' 47"	0° 54' 23"	14' 49.15"	291° 54' 14"	0.57455
15	200° 49' 50"	-2° 31' 23"	198° 16' 48"	-10° 28' 07"	0° 54' 22"	14' 48.98"	291° 49' 06"	0.57847
16	201° 19' 31"	-2° 33' 39"	198° 43' 51"	-10° 41' 25"	0° 54' 22"	14' 48.82"	291° 43' 51"	0.58237
17	201° 49' 11"	-2° 35' 55"	199° 10' 56"	-10° 54' 41"	0° 54' 21"	14' 48.66"	291° 38' 28"	0.58628
18	202° 18' 50"	-2° 38' 10"	199° 38' 03"	-11° 07' 53"	0° 54' 21"	14' 48.50"	291° 32' 57"	0.59017
19	202° 48' 29"	-2° 40' 25"	200° 05' 11"	-11° 21' 03"	0° 54' 20"	14' 48.35"	291° 27' 19"	0.59406
20	203° 18' 08"	-2° 42' 38"	200° 32' 22"	-11° 34' 11"	0° 54' 19"	14' 48.21"	291° 21' 33"	0.59794
21	203° 47' 46"	-2° 44' 51"	200° 59' 35"	-11° 47' 15"	0° 54' 19"	14' 48.07"	291° 15' 39"	0.60182
22	204° 17' 24"	-2° 47' 03"	201° 26' 50"	-12° 00' 17"	0° 54' 18"	14' 47.93"	291° 9' 38"	0.60568
23	204° 47' 01"	-2° 49' 14"	201° 54' 07"	-12° 13' 16"	0° 54' 18"	14' 47.80"	291° 3' 29"	0.60954
24	205° 16' 38"	-2° 51' 25"	202° 21' 26"	-12° 26' 12"	0° 54' 18"	14' 47.68"	290° 57' 13"	0.61339

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	102° 17' 57"	-0.60"	103° 21' 43"	22° 52' 11"	1.0166442	15'43.92"	23° 26' 18"	-4 m 25 s
1	102° 20' 20"	-0.61"	103° 24' 17"	22° 51' 58"	1.0166441	15'43.92"	23° 26' 18"	-4 m 25 s
2	102° 22' 43"	-0.61"	103° 26' 52"	22° 51' 45"	1.0166441	15'43.92"	23° 26' 18"	-4 m 26 s
3	102° 25' 06"	-0.62"	103° 29' 26"	22° 51' 31"	1.0166441	15'43.92"	23° 26' 18"	-4 m 26 s
4	102° 27' 29"	-0.62"	103° 32' 01"	22° 51' 18"	1.0166440	15'43.92"	23° 26' 18"	-4 m 26 s
5	102° 29' 52"	-0.63"	103° 34' 35"	22° 51' 05"	1.0166439	15'43.92"	23° 26' 18"	-4 m 27 s
6	102° 32' 15"	-0.63"	103° 37' 10"	22° 50' 51"	1.0166439	15'43.92"	23° 26' 18"	-4 m 27 s
7	102° 34' 38"	-0.63"	103° 39' 44"	22° 50' 38"	1.0166438	15'43.92"	23° 26' 18"	-4 m 28 s
8	102° 37' 01"	-0.64"	103° 42' 19"	22° 50' 25"	1.0166437	15'43.92"	23° 26' 18"	-4 m 28 s
9	102° 39' 24"	-0.64"	103° 44' 53"	22° 50' 11"	1.0166436	15'43.92"	23° 26' 18"	-4 m 29 s
10	102° 41' 47"	-0.65"	103° 47' 28"	22° 49' 57"	1.0166435	15'43.92"	23° 26' 18"	-4 m 29 s
11	102° 44' 10"	-0.65"	103° 50' 02"	22° 49' 44"	1.0166434	15'43.92"	23° 26' 18"	-4 m 30 s
12	102° 46' 33"	-0.66"	103° 52' 37"	22° 49' 30"	1.0166433	15'43.92"	23° 26' 18"	-4 m 30 s
13	102° 48' 56"	-0.66"	103° 55' 11"	22° 49' 17"	1.0166431	15'43.92"	23° 26' 18"	-4 m 30 s
14	102° 51' 19"	-0.66"	103° 57' 46"	22° 49' 03"	1.0166430	15'43.92"	23° 26' 18"	-4 m 31 s
15	102° 53' 42"	-0.67"	104° 00' 20"	22° 48' 49"	1.0166429	15'43.92"	23° 26' 18"	-4 m 31 s
16	102° 56' 05"	-0.67"	104° 02' 55"	22° 48' 35"	1.0166427	15'43.92"	23° 26' 18"	-4 m 32 s
17	102° 58' 28"	-0.68"	104° 05' 29"	22° 48' 22"	1.0166426	15'43.92"	23° 26' 18"	-4 m 32 s
18	103° 00' 51"	-0.68"	104° 08' 03"	22° 48' 08"	1.0166424	15'43.92"	23° 26' 18"	-4 m 33 s
19	103° 03' 14"	-0.69"	104° 10' 38"	22° 47' 54"	1.0166422	15'43.92"	23° 26' 18"	-4 m 33 s
20	103° 05' 37"	-0.69"	104° 13' 12"	22° 47' 40"	1.0166420	15'43.92"	23° 26' 18"	-4 m 33 s
21	103° 08' 00"	-0.69"	104° 15' 46"	22° 47' 26"	1.0166419	15'43.92"	23° 26' 18"	-4 m 34 s
22	103° 10' 23"	-0.70"	104° 18' 21"	22° 47' 12"	1.0166417	15'43.92"	23° 26' 18"	-4 m 34 s
23	103° 12' 46"	-0.70"	104° 20' 55"	22° 46' 58"	1.0166415	15'43.92"	23° 26' 18"	-4 m 35 s
24	103° 15' 09"	-0.71"	104° 23' 30"	22° 46' 44"	1.0166413	15'43.92"	23° 26' 18"	-4 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	205° 16' 38"	-2° 51' 25"	202° 21' 26"	-12° 26' 12"	0° 54' 18"	14' 47.68"	290° 57' 13"	0.61339
1	205° 46' 15"	-2° 53' 34"	202° 48' 48"	-12° 39' 05"	0° 54' 17"	14' 47.56"	290° 50' 48"	0.61723
2	206° 15' 52"	-2° 55' 43"	203° 16' 12"	-12° 51' 56"	0° 54' 17"	14' 47.44"	290° 44' 16"	0.62107
3	206° 45' 28"	-2° 57' 51"	203° 43' 39"	-13° 04' 43"	0° 54' 16"	14' 47.33"	290° 37' 36"	0.62489
4	207° 15' 04"	-2° 59' 58"	204° 11' 08"	-13° 17' 27"	0° 54' 16"	14' 47.22"	290° 30' 49"	0.62871
5	207° 44' 40"	-3° 02' 05"	204° 38' 40"	-13° 30' 08"	0° 54' 15"	14' 47.12"	290° 23' 54"	0.63252
6	208° 14' 15"	-3° 04' 10"	205° 06' 14"	-13° 42' 45"	0° 54' 15"	14' 47.02"	290° 16' 51"	0.63631
7	208° 43' 51"	-3° 06' 15"	205° 33' 51"	-13° 55' 20"	0° 54' 15"	14' 46.93"	290° 9' 40"	0.64010
8	209° 13' 26"	-3° 08' 19"	206° 01' 31"	-14° 07' 51"	0° 54' 14"	14' 46.84"	290° 2' 22"	0.64388
9	209° 43' 01"	-3° 10' 22"	206° 29' 13"	-14° 20' 19"	0° 54' 14"	14' 46.76"	289° 54' 55"	0.64765
10	210° 12' 36"	-3° 12' 24"	206° 56' 59"	-14° 32' 44"	0° 54' 14"	14' 46.68"	289° 47' 21"	0.65141
11	210° 42' 11"	-3° 14' 25"	207° 24' 47"	-14° 45' 06"	0° 54' 14"	14' 46.60"	289° 39' 39"	0.65516
12	211° 11' 46"	-3° 16' 26"	207° 52' 38"	-14° 57' 24"	0° 54' 13"	14' 46.54"	289° 31' 49"	0.65890
13	211° 41' 20"	-3° 18' 25"	208° 20' 32"	-15° 09' 38"	0° 54' 13"	14' 46.47"	289° 23' 52"	0.66263
14	212° 10' 55"	-3° 20' 24"	208° 48' 30"	-15° 21' 49"	0° 54' 13"	14' 46.41"	289° 15' 46"	0.66635
15	212° 40' 30"	-3° 22' 21"	209° 16' 30"	-15° 33' 56"	0° 54' 13"	14' 46.36"	289° 7' 33"	0.67006
16	213° 10' 04"	-3° 24' 18"	209° 44' 34"	-15° 46' 00"	0° 54' 12"	14' 46.31"	288° 59' 11"	0.67376
17	213° 39' 39"	-3° 26' 14"	210° 12' 41"	-15° 58' 00"	0° 54' 12"	14' 46.26"	288° 50' 42"	0.67744
18	214° 09' 14"	-3° 28' 09"	210° 40' 51"	-16° 09' 57"	0° 54' 12"	14' 46.22"	288° 42' 05"	0.68112
19	214° 38' 48"	-3° 30' 03"	211° 09' 05"	-16° 21' 50"	0° 54' 12"	14' 46.18"	288° 33' 19"	0.68478
20	215° 08' 23"	-3° 31' 56"	211° 37' 22"	-16° 33' 39"	0° 54' 12"	14' 46.15"	288° 24' 26"	0.68843
21	215° 37' 58"	-3° 33' 48"	212° 05' 42"	-16° 45' 24"	0° 54' 12"	14' 46.12"	288° 15' 25"	0.69207
22	216° 07' 33"	-3° 35' 39"	212° 34' 06"	-16° 57' 05"	0° 54' 12"	14' 46.10"	288° 6' 16"	0.69570
23	216° 37' 09"	-3° 37' 29"	213° 02' 34"	-17° 08' 42"	0° 54' 12"	14' 46.08"	287° 56' 58"	0.69931
24	217° 06' 44"	-3° 39' 18"	213° 31' 05"	-17° 20' 16"	0° 54' 12"	14' 46.07"	287° 47' 33"	0.70292

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	103° 15' 09"	-0.71"	104° 23' 30"	22° 46' 44"	1.0166413	15'43.92"	23° 26' 18"	-4 m 35 s
1	103° 17' 32"	-0.71"	104° 26' 04"	22° 46' 29"	1.0166410	15'43.92"	23° 26' 18"	-4 m 36 s
2	103° 19' 55"	-0.71"	104° 28' 38"	22° 46' 15"	1.0166408	15'43.92"	23° 26' 18"	-4 m 36 s
3	103° 22' 18"	-0.72"	104° 31' 13"	22° 46' 01"	1.0166406	15'43.92"	23° 26' 18"	-4 m 37 s
4	103° 24' 41"	-0.72"	104° 33' 47"	22° 45' 47"	1.0166403	15'43.92"	23° 26' 18"	-4 m 37 s
5	103° 27' 04"	-0.72"	104° 36' 21"	22° 45' 32"	1.0166401	15'43.92"	23° 26' 18"	-4 m 37 s
6	103° 29' 27"	-0.73"	104° 38' 55"	22° 45' 18"	1.0166398	15'43.92"	23° 26' 18"	-4 m 38 s
7	103° 31' 50"	-0.73"	104° 41' 30"	22° 45' 04"	1.0166396	15'43.92"	23° 26' 18"	-4 m 38 s
8	103° 34' 13"	-0.74"	104° 44' 04"	22° 44' 49"	1.0166393	15'43.92"	23° 26' 18"	-4 m 39 s
9	103° 36' 36"	-0.74"	104° 46' 38"	22° 44' 35"	1.0166390	15'43.92"	23° 26' 18"	-4 m 39 s
10	103° 38' 59"	-0.74"	104° 49' 12"	22° 44' 20"	1.0166388	15'43.92"	23° 26' 18"	-4 m 40 s
11	103° 41' 22"	-0.75"	104° 51' 47"	22° 44' 05"	1.0166385	15'43.92"	23° 26' 18"	-4 m 40 s
12	103° 43' 45"	-0.75"	104° 54' 21"	22° 43' 51"	1.0166382	15'43.92"	23° 26' 18"	-4 m 40 s
13	103° 46' 08"	-0.75"	104° 56' 55"	22° 43' 36"	1.0166379	15'43.93"	23° 26' 18"	-4 m 41 s
14	103° 48' 31"	-0.76"	104° 59' 29"	22° 43' 21"	1.0166376	15'43.93"	23° 26' 18"	-4 m 41 s
15	103° 50' 54"	-0.76"	105° 02' 04"	22° 43' 07"	1.0166372	15'43.93"	23° 26' 18"	-4 m 42 s
16	103° 53' 17"	-0.76"	105° 04' 38"	22° 42' 52"	1.0166369	15'43.93"	23° 26' 18"	-4 m 42 s
17	103° 55' 40"	-0.77"	105° 07' 12"	22° 42' 37"	1.0166366	15'43.93"	23° 26' 18"	-4 m 42 s
18	103° 58' 03"	-0.77"	105° 09' 46"	22° 42' 22"	1.0166362	15'43.93"	23° 26' 18"	-4 m 43 s
19	104° 00' 26"	-0.77"	105° 12' 20"	22° 42' 07"	1.0166359	15'43.93"	23° 26' 18"	-4 m 43 s
20	104° 02' 49"	-0.78"	105° 14' 54"	22° 41' 52"	1.0166355	15'43.93"	23° 26' 18"	-4 m 44 s
21	104° 05' 12"	-0.78"	105° 17' 29"	22° 41' 37"	1.0166352	15'43.93"	23° 26' 18"	-4 m 44 s
22	104° 07' 35"	-0.78"	105° 20' 03"	22° 41' 22"	1.0166348	15'43.93"	23° 26' 18"	-4 m 45 s
23	104° 09' 58"	-0.78"	105° 22' 37"	22° 41' 07"	1.0166344	15'43.93"	23° 26' 18"	-4 m 45 s
24	104° 12' 21"	-0.79"	105° 25' 11"	22° 40' 52"	1.0166341	15'43.93"	23° 26' 18"	-4 m 45 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	217° 06' 44"	-3° 39' 18"	213° 31' 05"	-17° 20' 16"	0° 54' 12"	14' 46.07"	287° 47' 33"	0.70292
1	217° 36' 20"	-3° 41' 07"	213° 59' 39"	-17° 31' 45"	0° 54' 12"	14' 46.06"	287° 37' 59"	0.70651
2	218° 05' 56"	-3° 42' 54"	214° 28' 18"	-17° 43' 10"	0° 54' 12"	14' 46.06"	287° 28' 17"	0.71009
3	218° 35' 32"	-3° 44' 40"	214° 57' 00"	-17° 54' 31"	0° 54' 12"	14' 46.06"	287° 18' 27"	0.71365
4	219° 05' 08"	-3° 46' 25"	215° 25' 46"	-18° 05' 48"	0° 54' 12"	14' 46.06"	287° 8' 29"	0.71720
5	219° 34' 44"	-3° 48' 09"	215° 54' 36"	-18° 17' 01"	0° 54' 12"	14' 46.07"	286° 58' 23"	0.72074
6	220° 04' 21"	-3° 49' 53"	216° 23' 30"	-18° 28' 09"	0° 54' 12"	14' 46.08"	286° 48' 08"	0.72427
7	220° 33' 58"	-3° 51' 35"	216° 52' 27"	-18° 39' 13"	0° 54' 12"	14' 46.10"	286° 37' 45"	0.72778
8	221° 03' 36"	-3° 53' 16"	217° 21' 29"	-18° 50' 13"	0° 54' 12"	14' 46.12"	286° 27' 14"	0.73128
9	221° 33' 14"	-3° 54' 56"	217° 50' 35"	-19° 01' 08"	0° 54' 12"	14' 46.15"	286° 16' 35"	0.73476
10	222° 02' 52"	-3° 56' 35"	218° 19' 44"	-19° 11' 59"	0° 54' 12"	14' 46.18"	286° 5' 47"	0.73823
11	222° 32' 30"	-3° 58' 13"	218° 48' 58"	-19° 22' 45"	0° 54' 12"	14' 46.21"	285° 54' 50"	0.74168
12	223° 02' 09"	-3° 59' 50"	219° 18' 16"	-19° 33' 27"	0° 54' 12"	14' 46.25"	285° 43' 46"	0.74512
13	223° 31' 49"	-4° 01' 26"	219° 47' 38"	-19° 44' 04"	0° 54' 12"	14' 46.30"	285° 32' 33"	0.74855
14	224° 01' 28"	-4° 03' 01"	220° 17' 05"	-19° 54' 36"	0° 54' 13"	14' 46.35"	285° 21' 11"	0.75196
15	224° 31' 09"	-4° 04' 35"	220° 46' 35"	-20° 05' 04"	0° 54' 13"	14' 46.40"	285° 9' 41"	0.75535
16	225° 00' 49"	-4° 06' 07"	221° 16' 10"	-20° 15' 27"	0° 54' 13"	14' 46.46"	284° 58' 02"	0.75873
17	225° 30' 31"	-4° 07' 39"	221° 45' 49"	-20° 25' 44"	0° 54' 13"	14' 46.52"	284° 46' 15"	0.76210
18	226° 00' 12"	-4° 09' 10"	222° 15' 33"	-20° 35' 57"	0° 54' 14"	14' 46.58"	284° 34' 19"	0.76545
19	226° 29' 55"	-4° 10' 39"	222° 45' 21"	-20° 46' 05"	0° 54' 14"	14' 46.65"	284° 22' 15"	0.76878
20	226° 59' 37"	-4° 12' 07"	223° 15' 13"	-20° 56' 08"	0° 54' 14"	14' 46.73"	284° 10' 02"	0.77210
21	227° 29' 21"	-4° 13' 34"	223° 45' 10"	-21° 06' 06"	0° 54' 14"	14' 46.80"	283° 57' 40"	0.77540
22	227° 59' 04"	-4° 15' 00"	224° 15' 11"	-21° 15' 59"	0° 54' 15"	14' 46.89"	283° 45' 09"	0.77868
23	228° 28' 49"	-4° 16' 25"	224° 45' 17"	-21° 25' 47"	0° 54' 15"	14' 46.97"	283° 32' 30"	0.78195
24	228° 58' 34"	-4° 17' 49"	225° 15' 27"	-21° 35' 29"	0° 54' 15"	14' 47.06"	283° 19' 42"	0.78520

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	104° 12' 21"	-0.79"	105° 25' 11"	22° 40' 52"	1.0166341	15'43.93"	23° 26' 18"	-4 m 45 s
1	104° 14' 44"	-0.79"	105° 27' 45"	22° 40' 37"	1.0166337	15'43.93"	23° 26' 18"	-4 m 46 s
2	104° 17' 07"	-0.79"	105° 30' 19"	22° 40' 22"	1.0166333	15'43.93"	23° 26' 18"	-4 m 46 s
3	104° 19' 30"	-0.80"	105° 32' 53"	22° 40' 07"	1.0166329	15'43.93"	23° 26' 18"	-4 m 47 s
4	104° 21' 53"	-0.80"	105° 35' 27"	22° 39' 51"	1.0166325	15'43.93"	23° 26' 18"	-4 m 47 s
5	104° 24' 16"	-0.80"	105° 38' 01"	22° 39' 36"	1.0166320	15'43.93"	23° 26' 18"	-4 m 48 s
6	104° 26' 39"	-0.80"	105° 40' 35"	22° 39' 21"	1.0166316	15'43.93"	23° 26' 18"	-4 m 48 s
7	104° 29' 02"	-0.81"	105° 43' 10"	22° 39' 05"	1.0166312	15'43.93"	23° 26' 18"	-4 m 48 s
8	104° 31' 25"	-0.81"	105° 45' 44"	22° 38' 50"	1.0166307	15'43.93"	23° 26' 18"	-4 m 49 s
9	104° 33' 48"	-0.81"	105° 48' 18"	22° 38' 34"	1.0166303	15'43.93"	23° 26' 18"	-4 m 49 s
10	104° 36' 11"	-0.81"	105° 50' 52"	22° 38' 19"	1.0166299	15'43.93"	23° 26' 18"	-4 m 50 s
11	104° 38' 34"	-0.82"	105° 53' 26"	22° 38' 03"	1.0166294	15'43.93"	23° 26' 18"	-4 m 50 s
12	104° 40' 57"	-0.82"	105° 55' 60"	22° 37' 48"	1.0166289	15'43.93"	23° 26' 18"	-4 m 50 s
13	104° 43' 20"	-0.82"	105° 58' 34"	22° 37' 32"	1.0166285	15'43.93"	23° 26' 18"	-4 m 51 s
14	104° 45' 43"	-0.82"	106° 01' 08"	22° 37' 16"	1.0166280	15'43.93"	23° 26' 18"	-4 m 51 s
15	104° 48' 06"	-0.83"	106° 03' 42"	22° 37' 01"	1.0166275	15'43.93"	23° 26' 18"	-4 m 52 s
16	104° 50' 29"	-0.83"	106° 06' 16"	22° 36' 45"	1.0166270	15'43.94"	23° 26' 18"	-4 m 52 s
17	104° 52' 52"	-0.83"	106° 08' 49"	22° 36' 29"	1.0166265	15'43.94"	23° 26' 18"	-4 m 52 s
18	104° 55' 15"	-0.83"	106° 11' 23"	22° 36' 13"	1.0166260	15'43.94"	23° 26' 18"	-4 m 53 s
19	104° 57' 38"	-0.83"	106° 13' 57"	22° 35' 57"	1.0166255	15'43.94"	23° 26' 18"	-4 m 53 s
20	105° 00' 01"	-0.84"	106° 16' 31"	22° 35' 42"	1.0166250	15'43.94"	23° 26' 18"	-4 m 54 s
21	105° 02' 24"	-0.84"	106° 19' 05"	22° 35' 26"	1.0166244	15'43.94"	23° 26' 18"	-4 m 54 s
22	105° 04' 47"	-0.84"	106° 21' 39"	22° 35' 10"	1.0166239	15'43.94"	23° 26' 18"	-4 m 55 s
23	105° 07' 10"	-0.84"	106° 24' 13"	22° 34' 54"	1.0166233	15'43.94"	23° 26' 18"	-4 m 55 s
24	105° 09' 33"	-0.84"	106° 26' 47"	22° 34' 37"	1.0166228	15'43.94"	23° 26' 18"	-4 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	228° 58' 34"	-4° 17' 49"	225° 15' 27"	-21° 35' 29"	0° 54' 15"	14' 47.06"	283° 19' 42"	0.78520
1	229° 28' 20"	-4° 19' 12"	225° 45' 42"	-21° 45' 06"	0° 54' 16"	14' 47.16"	283° 6' 45"	0.78844
2	229° 58' 06"	-4° 20' 33"	226° 16' 01"	-21° 54' 38"	0° 54' 16"	14' 47.25"	282° 53' 39"	0.79165
3	230° 27' 53"	-4° 21' 53"	226° 46' 25"	-22° 04' 04"	0° 54' 16"	14' 47.36"	282° 40' 24"	0.79485
4	230° 57' 41"	-4° 23' 13"	227° 16' 54"	-22° 13' 25"	0° 54' 17"	14' 47.46"	282° 27' 00"	0.79803
5	231° 27' 29"	-4° 24' 31"	227° 47' 27"	-22° 22' 41"	0° 54' 17"	14' 47.57"	282° 13' 27"	0.80120
6	231° 57' 18"	-4° 25' 47"	228° 18' 05"	-22° 31' 50"	0° 54' 18"	14' 47.69"	281° 59' 45"	0.80435
7	232° 27' 08"	-4° 27' 03"	228° 48' 48"	-22° 40' 54"	0° 54' 18"	14' 47.81"	281° 45' 54"	0.80747
8	232° 56' 58"	-4° 28' 17"	229° 19' 35"	-22° 49' 53"	0° 54' 18"	14' 47.93"	281° 31' 54"	0.81058
9	233° 26' 49"	-4° 29' 31"	229° 50' 27"	-22° 58' 45"	0° 54' 19"	14' 48.05"	281° 17' 45"	0.81368
10	233° 56' 41"	-4° 30' 43"	230° 21' 24"	-23° 07' 32"	0° 54' 19"	14' 48.18"	281° 3' 26"	0.81675
11	234° 26' 34"	-4° 31' 53"	230° 52' 26"	-23° 16' 13"	0° 54' 20"	14' 48.32"	280° 48' 58"	0.81980
12	234° 56' 28"	-4° 33' 03"	231° 23' 32"	-23° 24' 48"	0° 54' 20"	14' 48.45"	280° 34' 20"	0.82284
13	235° 26' 22"	-4° 34' 11"	231° 54' 43"	-23° 33' 17"	0° 54' 21"	14' 48.60"	280° 19' 33"	0.82585
14	235° 56' 17"	-4° 35' 19"	232° 25' 59"	-23° 41' 40"	0° 54' 21"	14' 48.74"	280° 4' 37"	0.82885
15	236° 26' 13"	-4° 36' 24"	232° 57' 19"	-23° 49' 57"	0° 54' 22"	14' 48.89"	279° 49' 31"	0.83183
16	236° 56' 10"	-4° 37' 29"	233° 28' 45"	-23° 58' 08"	0° 54' 23"	14' 49.04"	279° 34' 15"	0.83478
17	237° 26' 08"	-4° 38' 33"	234° 00' 15"	-24° 06' 13"	0° 54' 23"	14' 49.20"	279° 18' 50"	0.83772
18	237° 56' 07"	-4° 39' 35"	234° 31' 50"	-24° 14' 11"	0° 54' 24"	14' 49.36"	279° 3' 15"	0.84064
19	238° 26' 06"	-4° 40' 36"	235° 03' 30"	-24° 22' 03"	0° 54' 24"	14' 49.52"	278° 47' 30"	0.84353
20	238° 56' 07"	-4° 41' 35"	235° 35' 14"	-24° 29' 48"	0° 54' 25"	14' 49.69"	278° 31' 36"	0.84641
21	239° 26' 08"	-4° 42' 34"	236° 07' 04"	-24° 37' 27"	0° 54' 26"	14' 49.86"	278° 15' 31"	0.84927
22	239° 56' 10"	-4° 43' 31"	236° 38' 58"	-24° 45' 00"	0° 54' 26"	14' 50.03"	277° 59' 16"	0.85210
23	240° 26' 13"	-4° 44' 27"	237° 10' 56"	-24° 52' 26"	0° 54' 27"	14' 50.21"	277° 42' 51"	0.85491
24	240° 56' 17"	-4° 45' 21"	237° 43' 00"	-24° 59' 45"	0° 54' 27"	14' 50.39"	277° 26' 16"	0.85771

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	105° 09' 33"	-0.84"	106° 26' 47"	22° 34' 37"	1.0166228	15'43.94"	23° 26' 18"	-4 m 55 s
1	105° 11' 56"	-0.85"	106° 29' 21"	22° 34' 21"	1.0166222	15'43.94"	23° 26' 18"	-4 m 56 s
2	105° 14' 19"	-0.85"	106° 31' 55"	22° 34' 05"	1.0166217	15'43.94"	23° 26' 18"	-4 m 56 s
3	105° 16' 42"	-0.85"	106° 34' 28"	22° 33' 49"	1.0166211	15'43.94"	23° 26' 18"	-4 m 57 s
4	105° 19' 05"	-0.85"	106° 37' 02"	22° 33' 33"	1.0166205	15'43.94"	23° 26' 18"	-4 m 57 s
5	105° 21' 28"	-0.85"	106° 39' 36"	22° 33' 16"	1.0166200	15'43.94"	23° 26' 18"	-4 m 57 s
6	105° 23' 51"	-0.85"	106° 42' 10"	22° 33' 00"	1.0166194	15'43.94"	23° 26' 18"	-4 m 58 s
7	105° 26' 14"	-0.86"	106° 44' 44"	22° 32' 44"	1.0166188	15'43.94"	23° 26' 18"	-4 m 58 s
8	105° 28' 37"	-0.86"	106° 47' 18"	22° 32' 27"	1.0166182	15'43.94"	23° 26' 18"	-4 m 59 s
9	105° 31' 00"	-0.86"	106° 49' 51"	22° 32' 11"	1.0166176	15'43.94"	23° 26' 18"	-4 m 59 s
10	105° 33' 23"	-0.86"	106° 52' 25"	22° 31' 54"	1.0166170	15'43.94"	23° 26' 18"	-4 m 59 s
11	105° 35' 46"	-0.86"	106° 54' 59"	22° 31' 38"	1.0166163	15'43.95"	23° 26' 18"	-4 m 60 s
12	105° 38' 09"	-0.86"	106° 57' 33"	22° 31' 21"	1.0166157	15'43.95"	23° 26' 18"	-5 m 00 s
13	105° 40' 32"	-0.86"	107° 00' 06"	22° 31' 05"	1.0166151	15'43.95"	23° 26' 18"	-5 m 00 s
14	105° 42' 55"	-0.86"	107° 02' 40"	22° 30' 48"	1.0166144	15'43.95"	23° 26' 18"	-5 m 01 s
15	105° 45' 18"	-0.86"	107° 05' 14"	22° 30' 31"	1.0166138	15'43.95"	23° 26' 18"	-5 m 01 s
16	105° 47' 41"	-0.87"	107° 07' 48"	22° 30' 15"	1.0166131	15'43.95"	23° 26' 18"	-5 m 02 s
17	105° 50' 04"	-0.87"	107° 10' 21"	22° 29' 58"	1.0166125	15'43.95"	23° 26' 18"	-5 m 02 s
18	105° 52' 27"	-0.87"	107° 12' 55"	22° 29' 41"	1.0166118	15'43.95"	23° 26' 18"	-5 m 02 s
19	105° 54' 50"	-0.87"	107° 15' 29"	22° 29' 24"	1.0166111	15'43.95"	23° 26' 18"	-5 m 03 s
20	105° 57' 13"	-0.87"	107° 18' 02"	22° 29' 07"	1.0166104	15'43.95"	23° 26' 18"	-5 m 03 s
21	105° 59' 36"	-0.87"	107° 20' 36"	22° 28' 50"	1.0166098	15'43.95"	23° 26' 18"	-5 m 04 s
22	106° 01' 59"	-0.87"	107° 23' 10"	22° 28' 33"	1.0166091	15'43.95"	23° 26' 18"	-5 m 04 s
23	106° 04' 22"	-0.87"	107° 25' 43"	22° 28' 16"	1.0166084	15'43.95"	23° 26' 18"	-5 m 04 s
24	106° 06' 45"	-0.87"	107° 28' 17"	22° 27' 59"	1.0166077	15'43.95"	23° 26' 18"	-5 m 05 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	240° 56' 17"	-4° 45' 21"	237° 43' 00"	-24° 59' 45"	0° 54' 27"	14' 50.39"	277° 26' 16"	0.85771
1	241° 26' 23"	-4° 46' 14"	238° 15' 08"	-25° 06' 58"	0° 54' 28"	14' 50.57"	277° 9' 31"	0.86048
2	241° 56' 29"	-4° 47' 06"	238° 47' 22"	-25° 14' 04"	0° 54' 29"	14' 50.76"	276° 52' 35"	0.86323
3	242° 26' 36"	-4° 47' 57"	239° 19' 39"	-25° 21' 03"	0° 54' 30"	14' 50.95"	276° 35' 28"	0.86595
4	242° 56' 44"	-4° 48' 46"	239° 52' 02"	-25° 27' 55"	0° 54' 30"	14' 51.14"	276° 18' 11"	0.86866
5	243° 26' 53"	-4° 49' 34"	240° 24' 29"	-25° 34' 41"	0° 54' 31"	14' 51.34"	276° 0' 44"	0.87134
6	243° 57' 03"	-4° 50' 21"	240° 57' 01"	-25° 41' 19"	0° 54' 32"	14' 51.54"	275° 43' 05"	0.87400
7	244° 27' 14"	-4° 51' 06"	241° 29' 38"	-25° 47' 50"	0° 54' 32"	14' 51.75"	275° 25' 15"	0.87664
8	244° 57' 27"	-4° 51' 50"	242° 02' 19"	-25° 54' 14"	0° 54' 33"	14' 51.95"	275° 7' 15"	0.87925
9	245° 27' 40"	-4° 52' 33"	242° 35' 05"	-26° 00' 32"	0° 54' 34"	14' 52.16"	274° 49' 03"	0.88184
10	245° 57' 54"	-4° 53' 14"	243° 07' 55"	-26° 06' 41"	0° 54' 35"	14' 52.38"	274° 30' 39"	0.88441
11	246° 28' 10"	-4° 53' 54"	243° 40' 50"	-26° 12' 44"	0° 54' 36"	14' 52.59"	274° 12' 04"	0.88696
12	246° 58' 26"	-4° 54' 33"	244° 13' 49"	-26° 18' 39"	0° 54' 36"	14' 52.81"	273° 53' 18"	0.88948
13	247° 28' 44"	-4° 55' 10"	244° 46' 53"	-26° 24' 27"	0° 54' 37"	14' 53.04"	273° 34' 19"	0.89198
14	247° 59' 03"	-4° 55' 46"	245° 20' 02"	-26° 30' 08"	0° 54' 38"	14' 53.26"	273° 15' 08"	0.89445
15	248° 29' 23"	-4° 56' 20"	245° 53' 14"	-26° 35' 40"	0° 54' 39"	14' 53.49"	272° 55' 45"	0.89690
16	248° 59' 44"	-4° 56' 53"	246° 26' 32"	-26° 41' 06"	0° 54' 40"	14' 53.72"	272° 36' 10"	0.89933
17	249° 30' 06"	-4° 57' 25"	246° 59' 53"	-26° 46' 24"	0° 54' 41"	14' 53.96"	272° 16' 22"	0.90173
18	250° 00' 29"	-4° 57' 55"	247° 33' 19"	-26° 51' 34"	0° 54' 41"	14' 54.19"	271° 56' 21"	0.90410
19	250° 30' 54"	-4° 58' 24"	248° 06' 49"	-26° 56' 36"	0° 54' 42"	14' 54.43"	271° 36' 06"	0.90645
20	251° 01' 19"	-4° 58' 52"	248° 40' 23"	-27° 01' 31"	0° 54' 43"	14' 54.68"	271° 15' 39"	0.90878
21	251° 31' 46"	-4° 59' 18"	249° 14' 02"	-27° 06' 18"	0° 54' 44"	14' 54.92"	270° 54' 57"	0.91108
22	252° 02' 14"	-4° 59' 43"	249° 47' 44"	-27° 10' 57"	0° 54' 45"	14' 55.17"	270° 34' 02"	0.91336
23	252° 32' 44"	-5° 00' 06"	250° 21' 31"	-27° 15' 28"	0° 54' 46"	14' 55.42"	270° 12' 52"	0.91560
24	253° 03' 14"	-5° 00' 28"	250° 55' 21"	-27° 19' 51"	0° 54' 47"	14' 55.68"	269° 51' 28"	0.91783

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	106° 06' 45"	-0.87"	107° 28' 17"	22° 27' 59"	1.0166077	15'43.95"	23° 26' 18"	-5 m 05 s
1	106° 09' 08"	-0.87"	107° 30' 50"	22° 27' 42"	1.0166069	15'43.95"	23° 26' 18"	-5 m 05 s
2	106° 11' 31"	-0.87"	107° 33' 24"	22° 27' 25"	1.0166062	15'43.95"	23° 26' 18"	-5 m 06 s
3	106° 13' 54"	-0.87"	107° 35' 58"	22° 27' 08"	1.0166055	15'43.96"	23° 26' 18"	-5 m 06 s
4	106° 16' 17"	-0.87"	107° 38' 31"	22° 26' 51"	1.0166048	15'43.96"	23° 26' 18"	-5 m 06 s
5	106° 18' 40"	-0.87"	107° 41' 05"	22° 26' 33"	1.0166040	15'43.96"	23° 26' 18"	-5 m 07 s
6	106° 21' 03"	-0.87"	107° 43' 38"	22° 26' 16"	1.0166033	15'43.96"	23° 26' 18"	-5 m 07 s
7	106° 23' 26"	-0.87"	107° 46' 12"	22° 25' 59"	1.0166025	15'43.96"	23° 26' 18"	-5 m 07 s
8	106° 25' 49"	-0.87"	107° 48' 46"	22° 25' 41"	1.0166018	15'43.96"	23° 26' 18"	-5 m 08 s
9	106° 28' 12"	-0.87"	107° 51' 19"	22° 25' 24"	1.0166010	15'43.96"	23° 26' 18"	-5 m 08 s
10	106° 30' 35"	-0.87"	107° 53' 53"	22° 25' 06"	1.0166002	15'43.96"	23° 26' 18"	-5 m 09 s
11	106° 32' 58"	-0.87"	107° 56' 26"	22° 24' 49"	1.0165995	15'43.96"	23° 26' 18"	-5 m 09 s
12	106° 35' 21"	-0.87"	107° 58' 60"	22° 24' 31"	1.0165987	15'43.96"	23° 26' 18"	-5 m 09 s
13	106° 37' 44"	-0.87"	108° 01' 33"	22° 24' 14"	1.0165979	15'43.96"	23° 26' 18"	-5 m 10 s
14	106° 40' 07"	-0.87"	108° 04' 07"	22° 23' 56"	1.0165971	15'43.96"	23° 26' 18"	-5 m 10 s
15	106° 42' 30"	-0.87"	108° 06' 40"	22° 23' 39"	1.0165963	15'43.96"	23° 26' 18"	-5 m 11 s
16	106° 44' 53"	-0.87"	108° 09' 14"	22° 23' 21"	1.0165955	15'43.96"	23° 26' 18"	-5 m 11 s
17	106° 47' 16"	-0.87"	108° 11' 47"	22° 23' 03"	1.0165947	15'43.97"	23° 26' 18"	-5 m 11 s
18	106° 49' 39"	-0.87"	108° 14' 20"	22° 22' 45"	1.0165939	15'43.97"	23° 26' 18"	-5 m 12 s
19	106° 52' 02"	-0.87"	108° 16' 54"	22° 22' 28"	1.0165930	15'43.97"	23° 26' 18"	-5 m 12 s
20	106° 54' 25"	-0.87"	108° 19' 27"	22° 22' 10"	1.0165922	15'43.97"	23° 26' 18"	-5 m 12 s
21	106° 56' 47"	-0.87"	108° 22' 01"	22° 21' 52"	1.0165914	15'43.97"	23° 26' 18"	-5 m 13 s
22	106° 59' 10"	-0.87"	108° 24' 34"	22° 21' 34"	1.0165905	15'43.97"	23° 26' 18"	-5 m 13 s
23	107° 01' 33"	-0.87"	108° 27' 07"	22° 21' 16"	1.0165897	15'43.97"	23° 26' 18"	-5 m 14 s
24	107° 03' 56"	-0.87"	108° 29' 41"	22° 20' 58"	1.0165888	15'43.97"	23° 26' 18"	-5 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	253° 03' 14"	-5° 00' 28"	250° 55' 21"	-27° 19' 51"	0° 54' 47"	14' 55.68"	269° 51' 28"	0.91783
1	253° 33' 46"	-5° 00' 49"	251° 29' 16"	-27° 24' 06"	0° 54' 48"	14' 55.93"	269° 29' 48"	0.92003
2	254° 04' 19"	-5° 01' 08"	252° 03' 14"	-27° 28' 13"	0° 54' 49"	14' 56.19"	269° 7' 53"	0.92220
3	254° 34' 53"	-5° 01' 25"	252° 37' 17"	-27° 32' 12"	0° 54' 50"	14' 56.46"	268° 45' 42"	0.92434
4	255° 05' 28"	-5° 01' 42"	253° 11' 23"	-27° 36' 03"	0° 54' 51"	14' 56.72"	268° 23' 15"	0.92646
5	255° 36' 05"	-5° 01' 56"	253° 45' 33"	-27° 39' 45"	0° 54' 52"	14' 56.99"	268° 0' 31"	0.92855
6	256° 06' 43"	-5° 02' 10"	254° 19' 46"	-27° 43' 19"	0° 54' 53"	14' 57.26"	267° 37' 30"	0.93061
7	256° 37' 22"	-5° 02' 22"	254° 54' 03"	-27° 46' 45"	0° 54' 54"	14' 57.53"	267° 14' 11"	0.93265
8	257° 08' 02"	-5° 02' 32"	255° 28' 24"	-27° 50' 03"	0° 54' 55"	14' 57.80"	266° 50' 34"	0.93466
9	257° 38' 44"	-5° 02' 41"	256° 02' 48"	-27° 53' 12"	0° 54' 56"	14' 58.08"	266° 26' 38"	0.93664
10	258° 09' 27"	-5° 02' 49"	256° 37' 15"	-27° 56' 13"	0° 54' 57"	14' 58.36"	266° 2' 22"	0.93860
11	258° 40' 11"	-5° 02' 55"	257° 11' 46"	-27° 59' 05"	0° 54' 58"	14' 58.64"	265° 37' 46"	0.94052
12	259° 10' 56"	-5° 02' 59"	257° 46' 20"	-28° 01' 49"	0° 54' 59"	14' 58.92"	265° 12' 48"	0.94242
13	259° 41' 43"	-5° 03' 03"	258° 20' 57"	-28° 04' 24"	0° 54' 60"	14' 59.21"	264° 47' 29"	0.94429
14	260° 12' 31"	-5° 03' 04"	258° 55' 37"	-28° 06' 50"	0° 55' 01"	14' 59.50"	264° 21' 47"	0.94613
15	260° 43' 21"	-5° 03' 04"	259° 30' 20"	-28° 09' 08"	0° 55' 02"	14' 59.79"	263° 55' 41"	0.94794
16	261° 14' 11"	-5° 03' 03"	260° 05' 06"	-28° 11' 17"	0° 55' 03"	15' 00.08"	263° 29' 10"	0.94973
17	261° 45' 04"	-5° 03' 00"	260° 39' 55"	-28° 13' 18"	0° 55' 04"	15' 00.37"	263° 2' 13"	0.95148
18	262° 15' 57"	-5° 02' 56"	261° 14' 47"	-28° 15' 09"	0° 55' 05"	15' 00.67"	262° 34' 49"	0.95321
19	262° 46' 52"	-5° 02' 50"	261° 49' 42"	-28° 16' 52"	0° 55' 06"	15' 00.97"	262° 6' 57"	0.95490
20	263° 17' 48"	-5° 02' 43"	262° 24' 39"	-28° 18' 26"	0° 55' 07"	15' 01.27"	261° 38' 34"	0.95657
21	263° 48' 45"	-5° 02' 35"	262° 59' 38"	-28° 19' 51"	0° 55' 09"	15' 01.57"	261° 9' 41"	0.95821
22	264° 19' 44"	-5° 02' 24"	263° 34' 40"	-28° 21' 08"	0° 55' 10"	15' 01.87"	260° 40' 14"	0.95981
23	264° 50' 44"	-5° 02' 13"	264° 09' 44"	-28° 22' 15"	0° 55' 11"	15' 02.18"	260° 10' 12"	0.96139
24	265° 21' 45"	-5° 01' 60"	264° 44' 51"	-28° 23' 13"	0° 55' 12"	15' 02.49"	259° 39' 33"	0.96294

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	107° 03' 56"	-0.87"	108° 29' 41"	22° 20' 58"	1.0165888	15'43.97"	23° 26' 18"	-5 m 14 s
1	107° 06' 19"	-0.87"	108° 32' 14"	22° 20' 40"	1.0165879	15'43.97"	23° 26' 18"	-5 m 14 s
2	107° 08' 42"	-0.87"	108° 34' 48"	22° 20' 22"	1.0165871	15'43.97"	23° 26' 18"	-5 m 15 s
3	107° 11' 05"	-0.87"	108° 37' 21"	22° 20' 04"	1.0165862	15'43.97"	23° 26' 18"	-5 m 15 s
4	107° 13' 28"	-0.86"	108° 39' 54"	22° 19' 45"	1.0165853	15'43.97"	23° 26' 18"	-5 m 15 s
5	107° 15' 51"	-0.86"	108° 42' 27"	22° 19' 27"	1.0165844	15'43.97"	23° 26' 18"	-5 m 16 s
6	107° 18' 14"	-0.86"	108° 45' 01"	22° 19' 09"	1.0165835	15'43.98"	23° 26' 18"	-5 m 16 s
7	107° 20' 37"	-0.86"	108° 47' 34"	22° 18' 51"	1.0165826	15'43.98"	23° 26' 18"	-5 m 16 s
8	107° 23' 00"	-0.86"	108° 50' 07"	22° 18' 32"	1.0165817	15'43.98"	23° 26' 18"	-5 m 17 s
9	107° 25' 23"	-0.86"	108° 52' 41"	22° 18' 14"	1.0165808	15'43.98"	23° 26' 18"	-5 m 17 s
10	107° 27' 46"	-0.86"	108° 55' 14"	22° 17' 55"	1.0165799	15'43.98"	23° 26' 18"	-5 m 18 s
11	107° 30' 09"	-0.86"	108° 57' 47"	22° 17' 37"	1.0165790	15'43.98"	23° 26' 18"	-5 m 18 s
12	107° 32' 32"	-0.85"	109° 00' 20"	22° 17' 18"	1.0165780	15'43.98"	23° 26' 18"	-5 m 18 s
13	107° 34' 55"	-0.85"	109° 02' 54"	22° 16' 60"	1.0165771	15'43.98"	23° 26' 18"	-5 m 19 s
14	107° 37' 18"	-0.85"	109° 05' 27"	22° 16' 41"	1.0165761	15'43.98"	23° 26' 18"	-5 m 19 s
15	107° 39' 41"	-0.85"	109° 08' 00"	22° 16' 23"	1.0165752	15'43.98"	23° 26' 18"	-5 m 19 s
16	107° 42' 04"	-0.85"	109° 10' 33"	22° 16' 04"	1.0165742	15'43.98"	23° 26' 18"	-5 m 20 s
17	107° 44' 27"	-0.85"	109° 13' 06"	22° 15' 45"	1.0165733	15'43.99"	23° 26' 18"	-5 m 20 s
18	107° 46' 50"	-0.85"	109° 15' 40"	22° 15' 27"	1.0165723	15'43.99"	23° 26' 18"	-5 m 20 s
19	107° 49' 13"	-0.84"	109° 18' 13"	22° 15' 08"	1.0165713	15'43.99"	23° 26' 18"	-5 m 21 s
20	107° 51' 36"	-0.84"	109° 20' 46"	22° 14' 49"	1.0165703	15'43.99"	23° 26' 18"	-5 m 21 s
21	107° 53' 59"	-0.84"	109° 23' 19"	22° 14' 30"	1.0165694	15'43.99"	23° 26' 18"	-5 m 22 s
22	107° 56' 22"	-0.84"	109° 25' 52"	22° 14' 11"	1.0165684	15'43.99"	23° 26' 18"	-5 m 22 s
23	107° 58' 45"	-0.84"	109° 28' 25"	22° 13' 52"	1.0165674	15'43.99"	23° 26' 18"	-5 m 22 s
24	108° 01' 08"	-0.83"	109° 30' 58"	22° 13' 33"	1.0165664	15'43.99"	23° 26' 18"	-5 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	265° 21' 45"	-5° 01' 60"	264° 44' 51"	-28° 23' 13"	0° 55' 12"	15' 02.49"	259° 39' 33"	0.96294
1	265° 52' 48"	-5° 01' 45"	265° 19' 60"	-28° 24' 03"	0° 55' 13"	15' 02.80"	259° 8' 15"	0.96445
2	266° 23' 52"	-5° 01' 29"	265° 55' 10"	-28° 24' 43"	0° 55' 14"	15' 03.11"	258° 36' 16"	0.96594
3	266° 54' 58"	-5° 01' 11"	266° 30' 23"	-28° 25' 14"	0° 55' 15"	15' 03.42"	258° 3' 33"	0.96739
4	267° 26' 05"	-5° 00' 52"	267° 05' 38"	-28° 25' 37"	0° 55' 16"	15' 03.74"	257° 30' 03"	0.96881
5	267° 57' 13"	-5° 00' 31"	267° 40' 54"	-28° 25' 50"	0° 55' 18"	15' 04.06"	256° 55' 44"	0.97020
6	268° 28' 23"	-5° 00' 09"	268° 16' 12"	-28° 25' 54"	0° 55' 19"	15' 04.37"	256° 20' 31"	0.97156
7	268° 59' 34"	-4° 59' 45"	268° 51' 32"	-28° 25' 49"	0° 55' 20"	15' 04.69"	255° 44' 21"	0.97289
8	269° 30' 46"	-4° 59' 20"	269° 26' 53"	-28° 25' 34"	0° 55' 21"	15' 05.02"	255° 7' 10"	0.97419
9	270° 01' 60"	-4° 58' 53"	270° 02' 16"	-28° 25' 11"	0° 55' 22"	15' 05.34"	254° 28' 54"	0.97546
10	270° 33' 15"	-4° 58' 25"	270° 37' 39"	-28° 24' 38"	0° 55' 24"	15' 05.66"	253° 49' 27"	0.97669
11	271° 04' 31"	-4° 57' 55"	271° 13' 05"	-28° 23' 57"	0° 55' 25"	15' 05.99"	253° 8' 45"	0.97789
12	271° 35' 49"	-4° 57' 24"	271° 48' 31"	-28° 23' 06"	0° 55' 26"	15' 06.32"	252° 26' 40"	0.97906
13	272° 07' 09"	-4° 56' 51"	272° 23' 58"	-28° 22' 05"	0° 55' 27"	15' 06.64"	251° 43' 06"	0.98020
14	272° 38' 29"	-4° 56' 16"	272° 59' 26"	-28° 20' 56"	0° 55' 28"	15' 06.97"	250° 57' 55"	0.98130
15	273° 09' 51"	-4° 55' 41"	273° 34' 55"	-28° 19' 37"	0° 55' 30"	15' 07.31"	250° 10' 60"	0.98237
16	273° 41' 15"	-4° 55' 03"	274° 10' 25"	-28° 18' 09"	0° 55' 31"	15' 07.64"	249° 22' 10"	0.98341
17	274° 12' 40"	-4° 54' 24"	274° 45' 55"	-28° 16' 32"	0° 55' 32"	15' 07.97"	248° 31' 14"	0.98441
18	274° 44' 06"	-4° 53' 44"	275° 21' 26"	-28° 14' 45"	0° 55' 33"	15' 08.31"	247° 38' 01"	0.98538
19	275° 15' 34"	-4° 53' 02"	275° 56' 57"	-28° 12' 49"	0° 55' 34"	15' 08.64"	246° 42' 18"	0.98632
20	275° 47' 03"	-4° 52' 18"	276° 32' 28"	-28° 10' 44"	0° 55' 36"	15' 08.98"	245° 43' 47"	0.98723
21	276° 18' 33"	-4° 51' 33"	277° 07' 60"	-28° 08' 29"	0° 55' 37"	15' 09.32"	244° 42' 13"	0.98810
22	276° 50' 05"	-4° 50' 47"	277° 43' 32"	-28° 06' 06"	0° 55' 38"	15' 09.66"	243° 37' 15"	0.98893
23	277° 21' 38"	-4° 49' 59"	278° 19' 04"	-28° 03' 33"	0° 55' 39"	15' 10.00"	242° 28' 31"	0.98974
24	277° 53' 13"	-4° 49' 09"	278° 54' 35"	-28° 00' 50"	0° 55' 41"	15' 10.34"	241° 15' 34"	0.99050

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	108° 01' 08"	-0.83"	109° 30' 58"	22° 13' 33"	1.0165664	15'43.99"	23° 26' 18"	-5 m 23 s
1	108° 03' 31"	-0.83"	109° 33' 32"	22° 13' 14"	1.0165654	15'43.99"	23° 26' 18"	-5 m 23 s
2	108° 05' 54"	-0.83"	109° 36' 05"	22° 12' 55"	1.0165643	15'43.99"	23° 26' 18"	-5 m 23 s
3	108° 08' 17"	-0.83"	109° 38' 38"	22° 12' 36"	1.0165633	15'43.99"	23° 26' 18"	-5 m 24 s
4	108° 10' 40"	-0.83"	109° 41' 11"	22° 12' 17"	1.0165623	15'44.00"	23° 26' 18"	-5 m 24 s
5	108° 13' 03"	-0.82"	109° 43' 44"	22° 11' 58"	1.0165613	15'44.00"	23° 26' 18"	-5 m 24 s
6	108° 15' 26"	-0.82"	109° 46' 17"	22° 11' 39"	1.0165602	15'44.00"	23° 26' 18"	-5 m 25 s
7	108° 17' 49"	-0.82"	109° 48' 50"	22° 11' 19"	1.0165592	15'44.00"	23° 26' 18"	-5 m 25 s
8	108° 20' 12"	-0.82"	109° 51' 23"	22° 11' 00"	1.0165581	15'44.00"	23° 26' 18"	-5 m 25 s
9	108° 22' 35"	-0.81"	109° 53' 56"	22° 10' 41"	1.0165571	15'44.00"	23° 26' 18"	-5 m 26 s
10	108° 24' 58"	-0.81"	109° 56' 29"	22° 10' 21"	1.0165560	15'44.00"	23° 26' 18"	-5 m 26 s
11	108° 27' 21"	-0.81"	109° 59' 02"	22° 10' 02"	1.0165549	15'44.00"	23° 26' 18"	-5 m 26 s
12	108° 29' 44"	-0.81"	110° 01' 35"	22° 09' 42"	1.0165539	15'44.00"	23° 26' 18"	-5 m 27 s
13	108° 32' 07"	-0.80"	110° 04' 08"	22° 09' 23"	1.0165528	15'44.00"	23° 26' 18"	-5 m 27 s
14	108° 34' 30"	-0.80"	110° 06' 41"	22° 09' 03"	1.0165517	15'44.01"	23° 26' 18"	-5 m 27 s
15	108° 36' 53"	-0.80"	110° 09' 14"	22° 08' 44"	1.0165506	15'44.01"	23° 26' 18"	-5 m 28 s
16	108° 39' 16"	-0.80"	110° 11' 47"	22° 08' 24"	1.0165495	15'44.01"	23° 26' 18"	-5 m 28 s
17	108° 41' 39"	-0.79"	110° 14' 19"	22° 08' 05"	1.0165484	15'44.01"	23° 26' 18"	-5 m 28 s
18	108° 44' 02"	-0.79"	110° 16' 52"	22° 07' 45"	1.0165473	15'44.01"	23° 26' 18"	-5 m 29 s
19	108° 46' 25"	-0.79"	110° 19' 25"	22° 07' 25"	1.0165462	15'44.01"	23° 26' 18"	-5 m 29 s
20	108° 48' 48"	-0.78"	110° 21' 58"	22° 07' 05"	1.0165450	15'44.01"	23° 26' 18"	-5 m 29 s
21	108° 51' 11"	-0.78"	110° 24' 31"	22° 06' 46"	1.0165439	15'44.01"	23° 26' 18"	-5 m 30 s
22	108° 53' 34"	-0.78"	110° 27' 04"	22° 06' 26"	1.0165428	15'44.01"	23° 26' 18"	-5 m 30 s
23	108° 55' 57"	-0.78"	110° 29' 37"	22° 06' 06"	1.0165416	15'44.01"	23° 26' 18"	-5 m 30 s
24	108° 58' 20"	-0.77"	110° 32' 09"	22° 05' 46"	1.0165405	15'44.02"	23° 26' 18"	-5 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	277° 53' 13"	-4° 49' 09"	278° 54' 35"	-28° 00' 50"	0° 55' 41"	15' 10.34"	241° 15' 34"	0.99050
1	278° 24' 49"	-4° 48' 18"	279° 30' 07"	-27° 57' 59"	0° 55' 42"	15' 10.69"	239° 57' 55"	0.99124
2	278° 56' 26"	-4° 47' 25"	280° 05' 38"	-27° 54' 58"	0° 55' 43"	15' 11.03"	238° 34' 59"	0.99194
3	279° 28' 05"	-4° 46' 31"	280° 41' 09"	-27° 51' 47"	0° 55' 44"	15' 11.37"	237° 6' 07"	0.99260
4	279° 59' 45"	-4° 45' 36"	281° 16' 40"	-27° 48' 28"	0° 55' 46"	15' 11.72"	235° 30' 32"	0.99323
5	280° 31' 27"	-4° 44' 39"	281° 52' 09"	-27° 44' 59"	0° 55' 47"	15' 12.07"	233° 47' 23"	0.99383
6	281° 03' 10"	-4° 43' 40"	282° 27' 39"	-27° 41' 21"	0° 55' 48"	15' 12.41"	231° 55' 36"	0.99439
7	281° 34' 54"	-4° 42' 40"	283° 03' 07"	-27° 37' 34"	0° 55' 50"	15' 12.76"	229° 54' 03"	0.99491
8	282° 06' 40"	-4° 41' 38"	283° 38' 35"	-27° 33' 38"	0° 55' 51"	15' 13.11"	227° 41' 20"	0.99540
9	282° 38' 27"	-4° 40' 35"	284° 14' 02"	-27° 29' 32"	0° 55' 52"	15' 13.46"	225° 15' 54"	0.99586
10	283° 10' 16"	-4° 39' 30"	284° 49' 27"	-27° 25' 17"	0° 55' 53"	15' 13.81"	222° 35' 59"	0.99628
11	283° 42' 06"	-4° 38' 24"	285° 24' 52"	-27° 20' 53"	0° 55' 55"	15' 14.16"	219° 39' 34"	0.99666
12	284° 13' 58"	-4° 37' 16"	286° 00' 15"	-27° 16' 20"	0° 55' 56"	15' 14.51"	216° 24' 28"	0.99701
13	284° 45' 50"	-4° 36' 07"	286° 35' 37"	-27° 11' 38"	0° 55' 57"	15' 14.86"	212° 48' 23"	0.99732
14	285° 17' 44"	-4° 34' 56"	287° 10' 58"	-27° 06' 46"	0° 55' 59"	15' 15.21"	208° 48' 59"	0.99760
15	285° 49' 40"	-4° 33' 44"	287° 46' 17"	-27° 01' 46"	0° 55' 60"	15' 15.57"	204° 24' 11"	0.99784
16	286° 21' 37"	-4° 32' 30"	288° 21' 35"	-26° 56' 36"	0° 56' 01"	15' 15.92"	199° 32' 29"	0.99804
17	286° 53' 35"	-4° 31' 15"	288° 56' 51"	-26° 51' 17"	0° 56' 02"	15' 16.28"	194° 13' 23"	0.99821
18	287° 25' 35"	-4° 29' 58"	289° 32' 05"	-26° 45' 50"	0° 56' 04"	15' 16.63"	188° 28' 03"	0.99834
19	287° 57' 36"	-4° 28' 40"	290° 07' 18"	-26° 40' 13"	0° 56' 05"	15' 16.98"	182° 19' 41"	0.99843
20	288° 29' 39"	-4° 27' 20"	290° 42' 28"	-26° 34' 27"	0° 56' 06"	15' 17.34"	175° 53' 53"	0.99849
21	289° 01' 42"	-4° 25' 59"	291° 17' 37"	-26° 28' 33"	0° 56' 08"	15' 17.70"	169° 18' 23"	0.99851
22	289° 33' 48"	-4° 24' 37"	291° 52' 44"	-26° 22' 29"	0° 56' 09"	15' 18.05"	162° 42' 14"	0.99849
23	290° 05' 54"	-4° 23' 13"	292° 27' 48"	-26° 16' 17"	0° 56' 10"	15' 18.41"	156° 14' 35"	0.99844
24	290° 38' 02"	-4° 21' 47"	293° 02' 51"	-26° 09' 56"	0° 56' 12"	15' 18.76"	150° 3' 26"	0.99835

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	108° 58' 20"	-0.77"	110° 32' 09"	22° 05' 46"	1.0165405	15'44.02"	23° 26' 18"	-5 m 31 s
1	109° 00' 43"	-0.77"	110° 34' 42"	22° 05' 26"	1.0165393	15'44.02"	23° 26' 18"	-5 m 31 s
2	109° 03' 06"	-0.77"	110° 37' 15"	22° 05' 06"	1.0165382	15'44.02"	23° 26' 18"	-5 m 31 s
3	109° 05' 29"	-0.76"	110° 39' 48"	22° 04' 46"	1.0165370	15'44.02"	23° 26' 18"	-5 m 32 s
4	109° 07' 52"	-0.76"	110° 42' 21"	22° 04' 26"	1.0165358	15'44.02"	23° 26' 18"	-5 m 32 s
5	109° 10' 15"	-0.76"	110° 44' 53"	22° 04' 06"	1.0165347	15'44.02"	23° 26' 18"	-5 m 32 s
6	109° 12' 38"	-0.75"	110° 47' 26"	22° 03' 46"	1.0165335	15'44.02"	23° 26' 18"	-5 m 33 s
7	109° 15' 01"	-0.75"	110° 49' 59"	22° 03' 25"	1.0165323	15'44.02"	23° 26' 18"	-5 m 33 s
8	109° 17' 24"	-0.75"	110° 52' 32"	22° 03' 05"	1.0165311	15'44.02"	23° 26' 18"	-5 m 33 s
9	109° 19' 47"	-0.74"	110° 55' 04"	22° 02' 45"	1.0165299	15'44.03"	23° 26' 18"	-5 m 34 s
10	109° 22' 10"	-0.74"	110° 57' 37"	22° 02' 25"	1.0165287	15'44.03"	23° 26' 18"	-5 m 34 s
11	109° 24' 33"	-0.73"	111° 00' 10"	22° 02' 04"	1.0165275	15'44.03"	23° 26' 18"	-5 m 34 s
12	109° 26' 56"	-0.73"	111° 02' 43"	22° 01' 44"	1.0165263	15'44.03"	23° 26' 18"	-5 m 35 s
13	109° 29' 19"	-0.73"	111° 05' 15"	22° 01' 23"	1.0165251	15'44.03"	23° 26' 18"	-5 m 35 s
14	109° 31' 42"	-0.72"	111° 07' 48"	22° 01' 03"	1.0165238	15'44.03"	23° 26' 18"	-5 m 35 s
15	109° 34' 05"	-0.72"	111° 10' 21"	22° 00' 42"	1.0165226	15'44.03"	23° 26' 18"	-5 m 36 s
16	109° 36' 28"	-0.72"	111° 12' 53"	22° 00' 22"	1.0165214	15'44.03"	23° 26' 18"	-5 m 36 s
17	109° 38' 51"	-0.71"	111° 15' 26"	22° 00' 01"	1.0165201	15'44.03"	23° 26' 18"	-5 m 36 s
18	109° 41' 14"	-0.71"	111° 17' 58"	21° 59' 41"	1.0165189	15'44.04"	23° 26' 18"	-5 m 37 s
19	109° 43' 37"	-0.70"	111° 20' 31"	21° 59' 20"	1.0165176	15'44.04"	23° 26' 18"	-5 m 37 s
20	109° 45' 60"	-0.70"	111° 23' 04"	21° 58' 59"	1.0165163	15'44.04"	23° 26' 18"	-5 m 37 s
21	109° 48' 23"	-0.70"	111° 25' 36"	21° 58' 38"	1.0165151	15'44.04"	23° 26' 18"	-5 m 38 s
22	109° 50' 46"	-0.69"	111° 28' 09"	21° 58' 18"	1.0165138	15'44.04"	23° 26' 18"	-5 m 38 s
23	109° 53' 09"	-0.69"	111° 30' 41"	21° 57' 57"	1.0165125	15'44.04"	23° 26' 18"	-5 m 38 s
24	109° 55' 32"	-0.68"	111° 33' 14"	21° 57' 36"	1.0165112	15'44.04"	23° 26' 18"	-5 m 39 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	290° 38' 02"	-4° 21' 47"	293° 02' 51"	-26° 09' 56"	0° 56' 12"	15' 18.76"	150° 3' 26"	0.99835
1	291° 10' 11"	-4° 20' 20"	293° 37' 51"	-26° 03' 26"	0° 56' 13"	15' 19.12"	144° 14' 44"	0.99822
2	291° 42' 22"	-4° 18' 52"	294° 12' 49"	-25° 56' 47"	0° 56' 14"	15' 19.48"	138° 52' 05"	0.99806
3	292° 14' 34"	-4° 17' 22"	294° 47' 44"	-25° 50' 00"	0° 56' 16"	15' 19.83"	133° 56' 54"	0.99786
4	292° 46' 48"	-4° 15' 51"	295° 22' 37"	-25° 43' 04"	0° 56' 17"	15' 20.19"	129° 28' 55"	0.99762
5	293° 19' 02"	-4° 14' 18"	295° 57' 28"	-25° 35' 59"	0° 56' 18"	15' 20.55"	125° 26' 46"	0.99734
6	293° 51' 18"	-4° 12' 44"	296° 32' 16"	-25° 28' 46"	0° 56' 19"	15' 20.91"	121° 48' 24"	0.99703
7	294° 23' 36"	-4° 11' 08"	297° 07' 01"	-25° 21' 24"	0° 56' 21"	15' 21.26"	118° 31' 32"	0.99668
8	294° 55' 55"	-4° 09' 31"	297° 41' 44"	-25° 13' 54"	0° 56' 22"	15' 21.62"	115° 33' 49"	0.99629
9	295° 28' 15"	-4° 07' 52"	298° 16' 24"	-25° 06' 15"	0° 56' 23"	15' 21.98"	112° 53' 05"	0.99586
10	296° 00' 36"	-4° 06' 13"	298° 51' 01"	-24° 58' 28"	0° 56' 25"	15' 22.34"	110° 27' 15"	0.99540
11	296° 32' 59"	-4° 04' 31"	299° 25' 35"	-24° 50' 32"	0° 56' 26"	15' 22.69"	108° 14' 33"	0.99490
12	297° 05' 23"	-4° 02' 49"	300° 00' 06"	-24° 42' 28"	0° 56' 27"	15' 23.05"	106° 13' 22"	0.99436
13	297° 37' 49"	-4° 01' 05"	300° 34' 35"	-24° 34' 16"	0° 56' 29"	15' 23.41"	104° 22' 18"	0.99378
14	298° 10' 15"	-3° 59' 19"	301° 09' 00"	-24° 25' 55"	0° 56' 30"	15' 23.76"	102° 40' 09"	0.99316
15	298° 42' 43"	-3° 57' 32"	301° 43' 23"	-24° 17' 27"	0° 56' 31"	15' 24.12"	101° 5' 52"	0.99251
16	299° 15' 13"	-3° 55' 44"	302° 17' 42"	-24° 08' 50"	0° 56' 33"	15' 24.48"	99° 38' 32"	0.99182
17	299° 47' 44"	-3° 53' 54"	302° 51' 58"	-24° 00' 05"	0° 56' 34"	15' 24.83"	98° 17' 24"	0.99109
18	300° 20' 16"	-3° 52' 04"	303° 26' 11"	-23° 51' 12"	0° 56' 35"	15' 25.19"	97° 1' 46"	0.99032
19	300° 52' 49"	-3° 50' 11"	304° 00' 21"	-23° 42' 12"	0° 56' 37"	15' 25.55"	95° 51' 04"	0.98951
20	301° 25' 24"	-3° 48' 18"	304° 34' 27"	-23° 33' 03"	0° 56' 38"	15' 25.90"	94° 44' 46"	0.98867
21	301° 57' 60"	-3° 46' 23"	305° 08' 31"	-23° 23' 46"	0° 56' 39"	15' 26.26"	93° 42' 26"	0.98779
22	302° 30' 37"	-3° 44' 26"	305° 42' 30"	-23° 14' 22"	0° 56' 40"	15' 26.61"	92° 43' 41"	0.98687
23	303° 03' 15"	-3° 42' 29"	306° 16' 27"	-23° 04' 50"	0° 56' 42"	15' 26.97"	91° 48' 10"	0.98591
24	303° 35' 55"	-3° 40' 30"	306° 50' 20"	-22° 55' 10"	0° 56' 43"	15' 27.32"	90° 55' 36"	0.98491

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	109° 55' 32"	-0.68"	111° 33' 14"	21° 57' 36"	1.0165112	15'44.04"	23° 26' 18"	-5 m 39 s
1	109° 57' 55"	-0.68"	111° 35' 46"	21° 57' 15"	1.0165099	15'44.04"	23° 26' 18"	-5 m 39 s
2	110° 00' 18"	-0.68"	111° 38' 19"	21° 56' 54"	1.0165086	15'44.05"	23° 26' 18"	-5 m 39 s
3	110° 02' 41"	-0.67"	111° 40' 51"	21° 56' 33"	1.0165073	15'44.05"	23° 26' 18"	-5 m 40 s
4	110° 05' 04"	-0.67"	111° 43' 24"	21° 56' 12"	1.0165060	15'44.05"	23° 26' 18"	-5 m 40 s
5	110° 07' 27"	-0.66"	111° 45' 56"	21° 55' 51"	1.0165047	15'44.05"	23° 26' 18"	-5 m 40 s
6	110° 09' 50"	-0.66"	111° 48' 29"	21° 55' 30"	1.0165034	15'44.05"	23° 26' 18"	-5 m 40 s
7	110° 12' 13"	-0.65"	111° 51' 01"	21° 55' 09"	1.0165021	15'44.05"	23° 26' 18"	-5 m 41 s
8	110° 14' 36"	-0.65"	111° 53' 34"	21° 54' 48"	1.0165007	15'44.05"	23° 26' 18"	-5 m 41 s
9	110° 16' 59"	-0.65"	111° 56' 06"	21° 54' 26"	1.0164994	15'44.05"	23° 26' 18"	-5 m 41 s
10	110° 19' 22"	-0.64"	111° 58' 39"	21° 54' 05"	1.0164980	15'44.05"	23° 26' 18"	-5 m 42 s
11	110° 21' 45"	-0.64"	112° 01' 11"	21° 53' 44"	1.0164967	15'44.06"	23° 26' 18"	-5 m 42 s
12	110° 24' 08"	-0.63"	112° 03' 43"	21° 53' 22"	1.0164953	15'44.06"	23° 26' 18"	-5 m 42 s
13	110° 26' 31"	-0.63"	112° 06' 16"	21° 53' 01"	1.0164940	15'44.06"	23° 26' 18"	-5 m 43 s
14	110° 28' 54"	-0.62"	112° 08' 48"	21° 52' 40"	1.0164926	15'44.06"	23° 26' 18"	-5 m 43 s
15	110° 31' 17"	-0.62"	112° 11' 21"	21° 52' 18"	1.0164912	15'44.06"	23° 26' 18"	-5 m 43 s
16	110° 33' 40"	-0.61"	112° 13' 53"	21° 51' 57"	1.0164898	15'44.06"	23° 26' 18"	-5 m 44 s
17	110° 36' 03"	-0.61"	112° 16' 25"	21° 51' 35"	1.0164885	15'44.06"	23° 26' 18"	-5 m 44 s
18	110° 38' 26"	-0.60"	112° 18' 58"	21° 51' 14"	1.0164871	15'44.07"	23° 26' 18"	-5 m 44 s
19	110° 40' 49"	-0.60"	112° 21' 30"	21° 50' 52"	1.0164857	15'44.07"	23° 26' 18"	-5 m 44 s
20	110° 43' 12"	-0.59"	112° 24' 02"	21° 50' 30"	1.0164843	15'44.07"	23° 26' 18"	-5 m 45 s
21	110° 45' 35"	-0.59"	112° 26' 34"	21° 50' 09"	1.0164829	15'44.07"	23° 26' 18"	-5 m 45 s
22	110° 47' 58"	-0.59"	112° 29' 07"	21° 49' 47"	1.0164814	15'44.07"	23° 26' 18"	-5 m 45 s
23	110° 50' 21"	-0.58"	112° 31' 39"	21° 49' 25"	1.0164800	15'44.07"	23° 26' 18"	-5 m 46 s
24	110° 52' 44"	-0.58"	112° 34' 11"	21° 49' 03"	1.0164786	15'44.07"	23° 26' 18"	-5 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	303° 35' 55"	-3° 40' 30"	306° 50' 20"	-22° 55' 10"	0° 56' 43"	15' 27.32"	90° 55' 36"	0.98491
1	304° 08' 36"	-3° 38' 30"	307° 24' 10"	-22° 45' 22"	0° 56' 44"	15' 27.68"	90° 5' 42"	0.98388
2	304° 41' 19"	-3° 36' 28"	307° 57' 57"	-22° 35' 27"	0° 56' 46"	15' 28.03"	89° 18' 15"	0.98280
3	305° 14' 02"	-3° 34' 25"	308° 31' 40"	-22° 25' 25"	0° 56' 47"	15' 28.39"	88° 33' 03"	0.98169
4	305° 46' 47"	-3° 32' 21"	309° 05' 19"	-22° 15' 15"	0° 56' 48"	15' 28.74"	87° 49' 54"	0.98054
5	306° 19' 34"	-3° 30' 16"	309° 38' 55"	-22° 04' 58"	0° 56' 50"	15' 29.09"	87° 8' 39"	0.97935
6	306° 52' 21"	-3° 28' 09"	310° 12' 28"	-21° 54' 33"	0° 56' 51"	15' 29.44"	86° 29' 08"	0.97812
7	307° 25' 10"	-3° 26' 02"	310° 45' 57"	-21° 44' 01"	0° 56' 52"	15' 29.79"	85° 51' 15"	0.97686
8	307° 57' 60"	-3° 23' 53"	311° 19' 23"	-21° 33' 22"	0° 56' 53"	15' 30.15"	85° 14' 52"	0.97556
9	308° 30' 51"	-3° 21' 42"	311° 52' 45"	-21° 22' 36"	0° 56' 55"	15' 30.50"	84° 39' 53"	0.97422
10	309° 03' 43"	-3° 19' 31"	312° 26' 03"	-21° 11' 42"	0° 56' 56"	15' 30.85"	84° 6' 12"	0.97284
11	309° 36' 37"	-3° 17' 18"	312° 59' 18"	-21° 00' 42"	0° 56' 57"	15' 31.20"	83° 33' 44"	0.97142
12	310° 09' 32"	-3° 15' 04"	313° 32' 30"	-20° 49' 35"	0° 56' 59"	15' 31.54"	83° 2' 25"	0.96996
13	310° 42' 28"	-3° 12' 49"	314° 05' 38"	-20° 38' 21"	0° 56' 60"	15' 31.89"	82° 32' 09"	0.96847
14	311° 15' 26"	-3° 10' 33"	314° 38' 42"	-20° 26' 60"	0° 57' 01"	15' 32.24"	82° 2' 54"	0.96694
15	311° 48' 24"	-3° 08' 15"	315° 11' 43"	-20° 15' 32"	0° 57' 02"	15' 32.59"	81° 34' 35"	0.96537
16	312° 21' 24"	-3° 05' 57"	315° 44' 41"	-20° 03' 58"	0° 57' 04"	15' 32.93"	81° 7' 10"	0.96376
17	312° 54' 25"	-3° 03' 37"	316° 17' 35"	-19° 52' 17"	0° 57' 05"	15' 33.28"	80° 40' 36"	0.96211
18	313° 27' 28"	-3° 01' 16"	316° 50' 25"	-19° 40' 30"	0° 57' 06"	15' 33.62"	80° 14' 50"	0.96043
19	314° 00' 31"	-2° 58' 54"	317° 23' 12"	-19° 28' 36"	0° 57' 07"	15' 33.97"	79° 49' 49"	0.95871
20	314° 33' 36"	-2° 56' 31"	317° 55' 55"	-19° 16' 35"	0° 57' 09"	15' 34.31"	79° 25' 31"	0.95695
21	315° 06' 42"	-2° 54' 07"	318° 28' 35"	-19° 04' 29"	0° 57' 10"	15' 34.65"	79° 1' 55"	0.95515
22	315° 39' 49"	-2° 51' 41"	319° 01' 11"	-18° 52' 16"	0° 57' 11"	15' 34.99"	78° 38' 57"	0.95332
23	316° 12' 57"	-2° 49' 15"	319° 33' 44"	-18° 39' 57"	0° 57' 12"	15' 35.34"	78° 16' 38"	0.95145
24	316° 46' 07"	-2° 46' 48"	320° 06' 14"	-18° 27' 32"	0° 57' 14"	15' 35.68"	77° 54' 54"	0.94954

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	110° 52' 44"	-0.58"	112° 34' 11"	21° 49' 03"	1.0164786	15'44.07"	23° 26' 18"	-5 m 46 s
1	110° 55' 07"	-0.57"	112° 36' 44"	21° 48' 41"	1.0164772	15'44.07"	23° 26' 18"	-5 m 46 s
2	110° 57' 30"	-0.57"	112° 39' 16"	21° 48' 20"	1.0164757	15'44.08"	23° 26' 18"	-5 m 47 s
3	110° 59' 53"	-0.56"	112° 41' 48"	21° 47' 58"	1.0164743	15'44.08"	23° 26' 18"	-5 m 47 s
4	111° 02' 16"	-0.56"	112° 44' 20"	21° 47' 36"	1.0164728	15'44.08"	23° 26' 18"	-5 m 47 s
5	111° 04' 39"	-0.55"	112° 46' 52"	21° 47' 14"	1.0164714	15'44.08"	23° 26' 18"	-5 m 47 s
6	111° 07' 02"	-0.55"	112° 49' 25"	21° 46' 52"	1.0164699	15'44.08"	23° 26' 18"	-5 m 48 s
7	111° 09' 25"	-0.54"	112° 51' 57"	21° 46' 30"	1.0164684	15'44.08"	23° 26' 18"	-5 m 48 s
8	111° 11' 48"	-0.54"	112° 54' 29"	21° 46' 07"	1.0164670	15'44.08"	23° 26' 18"	-5 m 48 s
9	111° 14' 11"	-0.53"	112° 57' 01"	21° 45' 45"	1.0164655	15'44.09"	23° 26' 18"	-5 m 49 s
10	111° 16' 34"	-0.53"	112° 59' 33"	21° 45' 23"	1.0164640	15'44.09"	23° 26' 18"	-5 m 49 s
11	111° 18' 57"	-0.52"	113° 02' 05"	21° 45' 01"	1.0164625	15'44.09"	23° 26' 18"	-5 m 49 s
12	111° 21' 20"	-0.52"	113° 04' 37"	21° 44' 39"	1.0164610	15'44.09"	23° 26' 18"	-5 m 49 s
13	111° 23' 43"	-0.51"	113° 07' 09"	21° 44' 16"	1.0164595	15'44.09"	23° 26' 18"	-5 m 50 s
14	111° 26' 06"	-0.50"	113° 09' 42"	21° 43' 54"	1.0164580	15'44.09"	23° 26' 18"	-5 m 50 s
15	111° 28' 29"	-0.50"	113° 12' 14"	21° 43' 32"	1.0164565	15'44.09"	23° 26' 18"	-5 m 50 s
16	111° 30' 52"	-0.49"	113° 14' 46"	21° 43' 09"	1.0164549	15'44.09"	23° 26' 18"	-5 m 51 s
17	111° 33' 15"	-0.49"	113° 17' 18"	21° 42' 47"	1.0164534	15'44.10"	23° 26' 18"	-5 m 51 s
18	111° 35' 38"	-0.48"	113° 19' 50"	21° 42' 24"	1.0164519	15'44.10"	23° 26' 18"	-5 m 51 s
19	111° 38' 01"	-0.48"	113° 22' 22"	21° 42' 02"	1.0164503	15'44.10"	23° 26' 18"	-5 m 51 s
20	111° 40' 24"	-0.47"	113° 24' 54"	21° 41' 39"	1.0164488	15'44.10"	23° 26' 18"	-5 m 52 s
21	111° 42' 47"	-0.47"	113° 27' 26"	21° 41' 16"	1.0164472	15'44.10"	23° 26' 18"	-5 m 52 s
22	111° 45' 10"	-0.46"	113° 29' 58"	21° 40' 54"	1.0164457	15'44.10"	23° 26' 18"	-5 m 52 s
23	111° 47' 33"	-0.46"	113° 32' 30"	21° 40' 31"	1.0164441	15'44.11"	23° 26' 18"	-5 m 53 s
24	111° 49' 56"	-0.45"	113° 35' 02"	21° 40' 08"	1.0164425	15'44.11"	23° 26' 18"	-5 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	316° 46' 07"	-2° 46' 48"	320° 06' 14"	-18° 27' 32"	0° 57' 14"	15' 35.68"	77° 54' 54"	0.94954
1	317° 19' 18"	-2° 44' 19"	320° 38' 40"	-18° 15' 01"	0° 57' 15"	15' 36.02"	77° 33' 44"	0.94759
2	317° 52' 29"	-2° 41' 50"	321° 11' 02"	-18° 02' 23"	0° 57' 16"	15' 36.35"	77° 13' 07"	0.94560
3	318° 25' 43"	-2° 39' 19"	321° 43' 21"	-17° 49' 40"	0° 57' 17"	15' 36.69"	76° 53' 02"	0.94358
4	318° 58' 57"	-2° 36' 48"	322° 15' 37"	-17° 36' 51"	0° 57' 19"	15' 37.03"	76° 33' 27"	0.94152
5	319° 32' 12"	-2° 34' 15"	322° 47' 50"	-17° 23' 57"	0° 57' 20"	15' 37.37"	76° 14' 22"	0.93943
6	320° 05' 29"	-2° 31' 41"	323° 19' 59"	-17° 10' 56"	0° 57' 21"	15' 37.70"	75° 55' 44"	0.93729
7	320° 38' 47"	-2° 29' 07"	323° 52' 05"	-16° 57' 50"	0° 57' 22"	15' 38.03"	75° 37' 34"	0.93513
8	321° 12' 06"	-2° 26' 31"	324° 24' 08"	-16° 44' 39"	0° 57' 24"	15' 38.37"	75° 19' 50"	0.93292
9	321° 45' 26"	-2° 23' 55"	324° 56' 07"	-16° 31' 22"	0° 57' 25"	15' 38.70"	75° 2' 32"	0.93068
10	322° 18' 47"	-2° 21' 18"	325° 28' 04"	-16° 17' 60"	0° 57' 26"	15' 39.03"	74° 45' 38"	0.92840
11	322° 52' 09"	-2° 18' 39"	325° 59' 57"	-16° 04' 32"	0° 57' 27"	15' 39.36"	74° 29' 08"	0.92608
12	323° 25' 33"	-2° 16' 00"	326° 31' 47"	-15° 50' 59"	0° 57' 28"	15' 39.69"	74° 13' 01"	0.92373
13	323° 58' 58"	-2° 13' 20"	327° 03' 34"	-15° 37' 21"	0° 57' 30"	15' 40.02"	73° 57' 17"	0.92134
14	324° 32' 23"	-2° 10' 39"	327° 35' 18"	-15° 23' 38"	0° 57' 31"	15' 40.35"	73° 41' 55"	0.91891
15	325° 05' 50"	-2° 07' 57"	328° 06' 59"	-15° 09' 49"	0° 57' 32"	15' 40.68"	73° 26' 54"	0.91645
16	325° 39' 18"	-2° 05' 15"	328° 38' 36"	-14° 55' 56"	0° 57' 33"	15' 41.00"	73° 12' 13"	0.91396
17	326° 12' 48"	-2° 02' 31"	329° 10' 11"	-14° 41' 58"	0° 57' 34"	15' 41.33"	72° 57' 53"	0.91143
18	326° 46' 18"	-1° 59' 47"	329° 41' 44"	-14° 27' 55"	0° 57' 36"	15' 41.65"	72° 43' 53"	0.90886
19	327° 19' 50"	-1° 57' 02"	330° 13' 13"	-14° 13' 48"	0° 57' 37"	15' 41.97"	72° 30' 12"	0.90625
20	327° 53' 22"	-1° 54' 16"	330° 44' 39"	-13° 59' 35"	0° 57' 38"	15' 42.30"	72° 16' 49"	0.90362
21	328° 26' 56"	-1° 51' 29"	331° 16' 03"	-13° 45' 19"	0° 57' 39"	15' 42.62"	72° 3' 46"	0.90094
22	329° 00' 31"	-1° 48' 42"	331° 47' 24"	-13° 30' 57"	0° 57' 40"	15' 42.94"	71° 50' 60"	0.89824
23	329° 34' 07"	-1° 45' 54"	332° 18' 42"	-13° 16' 31"	0° 57' 42"	15' 43.25"	71° 38' 32"	0.89549
24	330° 07' 44"	-1° 43' 05"	332° 49' 58"	-13° 02' 01"	0° 57' 43"	15' 43.57"	71° 26' 21"	0.89272

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	111° 49' 56"	-0.45"	113° 35' 02"	21° 40' 08"	1.0164425	15'44.11"	23° 26' 18"	-5 m 53 s
1	111° 52' 20"	-0.45"	113° 37' 34"	21° 39' 45"	1.0164410	15'44.11"	23° 26' 18"	-5 m 53 s
2	111° 54' 43"	-0.44"	113° 40' 05"	21° 39' 23"	1.0164394	15'44.11"	23° 26' 18"	-5 m 53 s
3	111° 57' 06"	-0.44"	113° 42' 37"	21° 38' 60"	1.0164378	15'44.11"	23° 26' 18"	-5 m 54 s
4	111° 59' 29"	-0.43"	113° 45' 09"	21° 38' 37"	1.0164362	15'44.11"	23° 26' 18"	-5 m 54 s
5	112° 01' 52"	-0.42"	113° 47' 41"	21° 38' 14"	1.0164346	15'44.11"	23° 26' 18"	-5 m 54 s
6	112° 04' 15"	-0.42"	113° 50' 13"	21° 37' 51"	1.0164330	15'44.12"	23° 26' 18"	-5 m 54 s
7	112° 06' 38"	-0.41"	113° 52' 45"	21° 37' 28"	1.0164314	15'44.12"	23° 26' 18"	-5 m 55 s
8	112° 09' 01"	-0.41"	113° 55' 17"	21° 37' 05"	1.0164297	15'44.12"	23° 26' 18"	-5 m 55 s
9	112° 11' 24"	-0.40"	113° 57' 49"	21° 36' 42"	1.0164281	15'44.12"	23° 26' 18"	-5 m 55 s
10	112° 13' 47"	-0.40"	114° 00' 20"	21° 36' 19"	1.0164265	15'44.12"	23° 26' 18"	-5 m 56 s
11	112° 16' 10"	-0.39"	114° 02' 52"	21° 35' 56"	1.0164248	15'44.12"	23° 26' 18"	-5 m 56 s
12	112° 18' 33"	-0.39"	114° 05' 24"	21° 35' 32"	1.0164232	15'44.12"	23° 26' 18"	-5 m 56 s
13	112° 20' 56"	-0.38"	114° 07' 56"	21° 35' 09"	1.0164215	15'44.13"	23° 26' 18"	-5 m 56 s
14	112° 23' 19"	-0.37"	114° 10' 28"	21° 34' 46"	1.0164199	15'44.13"	23° 26' 18"	-5 m 57 s
15	112° 25' 42"	-0.37"	114° 12' 59"	21° 34' 23"	1.0164182	15'44.13"	23° 26' 18"	-5 m 57 s
16	112° 28' 05"	-0.36"	114° 15' 31"	21° 33' 59"	1.0164166	15'44.13"	23° 26' 18"	-5 m 57 s
17	112° 30' 28"	-0.36"	114° 18' 03"	21° 33' 36"	1.0164149	15'44.13"	23° 26' 18"	-5 m 57 s
18	112° 32' 51"	-0.35"	114° 20' 35"	21° 33' 12"	1.0164132	15'44.13"	23° 26' 18"	-5 m 58 s
19	112° 35' 14"	-0.35"	114° 23' 06"	21° 32' 49"	1.0164115	15'44.14"	23° 26' 18"	-5 m 58 s
20	112° 37' 37"	-0.34"	114° 25' 38"	21° 32' 25"	1.0164098	15'44.14"	23° 26' 18"	-5 m 58 s
21	112° 40' 00"	-0.34"	114° 28' 10"	21° 32' 02"	1.0164081	15'44.14"	23° 26' 18"	-5 m 58 s
22	112° 42' 23"	-0.33"	114° 30' 41"	21° 31' 38"	1.0164064	15'44.14"	23° 26' 18"	-5 m 59 s
23	112° 44' 46"	-0.32"	114° 33' 13"	21° 31' 15"	1.0164047	15'44.14"	23° 26' 18"	-5 m 59 s
24	112° 47' 10"	-0.32"	114° 35' 45"	21° 30' 51"	1.0164029	15'44.14"	23° 26' 18"	-5 m 59 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	330° 07' 44"	-1° 43' 05"	332° 49' 58"	-13° 02' 01"	0° 57' 43"	15' 43.57"	71° 26' 21"	0.89272
1	330° 41' 22"	-1° 40' 15"	333° 21' 12"	-12° 47' 27"	0° 57' 44"	15' 43.89"	71° 14' 27"	0.88990
2	331° 15' 02"	-1° 37' 25"	333° 52' 22"	-12° 32' 48"	0° 57' 45"	15' 44.20"	71° 2' 50"	0.88706
3	331° 48' 42"	-1° 34' 34"	334° 23' 31"	-12° 18' 05"	0° 57' 46"	15' 44.52"	70° 51' 30"	0.88418
4	332° 22' 23"	-1° 31' 42"	334° 54' 36"	-12° 03' 19"	0° 57' 47"	15' 44.83"	70° 40' 25"	0.88127
5	332° 56' 06"	-1° 28' 50"	335° 25' 40"	-11° 48' 28"	0° 57' 48"	15' 45.14"	70° 29' 36"	0.87832
6	333° 29' 50"	-1° 25' 57"	335° 56' 41"	-11° 33' 33"	0° 57' 50"	15' 45.46"	70° 19' 03"	0.87534
7	334° 03' 35"	-1° 23' 04"	336° 27' 40"	-11° 18' 35"	0° 57' 51"	15' 45.77"	70° 8' 45"	0.87232
8	334° 37' 21"	-1° 20' 10"	336° 58' 37"	-11° 03' 32"	0° 57' 52"	15' 46.07"	69° 58' 42"	0.86928
9	335° 11' 08"	-1° 17' 15"	337° 29' 32"	-10° 48' 26"	0° 57' 53"	15' 46.38"	69° 48' 55"	0.86620
10	335° 44' 56"	-1° 14' 20"	338° 00' 24"	-10° 33' 17"	0° 57' 54"	15' 46.69"	69° 39' 21"	0.86309
11	336° 18' 45"	-1° 11' 24"	338° 31' 15"	-10° 18' 04"	0° 57' 55"	15' 46.99"	69° 30' 03"	0.85994
12	336° 52' 35"	-1° 08' 27"	339° 02' 04"	-10° 02' 47"	0° 57' 56"	15' 47.30"	69° 20' 58"	0.85676
13	337° 26' 26"	-1° 05' 31"	339° 32' 51"	-9° 47' 27"	0° 57' 57"	15' 47.60"	69° 12' 08"	0.85355
14	338° 00' 19"	-1° 02' 33"	340° 03' 36"	-9° 32' 04"	0° 57' 59"	15' 47.90"	69° 3' 32"	0.85031
15	338° 34' 12"	0°-59' 35"	340° 34' 19"	-9° 16' 37"	0° 57' 60"	15' 48.20"	68° 55' 09"	0.84704
16	339° 08' 07"	0°-56' 37"	341° 05' 01"	-9° 01' 08"	0° 58' 01"	15' 48.50"	68° 46' 60"	0.84374
17	339° 42' 03"	0°-53' 38"	341° 35' 41"	-8° 45' 35"	0° 58' 02"	15' 48.80"	68° 39' 04"	0.84040
18	340° 15' 59"	0°-50' 39"	342° 06' 19"	-8° 29' 59"	0° 58' 03"	15' 49.10"	68° 31' 22"	0.83704
19	340° 49' 57"	0°-47' 40"	342° 36' 56"	-8° 14' 21"	0° 58' 04"	15' 49.40"	68° 23' 53"	0.83364
20	341° 23' 56"	0°-44' 40"	343° 07' 32"	-7° 58' 39"	0° 58' 05"	15' 49.69"	68° 16' 37"	0.83021
21	341° 57' 56"	0°-41' 39"	343° 38' 06"	-7° 42' 55"	0° 58' 06"	15' 49.98"	68° 9' 34"	0.82676
22	342° 31' 57"	0°-38' 39"	344° 08' 39"	-7° 27' 08"	0° 58' 07"	15' 50.28"	68° 2' 44"	0.82327
23	343° 05' 59"	0°-35' 37"	344° 39' 11"	-7° 11' 19"	0° 58' 08"	15' 50.57"	67° 56' 06"	0.81975
24	343° 40' 02"	0°-32' 36"	345° 09' 41"	-6° 55' 26"	0° 58' 09"	15' 50.86"	67° 49' 41"	0.81621

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	112° 47' 10"	-0.32"	114° 35' 45"	21° 30' 51"	1.0164029	15'44.14"	23° 26' 18"	-5 m 59 s
1	112° 49' 33"	-0.31"	114° 38' 16"	21° 30' 27"	1.0164012	15'44.14"	23° 26' 18"	-5 m 59 s
2	112° 51' 56"	-0.31"	114° 40' 48"	21° 30' 04"	1.0163995	15'44.15"	23° 26' 18"	-5 m 60 s
3	112° 54' 19"	-0.30"	114° 43' 20"	21° 29' 40"	1.0163977	15'44.15"	23° 26' 18"	-5 m 60 s
4	112° 56' 42"	-0.30"	114° 45' 51"	21° 29' 16"	1.0163960	15'44.15"	23° 26' 18"	-6 m 00 s
5	112° 59' 05"	-0.29"	114° 48' 23"	21° 28' 52"	1.0163942	15'44.15"	23° 26' 18"	-6 m 00 s
6	113° 01' 28"	-0.29"	114° 50' 54"	21° 28' 28"	1.0163925	15'44.15"	23° 26' 18"	-6 m 01 s
7	113° 03' 51"	-0.28"	114° 53' 26"	21° 28' 04"	1.0163907	15'44.15"	23° 26' 18"	-6 m 01 s
8	113° 06' 14"	-0.27"	114° 55' 57"	21° 27' 40"	1.0163889	15'44.16"	23° 26' 18"	-6 m 01 s
9	113° 08' 37"	-0.27"	114° 58' 29"	21° 27' 16"	1.0163871	15'44.16"	23° 26' 18"	-6 m 01 s
10	113° 11' 00"	-0.26"	115° 01' 01"	21° 26' 52"	1.0163854	15'44.16"	23° 26' 18"	-6 m 02 s
11	113° 13' 23"	-0.26"	115° 03' 32"	21° 26' 28"	1.0163836	15'44.16"	23° 26' 18"	-6 m 02 s
12	113° 15' 46"	-0.25"	115° 06' 04"	21° 26' 04"	1.0163818	15'44.16"	23° 26' 18"	-6 m 02 s
13	113° 18' 09"	-0.25"	115° 08' 35"	21° 25' 40"	1.0163800	15'44.16"	23° 26' 18"	-6 m 02 s
14	113° 20' 32"	-0.24"	115° 11' 07"	21° 25' 16"	1.0163781	15'44.17"	23° 26' 18"	-6 m 03 s
15	113° 22' 55"	-0.23"	115° 13' 38"	21° 24' 52"	1.0163763	15'44.17"	23° 26' 18"	-6 m 03 s
16	113° 25' 18"	-0.23"	115° 16' 09"	21° 24' 27"	1.0163745	15'44.17"	23° 26' 18"	-6 m 03 s
17	113° 27' 42"	-0.22"	115° 18' 41"	21° 24' 03"	1.0163727	15'44.17"	23° 26' 18"	-6 m 03 s
18	113° 30' 05"	-0.22"	115° 21' 12"	21° 23' 39"	1.0163708	15'44.17"	23° 26' 18"	-6 m 04 s
19	113° 32' 28"	-0.21"	115° 23' 44"	21° 23' 14"	1.0163690	15'44.17"	23° 26' 18"	-6 m 04 s
20	113° 34' 51"	-0.21"	115° 26' 15"	21° 22' 50"	1.0163671	15'44.18"	23° 26' 18"	-6 m 04 s
21	113° 37' 14"	-0.20"	115° 28' 46"	21° 22' 25"	1.0163652	15'44.18"	23° 26' 18"	-6 m 04 s
22	113° 39' 37"	-0.20"	115° 31' 18"	21° 22' 01"	1.0163634	15'44.18"	23° 26' 18"	-6 m 05 s
23	113° 42' 00"	-0.19"	115° 33' 49"	21° 21' 36"	1.0163615	15'44.18"	23° 26' 18"	-6 m 05 s
24	113° 44' 23"	-0.18"	115° 36' 21"	21° 21' 12"	1.0163596	15'44.18"	23° 26' 18"	-6 m 05 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	343° 40' 02"	0°-32' 36"	345° 09' 41"	-6° 55' 26"	0° 58' 09"	15' 50.86"	67° 49' 41"	0.81621
1	344° 14' 06"	0°-29' 34"	345° 40' 11"	-6° 39' 32"	0° 58' 10"	15' 51.15"	67° 43' 29"	0.81263
2	344° 48' 11"	0°-26' 32"	346° 10' 39"	-6° 23' 35"	0° 58' 12"	15' 51.43"	67° 37' 29"	0.80903
3	345° 22' 18"	0°-23' 30"	346° 41' 07"	-6° 07' 36"	0° 58' 13"	15' 51.72"	67° 31' 41"	0.80540
4	345° 56' 25"	0°-20' 28"	347° 11' 33"	-5° 51' 34"	0° 58' 14"	15' 52.01"	67° 26' 05"	0.80174
5	346° 30' 33"	0°-17' 25"	347° 41' 59"	-5° 35' 30"	0° 58' 15"	15' 52.29"	67° 20' 41"	0.79805
6	347° 04' 43"	0°-14' 25"	348° 12' 25"	-5° 19' 27"	0° 58' 16"	15' 52.57"	67° 15' 32"	0.79433
7	347° 38' 54"	0°-11' 21"	348° 42' 50"	-5° 03' 19"	0° 58' 17"	15' 52.85"	67° 10' 32"	0.79059
8	348° 13' 05"	0° -8' 18"	349° 13' 14"	-4° 47' 09"	0° 58' 18"	15' 53.13"	67° 5' 44"	0.78682
9	348° 47' 18"	0° -5' 15"	349° 43' 37"	-4° 30' 58"	0° 58' 19"	15' 53.41"	67° 1' 08"	0.78302
10	349° 21' 32"	0° -2' 11"	350° 14' 00"	-4° 14' 45"	0° 58' 20"	15' 53.69"	66° 56' 44"	0.77919
11	349° 55' 46"	0° 00' 53"	350° 44' 23"	-3° 58' 29"	0° 58' 21"	15' 53.97"	66° 52' 31"	0.77534
12	350° 30' 02"	0° 03' 56"	351° 14' 45"	-3° 42' 13"	0° 58' 22"	15' 54.24"	66° 48' 30"	0.77147
13	351° 04' 19"	0° 07' 00"	351° 45' 07"	-3° 25' 55"	0° 58' 23"	15' 54.51"	66° 44' 41"	0.76756
14	351° 38' 37"	0° 10' 04"	352° 15' 30"	-3° 09' 35"	0° 58' 24"	15' 54.79"	66° 41' 03"	0.76364
15	352° 12' 56"	0° 13' 08"	352° 45' 52"	-2° 53' 14"	0° 58' 25"	15' 55.06"	66° 37' 36"	0.75968
16	352° 47' 16"	0° 16' 12"	353° 16' 14"	-2° 36' 52"	0° 58' 26"	15' 55.33"	66° 34' 21"	0.75570
17	353° 21' 37"	0° 19' 16"	353° 46' 36"	-2° 20' 28"	0° 58' 27"	15' 55.60"	66° 31' 17"	0.75170
18	353° 55' 59"	0° 22' 20"	354° 16' 58"	-2° 04' 03"	0° 58' 28"	15' 55.86"	66° 28' 24"	0.74768
19	354° 30' 22"	0° 25' 24"	354° 47' 21"	-1° 47' 37"	0° 58' 29"	15' 56.13"	66° 25' 43"	0.74363
20	355° 04' 46"	0° 28' 28"	355° 17' 44"	-1° 31' 10"	0° 58' 30"	15' 56.39"	66° 23' 13"	0.73955
21	355° 39' 11"	0° 31' 32"	355° 48' 07"	-1° 14' 43"	0° 58' 31"	15' 56.66"	66° 20' 54"	0.73546
22	356° 13' 37"	0° 34' 36"	356° 18' 31"	0°-58' 14"	0° 58' 32"	15' 56.92"	66° 18' 46"	0.73134
23	356° 48' 05"	0° 37' 40"	356° 48' 56"	0°-41' 45"	0° 58' 33"	15' 57.18"	66° 16' 49"	0.72719
24	357° 22' 33"	0° 40' 43"	357° 19' 21"	0°-25' 15"	0° 58' 34"	15' 57.44"	66° 15' 03"	0.72303

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	113° 44' 23"	-0.18"	115° 36' 21"	21° 21' 12"	1.0163596	15'44.18"	23° 26' 18"	-6 m 05 s
1	113° 46' 46"	-0.18"	115° 38' 52"	21° 20' 47"	1.0163577	15'44.19"	23° 26' 18"	-6 m 05 s
2	113° 49' 09"	-0.17"	115° 41' 23"	21° 20' 23"	1.0163558	15'44.19"	23° 26' 18"	-6 m 06 s
3	113° 51' 32"	-0.17"	115° 43' 54"	21° 19' 58"	1.0163539	15'44.19"	23° 26' 18"	-6 m 06 s
4	113° 53' 55"	-0.16"	115° 46' 26"	21° 19' 33"	1.0163520	15'44.19"	23° 26' 18"	-6 m 06 s
5	113° 56' 18"	-0.16"	115° 48' 57"	21° 19' 08"	1.0163501	15'44.19"	23° 26' 18"	-6 m 06 s
6	113° 58' 42"	-0.15"	115° 51' 28"	21° 18' 44"	1.0163482	15'44.19"	23° 26' 18"	-6 m 06 s
7	114° 01' 05"	-0.15"	115° 53' 60"	21° 18' 19"	1.0163462	15'44.20"	23° 26' 18"	-6 m 07 s
8	114° 03' 28"	-0.14"	115° 56' 31"	21° 17' 54"	1.0163443	15'44.20"	23° 26' 18"	-6 m 07 s
9	114° 05' 51"	-0.14"	115° 59' 02"	21° 17' 29"	1.0163423	15'44.20"	23° 26' 18"	-6 m 07 s
10	114° 08' 14"	-0.13"	116° 01' 33"	21° 17' 04"	1.0163404	15'44.20"	23° 26' 18"	-6 m 07 s
11	114° 10' 37"	-0.12"	116° 04' 04"	21° 16' 39"	1.0163384	15'44.20"	23° 26' 18"	-6 m 08 s
12	114° 13' 00"	-0.12"	116° 06' 36"	21° 16' 14"	1.0163365	15'44.21"	23° 26' 18"	-6 m 08 s
13	114° 15' 23"	-0.11"	116° 09' 07"	21° 15' 49"	1.0163345	15'44.21"	23° 26' 18"	-6 m 08 s
14	114° 17' 46"	-0.11"	116° 11' 38"	21° 15' 24"	1.0163325	15'44.21"	23° 26' 18"	-6 m 08 s
15	114° 20' 09"	-0.10"	116° 14' 09"	21° 14' 59"	1.0163305	15'44.21"	23° 26' 18"	-6 m 08 s
16	114° 22' 32"	-0.10"	116° 16' 40"	21° 14' 34"	1.0163285	15'44.21"	23° 26' 18"	-6 m 09 s
17	114° 24' 56"	-0.09"	116° 19' 11"	21° 14' 08"	1.0163265	15'44.21"	23° 26' 18"	-6 m 09 s
18	114° 27' 19"	-0.09"	116° 21' 42"	21° 13' 43"	1.0163245	15'44.22"	23° 26' 18"	-6 m 09 s
19	114° 29' 42"	-0.08"	116° 24' 14"	21° 13' 18"	1.0163225	15'44.22"	23° 26' 18"	-6 m 09 s
20	114° 32' 05"	-0.08"	116° 26' 45"	21° 12' 53"	1.0163204	15'44.22"	23° 26' 18"	-6 m 10 s
21	114° 34' 28"	-0.07"	116° 29' 16"	21° 12' 27"	1.0163184	15'44.22"	23° 26' 18"	-6 m 10 s
22	114° 36' 51"	-0.07"	116° 31' 47"	21° 12' 02"	1.0163164	15'44.22"	23° 26' 18"	-6 m 10 s
23	114° 39' 14"	-0.06"	116° 34' 18"	21° 11' 36"	1.0163143	15'44.23"	23° 26' 18"	-6 m 10 s
24	114° 41' 37"	-0.06"	116° 36' 49"	21° 11' 11"	1.0163123	15'44.23"	23° 26' 18"	-6 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	357° 22' 33"	0° 40' 43"	357° 19' 21"	0°-25' 15"	0° 58' 34"	15' 57.44"	66° 15' 03"	0.72303
1	357° 57' 02"	0° 43' 46"	357° 49' 47"	0° -8' 44"	0° 58' 34"	15' 57.69"	66° 13' 28"	0.71884
2	358° 31' 33"	0° 46' 50"	358° 20' 13"	0° 07' 47"	0° 58' 35"	15' 57.95"	66° 12' 04"	0.71464
3	359° 06' 04"	0° 49' 53"	358° 50' 41"	0° 24' 19"	0° 58' 36"	15' 58.21"	66° 10' 51"	0.71041
4	359° 40' 37"	0° 52' 56"	359° 21' 10"	0° 40' 51"	0° 58' 37"	15' 58.46"	66° 9' 49"	0.70616
5	0° 15' 10"	0° 55' 58"	359° 51' 39"	0° 57' 23"	0° 58' 38"	15' 58.71"	66° 8' 58"	0.70189
6	0° 49' 45"	0° 59' 00"	0° 22' 10"	1° 13' 56"	0° 58' 39"	15' 58.96"	66° 8' 17"	0.69760
7	1° 24' 20"	1° 02' 03"	0° 52' 42"	1° 30' 28"	0° 58' 40"	15' 59.21"	66° 7' 48"	0.69329
8	1° 58' 57"	1° 05' 04"	1° 23' 16"	1° 47' 01"	0° 58' 41"	15' 59.46"	66° 7' 29"	0.68896
9	2° 33' 35"	1° 08' 06"	1° 53' 50"	2° 03' 33"	0° 58' 42"	15' 59.70"	66° 7' 21"	0.68461
10	3° 08' 13"	1° 11' 07"	2° 24' 27"	2° 20' 06"	0° 58' 43"	15' 59.95"	66° 7' 24"	0.68024
11	3° 42' 53"	1° 14' 08"	2° 55' 04"	2° 36' 38"	0° 58' 44"	16' 00.19"	66° 7' 38"	0.67586
12	4° 17' 34"	1° 17' 08"	3° 25' 44"	2° 53' 10"	0° 58' 45"	16' 00.43"	66° 8' 02"	0.67146
13	4° 52' 15"	1° 20' 09"	3° 56' 25"	3° 09' 42"	0° 58' 45"	16' 00.67"	66° 8' 38"	0.66704
14	5° 26' 58"	1° 23' 08"	4° 27' 08"	3° 26' 13"	0° 58' 46"	16' 00.91"	66° 9' 24"	0.66260
15	6° 01' 42"	1° 26' 08"	4° 57' 53"	3° 42' 44"	0° 58' 47"	16' 01.15"	66° 10' 20"	0.65815
16	6° 36' 27"	1° 29' 06"	5° 28' 40"	3° 59' 14"	0° 58' 48"	16' 01.39"	66° 11' 28"	0.65368
17	7° 11' 13"	1° 32' 05"	5° 59' 29"	4° 15' 43"	0° 58' 49"	16' 01.62"	66° 12' 46"	0.64919
18	7° 45' 60"	1° 35' 03"	6° 30' 20"	4° 32' 12"	0° 58' 50"	16' 01.85"	66° 14' 15"	0.64469
19	8° 20' 48"	1° 38' 00"	7° 01' 13"	4° 48' 39"	0° 58' 51"	16' 02.08"	66° 15' 54"	0.64017
20	8° 55' 37"	1° 40' 57"	7° 32' 09"	5° 05' 06"	0° 58' 51"	16' 02.31"	66° 17' 44"	0.63564
21	9° 30' 26"	1° 43' 53"	8° 03' 07"	5° 21' 32"	0° 58' 52"	16' 02.54"	66° 19' 45"	0.63109
22	10° 05' 17"	1° 46' 49"	8° 34' 07"	5° 37' 56"	0° 58' 53"	16' 02.77"	66° 21' 57"	0.62653
23	10° 40' 09"	1° 49' 44"	9° 05' 10"	5° 54' 20"	0° 58' 54"	16' 02.99"	66° 24' 19"	0.62196
24	11° 15' 02"	1° 52' 39"	9° 36' 16"	6° 10' 42"	0° 58' 55"	16' 03.22"	66° 26' 52"	0.61737

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	114° 41' 37"	-0.06"	116° 36' 49"	21° 11' 11"	1.0163123	15'44.23"	23° 26' 18"	-6 m 10 s
1	114° 44' 00"	-0.05"	116° 39' 20"	21° 10' 45"	1.0163102	15'44.23"	23° 26' 18"	-6 m 11 s
2	114° 46' 24"	-0.05"	116° 41' 51"	21° 10' 20"	1.0163081	15'44.23"	23° 26' 18"	-6 m 11 s
3	114° 48' 47"	-0.04"	116° 44' 22"	21° 09' 54"	1.0163061	15'44.23"	23° 26' 18"	-6 m 11 s
4	114° 51' 10"	-0.03"	116° 46' 53"	21° 09' 29"	1.0163040	15'44.24"	23° 26' 18"	-6 m 11 s
5	114° 53' 33"	-0.03"	116° 49' 24"	21° 09' 03"	1.0163019	15'44.24"	23° 26' 18"	-6 m 11 s
6	114° 55' 56"	-0.02"	116° 51' 55"	21° 08' 37"	1.0162998	15'44.24"	23° 26' 18"	-6 m 12 s
7	114° 58' 19"	-0.02"	116° 54' 26"	21° 08' 11"	1.0162977	15'44.24"	23° 26' 18"	-6 m 12 s
8	115° 00' 42"	-0.01"	116° 56' 57"	21° 07' 46"	1.0162955	15'44.24"	23° 26' 18"	-6 m 12 s
9	115° 03' 05"	-0.01"	116° 59' 27"	21° 07' 20"	1.0162934	15'44.25"	23° 26' 18"	-6 m 12 s
10	115° 05' 28"	-0.00"	117° 01' 58"	21° 06' 54"	1.0162913	15'44.25"	23° 26' 18"	-6 m 12 s
11	115° 07' 52"	0.00"	117° 04' 29"	21° 06' 28"	1.0162891	15'44.25"	23° 26' 18"	-6 m 13 s
12	115° 10' 15"	0.01"	117° 07' 00"	21° 06' 02"	1.0162870	15'44.25"	23° 26' 18"	-6 m 13 s
13	115° 12' 38"	0.01"	117° 09' 31"	21° 05' 36"	1.0162848	15'44.25"	23° 26' 18"	-6 m 13 s
14	115° 15' 01"	0.01"	117° 12' 02"	21° 05' 10"	1.0162827	15'44.26"	23° 26' 18"	-6 m 13 s
15	115° 17' 24"	0.02"	117° 14' 33"	21° 04' 44"	1.0162805	15'44.26"	23° 26' 18"	-6 m 13 s
16	115° 19' 47"	0.02"	117° 17' 03"	21° 04' 18"	1.0162783	15'44.26"	23° 26' 18"	-6 m 14 s
17	115° 22' 10"	0.03"	117° 19' 34"	21° 03' 52"	1.0162761	15'44.26"	23° 26' 18"	-6 m 14 s
18	115° 24' 33"	0.03"	117° 22' 05"	21° 03' 26"	1.0162739	15'44.26"	23° 26' 18"	-6 m 14 s
19	115° 26' 57"	0.04"	117° 24' 36"	21° 02' 60"	1.0162717	15'44.27"	23° 26' 18"	-6 m 14 s
20	115° 29' 20"	0.04"	117° 27' 07"	21° 02' 33"	1.0162695	15'44.27"	23° 26' 18"	-6 m 14 s
21	115° 31' 43"	0.05"	117° 29' 37"	21° 02' 07"	1.0162673	15'44.27"	23° 26' 18"	-6 m 15 s
22	115° 34' 06"	0.05"	117° 32' 08"	21° 01' 41"	1.0162651	15'44.27"	23° 26' 18"	-6 m 15 s
23	115° 36' 29"	0.06"	117° 34' 39"	21° 01' 15"	1.0162628	15'44.27"	23° 26' 18"	-6 m 15 s
24	115° 38' 52"	0.06"	117° 37' 10"	21° 00' 48"	1.0162606	15'44.28"	23° 26' 18"	-6 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	11° 15' 02"	1° 52' 39"	9° 36' 16"	6° 10' 42"	0° 58' 55"	16' 03.22"	66° 26' 52"	0.61737
1	11° 49' 56"	1° 55' 33"	10° 07' 24"	6° 27' 02"	0° 58' 56"	16' 03.44"	66° 29' 35"	0.61277
2	12° 24' 52"	1° 58' 26"	10° 38' 36"	6° 43' 21"	0° 58' 56"	16' 03.66"	66° 32' 30"	0.60816
3	12° 59' 48"	2° 01' 19"	11° 09' 50"	6° 59' 39"	0° 58' 57"	16' 03.88"	66° 35' 35"	0.60354
4	13° 34' 45"	2° 04' 11"	11° 41' 07"	7° 15' 55"	0° 58' 58"	16' 04.09"	66° 38' 50"	0.59890
5	14° 09' 43"	2° 07' 02"	12° 12' 27"	7° 32' 09"	0° 58' 59"	16' 04.31"	66° 42' 17"	0.59425
6	14° 44' 42"	2° 09' 53"	12° 43' 50"	7° 48' 22"	0° 58' 60"	16' 04.52"	66° 45' 54"	0.58960
7	15° 19' 42"	2° 12' 43"	13° 15' 17"	8° 04' 32"	0° 59' 00"	16' 04.73"	66° 49' 42"	0.58493
8	15° 54' 43"	2° 15' 32"	13° 46' 46"	8° 20' 41"	0° 59' 01"	16' 04.94"	66° 53' 40"	0.58025
9	16° 29' 45"	2° 18' 20"	14° 18' 19"	8° 36' 47"	0° 59' 02"	16' 05.15"	66° 57' 49"	0.57556
10	17° 04' 48"	2° 21' 08"	14° 49' 56"	8° 52' 52"	0° 59' 03"	16' 05.36"	67° 2' 09"	0.57087
11	17° 39' 52"	2° 23' 55"	15° 21' 36"	9° 08' 54"	0° 59' 03"	16' 05.56"	67° 6' 40"	0.56616
12	18° 14' 57"	2° 26' 41"	15° 53' 20"	9° 24' 53"	0° 59' 04"	16' 05.76"	67° 11' 21"	0.56145
13	18° 50' 03"	2° 29' 26"	16° 25' 07"	9° 40' 50"	0° 59' 05"	16' 05.96"	67° 16' 14"	0.55673
14	19° 25' 10"	2° 32' 10"	16° 56' 59"	9° 56' 45"	0° 59' 06"	16' 06.16"	67° 21' 16"	0.55200
15	20° 00' 18"	2° 34' 53"	17° 28' 54"	10° 12' 37"	0° 59' 06"	16' 06.36"	67° 26' 30"	0.54727
16	20° 35' 27"	2° 37' 36"	18° 00' 53"	10° 28' 26"	0° 59' 07"	16' 06.56"	67° 31' 55"	0.54253
17	21° 10' 37"	2° 40' 17"	18° 32' 56"	10° 44' 13"	0° 59' 08"	16' 06.75"	67° 37' 30"	0.53778
18	21° 45' 48"	2° 42' 58"	19° 05' 03"	10° 59' 56"	0° 59' 08"	16' 06.94"	67° 43' 16"	0.53303
19	22° 20' 60"	2° 45' 38"	19° 37' 14"	11° 15' 37"	0° 59' 09"	16' 07.13"	67° 49' 13"	0.52827
20	22° 56' 13"	2° 48' 16"	20° 09' 30"	11° 31' 14"	0° 59' 10"	16' 07.32"	67° 55' 21"	0.52351
21	23° 31' 27"	2° 50' 54"	20° 41' 49"	11° 46' 48"	0° 59' 10"	16' 07.50"	68° 1' 39"	0.51874
22	24° 06' 41"	2° 53' 30"	21° 14' 14"	12° 02' 19"	0° 59' 11"	16' 07.69"	68° 8' 09"	0.51397
23	24° 41' 57"	2° 56' 06"	21° 46' 42"	12° 17' 47"	0° 59' 12"	16' 07.87"	68° 14' 49"	0.50919
24	25° 17' 14"	2° 58' 41"	22° 19' 16"	12° 33' 11"	0° 59' 12"	16' 08.05"	68° 21' 40"	0.50442

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	115° 38' 52"	0.06"	117° 37' 10"	21° 00' 48"	1.0162606	15'44.28"	23° 26' 18"	-6 m 15 s
1	115° 41' 15"	0.07"	117° 39' 40"	21° 00' 22"	1.0162583	15'44.28"	23° 26' 18"	-6 m 15 s
2	115° 43' 38"	0.07"	117° 42' 11"	20° 59' 55"	1.0162561	15'44.28"	23° 26' 18"	-6 m 16 s
3	115° 46' 02"	0.08"	117° 44' 42"	20° 59' 29"	1.0162538	15'44.28"	23° 26' 18"	-6 m 16 s
4	115° 48' 25"	0.08"	117° 47' 12"	20° 59' 02"	1.0162515	15'44.28"	23° 26' 18"	-6 m 16 s
5	115° 50' 48"	0.08"	117° 49' 43"	20° 58' 36"	1.0162493	15'44.29"	23° 26' 18"	-6 m 16 s
6	115° 53' 11"	0.09"	117° 52' 14"	20° 58' 09"	1.0162470	15'44.29"	23° 26' 18"	-6 m 16 s
7	115° 55' 34"	0.09"	117° 54' 44"	20° 57' 43"	1.0162447	15'44.29"	23° 26' 18"	-6 m 17 s
8	115° 57' 57"	0.10"	117° 57' 15"	20° 57' 16"	1.0162424	15'44.29"	23° 26' 18"	-6 m 17 s
9	116° 00' 20"	0.10"	117° 59' 45"	20° 56' 49"	1.0162400	15'44.29"	23° 26' 18"	-6 m 17 s
10	116° 02' 44"	0.11"	118° 02' 16"	20° 56' 22"	1.0162377	15'44.30"	23° 26' 18"	-6 m 17 s
11	116° 05' 07"	0.11"	118° 04' 46"	20° 55' 56"	1.0162354	15'44.30"	23° 26' 18"	-6 m 17 s
12	116° 07' 30"	0.11"	118° 07' 17"	20° 55' 29"	1.0162330	15'44.30"	23° 26' 18"	-6 m 17 s
13	116° 09' 53"	0.12"	118° 09' 48"	20° 55' 02"	1.0162307	15'44.30"	23° 26' 18"	-6 m 18 s
14	116° 12' 16"	0.12"	118° 12' 18"	20° 54' 35"	1.0162283	15'44.31"	23° 26' 18"	-6 m 18 s
15	116° 14' 39"	0.13"	118° 14' 49"	20° 54' 08"	1.0162260	15'44.31"	23° 26' 18"	-6 m 18 s
16	116° 17' 03"	0.13"	118° 17' 19"	20° 53' 41"	1.0162236	15'44.31"	23° 26' 18"	-6 m 18 s
17	116° 19' 26"	0.13"	118° 19' 50"	20° 53' 14"	1.0162212	15'44.31"	23° 26' 18"	-6 m 18 s
18	116° 21' 49"	0.14"	118° 22' 20"	20° 52' 47"	1.0162188	15'44.31"	23° 26' 18"	-6 m 18 s
19	116° 24' 12"	0.14"	118° 24' 50"	20° 52' 20"	1.0162164	15'44.32"	23° 26' 18"	-6 m 19 s
20	116° 26' 35"	0.15"	118° 27' 21"	20° 51' 53"	1.0162140	15'44.32"	23° 26' 18"	-6 m 19 s
21	116° 28' 58"	0.15"	118° 29' 51"	20° 51' 26"	1.0162116	15'44.32"	23° 26' 18"	-6 m 19 s
22	116° 31' 22"	0.15"	118° 32' 22"	20° 50' 59"	1.0162091	15'44.32"	23° 26' 18"	-6 m 19 s
23	116° 33' 45"	0.16"	118° 34' 52"	20° 50' 31"	1.0162067	15'44.33"	23° 26' 18"	-6 m 19 s
24	116° 36' 08"	0.16"	118° 37' 23"	20° 50' 04"	1.0162043	15'44.33"	23° 26' 18"	-6 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	25° 17' 14"	2° 58' 41"	22° 19' 16"	12° 33' 11"	0° 59' 12"	16' 08.05"	68° 21' 40"	0.50442
1	25° 52' 31"	3° 01' 14"	22° 51' 53"	12° 48' 31"	0° 59' 13"	16' 08.23"	68° 28' 42"	0.49964
2	26° 27' 50"	3° 03' 46"	23° 24' 36"	13° 03' 48"	0° 59' 14"	16' 08.40"	68° 35' 55"	0.49486
3	27° 03' 09"	3° 06' 18"	23° 57' 23"	13° 19' 01"	0° 59' 14"	16' 08.57"	68° 43' 19"	0.49007
4	27° 38' 30"	3° 08' 48"	24° 30' 15"	13° 34' 10"	0° 59' 15"	16' 08.75"	68° 50' 54"	0.48529
5	28° 13' 51"	3° 11' 17"	25° 03' 12"	13° 49' 15"	0° 59' 16"	16' 08.91"	68° 58' 40"	0.48051
6	28° 49' 14"	3° 13' 45"	25° 36' 14"	14° 04' 16"	0° 59' 16"	16' 09.08"	69° 6' 37"	0.47572
7	29° 24' 37"	3° 16' 11"	26° 09' 21"	14° 19' 12"	0° 59' 17"	16' 09.25"	69° 14' 44"	0.47094
8	30° 00' 01"	3° 18' 37"	26° 42' 34"	14° 34' 05"	0° 59' 17"	16' 09.41"	69° 23' 03"	0.46615
9	30° 35' 26"	3° 21' 01"	27° 15' 51"	14° 48' 53"	0° 59' 18"	16' 09.57"	69° 31' 33"	0.46137
10	31° 10' 52"	3° 23' 24"	27° 49' 13"	15° 03' 36"	0° 59' 19"	16' 09.73"	69° 40' 14"	0.45659
11	31° 46' 18"	3° 25' 46"	28° 22' 41"	15° 18' 15"	0° 59' 19"	16' 09.88"	69° 49' 05"	0.45181
12	32° 21' 46"	3° 28' 06"	28° 56' 14"	15° 32' 50"	0° 59' 20"	16' 10.03"	69° 58' 08"	0.44704
13	32° 57' 15"	3° 30' 26"	29° 29' 53"	15° 47' 19"	0° 59' 20"	16' 10.19"	70° 7' 22"	0.44227
14	33° 32' 44"	3° 32' 44"	30° 03' 37"	16° 01' 44"	0° 59' 21"	16' 10.33"	70° 16' 47"	0.43750
15	34° 08' 14"	3° 35' 00"	30° 37' 26"	16° 16' 03"	0° 59' 21"	16' 10.48"	70° 26' 23"	0.43273
16	34° 43' 45"	3° 37' 15"	31° 11' 21"	16° 30' 18"	0° 59' 22"	16' 10.62"	70° 36' 10"	0.42797
17	35° 19' 17"	3° 39' 29"	31° 45' 22"	16° 44' 27"	0° 59' 22"	16' 10.77"	70° 46' 08"	0.42321
18	35° 54' 50"	3° 41' 42"	32° 19' 28"	16° 58' 31"	0° 59' 23"	16' 10.90"	70° 56' 18"	0.41846
19	36° 30' 24"	3° 43' 53"	32° 53' 40"	17° 12' 29"	0° 59' 23"	16' 11.04"	71° 6' 38"	0.41372
20	37° 05' 58"	3° 46' 03"	33° 27' 58"	17° 26' 22"	0° 59' 24"	16' 11.17"	71° 17' 10"	0.40898
21	37° 41' 33"	3° 48' 11"	34° 02' 22"	17° 40' 09"	0° 59' 24"	16' 11.31"	71° 27' 52"	0.40425
22	38° 17' 09"	3° 50' 18"	34° 36' 52"	17° 53' 51"	0° 59' 25"	16' 11.43"	71° 38' 46"	0.39953
23	38° 52' 46"	3° 52' 24"	35° 11' 27"	18° 07' 27"	0° 59' 25"	16' 11.56"	71° 49' 51"	0.39481
24	39° 28' 24"	3° 54' 28"	35° 46' 09"	18° 20' 56"	0° 59' 26"	16' 11.68"	72° 1' 07"	0.39010

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	116° 36' 08"	0.16"	118° 37' 23"	20° 50' 04"	1.0162043	15'44.33"	23° 26' 18"	-6 m 19 s
1	116° 38' 31"	0.16"	118° 39' 53"	20° 49' 37"	1.0162018	15'44.33"	23° 26' 18"	-6 m 20 s
2	116° 40' 54"	0.17"	118° 42' 23"	20° 49' 10"	1.0161994	15'44.33"	23° 26' 18"	-6 m 20 s
3	116° 43' 17"	0.17"	118° 44' 54"	20° 48' 42"	1.0161969	15'44.33"	23° 26' 18"	-6 m 20 s
4	116° 45' 41"	0.18"	118° 47' 24"	20° 48' 15"	1.0161944	15'44.34"	23° 26' 18"	-6 m 20 s
5	116° 48' 04"	0.18"	118° 49' 54"	20° 47' 47"	1.0161919	15'44.34"	23° 26' 18"	-6 m 20 s
6	116° 50' 27"	0.18"	118° 52' 25"	20° 47' 20"	1.0161894	15'44.34"	23° 26' 18"	-6 m 20 s
7	116° 52' 50"	0.19"	118° 54' 55"	20° 46' 52"	1.0161869	15'44.34"	23° 26' 18"	-6 m 21 s
8	116° 55' 13"	0.19"	118° 57' 25"	20° 46' 25"	1.0161844	15'44.35"	23° 26' 18"	-6 m 21 s
9	116° 57' 36"	0.19"	118° 59' 55"	20° 45' 57"	1.0161819	15'44.35"	23° 26' 18"	-6 m 21 s
10	116° 59' 60"	0.20"	119° 02' 26"	20° 45' 30"	1.0161793	15'44.35"	23° 26' 18"	-6 m 21 s
11	117° 02' 23"	0.20"	119° 04' 56"	20° 45' 02"	1.0161768	15'44.35"	23° 26' 18"	-6 m 21 s
12	117° 04' 46"	0.20"	119° 07' 26"	20° 44' 34"	1.0161742	15'44.36"	23° 26' 18"	-6 m 21 s
13	117° 07' 09"	0.20"	119° 09' 56"	20° 44' 06"	1.0161717	15'44.36"	23° 26' 18"	-6 m 22 s
14	117° 09' 32"	0.21"	119° 12' 26"	20° 43' 39"	1.0161691	15'44.36"	23° 26' 18"	-6 m 22 s
15	117° 11' 55"	0.21"	119° 14' 57"	20° 43' 11"	1.0161665	15'44.36"	23° 26' 18"	-6 m 22 s
16	117° 14' 19"	0.21"	119° 17' 27"	20° 42' 43"	1.0161639	15'44.37"	23° 26' 18"	-6 m 22 s
17	117° 16' 42"	0.22"	119° 19' 57"	20° 42' 15"	1.0161614	15'44.37"	23° 26' 18"	-6 m 22 s
18	117° 19' 05"	0.22"	119° 22' 27"	20° 41' 47"	1.0161587	15'44.37"	23° 26' 18"	-6 m 22 s
19	117° 21' 28"	0.22"	119° 24' 57"	20° 41' 19"	1.0161561	15'44.37"	23° 26' 18"	-6 m 22 s
20	117° 23' 51"	0.23"	119° 27' 27"	20° 40' 51"	1.0161535	15'44.38"	23° 26' 18"	-6 m 23 s
21	117° 26' 15"	0.23"	119° 29' 57"	20° 40' 23"	1.0161509	15'44.38"	23° 26' 18"	-6 m 23 s
22	117° 28' 38"	0.23"	119° 32' 28"	20° 39' 55"	1.0161482	15'44.38"	23° 26' 18"	-6 m 23 s
23	117° 31' 01"	0.23"	119° 34' 58"	20° 39' 27"	1.0161456	15'44.38"	23° 26' 18"	-6 m 23 s
24	117° 33' 24"	0.24"	119° 37' 28"	20° 38' 59"	1.0161429	15'44.38"	23° 26' 18"	-6 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	39° 28' 24"	3° 54' 28"	35° 46' 09"	18° 20' 56"	0° 59' 26"	16' 11.68"	72° 1' 07"	0.39010
1	40° 04' 02"	3° 56' 30"	36° 20' 56"	18° 34' 20"	0° 59' 26"	16' 11.81"	72° 12' 34"	0.38541
2	40° 39' 41"	3° 58' 31"	36° 55' 50"	18° 47' 37"	0° 59' 27"	16' 11.92"	72° 24' 12"	0.38072
3	41° 15' 21"	4° 00' 31"	37° 30' 49"	19° 00' 49"	0° 59' 27"	16' 12.04"	72° 36' 02"	0.37604
4	41° 50' 58"	4° 02' 29"	38° 05' 51"	19° 13' 52"	0° 59' 28"	16' 12.15"	72° 48' 01"	0.37137
5	42° 26' 40"	4° 04' 25"	38° 41' 03"	19° 26' 50"	0° 59' 28"	16' 12.26"	73° 0' 13"	0.36671
6	43° 02' 22"	4° 06' 20"	39° 16' 21"	19° 39' 42"	0° 59' 28"	16' 12.37"	73° 12' 36"	0.36207
7	43° 38' 05"	4° 08' 14"	39° 51' 45"	19° 52' 27"	0° 59' 29"	16' 12.47"	73° 25' 10"	0.35743
8	44° 13' 48"	4° 10' 06"	40° 27' 15"	20° 05' 05"	0° 59' 29"	16' 12.57"	73° 37' 55"	0.35280
9	44° 49' 33"	4° 11' 56"	41° 02' 52"	20° 17' 36"	0° 59' 29"	16' 12.67"	73° 50' 52"	0.34819
10	45° 25' 18"	4° 13' 44"	41° 38' 35"	20° 30' 00"	0° 59' 30"	16' 12.77"	74° 3' 59"	0.34359
11	46° 01' 03"	4° 15' 31"	42° 14' 24"	20° 42' 17"	0° 59' 30"	16' 12.86"	74° 17' 18"	0.33901
12	46° 36' 50"	4° 17' 17"	42° 50' 19"	20° 54' 27"	0° 59' 30"	16' 12.95"	74° 30' 48"	0.33443
13	47° 12' 37"	4° 19' 00"	43° 26' 21"	21° 06' 29"	0° 59' 31"	16' 13.04"	74° 44' 29"	0.32988
14	47° 48' 24"	4° 20' 42"	44° 02' 29"	21° 18' 24"	0° 59' 31"	16' 13.12"	74° 58' 21"	0.32533
15	48° 24' 12"	4° 22' 23"	44° 38' 43"	21° 30' 12"	0° 59' 31"	16' 13.20"	75° 12' 24"	0.32081
16	49° 00' 01"	4° 24' 01"	45° 15' 04"	21° 41' 51"	0° 59' 32"	16' 13.28"	75° 26' 38"	0.31629
17	49° 35' 51"	4° 25' 38"	45° 51' 31"	21° 53' 23"	0° 59' 32"	16' 13.35"	75° 41' 03"	0.31180
18	50° 11' 40"	4° 27' 14"	46° 28' 04"	22° 04' 47"	0° 59' 32"	16' 13.43"	75° 55' 39"	0.30732
19	50° 47' 31"	4° 28' 47"	47° 04' 44"	22° 16' 03"	0° 59' 32"	16' 13.49"	76° 10' 26"	0.30286
20	51° 23' 22"	4° 30' 19"	47° 41' 30"	22° 27' 10"	0° 59' 33"	16' 13.56"	76° 25' 25"	0.29841
21	51° 59' 14"	4° 31' 49"	48° 18' 22"	22° 38' 10"	0° 59' 33"	16' 13.62"	76° 40' 34"	0.29399
22	52° 35' 06"	4° 33' 17"	48° 55' 20"	22° 49' 01"	0° 59' 33"	16' 13.68"	76° 55' 54"	0.28958
23	53° 10' 59"	4° 34' 44"	49° 32' 25"	22° 59' 43"	0° 59' 33"	16' 13.73"	77° 11' 25"	0.28519
24	53° 46' 52"	4° 36' 09"	50° 09' 36"	23° 10' 18"	0° 59' 34"	16' 13.78"	77° 27' 07"	0.28082

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	117° 33' 24"	0.24"	119° 37' 28"	20° 38' 59"	1.0161429	15'44.38"	23° 26' 18"	-6 m 23 s
1	117° 35' 47"	0.24"	119° 39' 58"	20° 38' 31"	1.0161403	15'44.39"	23° 26' 18"	-6 m 23 s
2	117° 38' 11"	0.24"	119° 42' 28"	20° 38' 03"	1.0161376	15'44.39"	23° 26' 18"	-6 m 24 s
3	117° 40' 34"	0.24"	119° 44' 58"	20° 37' 34"	1.0161349	15'44.39"	23° 26' 18"	-6 m 24 s
4	117° 42' 57"	0.25"	119° 47' 28"	20° 37' 06"	1.0161322	15'44.39"	23° 26' 18"	-6 m 24 s
5	117° 45' 20"	0.25"	119° 49' 58"	20° 36' 38"	1.0161295	15'44.40"	23° 26' 18"	-6 m 24 s
6	117° 47' 43"	0.25"	119° 52' 28"	20° 36' 09"	1.0161268	15'44.40"	23° 26' 18"	-6 m 24 s
7	117° 50' 07"	0.25"	119° 54' 58"	20° 35' 41"	1.0161240	15'44.40"	23° 26' 18"	-6 m 24 s
8	117° 52' 30"	0.26"	119° 57' 28"	20° 35' 13"	1.0161213	15'44.40"	23° 26' 18"	-6 m 24 s
9	117° 54' 53"	0.26"	119° 59' 58"	20° 34' 44"	1.0161186	15'44.41"	23° 26' 18"	-6 m 24 s
10	117° 57' 16"	0.26"	120° 02' 27"	20° 34' 16"	1.0161158	15'44.41"	23° 26' 18"	-6 m 25 s
11	117° 59' 39"	0.26"	120° 04' 57"	20° 33' 47"	1.0161130	15'44.41"	23° 26' 18"	-6 m 25 s
12	118° 02' 03"	0.26"	120° 07' 27"	20° 33' 18"	1.0161103	15'44.42"	23° 26' 18"	-6 m 25 s
13	118° 04' 26"	0.27"	120° 09' 57"	20° 32' 50"	1.0161075	15'44.42"	23° 26' 18"	-6 m 25 s
14	118° 06' 49"	0.27"	120° 12' 27"	20° 32' 21"	1.0161047	15'44.42"	23° 26' 18"	-6 m 25 s
15	118° 09' 12"	0.27"	120° 14' 57"	20° 31' 53"	1.0161019	15'44.42"	23° 26' 18"	-6 m 25 s
16	118° 11' 36"	0.27"	120° 17' 27"	20° 31' 24"	1.0160991	15'44.43"	23° 26' 18"	-6 m 25 s
17	118° 13' 59"	0.27"	120° 19' 56"	20° 30' 55"	1.0160963	15'44.43"	23° 26' 18"	-6 m 26 s
18	118° 16' 22"	0.28"	120° 22' 26"	20° 30' 26"	1.0160934	15'44.43"	23° 26' 18"	-6 m 26 s
19	118° 18' 45"	0.28"	120° 24' 56"	20° 29' 57"	1.0160906	15'44.43"	23° 26' 18"	-6 m 26 s
20	118° 21' 08"	0.28"	120° 27' 26"	20° 29' 29"	1.0160877	15'44.44"	23° 26' 18"	-6 m 26 s
21	118° 23' 32"	0.28"	120° 29' 56"	20° 28' 60"	1.0160849	15'44.44"	23° 26' 18"	-6 m 26 s
22	118° 25' 55"	0.28"	120° 32' 25"	20° 28' 31"	1.0160820	15'44.44"	23° 26' 18"	-6 m 26 s
23	118° 28' 18"	0.28"	120° 34' 55"	20° 28' 02"	1.0160791	15'44.44"	23° 26' 18"	-6 m 26 s
24	118° 30' 41"	0.29"	120° 37' 25"	20° 27' 33"	1.0160762	15'44.45"	23° 26' 18"	-6 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	53° 46' 52"	4° 36' 09"	50° 09' 36"	23° 10' 18"	0° 59' 34"	16' 13.78"	77° 27' 07"	0.28082
1	54° 22' 46"	4° 37' 31"	50° 46' 53"	23° 20' 43"	0° 59' 34"	16' 13.83"	77° 43' 00"	0.27647
2	54° 58' 40"	4° 38' 53"	51° 24' 16"	23° 30' 60"	0° 59' 34"	16' 13.88"	77° 59' 04"	0.27214
3	55° 34' 34"	4° 40' 12"	52° 01' 45"	23° 41' 07"	0° 59' 34"	16' 13.92"	78° 15' 19"	0.26783
4	56° 10' 29"	4° 41' 29"	52° 39' 21"	23° 51' 06"	0° 59' 34"	16' 13.96"	78° 31' 44"	0.26355
5	56° 46' 25"	4° 42' 45"	53° 17' 02"	24° 00' 56"	0° 59' 34"	16' 13.99"	78° 48' 20"	0.25928
6	57° 22' 21"	4° 43' 59"	53° 54' 50"	24° 10' 37"	0° 59' 34"	16' 14.02"	79° 5' 07"	0.25504
7	57° 58' 17"	4° 45' 11"	54° 32' 43"	24° 20' 08"	0° 59' 35"	16' 14.05"	79° 22' 05"	0.25082
8	58° 34' 13"	4° 46' 21"	55° 10' 42"	24° 29' 30"	0° 59' 35"	16' 14.07"	79° 39' 13"	0.24662
9	59° 10' 10"	4° 47' 29"	55° 48' 48"	24° 38' 42"	0° 59' 35"	16' 14.09"	79° 56' 32"	0.24244
10	59° 46' 08"	4° 48' 35"	56° 26' 59"	24° 47' 45"	0° 59' 35"	16' 14.11"	80° 14' 01"	0.23829
11	60° 22' 05"	4° 49' 40"	57° 05' 16"	24° 56' 38"	0° 59' 35"	16' 14.12"	80° 31' 41"	0.23417
12	60° 58' 03"	4° 50' 42"	57° 43' 38"	25° 05' 22"	0° 59' 35"	16' 14.13"	80° 49' 32"	0.23007
13	61° 34' 01"	4° 51' 43"	58° 22' 06"	25° 13' 55"	0° 59' 35"	16' 14.14"	81° 7' 33"	0.22599
14	62° 09' 60"	4° 52' 42"	59° 00' 40"	25° 22' 19"	0° 59' 35"	16' 14.14"	81° 25' 44"	0.22194
15	62° 45' 58"	4° 53' 38"	59° 39' 19"	25° 30' 33"	0° 59' 35"	16' 14.14"	81° 44' 06"	0.21792
16	63° 21' 57"	4° 54' 33"	60° 18' 03"	25° 38' 36"	0° 59' 35"	16' 14.13"	82° 2' 39"	0.21392
17	63° 57' 56"	4° 55' 26"	60° 56' 53"	25° 46' 29"	0° 59' 35"	16' 14.12"	82° 21' 21"	0.20995
18	64° 33' 56"	4° 56' 17"	61° 35' 48"	25° 54' 12"	0° 59' 35"	16' 14.11"	82° 40' 14"	0.20600
19	65° 09' 55"	4° 57' 06"	62° 14' 48"	26° 01' 44"	0° 59' 35"	16' 14.09"	82° 59' 17"	0.20209
20	65° 45' 55"	4° 57' 53"	62° 53' 53"	26° 09' 06"	0° 59' 35"	16' 14.07"	83° 18' 30"	0.19820
21	66° 21' 55"	4° 58' 38"	63° 33' 04"	26° 16' 18"	0° 59' 34"	16' 14.04"	83° 37' 53"	0.19434
22	66° 57' 54"	4° 59' 22"	64° 12' 18"	26° 23' 18"	0° 59' 34"	16' 14.01"	83° 57' 27"	0.19051
23	67° 33' 54"	5° 00' 03"	64° 51' 38"	26° 30' 08"	0° 59' 34"	16' 13.98"	84° 17' 10"	0.18671
24	68° 09' 54"	5° 00' 42"	65° 31' 02"	26° 36' 48"	0° 59' 34"	16' 13.94"	84° 37' 04"	0.18294

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	118° 30' 41"	0.29"	120° 37' 25"	20° 27' 33"	1.0160762	15'44.45"	23° 26' 18"	-6 m 26 s
1	118° 33' 05"	0.29"	120° 39' 54"	20° 27' 04"	1.0160733	15'44.45"	23° 26' 18"	-6 m 27 s
2	118° 35' 28"	0.29"	120° 42' 24"	20° 26' 35"	1.0160704	15'44.45"	23° 26' 18"	-6 m 27 s
3	118° 37' 51"	0.29"	120° 44' 54"	20° 26' 06"	1.0160675	15'44.45"	23° 26' 18"	-6 m 27 s
4	118° 40' 14"	0.29"	120° 47' 23"	20° 25' 36"	1.0160646	15'44.46"	23° 26' 18"	-6 m 27 s
5	118° 42' 38"	0.29"	120° 49' 53"	20° 25' 07"	1.0160616	15'44.46"	23° 26' 18"	-6 m 27 s
6	118° 45' 01"	0.29"	120° 52' 23"	20° 24' 38"	1.0160587	15'44.46"	23° 26' 18"	-6 m 27 s
7	118° 47' 24"	0.29"	120° 54' 52"	20° 24' 09"	1.0160557	15'44.47"	23° 26' 18"	-6 m 27 s
8	118° 49' 47"	0.29"	120° 57' 22"	20° 23' 39"	1.0160528	15'44.47"	23° 26' 18"	-6 m 27 s
9	118° 52' 11"	0.30"	120° 59' 52"	20° 23' 10"	1.0160498	15'44.47"	23° 26' 18"	-6 m 27 s
10	118° 54' 34"	0.30"	121° 02' 21"	20° 22' 41"	1.0160468	15'44.47"	23° 26' 18"	-6 m 28 s
11	118° 56' 57"	0.30"	121° 04' 51"	20° 22' 11"	1.0160438	15'44.48"	23° 26' 18"	-6 m 28 s
12	118° 59' 20"	0.30"	121° 07' 20"	20° 21' 42"	1.0160408	15'44.48"	23° 26' 18"	-6 m 28 s
13	119° 01' 43"	0.30"	121° 09' 50"	20° 21' 13"	1.0160378	15'44.48"	23° 26' 18"	-6 m 28 s
14	119° 04' 07"	0.30"	121° 12' 19"	20° 20' 43"	1.0160348	15'44.49"	23° 26' 18"	-6 m 28 s
15	119° 06' 30"	0.30"	121° 14' 49"	20° 20' 13"	1.0160317	15'44.49"	23° 26' 18"	-6 m 28 s
16	119° 08' 53"	0.30"	121° 17' 18"	20° 19' 44"	1.0160287	15'44.49"	23° 26' 18"	-6 m 28 s
17	119° 11' 16"	0.30"	121° 19' 48"	20° 19' 14"	1.0160256	15'44.49"	23° 26' 18"	-6 m 28 s
18	119° 13' 40"	0.30"	121° 22' 17"	20° 18' 45"	1.0160225	15'44.50"	23° 26' 18"	-6 m 28 s
19	119° 16' 03"	0.30"	121° 24' 47"	20° 18' 15"	1.0160195	15'44.50"	23° 26' 18"	-6 m 28 s
20	119° 18' 26"	0.30"	121° 27' 16"	20° 17' 45"	1.0160164	15'44.50"	23° 26' 18"	-6 m 29 s
21	119° 20' 49"	0.30"	121° 29' 45"	20° 17' 15"	1.0160133	15'44.51"	23° 26' 18"	-6 m 29 s
22	119° 23' 13"	0.30"	121° 32' 15"	20° 16' 46"	1.0160102	15'44.51"	23° 26' 18"	-6 m 29 s
23	119° 25' 36"	0.30"	121° 34' 44"	20° 16' 16"	1.0160071	15'44.51"	23° 26' 18"	-6 m 29 s
24	119° 27' 59"	0.30"	121° 37' 14"	20° 15' 46"	1.0160039	15'44.51"	23° 26' 18"	-6 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	68° 09' 54"	5° 00' 42"	65° 31' 02"	26° 36' 48"	0° 59' 34"	16' 13.94"	84° 37' 04"	0.18294
1	68° 45' 54"	5° 01' 19"	66° 10' 31"	26° 43' 16"	0° 59' 34"	16' 13.90"	84° 57' 07"	0.17919
2	69° 21' 55"	5° 01' 54"	66° 50' 04"	26° 49' 33"	0° 59' 34"	16' 13.86"	85° 17' 21"	0.17548
3	69° 57' 55"	5° 02' 28"	67° 29' 42"	26° 55' 40"	0° 59' 34"	16' 13.81"	85° 37' 44"	0.17180
4	70° 33' 55"	5° 02' 59"	68° 09' 23"	27° 01' 35"	0° 59' 33"	16' 13.76"	85° 58' 18"	0.16815
5	71° 09' 55"	5° 03' 28"	68° 49' 09"	27° 07' 19"	0° 59' 33"	16' 13.70"	86° 19' 01"	0.16454
6	71° 45' 55"	5° 03' 55"	69° 28' 58"	27° 12' 51"	0° 59' 33"	16' 13.64"	86° 39' 54"	0.16095
7	72° 21' 55"	5° 04' 21"	70° 08' 51"	27° 18' 13"	0° 59' 33"	16' 13.57"	87° 0' 57"	0.15740
8	72° 57' 54"	5° 04' 44"	70° 48' 48"	27° 23' 23"	0° 59' 33"	16' 13.50"	87° 22' 10"	0.15388
9	73° 33' 54"	5° 05' 05"	71° 28' 49"	27° 28' 22"	0° 59' 32"	16' 13.43"	87° 43' 32"	0.15039
10	74° 09' 54"	5° 05' 24"	72° 08' 52"	27° 33' 09"	0° 59' 32"	16' 13.35"	88° 5' 05"	0.14694
11	74° 45' 53"	5° 05' 42"	72° 48' 59"	27° 37' 44"	0° 59' 32"	16' 13.27"	88° 26' 47"	0.14352
12	75° 21' 52"	5° 05' 57"	73° 29' 09"	27° 42' 08"	0° 59' 31"	16' 13.18"	88° 48' 39"	0.14013
13	75° 57' 51"	5° 06' 10"	74° 09' 22"	27° 46' 21"	0° 59' 31"	16' 13.09"	89° 10' 41"	0.13678
14	76° 33' 50"	5° 06' 21"	74° 49' 37"	27° 50' 21"	0° 59' 31"	16' 12.99"	89° 32' 53"	0.13347
15	77° 09' 48"	5° 06' 30"	75° 29' 56"	27° 54' 10"	0° 59' 30"	16' 12.89"	89° 55' 15"	0.13019
16	77° 45' 46"	5° 06' 37"	76° 10' 16"	27° 57' 47"	0° 59' 30"	16' 12.79"	90° 17' 47"	0.12694
17	78° 21' 44"	5° 06' 42"	76° 50' 39"	28° 01' 13"	0° 59' 30"	16' 12.68"	90° 40' 28"	0.12373
18	78° 57' 42"	5° 06' 45"	77° 31' 04"	28° 04' 26"	0° 59' 29"	16' 12.57"	91° 3' 20"	0.12056
19	79° 33' 39"	5° 06' 46"	78° 11' 31"	28° 07' 28"	0° 59' 29"	16' 12.45"	91° 26' 22"	0.11742
20	80° 09' 35"	5° 06' 46"	78° 51' 60"	28° 10' 17"	0° 59' 28"	16' 12.33"	91° 49' 35"	0.11432
21	80° 45' 32"	5° 06' 43"	79° 32' 30"	28° 12' 55"	0° 59' 28"	16' 12.21"	92° 12' 57"	0.11126
22	81° 21' 28"	5° 06' 38"	80° 13' 02"	28° 15' 21"	0° 59' 27"	16' 12.08"	92° 36' 30"	0.10823
23	81° 57' 23"	5° 06' 30"	80° 53' 35"	28° 17' 34"	0° 59' 27"	16' 11.94"	93° 0' 14"	0.10525
24	82° 33' 18"	5° 06' 21"	81° 34' 09"	28° 19' 36"	0° 59' 26"	16' 11.80"	93° 24' 09"	0.10230

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	119° 27' 59"	0.30"	121° 37' 14"	20° 15' 46"	1.0160039	15'44.51"	23° 26' 18"	-6 m 29 s
1	119° 30' 23"	0.30"	121° 39' 43"	20° 15' 16"	1.0160008	15'44.52"	23° 26' 18"	-6 m 29 s
2	119° 32' 46"	0.30"	121° 42' 12"	20° 14' 46"	1.0159976	15'44.52"	23° 26' 18"	-6 m 29 s
3	119° 35' 09"	0.30"	121° 44' 42"	20° 14' 16"	1.0159945	15'44.52"	23° 26' 18"	-6 m 29 s
4	119° 37' 32"	0.30"	121° 47' 11"	20° 13' 46"	1.0159913	15'44.53"	23° 26' 18"	-6 m 29 s
5	119° 39' 56"	0.30"	121° 49' 40"	20° 13' 16"	1.0159881	15'44.53"	23° 26' 18"	-6 m 29 s
6	119° 42' 19"	0.30"	121° 52' 10"	20° 12' 46"	1.0159849	15'44.53"	23° 26' 18"	-6 m 30 s
7	119° 44' 42"	0.30"	121° 54' 39"	20° 12' 16"	1.0159817	15'44.53"	23° 26' 18"	-6 m 30 s
8	119° 47' 05"	0.30"	121° 57' 08"	20° 11' 46"	1.0159785	15'44.54"	23° 26' 18"	-6 m 30 s
9	119° 49' 29"	0.30"	121° 59' 37"	20° 11' 16"	1.0159753	15'44.54"	23° 26' 18"	-6 m 30 s
10	119° 51' 52"	0.30"	122° 02' 06"	20° 10' 45"	1.0159721	15'44.54"	23° 26' 18"	-6 m 30 s
11	119° 54' 15"	0.30"	122° 04' 36"	20° 10' 15"	1.0159689	15'44.55"	23° 26' 18"	-6 m 30 s
12	119° 56' 38"	0.30"	122° 07' 05"	20° 09' 45"	1.0159656	15'44.55"	23° 26' 18"	-6 m 30 s
13	119° 59' 02"	0.30"	122° 09' 34"	20° 09' 15"	1.0159623	15'44.55"	23° 26' 18"	-6 m 30 s
14	120° 01' 25"	0.30"	122° 12' 03"	20° 08' 44"	1.0159591	15'44.56"	23° 26' 18"	-6 m 30 s
15	120° 03' 48"	0.30"	122° 14' 32"	20° 08' 14"	1.0159558	15'44.56"	23° 26' 18"	-6 m 30 s
16	120° 06' 12"	0.30"	122° 17' 01"	20° 07' 43"	1.0159525	15'44.56"	23° 26' 18"	-6 m 30 s
17	120° 08' 35"	0.30"	122° 19' 31"	20° 07' 13"	1.0159492	15'44.56"	23° 26' 18"	-6 m 30 s
18	120° 10' 58"	0.30"	122° 21' 60"	20° 06' 42"	1.0159459	15'44.57"	23° 26' 18"	-6 m 31 s
19	120° 13' 21"	0.30"	122° 24' 29"	20° 06' 12"	1.0159426	15'44.57"	23° 26' 18"	-6 m 31 s
20	120° 15' 45"	0.30"	122° 26' 58"	20° 05' 41"	1.0159392	15'44.57"	23° 26' 18"	-6 m 31 s
21	120° 18' 08"	0.30"	122° 29' 27"	20° 05' 11"	1.0159359	15'44.58"	23° 26' 18"	-6 m 31 s
22	120° 20' 31"	0.29"	122° 31' 56"	20° 04' 40"	1.0159325	15'44.58"	23° 26' 18"	-6 m 31 s
23	120° 22' 55"	0.29"	122° 34' 25"	20° 04' 09"	1.0159292	15'44.58"	23° 26' 18"	-6 m 31 s
24	120° 25' 18"	0.29"	122° 36' 54"	20° 03' 39"	1.0159258	15'44.59"	23° 26' 18"	-6 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	82° 33' 18"	5° 06' 21"	81° 34' 09"	28° 19' 36"	0° 59' 26"	16' 11.80"	93° 24' 09"	0.10230
1	83° 09' 13"	5° 06' 10"	82° 14' 44"	28° 21' 26"	0° 59' 26"	16' 11.66"	93° 48' 14"	0.09938
2	83° 45' 07"	5° 05' 57"	82° 55' 20"	28° 23' 03"	0° 59' 25"	16' 11.51"	94° 12' 31"	0.09651
3	84° 21' 00"	5° 05' 42"	83° 35' 56"	28° 24' 29"	0° 59' 25"	16' 11.36"	94° 36' 59"	0.09368
4	84° 56' 53"	5° 05' 25"	84° 16' 33"	28° 25' 42"	0° 59' 24"	16' 11.20"	95° 1' 38"	0.09088
5	85° 32' 45"	5° 05' 06"	84° 57' 10"	28° 26' 44"	0° 59' 23"	16' 11.04"	95° 26' 30"	0.08813
6	86° 08' 37"	5° 04' 45"	85° 37' 47"	28° 27' 33"	0° 59' 23"	16' 10.88"	95° 51' 34"	0.08541
7	86° 44' 28"	5° 04' 22"	86° 18' 24"	28° 28' 10"	0° 59' 22"	16' 10.71"	96° 16' 50"	0.08273
8	87° 20' 19"	5° 03' 57"	86° 59' 01"	28° 28' 35"	0° 59' 22"	16' 10.54"	96° 42' 20"	0.08010
9	87° 56' 08"	5° 03' 30"	87° 39' 37"	28° 28' 48"	0° 59' 21"	16' 10.36"	97° 8' 03"	0.07750
10	88° 31' 57"	5° 03' 01"	88° 20' 13"	28° 28' 49"	0° 59' 20"	16' 10.17"	97° 33' 60"	0.07495
11	89° 07' 45"	5° 02' 30"	89° 00' 48"	28° 28' 38"	0° 59' 20"	16' 09.99"	98° 0' 11"	0.07243
12	89° 43' 33"	5° 01' 57"	89° 41' 21"	28° 28' 14"	0° 59' 19"	16' 09.79"	98° 26' 37"	0.06996
13	90° 19' 19"	5° 01' 22"	90° 21' 54"	28° 27' 39"	0° 59' 18"	16' 09.60"	98° 53' 18"	0.06753
14	90° 55' 05"	5° 00' 46"	91° 02' 25"	28° 26' 52"	0° 59' 17"	16' 09.40"	99° 20' 16"	0.06514
15	91° 30' 50"	5° 00' 07"	91° 42' 54"	28° 25' 52"	0° 59' 17"	16' 09.19"	99° 47' 31"	0.06279
16	92° 06' 35"	4° 59' 26"	92° 23' 22"	28° 24' 41"	0° 59' 16"	16' 08.98"	100° 15' 04"	0.06048
17	92° 42' 18"	4° 58' 44"	93° 03' 48"	28° 23' 18"	0° 59' 15"	16' 08.77"	100° 42' 55"	0.05822
18	93° 18' 00"	4° 57' 59"	93° 44' 12"	28° 21' 43"	0° 59' 14"	16' 08.55"	101° 11' 06"	0.05600
19	93° 53' 42"	4° 57' 12"	94° 24' 34"	28° 19' 56"	0° 59' 14"	16' 08.33"	101° 39' 38"	0.05381
20	94° 29' 22"	4° 56' 24"	95° 04' 53"	28° 17' 57"	0° 59' 13"	16' 08.10"	102° 8' 32"	0.05168
21	95° 05' 01"	4° 55' 34"	95° 45' 10"	28° 15' 47"	0° 59' 12"	16' 07.87"	102° 37' 49"	0.04958
22	95° 40' 40"	4° 54' 42"	96° 25' 23"	28° 13' 24"	0° 59' 11"	16' 07.63"	103° 7' 30"	0.04753
23	96° 16' 17"	4° 53' 47"	97° 05' 34"	28° 10' 50"	0° 59' 10"	16' 07.39"	103° 37' 39"	0.04552
24	96° 51' 54"	4° 52' 52"	97° 45' 42"	28° 08' 04"	0° 59' 09"	16' 07.15"	104° 8' 15"	0.04356

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	120° 25' 18"	0.29"	122° 36' 54"	20° 03' 39"	1.0159258	15'44.59"	23° 26' 18"	-6 m 31 s
1	120° 27' 41"	0.29"	122° 39' 23"	20° 03' 08"	1.0159224	15'44.59"	23° 26' 18"	-6 m 31 s
2	120° 30' 04"	0.29"	122° 41' 52"	20° 02' 37"	1.0159190	15'44.59"	23° 26' 18"	-6 m 31 s
3	120° 32' 28"	0.29"	122° 44' 21"	20° 02' 06"	1.0159156	15'44.60"	23° 26' 18"	-6 m 31 s
4	120° 34' 51"	0.29"	122° 46' 50"	20° 01' 36"	1.0159122	15'44.60"	23° 26' 18"	-6 m 31 s
5	120° 37' 14"	0.29"	122° 49' 19"	20° 01' 05"	1.0159088	15'44.60"	23° 26' 18"	-6 m 31 s
6	120° 39' 38"	0.29"	122° 51' 48"	20° 00' 34"	1.0159053	15'44.61"	23° 26' 18"	-6 m 31 s
7	120° 42' 01"	0.28"	122° 54' 17"	20° 00' 03"	1.0159019	15'44.61"	23° 26' 18"	-6 m 32 s
8	120° 44' 24"	0.28"	122° 56' 46"	19° 59' 32"	1.0158984	15'44.61"	23° 26' 18"	-6 m 32 s
9	120° 46' 48"	0.28"	122° 59' 14"	19° 59' 01"	1.0158950	15'44.62"	23° 26' 18"	-6 m 32 s
10	120° 49' 11"	0.28"	123° 01' 43"	19° 58' 30"	1.0158915	15'44.62"	23° 26' 18"	-6 m 32 s
11	120° 51' 34"	0.28"	123° 04' 12"	19° 57' 59"	1.0158880	15'44.62"	23° 26' 18"	-6 m 32 s
12	120° 53' 57"	0.28"	123° 06' 41"	19° 57' 28"	1.0158845	15'44.63"	23° 26' 18"	-6 m 32 s
13	120° 56' 21"	0.27"	123° 09' 10"	19° 56' 56"	1.0158810	15'44.63"	23° 26' 18"	-6 m 32 s
14	120° 58' 44"	0.27"	123° 11' 39"	19° 56' 25"	1.0158775	15'44.63"	23° 26' 18"	-6 m 32 s
15	121° 01' 07"	0.27"	123° 14' 07"	19° 55' 54"	1.0158739	15'44.63"	23° 26' 18"	-6 m 32 s
16	121° 03' 31"	0.27"	123° 16' 36"	19° 55' 23"	1.0158704	15'44.64"	23° 26' 18"	-6 m 32 s
17	121° 05' 54"	0.27"	123° 19' 05"	19° 54' 51"	1.0158669	15'44.64"	23° 26' 18"	-6 m 32 s
18	121° 08' 17"	0.26"	123° 21' 34"	19° 54' 20"	1.0158633	15'44.64"	23° 26' 18"	-6 m 32 s
19	121° 10' 41"	0.26"	123° 24' 02"	19° 53' 49"	1.0158597	15'44.65"	23° 26' 18"	-6 m 32 s
20	121° 13' 04"	0.26"	123° 26' 31"	19° 53' 17"	1.0158561	15'44.65"	23° 26' 18"	-6 m 32 s
21	121° 15' 27"	0.26"	123° 28' 60"	19° 52' 46"	1.0158525	15'44.65"	23° 26' 18"	-6 m 32 s
22	121° 17' 51"	0.26"	123° 31' 28"	19° 52' 14"	1.0158489	15'44.66"	23° 26' 18"	-6 m 32 s
23	121° 20' 14"	0.25"	123° 33' 57"	19° 51' 43"	1.0158453	15'44.66"	23° 26' 18"	-6 m 32 s
24	121° 22' 37"	0.25"	123° 36' 26"	19° 51' 11"	1.0158417	15'44.66"	23° 26' 18"	-6 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	96° 51' 54"	4° 52' 52"	97° 45' 42"	28° 08' 04"	0° 59' 09"	16' 07.15"	104° 8' 15"	0.04356
1	97° 27' 29"	4° 51' 54"	98° 25' 47"	28° 05' 07"	0° 59' 08"	16' 06.90"	104° 39' 21"	0.04164
2	98° 03' 03"	4° 50' 54"	99° 05' 48"	28° 01' 58"	0° 59' 07"	16' 06.65"	105° 10' 59"	0.03976
3	98° 38' 36"	4° 49' 53"	99° 45' 46"	27° 58' 38"	0° 59' 06"	16' 06.39"	105° 43' 12"	0.03792
4	99° 14' 08"	4° 48' 49"	100° 25' 40"	27° 55' 06"	0° 59' 05"	16' 06.13"	106° 16' 01"	0.03613
5	99° 49' 39"	4° 47' 44"	101° 05' 30"	27° 51' 23"	0° 59' 04"	16' 05.86"	106° 49' 30"	0.03438
6	100° 25' 09"	4° 46' 37"	101° 45' 16"	27° 47' 28"	0° 59' 03"	16' 05.59"	107° 23' 43"	0.03268
7	101° 00' 37"	4° 45' 28"	102° 24' 58"	27° 43' 22"	0° 59' 02"	16' 05.32"	107° 58' 41"	0.03102
8	101° 36' 04"	4° 44' 17"	103° 04' 35"	27° 39' 05"	0° 59' 01"	16' 05.04"	108° 34' 31"	0.02941
9	102° 11' 30"	4° 43' 05"	103° 44' 08"	27° 34' 37"	0° 59' 00"	16' 04.76"	109° 11' 14"	0.02784
10	102° 46' 54"	4° 41' 51"	104° 23' 37"	27° 29' 58"	0° 58' 59"	16' 04.47"	109° 48' 58"	0.02631
11	103° 22' 18"	4° 40' 35"	105° 03' 01"	27° 25' 08"	0° 58' 58"	16' 04.18"	110° 27' 46"	0.02483
12	103° 57' 40"	4° 39' 17"	105° 42' 20"	27° 20' 07"	0° 58' 57"	16' 03.88"	111° 7' 45"	0.02339
13	104° 33' 00"	4° 37' 58"	106° 21' 34"	27° 14' 55"	0° 58' 56"	16' 03.58"	111° 49' 03"	0.02200
14	105° 08' 19"	4° 36' 37"	107° 00' 43"	27° 09' 32"	0° 58' 55"	16' 03.28"	112° 31' 45"	0.02066
15	105° 43' 37"	4° 35' 14"	107° 39' 46"	27° 03' 59"	0° 58' 54"	16' 02.97"	113° 16' 02"	0.01935
16	106° 18' 53"	4° 33' 49"	108° 18' 45"	26° 58' 15"	0° 58' 53"	16' 02.66"	114° 2' 03"	0.01810
17	106° 54' 08"	4° 32' 23"	108° 57' 37"	26° 52' 21"	0° 58' 52"	16' 02.34"	114° 49' 59"	0.01688
18	107° 29' 22"	4° 30' 55"	109° 36' 25"	26° 46' 16"	0° 58' 50"	16' 02.02"	115° 40' 04"	0.01571
19	108° 04' 34"	4° 29' 25"	110° 15' 06"	26° 40' 01"	0° 58' 49"	16' 01.70"	116° 32' 31"	0.01459
20	108° 39' 44"	4° 27' 54"	110° 53' 42"	26° 33' 35"	0° 58' 48"	16' 01.37"	117° 27' 37"	0.01351
21	109° 14' 53"	4° 26' 21"	111° 32' 12"	26° 26' 60"	0° 58' 47"	16' 01.04"	118° 25' 43"	0.01248
22	109° 50' 00"	4° 24' 47"	112° 10' 36"	26° 20' 14"	0° 58' 46"	16' 00.71"	119° 27' 10"	0.01149
23	110° 25' 06"	4° 23' 11"	112° 48' 54"	26° 13' 19"	0° 58' 44"	16' 00.37"	120° 32' 24"	0.01055
24	111° 00' 10"	4° 21' 33"	113° 27' 05"	26° 06' 14"	0° 58' 43"	16' 00.03"	121° 41' 57"	0.00965

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	121° 22' 37"	0.25"	123° 36' 26"	19° 51' 11"	1.0158417	15'44.66"	23° 26' 18"	-6 m 32 s
1	121° 25' 01"	0.25"	123° 38' 54"	19° 50' 40"	1.0158381	15'44.67"	23° 26' 18"	-6 m 33 s
2	121° 27' 24"	0.25"	123° 41' 23"	19° 50' 08"	1.0158344	15'44.67"	23° 26' 18"	-6 m 33 s
3	121° 29' 47"	0.24"	123° 43' 52"	19° 49' 37"	1.0158308	15'44.68"	23° 26' 18"	-6 m 33 s
4	121° 32' 10"	0.24"	123° 46' 20"	19° 49' 05"	1.0158271	15'44.68"	23° 26' 18"	-6 m 33 s
5	121° 34' 34"	0.24"	123° 48' 49"	19° 48' 33"	1.0158234	15'44.68"	23° 26' 18"	-6 m 33 s
6	121° 36' 57"	0.24"	123° 51' 17"	19° 48' 02"	1.0158197	15'44.69"	23° 26' 18"	-6 m 33 s
7	121° 39' 20"	0.23"	123° 53' 46"	19° 47' 30"	1.0158161	15'44.69"	23° 26' 18"	-6 m 33 s
8	121° 41' 44"	0.23"	123° 56' 14"	19° 46' 58"	1.0158123	15'44.69"	23° 26' 18"	-6 m 33 s
9	121° 44' 07"	0.23"	123° 58' 43"	19° 46' 26"	1.0158086	15'44.70"	23° 26' 18"	-6 m 33 s
10	121° 46' 30"	0.23"	124° 01' 11"	19° 45' 54"	1.0158049	15'44.70"	23° 26' 18"	-6 m 33 s
11	121° 48' 54"	0.22"	124° 03' 40"	19° 45' 22"	1.0158012	15'44.70"	23° 26' 18"	-6 m 33 s
12	121° 51' 17"	0.22"	124° 06' 08"	19° 44' 50"	1.0157974	15'44.71"	23° 26' 18"	-6 m 33 s
13	121° 53' 40"	0.22"	124° 08' 37"	19° 44' 18"	1.0157937	15'44.71"	23° 26' 18"	-6 m 33 s
14	121° 56' 04"	0.21"	124° 11' 05"	19° 43' 46"	1.0157899	15'44.71"	23° 26' 18"	-6 m 33 s
15	121° 58' 27"	0.21"	124° 13' 34"	19° 43' 14"	1.0157861	15'44.72"	23° 26' 18"	-6 m 33 s
16	122° 00' 50"	0.21"	124° 16' 02"	19° 42' 42"	1.0157823	15'44.72"	23° 26' 18"	-6 m 33 s
17	122° 03' 14"	0.21"	124° 18' 30"	19° 42' 10"	1.0157785	15'44.72"	23° 26' 18"	-6 m 33 s
18	122° 05' 37"	0.20"	124° 20' 59"	19° 41' 38"	1.0157747	15'44.73"	23° 26' 18"	-6 m 33 s
19	122° 08' 00"	0.20"	124° 23' 27"	19° 41' 06"	1.0157709	15'44.73"	23° 26' 18"	-6 m 33 s
20	122° 10' 24"	0.20"	124° 25' 56"	19° 40' 33"	1.0157671	15'44.73"	23° 26' 18"	-6 m 33 s
21	122° 12' 47"	0.19"	124° 28' 24"	19° 40' 01"	1.0157632	15'44.74"	23° 26' 18"	-6 m 33 s
22	122° 15' 10"	0.19"	124° 30' 52"	19° 39' 29"	1.0157594	15'44.74"	23° 26' 18"	-6 m 33 s
23	122° 17' 34"	0.19"	124° 33' 20"	19° 38' 57"	1.0157555	15'44.75"	23° 26' 18"	-6 m 33 s
24	122° 19' 57"	0.18"	124° 35' 49"	19° 38' 24"	1.0157516	15'44.75"	23° 26' 18"	-6 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	111° 00' 10"	4° 21' 33"	113° 27' 05"	26° 06' 14"	0° 58' 43"	16' 00.03"	121° 41' 57"	0.00965
1	111° 35' 13"	4° 19' 54"	114° 05' 11"	25° 58' 59"	0° 58' 42"	15' 59.68"	122° 56' 24"	0.00880
2	112° 10' 14"	4° 18' 13"	114° 43' 10"	25° 51' 34"	0° 58' 40"	15' 59.33"	124° 16' 28"	0.00799
3	112° 45' 13"	4° 16' 31"	115° 21' 02"	25° 43' 60"	0° 58' 39"	15' 58.98"	125° 42' 59"	0.00723
4	113° 20' 11"	4° 14' 47"	115° 58' 48"	25° 36' 16"	0° 58' 38"	15' 58.62"	127° 16' 56"	0.00651
5	113° 55' 07"	4° 13' 01"	116° 36' 28"	25° 28' 23"	0° 58' 37"	15' 58.26"	128° 59' 32"	0.00583
6	114° 30' 01"	4° 11' 14"	117° 14' 01"	25° 20' 21"	0° 58' 35"	15' 57.89"	130° 52' 12"	0.00521
7	115° 04' 54"	4° 09' 26"	117° 51' 27"	25° 12' 09"	0° 58' 34"	15' 57.53"	132° 56' 40"	0.00462
8	115° 39' 45"	4° 07' 36"	118° 28' 46"	25° 03' 49"	0° 58' 33"	15' 57.16"	135° 14' 60"	0.00408
9	116° 14' 34"	4° 05' 45"	119° 05' 59"	24° 55' 19"	0° 58' 31"	15' 56.78"	137° 49' 42"	0.00359
10	116° 49' 21"	4° 03' 52"	119° 43' 04"	24° 46' 41"	0° 58' 30"	15' 56.40"	140° 43' 47"	0.00314
11	117° 24' 06"	4° 01' 58"	120° 20' 03"	24° 37' 54"	0° 58' 28"	15' 56.02"	144° 0' 47"	0.00273
12	117° 58' 50"	4° 00' 02"	120° 56' 55"	24° 28' 58"	0° 58' 27"	15' 55.64"	147° 44' 52"	0.00237
13	118° 33' 32"	3° 58' 05"	121° 33' 40"	24° 19' 54"	0° 58' 26"	15' 55.25"	152° 0' 40"	0.00206
14	119° 08' 12"	3° 56' 07"	122° 10' 17"	24° 10' 42"	0° 58' 24"	15' 54.86"	156° 53' 05"	0.00178
15	119° 42' 50"	3° 54' 07"	122° 46' 48"	24° 01' 21"	0° 58' 23"	15' 54.46"	162° 26' 39"	0.00156
16	120° 17' 26"	3° 52' 06"	123° 23' 11"	23° 51' 52"	0° 58' 21"	15' 54.07"	168° 44' 30"	0.00137
17	120° 52' 01"	3° 50' 03"	123° 59' 27"	23° 42' 15"	0° 58' 20"	15' 53.67"	175° 46' 43"	0.00123
18	121° 26' 33"	3° 47' 60"	124° 35' 36"	23° 32' 30"	0° 58' 18"	15' 53.26"	183° 28' 31"	0.00114
19	122° 01' 03"	3° 45' 55"	125° 11' 38"	23° 22' 37"	0° 58' 17"	15' 52.86"	191° 38' 58"	0.00109
20	122° 35' 32"	3° 43' 48"	125° 47' 33"	23° 12' 36"	0° 58' 15"	15' 52.45"	200° 1' 30"	0.00108
21	123° 09' 59"	3° 41' 41"	126° 23' 20"	23° 02' 28"	0° 58' 14"	15' 52.03"	208° 16' 52"	0.00111
22	123° 44' 23"	3° 39' 32"	126° 58' 60"	22° 52' 13"	0° 58' 12"	15' 51.62"	216° 7' 24"	0.00119
23	124° 18' 46"	3° 37' 22"	127° 34' 32"	22° 41' 49"	0° 58' 11"	15' 51.20"	223° 20' 28"	0.00132
24	124° 53' 07"	3° 35' 11"	128° 09' 58"	22° 31' 19"	0° 58' 09"	15' 50.78"	229° 49' 37"	0.00148

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	122° 19' 57"	0.18"	124° 35' 49"	19° 38' 24"	1.0157516	15'44.75"	23° 26' 18"	-6 m 33 s
1	122° 22' 20"	0.18"	124° 38' 17"	19° 37' 52"	1.0157477	15'44.75"	23° 26' 18"	-6 m 33 s
2	122° 24' 44"	0.18"	124° 40' 45"	19° 37' 19"	1.0157438	15'44.76"	23° 26' 18"	-6 m 33 s
3	122° 27' 07"	0.17"	124° 43' 13"	19° 36' 47"	1.0157399	15'44.76"	23° 26' 18"	-6 m 33 s
4	122° 29' 31"	0.17"	124° 45' 42"	19° 36' 14"	1.0157360	15'44.76"	23° 26' 18"	-6 m 33 s
5	122° 31' 54"	0.17"	124° 48' 10"	19° 35' 42"	1.0157321	15'44.77"	23° 26' 18"	-6 m 33 s
6	122° 34' 17"	0.16"	124° 50' 38"	19° 35' 09"	1.0157282	15'44.77"	23° 26' 18"	-6 m 33 s
7	122° 36' 41"	0.16"	124° 53' 06"	19° 34' 37"	1.0157242	15'44.77"	23° 26' 18"	-6 m 33 s
8	122° 39' 04"	0.15"	124° 55' 34"	19° 34' 04"	1.0157203	15'44.78"	23° 26' 18"	-6 m 33 s
9	122° 41' 27"	0.15"	124° 58' 03"	19° 33' 32"	1.0157163	15'44.78"	23° 26' 18"	-6 m 33 s
10	122° 43' 51"	0.15"	125° 00' 31"	19° 32' 59"	1.0157123	15'44.79"	23° 26' 18"	-6 m 33 s
11	122° 46' 14"	0.14"	125° 02' 59"	19° 32' 26"	1.0157083	15'44.79"	23° 26' 18"	-6 m 34 s
12	122° 48' 37"	0.14"	125° 05' 27"	19° 31' 53"	1.0157043	15'44.79"	23° 26' 18"	-6 m 34 s
13	122° 51' 01"	0.14"	125° 07' 55"	19° 31' 21"	1.0157003	15'44.80"	23° 26' 18"	-6 m 34 s
14	122° 53' 24"	0.13"	125° 10' 23"	19° 30' 48"	1.0156963	15'44.80"	23° 26' 18"	-6 m 34 s
15	122° 55' 47"	0.13"	125° 12' 51"	19° 30' 15"	1.0156923	15'44.80"	23° 26' 18"	-6 m 34 s
16	122° 58' 11"	0.12"	125° 15' 19"	19° 29' 42"	1.0156883	15'44.81"	23° 26' 18"	-6 m 34 s
17	123° 00' 34"	0.12"	125° 17' 47"	19° 29' 09"	1.0156842	15'44.81"	23° 26' 18"	-6 m 34 s
18	123° 02' 58"	0.12"	125° 20' 15"	19° 28' 36"	1.0156801	15'44.82"	23° 26' 18"	-6 m 34 s
19	123° 05' 21"	0.11"	125° 22' 43"	19° 28' 03"	1.0156761	15'44.82"	23° 26' 18"	-6 m 34 s
20	123° 07' 44"	0.11"	125° 25' 11"	19° 27' 30"	1.0156720	15'44.82"	23° 26' 18"	-6 m 34 s
21	123° 10' 08"	0.10"	125° 27' 39"	19° 26' 57"	1.0156679	15'44.83"	23° 26' 18"	-6 m 34 s
22	123° 12' 31"	0.10"	125° 30' 07"	19° 26' 24"	1.0156638	15'44.83"	23° 26' 18"	-6 m 34 s
23	123° 14' 54"	0.09"	125° 32' 35"	19° 25' 51"	1.0156597	15'44.83"	23° 26' 18"	-6 m 34 s
24	123° 17' 18"	0.09"	125° 35' 03"	19° 25' 18"	1.0156556	15'44.84"	23° 26' 18"	-6 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	124° 53' 07"	3° 35' 11"	128° 09' 58"	22° 31' 19"	0° 58' 09"	15' 50.78"	229° 49' 37"	0.00148
1	125° 27' 25"	3° 32' 59"	128° 45' 16"	22° 20' 41"	0° 58' 08"	15' 50.36"	235° 33' 49"	0.00169
2	126° 01' 42"	3° 30' 45"	129° 20' 27"	22° 09' 57"	0° 58' 06"	15' 49.93"	240° 35' 30"	0.00194
3	126° 35' 57"	3° 28' 30"	129° 55' 30"	21° 59' 05"	0° 58' 04"	15' 49.50"	244° 58' 57"	0.00224
4	127° 10' 09"	3° 26' 14"	130° 30' 26"	21° 48' 07"	0° 58' 03"	15' 49.07"	248° 49' 04"	0.00257
5	127° 44' 20"	3° 23' 58"	131° 05' 15"	21° 37' 02"	0° 58' 01"	15' 48.64"	252° 10' 36"	0.00295
6	128° 18' 28"	3° 21' 39"	131° 39' 56"	21° 25' 50"	0° 57' 60"	15' 48.21"	255° 7' 49"	0.00338
7	128° 52' 34"	3° 19' 20"	132° 14' 30"	21° 14' 32"	0° 57' 58"	15' 47.77"	257° 44' 24"	0.00384
8	129° 26' 38"	3° 17' 00"	132° 48' 57"	21° 03' 07"	0° 57' 56"	15' 47.33"	260° 3' 38"	0.00435
9	130° 00' 41"	3° 14' 39"	133° 23' 17"	20° 51' 36"	0° 57' 55"	15' 46.88"	262° 8' 03"	0.00489
10	130° 34' 41"	3° 12' 17"	133° 57' 29"	20° 39' 59"	0° 57' 53"	15' 46.44"	263° 59' 53"	0.00548
11	131° 08' 39"	3° 09' 54"	134° 31' 34"	20° 28' 16"	0° 57' 52"	15' 45.99"	265° 40' 55"	0.00611
12	131° 42' 34"	3° 07' 29"	135° 05' 32"	20° 16' 27"	0° 57' 50"	15' 45.55"	267° 12' 40"	0.00679
13	132° 16' 28"	3° 05' 04"	135° 39' 23"	20° 04' 32"	0° 57' 48"	15' 45.10"	268° 36' 23"	0.00750
14	132° 50' 20"	3° 02' 38"	136° 13' 07"	19° 52' 31"	0° 57' 47"	15' 44.64"	269° 53' 07"	0.00825
15	133° 24' 09"	3° 00' 11"	136° 46' 43"	19° 40' 25"	0° 57' 45"	15' 44.19"	271° 3' 46"	0.00905
16	133° 57' 56"	2° 57' 43"	137° 20' 13"	19° 28' 13"	0° 57' 43"	15' 43.73"	272° 9' 04"	0.00988
17	134° 31' 41"	2° 55' 14"	137° 53' 35"	19° 15' 56"	0° 57' 42"	15' 43.28"	273° 9' 38"	0.01076
18	135° 05' 24"	2° 52' 44"	138° 26' 51"	19° 03' 33"	0° 57' 40"	15' 42.82"	274° 6' 00"	0.01168
19	135° 39' 05"	2° 50' 13"	138° 59' 59"	18° 51' 05"	0° 57' 38"	15' 42.36"	274° 58' 39"	0.01263
20	136° 12' 44"	2° 47' 42"	139° 33' 01"	18° 38' 32"	0° 57' 37"	15' 41.89"	275° 47' 57"	0.01363
21	136° 46' 20"	2° 45' 09"	140° 05' 55"	18° 25' 54"	0° 57' 35"	15' 41.43"	276° 34' 15"	0.01466
22	137° 19' 54"	2° 42' 36"	140° 38' 43"	18° 13' 12"	0° 57' 33"	15' 40.96"	277° 17' 51"	0.01573
23	137° 53' 26"	2° 40' 02"	141° 11' 24"	18° 00' 24"	0° 57' 31"	15' 40.50"	277° 58' 59"	0.01685
24	138° 26' 56"	2° 37' 28"	141° 43' 58"	17° 47' 32"	0° 57' 30"	15' 40.03"	278° 37' 55"	0.01800

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	123° 17' 18"	0.09"	125° 35' 03"	19° 25' 18"	1.0156556	15'44.84"	23° 26' 18"	-6 m 34 s
1	123° 19' 41"	0.09"	125° 37' 31"	19° 24' 44"	1.0156515	15'44.84"	23° 26' 18"	-6 m 34 s
2	123° 22' 04"	0.08"	125° 39' 58"	19° 24' 11"	1.0156473	15'44.85"	23° 26' 18"	-6 m 34 s
3	123° 24' 28"	0.08"	125° 42' 26"	19° 23' 38"	1.0156432	15'44.85"	23° 26' 18"	-6 m 34 s
4	123° 26' 51"	0.07"	125° 44' 54"	19° 23' 04"	1.0156390	15'44.85"	23° 26' 18"	-6 m 34 s
5	123° 29' 15"	0.07"	125° 47' 22"	19° 22' 31"	1.0156348	15'44.86"	23° 26' 18"	-6 m 34 s
6	123° 31' 38"	0.06"	125° 49' 50"	19° 21' 58"	1.0156307	15'44.86"	23° 26' 18"	-6 m 34 s
7	123° 34' 01"	0.06"	125° 52' 17"	19° 21' 24"	1.0156265	15'44.87"	23° 26' 18"	-6 m 34 s
8	123° 36' 25"	0.06"	125° 54' 45"	19° 20' 51"	1.0156223	15'44.87"	23° 26' 18"	-6 m 34 s
9	123° 38' 48"	0.05"	125° 57' 13"	19° 20' 17"	1.0156181	15'44.87"	23° 26' 18"	-6 m 34 s
10	123° 41' 11"	0.05"	125° 59' 41"	19° 19' 44"	1.0156138	15'44.88"	23° 26' 18"	-6 m 34 s
11	123° 43' 35"	0.04"	126° 02' 08"	19° 19' 10"	1.0156096	15'44.88"	23° 26' 18"	-6 m 33 s
12	123° 45' 58"	0.04"	126° 04' 36"	19° 18' 37"	1.0156054	15'44.88"	23° 26' 18"	-6 m 33 s
13	123° 48' 22"	0.03"	126° 07' 04"	19° 18' 03"	1.0156011	15'44.89"	23° 26' 18"	-6 m 33 s
14	123° 50' 45"	0.03"	126° 09' 32"	19° 17' 30"	1.0155969	15'44.89"	23° 26' 18"	-6 m 33 s
15	123° 53' 08"	0.02"	126° 11' 59"	19° 16' 56"	1.0155926	15'44.90"	23° 26' 18"	-6 m 33 s
16	123° 55' 32"	0.02"	126° 14' 27"	19° 16' 22"	1.0155883	15'44.90"	23° 26' 18"	-6 m 33 s
17	123° 57' 55"	0.01"	126° 16' 55"	19° 15' 49"	1.0155840	15'44.90"	23° 26' 18"	-6 m 33 s
18	124° 00' 19"	0.01"	126° 19' 22"	19° 15' 15"	1.0155797	15'44.91"	23° 26' 18"	-6 m 33 s
19	124° 02' 42"	0.00"	126° 21' 50"	19° 14' 41"	1.0155754	15'44.91"	23° 26' 18"	-6 m 33 s
20	124° 05' 05"	-0.00"	126° 24' 17"	19° 14' 07"	1.0155711	15'44.92"	23° 26' 18"	-6 m 33 s
21	124° 07' 29"	-0.01"	126° 26' 45"	19° 13' 33"	1.0155668	15'44.92"	23° 26' 18"	-6 m 33 s
22	124° 09' 52"	-0.01"	126° 29' 12"	19° 12' 59"	1.0155624	15'44.92"	23° 26' 18"	-6 m 33 s
23	124° 12' 15"	-0.02"	126° 31' 40"	19° 12' 25"	1.0155581	15'44.93"	23° 26' 18"	-6 m 33 s
24	124° 14' 39"	-0.02"	126° 34' 07"	19° 11' 51"	1.0155537	15'44.93"	23° 26' 18"	-6 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	138° 26' 56"	2° 37' 28"	141° 43' 58"	17° 47' 32"	0° 57' 30"	15' 40.03"	278° 37' 55"	0.01800
1	139° 00' 23"	2° 34' 52"	142° 16' 25"	17° 34' 35"	0° 57' 28"	15' 39.56"	279° 14' 48"	0.01919
2	139° 33' 49"	2° 32' 16"	142° 48' 46"	17° 21' 33"	0° 57' 26"	15' 39.09"	279° 49' 50"	0.02042
3	140° 07' 12"	2° 29' 39"	143° 21' 00"	17° 08' 28"	0° 57' 24"	15' 38.62"	280° 23' 09"	0.02168
4	140° 40' 32"	2° 27' 01"	143° 53' 08"	16° 55' 18"	0° 57' 23"	15' 38.15"	280° 54' 55"	0.02299
5	141° 13' 51"	2° 24' 23"	144° 25' 09"	16° 42' 03"	0° 57' 21"	15' 37.67"	281° 25' 13"	0.02433
6	141° 47' 07"	2° 21' 44"	144° 57' 03"	16° 28' 45"	0° 57' 19"	15' 37.20"	281° 54' 11"	0.02571
7	142° 20' 21"	2° 19' 05"	145° 28' 51"	16° 15' 23"	0° 57' 18"	15' 36.72"	282° 21' 54"	0.02712
8	142° 53' 33"	2° 16' 24"	146° 00' 33"	16° 01' 57"	0° 57' 16"	15' 36.25"	282° 48' 28"	0.02857
9	143° 26' 43"	2° 13' 43"	146° 32' 08"	15° 48' 27"	0° 57' 14"	15' 35.77"	283° 13' 57"	0.03006
10	143° 59' 50"	2° 11' 02"	147° 03' 37"	15° 34' 53"	0° 57' 12"	15' 35.29"	283° 38' 25"	0.03159
11	144° 32' 56"	2° 08' 20"	147° 35' 00"	15° 21' 16"	0° 57' 11"	15' 34.82"	284° 1' 56"	0.03315
12	145° 05' 58"	2° 05' 37"	148° 06' 17"	15° 07' 35"	0° 57' 09"	15' 34.34"	284° 24' 34"	0.03475
13	145° 38' 59"	2° 02' 54"	148° 37' 28"	14° 53' 51"	0° 57' 07"	15' 33.86"	284° 46' 21"	0.03638
14	146° 11' 57"	2° 00' 11"	149° 08' 33"	14° 40' 03"	0° 57' 05"	15' 33.38"	285° 7' 21"	0.03805
15	146° 44' 54"	1° 57' 27"	149° 39' 32"	14° 26' 13"	0° 57' 03"	15' 32.90"	285° 27' 36"	0.03975
16	147° 17' 47"	1° 54' 42"	150° 10' 25"	14° 12' 19"	0° 57' 02"	15' 32.42"	285° 47' 09"	0.04149
17	147° 50' 39"	1° 51' 57"	150° 41' 12"	13° 58' 22"	0° 56' 60"	15' 31.94"	286° 6' 02"	0.04326
18	148° 23' 28"	1° 49' 11"	151° 11' 53"	13° 44' 22"	0° 56' 58"	15' 31.46"	286° 24' 16"	0.04506
19	148° 56' 16"	1° 46' 25"	151° 42' 29"	13° 30' 19"	0° 56' 56"	15' 30.98"	286° 41' 54"	0.04690
20	149° 29' 01"	1° 43' 39"	152° 12' 59"	13° 16' 13"	0° 56' 55"	15' 30.50"	286° 58' 57"	0.04878
21	150° 01' 43"	1° 40' 52"	152° 43' 24"	13° 02' 05"	0° 56' 53"	15' 30.02"	287° 15' 27"	0.05068
22	150° 34' 24"	1° 38' 05"	153° 13' 43"	12° 47' 54"	0° 56' 51"	15' 29.53"	287° 31' 25"	0.05262
23	151° 07' 02"	1° 35' 18"	153° 43' 57"	12° 33' 40"	0° 56' 49"	15' 29.05"	287° 46' 53"	0.05459
24	151° 39' 38"	1° 32' 30"	154° 14' 05"	12° 19' 25"	0° 56' 48"	15' 28.57"	288° 1' 52"	0.05660

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	124° 14' 39"	-0.02"	126° 34' 07"	19° 11' 51"	1.0155537	15'44.93"	23° 26' 18"	-6 m 33 s
1	124° 17' 02"	-0.03"	126° 36' 35"	19° 11' 17"	1.0155493	15'44.94"	23° 26' 18"	-6 m 33 s
2	124° 19' 26"	-0.03"	126° 39' 02"	19° 10' 43"	1.0155450	15'44.94"	23° 26' 18"	-6 m 33 s
3	124° 21' 49"	-0.04"	126° 41' 30"	19° 10' 09"	1.0155406	15'44.95"	23° 26' 18"	-6 m 33 s
4	124° 24' 12"	-0.04"	126° 43' 57"	19° 09' 35"	1.0155362	15'44.95"	23° 26' 18"	-6 m 33 s
5	124° 26' 36"	-0.05"	126° 46' 25"	19° 09' 01"	1.0155318	15'44.95"	23° 26' 18"	-6 m 33 s
6	124° 28' 59"	-0.05"	126° 48' 52"	19° 08' 27"	1.0155273	15'44.96"	23° 26' 18"	-6 m 33 s
7	124° 31' 23"	-0.06"	126° 51' 20"	19° 07' 53"	1.0155229	15'44.96"	23° 26' 18"	-6 m 33 s
8	124° 33' 46"	-0.06"	126° 53' 47"	19° 07' 19"	1.0155185	15'44.97"	23° 26' 18"	-6 m 33 s
9	124° 36' 09"	-0.07"	126° 56' 14"	19° 06' 44"	1.0155140	15'44.97"	23° 26' 18"	-6 m 33 s
10	124° 38' 33"	-0.07"	126° 58' 42"	19° 06' 10"	1.0155096	15'44.97"	23° 26' 18"	-6 m 33 s
11	124° 40' 56"	-0.08"	127° 01' 09"	19° 05' 36"	1.0155051	15'44.98"	23° 26' 18"	-6 m 33 s
12	124° 43' 20"	-0.08"	127° 03' 36"	19° 05' 01"	1.0155006	15'44.98"	23° 26' 18"	-6 m 33 s
13	124° 45' 43"	-0.09"	127° 06' 04"	19° 04' 27"	1.0154961	15'44.99"	23° 26' 18"	-6 m 33 s
14	124° 48' 06"	-0.09"	127° 08' 31"	19° 03' 52"	1.0154916	15'44.99"	23° 26' 18"	-6 m 33 s
15	124° 50' 30"	-0.10"	127° 10' 58"	19° 03' 18"	1.0154871	15'44.99"	23° 26' 18"	-6 m 33 s
16	124° 52' 53"	-0.10"	127° 13' 26"	19° 02' 43"	1.0154826	15'45.00"	23° 26' 18"	-6 m 33 s
17	124° 55' 17"	-0.11"	127° 15' 53"	19° 02' 09"	1.0154781	15'45.00"	23° 26' 18"	-6 m 33 s
18	124° 57' 40"	-0.11"	127° 18' 20"	19° 01' 34"	1.0154736	15'45.01"	23° 26' 18"	-6 m 33 s
19	125° 00' 03"	-0.12"	127° 20' 47"	19° 00' 60"	1.0154690	15'45.01"	23° 26' 18"	-6 m 33 s
20	125° 02' 27"	-0.12"	127° 23' 14"	19° 00' 25"	1.0154645	15'45.02"	23° 26' 18"	-6 m 33 s
21	125° 04' 50"	-0.13"	127° 25' 42"	18° 59' 51"	1.0154599	15'45.02"	23° 26' 18"	-6 m 32 s
22	125° 07' 14"	-0.13"	127° 28' 09"	18° 59' 16"	1.0154553	15'45.02"	23° 26' 18"	-6 m 32 s
23	125° 09' 37"	-0.14"	127° 30' 36"	18° 58' 41"	1.0154508	15'45.03"	23° 26' 18"	-6 m 32 s
24	125° 12' 01"	-0.14"	127° 33' 03"	18° 58' 06"	1.0154462	15'45.03"	23° 26' 18"	-6 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	151° 39' 38"	1° 32' 30"	154° 14' 05"	12° 19' 25"	0° 56' 48"	15' 28.57"	288° 1' 52"	0.05660
1	152° 12' 11"	1° 29' 42"	154° 44' 08"	12° 05' 06"	0° 56' 46"	15' 28.09"	288° 16' 23"	0.05864
2	152° 44' 43"	1° 26' 53"	155° 14' 06"	11° 50' 46"	0° 56' 44"	15' 27.61"	288° 30' 27"	0.06071
3	153° 17' 12"	1° 24' 04"	155° 43' 59"	11° 36' 23"	0° 56' 42"	15' 27.14"	288° 44' 05"	0.06281
4	153° 49' 39"	1° 21' 15"	156° 13' 47"	11° 21' 58"	0° 56' 41"	15' 26.66"	288° 57' 19"	0.06494
5	154° 22' 04"	1° 18' 26"	156° 43' 30"	11° 07' 31"	0° 56' 39"	15' 26.18"	289° 10' 08"	0.06710
6	154° 54' 27"	1° 15' 36"	157° 13' 07"	10° 53' 02"	0° 56' 37"	15' 25.70"	289° 22' 34"	0.06930
7	155° 26' 47"	1° 12' 46"	157° 42' 40"	10° 38' 31"	0° 56' 35"	15' 25.22"	289° 34' 38"	0.07152
8	155° 59' 05"	1° 09' 56"	158° 12' 09"	10° 23' 58"	0° 56' 34"	15' 24.75"	289° 46' 20"	0.07377
9	156° 31' 21"	1° 07' 06"	158° 41' 32"	10° 09' 24"	0° 56' 32"	15' 24.27"	289° 57' 41"	0.07606
10	157° 03' 35"	1° 04' 16"	159° 10' 51"	9° 54' 48"	0° 56' 30"	15' 23.80"	290° 8' 42"	0.07837
11	157° 35' 47"	1° 01' 25"	159° 40' 06"	9° 40' 10"	0° 56' 28"	15' 23.32"	290° 19' 23"	0.08072
12	158° 07' 56"	0° 58' 34"	160° 09' 15"	9° 25' 31"	0° 56' 27"	15' 22.85"	290° 29' 44"	0.08309
13	158° 40' 04"	0° 55' 43"	160° 38' 21"	9° 10' 51"	0° 56' 25"	15' 22.38"	290° 39' 47"	0.08549
14	159° 12' 09"	0° 52' 52"	161° 07' 22"	8° 56' 09"	0° 56' 23"	15' 21.91"	290° 49' 32"	0.08792
15	159° 44' 12"	0° 50' 01"	161° 36' 19"	8° 41' 25"	0° 56' 21"	15' 21.44"	290° 58' 59"	0.09038
16	160° 16' 13"	0° 47' 10"	162° 05' 12"	8° 26' 41"	0° 56' 20"	15' 20.97"	291° 8' 09"	0.09286
17	160° 48' 11"	0° 44' 19"	162° 34' 01"	8° 11' 55"	0° 56' 18"	15' 20.50"	291° 17' 02"	0.09538
18	161° 20' 08"	0° 41' 27"	163° 02' 45"	7° 57' 08"	0° 56' 16"	15' 20.04"	291° 25' 38"	0.09792
19	161° 52' 03"	0° 38' 36"	163° 31' 26"	7° 42' 20"	0° 56' 15"	15' 19.57"	291° 33' 59"	0.10049
20	162° 23' 55"	0° 35' 45"	164° 00' 03"	7° 27' 32"	0° 56' 13"	15' 19.11"	291° 42' 04"	0.10308
21	162° 55' 45"	0° 32' 53"	164° 28' 36"	7° 12' 42"	0° 56' 11"	15' 18.65"	291° 49' 53"	0.10570
22	163° 27' 33"	0° 30' 02"	164° 57' 05"	6° 57' 52"	0° 56' 10"	15' 18.19"	291° 57' 27"	0.10835
23	163° 59' 19"	0° 27' 10"	165° 25' 31"	6° 43' 00"	0° 56' 08"	15' 17.73"	292° 4' 47"	0.11102
24	164° 31' 03"	0° 24' 19"	165° 53' 53"	6° 28' 09"	0° 56' 06"	15' 17.27"	292° 11' 53"	0.11372

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	125° 12' 01"	-0.14"	127° 33' 03"	18° 58' 06"	1.0154462	15'45.03"	23° 26' 18"	-6 m 32 s
1	125° 14' 24"	-0.15"	127° 35' 30"	18° 57' 32"	1.0154416	15'45.04"	23° 26' 18"	-6 m 32 s
2	125° 16' 47"	-0.16"	127° 37' 57"	18° 56' 57"	1.0154370	15'45.04"	23° 26' 18"	-6 m 32 s
3	125° 19' 11"	-0.16"	127° 40' 24"	18° 56' 22"	1.0154323	15'45.05"	23° 26' 18"	-6 m 32 s
4	125° 21' 34"	-0.17"	127° 42' 51"	18° 55' 47"	1.0154277	15'45.05"	23° 26' 18"	-6 m 32 s
5	125° 23' 58"	-0.17"	127° 45' 18"	18° 55' 12"	1.0154231	15'45.05"	23° 26' 18"	-6 m 32 s
6	125° 26' 21"	-0.18"	127° 47' 45"	18° 54' 37"	1.0154184	15'45.06"	23° 26' 18"	-6 m 32 s
7	125° 28' 44"	-0.18"	127° 50' 12"	18° 54' 02"	1.0154138	15'45.06"	23° 26' 18"	-6 m 32 s
8	125° 31' 08"	-0.19"	127° 52' 39"	18° 53' 27"	1.0154091	15'45.07"	23° 26' 18"	-6 m 32 s
9	125° 33' 31"	-0.19"	127° 55' 06"	18° 52' 52"	1.0154044	15'45.07"	23° 26' 18"	-6 m 32 s
10	125° 35' 55"	-0.20"	127° 57' 33"	18° 52' 17"	1.0153997	15'45.08"	23° 26' 18"	-6 m 32 s
11	125° 38' 18"	-0.20"	128° 00' 00"	18° 51' 42"	1.0153950	15'45.08"	23° 26' 18"	-6 m 32 s
12	125° 40' 42"	-0.21"	128° 02' 27"	18° 51' 07"	1.0153903	15'45.08"	23° 26' 18"	-6 m 32 s
13	125° 43' 05"	-0.21"	128° 04' 54"	18° 50' 32"	1.0153856	15'45.09"	23° 26' 18"	-6 m 32 s
14	125° 45' 28"	-0.22"	128° 07' 21"	18° 49' 56"	1.0153809	15'45.09"	23° 26' 18"	-6 m 31 s
15	125° 47' 52"	-0.23"	128° 09' 48"	18° 49' 21"	1.0153762	15'45.10"	23° 26' 18"	-6 m 31 s
16	125° 50' 15"	-0.23"	128° 12' 15"	18° 48' 46"	1.0153714	15'45.10"	23° 26' 18"	-6 m 31 s
17	125° 52' 39"	-0.24"	128° 14' 42"	18° 48' 11"	1.0153667	15'45.11"	23° 26' 18"	-6 m 31 s
18	125° 55' 02"	-0.24"	128° 17' 09"	18° 47' 35"	1.0153619	15'45.11"	23° 26' 18"	-6 m 31 s
19	125° 57' 26"	-0.25"	128° 19' 35"	18° 46' 60"	1.0153571	15'45.12"	23° 26' 18"	-6 m 31 s
20	125° 59' 49"	-0.25"	128° 22' 02"	18° 46' 24"	1.0153524	15'45.12"	23° 26' 18"	-6 m 31 s
21	126° 02' 12"	-0.26"	128° 24' 29"	18° 45' 49"	1.0153476	15'45.12"	23° 26' 18"	-6 m 31 s
22	126° 04' 36"	-0.26"	128° 26' 56"	18° 45' 14"	1.0153428	15'45.13"	23° 26' 18"	-6 m 31 s
23	126° 06' 59"	-0.27"	128° 29' 23"	18° 44' 38"	1.0153380	15'45.13"	23° 26' 18"	-6 m 31 s
24	126° 09' 23"	-0.27"	128° 31' 49"	18° 44' 03"	1.0153332	15'45.14"	23° 26' 18"	-6 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	164° 31' 03"	0° 24' 19"	165° 53' 53"	6° 28' 09"	0° 56' 06"	15' 17.27"	292° 11' 53"	0.11372
1	165° 02' 45"	0° 21' 28"	166° 22' 12"	6° 13' 16"	0° 56' 04"	15' 16.82"	292° 18' 44"	0.11645
2	165° 34' 25"	0° 18' 36"	166° 50' 27"	5° 58' 23"	0° 56' 03"	15' 16.37"	292° 25' 21"	0.11919
3	166° 06' 03"	0° 15' 45"	167° 18' 39"	5° 43' 29"	0° 56' 01"	15' 15.91"	292° 31' 45"	0.12197
4	166° 37' 39"	0° 12' 54"	167° 46' 47"	5° 28' 35"	0° 55' 60"	15' 15.47"	292° 37' 55"	0.12477
5	167° 09' 13"	0° 10' 03"	168° 14' 52"	5° 13' 41"	0° 55' 58"	15' 15.02"	292° 43' 53"	0.12759
6	167° 40' 44"	0° 07' 12"	168° 42' 55"	4° 58' 46"	0° 55' 56"	15' 14.57"	292° 49' 37"	0.13044
7	168° 12' 14"	0° 04' 21"	169° 10' 54"	4° 43' 51"	0° 55' 55"	15' 14.13"	292° 55' 09"	0.13330
8	168° 43' 42"	0° 01' 31"	169° 38' 50"	4° 28' 56"	0° 55' 53"	15' 13.69"	293° 0' 28"	0.13620
9	169° 15' 08"	0° -1' 20"	170° 06' 43"	4° 14' 01"	0° 55' 51"	15' 13.25"	293° 5' 35"	0.13911
10	169° 46' 32"	0° -4' 10"	170° 34' 34"	3° 59' 05"	0° 55' 50"	15' 12.81"	293° 10' 30"	0.14205
11	170° 17' 54"	0° -7' 00"	171° 02' 22"	3° 44' 10"	0° 55' 48"	15' 12.38"	293° 15' 14"	0.14501
12	170° 49' 14"	0° -9' 50"	171° 30' 07"	3° 29' 15"	0° 55' 47"	15' 11.94"	293° 19' 45"	0.14800
13	171° 20' 32"	0°-12' 40"	171° 57' 49"	3° 14' 19"	0° 55' 45"	15' 11.51"	293° 24' 05"	0.15100
14	171° 51' 48"	0°-15' 29"	172° 25' 29"	2° 59' 24"	0° 55' 43"	15' 11.09"	293° 28' 13"	0.15403
15	172° 23' 02"	0°-18' 19"	172° 53' 07"	2° 44' 29"	0° 55' 42"	15' 10.66"	293° 32' 11"	0.15708
16	172° 54' 15"	0°-21' 08"	173° 20' 42"	2° 29' 35"	0° 55' 40"	15' 10.24"	293° 35' 57"	0.16015
17	173° 25' 25"	0°-23' 56"	173° 48' 15"	2° 14' 40"	0° 55' 39"	15' 09.82"	293° 39' 32"	0.16324
18	173° 56' 34"	0°-26' 45"	174° 15' 46"	1° 59' 46"	0° 55' 37"	15' 09.40"	293° 42' 56"	0.16635
19	174° 27' 41"	0°-29' 33"	174° 43' 14"	1° 44' 53"	0° 55' 36"	15' 08.99"	293° 46' 10"	0.16948
20	174° 58' 46"	0°-32' 21"	175° 10' 41"	1° 29' 60"	0° 55' 34"	15' 08.57"	293° 49' 13"	0.17263
21	175° 29' 49"	0°-35' 08"	175° 38' 05"	1° 15' 07"	0° 55' 33"	15' 08.16"	293° 52' 06"	0.17580
22	176° 00' 50"	0°-37' 56"	176° 05' 28"	1° 00' 15"	0° 55' 31"	15' 07.76"	293° 54' 49"	0.17899
23	176° 31' 50"	0°-40' 42"	176° 32' 48"	0° 45' 24"	0° 55' 30"	15' 07.35"	293° 57' 21"	0.18220
24	177° 02' 48"	0°-43' 29"	177° 00' 07"	0° 30' 33"	0° 55' 28"	15' 06.95"	293° 59' 43"	0.18543

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	126° 09' 23"	-0.27"	128° 31' 49"	18° 44' 03"	1.0153332	15'45.14"	23° 26' 18"	-6 m 31 s
1	126° 11' 46"	-0.28"	128° 34' 16"	18° 43' 27"	1.0153283	15'45.14"	23° 26' 18"	-6 m 31 s
2	126° 14' 10"	-0.28"	128° 36' 43"	18° 42' 51"	1.0153235	15'45.15"	23° 26' 18"	-6 m 31 s
3	126° 16' 33"	-0.29"	128° 39' 09"	18° 42' 16"	1.0153187	15'45.15"	23° 26' 18"	-6 m 31 s
4	126° 18' 57"	-0.30"	128° 41' 36"	18° 41' 40"	1.0153138	15'45.16"	23° 26' 18"	-6 m 30 s
5	126° 21' 20"	-0.30"	128° 44' 03"	18° 41' 04"	1.0153090	15'45.16"	23° 26' 18"	-6 m 30 s
6	126° 23' 43"	-0.31"	128° 46' 29"	18° 40' 29"	1.0153041	15'45.17"	23° 26' 18"	-6 m 30 s
7	126° 26' 07"	-0.31"	128° 48' 56"	18° 39' 53"	1.0152992	15'45.17"	23° 26' 18"	-6 m 30 s
8	126° 28' 30"	-0.32"	128° 51' 23"	18° 39' 17"	1.0152943	15'45.17"	23° 26' 18"	-6 m 30 s
9	126° 30' 54"	-0.32"	128° 53' 49"	18° 38' 41"	1.0152894	15'45.18"	23° 26' 18"	-6 m 30 s
10	126° 33' 17"	-0.33"	128° 56' 16"	18° 38' 06"	1.0152845	15'45.18"	23° 26' 18"	-6 m 30 s
11	126° 35' 41"	-0.33"	128° 58' 42"	18° 37' 30"	1.0152796	15'45.19"	23° 26' 18"	-6 m 30 s
12	126° 38' 04"	-0.34"	129° 01' 09"	18° 36' 54"	1.0152747	15'45.19"	23° 26' 18"	-6 m 30 s
13	126° 40' 28"	-0.34"	129° 03' 35"	18° 36' 18"	1.0152698	15'45.20"	23° 26' 18"	-6 m 30 s
14	126° 42' 51"	-0.35"	129° 06' 02"	18° 35' 42"	1.0152648	15'45.20"	23° 26' 18"	-6 m 30 s
15	126° 45' 14"	-0.35"	129° 08' 29"	18° 35' 06"	1.0152599	15'45.21"	23° 26' 18"	-6 m 29 s
16	126° 47' 38"	-0.36"	129° 10' 55"	18° 34' 30"	1.0152549	15'45.21"	23° 26' 18"	-6 m 29 s
17	126° 50' 01"	-0.37"	129° 13' 21"	18° 33' 54"	1.0152500	15'45.22"	23° 26' 18"	-6 m 29 s
18	126° 52' 25"	-0.37"	129° 15' 48"	18° 33' 18"	1.0152450	15'45.22"	23° 26' 18"	-6 m 29 s
19	126° 54' 48"	-0.38"	129° 18' 14"	18° 32' 41"	1.0152400	15'45.22"	23° 26' 18"	-6 m 29 s
20	126° 57' 12"	-0.38"	129° 20' 41"	18° 32' 05"	1.0152350	15'45.23"	23° 26' 18"	-6 m 29 s
21	126° 59' 35"	-0.39"	129° 23' 07"	18° 31' 29"	1.0152300	15'45.23"	23° 26' 18"	-6 m 29 s
22	127° 01' 59"	-0.39"	129° 25' 34"	18° 30' 53"	1.0152250	15'45.24"	23° 26' 18"	-6 m 29 s
23	127° 04' 22"	-0.40"	129° 27' 60"	18° 30' 17"	1.0152200	15'45.24"	23° 26' 18"	-6 m 29 s
24	127° 06' 46"	-0.40"	129° 30' 26"	18° 29' 40"	1.0152150	15'45.25"	23° 26' 18"	-6 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	177° 02' 48"	0°-43' 29"	177° 00' 07"	0° 30' 33"	0° 55' 28"	15' 06.95"	293° 59' 43"	0.18543
1	177° 33' 44"	0°-46' 15"	177° 27' 24"	0° 15' 43"	0° 55' 27"	15' 06.56"	294° 1' 56"	0.18867
2	178° 04' 38"	0°-49' 01"	177° 54' 40"	0° 00' 54"	0° 55' 25"	15' 06.16"	294° 3' 58"	0.19194
3	178° 35' 31"	0°-51' 46"	178° 21' 54"	0°-13' 54"	0° 55' 24"	15' 05.77"	294° 5' 51"	0.19522
4	179° 06' 22"	0°-54' 32"	178° 49' 06"	0°-28' 42"	0° 55' 23"	15' 05.38"	294° 7' 34"	0.19852
5	179° 37' 11"	0°-57' 16"	179° 16' 18"	0°-43' 28"	0° 55' 21"	15' 05.00"	294° 9' 07"	0.20184
6	180° 07' 59"	-1° 00' 00"	179° 43' 27"	0°-58' 14"	0° 55' 20"	15' 04.61"	294° 10' 31"	0.20517
7	180° 38' 45"	-1° 02' 44"	180° 10' 36"	-1° 12' 58"	0° 55' 18"	15' 04.23"	294° 11' 45"	0.20852
8	181° 09' 29"	-1° 05' 28"	180° 37' 43"	-1° 27' 42"	0° 55' 17"	15' 03.86"	294° 12' 50"	0.21189
9	181° 40' 12"	-1° 08' 10"	181° 04' 49"	-1° 42' 24"	0° 55' 16"	15' 03.49"	294° 13' 46"	0.21528
10	182° 10' 53"	-1° 10' 53"	181° 31' 54"	-1° 57' 05"	0° 55' 14"	15' 03.12"	294° 14' 33"	0.21868
11	182° 41' 33"	-1° 13' 35"	181° 58' 59"	-2° 11' 45"	0° 55' 13"	15' 02.75"	294° 15' 11"	0.22209
12	183° 12' 11"	-1° 16' 16"	182° 26' 02"	-2° 26' 24"	0° 55' 12"	15' 02.39"	294° 15' 39"	0.22553
13	183° 42' 47"	-1° 18' 57"	182° 53' 04"	-2° 41' 02"	0° 55' 10"	15' 02.03"	294° 15' 59"	0.22898
14	184° 13' 22"	-1° 21' 38"	183° 20' 06"	-2° 55' 38"	0° 55' 09"	15' 01.67"	294° 16' 10"	0.23244
15	184° 43' 56"	-1° 24' 18"	183° 47' 07"	-3° 10' 12"	0° 55' 08"	15' 01.32"	294° 16' 11"	0.23592
16	185° 14' 28"	-1° 26' 57"	184° 14' 07"	-3° 24' 46"	0° 55' 06"	15' 00.97"	294° 16' 05"	0.23941
17	185° 44' 58"	-1° 29' 36"	184° 41' 07"	-3° 39' 17"	0° 55' 05"	15' 00.63"	294° 15' 49"	0.24292
18	186° 15' 27"	-1° 32' 15"	185° 08' 06"	-3° 53' 48"	0° 55' 04"	15' 00.29"	294° 15' 25"	0.24644
19	186° 45' 55"	-1° 34' 52"	185° 35' 05"	-4° 08' 16"	0° 55' 03"	14' 59.95"	294° 14' 52"	0.24997
20	187° 16' 21"	-1° 37' 30"	186° 02' 04"	-4° 22' 43"	0° 55' 01"	14' 59.62"	294° 14' 11"	0.25352
21	187° 46' 46"	-1° 40' 06"	186° 29' 02"	-4° 37' 09"	0° 55' 00"	14' 59.29"	294° 13' 21"	0.25708
22	188° 17' 09"	-1° 42' 42"	186° 55' 60"	-4° 51' 32"	0° 54' 59"	14' 58.96"	294° 12' 23"	0.26066
23	188° 47' 31"	-1° 45' 18"	187° 22' 58"	-5° 05' 54"	0° 54' 58"	14' 58.64"	294° 11' 16"	0.26425
24	189° 17' 52"	-1° 47' 53"	187° 49' 56"	-5° 20' 14"	0° 54' 57"	14' 58.32"	294° 10' 01"	0.26785

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	127° 06' 46"	-0.40"	129° 30' 26"	18° 29' 40"	1.0152150	15'45.25"	23° 26' 18"	-6 m 29 s
1	127° 09' 09"	-0.41"	129° 32' 53"	18° 29' 04"	1.0152099	15'45.25"	23° 26' 18"	-6 m 29 s
2	127° 11' 32"	-0.41"	129° 35' 19"	18° 28' 28"	1.0152049	15'45.26"	23° 26' 18"	-6 m 28 s
3	127° 13' 56"	-0.42"	129° 37' 45"	18° 27' 51"	1.0151998	15'45.26"	23° 26' 18"	-6 m 28 s
4	127° 16' 19"	-0.42"	129° 40' 12"	18° 27' 15"	1.0151948	15'45.27"	23° 26' 18"	-6 m 28 s
5	127° 18' 43"	-0.43"	129° 42' 38"	18° 26' 38"	1.0151897	15'45.27"	23° 26' 18"	-6 m 28 s
6	127° 21' 06"	-0.43"	129° 45' 04"	18° 26' 02"	1.0151846	15'45.28"	23° 26' 18"	-6 m 28 s
7	127° 23' 30"	-0.44"	129° 47' 30"	18° 25' 25"	1.0151796	15'45.28"	23° 26' 18"	-6 m 28 s
8	127° 25' 53"	-0.44"	129° 49' 56"	18° 24' 49"	1.0151745	15'45.29"	23° 26' 18"	-6 m 28 s
9	127° 28' 17"	-0.45"	129° 52' 23"	18° 24' 12"	1.0151694	15'45.29"	23° 26' 18"	-6 m 28 s
10	127° 30' 40"	-0.45"	129° 54' 49"	18° 23' 36"	1.0151643	15'45.30"	23° 26' 18"	-6 m 28 s
11	127° 33' 04"	-0.46"	129° 57' 15"	18° 22' 59"	1.0151591	15'45.30"	23° 26' 18"	-6 m 27 s
12	127° 35' 27"	-0.46"	129° 59' 41"	18° 22' 22"	1.0151540	15'45.30"	23° 26' 18"	-6 m 27 s
13	127° 37' 51"	-0.47"	130° 02' 07"	18° 21' 46"	1.0151489	15'45.31"	23° 26' 18"	-6 m 27 s
14	127° 40' 14"	-0.47"	130° 04' 33"	18° 21' 09"	1.0151437	15'45.31"	23° 26' 18"	-6 m 27 s
15	127° 42' 38"	-0.48"	130° 06' 60"	18° 20' 32"	1.0151386	15'45.32"	23° 26' 18"	-6 m 27 s
16	127° 45' 01"	-0.48"	130° 09' 26"	18° 19' 55"	1.0151334	15'45.32"	23° 26' 18"	-6 m 27 s
17	127° 47' 24"	-0.49"	130° 11' 52"	18° 19' 19"	1.0151282	15'45.33"	23° 26' 18"	-6 m 27 s
18	127° 49' 48"	-0.49"	130° 14' 18"	18° 18' 42"	1.0151231	15'45.33"	23° 26' 18"	-6 m 27 s
19	127° 52' 11"	-0.50"	130° 16' 44"	18° 18' 05"	1.0151179	15'45.34"	23° 26' 18"	-6 m 26 s
20	127° 54' 35"	-0.50"	130° 19' 10"	18° 17' 28"	1.0151127	15'45.34"	23° 26' 18"	-6 m 26 s
21	127° 56' 58"	-0.51"	130° 21' 36"	18° 16' 51"	1.0151075	15'45.35"	23° 26' 18"	-6 m 26 s
22	127° 59' 22"	-0.51"	130° 24' 02"	18° 16' 14"	1.0151023	15'45.35"	23° 26' 18"	-6 m 26 s
23	128° 01' 45"	-0.52"	130° 26' 28"	18° 15' 37"	1.0150971	15'45.36"	23° 26' 18"	-6 m 26 s
24	128° 04' 09"	-0.52"	130° 28' 54"	18° 14' 60"	1.0150918	15'45.36"	23° 26' 18"	-6 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	189° 17' 52"	-1° 47' 53"	187° 49' 56"	-5° 20' 14"	0° 54' 57"	14' 58.32"	294° 10' 01"	0.26785
1	189° 48' 11"	-1° 50' 27"	188° 16' 54"	-5° 34' 33"	0° 54' 55"	14' 58.01"	294° 8' 38"	0.27146
2	190° 18' 29"	-1° 53' 01"	188° 43' 51"	-5° 48' 49"	0° 54' 54"	14' 57.70"	294° 7' 06"	0.27509
3	190° 48' 46"	-1° 55' 34"	189° 10' 50"	-6° 03' 04"	0° 54' 53"	14' 57.39"	294° 5' 26"	0.27872
4	191° 19' 01"	-1° 58' 06"	189° 37' 48"	-6° 17' 16"	0° 54' 52"	14' 57.09"	294° 3' 38"	0.28237
5	191° 49' 16"	-2° 00' 38"	190° 04' 46"	-6° 31' 27"	0° 54' 51"	14' 56.79"	294° 1' 42"	0.28603
6	192° 19' 29"	-2° 03' 09"	190° 31' 45"	-6° 45' 35"	0° 54' 50"	14' 56.50"	293° 59' 38"	0.28970
7	192° 49' 41"	-2° 05' 39"	190° 58' 45"	-6° 59' 42"	0° 54' 49"	14' 56.20"	293° 57' 26"	0.29339
8	193° 19' 51"	-2° 08' 09"	191° 25' 44"	-7° 13' 46"	0° 54' 48"	14' 55.92"	293° 55' 06"	0.29708
9	193° 50' 01"	-2° 10' 38"	191° 52' 45"	-7° 27' 48"	0° 54' 47"	14' 55.64"	293° 52' 38"	0.30078
10	194° 20' 09"	-2° 13' 06"	192° 19' 46"	-7° 41' 48"	0° 54' 46"	14' 55.36"	293° 50' 01"	0.30450
11	194° 50' 16"	-2° 15' 34"	192° 46' 47"	-7° 55' 46"	0° 54' 45"	14' 55.09"	293° 47' 17"	0.30822
12	195° 20' 22"	-2° 18' 01"	193° 13' 50"	-8° 09' 41"	0° 54' 44"	14' 54.82"	293° 44' 25"	0.31195
13	195° 50' 27"	-2° 20' 27"	193° 40' 53"	-8° 23' 34"	0° 54' 43"	14' 54.55"	293° 41' 26"	0.31570
14	196° 20' 31"	-2° 22' 52"	194° 07' 57"	-8° 37' 25"	0° 54' 42"	14' 54.29"	293° 38' 18"	0.31945
15	196° 50' 34"	-2° 25' 17"	194° 35' 02"	-8° 51' 13"	0° 54' 41"	14' 54.03"	293° 35' 03"	0.32321
16	197° 20' 36"	-2° 27' 41"	195° 02' 08"	-9° 04' 59"	0° 54' 40"	14' 53.78"	293° 31' 39"	0.32698
17	197° 50' 37"	-2° 30' 04"	195° 29' 15"	-9° 18' 42"	0° 54' 39"	14' 53.53"	293° 28' 08"	0.33076
18	198° 20' 37"	-2° 32' 27"	195° 56' 24"	-9° 32' 23"	0° 54' 38"	14' 53.29"	293° 24' 30"	0.33455
19	198° 50' 36"	-2° 34' 48"	196° 23' 33"	-9° 46' 01"	0° 54' 37"	14' 53.05"	293° 20' 43"	0.33835
20	199° 20' 34"	-2° 37' 09"	196° 50' 44"	-9° 59' 37"	0° 54' 36"	14' 52.82"	293° 16' 49"	0.34215
21	199° 50' 31"	-2° 39' 29"	197° 17' 56"	-10° 13' 09"	0° 54' 36"	14' 52.59"	293° 12' 47"	0.34596
22	200° 20' 27"	-2° 41' 48"	197° 45' 09"	-10° 26' 40"	0° 54' 35"	14' 52.36"	293° 8' 38"	0.34978
23	200° 50' 23"	-2° 44' 07"	198° 12' 24"	-10° 40' 07"	0° 54' 34"	14' 52.14"	293° 4' 21"	0.35361
24	201° 20' 17"	-2° 46' 25"	198° 39' 41"	-10° 53' 32"	0° 54' 33"	14' 51.92"	292° 59' 56"	0.35744

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	128° 04' 09"	-0.52"	130° 28' 54"	18° 14' 60"	1.0150918	15'45.36"	23° 26' 18"	-6 m 26 s
1	128° 06' 32"	-0.53"	130° 31' 20"	18° 14' 23"	1.0150866	15'45.37"	23° 26' 18"	-6 m 26 s
2	128° 08' 56"	-0.53"	130° 33' 46"	18° 13' 46"	1.0150814	15'45.37"	23° 26' 18"	-6 m 26 s
3	128° 11' 19"	-0.54"	130° 36' 12"	18° 13' 09"	1.0150761	15'45.38"	23° 26' 18"	-6 m 25 s
4	128° 13' 43"	-0.54"	130° 38' 38"	18° 12' 31"	1.0150708	15'45.38"	23° 26' 18"	-6 m 25 s
5	128° 16' 06"	-0.55"	130° 41' 03"	18° 11' 54"	1.0150656	15'45.39"	23° 26' 18"	-6 m 25 s
6	128° 18' 30"	-0.55"	130° 43' 29"	18° 11' 17"	1.0150603	15'45.39"	23° 26' 18"	-6 m 25 s
7	128° 20' 53"	-0.56"	130° 45' 55"	18° 10' 40"	1.0150550	15'45.40"	23° 26' 18"	-6 m 25 s
8	128° 23' 17"	-0.56"	130° 48' 21"	18° 10' 03"	1.0150497	15'45.40"	23° 26' 18"	-6 m 25 s
9	128° 25' 40"	-0.56"	130° 50' 47"	18° 09' 25"	1.0150444	15'45.41"	23° 26' 18"	-6 m 25 s
10	128° 28' 04"	-0.57"	130° 53' 13"	18° 08' 48"	1.0150391	15'45.41"	23° 26' 18"	-6 m 25 s
11	128° 30' 27"	-0.57"	130° 55' 38"	18° 08' 10"	1.0150338	15'45.42"	23° 26' 18"	-6 m 24 s
12	128° 32' 51"	-0.58"	130° 58' 04"	18° 07' 33"	1.0150285	15'45.42"	23° 26' 18"	-6 m 24 s
13	128° 35' 14"	-0.58"	131° 00' 30"	18° 06' 56"	1.0150232	15'45.43"	23° 26' 18"	-6 m 24 s
14	128° 37' 38"	-0.59"	131° 02' 56"	18° 06' 18"	1.0150178	15'45.43"	23° 26' 18"	-6 m 24 s
15	128° 40' 01"	-0.59"	131° 05' 21"	18° 05' 41"	1.0150125	15'45.44"	23° 26' 18"	-6 m 24 s
16	128° 42' 25"	-0.59"	131° 07' 47"	18° 05' 03"	1.0150071	15'45.44"	23° 26' 18"	-6 m 24 s
17	128° 44' 48"	-0.60"	131° 10' 13"	18° 04' 26"	1.0150018	15'45.45"	23° 26' 18"	-6 m 24 s
18	128° 47' 12"	-0.60"	131° 12' 38"	18° 03' 48"	1.0149964	15'45.45"	23° 26' 18"	-6 m 23 s
19	128° 49' 35"	-0.61"	131° 15' 04"	18° 03' 10"	1.0149910	15'45.46"	23° 26' 18"	-6 m 23 s
20	128° 51' 59"	-0.61"	131° 17' 30"	18° 02' 33"	1.0149856	15'45.46"	23° 26' 18"	-6 m 23 s
21	128° 54' 22"	-0.62"	131° 19' 55"	18° 01' 55"	1.0149802	15'45.47"	23° 26' 18"	-6 m 23 s
22	128° 56' 46"	-0.62"	131° 22' 21"	18° 01' 17"	1.0149748	15'45.47"	23° 26' 18"	-6 m 23 s
23	128° 59' 09"	-0.62"	131° 24' 47"	18° 00' 40"	1.0149694	15'45.48"	23° 26' 18"	-6 m 23 s
24	129° 01' 33"	-0.63"	131° 27' 12"	18° 00' 02"	1.0149640	15'45.48"	23° 26' 18"	-6 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	201° 20' 17"	-2° 46' 25"	198° 39' 41"	-10° 53' 32"	0° 54' 33"	14' 51.92"	292° 59' 56"	0.35744
1	201° 50' 11"	-2° 48' 41"	199° 06' 59"	-11° 06' 53"	0° 54' 32"	14' 51.71"	292° 55' 24"	0.36128
2	202° 20' 04"	-2° 50' 57"	199° 34' 19"	-11° 20' 12"	0° 54' 32"	14' 51.50"	292° 50' 44"	0.36513
3	202° 49' 56"	-2° 53' 13"	200° 01' 40"	-11° 33' 28"	0° 54' 31"	14' 51.30"	292° 45' 57"	0.36898
4	203° 19' 47"	-2° 55' 27"	200° 29' 03"	-11° 46' 41"	0° 54' 30"	14' 51.10"	292° 41' 02"	0.37284
5	203° 49' 38"	-2° 57' 40"	200° 56' 28"	-11° 59' 52"	0° 54' 29"	14' 50.91"	292° 35' 59"	0.37671
6	204° 19' 28"	-2° 59' 53"	201° 23' 55"	-12° 12' 59"	0° 54' 29"	14' 50.72"	292° 30' 49"	0.38058
7	204° 49' 17"	-3° 02' 05"	201° 51' 24"	-12° 26' 02"	0° 54' 28"	14' 50.53"	292° 25' 32"	0.38446
8	205° 19' 05"	-3° 04' 16"	202° 18' 55"	-12° 39' 03"	0° 54' 27"	14' 50.35"	292° 20' 07"	0.38834
9	205° 48' 53"	-3° 06' 26"	202° 46' 28"	-12° 52' 01"	0° 54' 27"	14' 50.18"	292° 14' 35"	0.39223
10	206° 18' 40"	-3° 08' 35"	203° 14' 03"	-13° 04' 55"	0° 54' 26"	14' 50.01"	292° 8' 55"	0.39613
11	206° 48' 27"	-3° 10' 43"	203° 41' 41"	-13° 17' 47"	0° 54' 25"	14' 49.84"	292° 3' 08"	0.40002
12	207° 18' 13"	-3° 12' 50"	204° 09' 20"	-13° 30' 35"	0° 54' 25"	14' 49.68"	291° 57' 13"	0.40393
13	207° 47' 58"	-3° 14' 57"	204° 37' 02"	-13° 43' 19"	0° 54' 24"	14' 49.53"	291° 51' 11"	0.40783
14	208° 17' 43"	-3° 17' 02"	205° 04' 46"	-13° 56' 00"	0° 54' 24"	14' 49.37"	291° 45' 01"	0.41175
15	208° 47' 27"	-3° 19' 07"	205° 32' 33"	-14° 08' 38"	0° 54' 23"	14' 49.23"	291° 38' 45"	0.41566
16	209° 17' 11"	-3° 21' 10"	206° 00' 22"	-14° 21' 12"	0° 54' 23"	14' 49.08"	291° 32' 20"	0.41958
17	209° 46' 54"	-3° 23' 13"	206° 28' 14"	-14° 33' 43"	0° 54' 22"	14' 48.95"	291° 25' 49"	0.42350
18	210° 16' 37"	-3° 25' 15"	206° 56' 08"	-14° 46' 11"	0° 54' 22"	14' 48.81"	291° 19' 10"	0.42743
19	210° 46' 20"	-3° 27' 16"	207° 24' 05"	-14° 58' 34"	0° 54' 21"	14' 48.69"	291° 12' 23"	0.43136
20	211° 16' 02"	-3° 29' 15"	207° 52' 05"	-15° 10' 54"	0° 54' 21"	14' 48.56"	291° 5' 29"	0.43529
21	211° 45' 43"	-3° 31' 14"	208° 20' 08"	-15° 23' 11"	0° 54' 20"	14' 48.45"	290° 58' 28"	0.43923
22	212° 15' 25"	-3° 33' 12"	208° 48' 13"	-15° 35' 23"	0° 54' 20"	14' 48.33"	290° 51' 20"	0.44316
23	212° 45' 05"	-3° 35' 09"	209° 16' 21"	-15° 47' 32"	0° 54' 20"	14' 48.22"	290° 44' 04"	0.44710
24	213° 14' 46"	-3° 37' 05"	209° 44' 32"	-15° 59' 37"	0° 54' 19"	14' 48.12"	290° 36' 41"	0.45105

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	129° 01' 33"	-0.63"	131° 27' 12"	18° 00' 02"	1.0149640	15'45.48"	23° 26' 18"	-6 m 22 s
1	129° 03' 56"	-0.63"	131° 29' 38"	17° 59' 24"	1.0149586	15'45.49"	23° 26' 18"	-6 m 22 s
2	129° 06' 20"	-0.64"	131° 32' 03"	17° 58' 46"	1.0149532	15'45.49"	23° 26' 18"	-6 m 22 s
3	129° 08' 43"	-0.64"	131° 34' 29"	17° 58' 08"	1.0149477	15'45.50"	23° 26' 18"	-6 m 22 s
4	129° 11' 07"	-0.64"	131° 36' 54"	17° 57' 30"	1.0149423	15'45.50"	23° 26' 18"	-6 m 22 s
5	129° 13' 30"	-0.65"	131° 39' 20"	17° 56' 52"	1.0149368	15'45.51"	23° 26' 18"	-6 m 22 s
6	129° 15' 54"	-0.65"	131° 41' 45"	17° 56' 14"	1.0149314	15'45.51"	23° 26' 18"	-6 m 22 s
7	129° 18' 17"	-0.66"	131° 44' 11"	17° 55' 36"	1.0149259	15'45.52"	23° 26' 18"	-6 m 21 s
8	129° 20' 41"	-0.66"	131° 46' 36"	17° 54' 58"	1.0149204	15'45.52"	23° 26' 18"	-6 m 21 s
9	129° 23' 04"	-0.66"	131° 49' 02"	17° 54' 20"	1.0149149	15'45.53"	23° 26' 18"	-6 m 21 s
10	129° 25' 28"	-0.67"	131° 51' 27"	17° 53' 42"	1.0149094	15'45.53"	23° 26' 18"	-6 m 21 s
11	129° 27' 51"	-0.67"	131° 53' 52"	17° 53' 04"	1.0149039	15'45.54"	23° 26' 18"	-6 m 21 s
12	129° 30' 15"	-0.67"	131° 56' 18"	17° 52' 26"	1.0148984	15'45.54"	23° 26' 18"	-6 m 21 s
13	129° 32' 38"	-0.68"	131° 58' 43"	17° 51' 48"	1.0148929	15'45.55"	23° 26' 18"	-6 m 20 s
14	129° 35' 02"	-0.68"	132° 01' 08"	17° 51' 10"	1.0148874	15'45.55"	23° 26' 18"	-6 m 20 s
15	129° 37' 25"	-0.68"	132° 03' 34"	17° 50' 31"	1.0148819	15'45.56"	23° 26' 18"	-6 m 20 s
16	129° 39' 49"	-0.69"	132° 05' 59"	17° 49' 53"	1.0148763	15'45.56"	23° 26' 18"	-6 m 20 s
17	129° 42' 13"	-0.69"	132° 08' 24"	17° 49' 15"	1.0148708	15'45.57"	23° 26' 18"	-6 m 20 s
18	129° 44' 36"	-0.69"	132° 10' 50"	17° 48' 37"	1.0148652	15'45.57"	23° 26' 18"	-6 m 20 s
19	129° 46' 60"	-0.70"	132° 13' 15"	17° 47' 58"	1.0148597	15'45.58"	23° 26' 18"	-6 m 19 s
20	129° 49' 23"	-0.70"	132° 15' 40"	17° 47' 20"	1.0148541	15'45.58"	23° 26' 18"	-6 m 19 s
21	129° 51' 47"	-0.70"	132° 18' 05"	17° 46' 41"	1.0148485	15'45.59"	23° 26' 18"	-6 m 19 s
22	129° 54' 10"	-0.71"	132° 20' 31"	17° 46' 03"	1.0148429	15'45.59"	23° 26' 18"	-6 m 19 s
23	129° 56' 34"	-0.71"	132° 22' 56"	17° 45' 24"	1.0148374	15'45.60"	23° 26' 18"	-6 m 19 s
24	129° 58' 57"	-0.71"	132° 25' 21"	17° 44' 46"	1.0148318	15'45.61"	23° 26' 18"	-6 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	213° 14' 46"	-3° 37' 05"	209° 44' 32"	-15° 59' 37"	0° 54' 19"	14' 48.12"	290° 36' 41"	0.45105
1	213° 44' 26"	-3° 38' 60"	210° 12' 47"	-16° 11' 39"	0° 54' 19"	14' 48.02"	290° 29' 11"	0.45499
2	214° 14' 06"	-3° 40' 54"	210° 41' 04"	-16° 23' 36"	0° 54' 18"	14' 47.93"	290° 21' 33"	0.45894
3	214° 43' 46"	-3° 42' 47"	211° 09' 24"	-16° 35' 29"	0° 54' 18"	14' 47.84"	290° 13' 48"	0.46288
4	215° 13' 25"	-3° 44' 39"	211° 37' 47"	-16° 47' 19"	0° 54' 18"	14' 47.76"	290° 5' 56"	0.46683
5	215° 43' 05"	-3° 46' 30"	212° 06' 14"	-16° 59' 04"	0° 54' 18"	14' 47.68"	289° 57' 56"	0.47078
6	216° 12' 44"	-3° 48' 19"	212° 34' 44"	-17° 10' 45"	0° 54' 17"	14' 47.60"	289° 49' 49"	0.47473
7	216° 42' 23"	-3° 50' 08"	213° 03' 17"	-17° 22' 23"	0° 54' 17"	14' 47.53"	289° 41' 35"	0.47869
8	217° 12' 01"	-3° 51' 56"	213° 31' 54"	-17° 33' 56"	0° 54' 17"	14' 47.47"	289° 33' 14"	0.48264
9	217° 41' 40"	-3° 53' 43"	214° 00' 33"	-17° 45' 24"	0° 54' 17"	14' 47.41"	289° 24' 45"	0.48659
10	218° 11' 18"	-3° 55' 28"	214° 29' 17"	-17° 56' 49"	0° 54' 16"	14' 47.35"	289° 16' 09"	0.49054
11	218° 40' 57"	-3° 57' 13"	214° 58' 04"	-18° 08' 09"	0° 54' 16"	14' 47.30"	289° 7' 26"	0.49450
12	219° 10' 35"	-3° 58' 57"	215° 26' 54"	-18° 19' 25"	0° 54' 16"	14' 47.26"	288° 58' 36"	0.49845
13	219° 40' 13"	-4° 00' 39"	215° 55' 48"	-18° 30' 36"	0° 54' 16"	14' 47.22"	288° 49' 38"	0.50240
14	220° 09' 51"	-4° 02' 21"	216° 24' 45"	-18° 41' 43"	0° 54' 16"	14' 47.18"	288° 40' 33"	0.50635
15	220° 39' 30"	-4° 04' 01"	216° 53' 47"	-18° 52' 46"	0° 54' 16"	14' 47.15"	288° 31' 21"	0.51031
16	221° 09' 08"	-4° 05' 40"	217° 22' 52"	-19° 03' 44"	0° 54' 16"	14' 47.13"	288° 22' 02"	0.51426
17	221° 38' 46"	-4° 07' 18"	217° 52' 00"	-19° 14' 37"	0° 54' 15"	14' 47.11"	288° 12' 35"	0.51820
18	222° 08' 24"	-4° 08' 55"	218° 21' 13"	-19° 25' 26"	0° 54' 15"	14' 47.09"	288° 3' 01"	0.52215
19	222° 38' 03"	-4° 10' 31"	218° 50' 29"	-19° 36' 10"	0° 54' 15"	14' 47.08"	287° 53' 20"	0.52610
20	223° 07' 41"	-4° 12' 06"	219° 19' 49"	-19° 46' 49"	0° 54' 15"	14' 47.08"	287° 43' 32"	0.53004
21	223° 37' 20"	-4° 13' 40"	219° 49' 14"	-19° 57' 24"	0° 54' 15"	14' 47.08"	287° 33' 37"	0.53399
22	224° 06' 59"	-4° 15' 12"	220° 18' 42"	-20° 07' 53"	0° 54' 15"	14' 47.08"	287° 23' 35"	0.53793
23	224° 36' 38"	-4° 16' 44"	220° 48' 14"	-20° 18' 18"	0° 54' 15"	14' 47.09"	287° 13' 25"	0.54186
24	225° 06' 17"	-4° 18' 14"	221° 17' 50"	-20° 28' 38"	0° 54' 15"	14' 47.10"	287° 3' 08"	0.54580

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	129° 58' 57"	-0.71"	132° 25' 21"	17° 44' 46"	1.0148318	15'45.61"	23° 26' 18"	-6 m 19 s
1	130° 01' 21"	-0.72"	132° 27' 46"	17° 44' 07"	1.0148262	15'45.61"	23° 26' 18"	-6 m 18 s
2	130° 03' 44"	-0.72"	132° 30' 11"	17° 43' 29"	1.0148206	15'45.62"	23° 26' 18"	-6 m 18 s
3	130° 06' 08"	-0.72"	132° 32' 36"	17° 42' 50"	1.0148149	15'45.62"	23° 26' 18"	-6 m 18 s
4	130° 08' 31"	-0.73"	132° 35' 02"	17° 42' 12"	1.0148093	15'45.63"	23° 26' 18"	-6 m 18 s
5	130° 10' 55"	-0.73"	132° 37' 27"	17° 41' 33"	1.0148037	15'45.63"	23° 26' 18"	-6 m 18 s
6	130° 13' 18"	-0.73"	132° 39' 52"	17° 40' 54"	1.0147980	15'45.64"	23° 26' 18"	-6 m 17 s
7	130° 15' 42"	-0.73"	132° 42' 17"	17° 40' 16"	1.0147924	15'45.64"	23° 26' 18"	-6 m 17 s
8	130° 18' 05"	-0.74"	132° 44' 42"	17° 39' 37"	1.0147867	15'45.65"	23° 26' 18"	-6 m 17 s
9	130° 20' 29"	-0.74"	132° 47' 07"	17° 38' 58"	1.0147811	15'45.65"	23° 26' 18"	-6 m 17 s
10	130° 22' 53"	-0.74"	132° 49' 32"	17° 38' 19"	1.0147754	15'45.66"	23° 26' 18"	-6 m 17 s
11	130° 25' 16"	-0.74"	132° 51' 57"	17° 37' 40"	1.0147697	15'45.66"	23° 26' 18"	-6 m 16 s
12	130° 27' 40"	-0.75"	132° 54' 22"	17° 37' 02"	1.0147641	15'45.67"	23° 26' 18"	-6 m 16 s
13	130° 30' 03"	-0.75"	132° 56' 47"	17° 36' 23"	1.0147584	15'45.67"	23° 26' 18"	-6 m 16 s
14	130° 32' 27"	-0.75"	132° 59' 12"	17° 35' 44"	1.0147527	15'45.68"	23° 26' 18"	-6 m 16 s
15	130° 34' 50"	-0.75"	133° 01' 37"	17° 35' 05"	1.0147470	15'45.68"	23° 26' 18"	-6 m 16 s
16	130° 37' 14"	-0.76"	133° 04' 02"	17° 34' 26"	1.0147413	15'45.69"	23° 26' 18"	-6 m 16 s
17	130° 39' 37"	-0.76"	133° 06' 27"	17° 33' 47"	1.0147356	15'45.69"	23° 26' 18"	-6 m 15 s
18	130° 42' 01"	-0.76"	133° 08' 52"	17° 33' 08"	1.0147298	15'45.70"	23° 26' 18"	-6 m 15 s
19	130° 44' 25"	-0.76"	133° 11' 16"	17° 32' 29"	1.0147241	15'45.71"	23° 26' 18"	-6 m 15 s
20	130° 46' 48"	-0.77"	133° 13' 41"	17° 31' 50"	1.0147184	15'45.71"	23° 26' 18"	-6 m 15 s
21	130° 49' 12"	-0.77"	133° 16' 06"	17° 31' 11"	1.0147126	15'45.72"	23° 26' 18"	-6 m 15 s
22	130° 51' 35"	-0.77"	133° 18' 31"	17° 30' 31"	1.0147069	15'45.72"	23° 26' 18"	-6 m 14 s
23	130° 53' 59"	-0.77"	133° 20' 56"	17° 29' 52"	1.0147011	15'45.73"	23° 26' 18"	-6 m 14 s
24	130° 56' 22"	-0.77"	133° 23' 21"	17° 29' 13"	1.0146954	15'45.73"	23° 26' 18"	-6 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	225° 06' 17"	-4° 18' 14"	221° 17' 50"	-20° 28' 38"	0° 54' 15"	14' 47.10"	287° 3' 08"	0.54580
1	225° 35' 56"	-4° 19' 43"	221° 47' 30"	-20° 38' 53"	0° 54' 15"	14' 47.12"	286° 52' 44"	0.54973
2	226° 05' 36"	-4° 21' 11"	222° 17' 14"	-20° 49' 02"	0° 54' 16"	14' 47.15"	286° 42' 13"	0.55366
3	226° 35' 16"	-4° 22' 38"	222° 47' 03"	-20° 59' 07"	0° 54' 16"	14' 47.18"	286° 31' 35"	0.55759
4	227° 04' 56"	-4° 24' 04"	223° 16' 56"	-21° 09' 06"	0° 54' 16"	14' 47.21"	286° 20' 50"	0.56151
5	227° 34' 36"	-4° 25' 28"	223° 46' 52"	-21° 19' 01"	0° 54' 16"	14' 47.25"	286° 9' 58"	0.56543
6	228° 04' 17"	-4° 26' 51"	224° 16' 53"	-21° 28' 50"	0° 54' 16"	14' 47.29"	285° 58' 58"	0.56935
7	228° 33' 58"	-4° 28' 14"	224° 46' 59"	-21° 38' 34"	0° 54' 16"	14' 47.34"	285° 47' 52"	0.57326
8	229° 03' 39"	-4° 29' 34"	225° 17' 08"	-21° 48' 12"	0° 54' 16"	14' 47.39"	285° 36' 38"	0.57717
9	229° 33' 21"	-4° 30' 54"	225° 47' 22"	-21° 57' 45"	0° 54' 17"	14' 47.45"	285° 25' 18"	0.58107
10	230° 03' 03"	-4° 32' 13"	226° 17' 41"	-22° 07' 13"	0° 54' 17"	14' 47.51"	285° 13' 50"	0.58497
11	230° 32' 46"	-4° 33' 30"	226° 48' 03"	-22° 16' 35"	0° 54' 17"	14' 47.58"	285° 2' 15"	0.58887
12	231° 02' 29"	-4° 34' 46"	227° 18' 30"	-22° 25' 51"	0° 54' 17"	14' 47.65"	284° 50' 34"	0.59276
13	231° 32' 13"	-4° 36' 01"	227° 49' 02"	-22° 35' 02"	0° 54' 18"	14' 47.73"	284° 38' 45"	0.59664
14	232° 01' 57"	-4° 37' 15"	228° 19' 38"	-22° 44' 07"	0° 54' 18"	14' 47.81"	284° 26' 50"	0.60052
15	232° 31' 41"	-4° 38' 27"	228° 50' 18"	-22° 53' 07"	0° 54' 18"	14' 47.90"	284° 14' 47"	0.60440
16	233° 01' 26"	-4° 39' 39"	229° 21' 03"	-23° 02' 00"	0° 54' 19"	14' 47.99"	284° 2' 37"	0.60827
17	233° 31' 12"	-4° 40' 49"	229° 51' 52"	-23° 10' 48"	0° 54' 19"	14' 48.09"	283° 50' 21"	0.61213
18	234° 00' 58"	-4° 41' 58"	230° 22' 46"	-23° 19' 30"	0° 54' 19"	14' 48.19"	283° 37' 58"	0.61599
19	234° 30' 45"	-4° 43' 05"	230° 53' 44"	-23° 28' 06"	0° 54' 20"	14' 48.29"	283° 25' 28"	0.61984
20	235° 00' 32"	-4° 44' 11"	231° 24' 47"	-23° 36' 36"	0° 54' 20"	14' 48.40"	283° 12' 50"	0.62368
21	235° 30' 20"	-4° 45' 16"	231° 55' 55"	-23° 45' 00"	0° 54' 21"	14' 48.52"	283° 0' 07"	0.62752
22	236° 00' 08"	-4° 46' 20"	232° 27' 07"	-23° 53' 18"	0° 54' 21"	14' 48.64"	282° 47' 16"	0.63135
23	236° 29' 58"	-4° 47' 23"	232° 58' 24"	-24° 01' 30"	0° 54' 22"	14' 48.76"	282° 34' 18"	0.63518
24	236° 59' 48"	-4° 48' 24"	233° 29' 45"	-24° 09' 36"	0° 54' 22"	14' 48.89"	282° 21' 14"	0.63899

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	130° 56' 22"	-0.77"	133° 23' 21"	17° 29' 13"	1.0146954	15'45.73"	23° 26' 18"	-6 m 14 s
1	130° 58' 46"	-0.78"	133° 25' 45"	17° 28' 34"	1.0146896	15'45.74"	23° 26' 18"	-6 m 14 s
2	131° 01' 09"	-0.78"	133° 28' 10"	17° 27' 54"	1.0146838	15'45.74"	23° 26' 18"	-6 m 14 s
3	131° 03' 33"	-0.78"	133° 30' 35"	17° 27' 15"	1.0146780	15'45.75"	23° 26' 18"	-6 m 13 s
4	131° 05' 57"	-0.78"	133° 32' 60"	17° 26' 36"	1.0146722	15'45.75"	23° 26' 18"	-6 m 13 s
5	131° 08' 20"	-0.78"	133° 35' 24"	17° 25' 56"	1.0146664	15'45.76"	23° 26' 18"	-6 m 13 s
6	131° 10' 44"	-0.78"	133° 37' 49"	17° 25' 17"	1.0146606	15'45.76"	23° 26' 18"	-6 m 13 s
7	131° 13' 07"	-0.79"	133° 40' 14"	17° 24' 38"	1.0146548	15'45.77"	23° 26' 18"	-6 m 12 s
8	131° 15' 31"	-0.79"	133° 42' 38"	17° 23' 58"	1.0146490	15'45.78"	23° 26' 18"	-6 m 12 s
9	131° 17' 54"	-0.79"	133° 45' 03"	17° 23' 19"	1.0146432	15'45.78"	23° 26' 18"	-6 m 12 s
10	131° 20' 18"	-0.79"	133° 47' 28"	17° 22' 39"	1.0146374	15'45.79"	23° 26' 18"	-6 m 12 s
11	131° 22' 42"	-0.79"	133° 49' 52"	17° 21' 60"	1.0146315	15'45.79"	23° 26' 18"	-6 m 12 s
12	131° 25' 05"	-0.79"	133° 52' 17"	17° 21' 20"	1.0146257	15'45.80"	23° 26' 18"	-6 m 11 s
13	131° 27' 29"	-0.79"	133° 54' 41"	17° 20' 41"	1.0146198	15'45.80"	23° 26' 18"	-6 m 11 s
14	131° 29' 52"	-0.80"	133° 57' 06"	17° 20' 01"	1.0146140	15'45.81"	23° 26' 18"	-6 m 11 s
15	131° 32' 16"	-0.80"	133° 59' 31"	17° 19' 21"	1.0146081	15'45.81"	23° 26' 18"	-6 m 11 s
16	131° 34' 39"	-0.80"	134° 01' 55"	17° 18' 42"	1.0146022	15'45.82"	23° 26' 18"	-6 m 11 s
17	131° 37' 03"	-0.80"	134° 04' 20"	17° 18' 02"	1.0145964	15'45.82"	23° 26' 18"	-6 m 10 s
18	131° 39' 27"	-0.80"	134° 06' 44"	17° 17' 22"	1.0145905	15'45.83"	23° 26' 18"	-6 m 10 s
19	131° 41' 50"	-0.80"	134° 09' 09"	17° 16' 42"	1.0145846	15'45.84"	23° 26' 18"	-6 m 10 s
20	131° 44' 14"	-0.80"	134° 11' 33"	17° 16' 03"	1.0145787	15'45.84"	23° 26' 18"	-6 m 10 s
21	131° 46' 37"	-0.80"	134° 13' 58"	17° 15' 23"	1.0145728	15'45.85"	23° 26' 18"	-6 m 09 s
22	131° 49' 01"	-0.80"	134° 16' 22"	17° 14' 43"	1.0145669	15'45.85"	23° 26' 18"	-6 m 09 s
23	131° 51' 24"	-0.80"	134° 18' 46"	17° 14' 03"	1.0145610	15'45.86"	23° 26' 18"	-6 m 09 s
24	131° 53' 48"	-0.81"	134° 21' 11"	17° 13' 23"	1.0145551	15'45.86"	23° 26' 18"	-6 m 09 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	236° 59' 48"	-4° 48' 24"	233° 29' 45"	-24° 09' 36"	0° 54' 22"	14' 48.89"	282° 21' 14"	0.63899
1	237° 29' 38"	-4° 49' 24"	234° 01' 11"	-24° 17' 35"	0° 54' 22"	14' 49.03"	282° 8' 03"	0.64280
2	237° 59' 30"	-4° 50' 22"	234° 32' 41"	-24° 25' 28"	0° 54' 23"	14' 49.16"	281° 54' 46"	0.64660
3	238° 29' 22"	-4° 51' 20"	235° 04' 16"	-24° 33' 15"	0° 54' 24"	14' 49.31"	281° 41' 21"	0.65040
4	238° 59' 14"	-4° 52' 16"	235° 35' 56"	-24° 40' 55"	0° 54' 24"	14' 49.45"	281° 27' 50"	0.65418
5	239° 29' 08"	-4° 53' 10"	236° 07' 40"	-24° 48' 29"	0° 54' 25"	14' 49.61"	281° 14' 12"	0.65796
6	239° 59' 02"	-4° 54' 04"	236° 39' 29"	-24° 55' 56"	0° 54' 25"	14' 49.76"	281° 0' 28"	0.66173
7	240° 28' 58"	-4° 54' 56"	237° 11' 23"	-25° 03' 16"	0° 54' 26"	14' 49.93"	280° 46' 37"	0.66549
8	240° 58' 54"	-4° 55' 47"	237° 43' 21"	-25° 10' 30"	0° 54' 26"	14' 50.09"	280° 32' 40"	0.66924
9	241° 28' 51"	-4° 56' 36"	238° 15' 23"	-25° 17' 37"	0° 54' 27"	14' 50.26"	280° 18' 36"	0.67299
10	241° 58' 48"	-4° 57' 24"	238° 47' 31"	-25° 24' 38"	0° 54' 28"	14' 50.44"	280° 4' 26"	0.67672
11	242° 28' 47"	-4° 58' 11"	239° 19' 42"	-25° 31' 32"	0° 54' 28"	14' 50.62"	279° 50' 09"	0.68044
12	242° 58' 47"	-4° 58' 57"	239° 51' 59"	-25° 38' 18"	0° 54' 29"	14' 50.80"	279° 35' 46"	0.68416
13	243° 28' 47"	-4° 59' 41"	240° 24' 20"	-25° 44' 58"	0° 54' 30"	14' 50.99"	279° 21' 17"	0.68786
14	243° 58' 48"	-5° 00' 24"	240° 56' 45"	-25° 51' 31"	0° 54' 30"	14' 51.18"	279° 6' 41"	0.69156
15	244° 28' 51"	-5° 01' 05"	241° 29' 16"	-25° 57' 57"	0° 54' 31"	14' 51.38"	278° 51' 59"	0.69524
16	244° 58' 54"	-5° 01' 45"	242° 01' 50"	-26° 04' 16"	0° 54' 32"	14' 51.58"	278° 37' 10"	0.69891
17	245° 28' 59"	-5° 02' 24"	242° 34' 29"	-26° 10' 27"	0° 54' 33"	14' 51.79"	278° 22' 16"	0.70258
18	245° 59' 04"	-5° 03' 01"	243° 07' 13"	-26° 16' 32"	0° 54' 33"	14' 52.00"	278° 7' 15"	0.70623
19	246° 29' 10"	-5° 03' 37"	243° 40' 01"	-26° 22' 29"	0° 54' 34"	14' 52.21"	277° 52' 08"	0.70987
20	246° 59' 18"	-5° 04' 12"	244° 12' 53"	-26° 28' 19"	0° 54' 35"	14' 52.43"	277° 36' 55"	0.71350
21	247° 29' 26"	-5° 04' 45"	244° 45' 50"	-26° 34' 01"	0° 54' 36"	14' 52.65"	277° 21' 37"	0.71711
22	247° 59' 36"	-5° 05' 17"	245° 18' 52"	-26° 39' 36"	0° 54' 37"	14' 52.88"	277° 6' 12"	0.72072
23	248° 29' 47"	-5° 05' 47"	245° 51' 57"	-26° 45' 04"	0° 54' 37"	14' 53.11"	276° 50' 41"	0.72431
24	248° 59' 58"	-5° 06' 16"	246° 25' 07"	-26° 50' 24"	0° 54' 38"	14' 53.35"	276° 35' 04"	0.72789

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	131° 53' 48"	-0.81"	134° 21' 11"	17° 13' 23"	1.0145551	15'45.86"	23° 26' 18"	-6 m 09 s
1	131° 56' 12"	-0.81"	134° 23' 35"	17° 12' 43"	1.0145491	15'45.87"	23° 26' 18"	-6 m 08 s
2	131° 58' 35"	-0.81"	134° 25' 60"	17° 12' 03"	1.0145432	15'45.87"	23° 26' 18"	-6 m 08 s
3	132° 00' 59"	-0.81"	134° 28' 24"	17° 11' 23"	1.0145373	15'45.88"	23° 26' 18"	-6 m 08 s
4	132° 03' 22"	-0.81"	134° 30' 48"	17° 10' 43"	1.0145313	15'45.89"	23° 26' 18"	-6 m 08 s
5	132° 05' 46"	-0.81"	134° 33' 13"	17° 10' 03"	1.0145254	15'45.89"	23° 26' 18"	-6 m 08 s
6	132° 08' 10"	-0.81"	134° 35' 37"	17° 09' 23"	1.0145194	15'45.90"	23° 26' 18"	-6 m 07 s
7	132° 10' 33"	-0.81"	134° 38' 01"	17° 08' 43"	1.0145134	15'45.90"	23° 26' 18"	-6 m 07 s
8	132° 12' 57"	-0.81"	134° 40' 26"	17° 08' 03"	1.0145075	15'45.91"	23° 26' 18"	-6 m 07 s
9	132° 15' 20"	-0.81"	134° 42' 50"	17° 07' 23"	1.0145015	15'45.91"	23° 26' 18"	-6 m 07 s
10	132° 17' 44"	-0.81"	134° 45' 14"	17° 06' 42"	1.0144955	15'45.92"	23° 26' 18"	-6 m 06 s
11	132° 20' 08"	-0.81"	134° 47' 38"	17° 06' 02"	1.0144895	15'45.92"	23° 26' 18"	-6 m 06 s
12	132° 22' 31"	-0.81"	134° 50' 02"	17° 05' 22"	1.0144835	15'45.93"	23° 26' 18"	-6 m 06 s
13	132° 24' 55"	-0.81"	134° 52' 27"	17° 04' 42"	1.0144775	15'45.94"	23° 26' 18"	-6 m 06 s
14	132° 27' 18"	-0.81"	134° 54' 51"	17° 04' 01"	1.0144715	15'45.94"	23° 26' 18"	-6 m 05 s
15	132° 29' 42"	-0.81"	134° 57' 15"	17° 03' 21"	1.0144655	15'45.95"	23° 26' 18"	-6 m 05 s
16	132° 32' 06"	-0.81"	134° 59' 39"	17° 02' 41"	1.0144595	15'45.95"	23° 26' 18"	-6 m 05 s
17	132° 34' 29"	-0.81"	135° 02' 03"	17° 02' 00"	1.0144534	15'45.96"	23° 26' 18"	-6 m 05 s
18	132° 36' 53"	-0.81"	135° 04' 27"	17° 01' 20"	1.0144474	15'45.96"	23° 26' 18"	-6 m 04 s
19	132° 39' 16"	-0.81"	135° 06' 52"	17° 00' 39"	1.0144414	15'45.97"	23° 26' 18"	-6 m 04 s
20	132° 41' 40"	-0.81"	135° 09' 16"	16° 59' 59"	1.0144353	15'45.97"	23° 26' 18"	-6 m 04 s
21	132° 44' 04"	-0.81"	135° 11' 40"	16° 59' 18"	1.0144293	15'45.98"	23° 26' 18"	-6 m 04 s
22	132° 46' 27"	-0.81"	135° 14' 04"	16° 58' 38"	1.0144232	15'45.99"	23° 26' 18"	-6 m 03 s
23	132° 48' 51"	-0.81"	135° 16' 28"	16° 57' 57"	1.0144172	15'45.99"	23° 26' 18"	-6 m 03 s
24	132° 51' 14"	-0.81"	135° 18' 52"	16° 57' 17"	1.0144111	15'46.00"	23° 26' 18"	-6 m 03 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	248° 59' 58"	-5° 06' 16"	246° 25' 07"	-26° 50' 24"	0° 54' 38"	14' 53.35"	276° 35' 04"	0.72789
1	249° 30' 11"	-5° 06' 44"	246° 58' 21"	-26° 55' 37"	0° 54' 39"	14' 53.58"	276° 19' 22"	0.73146
2	250° 00' 25"	-5° 07' 10"	247° 31' 40"	-27° 00' 42"	0° 54' 40"	14' 53.83"	276° 3' 33"	0.73502
3	250° 30' 41"	-5° 07' 35"	248° 05' 02"	-27° 05' 39"	0° 54' 41"	14' 54.08"	275° 47' 39"	0.73856
4	251° 00' 57"	-5° 07' 58"	248° 38' 29"	-27° 10' 28"	0° 54' 42"	14' 54.33"	275° 31' 40"	0.74209
5	251° 31' 15"	-5° 08' 20"	249° 12' 00"	-27° 15' 10"	0° 54' 43"	14' 54.58"	275° 15' 34"	0.74561
6	252° 01' 34"	-5° 08' 41"	249° 45' 35"	-27° 19' 44"	0° 54' 44"	14' 54.84"	274° 59' 23"	0.74911
7	252° 31' 54"	-5° 08' 60"	250° 19' 15"	-27° 24' 10"	0° 54' 45"	14' 55.11"	274° 43' 07"	0.75260
8	253° 02' 15"	-5° 09' 18"	250° 52' 58"	-27° 28' 28"	0° 54' 46"	14' 55.38"	274° 26' 45"	0.75608
9	253° 32' 38"	-5° 09' 34"	251° 26' 45"	-27° 32' 39"	0° 54' 47"	14' 55.65"	274° 10' 18"	0.75954
10	254° 03' 01"	-5° 09' 49"	252° 00' 36"	-27° 36' 41"	0° 54' 48"	14' 55.92"	273° 53' 45"	0.76299
11	254° 33' 27"	-5° 10' 02"	252° 34' 31"	-27° 40' 35"	0° 54' 49"	14' 56.20"	273° 37' 07"	0.76642
12	255° 03' 53"	-5° 10' 14"	253° 08' 30"	-27° 44' 21"	0° 54' 50"	14' 56.48"	273° 20' 24"	0.76984
13	255° 34' 21"	-5° 10' 24"	253° 42' 32"	-27° 47' 58"	0° 54' 51"	14' 56.77"	273° 3' 36"	0.77324
14	256° 04' 50"	-5° 10' 33"	254° 16' 38"	-27° 51' 28"	0° 54' 52"	14' 57.06"	272° 46' 42"	0.77662
15	256° 35' 20"	-5° 10' 41"	254° 50' 48"	-27° 54' 49"	0° 54' 53"	14' 57.36"	272° 29' 43"	0.77999
16	257° 05' 52"	-5° 10' 47"	255° 25' 02"	-27° 58' 02"	0° 54' 54"	14' 57.65"	272° 12' 40"	0.78335
17	257° 36' 25"	-5° 10' 51"	255° 59' 19"	-28° 01' 07"	0° 54' 55"	14' 57.96"	271° 55' 31"	0.78669
18	258° 06' 60"	-5° 10' 55"	256° 33' 39"	-28° 04' 03"	0° 54' 56"	14' 58.26"	271° 38' 18"	0.79001
19	258° 37' 36"	-5° 10' 56"	257° 08' 03"	-28° 06' 51"	0° 54' 58"	14' 58.57"	271° 20' 60"	0.79332
20	259° 08' 13"	-5° 10' 56"	257° 42' 30"	-28° 09' 30"	0° 54' 59"	14' 58.88"	271° 3' 37"	0.79661
21	259° 38' 52"	-5° 10' 55"	258° 17' 01"	-28° 12' 01"	0° 54' 60"	14' 59.20"	270° 46' 09"	0.79988
22	260° 09' 32"	-5° 10' 52"	258° 51' 34"	-28° 14' 23"	0° 55' 01"	14' 59.52"	270° 28' 37"	0.80313
23	260° 40' 14"	-5° 10' 48"	259° 26' 11"	-28° 16' 37"	0° 55' 02"	14' 59.84"	270° 10' 60"	0.80637
24	261° 10' 57"	-5° 10' 42"	260° 00' 51"	-28° 18' 42"	0° 55' 03"	15' 00.17"	269° 53' 18"	0.80959

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	132° 51' 14"	-0.81"	135° 18' 52"	16° 57' 17"	1.0144111	15'46.00"	23° 26' 18"	-6 m 03 s
1	132° 53' 38"	-0.81"	135° 21' 16"	16° 56' 36"	1.0144050	15'46.00"	23° 26' 18"	-6 m 03 s
2	132° 56' 02"	-0.81"	135° 23' 40"	16° 55' 55"	1.0143989	15'46.01"	23° 26' 18"	-6 m 02 s
3	132° 58' 25"	-0.80"	135° 26' 04"	16° 55' 15"	1.0143929	15'46.01"	23° 26' 18"	-6 m 02 s
4	133° 00' 49"	-0.80"	135° 28' 28"	16° 54' 34"	1.0143868	15'46.02"	23° 26' 18"	-6 m 02 s
5	133° 03' 13"	-0.80"	135° 30' 52"	16° 53' 53"	1.0143807	15'46.03"	23° 26' 18"	-6 m 02 s
6	133° 05' 36"	-0.80"	135° 33' 16"	16° 53' 12"	1.0143746	15'46.03"	23° 26' 18"	-6 m 01 s
7	133° 07' 60"	-0.80"	135° 35' 40"	16° 52' 32"	1.0143685	15'46.04"	23° 26' 18"	-6 m 01 s
8	133° 10' 23"	-0.80"	135° 38' 03"	16° 51' 51"	1.0143623	15'46.04"	23° 26' 18"	-6 m 01 s
9	133° 12' 47"	-0.80"	135° 40' 27"	16° 51' 10"	1.0143562	15'46.05"	23° 26' 18"	-6 m 01 s
10	133° 15' 11"	-0.80"	135° 42' 51"	16° 50' 29"	1.0143501	15'46.05"	23° 26' 18"	-6 m 00 s
11	133° 17' 34"	-0.80"	135° 45' 15"	16° 49' 48"	1.0143440	15'46.06"	23° 26' 18"	-6 m 00 s
12	133° 19' 58"	-0.80"	135° 47' 39"	16° 49' 07"	1.0143378	15'46.07"	23° 26' 18"	-5 m 60 s
13	133° 22' 22"	-0.79"	135° 50' 03"	16° 48' 26"	1.0143317	15'46.07"	23° 26' 18"	-5 m 60 s
14	133° 24' 45"	-0.79"	135° 52' 27"	16° 47' 45"	1.0143255	15'46.08"	23° 26' 18"	-5 m 59 s
15	133° 27' 09"	-0.79"	135° 54' 50"	16° 47' 04"	1.0143194	15'46.08"	23° 26' 18"	-5 m 59 s
16	133° 29' 33"	-0.79"	135° 57' 14"	16° 46' 23"	1.0143132	15'46.09"	23° 26' 18"	-5 m 59 s
17	133° 31' 56"	-0.79"	135° 59' 38"	16° 45' 42"	1.0143071	15'46.09"	23° 26' 18"	-5 m 58 s
18	133° 34' 20"	-0.79"	136° 02' 02"	16° 45' 01"	1.0143009	15'46.10"	23° 26' 18"	-5 m 58 s
19	133° 36' 43"	-0.79"	136° 04' 25"	16° 44' 20"	1.0142947	15'46.11"	23° 26' 18"	-5 m 58 s
20	133° 39' 07"	-0.78"	136° 06' 49"	16° 43' 39"	1.0142885	15'46.11"	23° 26' 18"	-5 m 58 s
21	133° 41' 31"	-0.78"	136° 09' 13"	16° 42' 57"	1.0142824	15'46.12"	23° 26' 18"	-5 m 57 s
22	133° 43' 54"	-0.78"	136° 11' 36"	16° 42' 16"	1.0142762	15'46.12"	23° 26' 18"	-5 m 57 s
23	133° 46' 18"	-0.78"	136° 14' 00"	16° 41' 35"	1.0142700	15'46.13"	23° 26' 18"	-5 m 57 s
24	133° 48' 42"	-0.78"	136° 16' 24"	16° 40' 54"	1.0142638	15'46.13"	23° 26' 18"	-5 m 57 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	261° 10' 57"	-5° 10' 42"	260° 00' 51"	-28° 18' 42"	0° 55' 03"	15' 00.17"	269° 53' 18"	0.80959
1	261° 41' 42"	-5° 10' 35"	260° 35' 34"	-28° 20' 38"	0° 55' 05"	15' 00.50"	269° 35' 32"	0.81279
2	262° 12' 28"	-5° 10' 26"	261° 10' 20"	-28° 22' 26"	0° 55' 06"	15' 00.83"	269° 17' 42"	0.81597
3	262° 43' 16"	-5° 10' 16"	261° 45' 08"	-28° 24' 05"	0° 55' 07"	15' 01.16"	268° 59' 47"	0.81914
4	263° 14' 05"	-5° 10' 04"	262° 19' 60"	-28° 25' 35"	0° 55' 08"	15' 01.50"	268° 41' 48"	0.82229
5	263° 44' 55"	-5° 09' 51"	262° 54' 54"	-28° 26' 56"	0° 55' 10"	15' 01.85"	268° 23' 44"	0.82541
6	264° 15' 48"	-5° 09' 36"	263° 29' 51"	-28° 28' 08"	0° 55' 11"	15' 02.19"	268° 5' 37"	0.82852
7	264° 46' 41"	-5° 09' 20"	264° 04' 50"	-28° 29' 12"	0° 55' 12"	15' 02.54"	267° 47' 25"	0.83161
8	265° 17' 37"	-5° 09' 02"	264° 39' 52"	-28° 30' 06"	0° 55' 13"	15' 02.89"	267° 29' 09"	0.83468
9	265° 48' 34"	-5° 08' 42"	265° 14' 56"	-28° 30' 52"	0° 55' 15"	15' 03.25"	267° 10' 49"	0.83773
10	266° 19' 32"	-5° 08' 22"	265° 50' 02"	-28° 31' 29"	0° 55' 16"	15' 03.60"	266° 52' 25"	0.84076
11	266° 50' 32"	-5° 07' 59"	266° 25' 11"	-28° 31' 56"	0° 55' 17"	15' 03.96"	266° 33' 57"	0.84376
12	267° 21' 34"	-5° 07' 35"	267° 00' 21"	-28° 32' 15"	0° 55' 19"	15' 04.33"	266° 15' 25"	0.84675
13	267° 52' 37"	-5° 07' 10"	267° 35' 34"	-28° 32' 24"	0° 55' 20"	15' 04.69"	265° 56' 50"	0.84972
14	268° 23' 42"	-5° 06' 43"	268° 10' 49"	-28° 32' 25"	0° 55' 21"	15' 05.06"	265° 38' 10"	0.85266
15	268° 54' 49"	-5° 06' 14"	268° 46' 05"	-28° 32' 16"	0° 55' 23"	15' 05.43"	265° 19' 27"	0.85559
16	269° 25' 57"	-5° 05' 44"	269° 21' 24"	-28° 31' 58"	0° 55' 24"	15' 05.81"	265° 0' 40"	0.85849
17	269° 57' 07"	-5° 05' 13"	269° 56' 44"	-28° 31' 31"	0° 55' 25"	15' 06.19"	264° 41' 49"	0.86137
18	270° 28' 18"	-5° 04' 39"	270° 32' 05"	-28° 30' 55"	0° 55' 27"	15' 06.57"	264° 22' 54"	0.86423
19	270° 59' 32"	-5° 04' 05"	271° 07' 28"	-28° 30' 09"	0° 55' 28"	15' 06.95"	264° 3' 55"	0.86706
20	271° 30' 46"	-5° 03' 28"	271° 42' 53"	-28° 29' 14"	0° 55' 30"	15' 07.33"	263° 44' 53"	0.86988
21	272° 02' 03"	-5° 02' 51"	272° 18' 19"	-28° 28' 10"	0° 55' 31"	15' 07.72"	263° 25' 47"	0.87267
22	272° 33' 21"	-5° 02' 11"	272° 53' 46"	-28° 26' 57"	0° 55' 33"	15' 08.11"	263° 6' 38"	0.87543
23	273° 04' 41"	-5° 01' 30"	273° 29' 14"	-28° 25' 35"	0° 55' 34"	15' 08.50"	262° 47' 24"	0.87817
24	273° 36' 03"	-5° 00' 48"	274° 04' 43"	-28° 24' 03"	0° 55' 35"	15' 08.90"	262° 28' 07"	0.88089

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	133° 48' 42"	-0.78"	136° 16' 24"	16° 40' 54"	1.0142638	15'46.13"	23° 26' 18"	-5 m 57 s
1	133° 51' 05"	-0.78"	136° 18' 47"	16° 40' 12"	1.0142575	15'46.14"	23° 26' 18"	-5 m 56 s
2	133° 53' 29"	-0.77"	136° 21' 11"	16° 39' 31"	1.0142513	15'46.15"	23° 26' 18"	-5 m 56 s
3	133° 55' 53"	-0.77"	136° 23' 35"	16° 38' 50"	1.0142451	15'46.15"	23° 26' 18"	-5 m 56 s
4	133° 58' 16"	-0.77"	136° 25' 58"	16° 38' 08"	1.0142389	15'46.16"	23° 26' 18"	-5 m 55 s
5	134° 00' 40"	-0.77"	136° 28' 22"	16° 37' 27"	1.0142327	15'46.16"	23° 26' 18"	-5 m 55 s
6	134° 03' 04"	-0.77"	136° 30' 45"	16° 36' 45"	1.0142264	15'46.17"	23° 26' 18"	-5 m 55 s
7	134° 05' 27"	-0.76"	136° 33' 09"	16° 36' 04"	1.0142202	15'46.18"	23° 26' 18"	-5 m 55 s
8	134° 07' 51"	-0.76"	136° 35' 32"	16° 35' 22"	1.0142139	15'46.18"	23° 26' 18"	-5 m 54 s
9	134° 10' 15"	-0.76"	136° 37' 56"	16° 34' 41"	1.0142077	15'46.19"	23° 26' 18"	-5 m 54 s
10	134° 12' 38"	-0.76"	136° 40' 19"	16° 33' 59"	1.0142014	15'46.19"	23° 26' 18"	-5 m 54 s
11	134° 15' 02"	-0.75"	136° 42' 43"	16° 33' 18"	1.0141952	15'46.20"	23° 26' 18"	-5 m 53 s
12	134° 17' 26"	-0.75"	136° 45' 06"	16° 32' 36"	1.0141889	15'46.20"	23° 26' 18"	-5 m 53 s
13	134° 19' 49"	-0.75"	136° 47' 30"	16° 31' 55"	1.0141826	15'46.21"	23° 26' 18"	-5 m 53 s
14	134° 22' 13"	-0.75"	136° 49' 53"	16° 31' 13"	1.0141763	15'46.22"	23° 26' 18"	-5 m 53 s
15	134° 24' 37"	-0.74"	136° 52' 16"	16° 30' 31"	1.0141700	15'46.22"	23° 26' 18"	-5 m 52 s
16	134° 27' 00"	-0.74"	136° 54' 40"	16° 29' 49"	1.0141638	15'46.23"	23° 26' 18"	-5 m 52 s
17	134° 29' 24"	-0.74"	136° 57' 03"	16° 29' 08"	1.0141575	15'46.23"	23° 26' 18"	-5 m 52 s
18	134° 31' 48"	-0.74"	136° 59' 27"	16° 28' 26"	1.0141512	15'46.24"	23° 26' 18"	-5 m 51 s
19	134° 34' 11"	-0.73"	137° 01' 50"	16° 27' 44"	1.0141449	15'46.25"	23° 26' 18"	-5 m 51 s
20	134° 36' 35"	-0.73"	137° 04' 13"	16° 27' 02"	1.0141386	15'46.25"	23° 26' 18"	-5 m 51 s
21	134° 38' 59"	-0.73"	137° 06' 37"	16° 26' 20"	1.0141322	15'46.26"	23° 26' 18"	-5 m 50 s
22	134° 41' 22"	-0.73"	137° 08' 60"	16° 25' 39"	1.0141259	15'46.26"	23° 26' 18"	-5 m 50 s
23	134° 43' 46"	-0.72"	137° 11' 23"	16° 24' 57"	1.0141196	15'46.27"	23° 26' 18"	-5 m 50 s
24	134° 46' 10"	-0.72"	137° 13' 46"	16° 24' 15"	1.0141133	15'46.27"	23° 26' 18"	-5 m 50 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	273° 36' 03"	-5° 00' 48"	274° 04' 43"	-28° 24' 03"	0° 55' 35"	15' 08.90"	262° 28' 07"	0.88089
1	274° 07' 26"	-5° 00' 04"	274° 40' 13"	-28° 22' 22"	0° 55' 37"	15' 09.29"	262° 8' 46"	0.88359
2	274° 38' 51"	-4° 59' 19"	275° 15' 44"	-28° 20' 31"	0° 55' 38"	15' 09.69"	261° 49' 22"	0.88626
3	275° 10' 18"	-4° 58' 31"	275° 51' 16"	-28° 18' 32"	0° 55' 40"	15' 10.09"	261° 29' 53"	0.88891
4	275° 41' 47"	-4° 57' 43"	276° 26' 48"	-28° 16' 23"	0° 55' 41"	15' 10.50"	261° 10' 21"	0.89153
5	276° 13' 17"	-4° 56' 53"	277° 02' 21"	-28° 14' 04"	0° 55' 43"	15' 10.90"	260° 50' 45"	0.89413
6	276° 44' 49"	-4° 56' 01"	277° 37' 55"	-28° 11' 36"	0° 55' 44"	15' 11.31"	260° 31' 05"	0.89670
7	277° 16' 23"	-4° 55' 08"	278° 13' 28"	-28° 08' 59"	0° 55' 46"	15' 11.72"	260° 11' 21"	0.89924
8	277° 47' 59"	-4° 54' 13"	278° 49' 03"	-28° 06' 13"	0° 55' 47"	15' 12.13"	259° 51' 33"	0.90176
9	278° 19' 36"	-4° 53' 16"	279° 24' 37"	-28° 03' 17"	0° 55' 49"	15' 12.54"	259° 31' 40"	0.90426
10	278° 51' 15"	-4° 52' 19"	280° 00' 11"	-28° 00' 12"	0° 55' 50"	15' 12.96"	259° 11' 44"	0.90673
11	279° 22' 56"	-4° 51' 19"	280° 35' 46"	-27° 56' 57"	0° 55' 52"	15' 13.38"	258° 51' 42"	0.90917
12	279° 54' 39"	-4° 50' 18"	281° 11' 20"	-27° 53' 34"	0° 55' 53"	15' 13.79"	258° 31' 37"	0.91158
13	280° 26' 24"	-4° 49' 15"	281° 46' 55"	-27° 50' 00"	0° 55' 55"	15' 14.21"	258° 11' 26"	0.91397
14	280° 58' 10"	-4° 48' 11"	282° 22' 28"	-27° 46' 18"	0° 55' 56"	15' 14.64"	257° 51' 11"	0.91633
15	281° 29' 58"	-4° 47' 06"	282° 58' 02"	-27° 42' 26"	0° 55' 58"	15' 15.06"	257° 30' 51"	0.91866
16	282° 01' 48"	-4° 45' 58"	283° 33' 35"	-27° 38' 25"	0° 55' 60"	15' 15.48"	257° 10' 25"	0.92097
17	282° 33' 40"	-4° 44' 50"	284° 09' 08"	-27° 34' 14"	0° 56' 01"	15' 15.91"	256° 49' 54"	0.92324
18	283° 05' 33"	-4° 43' 39"	284° 44' 40"	-27° 29' 54"	0° 56' 03"	15' 16.34"	256° 29' 17"	0.92549
19	283° 37' 29"	-4° 42' 27"	285° 20' 11"	-27° 25' 25"	0° 56' 04"	15' 16.77"	256° 8' 34"	0.92771
20	284° 09' 26"	-4° 41' 14"	285° 55' 42"	-27° 20' 46"	0° 56' 06"	15' 17.20"	255° 47' 45"	0.92990
21	284° 41' 25"	-4° 39' 59"	286° 31' 11"	-27° 15' 59"	0° 56' 07"	15' 17.63"	255° 26' 49"	0.93206
22	285° 13' 26"	-4° 38' 43"	287° 06' 40"	-27° 11' 02"	0° 56' 09"	15' 18.06"	255° 5' 46"	0.93419
23	285° 45' 28"	-4° 37' 25"	287° 42' 08"	-27° 05' 55"	0° 56' 11"	15' 18.50"	254° 44' 36"	0.93630
24	286° 17' 33"	-4° 36' 05"	288° 17' 34"	-27° 00' 40"	0° 56' 12"	15' 18.93"	254° 23' 18"	0.93837

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	134° 46' 10"	-0.72"	137° 13' 46"	16° 24' 15"	1.0141133	15'46.27"	23° 26' 18"	-5 m 50 s
1	134° 48' 33"	-0.72"	137° 16' 10"	16° 23' 33"	1.0141069	15'46.28"	23° 26' 18"	-5 m 49 s
2	134° 50' 57"	-0.71"	137° 18' 33"	16° 22' 51"	1.0141006	15'46.29"	23° 26' 18"	-5 m 49 s
3	134° 53' 21"	-0.71"	137° 20' 56"	16° 22' 09"	1.0140942	15'46.29"	23° 26' 18"	-5 m 49 s
4	134° 55' 44"	-0.71"	137° 23' 19"	16° 21' 27"	1.0140879	15'46.30"	23° 26' 18"	-5 m 48 s
5	134° 58' 08"	-0.70"	137° 25' 43"	16° 20' 45"	1.0140815	15'46.30"	23° 26' 18"	-5 m 48 s
6	135° 00' 32"	-0.70"	137° 28' 06"	16° 20' 03"	1.0140752	15'46.31"	23° 26' 18"	-5 m 48 s
7	135° 02' 55"	-0.70"	137° 30' 29"	16° 19' 20"	1.0140688	15'46.32"	23° 26' 18"	-5 m 47 s
8	135° 05' 19"	-0.69"	137° 32' 52"	16° 18' 38"	1.0140624	15'46.32"	23° 26' 18"	-5 m 47 s
9	135° 07' 43"	-0.69"	137° 35' 15"	16° 17' 56"	1.0140561	15'46.33"	23° 26' 18"	-5 m 47 s
10	135° 10' 07"	-0.69"	137° 37' 38"	16° 17' 14"	1.0140497	15'46.33"	23° 26' 18"	-5 m 46 s
11	135° 12' 30"	-0.68"	137° 40' 01"	16° 16' 32"	1.0140433	15'46.34"	23° 26' 18"	-5 m 46 s
12	135° 14' 54"	-0.68"	137° 42' 24"	16° 15' 49"	1.0140369	15'46.35"	23° 26' 18"	-5 m 46 s
13	135° 17' 18"	-0.68"	137° 44' 47"	16° 15' 07"	1.0140305	15'46.35"	23° 26' 18"	-5 m 46 s
14	135° 19' 41"	-0.67"	137° 47' 11"	16° 14' 25"	1.0140241	15'46.36"	23° 26' 18"	-5 m 45 s
15	135° 22' 05"	-0.67"	137° 49' 34"	16° 13' 42"	1.0140177	15'46.36"	23° 26' 18"	-5 m 45 s
16	135° 24' 29"	-0.67"	137° 51' 57"	16° 13' 00"	1.0140113	15'46.37"	23° 26' 18"	-5 m 45 s
17	135° 26' 53"	-0.66"	137° 54' 20"	16° 12' 18"	1.0140049	15'46.38"	23° 26' 18"	-5 m 44 s
18	135° 29' 16"	-0.66"	137° 56' 43"	16° 11' 35"	1.0139985	15'46.38"	23° 26' 18"	-5 m 44 s
19	135° 31' 40"	-0.65"	137° 59' 06"	16° 10' 53"	1.0139920	15'46.39"	23° 26' 18"	-5 m 44 s
20	135° 34' 04"	-0.65"	138° 01' 29"	16° 10' 10"	1.0139856	15'46.39"	23° 26' 18"	-5 m 43 s
21	135° 36' 27"	-0.65"	138° 03' 51"	16° 09' 28"	1.0139792	15'46.40"	23° 26' 18"	-5 m 43 s
22	135° 38' 51"	-0.64"	138° 06' 14"	16° 08' 45"	1.0139727	15'46.41"	23° 26' 18"	-5 m 43 s
23	135° 41' 15"	-0.64"	138° 08' 37"	16° 08' 03"	1.0139663	15'46.41"	23° 26' 18"	-5 m 42 s
24	135° 43' 39"	-0.64"	138° 11' 00"	16° 07' 20"	1.0139598	15'46.42"	23° 26' 18"	-5 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	286° 17' 33"	-4° 36' 05"	288° 17' 34"	-27° 00' 40"	0° 56' 12"	15' 18.93"	254° 23' 18"	0.93837
1	286° 49' 39"	-4° 34' 44"	288° 52' 60"	-26° 55' 15"	0° 56' 14"	15' 19.37"	254° 1' 52"	0.94041
2	287° 21' 47"	-4° 33' 21"	289° 28' 24"	-26° 49' 41"	0° 56' 15"	15' 19.81"	253° 40' 16"	0.94242
3	287° 53' 57"	-4° 31' 57"	290° 03' 46"	-26° 43' 58"	0° 56' 17"	15' 20.24"	253° 18' 32"	0.94441
4	288° 26' 09"	-4° 30' 31"	290° 39' 08"	-26° 38' 06"	0° 56' 19"	15' 20.68"	252° 56' 37"	0.94636
5	288° 58' 23"	-4° 29' 04"	291° 14' 27"	-26° 32' 05"	0° 56' 20"	15' 21.12"	252° 34' 31"	0.94827
6	289° 30' 39"	-4° 27' 36"	291° 49' 45"	-26° 25' 55"	0° 56' 22"	15' 21.56"	252° 12' 14"	0.95016
7	290° 02' 56"	-4° 26' 05"	292° 25' 02"	-26° 19' 35"	0° 56' 24"	15' 22.01"	251° 49' 45"	0.95202
8	290° 35' 15"	-4° 24' 34"	293° 00' 16"	-26° 13' 07"	0° 56' 25"	15' 22.45"	251° 27' 03"	0.95384
9	291° 07' 36"	-4° 23' 00"	293° 35' 29"	-26° 06' 29"	0° 56' 27"	15' 22.89"	251° 4' 06"	0.95564
10	291° 39' 59"	-4° 21' 26"	294° 10' 40"	-25° 59' 43"	0° 56' 28"	15' 23.33"	250° 40' 55"	0.95739
11	292° 12' 24"	-4° 19' 49"	294° 45' 49"	-25° 52' 48"	0° 56' 30"	15' 23.78"	250° 17' 26"	0.95912
12	292° 44' 50"	-4° 18' 12"	295° 20' 56"	-25° 45' 43"	0° 56' 32"	15' 24.22"	249° 53' 41"	0.96082
13	293° 17' 19"	-4° 16' 32"	295° 56' 01"	-25° 38' 30"	0° 56' 33"	15' 24.67"	249° 29' 36"	0.96248
14	293° 49' 49"	-4° 14' 52"	296° 31' 04"	-25° 31' 08"	0° 56' 35"	15' 25.11"	249° 5' 10"	0.96410
15	294° 22' 21"	-4° 13' 09"	297° 06' 05"	-25° 23' 38"	0° 56' 37"	15' 25.56"	248° 40' 23"	0.96570
16	294° 54' 55"	-4° 11' 26"	297° 41' 03"	-25° 15' 58"	0° 56' 38"	15' 26.00"	248° 15' 11"	0.96726
17	295° 27' 31"	-4° 09' 41"	298° 15' 59"	-25° 08' 10"	0° 56' 40"	15' 26.45"	247° 49' 32"	0.96878
18	296° 00' 08"	-4° 07' 54"	298° 50' 52"	-25° 00' 13"	0° 56' 41"	15' 26.89"	247° 23' 25"	0.97028
19	296° 32' 48"	-4° 06' 06"	299° 25' 43"	-24° 52' 08"	0° 56' 43"	15' 27.34"	246° 56' 47"	0.97173
20	297° 05' 29"	-4° 04' 16"	300° 00' 32"	-24° 43' 53"	0° 56' 45"	15' 27.78"	246° 29' 35"	0.97316
21	297° 38' 12"	-4° 02' 26"	300° 35' 18"	-24° 35' 31"	0° 56' 46"	15' 28.23"	246° 1' 46"	0.97454
22	298° 10' 57"	-4° 00' 33"	301° 10' 02"	-24° 26' 60"	0° 56' 48"	15' 28.67"	245° 33' 16"	0.97590
23	298° 43' 44"	-3° 58' 39"	301° 44' 42"	-24° 18' 20"	0° 56' 50"	15' 29.12"	245° 4' 02"	0.97721
24	299° 16' 32"	-3° 56' 44"	302° 19' 21"	-24° 09' 32"	0° 56' 51"	15' 29.56"	244° 33' 58"	0.97849

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	135° 43' 39"	-0.64"	138° 11' 00"	16° 07' 20"	1.0139598	15'46.42"	23° 26' 18"	-5 m 42 s
1	135° 46' 02"	-0.63"	138° 13' 23"	16° 06' 37"	1.0139534	15'46.42"	23° 26' 18"	-5 m 42 s
2	135° 48' 26"	-0.63"	138° 15' 46"	16° 05' 55"	1.0139469	15'46.43"	23° 26' 18"	-5 m 41 s
3	135° 50' 50"	-0.62"	138° 18' 09"	16° 05' 12"	1.0139405	15'46.44"	23° 26' 18"	-5 m 41 s
4	135° 53' 13"	-0.62"	138° 20' 32"	16° 04' 29"	1.0139340	15'46.44"	23° 26' 18"	-5 m 41 s
5	135° 55' 37"	-0.61"	138° 22' 54"	16° 03' 47"	1.0139275	15'46.45"	23° 26' 18"	-5 m 40 s
6	135° 58' 01"	-0.61"	138° 25' 17"	16° 03' 04"	1.0139210	15'46.45"	23° 26' 18"	-5 m 40 s
7	136° 00' 25"	-0.61"	138° 27' 40"	16° 02' 21"	1.0139146	15'46.46"	23° 26' 18"	-5 m 40 s
8	136° 02' 48"	-0.60"	138° 30' 03"	16° 01' 38"	1.0139081	15'46.47"	23° 26' 18"	-5 m 39 s
9	136° 05' 12"	-0.60"	138° 32' 26"	16° 00' 56"	1.0139016	15'46.47"	23° 26' 18"	-5 m 39 s
10	136° 07' 36"	-0.59"	138° 34' 48"	16° 00' 13"	1.0138951	15'46.48"	23° 26' 18"	-5 m 39 s
11	136° 09' 60"	-0.59"	138° 37' 11"	15° 59' 30"	1.0138886	15'46.48"	23° 26' 18"	-5 m 38 s
12	136° 12' 23"	-0.58"	138° 39' 34"	15° 58' 47"	1.0138821	15'46.49"	23° 26' 18"	-5 m 38 s
13	136° 14' 47"	-0.58"	138° 41' 56"	15° 58' 04"	1.0138756	15'46.50"	23° 26' 18"	-5 m 38 s
14	136° 17' 11"	-0.58"	138° 44' 19"	15° 57' 21"	1.0138691	15'46.50"	23° 26' 18"	-5 m 37 s
15	136° 19' 35"	-0.57"	138° 46' 42"	15° 56' 38"	1.0138625	15'46.51"	23° 26' 18"	-5 m 37 s
16	136° 21' 58"	-0.57"	138° 49' 04"	15° 55' 55"	1.0138560	15'46.52"	23° 26' 18"	-5 m 37 s
17	136° 24' 22"	-0.56"	138° 51' 27"	15° 55' 12"	1.0138495	15'46.52"	23° 26' 18"	-5 m 36 s
18	136° 26' 46"	-0.56"	138° 53' 50"	15° 54' 29"	1.0138430	15'46.53"	23° 26' 18"	-5 m 36 s
19	136° 29' 10"	-0.55"	138° 56' 12"	15° 53' 46"	1.0138364	15'46.53"	23° 26' 18"	-5 m 36 s
20	136° 31' 33"	-0.55"	138° 58' 35"	15° 53' 03"	1.0138299	15'46.54"	23° 26' 18"	-5 m 35 s
21	136° 33' 57"	-0.54"	139° 00' 57"	15° 52' 20"	1.0138233	15'46.55"	23° 26' 18"	-5 m 35 s
22	136° 36' 21"	-0.54"	139° 03' 20"	15° 51' 36"	1.0138168	15'46.55"	23° 26' 18"	-5 m 35 s
23	136° 38' 45"	-0.53"	139° 05' 42"	15° 50' 53"	1.0138102	15'46.56"	23° 26' 18"	-5 m 34 s
24	136° 41' 08"	-0.53"	139° 08' 05"	15° 50' 10"	1.0138037	15'46.56"	23° 26' 18"	-5 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	299° 16' 32"	-3° 56' 44"	302° 19' 21"	-24° 09' 32"	0° 56' 51"	15' 29.56"	244° 33' 58"	0.97849
1	299° 49' 22"	-3° 54' 47"	302° 53' 56"	-24° 00' 36"	0° 56' 53"	15' 30.01"	244° 3' 00"	0.97974
2	300° 22' 15"	-3° 52' 49"	303° 28' 29"	-23° 51' 31"	0° 56' 55"	15' 30.45"	243° 31' 03"	0.98095
3	300° 55' 09"	-3° 50' 50"	304° 02' 58"	-23° 42' 18"	0° 56' 56"	15' 30.90"	242° 57' 59"	0.98212
4	301° 28' 04"	-3° 48' 49"	304° 37' 25"	-23° 32' 57"	0° 56' 58"	15' 31.34"	242° 23' 42"	0.98326
5	302° 01' 02"	-3° 46' 47"	305° 11' 49"	-23° 23' 28"	0° 56' 59"	15' 31.78"	241° 48' 04"	0.98436
6	302° 34' 01"	-3° 44' 43"	305° 46' 11"	-23° 13' 51"	0° 57' 01"	15' 32.23"	241° 10' 54"	0.98542
7	303° 07' 02"	-3° 42' 38"	306° 20' 29"	-23° 04' 05"	0° 57' 03"	15' 32.67"	240° 32' 03"	0.98644
8	303° 40' 05"	-3° 40' 31"	306° 54' 44"	-22° 54' 12"	0° 57' 04"	15' 33.11"	239° 51' 17"	0.98743
9	304° 13' 10"	-3° 38' 24"	307° 28' 56"	-22° 44' 11"	0° 57' 06"	15' 33.55"	239° 8' 22"	0.98838
10	304° 46' 17"	-3° 36' 14"	308° 03' 05"	-22° 34' 01"	0° 57' 08"	15' 33.99"	238° 23' 02"	0.98929
11	305° 19' 25"	-3° 34' 04"	308° 37' 11"	-22° 23' 44"	0° 57' 09"	15' 34.43"	237° 34' 55"	0.99017
12	305° 52' 35"	-3° 31' 52"	309° 11' 14"	-22° 13' 20"	0° 57' 11"	15' 34.87"	236° 43' 40"	0.99100
13	306° 25' 47"	-3° 29' 39"	309° 45' 14"	-22° 02' 47"	0° 57' 12"	15' 35.31"	235° 48' 48"	0.99180
14	306° 59' 00"	-3° 27' 25"	310° 19' 11"	-21° 52' 07"	0° 57' 14"	15' 35.74"	234° 49' 45"	0.99256
15	307° 32' 15"	-3° 25' 09"	310° 53' 04"	-21° 41' 20"	0° 57' 16"	15' 36.18"	233° 45' 54"	0.99328
16	308° 05' 32"	-3° 22' 52"	311° 26' 54"	-21° 30' 25"	0° 57' 17"	15' 36.61"	232° 36' 24"	0.99396
17	308° 38' 51"	-3° 20' 33"	312° 00' 42"	-21° 19' 22"	0° 57' 19"	15' 37.04"	231° 20' 17"	0.99460
18	309° 12' 12"	-3° 18' 14"	312° 34' 25"	-21° 08' 12"	0° 57' 20"	15' 37.47"	229° 56' 21"	0.99521
19	309° 45' 34"	-3° 15' 53"	313° 08' 06"	-20° 56' 55"	0° 57' 22"	15' 37.91"	228° 23' 07"	0.99577
20	310° 18' 58"	-3° 13' 31"	313° 41' 44"	-20° 45' 30"	0° 57' 23"	15' 38.33"	226° 38' 41"	0.99630
21	310° 52' 24"	-3° 11' 08"	314° 15' 18"	-20° 33' 59"	0° 57' 25"	15' 38.76"	224° 40' 43"	0.99678
22	311° 25' 51"	-3° 08' 43"	314° 48' 49"	-20° 22' 20"	0° 57' 27"	15' 39.19"	222° 26' 11"	0.99722
23	311° 59' 20"	-3° 06' 17"	315° 22' 17"	-20° 10' 34"	0° 57' 28"	15' 39.61"	219° 51' 14"	0.99763
24	312° 32' 51"	-3° 03' 50"	315° 55' 41"	-19° 58' 41"	0° 57' 30"	15' 40.04"	216° 50' 56"	0.99799

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	136° 41' 08"	-0.53"	139° 08' 05"	15° 50' 10"	1.0138037	15'46.56"	23° 26' 18"	-5 m 34 s
1	136° 43' 32"	-0.52"	139° 10' 28"	15° 49' 27"	1.0137971	15'46.57"	23° 26' 18"	-5 m 33 s
2	136° 45' 56"	-0.52"	139° 12' 50"	15° 48' 43"	1.0137905	15'46.58"	23° 26' 18"	-5 m 33 s
3	136° 48' 20"	-0.51"	139° 15' 12"	15° 48' 00"	1.0137840	15'46.58"	23° 26' 18"	-5 m 33 s
4	136° 50' 43"	-0.51"	139° 17' 35"	15° 47' 17"	1.0137774	15'46.59"	23° 26' 18"	-5 m 32 s
5	136° 53' 07"	-0.50"	139° 19' 57"	15° 46' 33"	1.0137708	15'46.59"	23° 26' 18"	-5 m 32 s
6	136° 55' 31"	-0.50"	139° 22' 20"	15° 45' 50"	1.0137642	15'46.60"	23° 26' 18"	-5 m 32 s
7	136° 57' 55"	-0.49"	139° 24' 42"	15° 45' 07"	1.0137576	15'46.61"	23° 26' 18"	-5 m 31 s
8	137° 00' 19"	-0.49"	139° 27' 05"	15° 44' 23"	1.0137510	15'46.61"	23° 26' 18"	-5 m 31 s
9	137° 02' 42"	-0.48"	139° 29' 27"	15° 43' 40"	1.0137444	15'46.62"	23° 26' 18"	-5 m 31 s
10	137° 05' 06"	-0.48"	139° 31' 49"	15° 42' 56"	1.0137378	15'46.63"	23° 26' 18"	-5 m 30 s
11	137° 07' 30"	-0.47"	139° 34' 12"	15° 42' 13"	1.0137312	15'46.63"	23° 26' 18"	-5 m 30 s
12	137° 09' 54"	-0.47"	139° 36' 34"	15° 41' 29"	1.0137246	15'46.64"	23° 26' 18"	-5 m 30 s
13	137° 12' 17"	-0.46"	139° 38' 56"	15° 40' 46"	1.0137180	15'46.64"	23° 26' 18"	-5 m 29 s
14	137° 14' 41"	-0.46"	139° 41' 19"	15° 40' 02"	1.0137114	15'46.65"	23° 26' 18"	-5 m 29 s
15	137° 17' 05"	-0.45"	139° 43' 41"	15° 39' 18"	1.0137047	15'46.66"	23° 26' 18"	-5 m 28 s
16	137° 19' 29"	-0.45"	139° 46' 03"	15° 38' 35"	1.0136981	15'46.66"	23° 26' 19"	-5 m 28 s
17	137° 21' 53"	-0.44"	139° 48' 26"	15° 37' 51"	1.0136915	15'46.67"	23° 26' 19"	-5 m 28 s
18	137° 24' 16"	-0.44"	139° 50' 48"	15° 37' 07"	1.0136848	15'46.67"	23° 26' 19"	-5 m 27 s
19	137° 26' 40"	-0.43"	139° 53' 10"	15° 36' 24"	1.0136782	15'46.68"	23° 26' 19"	-5 m 27 s
20	137° 29' 04"	-0.43"	139° 55' 32"	15° 35' 40"	1.0136715	15'46.69"	23° 26' 19"	-5 m 27 s
21	137° 31' 28"	-0.42"	139° 57' 55"	15° 34' 56"	1.0136649	15'46.69"	23° 26' 19"	-5 m 26 s
22	137° 33' 52"	-0.42"	140° 00' 17"	15° 34' 12"	1.0136582	15'46.70"	23° 26' 19"	-5 m 26 s
23	137° 36' 15"	-0.41"	140° 02' 39"	15° 33' 29"	1.0136516	15'46.71"	23° 26' 19"	-5 m 25 s
24	137° 38' 39"	-0.41"	140° 05' 01"	15° 32' 45"	1.0136449	15'46.71"	23° 26' 19"	-5 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	312° 32' 51"	-3° 03' 50"	315° 55' 41"	-19° 58' 41"	0° 57' 30"	15' 40.04"	216° 50' 56"	0.99799
1	313° 06' 23"	-3° 01' 22"	316° 29' 03"	-19° 46' 41"	0° 57' 31"	15' 40.46"	213° 18' 54"	0.99832
2	313° 39' 57"	-2° 58' 53"	317° 02' 21"	-19° 34' 35"	0° 57' 33"	15' 40.88"	209° 7' 04"	0.99860
3	314° 13' 33"	-2° 56' 22"	317° 35' 36"	-19° 22' 21"	0° 57' 34"	15' 41.30"	204° 5' 25"	0.99884
4	314° 47' 10"	-2° 53' 50"	318° 08' 47"	-19° 10' 01"	0° 57' 36"	15' 41.72"	198° 2' 22"	0.99904
5	315° 20' 49"	-2° 51' 17"	318° 41' 56"	-18° 57' 35"	0° 57' 37"	15' 42.13"	190° 46' 16"	0.99920
6	315° 54' 30"	-2° 48' 43"	319° 15' 01"	-18° 45' 01"	0° 57' 39"	15' 42.54"	182° 9' 17"	0.99932
7	316° 28' 12"	-2° 46' 08"	319° 48' 03"	-18° 32' 22"	0° 57' 40"	15' 42.96"	172° 14' 16"	0.99940
8	317° 01' 56"	-2° 43' 32"	320° 21' 02"	-18° 19' 36"	0° 57' 42"	15' 43.37"	161° 22' 09"	0.99944
9	317° 35' 41"	-2° 40' 55"	320° 53' 57"	-18° 06' 43"	0° 57' 43"	15' 43.77"	150° 12' 35"	0.99943
10	318° 09' 28"	-2° 38' 16"	321° 26' 50"	-17° 53' 44"	0° 57' 45"	15' 44.18"	139° 31' 54"	0.99939
11	318° 43' 17"	-2° 35' 37"	321° 59' 39"	-17° 40' 39"	0° 57' 46"	15' 44.58"	129° 55' 43"	0.99930
12	319° 17' 07"	-2° 32' 56"	322° 32' 25"	-17° 27' 28"	0° 57' 48"	15' 44.98"	121° 39' 59"	0.99917
13	319° 50' 59"	-2° 30' 15"	323° 05' 08"	-17° 14' 11"	0° 57' 49"	15' 45.38"	114° 44' 09"	0.99900
14	320° 24' 53"	-2° 27' 32"	323° 37' 48"	-17° 00' 48"	0° 57' 51"	15' 45.78"	108° 58' 53"	0.99878
15	320° 58' 48"	-2° 24' 48"	324° 10' 25"	-16° 47' 19"	0° 57' 52"	15' 46.18"	104° 12' 18"	0.99853
16	321° 32' 44"	-2° 22' 04"	324° 42' 59"	-16° 33' 45"	0° 57' 54"	15' 46.57"	100° 13' 08"	0.99823
17	322° 06' 42"	-2° 19' 18"	325° 15' 30"	-16° 20' 04"	0° 57' 55"	15' 46.96"	96° 51' 51"	0.99789
18	322° 40' 42"	-2° 16' 32"	325° 47' 58"	-16° 06' 18"	0° 57' 57"	15' 47.35"	94° 0' 50"	0.99750
19	323° 14' 43"	-2° 13' 44"	326° 20' 23"	-15° 52' 26"	0° 57' 58"	15' 47.74"	91° 34' 05"	0.99708
20	323° 48' 45"	-2° 10' 56"	326° 52' 45"	-15° 38' 29"	0° 57' 59"	15' 48.12"	89° 26' 57"	0.99661
21	324° 22' 49"	-2° 08' 07"	327° 25' 04"	-15° 24' 27"	0° 58' 01"	15' 48.50"	87° 35' 49"	0.99610
22	324° 56' 55"	-2° 05' 16"	327° 57' 20"	-15° 10' 19"	0° 58' 02"	15' 48.88"	85° 57' 52"	0.99555
23	325° 31' 02"	-2° 02' 25"	328° 29' 33"	-14° 56' 05"	0° 58' 04"	15' 49.25"	84° 30' 51"	0.99495
24	326° 05' 10"	-1° 59' 33"	329° 01' 44"	-14° 41' 47"	0° 58' 05"	15' 49.63"	83° 12' 60"	0.99431

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	137° 38' 39"	-0.41"	140° 05' 01"	15° 32' 45"	1.0136449	15'46.71"	23° 26' 19"	-5 m 25 s
1	137° 41' 03"	-0.40"	140° 07' 23"	15° 32' 01"	1.0136382	15'46.72"	23° 26' 19"	-5 m 25 s
2	137° 43' 27"	-0.40"	140° 09' 45"	15° 31' 17"	1.0136315	15'46.72"	23° 26' 19"	-5 m 24 s
3	137° 45' 51"	-0.39"	140° 12' 07"	15° 30' 33"	1.0136249	15'46.73"	23° 26' 19"	-5 m 24 s
4	137° 48' 14"	-0.38"	140° 14' 30"	15° 29' 49"	1.0136182	15'46.74"	23° 26' 19"	-5 m 24 s
5	137° 50' 38"	-0.38"	140° 16' 52"	15° 29' 05"	1.0136115	15'46.74"	23° 26' 19"	-5 m 23 s
6	137° 53' 02"	-0.37"	140° 19' 14"	15° 28' 21"	1.0136048	15'46.75"	23° 26' 19"	-5 m 23 s
7	137° 55' 26"	-0.37"	140° 21' 36"	15° 27' 37"	1.0135981	15'46.76"	23° 26' 19"	-5 m 22 s
8	137° 57' 50"	-0.36"	140° 23' 58"	15° 26' 53"	1.0135914	15'46.76"	23° 26' 19"	-5 m 22 s
9	138° 00' 14"	-0.36"	140° 26' 20"	15° 26' 09"	1.0135847	15'46.77"	23° 26' 19"	-5 m 22 s
10	138° 02' 37"	-0.35"	140° 28' 42"	15° 25' 25"	1.0135780	15'46.77"	23° 26' 19"	-5 m 21 s
11	138° 05' 01"	-0.35"	140° 31' 04"	15° 24' 41"	1.0135713	15'46.78"	23° 26' 19"	-5 m 21 s
12	138° 07' 25"	-0.34"	140° 33' 26"	15° 23' 56"	1.0135646	15'46.79"	23° 26' 19"	-5 m 20 s
13	138° 09' 49"	-0.33"	140° 35' 48"	15° 23' 12"	1.0135578	15'46.79"	23° 26' 19"	-5 m 20 s
14	138° 12' 13"	-0.33"	140° 38' 10"	15° 22' 28"	1.0135511	15'46.80"	23° 26' 19"	-5 m 20 s
15	138° 14' 37"	-0.32"	140° 40' 32"	15° 21' 44"	1.0135444	15'46.81"	23° 26' 19"	-5 m 19 s
16	138° 17' 00"	-0.32"	140° 42' 54"	15° 20' 60"	1.0135376	15'46.81"	23° 26' 19"	-5 m 19 s
17	138° 19' 24"	-0.31"	140° 45' 16"	15° 20' 15"	1.0135309	15'46.82"	23° 26' 19"	-5 m 19 s
18	138° 21' 48"	-0.31"	140° 47' 37"	15° 19' 31"	1.0135242	15'46.82"	23° 26' 19"	-5 m 18 s
19	138° 24' 12"	-0.30"	140° 49' 59"	15° 18' 47"	1.0135174	15'46.83"	23° 26' 19"	-5 m 18 s
20	138° 26' 36"	-0.30"	140° 52' 21"	15° 18' 02"	1.0135106	15'46.84"	23° 26' 19"	-5 m 17 s
21	138° 28' 60"	-0.29"	140° 54' 43"	15° 17' 18"	1.0135039	15'46.84"	23° 26' 19"	-5 m 17 s
22	138° 31' 23"	-0.28"	140° 57' 05"	15° 16' 33"	1.0134971	15'46.85"	23° 26' 19"	-5 m 17 s
23	138° 33' 47"	-0.28"	140° 59' 27"	15° 15' 49"	1.0134904	15'46.86"	23° 26' 19"	-5 m 16 s
24	138° 36' 11"	-0.27"	141° 01' 48"	15° 15' 04"	1.0134836	15'46.86"	23° 26' 19"	-5 m 16 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	326° 05' 10"	-1° 59' 33"	329° 01' 44"	-14° 41' 47"	0° 58' 05"	15' 49.63"	83° 12' 60"	0.99431
1	326° 39' 20"	-1° 56' 40"	329° 33' 52"	-14° 27' 24"	0° 58' 06"	15' 50.00"	82° 2' 55"	0.99363
2	327° 13' 31"	-1° 53' 47"	330° 05' 57"	-14° 12' 55"	0° 58' 08"	15' 50.37"	80° 59' 26"	0.99291
3	327° 47' 44"	-1° 50' 52"	330° 37' 60"	-13° 58' 22"	0° 58' 09"	15' 50.73"	80° 1' 38"	0.99214
4	328° 21' 58"	-1° 47' 57"	331° 09' 59"	-13° 43' 43"	0° 58' 10"	15' 51.10"	79° 8' 44"	0.99133
5	328° 56' 13"	-1° 45' 01"	331° 41' 57"	-13° 29' 00"	0° 58' 12"	15' 51.46"	78° 20' 08"	0.99048
6	329° 30' 30"	-1° 42' 04"	332° 13' 51"	-13° 14' 13"	0° 58' 13"	15' 51.81"	77° 35' 16"	0.98958
7	330° 04' 49"	-1° 39' 06"	332° 45' 43"	-12° 59' 20"	0° 58' 14"	15' 52.17"	76° 53' 43"	0.98864
8	330° 39' 08"	-1° 36' 08"	333° 17' 33"	-12° 44' 23"	0° 58' 16"	15' 52.52"	76° 15' 05"	0.98766
9	331° 13' 29"	-1° 33' 09"	333° 49' 20"	-12° 29' 22"	0° 58' 17"	15' 52.87"	75° 39' 04"	0.98663
10	331° 47' 52"	-1° 30' 09"	334° 21' 05"	-12° 14' 16"	0° 58' 18"	15' 53.22"	75° 5' 24"	0.98557
11	332° 22' 15"	-1° 27' 09"	334° 52' 48"	-11° 59' 06"	0° 58' 19"	15' 53.56"	74° 33' 50"	0.98446
12	332° 56' 40"	-1° 24' 08"	335° 24' 28"	-11° 43' 52"	0° 58' 21"	15' 53.90"	74° 4' 10"	0.98330
13	333° 31' 07"	-1° 21' 06"	335° 56' 06"	-11° 28' 34"	0° 58' 22"	15' 54.24"	73° 36' 14"	0.98211
14	334° 05' 34"	-1° 18' 03"	336° 27' 42"	-11° 13' 12"	0° 58' 23"	15' 54.57"	73° 9' 52"	0.98087
15	334° 40' 03"	-1° 15' 00"	336° 59' 16"	-10° 57' 45"	0° 58' 24"	15' 54.90"	72° 44' 57"	0.97958
16	335° 14' 33"	-1° 11' 57"	337° 30' 47"	-10° 42' 15"	0° 58' 25"	15' 55.23"	72° 21' 20"	0.97826
17	335° 49' 04"	-1° 08' 53"	338° 02' 17"	-10° 26' 41"	0° 58' 27"	15' 55.56"	71° 58' 57"	0.97689
18	336° 23' 37"	-1° 05' 48"	338° 33' 45"	-10° 11' 04"	0° 58' 28"	15' 55.88"	71° 37' 42"	0.97548
19	336° 58' 11"	-1° 02' 43"	339° 05' 11"	-9° 55' 23"	0° 58' 29"	15' 56.20"	71° 17' 29"	0.97402
20	337° 32' 46"	0°-59' 37"	339° 36' 35"	-9° 39' 38"	0° 58' 30"	15' 56.51"	70° 58' 14"	0.97253
21	338° 07' 22"	0°-56' 31"	340° 07' 57"	-9° 23' 50"	0° 58' 31"	15' 56.82"	70° 39' 54"	0.97099
22	338° 41' 60"	0°-53' 24"	340° 39' 17"	-9° 07' 58"	0° 58' 32"	15' 57.13"	70° 22' 24"	0.96941
23	339° 16' 38"	0°-50' 17"	341° 10' 36"	-8° 52' 04"	0° 58' 34"	15' 57.44"	70° 5' 42"	0.96778
24	339° 51' 18"	0°-47' 10"	341° 41' 53"	-8° 36' 06"	0° 58' 35"	15' 57.74"	69° 49' 45"	0.96612

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	138° 36' 11"	-0.27"	141° 01' 48"	15° 15' 04"	1.0134836	15'46.86"	23° 26' 19"	-5 m 16 s
1	138° 38' 35"	-0.27"	141° 04' 10"	15° 14' 20"	1.0134768	15'46.87"	23° 26' 19"	-5 m 15 s
2	138° 40' 59"	-0.26"	141° 06' 32"	15° 13' 35"	1.0134700	15'46.88"	23° 26' 19"	-5 m 15 s
3	138° 43' 23"	-0.26"	141° 08' 54"	15° 12' 51"	1.0134633	15'46.88"	23° 26' 19"	-5 m 15 s
4	138° 45' 47"	-0.25"	141° 11' 16"	15° 12' 06"	1.0134565	15'46.89"	23° 26' 19"	-5 m 14 s
5	138° 48' 11"	-0.24"	141° 13' 37"	15° 11' 22"	1.0134497	15'46.89"	23° 26' 19"	-5 m 14 s
6	138° 50' 34"	-0.24"	141° 15' 59"	15° 10' 37"	1.0134429	15'46.90"	23° 26' 19"	-5 m 13 s
7	138° 52' 58"	-0.23"	141° 18' 21"	15° 09' 53"	1.0134361	15'46.91"	23° 26' 19"	-5 m 13 s
8	138° 55' 22"	-0.23"	141° 20' 42"	15° 09' 08"	1.0134293	15'46.91"	23° 26' 19"	-5 m 13 s
9	138° 57' 46"	-0.22"	141° 23' 04"	15° 08' 23"	1.0134225	15'46.92"	23° 26' 19"	-5 m 12 s
10	139° 00' 10"	-0.22"	141° 25' 26"	15° 07' 38"	1.0134156	15'46.93"	23° 26' 19"	-5 m 12 s
11	139° 02' 34"	-0.21"	141° 27' 47"	15° 06' 54"	1.0134088	15'46.93"	23° 26' 19"	-5 m 11 s
12	139° 04' 58"	-0.21"	141° 30' 09"	15° 06' 09"	1.0134020	15'46.94"	23° 26' 19"	-5 m 11 s
13	139° 07' 22"	-0.20"	141° 32' 31"	15° 05' 24"	1.0133952	15'46.95"	23° 26' 19"	-5 m 10 s
14	139° 09' 45"	-0.19"	141° 34' 52"	15° 04' 39"	1.0133883	15'46.95"	23° 26' 19"	-5 m 10 s
15	139° 12' 09"	-0.19"	141° 37' 14"	15° 03' 54"	1.0133815	15'46.96"	23° 26' 19"	-5 m 10 s
16	139° 14' 33"	-0.18"	141° 39' 35"	15° 03' 10"	1.0133747	15'46.96"	23° 26' 19"	-5 m 09 s
17	139° 16' 57"	-0.18"	141° 41' 57"	15° 02' 25"	1.0133678	15'46.97"	23° 26' 19"	-5 m 09 s
18	139° 19' 21"	-0.17"	141° 44' 18"	15° 01' 40"	1.0133610	15'46.98"	23° 26' 19"	-5 m 08 s
19	139° 21' 45"	-0.17"	141° 46' 40"	15° 00' 55"	1.0133541	15'46.98"	23° 26' 19"	-5 m 08 s
20	139° 24' 09"	-0.16"	141° 49' 02"	15° 00' 10"	1.0133472	15'46.99"	23° 26' 19"	-5 m 08 s
21	139° 26' 33"	-0.15"	141° 51' 23"	14° 59' 25"	1.0133404	15'47.00"	23° 26' 19"	-5 m 07 s
22	139° 28' 57"	-0.15"	141° 53' 45"	14° 58' 40"	1.0133335	15'47.00"	23° 26' 19"	-5 m 07 s
23	139° 31' 21"	-0.14"	141° 56' 06"	14° 57' 55"	1.0133266	15'47.01"	23° 26' 19"	-5 m 06 s
24	139° 33' 44"	-0.14"	141° 58' 27"	14° 57' 10"	1.0133198	15'47.02"	23° 26' 19"	-5 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	339° 51' 18"	0°-47' 10"	341° 41' 53"	-8° 36' 06"	0° 58' 35"	15' 57.74"	69° 49' 45"	0.96612
1	340° 25' 59"	0°-44' 02"	342° 13' 08"	-8° 20' 05"	0° 58' 36"	15' 58.04"	69° 34' 30"	0.96441
2	341° 00' 41"	0°-40' 53"	342° 44' 22"	-8° 04' 01"	0° 58' 37"	15' 58.34"	69° 19' 55"	0.96266
3	341° 35' 24"	0°-37' 45"	343° 15' 35"	-7° 47' 54"	0° 58' 38"	15' 58.63"	69° 5' 57"	0.96086
4	342° 10' 09"	0°-34' 36"	343° 46' 46"	-7° 31' 44"	0° 58' 39"	15' 58.92"	68° 52' 36"	0.95903
5	342° 44' 54"	0°-31' 26"	344° 17' 56"	-7° 15' 31"	0° 58' 40"	15' 59.20"	68° 39' 48"	0.95715
6	343° 19' 41"	0°-28' 17"	344° 49' 05"	-6° 59' 16"	0° 58' 41"	15' 59.49"	68° 27' 33"	0.95523
7	343° 54' 28"	0°-25' 07"	345° 20' 12"	-6° 42' 58"	0° 58' 42"	15' 59.77"	68° 15' 48"	0.95327
8	344° 29' 17"	0°-21' 56"	345° 51' 19"	-6° 26' 38"	0° 58' 43"	16' 00.04"	68° 4' 34"	0.95127
9	345° 04' 07"	0°-18' 46"	346° 22' 24"	-6° 10' 16"	0° 58' 44"	16' 00.31"	67° 53' 47"	0.94922
10	345° 38' 57"	0°-15' 35"	346° 53' 28"	-5° 53' 51"	0° 58' 45"	16' 00.58"	67° 43' 28"	0.94714
11	346° 13' 49"	0°-12' 27"	347° 24' 33"	-5° 37' 26"	0° 58' 46"	16' 00.85"	67° 33' 39"	0.94501
12	346° 48' 42"	0° -9' 16"	347° 55' 35"	-5° 20' 56"	0° 58' 47"	16' 01.11"	67° 24' 11"	0.94284
13	347° 23' 36"	0° -6' 04"	348° 26' 37"	-5° 04' 25"	0° 58' 48"	16' 01.37"	67° 15' 08"	0.94064
14	347° 58' 30"	0° -2' 53"	348° 57' 38"	-4° 47' 52"	0° 58' 49"	16' 01.62"	67° 6' 27"	0.93839
15	348° 33' 26"	0° 00' 19"	349° 28' 39"	-4° 31' 16"	0° 58' 50"	16' 01.87"	66° 58' 10"	0.93610
16	349° 08' 23"	0° 03' 30"	349° 59' 39"	-4° 14' 40"	0° 58' 51"	16' 02.12"	66° 50' 14"	0.93377
17	349° 43' 20"	0° 06' 42"	350° 30' 38"	-3° 58' 01"	0° 58' 52"	16' 02.37"	66° 42' 40"	0.93140
18	350° 18' 19"	0° 09' 54"	351° 01' 37"	-3° 41' 21"	0° 58' 53"	16' 02.61"	66° 35' 26"	0.92899
19	350° 53' 18"	0° 13' 06"	351° 32' 35"	-3° 24' 39"	0° 58' 53"	16' 02.84"	66° 28' 32"	0.92653
20	351° 28' 19"	0° 16' 17"	352° 03' 34"	-3° 07' 56"	0° 58' 54"	16' 03.08"	66° 21' 58"	0.92404
21	352° 03' 20"	0° 19' 29"	352° 34' 32"	-2° 51' 11"	0° 58' 55"	16' 03.31"	66° 15' 43"	0.92151
22	352° 38' 22"	0° 22' 41"	353° 05' 29"	-2° 34' 25"	0° 58' 56"	16' 03.53"	66° 9' 46"	0.91895
23	353° 13' 25"	0° 25' 53"	353° 36' 27"	-2° 17' 38"	0° 58' 57"	16' 03.76"	66° 4' 08"	0.91634
24	353° 48' 29"	0° 29' 04"	354° 07' 25"	-2° 00' 50"	0° 58' 58"	16' 03.98"	65° 58' 47"	0.91369

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	139° 33' 44"	-0.14"	141° 58' 27"	14° 57' 10"	1.0133198	15'47.02"	23° 26' 19"	-5 m 06 s
1	139° 36' 08"	-0.13"	142° 00' 49"	14° 56' 25"	1.0133129	15'47.02"	23° 26' 19"	-5 m 05 s
2	139° 38' 32"	-0.13"	142° 03' 10"	14° 55' 39"	1.0133060	15'47.03"	23° 26' 19"	-5 m 05 s
3	139° 40' 56"	-0.12"	142° 05' 32"	14° 54' 54"	1.0132991	15'47.04"	23° 26' 19"	-5 m 05 s
4	139° 43' 20"	-0.11"	142° 07' 53"	14° 54' 09"	1.0132922	15'47.04"	23° 26' 19"	-5 m 04 s
5	139° 45' 44"	-0.11"	142° 10' 15"	14° 53' 24"	1.0132853	15'47.05"	23° 26' 19"	-5 m 04 s
6	139° 48' 08"	-0.10"	142° 12' 36"	14° 52' 39"	1.0132784	15'47.05"	23° 26' 19"	-5 m 03 s
7	139° 50' 32"	-0.10"	142° 14' 57"	14° 51' 53"	1.0132715	15'47.06"	23° 26' 19"	-5 m 03 s
8	139° 52' 56"	-0.09"	142° 17' 19"	14° 51' 08"	1.0132646	15'47.07"	23° 26' 19"	-5 m 02 s
9	139° 55' 20"	-0.09"	142° 19' 40"	14° 50' 23"	1.0132577	15'47.07"	23° 26' 19"	-5 m 02 s
10	139° 57' 44"	-0.08"	142° 22' 01"	14° 49' 38"	1.0132507	15'47.08"	23° 26' 19"	-5 m 02 s
11	140° 00' 08"	-0.08"	142° 24' 23"	14° 48' 52"	1.0132438	15'47.09"	23° 26' 19"	-5 m 01 s
12	140° 02' 32"	-0.07"	142° 26' 44"	14° 48' 07"	1.0132369	15'47.09"	23° 26' 19"	-5 m 01 s
13	140° 04' 55"	-0.06"	142° 29' 05"	14° 47' 21"	1.0132299	15'47.10"	23° 26' 19"	-5 m 00 s
14	140° 07' 19"	-0.06"	142° 31' 26"	14° 46' 36"	1.0132230	15'47.11"	23° 26' 19"	-4 m 60 s
15	140° 09' 43"	-0.05"	142° 33' 48"	14° 45' 51"	1.0132161	15'47.11"	23° 26' 19"	-4 m 59 s
16	140° 12' 07"	-0.05"	142° 36' 09"	14° 45' 05"	1.0132091	15'47.12"	23° 26' 19"	-4 m 59 s
17	140° 14' 31"	-0.04"	142° 38' 30"	14° 44' 20"	1.0132021	15'47.13"	23° 26' 19"	-4 m 59 s
18	140° 16' 55"	-0.04"	142° 40' 51"	14° 43' 34"	1.0131952	15'47.13"	23° 26' 19"	-4 m 58 s
19	140° 19' 19"	-0.03"	142° 43' 12"	14° 42' 49"	1.0131882	15'47.14"	23° 26' 19"	-4 m 58 s
20	140° 21' 43"	-0.03"	142° 45' 34"	14° 42' 03"	1.0131813	15'47.15"	23° 26' 19"	-4 m 57 s
21	140° 24' 07"	-0.02"	142° 47' 55"	14° 41' 17"	1.0131743	15'47.15"	23° 26' 19"	-4 m 57 s
22	140° 26' 31"	-0.02"	142° 50' 16"	14° 40' 32"	1.0131673	15'47.16"	23° 26' 19"	-4 m 56 s
23	140° 28' 55"	-0.01"	142° 52' 37"	14° 39' 46"	1.0131603	15'47.17"	23° 26' 19"	-4 m 56 s
24	140° 31' 19"	-0.00"	142° 54' 58"	14° 39' 01"	1.0131533	15'47.17"	23° 26' 19"	-4 m 55 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	353° 48' 29"	0° 29' 04"	354° 07' 25"	-2° 00' 50"	0° 58' 58"	16' 03.98"	65° 58' 47"	0.91369
1	354° 23' 34"	0° 32' 16"	354° 38' 23"	-1° 44' 01"	0° 58' 58"	16' 04.19"	65° 53' 43"	0.91100
2	354° 58' 39"	0° 35' 27"	355° 09' 21"	-1° 27' 11"	0° 58' 59"	16' 04.40"	65° 48' 57"	0.90828
3	355° 33' 46"	0° 38' 38"	355° 40' 19"	-1° 10' 20"	0° 58' 60"	16' 04.61"	65° 44' 27"	0.90552
4	356° 08' 53"	0° 41' 50"	356° 11' 18"	0°-53' 29"	0° 59' 01"	16' 04.82"	65° 40' 13"	0.90272
5	356° 44' 01"	0° 45' 00"	356° 42' 17"	0°-36' 37"	0° 59' 01"	16' 05.02"	65° 36' 16"	0.89988
6	357° 19' 10"	0° 48' 11"	357° 13' 16"	0°-19' 44"	0° 59' 02"	16' 05.22"	65° 32' 34"	0.89700
7	357° 54' 19"	0° 51' 22"	357° 44' 16"	0° -2' 51"	0° 59' 03"	16' 05.41"	65° 29' 08"	0.89409
8	358° 29' 29"	0° 54' 32"	358° 15' 16"	0° 14' 02"	0° 59' 04"	16' 05.60"	65° 25' 56"	0.89114
9	359° 04' 40"	0° 57' 42"	358° 46' 17"	0° 30' 56"	0° 59' 04"	16' 05.79"	65° 23' 00"	0.88815
10	359° 39' 52"	1° 00' 52"	359° 17' 19"	0° 47' 50"	0° 59' 05"	16' 05.97"	65° 20' 19"	0.88513
11	0° 15' 05"	1° 04' 01"	359° 48' 22"	1° 04' 44"	0° 59' 06"	16' 06.15"	65° 17' 52"	0.88207
12	0° 50' 18"	1° 07' 10"	0° 19' 26"	1° 21' 38"	0° 59' 06"	16' 06.33"	65° 15' 39"	0.87897
13	1° 25' 32"	1° 10' 19"	0° 50' 30"	1° 38' 32"	0° 59' 07"	16' 06.50"	65° 13' 40"	0.87584
14	2° 00' 46"	1° 13' 27"	1° 21' 36"	1° 55' 25"	0° 59' 07"	16' 06.67"	65° 11' 56"	0.87267
15	2° 36' 01"	1° 16' 35"	1° 52' 42"	2° 12' 19"	0° 59' 08"	16' 06.84"	65° 10' 25"	0.86947
16	3° 11' 17"	1° 19' 42"	2° 23' 50"	2° 29' 12"	0° 59' 09"	16' 07.00"	65° 9' 08"	0.86623
17	3° 46' 33"	1° 22' 49"	2° 54' 60"	2° 46' 04"	0° 59' 09"	16' 07.16"	65° 8' 04"	0.86296
18	4° 21' 51"	1° 25' 56"	3° 26' 10"	3° 02' 56"	0° 59' 10"	16' 07.32"	65° 7' 14"	0.85966
19	4° 57' 08"	1° 29' 02"	3° 57' 22"	3° 19' 48"	0° 59' 10"	16' 07.47"	65° 6' 37"	0.85632
20	5° 32' 27"	1° 32' 07"	4° 28' 36"	3° 36' 38"	0° 59' 11"	16' 07.62"	65° 6' 13"	0.85294
21	6° 07' 45"	1° 35' 12"	4° 59' 51"	3° 53' 28"	0° 59' 11"	16' 07.76"	65° 6' 02"	0.84954
22	6° 43' 05"	1° 38' 17"	5° 31' 08"	4° 10' 17"	0° 59' 12"	16' 07.90"	65° 6' 03"	0.84610
23	7° 18' 25"	1° 41' 21"	6° 02' 26"	4° 27' 05"	0° 59' 12"	16' 08.04"	65° 6' 18"	0.84262
24	7° 53' 46"	1° 44' 24"	6° 33' 46"	4° 43' 51"	0° 59' 13"	16' 08.17"	65° 6' 45"	0.83912

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	140° 31' 19"	-0.00"	142° 54' 58"	14° 39' 01"	1.0131533	15'47.17"	23° 26' 19"	-4 m 55 s
1	140° 33' 43"	0.00"	142° 57' 19"	14° 38' 15"	1.0131463	15'47.18"	23° 26' 19"	-4 m 55 s
2	140° 36' 07"	0.01"	142° 59' 40"	14° 37' 29"	1.0131393	15'47.18"	23° 26' 19"	-4 m 55 s
3	140° 38' 31"	0.01"	143° 02' 01"	14° 36' 43"	1.0131323	15'47.19"	23° 26' 19"	-4 m 54 s
4	140° 40' 55"	0.02"	143° 04' 23"	14° 35' 58"	1.0131253	15'47.20"	23° 26' 19"	-4 m 54 s
5	140° 43' 19"	0.02"	143° 06' 44"	14° 35' 12"	1.0131183	15'47.20"	23° 26' 19"	-4 m 53 s
6	140° 45' 43"	0.03"	143° 09' 05"	14° 34' 26"	1.0131113	15'47.21"	23° 26' 19"	-4 m 53 s
7	140° 48' 07"	0.03"	143° 11' 26"	14° 33' 40"	1.0131043	15'47.22"	23° 26' 19"	-4 m 52 s
8	140° 50' 31"	0.04"	143° 13' 47"	14° 32' 54"	1.0130972	15'47.22"	23° 26' 19"	-4 m 52 s
9	140° 52' 55"	0.04"	143° 16' 08"	14° 32' 08"	1.0130902	15'47.23"	23° 26' 19"	-4 m 51 s
10	140° 55' 19"	0.05"	143° 18' 29"	14° 31' 23"	1.0130832	15'47.24"	23° 26' 19"	-4 m 51 s
11	140° 57' 43"	0.05"	143° 20' 50"	14° 30' 37"	1.0130761	15'47.24"	23° 26' 19"	-4 m 50 s
12	141° 00' 07"	0.06"	143° 23' 11"	14° 29' 51"	1.0130691	15'47.25"	23° 26' 19"	-4 m 50 s
13	141° 02' 31"	0.06"	143° 25' 32"	14° 29' 05"	1.0130620	15'47.26"	23° 26' 19"	-4 m 50 s
14	141° 04' 55"	0.07"	143° 27' 52"	14° 28' 19"	1.0130550	15'47.26"	23° 26' 19"	-4 m 49 s
15	141° 07' 19"	0.07"	143° 30' 13"	14° 27' 33"	1.0130479	15'47.27"	23° 26' 19"	-4 m 49 s
16	141° 09' 43"	0.08"	143° 32' 34"	14° 26' 47"	1.0130408	15'47.28"	23° 26' 19"	-4 m 48 s
17	141° 12' 07"	0.08"	143° 34' 55"	14° 26' 00"	1.0130338	15'47.28"	23° 26' 19"	-4 m 48 s
18	141° 14' 31"	0.09"	143° 37' 16"	14° 25' 14"	1.0130267	15'47.29"	23° 26' 19"	-4 m 47 s
19	141° 16' 55"	0.09"	143° 39' 37"	14° 24' 28"	1.0130196	15'47.30"	23° 26' 19"	-4 m 47 s
20	141° 19' 19"	0.10"	143° 41' 58"	14° 23' 42"	1.0130125	15'47.30"	23° 26' 19"	-4 m 46 s
21	141° 21' 43"	0.10"	143° 44' 19"	14° 22' 56"	1.0130054	15'47.31"	23° 26' 19"	-4 m 46 s
22	141° 24' 07"	0.11"	143° 46' 39"	14° 22' 10"	1.0129983	15'47.32"	23° 26' 19"	-4 m 45 s
23	141° 26' 31"	0.11"	143° 49' 00"	14° 21' 24"	1.0129912	15'47.32"	23° 26' 19"	-4 m 45 s
24	141° 28' 55"	0.12"	143° 51' 21"	14° 20' 37"	1.0129841	15'47.33"	23° 26' 19"	-4 m 44 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	7° 53' 46"	1° 44' 24"	6° 33' 46"	4° 43' 51"	0° 59' 13"	16' 08.17"	65° 6' 45"	0.83912
1	8° 29' 07"	1° 47' 27"	7° 05' 09"	5° 00' 37"	0° 59' 13"	16' 08.30"	65° 7' 24"	0.83558
2	9° 04' 28"	1° 50' 29"	7° 36' 33"	5° 17' 21"	0° 59' 14"	16' 08.43"	65° 8' 16"	0.83201
3	9° 39' 51"	1° 53' 30"	8° 07' 59"	5° 34' 04"	0° 59' 14"	16' 08.55"	65° 9' 21"	0.82841
4	10° 15' 13"	1° 56' 31"	8° 39' 27"	5° 50' 46"	0° 59' 15"	16' 08.68"	65° 10' 37"	0.82478
5	10° 50' 36"	1° 59' 31"	9° 10' 58"	6° 07' 25"	0° 59' 15"	16' 08.79"	65° 12' 06"	0.82111
6	11° 26' 00"	2° 02' 30"	9° 42' 31"	6° 24' 04"	0° 59' 16"	16' 08.91"	65° 13' 47"	0.81742
7	12° 01' 24"	2° 05' 29"	10° 14' 06"	6° 40' 40"	0° 59' 16"	16' 09.02"	65° 15' 40"	0.81370
8	12° 36' 49"	2° 08' 27"	10° 45' 44"	6° 57' 15"	0° 59' 16"	16' 09.12"	65° 17' 45"	0.80995
9	13° 12' 14"	2° 11' 24"	11° 17' 24"	7° 13' 47"	0° 59' 17"	16' 09.23"	65° 20' 02"	0.80616
10	13° 47' 39"	2° 14' 20"	11° 49' 06"	7° 30' 18"	0° 59' 17"	16' 09.33"	65° 22' 30"	0.80235
11	14° 23' 05"	2° 17' 15"	12° 20' 52"	7° 46' 46"	0° 59' 18"	16' 09.42"	65° 25' 11"	0.79851
12	14° 58' 32"	2° 20' 10"	12° 52' 40"	8° 03' 12"	0° 59' 18"	16' 09.52"	65° 28' 03"	0.79464
13	15° 33' 58"	2° 23' 03"	13° 24' 31"	8° 19' 36"	0° 59' 18"	16' 09.61"	65° 31' 06"	0.79075
14	16° 09' 26"	2° 25' 56"	13° 56' 25"	8° 35' 58"	0° 59' 19"	16' 09.69"	65° 34' 22"	0.78683
15	16° 44' 53"	2° 28' 48"	14° 28' 21"	8° 52' 17"	0° 59' 19"	16' 09.78"	65° 37' 48"	0.78287
16	17° 20' 21"	2° 31' 39"	15° 00' 21"	9° 08' 33"	0° 59' 19"	16' 09.86"	65° 41' 27"	0.77890
17	17° 55' 49"	2° 34' 29"	15° 32' 24"	9° 24' 46"	0° 59' 19"	16' 09.93"	65° 45' 17"	0.77489
18	18° 31' 18"	2° 37' 18"	16° 04' 30"	9° 40' 57"	0° 59' 20"	16' 10.01"	65° 49' 18"	0.77086
19	19° 06' 47"	2° 40' 06"	16° 36' 40"	9° 57' 05"	0° 59' 20"	16' 10.08"	65° 53' 30"	0.76681
20	19° 42' 16"	2° 42' 53"	17° 08' 52"	10° 13' 10"	0° 59' 20"	16' 10.15"	65° 57' 54"	0.76273
21	20° 17' 46"	2° 45' 39"	17° 41' 08"	10° 29' 12"	0° 59' 20"	16' 10.21"	66° 2' 30"	0.75862
22	20° 53' 15"	2° 48' 24"	18° 13' 28"	10° 45' 11"	0° 59' 21"	16' 10.27"	66° 7' 16"	0.75449
23	21° 28' 46"	2° 51' 08"	18° 45' 51"	11° 01' 06"	0° 59' 21"	16' 10.33"	66° 12' 14"	0.75034
24	22° 04' 16"	2° 53' 51"	19° 18' 17"	11° 16' 58"	0° 59' 21"	16' 10.38"	66° 17' 23"	0.74616

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	141° 28' 55"	0.12"	143° 51' 21"	14° 20' 37"	1.0129841	15'47.33"	23° 26' 19"	-4 m 44 s
1	141° 31' 19"	0.12"	143° 53' 42"	14° 19' 51"	1.0129770	15'47.34"	23° 26' 19"	-4 m 44 s
2	141° 33' 43"	0.13"	143° 56' 02"	14° 19' 05"	1.0129699	15'47.34"	23° 26' 19"	-4 m 44 s
3	141° 36' 07"	0.13"	143° 58' 23"	14° 18' 18"	1.0129628	15'47.35"	23° 26' 19"	-4 m 43 s
4	141° 38' 31"	0.14"	144° 00' 44"	14° 17' 32"	1.0129556	15'47.36"	23° 26' 19"	-4 m 43 s
5	141° 40' 55"	0.14"	144° 03' 05"	14° 16' 46"	1.0129485	15'47.36"	23° 26' 19"	-4 m 42 s
6	141° 43' 19"	0.14"	144° 05' 25"	14° 15' 59"	1.0129414	15'47.37"	23° 26' 19"	-4 m 42 s
7	141° 45' 43"	0.15"	144° 07' 46"	14° 15' 13"	1.0129342	15'47.38"	23° 26' 19"	-4 m 41 s
8	141° 48' 07"	0.15"	144° 10' 07"	14° 14' 26"	1.0129271	15'47.38"	23° 26' 19"	-4 m 41 s
9	141° 50' 31"	0.16"	144° 12' 27"	14° 13' 40"	1.0129199	15'47.39"	23° 26' 19"	-4 m 40 s
10	141° 52' 55"	0.16"	144° 14' 48"	14° 12' 53"	1.0129128	15'47.40"	23° 26' 19"	-4 m 40 s
11	141° 55' 19"	0.17"	144° 17' 09"	14° 12' 07"	1.0129056	15'47.40"	23° 26' 19"	-4 m 39 s
12	141° 57' 43"	0.17"	144° 19' 29"	14° 11' 20"	1.0128984	15'47.41"	23° 26' 19"	-4 m 39 s
13	142° 00' 07"	0.18"	144° 21' 50"	14° 10' 34"	1.0128912	15'47.42"	23° 26' 19"	-4 m 38 s
14	142° 02' 32"	0.18"	144° 24' 11"	14° 09' 47"	1.0128841	15'47.42"	23° 26' 19"	-4 m 38 s
15	142° 04' 56"	0.18"	144° 26' 31"	14° 09' 01"	1.0128769	15'47.43"	23° 26' 19"	-4 m 37 s
16	142° 07' 20"	0.19"	144° 28' 52"	14° 08' 14"	1.0128697	15'47.44"	23° 26' 19"	-4 m 37 s
17	142° 09' 44"	0.19"	144° 31' 12"	14° 07' 27"	1.0128625	15'47.44"	23° 26' 19"	-4 m 36 s
18	142° 12' 08"	0.20"	144° 33' 33"	14° 06' 41"	1.0128553	15'47.45"	23° 26' 19"	-4 m 36 s
19	142° 14' 32"	0.20"	144° 35' 53"	14° 05' 54"	1.0128481	15'47.46"	23° 26' 19"	-4 m 35 s
20	142° 16' 56"	0.21"	144° 38' 14"	14° 05' 07"	1.0128409	15'47.46"	23° 26' 19"	-4 m 35 s
21	142° 19' 20"	0.21"	144° 40' 34"	14° 04' 21"	1.0128336	15'47.47"	23° 26' 19"	-4 m 34 s
22	142° 21' 44"	0.21"	144° 42' 55"	14° 03' 34"	1.0128264	15'47.48"	23° 26' 19"	-4 m 34 s
23	142° 24' 08"	0.22"	144° 45' 15"	14° 02' 47"	1.0128192	15'47.48"	23° 26' 19"	-4 m 33 s
24	142° 26' 32"	0.22"	144° 47' 36"	14° 02' 00"	1.0128119	15'47.49"	23° 26' 19"	-4 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	22° 04' 16"	2° 53' 51"	19° 18' 17"	11° 16' 58"	0° 59' 21"	16' 10.38"	66° 17' 23"	0.74616
1	22° 39' 47"	2° 56' 33"	19° 50' 48"	11° 32' 46"	0° 59' 21"	16' 10.43"	66° 22' 43"	0.74196
2	23° 15' 18"	2° 59' 14"	20° 23' 22"	11° 48' 31"	0° 59' 21"	16' 10.48"	66° 28' 14"	0.73774
3	23° 50' 49"	3° 01' 53"	20° 55' 60"	12° 04' 13"	0° 59' 22"	16' 10.53"	66° 33' 56"	0.73349
4	24° 26' 21"	3° 04' 31"	21° 28' 41"	12° 19' 50"	0° 59' 22"	16' 10.57"	66° 39' 49"	0.72923
5	25° 01' 52"	3° 07' 09"	22° 01' 27"	12° 35' 24"	0° 59' 22"	16' 10.61"	66° 45' 53"	0.72494
6	25° 37' 24"	3° 09' 45"	22° 34' 17"	12° 50' 53"	0° 59' 22"	16' 10.65"	66° 52' 09"	0.72063
7	26° 12' 56"	3° 12' 19"	23° 07' 11"	13° 06' 19"	0° 59' 22"	16' 10.68"	66° 58' 35"	0.71630
8	26° 48' 29"	3° 14' 53"	23° 40' 09"	13° 21' 40"	0° 59' 22"	16' 10.71"	67° 5' 12"	0.71195
9	27° 24' 01"	3° 17' 25"	24° 13' 11"	13° 36' 57"	0° 59' 22"	16' 10.74"	67° 12' 00"	0.70758
10	27° 59' 34"	3° 19' 56"	24° 46' 17"	13° 52' 10"	0° 59' 22"	16' 10.76"	67° 18' 59"	0.70319
11	28° 35' 07"	3° 22' 26"	25° 19' 28"	14° 07' 18"	0° 59' 23"	16' 10.78"	67° 26' 09"	0.69878
12	29° 10' 40"	3° 24' 55"	25° 52' 43"	14° 22' 22"	0° 59' 23"	16' 10.80"	67° 33' 30"	0.69435
13	29° 46' 13"	3° 27' 22"	26° 26' 02"	14° 37' 21"	0° 59' 23"	16' 10.82"	67° 41' 01"	0.68990
14	30° 21' 46"	3° 29' 48"	26° 59' 26"	14° 52' 15"	0° 59' 23"	16' 10.83"	67° 48' 43"	0.68544
15	30° 57' 20"	3° 32' 12"	27° 32' 55"	15° 07' 05"	0° 59' 23"	16' 10.84"	67° 56' 36"	0.68096
16	31° 32' 53"	3° 34' 36"	28° 06' 28"	15° 21' 49"	0° 59' 23"	16' 10.85"	68° 4' 40"	0.67646
17	32° 08' 27"	3° 36' 57"	28° 40' 06"	15° 36' 29"	0° 59' 23"	16' 10.85"	68° 12' 55"	0.67195
18	32° 44' 01"	3° 39' 18"	29° 13' 48"	15° 51' 03"	0° 59' 23"	16' 10.85"	68° 21' 20"	0.66742
19	33° 19' 35"	3° 41' 37"	29° 47' 36"	16° 05' 32"	0° 59' 23"	16' 10.85"	68° 29' 55"	0.66287
20	33° 55' 09"	3° 43' 54"	30° 21' 28"	16° 19' 56"	0° 59' 23"	16' 10.85"	68° 38' 42"	0.65831
21	34° 30' 43"	3° 46' 10"	30° 55' 25"	16° 34' 14"	0° 59' 23"	16' 10.84"	68° 47' 39"	0.65374
22	35° 06' 17"	3° 48' 25"	31° 29' 27"	16° 48' 27"	0° 59' 23"	16' 10.83"	68° 56' 46"	0.64915
23	35° 41' 51"	3° 50' 38"	32° 03' 34"	17° 02' 34"	0° 59' 23"	16' 10.82"	69° 6' 04"	0.64455
24	36° 17' 25"	3° 52' 50"	32° 37' 45"	17° 16' 35"	0° 59' 23"	16' 10.80"	69° 15' 33"	0.63993

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	142° 26' 32"	0.22"	144° 47' 36"	14° 02' 00"	1.0128119	15'47.49"	23° 26' 19"	-4 m 33 s
1	142° 28' 56"	0.23"	144° 49' 56"	14° 01' 13"	1.0128047	15'47.50"	23° 26' 19"	-4 m 32 s
2	142° 31' 21"	0.23"	144° 52' 17"	14° 00' 27"	1.0127974	15'47.50"	23° 26' 19"	-4 m 32 s
3	142° 33' 45"	0.23"	144° 54' 37"	13° 59' 40"	1.0127902	15'47.51"	23° 26' 19"	-4 m 31 s
4	142° 36' 09"	0.24"	144° 56' 58"	13° 58' 53"	1.0127829	15'47.52"	23° 26' 19"	-4 m 31 s
5	142° 38' 33"	0.24"	144° 59' 18"	13° 58' 06"	1.0127757	15'47.52"	23° 26' 19"	-4 m 30 s
6	142° 40' 57"	0.24"	145° 01' 38"	13° 57' 19"	1.0127684	15'47.53"	23° 26' 19"	-4 m 30 s
7	142° 43' 21"	0.25"	145° 03' 59"	13° 56' 32"	1.0127611	15'47.54"	23° 26' 19"	-4 m 29 s
8	142° 45' 45"	0.25"	145° 06' 19"	13° 55' 45"	1.0127538	15'47.55"	23° 26' 19"	-4 m 29 s
9	142° 48' 09"	0.26"	145° 08' 39"	13° 54' 58"	1.0127465	15'47.55"	23° 26' 19"	-4 m 28 s
10	142° 50' 33"	0.26"	145° 10' 60"	13° 54' 11"	1.0127392	15'47.56"	23° 26' 19"	-4 m 28 s
11	142° 52' 57"	0.26"	145° 13' 20"	13° 53' 24"	1.0127319	15'47.57"	23° 26' 19"	-4 m 27 s
12	142° 55' 22"	0.27"	145° 15' 40"	13° 52' 37"	1.0127246	15'47.57"	23° 26' 19"	-4 m 27 s
13	142° 57' 46"	0.27"	145° 18' 01"	13° 51' 49"	1.0127173	15'47.58"	23° 26' 19"	-4 m 26 s
14	143° 00' 10"	0.27"	145° 20' 21"	13° 51' 02"	1.0127100	15'47.59"	23° 26' 19"	-4 m 26 s
15	143° 02' 34"	0.28"	145° 22' 41"	13° 50' 15"	1.0127027	15'47.59"	23° 26' 19"	-4 m 25 s
16	143° 04' 58"	0.28"	145° 25' 02"	13° 49' 28"	1.0126953	15'47.60"	23° 26' 19"	-4 m 25 s
17	143° 07' 22"	0.28"	145° 27' 22"	13° 48' 41"	1.0126880	15'47.61"	23° 26' 19"	-4 m 24 s
18	143° 09' 46"	0.29"	145° 29' 42"	13° 47' 54"	1.0126807	15'47.61"	23° 26' 19"	-4 m 24 s
19	143° 12' 11"	0.29"	145° 32' 02"	13° 47' 06"	1.0126733	15'47.62"	23° 26' 19"	-4 m 23 s
20	143° 14' 35"	0.29"	145° 34' 22"	13° 46' 19"	1.0126660	15'47.63"	23° 26' 19"	-4 m 23 s
21	143° 16' 59"	0.29"	145° 36' 43"	13° 45' 32"	1.0126586	15'47.63"	23° 26' 19"	-4 m 22 s
22	143° 19' 23"	0.30"	145° 39' 03"	13° 44' 44"	1.0126512	15'47.64"	23° 26' 19"	-4 m 22 s
23	143° 21' 47"	0.30"	145° 41' 23"	13° 43' 57"	1.0126438	15'47.65"	23° 26' 19"	-4 m 21 s
24	143° 24' 11"	0.30"	145° 43' 43"	13° 43' 10"	1.0126365	15'47.65"	23° 26' 19"	-4 m 21 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	36° 17' 25"	3° 52' 50"	32° 37' 45"	17° 16' 35"	0° 59' 23"	16' 10.80"	69° 15' 33"	0.63993
1	36° 52' 59"	3° 55' 00"	33° 12' 02"	17° 30' 30"	0° 59' 23"	16' 10.78"	69° 25' 12"	0.63530
2	37° 28' 33"	3° 57' 09"	33° 46' 24"	17° 44' 20"	0° 59' 22"	16' 10.76"	69° 35' 01"	0.63066
3	38° 04' 08"	3° 59' 16"	34° 20' 51"	17° 58' 03"	0° 59' 22"	16' 10.74"	69° 45' 01"	0.62601
4	38° 39' 42"	4° 01' 22"	34° 55' 24"	18° 11' 40"	0° 59' 22"	16' 10.71"	69° 55' 11"	0.62135
5	39° 15' 16"	4° 03' 26"	35° 30' 01"	18° 25' 11"	0° 59' 22"	16' 10.69"	70° 5' 32"	0.61667
6	39° 50' 50"	4° 05' 29"	36° 04' 44"	18° 38' 36"	0° 59' 22"	16' 10.65"	70° 16' 03"	0.61199
7	40° 26' 24"	4° 07' 30"	36° 39' 32"	18° 51' 54"	0° 59' 22"	16' 10.62"	70° 26' 44"	0.60729
8	41° 01' 58"	4° 09' 29"	37° 14' 25"	19° 05' 05"	0° 59' 22"	16' 10.59"	70° 37' 35"	0.60259
9	41° 37' 32"	4° 11' 27"	37° 49' 24"	19° 18' 10"	0° 59' 22"	16' 10.55"	70° 48' 37"	0.59787
10	42° 13' 06"	4° 13' 23"	38° 24' 28"	19° 31' 08"	0° 59' 22"	16' 10.51"	70° 59' 49"	0.59315
11	42° 48' 40"	4° 15' 17"	38° 59' 37"	19° 43' 59"	0° 59' 21"	16' 10.46"	71° 11' 10"	0.58842
12	43° 24' 14"	4° 17' 10"	39° 34' 52"	19° 56' 44"	0° 59' 21"	16' 10.42"	71° 22' 42"	0.58368
13	43° 59' 48"	4° 19' 01"	40° 10' 12"	20° 09' 21"	0° 59' 21"	16' 10.37"	71° 34' 24"	0.57893
14	44° 35' 22"	4° 20' 51"	40° 45' 37"	20° 21' 51"	0° 59' 21"	16' 10.32"	71° 46' 16"	0.57418
15	45° 10' 55"	4° 22' 39"	41° 21' 08"	20° 34' 14"	0° 59' 21"	16' 10.26"	71° 58' 18"	0.56942
16	45° 46' 29"	4° 24' 25"	41° 56' 44"	20° 46' 29"	0° 59' 20"	16' 10.21"	72° 10' 30"	0.56466
17	46° 22' 02"	4° 26' 09"	42° 32' 26"	20° 58' 37"	0° 59' 20"	16' 10.15"	72° 22' 52"	0.55989
18	46° 57' 32"	4° 27' 52"	43° 08' 10"	21° 10' 36"	0° 59' 20"	16' 10.09"	72° 35' 22"	0.55512
19	47° 33' 05"	4° 29' 33"	43° 44' 03"	21° 22' 29"	0° 59' 20"	16' 10.02"	72° 48' 03"	0.55034
20	48° 08' 38"	4° 31' 12"	44° 20' 01"	21° 34' 14"	0° 59' 19"	16' 09.96"	73° 0' 54"	0.54556
21	48° 44' 10"	4° 32' 50"	44° 56' 05"	21° 45' 52"	0° 59' 19"	16' 09.89"	73° 13' 54"	0.54077
22	49° 19' 43"	4° 34' 26"	45° 32' 14"	21° 57' 21"	0° 59' 19"	16' 09.82"	73° 27' 04"	0.53598
23	49° 55' 15"	4° 35' 60"	46° 08' 29"	22° 08' 42"	0° 59' 19"	16' 09.75"	73° 40' 24"	0.53119
24	50° 30' 48"	4° 37' 32"	46° 44' 49"	22° 19' 55"	0° 59' 18"	16' 09.67"	73° 53' 53"	0.52639

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	143° 24' 11"	0.30"	145° 43' 43"	13° 43' 10"	1.0126365	15'47.65"	23° 26' 19"	-4 m 21 s
1	143° 26' 35"	0.31"	145° 46' 03"	13° 42' 22"	1.0126291	15'47.66"	23° 26' 19"	-4 m 20 s
2	143° 28' 60"	0.31"	145° 48' 23"	13° 41' 35"	1.0126217	15'47.67"	23° 26' 19"	-4 m 20 s
3	143° 31' 24"	0.31"	145° 50' 44"	13° 40' 47"	1.0126143	15'47.68"	23° 26' 19"	-4 m 19 s
4	143° 33' 48"	0.31"	145° 53' 04"	13° 39' 60"	1.0126069	15'47.68"	23° 26' 19"	-4 m 19 s
5	143° 36' 12"	0.32"	145° 55' 24"	13° 39' 12"	1.0125995	15'47.69"	23° 26' 19"	-4 m 18 s
6	143° 38' 36"	0.32"	145° 57' 44"	13° 38' 25"	1.0125921	15'47.70"	23° 26' 19"	-4 m 18 s
7	143° 41' 00"	0.32"	146° 00' 04"	13° 37' 37"	1.0125846	15'47.70"	23° 26' 19"	-4 m 17 s
8	143° 43' 25"	0.33"	146° 02' 24"	13° 36' 50"	1.0125772	15'47.71"	23° 26' 19"	-4 m 17 s
9	143° 45' 49"	0.33"	146° 04' 44"	13° 36' 02"	1.0125698	15'47.72"	23° 26' 19"	-4 m 16 s
10	143° 48' 13"	0.33"	146° 07' 04"	13° 35' 15"	1.0125623	15'47.72"	23° 26' 19"	-4 m 16 s
11	143° 50' 37"	0.33"	146° 09' 24"	13° 34' 27"	1.0125549	15'47.73"	23° 26' 19"	-4 m 15 s
12	143° 53' 01"	0.34"	146° 11' 44"	13° 33' 39"	1.0125474	15'47.74"	23° 26' 19"	-4 m 15 s
13	143° 55' 26"	0.34"	146° 14' 04"	13° 32' 52"	1.0125399	15'47.75"	23° 26' 19"	-4 m 14 s
14	143° 57' 50"	0.34"	146° 16' 24"	13° 32' 04"	1.0125325	15'47.75"	23° 26' 19"	-4 m 14 s
15	144° 00' 14"	0.34"	146° 18' 44"	13° 31' 16"	1.0125250	15'47.76"	23° 26' 19"	-4 m 13 s
16	144° 02' 38"	0.34"	146° 21' 04"	13° 30' 29"	1.0125175	15'47.77"	23° 26' 19"	-4 m 13 s
17	144° 05' 02"	0.35"	146° 23' 24"	13° 29' 41"	1.0125100	15'47.77"	23° 26' 19"	-4 m 12 s
18	144° 07' 27"	0.35"	146° 25' 44"	13° 28' 53"	1.0125025	15'47.78"	23° 26' 19"	-4 m 12 s
19	144° 09' 51"	0.35"	146° 28' 04"	13° 28' 05"	1.0124950	15'47.79"	23° 26' 19"	-4 m 11 s
20	144° 12' 15"	0.35"	146° 30' 23"	13° 27' 17"	1.0124875	15'47.79"	23° 26' 19"	-4 m 10 s
21	144° 14' 39"	0.35"	146° 32' 43"	13° 26' 30"	1.0124800	15'47.80"	23° 26' 19"	-4 m 10 s
22	144° 17' 03"	0.36"	146° 35' 03"	13° 25' 42"	1.0124725	15'47.81"	23° 26' 19"	-4 m 09 s
23	144° 19' 28"	0.36"	146° 37' 23"	13° 24' 54"	1.0124649	15'47.82"	23° 26' 19"	-4 m 09 s
24	144° 21' 52"	0.36"	146° 39' 43"	13° 24' 06"	1.0124574	15'47.82"	23° 26' 19"	-4 m 08 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	50° 30' 48"	4° 37' 32"	46° 44' 49"	22° 19' 55"	0° 59' 18"	16' 09.67"	73° 53' 53"	0.52639
1	51° 06' 20"	4° 39' 02"	47° 21' 15"	22° 30' 60"	0° 59' 18"	16' 09.59"	74° 7' 31"	0.52159
2	51° 41' 52"	4° 40' 31"	47° 57' 46"	22° 41' 57"	0° 59' 18"	16' 09.51"	74° 21' 19"	0.51680
3	52° 17' 23"	4° 41' 58"	48° 34' 22"	22° 52' 45"	0° 59' 18"	16' 09.43"	74° 35' 15"	0.51200
4	52° 52' 55"	4° 43' 23"	49° 11' 04"	23° 03' 24"	0° 59' 17"	16' 09.35"	74° 49' 21"	0.50720
5	53° 28' 26"	4° 44' 46"	49° 47' 52"	23° 13' 55"	0° 59' 17"	16' 09.26"	75° 3' 37"	0.50240
6	54° 03' 57"	4° 46' 08"	50° 24' 44"	23° 24' 18"	0° 59' 17"	16' 09.17"	75° 18' 01"	0.49760
7	54° 39' 27"	4° 47' 27"	51° 01' 42"	23° 34' 31"	0° 59' 16"	16' 09.08"	75° 32' 34"	0.49280
8	55° 14' 58"	4° 48' 45"	51° 38' 46"	23° 44' 36"	0° 59' 16"	16' 08.99"	75° 47' 16"	0.48801
9	55° 50' 28"	4° 50' 01"	52° 15' 54"	23° 54' 31"	0° 59' 16"	16' 08.89"	76° 2' 06"	0.48321
10	56° 25' 58"	4° 51' 15"	52° 53' 08"	24° 04' 18"	0° 59' 15"	16' 08.80"	76° 17' 06"	0.47842
11	57° 01' 27"	4° 52' 27"	53° 30' 27"	24° 13' 56"	0° 59' 15"	16' 08.70"	76° 32' 14"	0.47363
12	57° 36' 56"	4° 53' 37"	54° 07' 51"	24° 23' 24"	0° 59' 14"	16' 08.59"	76° 47' 30"	0.46884
13	58° 12' 25"	4° 54' 45"	54° 45' 21"	24° 32' 43"	0° 59' 14"	16' 08.49"	77° 2' 55"	0.46406
14	58° 47' 54"	4° 55' 52"	55° 22' 55"	24° 41' 52"	0° 59' 14"	16' 08.38"	77° 18' 29"	0.45929
15	59° 23' 22"	4° 56' 56"	56° 00' 34"	24° 50' 52"	0° 59' 13"	16' 08.27"	77° 34' 10"	0.45451
16	59° 58' 50"	4° 57' 59"	56° 38' 19"	24° 59' 43"	0° 59' 13"	16' 08.16"	77° 49' 60"	0.44974
17	60° 34' 18"	4° 58' 60"	57° 16' 08"	25° 08' 23"	0° 59' 13"	16' 08.05"	78° 5' 57"	0.44498
18	61° 09' 45"	4° 59' 59"	57° 54' 02"	25° 16' 55"	0° 59' 12"	16' 07.94"	78° 22' 03"	0.44023
19	61° 45' 12"	5° 00' 56"	58° 32' 01"	25° 25' 16"	0° 59' 12"	16' 07.82"	78° 38' 16"	0.43548
20	62° 20' 38"	5° 01' 51"	59° 10' 04"	25° 33' 27"	0° 59' 11"	16' 07.70"	78° 54' 37"	0.43073
21	62° 56' 04"	5° 02' 44"	59° 48' 13"	25° 41' 28"	0° 59' 11"	16' 07.58"	79° 11' 05"	0.42600
22	63° 31' 30"	5° 03' 35"	60° 26' 25"	25° 49' 20"	0° 59' 10"	16' 07.45"	79° 27' 41"	0.42127
23	64° 06' 55"	5° 04' 24"	61° 04' 43"	25° 57' 01"	0° 59' 10"	16' 07.33"	79° 44' 25"	0.41655
24	64° 42' 20"	5° 05' 11"	61° 43' 04"	26° 04' 32"	0° 59' 09"	16' 07.20"	80° 1' 15"	0.41184

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	144° 21' 52"	0.36"	146° 39' 43"	13° 24' 06"	1.0124574	15'47.82"	23° 26' 19"	-4 m 08 s
1	144° 24' 16"	0.36"	146° 42' 03"	13° 23' 18"	1.0124499	15'47.83"	23° 26' 19"	-4 m 08 s
2	144° 26' 40"	0.36"	146° 44' 23"	13° 22' 30"	1.0124423	15'47.84"	23° 26' 19"	-4 m 07 s
3	144° 29' 05"	0.36"	146° 46' 42"	13° 21' 42"	1.0124348	15'47.84"	23° 26' 19"	-4 m 07 s
4	144° 31' 29"	0.37"	146° 49' 02"	13° 20' 54"	1.0124272	15'47.85"	23° 26' 19"	-4 m 06 s
5	144° 33' 53"	0.37"	146° 51' 22"	13° 20' 06"	1.0124196	15'47.86"	23° 26' 19"	-4 m 06 s
6	144° 36' 17"	0.37"	146° 53' 42"	13° 19' 18"	1.0124121	15'47.87"	23° 26' 18"	-4 m 05 s
7	144° 38' 41"	0.37"	146° 56' 02"	13° 18' 30"	1.0124045	15'47.87"	23° 26' 18"	-4 m 05 s
8	144° 41' 06"	0.37"	146° 58' 21"	13° 17' 42"	1.0123969	15'47.88"	23° 26' 18"	-4 m 04 s
9	144° 43' 30"	0.37"	147° 00' 41"	13° 16' 54"	1.0123893	15'47.89"	23° 26' 18"	-4 m 03 s
10	144° 45' 54"	0.37"	147° 03' 01"	13° 16' 06"	1.0123817	15'47.89"	23° 26' 18"	-4 m 03 s
11	144° 48' 18"	0.38"	147° 05' 20"	13° 15' 17"	1.0123741	15'47.90"	23° 26' 18"	-4 m 02 s
12	144° 50' 43"	0.38"	147° 07' 40"	13° 14' 29"	1.0123664	15'47.91"	23° 26' 18"	-4 m 02 s
13	144° 53' 07"	0.38"	147° 09' 60"	13° 13' 41"	1.0123588	15'47.91"	23° 26' 18"	-4 m 01 s
14	144° 55' 31"	0.38"	147° 12' 19"	13° 12' 53"	1.0123512	15'47.92"	23° 26' 18"	-4 m 01 s
15	144° 57' 55"	0.38"	147° 14' 39"	13° 12' 05"	1.0123435	15'47.93"	23° 26' 18"	-4 m 00 s
16	145° 00' 20"	0.38"	147° 16' 59"	13° 11' 16"	1.0123359	15'47.94"	23° 26' 18"	-3 m 60 s
17	145° 02' 44"	0.38"	147° 19' 18"	13° 10' 28"	1.0123282	15'47.94"	23° 26' 18"	-3 m 59 s
18	145° 05' 08"	0.38"	147° 21' 38"	13° 09' 40"	1.0123206	15'47.95"	23° 26' 18"	-3 m 59 s
19	145° 07' 33"	0.38"	147° 23' 58"	13° 08' 51"	1.0123129	15'47.96"	23° 26' 18"	-3 m 58 s
20	145° 09' 57"	0.38"	147° 26' 17"	13° 08' 03"	1.0123052	15'47.97"	23° 26' 18"	-3 m 57 s
21	145° 12' 21"	0.38"	147° 28' 37"	13° 07' 15"	1.0122975	15'47.97"	23° 26' 18"	-3 m 57 s
22	145° 14' 45"	0.39"	147° 30' 56"	13° 06' 26"	1.0122899	15'47.98"	23° 26' 18"	-3 m 56 s
23	145° 17' 10"	0.39"	147° 33' 16"	13° 05' 38"	1.0122822	15'47.99"	23° 26' 18"	-3 m 56 s
24	145° 19' 34"	0.39"	147° 35' 35"	13° 04' 49"	1.0122745	15'47.99"	23° 26' 18"	-3 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	64° 42' 20"	5° 05' 11"	61° 43' 04"	26° 04' 32"	0° 59' 09"	16' 07.20"	80° 1' 15"	0.41184
1	65° 17' 45"	5° 05' 57"	62° 21' 30"	26° 11' 53"	0° 59' 09"	16' 07.07"	80° 18' 13"	0.40714
2	65° 53' 09"	5° 06' 40"	63° 00' 00"	26° 19' 03"	0° 59' 08"	16' 06.94"	80° 35' 17"	0.40245
3	66° 28' 32"	5° 07' 22"	63° 38' 35"	26° 26' 03"	0° 59' 08"	16' 06.81"	80° 52' 29"	0.39777
4	67° 03' 55"	5° 08' 01"	64° 17' 13"	26° 32' 53"	0° 59' 07"	16' 06.67"	81° 9' 47"	0.39309
5	67° 39' 18"	5° 08' 39"	64° 55' 55"	26° 39' 32"	0° 59' 07"	16' 06.53"	81° 27' 12"	0.38843
6	68° 14' 40"	5° 09' 14"	65° 34' 41"	26° 46' 00"	0° 59' 06"	16' 06.39"	81° 44' 43"	0.38379
7	68° 50' 02"	5° 09' 48"	66° 13' 31"	26° 52' 18"	0° 59' 06"	16' 06.25"	82° 2' 20"	0.37915
8	69° 25' 23"	5° 10' 19"	66° 52' 25"	26° 58' 25"	0° 59' 05"	16' 06.11"	82° 20' 03"	0.37452
9	70° 00' 43"	5° 10' 49"	67° 31' 22"	27° 04' 21"	0° 59' 05"	16' 05.96"	82° 37' 53"	0.36991
10	70° 36' 04"	5° 11' 17"	68° 10' 23"	27° 10' 06"	0° 59' 04"	16' 05.81"	82° 55' 48"	0.36531
11	71° 11' 23"	5° 11' 42"	68° 49' 27"	27° 15' 41"	0° 59' 04"	16' 05.66"	83° 13' 49"	0.36073
12	71° 46' 42"	5° 12' 06"	69° 28' 34"	27° 21' 04"	0° 59' 03"	16' 05.51"	83° 31' 56"	0.35615
13	72° 22' 01"	5° 12' 28"	70° 07' 44"	27° 26' 17"	0° 59' 03"	16' 05.35"	83° 50' 08"	0.35160
14	72° 57' 19"	5° 12' 48"	70° 46' 57"	27° 31' 18"	0° 59' 02"	16' 05.20"	84° 8' 25"	0.34705
15	73° 32' 36"	5° 13' 05"	71° 26' 13"	27° 36' 08"	0° 59' 01"	16' 05.04"	84° 26' 48"	0.34253
16	74° 07' 53"	5° 13' 21"	72° 05' 32"	27° 40' 48"	0° 59' 01"	16' 04.88"	84° 45' 15"	0.33801
17	74° 43' 09"	5° 13' 35"	72° 44' 53"	27° 45' 16"	0° 59' 00"	16' 04.72"	85° 3' 47"	0.33352
18	75° 18' 25"	5° 13' 47"	73° 24' 17"	27° 49' 32"	0° 58' 60"	16' 04.55"	85° 22' 24"	0.32904
19	75° 53' 40"	5° 13' 57"	74° 03' 43"	27° 53' 38"	0° 58' 59"	16' 04.38"	85° 41' 05"	0.32457
20	76° 28' 55"	5° 14' 05"	74° 43' 12"	27° 57' 32"	0° 58' 58"	16' 04.22"	85° 59' 51"	0.32013
21	77° 04' 08"	5° 14' 11"	75° 22' 42"	28° 01' 15"	0° 58' 58"	16' 04.04"	86° 18' 40"	0.31570
22	77° 39' 22"	5° 14' 15"	76° 02' 14"	28° 04' 46"	0° 58' 57"	16' 03.87"	86° 37' 34"	0.31129
23	78° 14' 34"	5° 14' 17"	76° 41' 49"	28° 08' 06"	0° 58' 57"	16' 03.70"	86° 56' 31"	0.30690
24	78° 49' 46"	5° 14' 17"	77° 21' 24"	28° 11' 15"	0° 58' 56"	16' 03.52"	87° 15' 32"	0.30253

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	145° 19' 34"	0.39"	147° 35' 35"	13° 04' 49"	1.0122745	15'47.99"	23° 26' 18"	-3 m 55 s
1	145° 21' 58"	0.39"	147° 37' 55"	13° 04' 01"	1.0122667	15'48.00"	23° 26' 18"	-3 m 55 s
2	145° 24' 23"	0.39"	147° 40' 14"	13° 03' 12"	1.0122590	15'48.01"	23° 26' 18"	-3 m 54 s
3	145° 26' 47"	0.39"	147° 42' 34"	13° 02' 24"	1.0122513	15'48.02"	23° 26' 18"	-3 m 54 s
4	145° 29' 11"	0.39"	147° 44' 53"	13° 01' 35"	1.0122436	15'48.02"	23° 26' 18"	-3 m 53 s
5	145° 31' 35"	0.39"	147° 47' 13"	13° 00' 47"	1.0122358	15'48.03"	23° 26' 18"	-3 m 52 s
6	145° 33' 60"	0.39"	147° 49' 32"	12° 59' 58"	1.0122281	15'48.04"	23° 26' 18"	-3 m 52 s
7	145° 36' 24"	0.39"	147° 51' 52"	12° 59' 10"	1.0122203	15'48.04"	23° 26' 18"	-3 m 51 s
8	145° 38' 48"	0.39"	147° 54' 11"	12° 58' 21"	1.0122125	15'48.05"	23° 26' 18"	-3 m 51 s
9	145° 41' 13"	0.39"	147° 56' 31"	12° 57' 32"	1.0122048	15'48.06"	23° 26' 18"	-3 m 50 s
10	145° 43' 37"	0.39"	147° 58' 50"	12° 56' 44"	1.0121970	15'48.07"	23° 26' 18"	-3 m 50 s
11	145° 46' 01"	0.39"	148° 01' 10"	12° 55' 55"	1.0121892	15'48.07"	23° 26' 18"	-3 m 49 s
12	145° 48' 26"	0.39"	148° 03' 29"	12° 55' 06"	1.0121814	15'48.08"	23° 26' 18"	-3 m 49 s
13	145° 50' 50"	0.39"	148° 05' 48"	12° 54' 18"	1.0121736	15'48.09"	23° 26' 18"	-3 m 48 s
14	145° 53' 14"	0.39"	148° 08' 08"	12° 53' 29"	1.0121658	15'48.10"	23° 26' 18"	-3 m 47 s
15	145° 55' 39"	0.39"	148° 10' 27"	12° 52' 40"	1.0121580	15'48.10"	23° 26' 18"	-3 m 47 s
16	145° 58' 03"	0.39"	148° 12' 46"	12° 51' 51"	1.0121502	15'48.11"	23° 26' 18"	-3 m 46 s
17	146° 00' 27"	0.39"	148° 15' 06"	12° 51' 02"	1.0121423	15'48.12"	23° 26' 18"	-3 m 46 s
18	146° 02' 52"	0.39"	148° 17' 25"	12° 50' 14"	1.0121345	15'48.12"	23° 26' 18"	-3 m 45 s
19	146° 05' 16"	0.39"	148° 19' 44"	12° 49' 25"	1.0121267	15'48.13"	23° 26' 18"	-3 m 45 s
20	146° 07' 40"	0.38"	148° 22' 04"	12° 48' 36"	1.0121188	15'48.14"	23° 26' 18"	-3 m 44 s
21	146° 10' 05"	0.38"	148° 24' 23"	12° 47' 47"	1.0121109	15'48.15"	23° 26' 18"	-3 m 43 s
22	146° 12' 29"	0.38"	148° 26' 42"	12° 46' 58"	1.0121031	15'48.15"	23° 26' 18"	-3 m 43 s
23	146° 14' 53"	0.38"	148° 29' 01"	12° 46' 09"	1.0120952	15'48.16"	23° 26' 18"	-3 m 42 s
24	146° 17' 18"	0.38"	148° 31' 21"	12° 45' 20"	1.0120873	15'48.17"	23° 26' 18"	-3 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	78° 49' 46"	5° 14' 17"	77° 21' 24"	28° 11' 15"	0° 58' 56"	16' 03.52"	87° 15' 32"	0.30253
1	79° 24' 57"	5° 14' 15"	78° 01' 02"	28° 14' 12"	0° 58' 55"	16' 03.34"	87° 34' 36"	0.29817
2	80° 00' 08"	5° 14' 11"	78° 40' 41"	28° 16' 58"	0° 58' 55"	16' 03.16"	87° 53' 44"	0.29384
3	80° 35' 18"	5° 14' 05"	79° 20' 20"	28° 19' 32"	0° 58' 54"	16' 02.98"	88° 12' 55"	0.28952
4	81° 10' 27"	5° 13' 57"	80° 00' 01"	28° 21' 54"	0° 58' 53"	16' 02.79"	88° 32' 08"	0.28523
5	81° 45' 35"	5° 13' 47"	80° 39' 43"	28° 24' 06"	0° 58' 53"	16' 02.61"	88° 51' 25"	0.28096
6	82° 20' 43"	5° 13' 35"	81° 19' 26"	28° 26' 05"	0° 58' 52"	16' 02.42"	89° 10' 44"	0.27671
7	82° 55' 50"	5° 13' 22"	81° 59' 09"	28° 27' 53"	0° 58' 51"	16' 02.23"	89° 30' 05"	0.27247
8	83° 30' 56"	5° 13' 06"	82° 38' 53"	28° 29' 29"	0° 58' 50"	16' 02.04"	89° 49' 29"	0.26827
9	84° 06' 01"	5° 12' 48"	83° 18' 37"	28° 30' 54"	0° 58' 50"	16' 01.84"	90° 8' 55"	0.26408
10	84° 41' 06"	5° 12' 29"	83° 58' 21"	28° 32' 07"	0° 58' 49"	16' 01.64"	90° 28' 22"	0.25992
11	85° 16' 10"	5° 12' 07"	84° 38' 06"	28° 33' 09"	0° 58' 48"	16' 01.45"	90° 47' 52"	0.25578
12	85° 51' 13"	5° 11' 44"	85° 17' 50"	28° 33' 59"	0° 58' 48"	16' 01.24"	91° 7' 23"	0.25166
13	86° 26' 16"	5° 11' 19"	85° 57' 34"	28° 34' 37"	0° 58' 47"	16' 01.04"	91° 26' 55"	0.24757
14	87° 01' 17"	5° 10' 51"	86° 37' 17"	28° 35' 04"	0° 58' 46"	16' 00.84"	91° 46' 28"	0.24350
15	87° 36' 18"	5° 10' 22"	87° 16' 60"	28° 35' 19"	0° 58' 45"	16' 00.63"	92° 6' 03"	0.23945
16	88° 11' 18"	5° 09' 51"	87° 56' 42"	28° 35' 23"	0° 58' 45"	16' 00.42"	92° 25' 38"	0.23543
17	88° 46' 17"	5° 09' 18"	88° 36' 23"	28° 35' 15"	0° 58' 44"	16' 00.21"	92° 45' 15"	0.23144
18	89° 21' 15"	5° 08' 43"	89° 16' 03"	28° 34' 56"	0° 58' 43"	15' 60.00"	93° 4' 51"	0.22747
19	89° 56' 13"	5° 08' 06"	89° 55' 42"	28° 34' 25"	0° 58' 42"	15' 59.78"	93° 24' 28"	0.22352
20	90° 31' 09"	5° 07' 28"	90° 35' 20"	28° 33' 42"	0° 58' 41"	15' 59.57"	93° 44' 05"	0.21960
21	91° 06' 05"	5° 06' 47"	91° 14' 56"	28° 32' 48"	0° 58' 41"	15' 59.35"	94° 3' 43"	0.21571
22	91° 40' 59"	5° 06' 04"	91° 54' 30"	28° 31' 43"	0° 58' 40"	15' 59.13"	94° 23' 20"	0.21185
23	92° 15' 53"	5° 05' 20"	92° 34' 02"	28° 30' 26"	0° 58' 39"	15' 58.90"	94° 42' 57"	0.20801
24	92° 50' 46"	5° 04' 34"	93° 13' 33"	28° 28' 58"	0° 58' 38"	15' 58.68"	95° 2' 33"	0.20420

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	146° 17' 18"	0.38"	148° 31' 21"	12° 45' 20"	1.0120873	15'48.17"	23° 26' 18"	-3 m 42 s
1	146° 19' 42"	0.38"	148° 33' 40"	12° 44' 31"	1.0120794	15'48.18"	23° 26' 18"	-3 m 41 s
2	146° 22' 06"	0.38"	148° 35' 59"	12° 43' 42"	1.0120715	15'48.18"	23° 26' 18"	-3 m 41 s
3	146° 24' 31"	0.38"	148° 38' 18"	12° 42' 53"	1.0120636	15'48.19"	23° 26' 18"	-3 m 40 s
4	146° 26' 55"	0.38"	148° 40' 38"	12° 42' 04"	1.0120557	15'48.20"	23° 26' 18"	-3 m 39 s
5	146° 29' 20"	0.38"	148° 42' 57"	12° 41' 15"	1.0120478	15'48.21"	23° 26' 18"	-3 m 39 s
6	146° 31' 44"	0.38"	148° 45' 16"	12° 40' 26"	1.0120398	15'48.21"	23° 26' 18"	-3 m 38 s
7	146° 34' 08"	0.38"	148° 47' 35"	12° 39' 37"	1.0120319	15'48.22"	23° 26' 18"	-3 m 38 s
8	146° 36' 33"	0.37"	148° 49' 54"	12° 38' 48"	1.0120239	15'48.23"	23° 26' 19"	-3 m 37 s
9	146° 38' 57"	0.37"	148° 52' 13"	12° 37' 59"	1.0120160	15'48.24"	23° 26' 19"	-3 m 36 s
10	146° 41' 21"	0.37"	148° 54' 32"	12° 37' 09"	1.0120080	15'48.24"	23° 26' 19"	-3 m 36 s
11	146° 43' 46"	0.37"	148° 56' 52"	12° 36' 20"	1.0120001	15'48.25"	23° 26' 19"	-3 m 35 s
12	146° 46' 10"	0.37"	148° 59' 11"	12° 35' 31"	1.0119921	15'48.26"	23° 26' 19"	-3 m 35 s
13	146° 48' 35"	0.37"	149° 01' 30"	12° 34' 42"	1.0119841	15'48.27"	23° 26' 19"	-3 m 34 s
14	146° 50' 59"	0.37"	149° 03' 49"	12° 33' 52"	1.0119761	15'48.27"	23° 26' 19"	-3 m 34 s
15	146° 53' 23"	0.36"	149° 06' 08"	12° 33' 03"	1.0119681	15'48.28"	23° 26' 19"	-3 m 33 s
16	146° 55' 48"	0.36"	149° 08' 27"	12° 32' 14"	1.0119601	15'48.29"	23° 26' 19"	-3 m 32 s
17	146° 58' 12"	0.36"	149° 10' 46"	12° 31' 25"	1.0119521	15'48.30"	23° 26' 19"	-3 m 32 s
18	147° 00' 37"	0.36"	149° 13' 05"	12° 30' 35"	1.0119440	15'48.30"	23° 26' 19"	-3 m 31 s
19	147° 03' 01"	0.36"	149° 15' 24"	12° 29' 46"	1.0119360	15'48.31"	23° 26' 19"	-3 m 31 s
20	147° 05' 25"	0.36"	149° 17' 43"	12° 28' 56"	1.0119280	15'48.32"	23° 26' 19"	-3 m 30 s
21	147° 07' 50"	0.35"	149° 20' 02"	12° 28' 07"	1.0119199	15'48.33"	23° 26' 19"	-3 m 29 s
22	147° 10' 14"	0.35"	149° 22' 21"	12° 27' 18"	1.0119118	15'48.33"	23° 26' 19"	-3 m 29 s
23	147° 12' 39"	0.35"	149° 24' 40"	12° 26' 28"	1.0119038	15'48.34"	23° 26' 19"	-3 m 28 s
24	147° 15' 03"	0.35"	149° 26' 59"	12° 25' 39"	1.0118957	15'48.35"	23° 26' 19"	-3 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	92° 50' 46"	5° 04' 34"	93° 13' 33"	28° 28' 58"	0° 58' 38"	15' 58.68"	95° 2' 33"	0.20420
1	93° 25' 38"	5° 03' 46"	93° 53' 01"	28° 27' 18"	0° 58' 37"	15' 58.45"	95° 22' 09"	0.20042
2	94° 00' 29"	5° 02' 56"	94° 32' 27"	28° 25' 27"	0° 58' 36"	15' 58.22"	95° 41' 44"	0.19667
3	94° 35' 19"	5° 02' 04"	95° 11' 51"	28° 23' 25"	0° 58' 36"	15' 57.99"	96° 1' 19"	0.19294
4	95° 10' 09"	5° 01' 11"	95° 51' 12"	28° 21' 11"	0° 58' 35"	15' 57.76"	96° 20' 52"	0.18925
5	95° 44' 57"	5° 00' 15"	96° 30' 31"	28° 18' 46"	0° 58' 34"	15' 57.53"	96° 40' 24"	0.18558
6	96° 19' 44"	4° 59' 18"	97° 09' 46"	28° 16' 10"	0° 58' 33"	15' 57.29"	96° 59' 55"	0.18194
7	96° 54' 30"	4° 58' 19"	97° 48' 59"	28° 13' 23"	0° 58' 32"	15' 57.05"	97° 19' 25"	0.17833
8	97° 29' 15"	4° 57' 18"	98° 28' 08"	28° 10' 25"	0° 58' 31"	15' 56.81"	97° 38' 52"	0.17475
9	98° 03' 60"	4° 56' 15"	99° 07' 15"	28° 07' 16"	0° 58' 30"	15' 56.57"	97° 58' 19"	0.17120
10	98° 38' 43"	4° 55' 11"	99° 46' 17"	28° 03' 55"	0° 58' 29"	15' 56.32"	98° 17' 43"	0.16769
11	99° 13' 25"	4° 54' 05"	100° 25' 17"	28° 00' 24"	0° 58' 29"	15' 56.08"	98° 37' 06"	0.16420
12	99° 48' 06"	4° 52' 57"	101° 04' 12"	27° 56' 42"	0° 58' 28"	15' 55.83"	98° 56' 26"	0.16074
13	100° 22' 46"	4° 51' 47"	101° 43' 04"	27° 52' 49"	0° 58' 27"	15' 55.58"	99° 15' 45"	0.15732
14	100° 57' 25"	4° 50' 35"	102° 21' 52"	27° 48' 45"	0° 58' 26"	15' 55.32"	99° 35' 01"	0.15393
15	101° 32' 03"	4° 49' 22"	103° 00' 36"	27° 44' 31"	0° 58' 25"	15' 55.07"	99° 54' 15"	0.15057
16	102° 06' 40"	4° 48' 07"	103° 39' 16"	27° 40' 06"	0° 58' 24"	15' 54.81"	100° 13' 26"	0.14724
17	102° 41' 16"	4° 46' 51"	104° 17' 52"	27° 35' 30"	0° 58' 23"	15' 54.55"	100° 32' 35"	0.14394
18	103° 15' 51"	4° 45' 32"	104° 56' 23"	27° 30' 44"	0° 58' 22"	15' 54.29"	100° 51' 42"	0.14068
19	103° 50' 24"	4° 44' 12"	105° 34' 50"	27° 25' 47"	0° 58' 21"	15' 54.03"	101° 10' 45"	0.13745
20	104° 24' 57"	4° 42' 50"	106° 13' 12"	27° 20' 40"	0° 58' 20"	15' 53.77"	101° 29' 46"	0.13425
21	104° 59' 28"	4° 41' 27"	106° 51' 29"	27° 15' 22"	0° 58' 19"	15' 53.50"	101° 48' 45"	0.13109
22	105° 33' 58"	4° 40' 02"	107° 29' 42"	27° 09' 55"	0° 58' 18"	15' 53.23"	102° 7' 40"	0.12796
23	106° 08' 27"	4° 38' 35"	108° 07' 49"	27° 04' 17"	0° 58' 17"	15' 52.96"	102° 26' 33"	0.12486
24	106° 42' 55"	4° 37' 07"	108° 45' 52"	26° 58' 29"	0° 58' 16"	15' 52.69"	102° 45' 22"	0.12180

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	147° 15' 03"	0.35"	149° 26' 59"	12° 25' 39"	1.0118957	15'48.35"	23° 26' 19"	-3 m 28 s
1	147° 17' 27"	0.35"	149° 29' 18"	12° 24' 49"	1.0118876	15'48.36"	23° 26' 19"	-3 m 27 s
2	147° 19' 52"	0.34"	149° 31' 37"	12° 23' 60"	1.0118795	15'48.36"	23° 26' 19"	-3 m 26 s
3	147° 22' 16"	0.34"	149° 33' 56"	12° 23' 10"	1.0118714	15'48.37"	23° 26' 19"	-3 m 26 s
4	147° 24' 41"	0.34"	149° 36' 15"	12° 22' 21"	1.0118633	15'48.38"	23° 26' 19"	-3 m 25 s
5	147° 27' 05"	0.34"	149° 38' 33"	12° 21' 31"	1.0118552	15'48.39"	23° 26' 19"	-3 m 25 s
6	147° 29' 30"	0.34"	149° 40' 52"	12° 20' 42"	1.0118471	15'48.39"	23° 26' 19"	-3 m 24 s
7	147° 31' 54"	0.33"	149° 43' 11"	12° 19' 52"	1.0118390	15'48.40"	23° 26' 19"	-3 m 23 s
8	147° 34' 19"	0.33"	149° 45' 30"	12° 19' 02"	1.0118308	15'48.41"	23° 26' 19"	-3 m 23 s
9	147° 36' 43"	0.33"	149° 47' 49"	12° 18' 13"	1.0118227	15'48.42"	23° 26' 19"	-3 m 22 s
10	147° 39' 07"	0.33"	149° 50' 08"	12° 17' 23"	1.0118145	15'48.42"	23° 26' 19"	-3 m 22 s
11	147° 41' 32"	0.32"	149° 52' 26"	12° 16' 33"	1.0118064	15'48.43"	23° 26' 19"	-3 m 21 s
12	147° 43' 56"	0.32"	149° 54' 45"	12° 15' 44"	1.0117982	15'48.44"	23° 26' 19"	-3 m 20 s
13	147° 46' 21"	0.32"	149° 57' 04"	12° 14' 54"	1.0117900	15'48.45"	23° 26' 19"	-3 m 20 s
14	147° 48' 45"	0.32"	149° 59' 23"	12° 14' 04"	1.0117818	15'48.46"	23° 26' 19"	-3 m 19 s
15	147° 51' 10"	0.31"	150° 01' 42"	12° 13' 14"	1.0117736	15'48.46"	23° 26' 19"	-3 m 19 s
16	147° 53' 34"	0.31"	150° 04' 00"	12° 12' 25"	1.0117654	15'48.47"	23° 26' 19"	-3 m 18 s
17	147° 55' 59"	0.31"	150° 06' 19"	12° 11' 35"	1.0117572	15'48.48"	23° 26' 19"	-3 m 17 s
18	147° 58' 23"	0.30"	150° 08' 38"	12° 10' 45"	1.0117490	15'48.49"	23° 26' 19"	-3 m 17 s
19	148° 00' 48"	0.30"	150° 10' 57"	12° 09' 55"	1.0117408	15'48.49"	23° 26' 19"	-3 m 16 s
20	148° 03' 12"	0.30"	150° 13' 15"	12° 09' 05"	1.0117325	15'48.50"	23° 26' 19"	-3 m 16 s
21	148° 05' 37"	0.30"	150° 15' 34"	12° 08' 15"	1.0117243	15'48.51"	23° 26' 19"	-3 m 15 s
22	148° 08' 01"	0.29"	150° 17' 53"	12° 07' 25"	1.0117160	15'48.52"	23° 26' 19"	-3 m 14 s
23	148° 10' 25"	0.29"	150° 20' 11"	12° 06' 35"	1.0117078	15'48.52"	23° 26' 19"	-3 m 14 s
24	148° 12' 50"	0.29"	150° 22' 30"	12° 05' 45"	1.0116995	15'48.53"	23° 26' 19"	-3 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	106° 42' 55"	4° 37' 07"	108° 45' 52"	26° 58' 29"	0° 58' 16"	15' 52.69"	102° 45' 22"	0.12180
1	107° 17' 21"	4° 35' 37"	109° 23' 49"	26° 52' 31"	0° 58' 15"	15' 52.41"	103° 4' 09"	0.11877
2	107° 51' 47"	4° 34' 05"	110° 01' 42"	26° 46' 23"	0° 58' 14"	15' 52.14"	103° 22' 53"	0.11578
3	108° 26' 11"	4° 32' 32"	110° 39' 29"	26° 40' 05"	0° 58' 13"	15' 51.86"	103° 41' 34"	0.11282
4	109° 00' 34"	4° 30' 57"	111° 17' 10"	26° 33' 38"	0° 58' 12"	15' 51.58"	104° 0' 11"	0.10990
5	109° 34' 56"	4° 29' 21"	111° 54' 46"	26° 27' 01"	0° 58' 11"	15' 51.30"	104° 18' 46"	0.10701
6	110° 09' 17"	4° 27' 43"	112° 32' 17"	26° 20' 14"	0° 58' 10"	15' 51.01"	104° 37' 18"	0.10416
7	110° 43' 36"	4° 26' 03"	113° 09' 42"	26° 13' 17"	0° 58' 09"	15' 50.73"	104° 55' 47"	0.10134
8	111° 17' 54"	4° 24' 22"	113° 47' 01"	26° 06' 12"	0° 58' 08"	15' 50.44"	105° 14' 13"	0.09856
9	111° 52' 11"	4° 22' 40"	114° 24' 15"	25° 58' 56"	0° 58' 07"	15' 50.15"	105° 32' 36"	0.09582
10	112° 26' 26"	4° 20' 56"	115° 01' 22"	25° 51' 32"	0° 58' 06"	15' 49.86"	105° 50' 56"	0.09311
11	113° 00' 41"	4° 19' 10"	115° 38' 24"	25° 43' 58"	0° 58' 05"	15' 49.56"	106° 9' 14"	0.09044
12	113° 34' 54"	4° 17' 23"	116° 15' 20"	25° 36' 16"	0° 58' 04"	15' 49.27"	106° 27' 29"	0.08780
13	114° 09' 05"	4° 15' 34"	116° 52' 10"	25° 28' 24"	0° 58' 02"	15' 48.97"	106° 45' 42"	0.08521
14	114° 43' 16"	4° 13' 44"	117° 28' 53"	25° 20' 23"	0° 58' 01"	15' 48.67"	107° 3' 52"	0.08264
15	115° 17' 25"	4° 11' 53"	118° 05' 31"	25° 12' 14"	0° 58' 00"	15' 48.37"	107° 21' 60"	0.08012
16	115° 51' 32"	4° 10' 00"	118° 42' 02"	25° 03' 56"	0° 57' 59"	15' 48.07"	107° 40' 05"	0.07763
17	116° 25' 39"	4° 08' 06"	119° 18' 27"	24° 55' 29"	0° 57' 58"	15' 47.76"	107° 58' 09"	0.07519
18	116° 59' 44"	4° 06' 10"	119° 54' 46"	24° 46' 54"	0° 57' 57"	15' 47.46"	108° 16' 11"	0.07277
19	117° 33' 48"	4° 04' 13"	120° 30' 58"	24° 38' 10"	0° 57' 56"	15' 47.15"	108° 34' 12"	0.07040
20	118° 07' 50"	4° 02' 15"	121° 07' 04"	24° 29' 18"	0° 57' 55"	15' 46.84"	108° 52' 11"	0.06806
21	118° 41' 51"	4° 00' 15"	121° 43' 04"	24° 20' 17"	0° 57' 53"	15' 46.52"	109° 10' 09"	0.06577
22	119° 15' 50"	3° 58' 14"	122° 18' 57"	24° 11' 09"	0° 57' 52"	15' 46.21"	109° 28' 06"	0.06351
23	119° 49' 49"	3° 56' 11"	122° 54' 44"	24° 01' 52"	0° 57' 51"	15' 45.89"	109° 46' 03"	0.06129
24	120° 23' 45"	3° 54' 08"	123° 30' 24"	23° 52' 28"	0° 57' 50"	15' 45.58"	110° 3' 59"	0.05910

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	148° 12' 50"	0.29"	150° 22' 30"	12° 05' 45"	1.0116995	15'48.53"	23° 26' 19"	-3 m 13 s
1	148° 15' 14"	0.28"	150° 24' 49"	12° 04' 56"	1.0116912	15'48.54"	23° 26' 19"	-3 m 12 s
2	148° 17' 39"	0.28"	150° 27' 07"	12° 04' 06"	1.0116829	15'48.55"	23° 26' 19"	-3 m 12 s
3	148° 20' 03"	0.28"	150° 29' 26"	12° 03' 16"	1.0116746	15'48.56"	23° 26' 19"	-3 m 11 s
4	148° 22' 28"	0.27"	150° 31' 45"	12° 02' 25"	1.0116663	15'48.56"	23° 26' 19"	-3 m 11 s
5	148° 24' 52"	0.27"	150° 34' 03"	12° 01' 35"	1.0116580	15'48.57"	23° 26' 19"	-3 m 10 s
6	148° 27' 17"	0.27"	150° 36' 22"	12° 00' 45"	1.0116497	15'48.58"	23° 26' 19"	-3 m 09 s
7	148° 29' 41"	0.26"	150° 38' 40"	11° 59' 55"	1.0116414	15'48.59"	23° 26' 19"	-3 m 09 s
8	148° 32' 06"	0.26"	150° 40' 59"	11° 59' 05"	1.0116330	15'48.59"	23° 26' 19"	-3 m 08 s
9	148° 34' 30"	0.26"	150° 43' 17"	11° 58' 15"	1.0116247	15'48.60"	23° 26' 19"	-3 m 08 s
10	148° 36' 55"	0.25"	150° 45' 36"	11° 57' 25"	1.0116164	15'48.61"	23° 26' 19"	-3 m 07 s
11	148° 39' 19"	0.25"	150° 47' 54"	11° 56' 35"	1.0116080	15'48.62"	23° 26' 19"	-3 m 06 s
12	148° 41' 44"	0.25"	150° 50' 13"	11° 55' 45"	1.0115996	15'48.63"	23° 26' 19"	-3 m 06 s
13	148° 44' 08"	0.24"	150° 52' 31"	11° 54' 54"	1.0115912	15'48.63"	23° 26' 19"	-3 m 05 s
14	148° 46' 33"	0.24"	150° 54' 50"	11° 54' 04"	1.0115829	15'48.64"	23° 26' 19"	-3 m 04 s
15	148° 48' 58"	0.23"	150° 57' 08"	11° 53' 14"	1.0115745	15'48.65"	23° 26' 19"	-3 m 04 s
16	148° 51' 22"	0.23"	150° 59' 27"	11° 52' 24"	1.0115661	15'48.66"	23° 26' 19"	-3 m 03 s
17	148° 53' 47"	0.23"	151° 01' 45"	11° 51' 33"	1.0115577	15'48.67"	23° 26' 19"	-3 m 03 s
18	148° 56' 11"	0.22"	151° 04' 04"	11° 50' 43"	1.0115492	15'48.67"	23° 26' 19"	-3 m 02 s
19	148° 58' 36"	0.22"	151° 06' 22"	11° 49' 53"	1.0115408	15'48.68"	23° 26' 19"	-3 m 01 s
20	149° 01' 00"	0.22"	151° 08' 41"	11° 49' 02"	1.0115324	15'48.69"	23° 26' 19"	-3 m 01 s
21	149° 03' 25"	0.21"	151° 10' 59"	11° 48' 12"	1.0115239	15'48.70"	23° 26' 19"	-3 m 00 s
22	149° 05' 49"	0.21"	151° 13' 17"	11° 47' 22"	1.0115155	15'48.71"	23° 26' 19"	-2 m 59 s
23	149° 08' 14"	0.20"	151° 15' 36"	11° 46' 31"	1.0115070	15'48.71"	23° 26' 19"	-2 m 59 s
24	149° 10' 38"	0.20"	151° 17' 54"	11° 45' 41"	1.0114986	15'48.72"	23° 26' 19"	-2 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	120° 23' 45"	3° 54' 08"	123° 30' 24"	23° 52' 28"	0° 57' 50"	15' 45.58"	110° 3' 59"	0.05910
1	120° 57' 41"	3° 52' 03"	124° 05' 58"	23° 42' 56"	0° 57' 49"	15' 45.26"	110° 21' 56"	0.05696
2	121° 31' 35"	3° 49' 56"	124° 41' 25"	23° 33' 15"	0° 57' 48"	15' 44.94"	110° 39' 54"	0.05486
3	122° 05' 27"	3° 47' 49"	125° 16' 46"	23° 23' 28"	0° 57' 46"	15' 44.61"	110° 57' 52"	0.05279
4	122° 39' 18"	3° 45' 40"	125° 51' 60"	23° 13' 32"	0° 57' 45"	15' 44.29"	111° 15' 52"	0.05076
5	123° 13' 08"	3° 43' 30"	126° 27' 07"	23° 03' 30"	0° 57' 44"	15' 43.96"	111° 33' 55"	0.04877
6	123° 46' 56"	3° 41' 18"	127° 02' 08"	22° 53' 19"	0° 57' 43"	15' 43.64"	111° 51' 60"	0.04683
7	124° 20' 43"	3° 39' 06"	127° 37' 02"	22° 43' 02"	0° 57' 42"	15' 43.31"	112° 10' 08"	0.04492
8	124° 54' 28"	3° 36' 52"	128° 11' 50"	22° 32' 37"	0° 57' 40"	15' 42.98"	112° 28' 20"	0.04305
9	125° 28' 12"	3° 34' 37"	128° 46' 31"	22° 22' 06"	0° 57' 39"	15' 42.64"	112° 46' 37"	0.04121
10	126° 01' 54"	3° 32' 21"	129° 21' 05"	22° 11' 27"	0° 57' 38"	15' 42.31"	113° 5' 00"	0.03942
11	126° 35' 35"	3° 30' 04"	129° 55' 33"	22° 00' 42"	0° 57' 37"	15' 41.97"	113° 23' 29"	0.03767
12	127° 09' 14"	3° 27' 46"	130° 29' 54"	21° 49' 50"	0° 57' 36"	15' 41.64"	113° 42' 06"	0.03596
13	127° 42' 52"	3° 25' 26"	131° 04' 09"	21° 38' 51"	0° 57' 34"	15' 41.30"	114° 0' 52"	0.03429
14	128° 16' 28"	3° 23' 06"	131° 38' 17"	21° 27' 45"	0° 57' 33"	15' 40.96"	114° 19' 48"	0.03265
15	128° 50' 03"	3° 20' 44"	132° 12' 18"	21° 16' 33"	0° 57' 32"	15' 40.61"	114° 38' 55"	0.03106
16	129° 23' 36"	3° 18' 22"	132° 46' 13"	21° 05' 15"	0° 57' 31"	15' 40.27"	114° 58' 14"	0.02951
17	129° 57' 08"	3° 15' 58"	133° 20' 01"	20° 53' 51"	0° 57' 29"	15' 39.92"	115° 17' 49"	0.02800
18	130° 30' 38"	3° 13' 33"	133° 53' 43"	20° 42' 20"	0° 57' 28"	15' 39.58"	115° 37' 39"	0.02652
19	131° 04' 06"	3° 11' 07"	134° 27' 18"	20° 30' 43"	0° 57' 27"	15' 39.23"	115° 57' 49"	0.02509
20	131° 37' 33"	3° 08' 41"	135° 00' 46"	20° 19' 01"	0° 57' 25"	15' 38.88"	116° 18' 18"	0.02370
21	132° 10' 59"	3° 06' 13"	135° 34' 08"	20° 07' 12"	0° 57' 24"	15' 38.53"	116° 39' 12"	0.02235
22	132° 44' 23"	3° 03' 44"	136° 07' 24"	19° 55' 18"	0° 57' 23"	15' 38.18"	117° 0' 31"	0.02103
23	133° 17' 45"	3° 01' 15"	136° 40' 33"	19° 43' 18"	0° 57' 22"	15' 37.82"	117° 22' 20"	0.01976
24	133° 51' 05"	2° 58' 44"	137° 13' 36"	19° 31' 12"	0° 57' 20"	15' 37.47"	117° 44' 43"	0.01853

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	149° 10' 38"	0.20"	151° 17' 54"	11° 45' 41"	1.0114986	15'48.72"	23° 26' 19"	-2 m 58 s
1	149° 13' 03"	0.20"	151° 20' 13"	11° 44' 50"	1.0114901	15'48.73"	23° 26' 19"	-2 m 57 s
2	149° 15' 27"	0.19"	151° 22' 31"	11° 43' 60"	1.0114816	15'48.74"	23° 26' 19"	-2 m 57 s
3	149° 17' 52"	0.19"	151° 24' 49"	11° 43' 09"	1.0114731	15'48.74"	23° 26' 19"	-2 m 56 s
4	149° 20' 17"	0.18"	151° 27' 08"	11° 42' 19"	1.0114646	15'48.75"	23° 26' 19"	-2 m 56 s
5	149° 22' 41"	0.18"	151° 29' 26"	11° 41' 28"	1.0114561	15'48.76"	23° 26' 19"	-2 m 55 s
6	149° 25' 06"	0.17"	151° 31' 44"	11° 40' 38"	1.0114476	15'48.77"	23° 26' 19"	-2 m 54 s
7	149° 27' 30"	0.17"	151° 34' 03"	11° 39' 47"	1.0114391	15'48.78"	23° 26' 19"	-2 m 54 s
8	149° 29' 55"	0.17"	151° 36' 21"	11° 38' 57"	1.0114305	15'48.78"	23° 26' 19"	-2 m 53 s
9	149° 32' 19"	0.16"	151° 38' 39"	11° 38' 06"	1.0114220	15'48.79"	23° 26' 19"	-2 m 52 s
10	149° 34' 44"	0.16"	151° 40' 57"	11° 37' 15"	1.0114134	15'48.80"	23° 26' 19"	-2 m 52 s
11	149° 37' 09"	0.15"	151° 43' 16"	11° 36' 25"	1.0114049	15'48.81"	23° 26' 19"	-2 m 51 s
12	149° 39' 33"	0.15"	151° 45' 34"	11° 35' 34"	1.0113963	15'48.82"	23° 26' 19"	-2 m 50 s
13	149° 41' 58"	0.14"	151° 47' 52"	11° 34' 43"	1.0113877	15'48.83"	23° 26' 19"	-2 m 50 s
14	149° 44' 22"	0.14"	151° 50' 10"	11° 33' 53"	1.0113792	15'48.83"	23° 26' 19"	-2 m 49 s
15	149° 46' 47"	0.13"	151° 52' 28"	11° 33' 02"	1.0113706	15'48.84"	23° 26' 19"	-2 m 49 s
16	149° 49' 11"	0.13"	151° 54' 47"	11° 32' 11"	1.0113620	15'48.85"	23° 26' 19"	-2 m 48 s
17	149° 51' 36"	0.13"	151° 57' 05"	11° 31' 21"	1.0113534	15'48.86"	23° 26' 19"	-2 m 47 s
18	149° 54' 01"	0.12"	151° 59' 23"	11° 30' 30"	1.0113447	15'48.87"	23° 26' 19"	-2 m 47 s
19	149° 56' 25"	0.12"	152° 01' 41"	11° 29' 39"	1.0113361	15'48.87"	23° 26' 19"	-2 m 46 s
20	149° 58' 50"	0.11"	152° 03' 59"	11° 28' 48"	1.0113275	15'48.88"	23° 26' 19"	-2 m 45 s
21	150° 01' 14"	0.11"	152° 06' 17"	11° 27' 57"	1.0113188	15'48.89"	23° 26' 19"	-2 m 45 s
22	150° 03' 39"	0.10"	152° 08' 36"	11° 27' 07"	1.0113102	15'48.90"	23° 26' 19"	-2 m 44 s
23	150° 06' 04"	0.10"	152° 10' 54"	11° 26' 16"	1.0113015	15'48.91"	23° 26' 19"	-2 m 43 s
24	150° 08' 28"	0.09"	152° 13' 12"	11° 25' 25"	1.0112929	15'48.91"	23° 26' 19"	-2 m 43 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	133° 51' 05"	2° 58' 44"	137° 13' 36"	19° 31' 12"	0° 57' 20"	15' 37.47"	117° 44' 43"	0.01853
1	134° 24' 25"	2° 56' 13"	137° 46' 32"	19° 19' 01"	0° 57' 19"	15' 37.11"	118° 7' 42"	0.01734
2	134° 57' 42"	2° 53' 41"	138° 19' 22"	19° 06' 45"	0° 57' 18"	15' 36.76"	118° 31' 24"	0.01619
3	135° 30' 58"	2° 51' 08"	138° 52' 06"	18° 54' 23"	0° 57' 16"	15' 36.40"	118° 55' 54"	0.01508
4	136° 04' 12"	2° 48' 34"	139° 24' 43"	18° 41' 56"	0° 57' 15"	15' 36.04"	119° 21' 18"	0.01401
5	136° 37' 25"	2° 45' 59"	139° 57' 15"	18° 29' 25"	0° 57' 14"	15' 35.68"	119° 47' 42"	0.01297
6	137° 10' 36"	2° 43' 23"	140° 29' 40"	18° 16' 48"	0° 57' 12"	15' 35.31"	120° 15' 17"	0.01198
7	137° 43' 45"	2° 40' 47"	141° 01' 58"	18° 04' 06"	0° 57' 11"	15' 34.95"	120° 44' 11"	0.01103
8	138° 16' 53"	2° 38' 09"	141° 34' 11"	17° 51' 19"	0° 57' 10"	15' 34.59"	121° 14' 36"	0.01012
9	138° 49' 59"	2° 35' 31"	142° 06' 18"	17° 38' 28"	0° 57' 08"	15' 34.22"	121° 46' 45"	0.00925
10	139° 23' 04"	2° 32' 52"	142° 38' 18"	17° 25' 32"	0° 57' 07"	15' 33.85"	122° 20' 55"	0.00843
11	139° 56' 07"	2° 30' 13"	143° 10' 13"	17° 12' 32"	0° 57' 06"	15' 33.49"	122° 57' 25"	0.00764
12	140° 29' 08"	2° 27' 33"	143° 42' 01"	16° 59' 27"	0° 57' 04"	15' 33.12"	123° 36' 38"	0.00689
13	141° 02' 08"	2° 24' 52"	144° 13' 44"	16° 46' 18"	0° 57' 03"	15' 32.75"	124° 19' 03"	0.00618
14	141° 35' 06"	2° 22' 10"	144° 45' 21"	16° 33' 05"	0° 57' 02"	15' 32.38"	125° 5' 14"	0.00551
15	142° 08' 02"	2° 19' 28"	145° 16' 52"	16° 19' 47"	0° 57' 00"	15' 32.00"	125° 55' 56"	0.00488
16	142° 40' 56"	2° 16' 45"	145° 48' 17"	16° 06' 26"	0° 56' 59"	15' 31.63"	126° 52' 02"	0.00429
17	143° 13' 49"	2° 14' 01"	146° 19' 36"	15° 53' 00"	0° 56' 57"	15' 31.26"	127° 54' 43"	0.00374
18	143° 46' 41"	2° 11' 17"	146° 50' 50"	15° 39' 31"	0° 56' 56"	15' 30.88"	129° 5' 29"	0.00323
19	144° 19' 30"	2° 08' 32"	147° 21' 59"	15° 25' 58"	0° 56' 55"	15' 30.51"	130° 26' 17"	0.00276
20	144° 52' 18"	2° 05' 47"	147° 53' 01"	15° 12' 21"	0° 56' 53"	15' 30.13"	131° 59' 45"	0.00233
21	145° 25' 04"	2° 03' 01"	148° 23' 58"	14° 58' 40"	0° 56' 52"	15' 29.75"	133° 49' 30"	0.00194
22	145° 57' 49"	2° 00' 15"	148° 54' 50"	14° 44' 56"	0° 56' 51"	15' 29.38"	136° 0' 29"	0.00159
23	146° 30' 32"	1° 57' 28"	149° 25' 37"	14° 31' 09"	0° 56' 49"	15' 29.00"	138° 39' 49"	0.00128
24	147° 03' 13"	1° 54' 40"	149° 56' 18"	14° 17' 18"	0° 56' 48"	15' 28.62"	141° 57' 48"	0.00101

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	150° 08' 28"	0.09"	152° 13' 12"	11° 25' 25"	1.0112929	15'48.91"	23° 26' 19"	-2 m 43 s
1	150° 10' 53"	0.09"	152° 15' 30"	11° 24' 34"	1.0112842	15'48.92"	23° 26' 19"	-2 m 42 s
2	150° 13' 17"	0.08"	152° 17' 48"	11° 23' 43"	1.0112755	15'48.93"	23° 26' 19"	-2 m 41 s
3	150° 15' 42"	0.08"	152° 20' 06"	11° 22' 52"	1.0112668	15'48.94"	23° 26' 19"	-2 m 41 s
4	150° 18' 07"	0.07"	152° 22' 24"	11° 22' 01"	1.0112581	15'48.95"	23° 26' 19"	-2 m 40 s
5	150° 20' 31"	0.07"	152° 24' 42"	11° 21' 10"	1.0112494	15'48.95"	23° 26' 19"	-2 m 39 s
6	150° 22' 56"	0.06"	152° 27' 00"	11° 20' 19"	1.0112407	15'48.96"	23° 26' 19"	-2 m 39 s
7	150° 25' 21"	0.06"	152° 29' 18"	11° 19' 28"	1.0112320	15'48.97"	23° 26' 19"	-2 m 38 s
8	150° 27' 45"	0.05"	152° 31' 36"	11° 18' 37"	1.0112233	15'48.98"	23° 26' 19"	-2 m 37 s
9	150° 30' 10"	0.05"	152° 33' 54"	11° 17' 46"	1.0112145	15'48.99"	23° 26' 19"	-2 m 37 s
10	150° 32' 34"	0.04"	152° 36' 12"	11° 16' 55"	1.0112058	15'49.00"	23° 26' 19"	-2 m 36 s
11	150° 34' 59"	0.04"	152° 38' 30"	11° 16' 04"	1.0111970	15'49.00"	23° 26' 19"	-2 m 35 s
12	150° 37' 24"	0.03"	152° 40' 48"	11° 15' 13"	1.0111883	15'49.01"	23° 26' 19"	-2 m 35 s
13	150° 39' 48"	0.03"	152° 43' 06"	11° 14' 22"	1.0111795	15'49.02"	23° 26' 19"	-2 m 34 s
14	150° 42' 13"	0.02"	152° 45' 24"	11° 13' 30"	1.0111707	15'49.03"	23° 26' 19"	-2 m 33 s
15	150° 44' 38"	0.02"	152° 47' 42"	11° 12' 39"	1.0111619	15'49.04"	23° 26' 19"	-2 m 33 s
16	150° 47' 02"	0.01"	152° 49' 60"	11° 11' 48"	1.0111531	15'49.05"	23° 26' 19"	-2 m 32 s
17	150° 49' 27"	0.01"	152° 52' 18"	11° 10' 57"	1.0111443	15'49.05"	23° 26' 19"	-2 m 31 s
18	150° 51' 52"	0.00"	152° 54' 36"	11° 10' 06"	1.0111355	15'49.06"	23° 26' 19"	-2 m 31 s
19	150° 54' 16"	-0.00"	152° 56' 53"	11° 09' 14"	1.0111267	15'49.07"	23° 26' 19"	-2 m 30 s
20	150° 56' 41"	-0.01"	152° 59' 11"	11° 08' 23"	1.0111179	15'49.08"	23° 26' 19"	-2 m 29 s
21	150° 59' 06"	-0.01"	153° 01' 29"	11° 07' 32"	1.0111091	15'49.09"	23° 26' 19"	-2 m 29 s
22	151° 01' 30"	-0.02"	153° 03' 47"	11° 06' 41"	1.0111002	15'49.09"	23° 26' 19"	-2 m 28 s
23	151° 03' 55"	-0.02"	153° 06' 05"	11° 05' 49"	1.0110914	15'49.10"	23° 26' 19"	-2 m 27 s
24	151° 06' 20"	-0.03"	153° 08' 23"	11° 04' 58"	1.0110825	15'49.11"	23° 26' 19"	-2 m 27 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	147° 03' 13"	1° 54' 40"	149° 56' 18"	14° 17' 18"	0° 56' 48"	15' 28.62"	141° 57' 48"	0.00101
1	147° 35' 52"	1° 51' 52"	150° 26' 53"	14° 03' 24"	0° 56' 46"	15' 28.24"	146° 9' 42"	0.00078
2	148° 08' 30"	1° 49' 04"	150° 57' 24"	13° 49' 27"	0° 56' 45"	15' 27.86"	151° 38' 26"	0.00058
3	148° 41' 06"	1° 46' 15"	151° 27' 49"	13° 35' 27"	0° 56' 44"	15' 27.48"	158° 57' 48"	0.00043
4	149° 13' 41"	1° 43' 25"	151° 58' 10"	13° 21' 24"	0° 56' 42"	15' 27.10"	168° 53' 24"	0.00032
5	149° 46' 13"	1° 40' 35"	152° 28' 25"	13° 07' 18"	0° 56' 41"	15' 26.72"	182° 9' 38"	0.00024
6	150° 18' 44"	1° 37' 45"	152° 58' 35"	12° 53' 09"	0° 56' 39"	15' 26.34"	198° 40' 52"	0.00020
7	150° 51' 14"	1° 34' 55"	153° 28' 41"	12° 38' 57"	0° 56' 38"	15' 25.95"	216° 28' 33"	0.00021
8	151° 23' 41"	1° 32' 04"	153° 58' 42"	12° 24' 43"	0° 56' 37"	15' 25.57"	232° 31' 51"	0.00025
9	151° 56' 07"	1° 29' 12"	154° 28' 37"	12° 10' 26"	0° 56' 35"	15' 25.19"	245° 12' 15"	0.00033
10	152° 28' 31"	1° 26' 20"	154° 58' 28"	11° 56' 06"	0° 56' 34"	15' 24.80"	254° 37' 32"	0.00044
11	153° 00' 54"	1° 23' 28"	155° 28' 15"	11° 41' 44"	0° 56' 32"	15' 24.42"	261° 34' 29"	0.00060
12	153° 33' 14"	1° 20' 36"	155° 57' 57"	11° 27' 20"	0° 56' 31"	15' 24.04"	266° 47' 01"	0.00080
13	154° 05' 34"	1° 17' 44"	156° 27' 34"	11° 12' 53"	0° 56' 30"	15' 23.65"	270° 46' 55"	0.00103
14	154° 37' 51"	1° 14' 51"	156° 57' 07"	10° 58' 25"	0° 56' 28"	15' 23.27"	273° 55' 37"	0.00130
15	155° 10' 07"	1° 11' 57"	157° 26' 35"	10° 43' 54"	0° 56' 27"	15' 22.88"	276° 27' 23"	0.00161
16	155° 42' 20"	1° 09' 04"	157° 55' 60"	10° 29' 21"	0° 56' 25"	15' 22.50"	278° 31' 54"	0.00195
17	156° 14' 33"	1° 06' 10"	158° 25' 20"	10° 14' 46"	0° 56' 24"	15' 22.11"	280° 15' 51"	0.00234
18	156° 46' 43"	1° 03' 17"	158° 54' 35"	10° 00' 09"	0° 56' 22"	15' 21.73"	281° 43' 56"	0.00276
19	157° 18' 52"	1° 00' 23"	159° 23' 47"	9° 45' 31"	0° 56' 21"	15' 21.34"	282° 59' 34"	0.00322
20	157° 50' 59"	0° 57' 29"	159° 52' 54"	9° 30' 51"	0° 56' 20"	15' 20.96"	284° 5' 13"	0.00372
21	158° 23' 04"	0° 54' 34"	160° 21' 58"	9° 16' 09"	0° 56' 18"	15' 20.57"	285° 2' 49"	0.00425
22	158° 55' 08"	0° 51' 40"	160° 50' 57"	9° 01' 25"	0° 56' 17"	15' 20.19"	285° 53' 47"	0.00482
23	159° 27' 10"	0° 48' 45"	161° 19' 53"	8° 46' 40"	0° 56' 15"	15' 19.80"	286° 39' 14"	0.00543
24	159° 59' 11"	0° 45' 50"	161° 48' 45"	8° 31' 54"	0° 56' 14"	15' 19.42"	287° 20' 02"	0.00607

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	151° 06' 20"	-0.03"	153° 08' 23"	11° 04' 58"	1.0110825	15'49.11"	23° 26' 19"	-2 m 27 s
1	151° 08' 44"	-0.03"	153° 10' 40"	11° 04' 07"	1.0110736	15'49.12"	23° 26' 19"	-2 m 26 s
2	151° 11' 09"	-0.04"	153° 12' 58"	11° 03' 15"	1.0110648	15'49.13"	23° 26' 19"	-2 m 25 s
3	151° 13' 34"	-0.04"	153° 15' 16"	11° 02' 24"	1.0110559	15'49.14"	23° 26' 19"	-2 m 25 s
4	151° 15' 58"	-0.05"	153° 17' 34"	11° 01' 32"	1.0110470	15'49.14"	23° 26' 19"	-2 m 24 s
5	151° 18' 23"	-0.05"	153° 19' 52"	11° 00' 41"	1.0110381	15'49.15"	23° 26' 19"	-2 m 23 s
6	151° 20' 48"	-0.06"	153° 22' 09"	10° 59' 50"	1.0110292	15'49.16"	23° 26' 19"	-2 m 23 s
7	151° 23' 12"	-0.06"	153° 24' 27"	10° 58' 58"	1.0110203	15'49.17"	23° 26' 19"	-2 m 22 s
8	151° 25' 37"	-0.07"	153° 26' 45"	10° 58' 07"	1.0110114	15'49.18"	23° 26' 19"	-2 m 21 s
9	151° 28' 02"	-0.08"	153° 29' 03"	10° 57' 15"	1.0110024	15'49.19"	23° 26' 19"	-2 m 21 s
10	151° 30' 26"	-0.08"	153° 31' 20"	10° 56' 24"	1.0109935	15'49.20"	23° 26' 19"	-2 m 20 s
11	151° 32' 51"	-0.09"	153° 33' 38"	10° 55' 32"	1.0109845	15'49.20"	23° 26' 19"	-2 m 19 s
12	151° 35' 16"	-0.09"	153° 35' 56"	10° 54' 41"	1.0109756	15'49.21"	23° 26' 19"	-2 m 19 s
13	151° 37' 40"	-0.10"	153° 38' 13"	10° 53' 49"	1.0109666	15'49.22"	23° 26' 19"	-2 m 18 s
14	151° 40' 05"	-0.10"	153° 40' 31"	10° 52' 57"	1.0109577	15'49.23"	23° 26' 19"	-2 m 17 s
15	151° 42' 30"	-0.11"	153° 42' 49"	10° 52' 06"	1.0109487	15'49.24"	23° 26' 19"	-2 m 17 s
16	151° 44' 55"	-0.11"	153° 45' 06"	10° 51' 14"	1.0109397	15'49.25"	23° 26' 19"	-2 m 16 s
17	151° 47' 19"	-0.12"	153° 47' 24"	10° 50' 23"	1.0109307	15'49.25"	23° 26' 19"	-2 m 15 s
18	151° 49' 44"	-0.12"	153° 49' 42"	10° 49' 31"	1.0109217	15'49.26"	23° 26' 19"	-2 m 15 s
19	151° 52' 09"	-0.13"	153° 51' 59"	10° 48' 39"	1.0109127	15'49.27"	23° 26' 19"	-2 m 14 s
20	151° 54' 33"	-0.13"	153° 54' 17"	10° 47' 48"	1.0109037	15'49.28"	23° 26' 19"	-2 m 13 s
21	151° 56' 58"	-0.14"	153° 56' 34"	10° 46' 56"	1.0108947	15'49.29"	23° 26' 19"	-2 m 13 s
22	151° 59' 23"	-0.15"	153° 58' 52"	10° 46' 04"	1.0108856	15'49.30"	23° 26' 19"	-2 m 12 s
23	152° 01' 48"	-0.15"	154° 01' 10"	10° 45' 12"	1.0108766	15'49.30"	23° 26' 19"	-2 m 11 s
24	152° 04' 12"	-0.16"	154° 03' 27"	10° 44' 21"	1.0108676	15'49.31"	23° 26' 19"	-2 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	159° 59' 11"	0° 45' 50"	161° 48' 45"	8° 31' 54"	0° 56' 14"	15' 19.42"	287° 20' 02"	0.00607
1	160° 31' 09"	0° 42' 56"	162° 17' 33"	8° 17' 06"	0° 56' 13"	15' 19.04"	287° 56' 54"	0.00675
2	161° 03' 06"	0° 40' 01"	162° 46' 18"	8° 02' 17"	0° 56' 11"	15' 18.65"	288° 30' 22"	0.00747
3	161° 35' 01"	0° 37' 06"	163° 14' 59"	7° 47' 26"	0° 56' 10"	15' 18.27"	289° 0' 55"	0.00822
4	162° 06' 55"	0° 34' 11"	163° 43' 36"	7° 32' 35"	0° 56' 08"	15' 17.89"	289° 28' 55"	0.00901
5	162° 38' 47"	0° 31' 16"	164° 12' 10"	7° 17' 42"	0° 56' 07"	15' 17.50"	289° 54' 41"	0.00983
6	163° 10' 37"	0° 28' 20"	164° 40' 41"	7° 02' 48"	0° 56' 06"	15' 17.12"	290° 18' 28"	0.01069
7	163° 42' 26"	0° 25' 25"	165° 09' 08"	6° 47' 54"	0° 56' 04"	15' 16.74"	290° 40' 30"	0.01159
8	164° 14' 13"	0° 22' 30"	165° 37' 32"	6° 32' 58"	0° 56' 03"	15' 16.36"	291° 0' 58"	0.01252
9	164° 45' 58"	0° 19' 35"	166° 05' 53"	6° 18' 02"	0° 56' 01"	15' 15.98"	291° 20' 01"	0.01349
10	165° 17' 41"	0° 16' 40"	166° 34' 11"	6° 03' 05"	0° 56' 00"	15' 15.60"	291° 37' 49"	0.01449
11	165° 49' 23"	0° 13' 45"	167° 02' 26"	5° 48' 07"	0° 55' 59"	15' 15.22"	291° 54' 27"	0.01553
12	166° 21' 03"	0° 10' 50"	167° 30' 37"	5° 33' 08"	0° 55' 57"	15' 14.84"	292° 10' 02"	0.01660
13	166° 52' 42"	0° 07' 56"	167° 58' 46"	5° 18' 09"	0° 55' 56"	15' 14.47"	292° 24' 39"	0.01770
14	167° 24' 19"	0° 05' 01"	168° 26' 52"	5° 03' 10"	0° 55' 54"	15' 14.09"	292° 38' 24"	0.01884
15	167° 55' 54"	0° 02' 06"	168° 54' 56"	4° 48' 10"	0° 55' 53"	15' 13.71"	292° 51' 19"	0.02002
16	168° 27' 28"	0° 00'-48"	169° 22' 56"	4° 33' 10"	0° 55' 52"	15' 13.34"	293° 3' 30"	0.02122
17	168° 58' 60"	0° -3' 42"	169° 50' 54"	4° 18' 09"	0° 55' 50"	15' 12.96"	293° 14' 59"	0.02246
18	169° 30' 30"	0° -6' 36"	170° 18' 50"	4° 03' 08"	0° 55' 49"	15' 12.59"	293° 25' 49"	0.02374
19	170° 01' 59"	0° -9' 30"	170° 46' 43"	3° 48' 07"	0° 55' 48"	15' 12.22"	293° 36' 02"	0.02505
20	170° 33' 26"	0°-12' 24"	171° 14' 33"	3° 33' 06"	0° 55' 46"	15' 11.85"	293° 45' 42"	0.02639
21	171° 04' 51"	0°-15' 18"	171° 42' 21"	3° 18' 05"	0° 55' 45"	15' 11.48"	293° 54' 49"	0.02777
22	171° 36' 15"	0°-18' 11"	172° 10' 07"	3° 03' 03"	0° 55' 44"	15' 11.11"	294° 3' 26"	0.02917
23	172° 07' 38"	0°-21' 04"	172° 37' 51"	2° 48' 02"	0° 55' 42"	15' 10.74"	294° 11' 35"	0.03061
24	172° 38' 58"	0°-23' 57"	173° 05' 32"	2° 33' 01"	0° 55' 41"	15' 10.37"	294° 19' 17"	0.03209

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	152° 04' 12"	-0.16"	154° 03' 27"	10° 44' 21"	1.0108676	15'49.31"	23° 26' 19"	-2 m 11 s
1	152° 06' 37"	-0.16"	154° 05' 45"	10° 43' 29"	1.0108585	15'49.32"	23° 26' 19"	-2 m 10 s
2	152° 09' 02"	-0.17"	154° 08' 02"	10° 42' 37"	1.0108494	15'49.33"	23° 26' 19"	-2 m 09 s
3	152° 11' 26"	-0.17"	154° 10' 20"	10° 41' 45"	1.0108404	15'49.34"	23° 26' 19"	-2 m 08 s
4	152° 13' 51"	-0.18"	154° 12' 37"	10° 40' 53"	1.0108313	15'49.35"	23° 26' 19"	-2 m 08 s
5	152° 16' 16"	-0.18"	154° 14' 55"	10° 40' 02"	1.0108222	15'49.36"	23° 26' 19"	-2 m 07 s
6	152° 18' 41"	-0.19"	154° 17' 12"	10° 39' 10"	1.0108131	15'49.36"	23° 26' 19"	-2 m 06 s
7	152° 21' 05"	-0.19"	154° 19' 30"	10° 38' 18"	1.0108040	15'49.37"	23° 26' 19"	-2 m 06 s
8	152° 23' 30"	-0.20"	154° 21' 47"	10° 37' 26"	1.0107949	15'49.38"	23° 26' 19"	-2 m 05 s
9	152° 25' 55"	-0.20"	154° 24' 05"	10° 36' 34"	1.0107858	15'49.39"	23° 26' 19"	-2 m 04 s
10	152° 28' 20"	-0.21"	154° 26' 22"	10° 35' 42"	1.0107767	15'49.40"	23° 26' 19"	-2 m 04 s
11	152° 30' 44"	-0.22"	154° 28' 40"	10° 34' 50"	1.0107676	15'49.41"	23° 26' 19"	-2 m 03 s
12	152° 33' 09"	-0.22"	154° 30' 57"	10° 33' 58"	1.0107584	15'49.42"	23° 26' 19"	-2 m 02 s
13	152° 35' 34"	-0.23"	154° 33' 14"	10° 33' 06"	1.0107493	15'49.42"	23° 26' 19"	-2 m 02 s
14	152° 37' 59"	-0.23"	154° 35' 32"	10° 32' 14"	1.0107401	15'49.43"	23° 26' 19"	-2 m 01 s
15	152° 40' 23"	-0.24"	154° 37' 49"	10° 31' 22"	1.0107310	15'49.44"	23° 26' 19"	-2 m 00 s
16	152° 42' 48"	-0.24"	154° 40' 07"	10° 30' 30"	1.0107218	15'49.45"	23° 26' 19"	-1 m 59 s
17	152° 45' 13"	-0.25"	154° 42' 24"	10° 29' 38"	1.0107126	15'49.46"	23° 26' 19"	-1 m 59 s
18	152° 47' 38"	-0.25"	154° 44' 41"	10° 28' 46"	1.0107034	15'49.47"	23° 26' 19"	-1 m 58 s
19	152° 50' 03"	-0.26"	154° 46' 59"	10° 27' 54"	1.0106943	15'49.48"	23° 26' 19"	-1 m 57 s
20	152° 52' 27"	-0.26"	154° 49' 16"	10° 27' 02"	1.0106851	15'49.48"	23° 26' 19"	-1 m 57 s
21	152° 54' 52"	-0.27"	154° 51' 33"	10° 26' 10"	1.0106759	15'49.49"	23° 26' 19"	-1 m 56 s
22	152° 57' 17"	-0.27"	154° 53' 51"	10° 25' 18"	1.0106667	15'49.50"	23° 26' 19"	-1 m 55 s
23	152° 59' 42"	-0.28"	154° 56' 08"	10° 24' 25"	1.0106574	15'49.51"	23° 26' 19"	-1 m 55 s
24	153° 02' 06"	-0.28"	154° 58' 25"	10° 23' 33"	1.0106482	15'49.52"	23° 26' 19"	-1 m 54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	172° 38' 58"	0°-23' 57"	173° 05' 32"	2° 33' 01"	0° 55' 41"	15' 10.37"	294° 19' 17"	0.03209
1	173° 10' 17"	0°-26' 50"	173° 33' 12"	2° 18' 00"	0° 55' 39"	15' 10.01"	294° 26' 33"	0.03359
2	173° 41' 35"	0°-29' 42"	174° 00' 49"	2° 02' 59"	0° 55' 38"	15' 09.65"	294° 33' 25"	0.03513
3	174° 12' 51"	0°-32' 34"	174° 28' 25"	1° 47' 59"	0° 55' 37"	15' 09.28"	294° 39' 54"	0.03670
4	174° 44' 05"	0°-35' 26"	174° 55' 59"	1° 32' 59"	0° 55' 35"	15' 08.92"	294° 46' 01"	0.03830
5	175° 15' 18"	0°-38' 17"	175° 23' 30"	1° 17' 59"	0° 55' 34"	15' 08.56"	294° 51' 47"	0.03993
6	175° 46' 29"	0°-41' 08"	175° 51' 01"	1° 03' 00"	0° 55' 33"	15' 08.20"	294° 57' 12"	0.04159
7	176° 17' 39"	0°-43' 59"	176° 18' 29"	0° 48' 02"	0° 55' 32"	15' 07.85"	295° 2' 19"	0.04328
8	176° 48' 47"	0°-46' 49"	176° 45' 56"	0° 33' 03"	0° 55' 30"	15' 07.49"	295° 7' 06"	0.04501
9	177° 19' 54"	0°-49' 39"	177° 13' 21"	0° 18' 06"	0° 55' 29"	15' 07.14"	295° 11' 36"	0.04676
10	177° 50' 59"	0°-52' 29"	177° 40' 45"	0° 03' 09"	0° 55' 28"	15' 06.78"	295° 15' 48"	0.04855
11	178° 22' 02"	0°-55' 18"	178° 08' 08"	0°-11' 47"	0° 55' 26"	15' 06.43"	295° 19' 44"	0.05036
12	178° 53' 04"	0°-58' 07"	178° 35' 29"	0°-26' 42"	0° 55' 25"	15' 06.08"	295° 23' 24"	0.05221
13	179° 24' 05"	-1° 00' 56"	179° 02' 49"	0°-41' 37"	0° 55' 24"	15' 05.74"	295° 26' 48"	0.05409
14	179° 55' 04"	-1° 03' 44"	179° 30' 07"	0°-56' 30"	0° 55' 23"	15' 05.39"	295° 29' 56"	0.05599
15	180° 26' 01"	-1° 06' 31"	179° 57' 25"	-1° 11' 23"	0° 55' 21"	15' 05.05"	295° 32' 50"	0.05792
16	180° 56' 58"	-1° 09' 18"	180° 24' 41"	-1° 26' 14"	0° 55' 20"	15' 04.71"	295° 35' 30"	0.05989
17	181° 27' 52"	-1° 12' 05"	180° 51' 57"	-1° 41' 05"	0° 55' 19"	15' 04.37"	295° 37' 56"	0.06188
18	181° 58' 45"	-1° 14' 51"	181° 19' 11"	-1° 55' 54"	0° 55' 18"	15' 04.03"	295° 40' 08"	0.06390
19	182° 29' 37"	-1° 17' 37"	181° 46' 25"	-2° 10' 43"	0° 55' 16"	15' 03.69"	295° 42' 07"	0.06595
20	183° 00' 27"	-1° 20' 22"	182° 13' 38"	-2° 25' 30"	0° 55' 15"	15' 03.36"	295° 43' 53"	0.06803
21	183° 31' 16"	-1° 23' 07"	182° 40' 50"	-2° 40' 16"	0° 55' 14"	15' 03.03"	295° 45' 27"	0.07013
22	184° 02' 04"	-1° 25' 51"	183° 08' 02"	-2° 55' 00"	0° 55' 13"	15' 02.70"	295° 46' 48"	0.07227
23	184° 32' 50"	-1° 28' 34"	183° 35' 13"	-3° 09' 43"	0° 55' 11"	15' 02.37"	295° 47' 58"	0.07443
24	185° 03' 34"	-1° 31' 17"	184° 02' 23"	-3° 24' 25"	0° 55' 10"	15' 02.05"	295° 48' 55"	0.07662

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	153° 02' 06"	-0.28"	154° 58' 25"	10° 23' 33"	1.0106482	15'49.52"	23° 26' 19"	-1 m 54 s
1	153° 04' 31"	-0.29"	155° 00' 43"	10° 22' 41"	1.0106390	15'49.53"	23° 26' 19"	-1 m 53 s
2	153° 06' 56"	-0.29"	155° 02' 60"	10° 21' 49"	1.0106297	15'49.54"	23° 26' 19"	-1 m 52 s
3	153° 09' 21"	-0.30"	155° 05' 17"	10° 20' 57"	1.0106205	15'49.55"	23° 26' 19"	-1 m 52 s
4	153° 11' 46"	-0.31"	155° 07' 34"	10° 20' 04"	1.0106112	15'49.55"	23° 26' 19"	-1 m 51 s
5	153° 14' 10"	-0.31"	155° 09' 52"	10° 19' 12"	1.0106020	15'49.56"	23° 26' 19"	-1 m 50 s
6	153° 16' 35"	-0.32"	155° 12' 09"	10° 18' 20"	1.0105927	15'49.57"	23° 26' 19"	-1 m 50 s
7	153° 18' 60"	-0.32"	155° 14' 26"	10° 17' 27"	1.0105834	15'49.58"	23° 26' 19"	-1 m 49 s
8	153° 21' 25"	-0.33"	155° 16' 43"	10° 16' 35"	1.0105741	15'49.59"	23° 26' 19"	-1 m 48 s
9	153° 23' 50"	-0.33"	155° 19' 01"	10° 15' 43"	1.0105649	15'49.60"	23° 26' 19"	-1 m 47 s
10	153° 26' 14"	-0.34"	155° 21' 18"	10° 14' 50"	1.0105556	15'49.61"	23° 26' 19"	-1 m 47 s
11	153° 28' 39"	-0.34"	155° 23' 35"	10° 13' 58"	1.0105463	15'49.62"	23° 26' 19"	-1 m 46 s
12	153° 31' 04"	-0.35"	155° 25' 52"	10° 13' 06"	1.0105369	15'49.62"	23° 26' 19"	-1 m 45 s
13	153° 33' 29"	-0.35"	155° 28' 09"	10° 12' 13"	1.0105276	15'49.63"	23° 26' 19"	-1 m 45 s
14	153° 35' 54"	-0.36"	155° 30' 26"	10° 11' 21"	1.0105183	15'49.64"	23° 26' 19"	-1 m 44 s
15	153° 38' 18"	-0.36"	155° 32' 44"	10° 10' 28"	1.0105090	15'49.65"	23° 26' 19"	-1 m 43 s
16	153° 40' 43"	-0.37"	155° 35' 01"	10° 09' 36"	1.0104996	15'49.66"	23° 26' 19"	-1 m 42 s
17	153° 43' 08"	-0.37"	155° 37' 18"	10° 08' 44"	1.0104903	15'49.67"	23° 26' 19"	-1 m 42 s
18	153° 45' 33"	-0.38"	155° 39' 35"	10° 07' 51"	1.0104809	15'49.68"	23° 26' 19"	-1 m 41 s
19	153° 47' 58"	-0.38"	155° 41' 52"	10° 06' 59"	1.0104716	15'49.69"	23° 26' 19"	-1 m 40 s
20	153° 50' 23"	-0.39"	155° 44' 09"	10° 06' 06"	1.0104622	15'49.69"	23° 26' 19"	-1 m 40 s
21	153° 52' 47"	-0.39"	155° 46' 26"	10° 05' 14"	1.0104528	15'49.70"	23° 26' 19"	-1 m 39 s
22	153° 55' 12"	-0.40"	155° 48' 43"	10° 04' 21"	1.0104434	15'49.71"	23° 26' 19"	-1 m 38 s
23	153° 57' 37"	-0.40"	155° 51' 00"	10° 03' 28"	1.0104341	15'49.72"	23° 26' 19"	-1 m 37 s
24	154° 00' 02"	-0.41"	155° 53' 17"	10° 02' 36"	1.0104247	15'49.73"	23° 26' 19"	-1 m 37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	185° 03' 34"	-1° 31' 17"	184° 02' 23"	-3° 24' 25"	0° 55' 10"	15' 02.05"	295° 48' 55"	0.07662
1	185° 34' 18"	-1° 33' 60"	184° 29' 33"	-3° 39' 05"	0° 55' 09"	15' 01.72"	295° 49' 41"	0.07883
2	186° 04' 59"	-1° 36' 42"	184° 56' 43"	-3° 53' 44"	0° 55' 08"	15' 01.40"	295° 50' 15"	0.08108
3	186° 35' 40"	-1° 39' 23"	185° 23' 52"	-4° 08' 21"	0° 55' 07"	15' 01.08"	295° 50' 39"	0.08335
4	187° 06' 19"	-1° 42' 04"	185° 51' 01"	-4° 22' 57"	0° 55' 06"	15' 00.77"	295° 50' 51"	0.08564
5	187° 36' 57"	-1° 44' 44"	186° 18' 09"	-4° 37' 31"	0° 55' 04"	15' 00.45"	295° 50' 53"	0.08796
6	188° 07' 33"	-1° 47' 23"	186° 45' 18"	-4° 52' 03"	0° 55' 03"	15' 00.14"	295° 50' 44"	0.09031
7	188° 38' 09"	-1° 50' 02"	187° 12' 26"	-5° 06' 34"	0° 55' 02"	14' 59.83"	295° 50' 24"	0.09269
8	189° 08' 42"	-1° 52' 40"	187° 39' 35"	-5° 21' 02"	0° 55' 01"	14' 59.53"	295° 49' 55"	0.09509
9	189° 39' 15"	-1° 55' 18"	188° 06' 43"	-5° 35' 29"	0° 54' 60"	14' 59.22"	295° 49' 15"	0.09751
10	190° 09' 46"	-1° 57' 55"	188° 33' 52"	-5° 49' 54"	0° 54' 59"	14' 58.92"	295° 48' 25"	0.09996
11	190° 40' 16"	-2° 00' 31"	189° 01' 01"	-6° 04' 17"	0° 54' 58"	14' 58.62"	295° 47' 25"	0.10244
12	191° 10' 45"	-2° 03' 07"	189° 28' 10"	-6° 18' 38"	0° 54' 57"	14' 58.33"	295° 46' 16"	0.10494
13	191° 41' 12"	-2° 05' 42"	189° 55' 19"	-6° 32' 57"	0° 54' 56"	14' 58.03"	295° 44' 57"	0.10746
14	192° 11' 39"	-2° 08' 16"	190° 22' 29"	-6° 47' 14"	0° 54' 54"	14' 57.74"	295° 43' 29"	0.11001
15	192° 42' 04"	-2° 10' 50"	190° 49' 39"	-7° 01' 29"	0° 54' 53"	14' 57.46"	295° 41' 51"	0.11259
16	193° 12' 28"	-2° 13' 22"	191° 16' 50"	-7° 15' 42"	0° 54' 52"	14' 57.17"	295° 40' 04"	0.11518
17	193° 42' 50"	-2° 15' 54"	191° 44' 01"	-7° 29' 52"	0° 54' 51"	14' 56.89"	295° 38' 08"	0.11780
18	194° 13' 12"	-2° 18' 26"	192° 11' 12"	-7° 44' 00"	0° 54' 50"	14' 56.61"	295° 36' 03"	0.12045
19	194° 43' 32"	-2° 20' 56"	192° 38' 25"	-7° 58' 06"	0° 54' 49"	14' 56.34"	295° 33' 48"	0.12312
20	195° 13' 51"	-2° 23' 26"	193° 05' 38"	-8° 12' 10"	0° 54' 48"	14' 56.06"	295° 31' 25"	0.12581
21	195° 44' 09"	-2° 25' 55"	193° 32' 52"	-8° 26' 11"	0° 54' 47"	14' 55.79"	295° 28' 53"	0.12852
22	196° 14' 26"	-2° 28' 23"	194° 00' 07"	-8° 40' 09"	0° 54' 46"	14' 55.53"	295° 26' 13"	0.13126
23	196° 44' 41"	-2° 30' 51"	194° 27' 23"	-8° 54' 05"	0° 54' 45"	14' 55.26"	295° 23' 23"	0.13402
24	197° 14' 56"	-2° 33' 18"	194° 54' 39"	-9° 07' 59"	0° 54' 44"	14' 55.00"	295° 20' 26"	0.13680

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	154° 00' 02"	-0.41"	155° 53' 17"	10° 02' 36"	1.0104247	15'49.73"	23° 26' 19"	-1 m 37 s
1	154° 02' 27"	-0.41"	155° 55' 34"	10° 01' 43"	1.0104153	15'49.74"	23° 26' 19"	-1 m 36 s
2	154° 04' 52"	-0.42"	155° 57' 52"	10° 00' 51"	1.0104059	15'49.75"	23° 26' 19"	-1 m 35 s
3	154° 07' 16"	-0.42"	156° 00' 09"	9° 59' 58"	1.0103964	15'49.76"	23° 26' 19"	-1 m 35 s
4	154° 09' 41"	-0.43"	156° 02' 26"	9° 59' 05"	1.0103870	15'49.76"	23° 26' 19"	-1 m 34 s
5	154° 12' 06"	-0.43"	156° 04' 43"	9° 58' 13"	1.0103776	15'49.77"	23° 26' 19"	-1 m 33 s
6	154° 14' 31"	-0.43"	156° 06' 60"	9° 57' 20"	1.0103681	15'49.78"	23° 26' 19"	-1 m 32 s
7	154° 16' 56"	-0.44"	156° 09' 17"	9° 56' 27"	1.0103587	15'49.79"	23° 26' 19"	-1 m 32 s
8	154° 19' 21"	-0.44"	156° 11' 33"	9° 55' 35"	1.0103493	15'49.80"	23° 26' 19"	-1 m 31 s
9	154° 21' 45"	-0.45"	156° 13' 50"	9° 54' 42"	1.0103398	15'49.81"	23° 26' 19"	-1 m 30 s
10	154° 24' 10"	-0.45"	156° 16' 07"	9° 53' 49"	1.0103303	15'49.82"	23° 26' 19"	-1 m 29 s
11	154° 26' 35"	-0.46"	156° 18' 24"	9° 52' 56"	1.0103209	15'49.83"	23° 26' 19"	-1 m 29 s
12	154° 29' 00"	-0.46"	156° 20' 41"	9° 52' 04"	1.0103114	15'49.84"	23° 26' 19"	-1 m 28 s
13	154° 31' 25"	-0.47"	156° 22' 58"	9° 51' 11"	1.0103019	15'49.84"	23° 26' 19"	-1 m 27 s
14	154° 33' 50"	-0.47"	156° 25' 15"	9° 50' 18"	1.0102924	15'49.85"	23° 26' 19"	-1 m 27 s
15	154° 36' 15"	-0.48"	156° 27' 32"	9° 49' 25"	1.0102829	15'49.86"	23° 26' 19"	-1 m 26 s
16	154° 38' 40"	-0.48"	156° 29' 49"	9° 48' 32"	1.0102734	15'49.87"	23° 26' 19"	-1 m 25 s
17	154° 41' 04"	-0.48"	156° 32' 06"	9° 47' 39"	1.0102639	15'49.88"	23° 26' 19"	-1 m 24 s
18	154° 43' 29"	-0.49"	156° 34' 23"	9° 46' 47"	1.0102544	15'49.89"	23° 26' 19"	-1 m 24 s
19	154° 45' 54"	-0.49"	156° 36' 40"	9° 45' 54"	1.0102449	15'49.90"	23° 26' 19"	-1 m 23 s
20	154° 48' 19"	-0.50"	156° 38' 56"	9° 45' 01"	1.0102353	15'49.91"	23° 26' 19"	-1 m 22 s
21	154° 50' 44"	-0.50"	156° 41' 13"	9° 44' 08"	1.0102258	15'49.92"	23° 26' 19"	-1 m 21 s
22	154° 53' 09"	-0.51"	156° 43' 30"	9° 43' 15"	1.0102163	15'49.93"	23° 26' 19"	-1 m 21 s
23	154° 55' 34"	-0.51"	156° 45' 47"	9° 42' 22"	1.0102067	15'49.93"	23° 26' 19"	-1 m 20 s
24	154° 57' 59"	-0.51"	156° 48' 04"	9° 41' 29"	1.0101972	15'49.94"	23° 26' 19"	-1 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	197° 14' 56"	-2° 33' 18"	194° 54' 39"	-9° 07' 59"	0° 54' 44"	14' 55.00"	295° 20' 26"	0.13680
1	197° 45' 09"	-2° 35' 43"	195° 21' 57"	-9° 21' 50"	0° 54' 43"	14' 54.74"	295° 17' 19"	0.13960
2	198° 15' 22"	-2° 38' 09"	195° 49' 16"	-9° 35' 38"	0° 54' 43"	14' 54.49"	295° 14' 04"	0.14242
3	198° 45' 33"	-2° 40' 33"	196° 16' 36"	-9° 49' 24"	0° 54' 42"	14' 54.24"	295° 10' 41"	0.14527
4	199° 15' 43"	-2° 42' 56"	196° 43' 57"	-10° 03' 07"	0° 54' 41"	14' 53.99"	295° 7' 10"	0.14814
5	199° 45' 53"	-2° 45' 19"	197° 11' 19"	-10° 16' 47"	0° 54' 40"	14' 53.75"	295° 3' 30"	0.15102
6	200° 16' 01"	-2° 47' 41"	197° 38' 43"	-10° 30' 25"	0° 54' 39"	14' 53.50"	294° 59' 42"	0.15393
7	200° 46' 08"	-2° 50' 01"	198° 06' 08"	-10° 43' 59"	0° 54' 38"	14' 53.27"	294° 55' 46"	0.15686
8	201° 16' 15"	-2° 52' 21"	198° 33' 35"	-10° 57' 31"	0° 54' 37"	14' 53.03"	294° 51' 42"	0.15981
9	201° 46' 20"	-2° 54' 41"	199° 01' 03"	-11° 10' 59"	0° 54' 36"	14' 52.80"	294° 47' 29"	0.16278
10	202° 16' 24"	-2° 56' 59"	199° 28' 33"	-11° 24' 25"	0° 54' 36"	14' 52.57"	294° 43' 09"	0.16578
11	202° 46' 28"	-2° 59' 16"	199° 56' 04"	-11° 37' 48"	0° 54' 35"	14' 52.35"	294° 38' 41"	0.16879
12	203° 16' 30"	-3° 01' 33"	200° 23' 37"	-11° 51' 07"	0° 54' 34"	14' 52.13"	294° 34' 05"	0.17182
13	203° 46' 32"	-3° 03' 48"	200° 51' 12"	-12° 04' 24"	0° 54' 33"	14' 51.91"	294° 29' 21"	0.17486
14	204° 16' 32"	-3° 06' 03"	201° 18' 48"	-12° 17' 37"	0° 54' 32"	14' 51.70"	294° 24' 29"	0.17793
15	204° 46' 32"	-3° 08' 17"	201° 46' 27"	-12° 30' 47"	0° 54' 32"	14' 51.49"	294° 19' 29"	0.18102
16	205° 16' 31"	-3° 10' 30"	202° 14' 07"	-12° 43' 54"	0° 54' 31"	14' 51.28"	294° 14' 22"	0.18413
17	205° 46' 29"	-3° 12' 42"	202° 41' 49"	-12° 56' 58"	0° 54' 30"	14' 51.08"	294° 9' 07"	0.18725
18	206° 16' 26"	-3° 14' 52"	203° 09' 33"	-13° 09' 58"	0° 54' 29"	14' 50.88"	294° 3' 44"	0.19039
19	206° 46' 23"	-3° 17' 02"	203° 37' 20"	-13° 22' 55"	0° 54' 29"	14' 50.69"	293° 58' 14"	0.19356
20	207° 16' 18"	-3° 19' 12"	204° 05' 08"	-13° 35' 48"	0° 54' 28"	14' 50.50"	293° 52' 36"	0.19674
21	207° 46' 13"	-3° 21' 20"	204° 32' 59"	-13° 48' 38"	0° 54' 27"	14' 50.31"	293° 46' 50"	0.19993
22	208° 16' 07"	-3° 23' 27"	205° 00' 51"	-14° 01' 25"	0° 54' 27"	14' 50.13"	293° 40' 57"	0.20315
23	208° 46' 01"	-3° 25' 33"	205° 28' 46"	-14° 14' 07"	0° 54' 26"	14' 49.95"	293° 34' 57"	0.20638
24	209° 15' 53"	-3° 27' 38"	205° 56' 44"	-14° 26' 47"	0° 54' 25"	14' 49.77"	293° 28' 49"	0.20963

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	154° 57' 59"	-0.51"	156° 48' 04"	9° 41' 29"	1.0101972	15'49.94"	23° 26' 19"	-1 m 19 s
1	155° 00' 24"	-0.52"	156° 50' 21"	9° 40' 36"	1.0101876	15'49.95"	23° 26' 19"	-1 m 19 s
2	155° 02' 48"	-0.52"	156° 52' 37"	9° 39' 43"	1.0101780	15'49.96"	23° 26' 19"	-1 m 18 s
3	155° 05' 13"	-0.53"	156° 54' 54"	9° 38' 50"	1.0101685	15'49.97"	23° 26' 19"	-1 m 17 s
4	155° 07' 38"	-0.53"	156° 57' 11"	9° 37' 57"	1.0101589	15'49.98"	23° 26' 19"	-1 m 16 s
5	155° 10' 03"	-0.54"	156° 59' 28"	9° 37' 04"	1.0101493	15'49.99"	23° 26' 19"	-1 m 16 s
6	155° 12' 28"	-0.54"	157° 01' 44"	9° 36' 11"	1.0101397	15'50.00"	23° 26' 19"	-1 m 15 s
7	155° 14' 53"	-0.54"	157° 04' 01"	9° 35' 18"	1.0101301	15'50.01"	23° 26' 19"	-1 m 14 s
8	155° 17' 18"	-0.55"	157° 06' 18"	9° 34' 25"	1.0101205	15'50.02"	23° 26' 19"	-1 m 13 s
9	155° 19' 43"	-0.55"	157° 08' 35"	9° 33' 32"	1.0101109	15'50.02"	23° 26' 19"	-1 m 13 s
10	155° 22' 08"	-0.55"	157° 10' 51"	9° 32' 38"	1.0101013	15'50.03"	23° 26' 19"	-1 m 12 s
11	155° 24' 33"	-0.56"	157° 13' 08"	9° 31' 45"	1.0100916	15'50.04"	23° 26' 19"	-1 m 11 s
12	155° 26' 58"	-0.56"	157° 15' 25"	9° 30' 52"	1.0100820	15'50.05"	23° 26' 19"	-1 m 10 s
13	155° 29' 22"	-0.57"	157° 17' 41"	9° 29' 59"	1.0100724	15'50.06"	23° 26' 19"	-1 m 10 s
14	155° 31' 47"	-0.57"	157° 19' 58"	9° 29' 06"	1.0100627	15'50.07"	23° 26' 19"	-1 m 09 s
15	155° 34' 12"	-0.57"	157° 22' 15"	9° 28' 13"	1.0100531	15'50.08"	23° 26' 19"	-1 m 08 s
16	155° 36' 37"	-0.58"	157° 24' 31"	9° 27' 19"	1.0100434	15'50.09"	23° 26' 19"	-1 m 07 s
17	155° 39' 02"	-0.58"	157° 26' 48"	9° 26' 26"	1.0100338	15'50.10"	23° 26' 19"	-1 m 07 s
18	155° 41' 27"	-0.58"	157° 29' 05"	9° 25' 33"	1.0100241	15'50.11"	23° 26' 19"	-1 m 06 s
19	155° 43' 52"	-0.59"	157° 31' 21"	9° 24' 40"	1.0100144	15'50.12"	23° 26' 19"	-1 m 05 s
20	155° 46' 17"	-0.59"	157° 33' 38"	9° 23' 46"	1.0100047	15'50.12"	23° 26' 19"	-1 m 04 s
21	155° 48' 42"	-0.59"	157° 35' 55"	9° 22' 53"	1.0099950	15'50.13"	23° 26' 19"	-1 m 04 s
22	155° 51' 07"	-0.60"	157° 38' 11"	9° 21' 60"	1.0099854	15'50.14"	23° 26' 19"	-1 m 03 s
23	155° 53' 32"	-0.60"	157° 40' 28"	9° 21' 06"	1.0099757	15'50.15"	23° 26' 19"	-1 m 02 s
24	155° 55' 57"	-0.60"	157° 42' 44"	9° 20' 13"	1.0099660	15'50.16"	23° 26' 19"	-1 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	209° 15' 53"	-3° 27' 38"	205° 56' 44"	-14° 26' 47"	0° 54' 25"	14' 49.77"	293° 28' 49"	0.20963
1	209° 45' 45"	-3° 29' 42"	206° 24' 44"	-14° 39' 22"	0° 54' 25"	14' 49.60"	293° 22' 33"	0.21289
2	210° 15' 36"	-3° 31' 45"	206° 52' 46"	-14° 51' 54"	0° 54' 24"	14' 49.43"	293° 16' 10"	0.21618
3	210° 45' 27"	-3° 33' 47"	207° 20' 51"	-15° 04' 22"	0° 54' 23"	14' 49.27"	293° 9' 40"	0.21947
4	211° 15' 17"	-3° 35' 49"	207° 48' 58"	-15° 16' 47"	0° 54' 23"	14' 49.11"	293° 3' 02"	0.22279
5	211° 45' 06"	-3° 37' 49"	208° 17' 08"	-15° 29' 07"	0° 54' 22"	14' 48.95"	292° 56' 17"	0.22612
6	212° 14' 54"	-3° 39' 48"	208° 45' 20"	-15° 41' 24"	0° 54' 22"	14' 48.80"	292° 49' 24"	0.22947
7	212° 44' 42"	-3° 41' 46"	209° 13' 35"	-15° 53' 36"	0° 54' 21"	14' 48.65"	292° 42' 25"	0.23283
8	213° 14' 30"	-3° 43' 43"	209° 41' 53"	-16° 05' 45"	0° 54' 21"	14' 48.51"	292° 35' 17"	0.23621
9	213° 44' 17"	-3° 45' 39"	210° 10' 14"	-16° 17' 50"	0° 54' 20"	14' 48.37"	292° 28' 03"	0.23960
10	214° 14' 03"	-3° 47' 34"	210° 38' 37"	-16° 29' 51"	0° 54' 20"	14' 48.24"	292° 20' 42"	0.24301
11	214° 43' 48"	-3° 49' 27"	211° 07' 04"	-16° 41' 47"	0° 54' 19"	14' 48.10"	292° 13' 13"	0.24643
12	215° 13' 34"	-3° 51' 20"	211° 35' 33"	-16° 53' 40"	0° 54' 19"	14' 47.98"	292° 5' 37"	0.24987
13	215° 43' 18"	-3° 53' 12"	212° 04' 05"	-17° 05' 28"	0° 54' 18"	14' 47.86"	291° 57' 54"	0.25332
14	216° 13' 02"	-3° 55' 03"	212° 32' 40"	-17° 17' 12"	0° 54' 18"	14' 47.74"	291° 50' 04"	0.25679
15	216° 42' 46"	-3° 56' 52"	213° 01' 19"	-17° 28' 51"	0° 54' 17"	14' 47.62"	291° 42' 07"	0.26027
16	217° 12' 29"	-3° 58' 41"	213° 30' 00"	-17° 40' 27"	0° 54' 17"	14' 47.51"	291° 34' 02"	0.26377
17	217° 42' 12"	-4° 00' 28"	213° 58' 45"	-17° 51' 58"	0° 54' 17"	14' 47.41"	291° 25' 51"	0.26727
18	218° 11' 55"	-4° 02' 14"	214° 27' 33"	-18° 03' 24"	0° 54' 16"	14' 47.31"	291° 17' 32"	0.27080
19	218° 41' 37"	-4° 03' 59"	214° 56' 24"	-18° 14' 46"	0° 54' 16"	14' 47.21"	291° 9' 07"	0.27433
20	219° 11' 18"	-4° 05' 43"	215° 25' 18"	-18° 26' 04"	0° 54' 15"	14' 47.12"	291° 0' 34"	0.27788
21	219° 40' 60"	-4° 07' 26"	215° 54' 15"	-18° 37' 17"	0° 54' 15"	14' 47.03"	290° 51' 54"	0.28144
22	220° 10' 41"	-4° 09' 08"	216° 23' 16"	-18° 48' 25"	0° 54' 15"	14' 46.95"	290° 43' 08"	0.28501
23	220° 40' 21"	-4° 10' 49"	216° 52' 21"	-18° 59' 29"	0° 54' 15"	14' 46.87"	290° 34' 14"	0.28860
24	221° 10' 02"	-4° 12' 28"	217° 21' 29"	-19° 10' 28"	0° 54' 14"	14' 46.80"	290° 25' 14"	0.29220

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	155° 55' 57"	-0.60"	157° 42' 44"	9° 20' 13"	1.0099660	15'50.16"	23° 26' 19"	-1 m 01 s
1	155° 58' 22"	-0.61"	157° 45' 01"	9° 19' 20"	1.0099562	15'50.17"	23° 26' 19"	-1 m 01 s
2	156° 00' 47"	-0.61"	157° 47' 18"	9° 18' 26"	1.0099465	15'50.18"	23° 26' 19"	0 m-60 s
3	156° 03' 12"	-0.61"	157° 49' 34"	9° 17' 33"	1.0099368	15'50.19"	23° 26' 19"	0 m-59 s
4	156° 05' 37"	-0.62"	157° 51' 51"	9° 16' 40"	1.0099271	15'50.20"	23° 26' 19"	0 m-58 s
5	156° 08' 02"	-0.62"	157° 54' 07"	9° 15' 46"	1.0099173	15'50.21"	23° 26' 19"	0 m-58 s
6	156° 10' 26"	-0.62"	157° 56' 24"	9° 14' 53"	1.0099076	15'50.22"	23° 26' 19"	0 m-57 s
7	156° 12' 51"	-0.63"	157° 58' 40"	9° 13' 59"	1.0098979	15'50.22"	23° 26' 19"	0 m-56 s
8	156° 15' 16"	-0.63"	158° 00' 57"	9° 13' 06"	1.0098881	15'50.23"	23° 26' 19"	0 m-55 s
9	156° 17' 41"	-0.63"	158° 03' 13"	9° 12' 12"	1.0098784	15'50.24"	23° 26' 19"	0 m-55 s
10	156° 20' 06"	-0.63"	158° 05' 30"	9° 11' 19"	1.0098686	15'50.25"	23° 26' 19"	0 m-54 s
11	156° 22' 31"	-0.64"	158° 07' 46"	9° 10' 25"	1.0098588	15'50.26"	23° 26' 19"	0 m-53 s
12	156° 24' 56"	-0.64"	158° 10' 03"	9° 09' 32"	1.0098490	15'50.27"	23° 26' 19"	0 m-52 s
13	156° 27' 21"	-0.64"	158° 12' 19"	9° 08' 38"	1.0098393	15'50.28"	23° 26' 19"	0 m-52 s
14	156° 29' 46"	-0.65"	158° 14' 36"	9° 07' 45"	1.0098295	15'50.29"	23° 26' 19"	0 m-51 s
15	156° 32' 11"	-0.65"	158° 16' 52"	9° 06' 51"	1.0098197	15'50.30"	23° 26' 19"	0 m-50 s
16	156° 34' 36"	-0.65"	158° 19' 09"	9° 05' 58"	1.0098099	15'50.31"	23° 26' 19"	0 m-49 s
17	156° 37' 01"	-0.65"	158° 21' 25"	9° 05' 04"	1.0098001	15'50.32"	23° 26' 19"	0 m-49 s
18	156° 39' 26"	-0.66"	158° 23' 41"	9° 04' 10"	1.0097903	15'50.33"	23° 26' 19"	0 m-48 s
19	156° 41' 51"	-0.66"	158° 25' 58"	9° 03' 17"	1.0097805	15'50.34"	23° 26' 19"	0 m-47 s
20	156° 44' 16"	-0.66"	158° 28' 14"	9° 02' 23"	1.0097707	15'50.34"	23° 26' 19"	0 m-46 s
21	156° 46' 41"	-0.66"	158° 30' 31"	9° 01' 29"	1.0097608	15'50.35"	23° 26' 19"	0 m-46 s
22	156° 49' 06"	-0.67"	158° 32' 47"	9° 00' 36"	1.0097510	15'50.36"	23° 26' 19"	0 m-45 s
23	156° 51' 31"	-0.67"	158° 35' 03"	8° 59' 42"	1.0097412	15'50.37"	23° 26' 19"	0 m-44 s
24	156° 53' 56"	-0.67"	158° 37' 20"	8° 58' 48"	1.0097313	15'50.38"	23° 26' 19"	0 m-43 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	221° 10' 02"	-4° 12' 28"	217° 21' 29"	-19° 10' 28"	0° 54' 14"	14' 46.80"	290° 25' 14"	0.29220
1	221° 39' 42"	-4° 14' 06"	217° 50' 40"	-19° 21' 22"	0° 54' 14"	14' 46.73"	290° 16' 06"	0.29581
2	222° 09' 22"	-4° 15' 44"	218° 19' 55"	-19° 32' 12"	0° 54' 14"	14' 46.66"	290° 6' 52"	0.29943
3	222° 39' 01"	-4° 17' 20"	218° 49' 13"	-19° 42' 57"	0° 54' 14"	14' 46.60"	289° 57' 31"	0.30306
4	223° 08' 40"	-4° 18' 55"	219° 18' 35"	-19° 53' 36"	0° 54' 13"	14' 46.54"	289° 48' 03"	0.30671
5	223° 38' 20"	-4° 20' 28"	219° 48' 00"	-20° 04' 11"	0° 54' 13"	14' 46.49"	289° 38' 28"	0.31037
6	224° 07' 59"	-4° 22' 01"	220° 17' 30"	-20° 14' 41"	0° 54' 13"	14' 46.44"	289° 28' 47"	0.31403
7	224° 37' 37"	-4° 23' 32"	220° 47' 02"	-20° 25' 06"	0° 54' 13"	14' 46.40"	289° 18' 59"	0.31771
8	225° 07' 16"	-4° 25' 02"	221° 16' 39"	-20° 35' 25"	0° 54' 13"	14' 46.36"	289° 9' 03"	0.32140
9	225° 36' 54"	-4° 26' 31"	221° 46' 19"	-20° 45' 40"	0° 54' 13"	14' 46.33"	288° 59' 02"	0.32510
10	226° 06' 33"	-4° 27' 59"	222° 16' 04"	-20° 55' 49"	0° 54' 12"	14' 46.30"	288° 48' 53"	0.32881
11	226° 36' 11"	-4° 29' 26"	222° 45' 52"	-21° 05' 53"	0° 54' 12"	14' 46.28"	288° 38' 38"	0.33254
12	227° 05' 49"	-4° 30' 51"	223° 15' 43"	-21° 15' 52"	0° 54' 12"	14' 46.26"	288° 28' 16"	0.33627
13	227° 35' 28"	-4° 32' 15"	223° 45' 39"	-21° 25' 46"	0° 54' 12"	14' 46.24"	288° 17' 47"	0.34001
14	228° 05' 06"	-4° 33' 38"	224° 15' 39"	-21° 35' 34"	0° 54' 12"	14' 46.24"	288° 7' 12"	0.34376
15	228° 34' 44"	-4° 35' 00"	224° 45' 42"	-21° 45' 17"	0° 54' 12"	14' 46.23"	287° 56' 31"	0.34752
16	229° 04' 22"	-4° 36' 21"	225° 15' 49"	-21° 54' 54"	0° 54' 12"	14' 46.23"	287° 45' 42"	0.35129
17	229° 34' 00"	-4° 37' 40"	225° 46' 01"	-22° 04' 26"	0° 54' 12"	14' 46.23"	287° 34' 48"	0.35506
18	230° 03' 39"	-4° 38' 58"	226° 16' 16"	-22° 13' 52"	0° 54' 12"	14' 46.24"	287° 23' 46"	0.35885
19	230° 33' 17"	-4° 40' 15"	226° 46' 36"	-22° 23' 13"	0° 54' 12"	14' 46.26"	287° 12' 38"	0.36265
20	231° 02' 56"	-4° 41' 31"	227° 16' 59"	-22° 32' 28"	0° 54' 12"	14' 46.28"	287° 1' 24"	0.36645
21	231° 32' 34"	-4° 42' 45"	227° 47' 27"	-22° 41' 37"	0° 54' 12"	14' 46.30"	286° 50' 04"	0.37026
22	232° 02' 13"	-4° 43' 58"	228° 17' 58"	-22° 50' 40"	0° 54' 13"	14' 46.33"	286° 38' 37"	0.37408
23	232° 31' 52"	-4° 45' 10"	228° 48' 34"	-22° 59' 38"	0° 54' 13"	14' 46.36"	286° 27' 03"	0.37791
24	233° 01' 31"	-4° 46' 20"	229° 19' 14"	-23° 08' 30"	0° 54' 13"	14' 46.40"	286° 15' 24"	0.38175

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	156° 53' 56"	-0.67"	158° 37' 20"	8° 58' 48"	1.0097313	15'50.38"	23° 26' 19"	0 m-43 s
1	156° 56' 21"	-0.67"	158° 39' 36"	8° 57' 55"	1.0097215	15'50.39"	23° 26' 19"	0 m-42 s
2	156° 58' 46"	-0.67"	158° 41' 52"	8° 57' 01"	1.0097116	15'50.40"	23° 26' 19"	0 m-42 s
3	157° 01' 11"	-0.68"	158° 44' 09"	8° 56' 07"	1.0097018	15'50.41"	23° 26' 19"	0 m-41 s
4	157° 03' 36"	-0.68"	158° 46' 25"	8° 55' 13"	1.0096919	15'50.42"	23° 26' 19"	0 m-40 s
5	157° 06' 01"	-0.68"	158° 48' 41"	8° 54' 20"	1.0096820	15'50.43"	23° 26' 19"	0 m-39 s
6	157° 08' 26"	-0.68"	158° 50' 58"	8° 53' 26"	1.0096722	15'50.44"	23° 26' 19"	0 m-39 s
7	157° 10' 51"	-0.68"	158° 53' 14"	8° 52' 32"	1.0096623	15'50.45"	23° 26' 19"	0 m-38 s
8	157° 13' 16"	-0.69"	158° 55' 30"	8° 51' 38"	1.0096524	15'50.46"	23° 26' 19"	0 m-37 s
9	157° 15' 41"	-0.69"	158° 57' 47"	8° 50' 44"	1.0096425	15'50.47"	23° 26' 19"	0 m-36 s
10	157° 18' 06"	-0.69"	159° 00' 03"	8° 49' 50"	1.0096326	15'50.47"	23° 26' 19"	0 m-36 s
11	157° 20' 31"	-0.69"	159° 02' 19"	8° 48' 57"	1.0096227	15'50.48"	23° 26' 19"	0 m-35 s
12	157° 22' 56"	-0.69"	159° 04' 35"	8° 48' 03"	1.0096128	15'50.49"	23° 26' 19"	0 m-34 s
13	157° 25' 21"	-0.69"	159° 06' 52"	8° 47' 09"	1.0096029	15'50.50"	23° 26' 19"	0 m-33 s
14	157° 27' 47"	-0.69"	159° 09' 08"	8° 46' 15"	1.0095930	15'50.51"	23° 26' 19"	0 m-33 s
15	157° 30' 12"	-0.70"	159° 11' 24"	8° 45' 21"	1.0095830	15'50.52"	23° 26' 19"	0 m-32 s
16	157° 32' 37"	-0.70"	159° 13' 40"	8° 44' 27"	1.0095731	15'50.53"	23° 26' 19"	0 m-31 s
17	157° 35' 02"	-0.70"	159° 15' 57"	8° 43' 33"	1.0095632	15'50.54"	23° 26' 19"	0 m-30 s
18	157° 37' 27"	-0.70"	159° 18' 13"	8° 42' 39"	1.0095533	15'50.55"	23° 26' 19"	0 m-29 s
19	157° 39' 52"	-0.70"	159° 20' 29"	8° 41' 45"	1.0095433	15'50.56"	23° 26' 19"	0 m-29 s
20	157° 42' 17"	-0.70"	159° 22' 45"	8° 40' 51"	1.0095334	15'50.57"	23° 26' 19"	0 m-28 s
21	157° 44' 42"	-0.70"	159° 25' 01"	8° 39' 57"	1.0095234	15'50.58"	23° 26' 19"	0 m-27 s
22	157° 47' 07"	-0.71"	159° 27' 18"	8° 39' 03"	1.0095135	15'50.59"	23° 26' 19"	0 m-26 s
23	157° 49' 32"	-0.71"	159° 29' 34"	8° 38' 09"	1.0095035	15'50.60"	23° 26' 19"	0 m-26 s
24	157° 51' 57"	-0.71"	159° 31' 50"	8° 37' 15"	1.0094935	15'50.61"	23° 26' 19"	0 m-25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	233° 01' 31"	-4° 46' 20"	229° 19' 14"	-23° 08' 30"	0° 54' 13"	14' 46.40"	286° 15' 24"	0.38175
1	233° 31' 10"	-4° 47' 30"	229° 49' 58"	-23° 17' 16"	0° 54' 13"	14' 46.44"	286° 3' 38"	0.38559
2	234° 00' 49"	-4° 48' 38"	230° 20' 46"	-23° 25' 55"	0° 54' 13"	14' 46.49"	285° 51' 45"	0.38944
3	234° 30' 29"	-4° 49' 44"	230° 51' 38"	-23° 34' 29"	0° 54' 13"	14' 46.54"	285° 39' 47"	0.39330
4	235° 00' 09"	-4° 50' 50"	231° 22' 35"	-23° 42' 57"	0° 54' 14"	14' 46.60"	285° 27' 42"	0.39716
5	235° 29' 49"	-4° 51' 54"	231° 53' 35"	-23° 51' 19"	0° 54' 14"	14' 46.66"	285° 15' 32"	0.40104
6	235° 59' 29"	-4° 52' 57"	232° 24' 40"	-23° 59' 34"	0° 54' 14"	14' 46.73"	285° 3' 15"	0.40491
7	236° 29' 10"	-4° 53' 59"	232° 55' 49"	-24° 07' 44"	0° 54' 14"	14' 46.80"	284° 50' 52"	0.40880
8	236° 58' 51"	-4° 54' 59"	233° 27' 02"	-24° 15' 47"	0° 54' 15"	14' 46.88"	284° 38' 23"	0.41269
9	237° 28' 33"	-4° 55' 58"	233° 58' 20"	-24° 23' 43"	0° 54' 15"	14' 46.96"	284° 25' 48"	0.41659
10	237° 58' 15"	-4° 56' 56"	234° 29' 41"	-24° 31' 34"	0° 54' 15"	14' 47.05"	284° 13' 07"	0.42049
11	238° 27' 57"	-4° 57' 52"	235° 01' 07"	-24° 39' 18"	0° 54' 16"	14' 47.14"	284° 0' 20"	0.42440
12	238° 57' 39"	-4° 58' 47"	235° 32' 37"	-24° 46' 55"	0° 54' 16"	14' 47.23"	283° 47' 27"	0.42831
13	239° 27' 23"	-4° 59' 41"	236° 04' 11"	-24° 54' 26"	0° 54' 16"	14' 47.33"	283° 34' 29"	0.43223
14	239° 57' 06"	-5° 00' 33"	236° 35' 50"	-25° 01' 50"	0° 54' 17"	14' 47.44"	283° 21' 24"	0.43616
15	240° 26' 50"	-5° 01' 24"	237° 07' 33"	-25° 09' 08"	0° 54' 17"	14' 47.55"	283° 8' 14"	0.44009
16	240° 56' 35"	-5° 02' 14"	237° 39' 20"	-25° 16' 19"	0° 54' 17"	14' 47.67"	282° 54' 59"	0.44402
17	241° 26' 20"	-5° 03' 03"	238° 11' 11"	-25° 23' 24"	0° 54' 18"	14' 47.79"	282° 41' 37"	0.44796
18	241° 56' 05"	-5° 03' 50"	238° 43' 06"	-25° 30' 21"	0° 54' 18"	14' 47.91"	282° 28' 10"	0.45190
19	242° 25' 51"	-5° 04' 35"	239° 15' 06"	-25° 37' 12"	0° 54' 19"	14' 48.05"	282° 14' 38"	0.45585
20	242° 55' 38"	-5° 05' 20"	239° 47' 09"	-25° 43' 56"	0° 54' 19"	14' 48.18"	282° 1' 00"	0.45980
21	243° 25' 25"	-5° 06' 03"	240° 19' 17"	-25° 50' 33"	0° 54' 20"	14' 48.32"	281° 47' 17"	0.46375
22	243° 55' 13"	-5° 06' 44"	240° 51' 29"	-25° 57' 03"	0° 54' 20"	14' 48.47"	281° 33' 28"	0.46771
23	244° 25' 02"	-5° 07' 25"	241° 23' 46"	-26° 03' 26"	0° 54' 21"	14' 48.62"	281° 19' 34"	0.47167
24	244° 54' 51"	-5° 08' 04"	241° 56' 06"	-26° 09' 42"	0° 54' 22"	14' 48.77"	281° 5' 35"	0.47563

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	157° 51' 57"	-0.71"	159° 31' 50"	8° 37' 15"	1.0094935	15'50.61"	23° 26' 19"	0 m-25 s
1	157° 54' 22"	-0.71"	159° 34' 06"	8° 36' 21"	1.0094835	15'50.61"	23° 26' 19"	0 m-24 s
2	157° 56' 47"	-0.71"	159° 36' 22"	8° 35' 27"	1.0094736	15'50.62"	23° 26' 19"	0 m-23 s
3	157° 59' 12"	-0.71"	159° 38' 38"	8° 34' 33"	1.0094636	15'50.63"	23° 26' 19"	0 m-22 s
4	158° 01' 37"	-0.71"	159° 40' 54"	8° 33' 39"	1.0094536	15'50.64"	23° 26' 19"	0 m-22 s
5	158° 04' 02"	-0.71"	159° 43' 11"	8° 32' 45"	1.0094436	15'50.65"	23° 26' 19"	0 m-21 s
6	158° 06' 27"	-0.71"	159° 45' 27"	8° 31' 50"	1.0094336	15'50.66"	23° 26' 19"	0 m-20 s
7	158° 08' 52"	-0.71"	159° 47' 43"	8° 30' 56"	1.0094236	15'50.67"	23° 26' 19"	0 m-19 s
8	158° 11' 18"	-0.71"	159° 49' 59"	8° 30' 02"	1.0094136	15'50.68"	23° 26' 19"	0 m-19 s
9	158° 13' 43"	-0.71"	159° 52' 15"	8° 29' 08"	1.0094036	15'50.69"	23° 26' 19"	0 m-18 s
10	158° 16' 08"	-0.71"	159° 54' 31"	8° 28' 14"	1.0093936	15'50.70"	23° 26' 19"	0 m-17 s
11	158° 18' 33"	-0.71"	159° 56' 47"	8° 27' 20"	1.0093836	15'50.71"	23° 26' 19"	0 m-16 s
12	158° 20' 58"	-0.71"	159° 59' 03"	8° 26' 25"	1.0093735	15'50.72"	23° 26' 19"	0 m-15 s
13	158° 23' 23"	-0.71"	160° 01' 19"	8° 25' 31"	1.0093635	15'50.73"	23° 26' 19"	0 m-15 s
14	158° 25' 48"	-0.72"	160° 03' 35"	8° 24' 37"	1.0093535	15'50.74"	23° 26' 19"	0 m-14 s
15	158° 28' 13"	-0.72"	160° 05' 51"	8° 23' 43"	1.0093434	15'50.75"	23° 26' 19"	0 m-13 s
16	158° 30' 38"	-0.72"	160° 08' 07"	8° 22' 48"	1.0093334	15'50.76"	23° 26' 19"	0 m-12 s
17	158° 33' 03"	-0.72"	160° 10' 23"	8° 21' 54"	1.0093233	15'50.77"	23° 26' 19"	0 m-11 s
18	158° 35' 28"	-0.72"	160° 12' 39"	8° 20' 60"	1.0093133	15'50.78"	23° 26' 19"	0 m-11 s
19	158° 37' 54"	-0.72"	160° 14' 55"	8° 20' 05"	1.0093032	15'50.78"	23° 26' 19"	0 m-10 s
20	158° 40' 19"	-0.72"	160° 17' 11"	8° 19' 11"	1.0092932	15'50.79"	23° 26' 19"	0 m -9 s
21	158° 42' 44"	-0.72"	160° 19' 27"	8° 18' 17"	1.0092831	15'50.80"	23° 26' 19"	0 m -8 s
22	158° 45' 09"	-0.72"	160° 21' 43"	8° 17' 22"	1.0092730	15'50.81"	23° 26' 19"	0 m -8 s
23	158° 47' 34"	-0.71"	160° 23' 59"	8° 16' 28"	1.0092629	15'50.82"	23° 26' 19"	0 m -7 s
24	158° 49' 59"	-0.71"	160° 26' 15"	8° 15' 34"	1.0092529	15'50.83"	23° 26' 19"	0 m -6 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	244° 54' 51"	-5° 08' 04"	241° 56' 06"	-26° 09' 42"	0° 54' 22"	14' 48.77"	281° 5' 35"	0.47563
1	245° 24' 41"	-5° 08' 41"	242° 28' 31"	-26° 15' 51"	0° 54' 22"	14' 48.93"	280° 51' 30"	0.47960
2	245° 54' 32"	-5° 09' 17"	243° 00' 59"	-26° 21' 53"	0° 54' 23"	14' 49.10"	280° 37' 21"	0.48357
3	246° 24' 23"	-5° 09' 52"	243° 33' 32"	-26° 27' 48"	0° 54' 23"	14' 49.27"	280° 23' 06"	0.48755
4	246° 54' 15"	-5° 10' 26"	244° 06' 09"	-26° 33' 35"	0° 54' 24"	14' 49.44"	280° 8' 46"	0.49152
5	247° 24' 08"	-5° 10' 58"	244° 38' 49"	-26° 39' 15"	0° 54' 25"	14' 49.62"	279° 54' 22"	0.49550
6	247° 54' 01"	-5° 11' 28"	245° 11' 34"	-26° 44' 48"	0° 54' 25"	14' 49.81"	279° 39' 52"	0.49948
7	248° 23' 56"	-5° 11' 58"	245° 44' 23"	-26° 50' 13"	0° 54' 26"	14' 50.00"	279° 25' 18"	0.50346
8	248° 53' 51"	-5° 12' 26"	246° 17' 16"	-26° 55' 31"	0° 54' 27"	14' 50.19"	279° 10' 39"	0.50744
9	249° 23' 47"	-5° 12' 52"	246° 50' 12"	-27° 00' 41"	0° 54' 27"	14' 50.39"	278° 55' 55"	0.51142
10	249° 53' 44"	-5° 13' 17"	247° 23' 13"	-27° 05' 44"	0° 54' 28"	14' 50.59"	278° 41' 07"	0.51541
11	250° 23' 42"	-5° 13' 41"	247° 56' 17"	-27° 10' 39"	0° 54' 29"	14' 50.80"	278° 26' 14"	0.51940
12	250° 53' 41"	-5° 14' 03"	248° 29' 26"	-27° 15' 26"	0° 54' 30"	14' 51.02"	278° 11' 17"	0.52338
13	251° 23' 40"	-5° 14' 24"	249° 02' 38"	-27° 20' 06"	0° 54' 31"	14' 51.24"	277° 56' 15"	0.52737
14	251° 53' 41"	-5° 14' 43"	249° 35' 54"	-27° 24' 38"	0° 54' 31"	14' 51.46"	277° 41' 09"	0.53136
15	252° 23' 42"	-5° 15' 01"	250° 09' 13"	-27° 29' 03"	0° 54' 32"	14' 51.69"	277° 25' 59"	0.53535
16	252° 53' 45"	-5° 15' 18"	250° 42' 36"	-27° 33' 19"	0° 54' 33"	14' 51.92"	277° 10' 44"	0.53933
17	253° 23' 48"	-5° 15' 33"	251° 16' 03"	-27° 37' 28"	0° 54' 34"	14' 52.16"	276° 55' 26"	0.54332
18	253° 53' 53"	-5° 15' 47"	251° 49' 34"	-27° 41' 29"	0° 54' 35"	14' 52.40"	276° 40' 04"	0.54731
19	254° 23' 58"	-5° 15' 59"	252° 23' 08"	-27° 45' 22"	0° 54' 36"	14' 52.65"	276° 24' 37"	0.55129
20	254° 54' 05"	-5° 16' 10"	252° 56' 46"	-27° 49' 06"	0° 54' 37"	14' 52.90"	276° 9' 07"	0.55528
21	255° 24' 13"	-5° 16' 19"	253° 30' 27"	-27° 52' 43"	0° 54' 38"	14' 53.16"	275° 53' 33"	0.55926
22	255° 54' 22"	-5° 16' 27"	254° 04' 11"	-27° 56' 12"	0° 54' 39"	14' 53.42"	275° 37' 56"	0.56325
23	256° 24' 32"	-5° 16' 34"	254° 37' 59"	-27° 59' 33"	0° 54' 40"	14' 53.69"	275° 22' 15"	0.56723
24	256° 54' 43"	-5° 16' 39"	255° 11' 50"	-28° 02' 45"	0° 54' 41"	14' 53.96"	275° 6' 31"	0.57121

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	158° 49' 59"	-0.71"	160° 26' 15"	8° 15' 34"	1.0092529	15'50.83"	23° 26' 19"	0 m -6 s
1	158° 52' 24"	-0.71"	160° 28' 31"	8° 14' 39"	1.0092428	15'50.84"	23° 26' 19"	0 m -5 s
2	158° 54' 49"	-0.71"	160° 30' 47"	8° 13' 45"	1.0092327	15'50.85"	23° 26' 19"	0 m -4 s
3	158° 57' 14"	-0.71"	160° 33' 03"	8° 12' 50"	1.0092226	15'50.86"	23° 26' 19"	0 m -4 s
4	158° 59' 40"	-0.71"	160° 35' 19"	8° 11' 56"	1.0092125	15'50.87"	23° 26' 19"	0 m -3 s
5	159° 02' 05"	-0.71"	160° 37' 35"	8° 11' 01"	1.0092024	15'50.88"	23° 26' 19"	0 m -2 s
6	159° 04' 30"	-0.71"	160° 39' 51"	8° 10' 07"	1.0091923	15'50.89"	23° 26' 19"	0 m -1 s
7	159° 06' 55"	-0.71"	160° 42' 07"	8° 09' 13"	1.0091822	15'50.90"	23° 26' 19"	0 m -0 s
8	159° 09' 20"	-0.71"	160° 44' 22"	8° 08' 18"	1.0091721	15'50.91"	23° 26' 19"	0 m 00 s
9	159° 11' 45"	-0.71"	160° 46' 38"	8° 07' 24"	1.0091619	15'50.92"	23° 26' 19"	0 m 01 s
10	159° 14' 10"	-0.71"	160° 48' 54"	8° 06' 29"	1.0091518	15'50.93"	23° 26' 19"	0 m 02 s
11	159° 16' 36"	-0.71"	160° 51' 10"	8° 05' 34"	1.0091417	15'50.94"	23° 26' 19"	0 m 03 s
12	159° 19' 01"	-0.71"	160° 53' 26"	8° 04' 40"	1.0091315	15'50.95"	23° 26' 19"	0 m 04 s
13	159° 21' 26"	-0.71"	160° 55' 42"	8° 03' 45"	1.0091214	15'50.96"	23° 26' 19"	0 m 04 s
14	159° 23' 51"	-0.70"	160° 57' 58"	8° 02' 51"	1.0091113	15'50.97"	23° 26' 19"	0 m 05 s
15	159° 26' 16"	-0.70"	161° 00' 13"	8° 01' 56"	1.0091011	15'50.98"	23° 26' 19"	0 m 06 s
16	159° 28' 41"	-0.70"	161° 02' 29"	8° 01' 02"	1.0090910	15'50.98"	23° 26' 19"	0 m 07 s
17	159° 31' 06"	-0.70"	161° 04' 45"	8° 00' 07"	1.0090808	15'50.99"	23° 26' 19"	0 m 08 s
18	159° 33' 32"	-0.70"	161° 07' 01"	7° 59' 12"	1.0090707	15'51.00"	23° 26' 19"	0 m 08 s
19	159° 35' 57"	-0.70"	161° 09' 17"	7° 58' 18"	1.0090605	15'51.01"	23° 26' 19"	0 m 09 s
20	159° 38' 22"	-0.70"	161° 11' 33"	7° 57' 23"	1.0090503	15'51.02"	23° 26' 19"	0 m 10 s
21	159° 40' 47"	-0.70"	161° 13' 48"	7° 56' 28"	1.0090402	15'51.03"	23° 26' 19"	0 m 11 s
22	159° 43' 12"	-0.69"	161° 16' 04"	7° 55' 34"	1.0090300	15'51.04"	23° 26' 19"	0 m 12 s
23	159° 45' 37"	-0.69"	161° 18' 20"	7° 54' 39"	1.0090198	15'51.05"	23° 26' 19"	0 m 12 s
24	159° 48' 03"	-0.69"	161° 20' 36"	7° 53' 44"	1.0090096	15'51.06"	23° 26' 19"	0 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	256° 54' 43"	-5° 16' 39"	255° 11' 50"	-28° 02' 45"	0° 54' 41"	14' 53.96"	275° 6' 31"	0.57121
1	257° 24' 55"	-5° 16' 42"	255° 45' 45"	-28° 05' 49"	0° 54' 42"	14' 54.23"	274° 50' 43"	0.57519
2	257° 55' 08"	-5° 16' 44"	256° 19' 42"	-28° 08' 45"	0° 54' 43"	14' 54.51"	274° 34' 52"	0.57916
3	258° 25' 23"	-5° 16' 45"	256° 53' 43"	-28° 11' 33"	0° 54' 44"	14' 54.80"	274° 18' 58"	0.58314
4	258° 55' 39"	-5° 16' 44"	257° 27' 47"	-28° 14' 13"	0° 54' 45"	14' 55.09"	274° 3' 00"	0.58711
5	259° 25' 56"	-5° 16' 42"	258° 01' 54"	-28° 16' 44"	0° 54' 46"	14' 55.38"	273° 46' 60"	0.59108
6	259° 56' 14"	-5° 16' 38"	258° 36' 04"	-28° 19' 07"	0° 54' 47"	14' 55.68"	273° 30' 57"	0.59504
7	260° 26' 34"	-5° 16' 33"	259° 10' 17"	-28° 21' 21"	0° 54' 48"	14' 55.99"	273° 14' 51"	0.59900
8	260° 56' 55"	-5° 16' 26"	259° 44' 33"	-28° 23' 27"	0° 54' 49"	14' 56.29"	272° 58' 42"	0.60296
9	261° 27' 17"	-5° 16' 18"	260° 18' 51"	-28° 25' 24"	0° 54' 50"	14' 56.61"	272° 42' 31"	0.60692
10	261° 57' 40"	-5° 16' 09"	260° 53' 13"	-28° 27' 13"	0° 54' 51"	14' 56.92"	272° 26' 17"	0.61087
11	262° 28' 05"	-5° 15' 57"	261° 27' 37"	-28° 28' 53"	0° 54' 53"	14' 57.25"	272° 10' 01"	0.61482
12	262° 58' 31"	-5° 15' 45"	262° 02' 03"	-28° 30' 25"	0° 54' 54"	14' 57.57"	271° 53' 43"	0.61876
13	263° 28' 59"	-5° 15' 31"	262° 36' 32"	-28° 31' 48"	0° 54' 55"	14' 57.90"	271° 37' 22"	0.62270
14	263° 59' 28"	-5° 15' 15"	263° 11' 04"	-28° 33' 02"	0° 54' 56"	14' 58.24"	271° 20' 60"	0.62663
15	264° 29' 59"	-5° 14' 58"	263° 45' 38"	-28° 34' 08"	0° 54' 58"	14' 58.58"	271° 4' 35"	0.63056
16	265° 00' 30"	-5° 14' 39"	264° 20' 14"	-28° 35' 05"	0° 54' 59"	14' 58.92"	270° 48' 09"	0.63448
17	265° 31' 04"	-5° 14' 19"	264° 54' 53"	-28° 35' 53"	0° 55' 00"	14' 59.27"	270° 31' 41"	0.63840
18	266° 01' 39"	-5° 13' 58"	265° 29' 34"	-28° 36' 33"	0° 55' 01"	14' 59.62"	270° 15' 11"	0.64231
19	266° 32' 15"	-5° 13' 35"	266° 04' 17"	-28° 37' 03"	0° 55' 03"	14' 59.98"	269° 58' 40"	0.64621
20	267° 02' 53"	-5° 13' 10"	266° 39' 02"	-28° 37' 25"	0° 55' 04"	15' 00.34"	269° 42' 08"	0.65011
21	267° 33' 32"	-5° 12' 44"	267° 13' 49"	-28° 37' 38"	0° 55' 05"	15' 00.70"	269° 25' 34"	0.65401
22	268° 04' 13"	-5° 12' 16"	267° 48' 38"	-28° 37' 42"	0° 55' 07"	15' 01.07"	269° 8' 59"	0.65789
23	268° 34' 55"	-5° 11' 47"	268° 23' 28"	-28° 37' 37"	0° 55' 08"	15' 01.45"	268° 52' 23"	0.66177
24	269° 05' 40"	-5° 11' 17"	268° 58' 21"	-28° 37' 24"	0° 55' 09"	15' 01.82"	268° 35' 46"	0.66564

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	159° 48' 03"	-0.69"	161° 20' 36"	7° 53' 44"	1.0090096	15'51.06"	23° 26' 19"	0 m 13 s
1	159° 50' 28"	-0.69"	161° 22' 51"	7° 52' 50"	1.0089994	15'51.07"	23° 26' 19"	0 m 14 s
2	159° 52' 53"	-0.69"	161° 25' 07"	7° 51' 55"	1.0089893	15'51.08"	23° 26' 19"	0 m 15 s
3	159° 55' 18"	-0.69"	161° 27' 23"	7° 51' 00"	1.0089791	15'51.09"	23° 26' 19"	0 m 16 s
4	159° 57' 43"	-0.68"	161° 29' 39"	7° 50' 05"	1.0089689	15'51.10"	23° 26' 19"	0 m 16 s
5	160° 00' 09"	-0.68"	161° 31' 54"	7° 49' 11"	1.0089587	15'51.11"	23° 26' 19"	0 m 17 s
6	160° 02' 34"	-0.68"	161° 34' 10"	7° 48' 16"	1.0089485	15'51.12"	23° 26' 19"	0 m 18 s
7	160° 04' 59"	-0.68"	161° 36' 26"	7° 47' 21"	1.0089382	15'51.13"	23° 26' 19"	0 m 19 s
8	160° 07' 24"	-0.68"	161° 38' 41"	7° 46' 26"	1.0089280	15'51.14"	23° 26' 19"	0 m 20 s
9	160° 09' 49"	-0.68"	161° 40' 57"	7° 45' 31"	1.0089178	15'51.15"	23° 26' 19"	0 m 20 s
10	160° 12' 15"	-0.67"	161° 43' 13"	7° 44' 37"	1.0089076	15'51.16"	23° 26' 19"	0 m 21 s
11	160° 14' 40"	-0.67"	161° 45' 29"	7° 43' 42"	1.0088974	15'51.17"	23° 26' 19"	0 m 22 s
12	160° 17' 05"	-0.67"	161° 47' 44"	7° 42' 47"	1.0088871	15'51.18"	23° 26' 19"	0 m 23 s
13	160° 19' 30"	-0.67"	161° 49' 60"	7° 41' 52"	1.0088769	15'51.19"	23° 26' 19"	0 m 24 s
14	160° 21' 55"	-0.66"	161° 52' 16"	7° 40' 57"	1.0088667	15'51.20"	23° 26' 19"	0 m 24 s
15	160° 24' 21"	-0.66"	161° 54' 31"	7° 40' 02"	1.0088564	15'51.21"	23° 26' 19"	0 m 25 s
16	160° 26' 46"	-0.66"	161° 56' 47"	7° 39' 07"	1.0088462	15'51.22"	23° 26' 19"	0 m 26 s
17	160° 29' 11"	-0.66"	161° 59' 02"	7° 38' 12"	1.0088359	15'51.23"	23° 26' 19"	0 m 27 s
18	160° 31' 36"	-0.65"	162° 01' 18"	7° 37' 17"	1.0088257	15'51.23"	23° 26' 19"	0 m 28 s
19	160° 34' 01"	-0.65"	162° 03' 34"	7° 36' 23"	1.0088154	15'51.24"	23° 26' 19"	0 m 28 s
20	160° 36' 27"	-0.65"	162° 05' 49"	7° 35' 28"	1.0088052	15'51.25"	23° 26' 19"	0 m 29 s
21	160° 38' 52"	-0.65"	162° 08' 05"	7° 34' 33"	1.0087949	15'51.26"	23° 26' 19"	0 m 30 s
22	160° 41' 17"	-0.64"	162° 10' 21"	7° 33' 38"	1.0087847	15'51.27"	23° 26' 19"	0 m 31 s
23	160° 43' 42"	-0.64"	162° 12' 36"	7° 32' 43"	1.0087744	15'51.28"	23° 26' 19"	0 m 32 s
24	160° 46' 08"	-0.64"	162° 14' 52"	7° 31' 48"	1.0087641	15'51.29"	23° 26' 19"	0 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	269° 05' 40"	-5° 11' 17"	268° 58' 21"	-28° 37' 24"	0° 55' 09"	15' 01.82"	268° 35' 46"	0.66564
1	269° 36' 25"	-5° 10' 44"	269° 33' 15"	-28° 37' 01"	0° 55' 11"	15' 02.21"	268° 19' 08"	0.66951
2	270° 07' 12"	-5° 10' 11"	270° 08' 11"	-28° 36' 29"	0° 55' 12"	15' 02.59"	268° 2' 29"	0.67336
3	270° 38' 01"	-5° 09' 35"	270° 43' 08"	-28° 35' 48"	0° 55' 14"	15' 02.98"	267° 45' 50"	0.67721
4	271° 08' 52"	-5° 08' 59"	271° 18' 06"	-28° 34' 59"	0° 55' 15"	15' 03.38"	267° 29' 11"	0.68105
5	271° 39' 44"	-5° 08' 21"	271° 53' 06"	-28° 34' 00"	0° 55' 17"	15' 03.77"	267° 12' 31"	0.68489
6	272° 10' 38"	-5° 07' 41"	272° 28' 08"	-28° 32' 52"	0° 55' 18"	15' 04.18"	266° 55' 51"	0.68871
7	272° 41' 34"	-5° 06' 59"	273° 03' 10"	-28° 31' 35"	0° 55' 20"	15' 04.58"	266° 39' 11"	0.69252
8	273° 12' 31"	-5° 06' 17"	273° 38' 14"	-28° 30' 10"	0° 55' 21"	15' 04.99"	266° 22' 30"	0.69633
9	273° 43' 30"	-5° 05' 32"	274° 13' 19"	-28° 28' 35"	0° 55' 23"	15' 05.41"	266° 5' 50"	0.70012
10	274° 14' 31"	-5° 04' 46"	274° 48' 24"	-28° 26' 50"	0° 55' 24"	15' 05.82"	265° 49' 11"	0.70391
11	274° 45' 33"	-5° 03' 59"	275° 23' 31"	-28° 24' 57"	0° 55' 26"	15' 06.24"	265° 32' 31"	0.70769
12	275° 16' 38"	-5° 03' 10"	275° 58' 38"	-28° 22' 55"	0° 55' 27"	15' 06.67"	265° 15' 52"	0.71145
13	275° 47' 44"	-5° 02' 20"	276° 33' 46"	-28° 20' 43"	0° 55' 29"	15' 07.10"	264° 59' 14"	0.71521
14	276° 18' 52"	-5° 01' 28"	277° 08' 55"	-28° 18' 23"	0° 55' 30"	15' 07.53"	264° 42' 36"	0.71895
15	276° 50' 02"	-5° 00' 34"	277° 44' 04"	-28° 15' 53"	0° 55' 32"	15' 07.96"	264° 25' 59"	0.72268
16	277° 21' 13"	-4° 59' 39"	278° 19' 13"	-28° 13' 14"	0° 55' 34"	15' 08.40"	264° 9' 24"	0.72641
17	277° 52' 27"	-4° 58' 43"	278° 54' 23"	-28° 10' 26"	0° 55' 35"	15' 08.85"	263° 52' 49"	0.73012
18	278° 23' 42"	-4° 57' 44"	279° 29' 34"	-28° 07' 29"	0° 55' 37"	15' 09.29"	263° 36' 15"	0.73382
19	278° 54' 59"	-4° 56' 45"	280° 04' 44"	-28° 04' 22"	0° 55' 39"	15' 09.74"	263° 19' 43"	0.73750
20	279° 26' 18"	-4° 55' 44"	280° 39' 55"	-28° 01' 07"	0° 55' 40"	15' 10.20"	263° 3' 13"	0.74118
21	279° 57' 39"	-4° 54' 41"	281° 15' 06"	-27° 57' 42"	0° 55' 42"	15' 10.65"	262° 46' 43"	0.74484
22	280° 29' 02"	-4° 53' 37"	281° 50' 17"	-27° 54' 08"	0° 55' 44"	15' 11.11"	262° 30' 16"	0.74848
23	281° 00' 27"	-4° 52' 31"	282° 25' 28"	-27° 50' 25"	0° 55' 45"	15' 11.58"	262° 13' 50"	0.75212
24	281° 31' 54"	-4° 51' 23"	283° 00' 38"	-27° 46' 33"	0° 55' 47"	15' 12.04"	261° 57' 27"	0.75574

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	160° 46' 08"	-0.64"	162° 14' 52"	7° 31' 48"	1.0087641	15'51.29"	23° 26' 19"	0 m 33 s
1	160° 48' 33"	-0.64"	162° 17' 07"	7° 30' 53"	1.0087539	15'51.30"	23° 26' 19"	0 m 33 s
2	160° 50' 58"	-0.63"	162° 19' 23"	7° 29' 58"	1.0087436	15'51.31"	23° 26' 19"	0 m 34 s
3	160° 53' 23"	-0.63"	162° 21' 38"	7° 29' 02"	1.0087333	15'51.32"	23° 26' 19"	0 m 35 s
4	160° 55' 48"	-0.63"	162° 23' 54"	7° 28' 07"	1.0087230	15'51.33"	23° 26' 19"	0 m 36 s
5	160° 58' 14"	-0.62"	162° 26' 10"	7° 27' 12"	1.0087127	15'51.34"	23° 26' 19"	0 m 37 s
6	161° 00' 39"	-0.62"	162° 28' 25"	7° 26' 17"	1.0087024	15'51.35"	23° 26' 19"	0 m 37 s
7	161° 03' 04"	-0.62"	162° 30' 41"	7° 25' 22"	1.0086921	15'51.36"	23° 26' 19"	0 m 38 s
8	161° 05' 29"	-0.62"	162° 32' 56"	7° 24' 27"	1.0086819	15'51.37"	23° 26' 19"	0 m 39 s
9	161° 07' 55"	-0.61"	162° 35' 12"	7° 23' 32"	1.0086716	15'51.38"	23° 26' 19"	0 m 40 s
10	161° 10' 20"	-0.61"	162° 37' 27"	7° 22' 37"	1.0086612	15'51.39"	23° 26' 19"	0 m 41 s
11	161° 12' 45"	-0.61"	162° 39' 43"	7° 21' 42"	1.0086509	15'51.40"	23° 26' 19"	0 m 42 s
12	161° 15' 11"	-0.60"	162° 41' 58"	7° 20' 47"	1.0086406	15'51.41"	23° 26' 19"	0 m 42 s
13	161° 17' 36"	-0.60"	162° 44' 14"	7° 19' 51"	1.0086303	15'51.42"	23° 26' 19"	0 m 43 s
14	161° 20' 01"	-0.60"	162° 46' 29"	7° 18' 56"	1.0086200	15'51.43"	23° 26' 19"	0 m 44 s
15	161° 22' 26"	-0.59"	162° 48' 45"	7° 18' 01"	1.0086097	15'51.44"	23° 26' 19"	0 m 45 s
16	161° 24' 52"	-0.59"	162° 51' 00"	7° 17' 06"	1.0085994	15'51.45"	23° 26' 19"	0 m 46 s
17	161° 27' 17"	-0.59"	162° 53' 16"	7° 16' 11"	1.0085890	15'51.46"	23° 26' 19"	0 m 46 s
18	161° 29' 42"	-0.58"	162° 55' 31"	7° 15' 15"	1.0085787	15'51.47"	23° 26' 19"	0 m 47 s
19	161° 32' 07"	-0.58"	162° 57' 46"	7° 14' 20"	1.0085684	15'51.48"	23° 26' 19"	0 m 48 s
20	161° 34' 33"	-0.57"	163° 00' 02"	7° 13' 25"	1.0085580	15'51.49"	23° 26' 19"	0 m 49 s
21	161° 36' 58"	-0.57"	163° 02' 17"	7° 12' 30"	1.0085477	15'51.50"	23° 26' 19"	0 m 50 s
22	161° 39' 23"	-0.57"	163° 04' 33"	7° 11' 34"	1.0085374	15'51.51"	23° 26' 19"	0 m 51 s
23	161° 41' 49"	-0.56"	163° 06' 48"	7° 10' 39"	1.0085270	15'51.52"	23° 26' 19"	0 m 51 s
24	161° 44' 14"	-0.56"	163° 09' 04"	7° 09' 44"	1.0085167	15'51.53"	23° 26' 19"	0 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	281° 31' 54"	-4° 51' 23"	283° 00' 38"	-27° 46' 33"	0° 55' 47"	15' 12.04"	261° 57' 27"	0.75574
1	282° 03' 23"	-4° 50' 15"	283° 35' 49"	-27° 42' 31"	0° 55' 49"	15' 12.51"	261° 41' 05"	0.75935
2	282° 34' 54"	-4° 49' 04"	284° 10' 59"	-27° 38' 20"	0° 55' 50"	15' 12.98"	261° 24' 45"	0.76294
3	283° 06' 26"	-4° 47' 52"	284° 46' 08"	-27° 34' 01"	0° 55' 52"	15' 13.46"	261° 8' 28"	0.76652
4	283° 38' 01"	-4° 46' 39"	285° 21' 17"	-27° 29' 32"	0° 55' 54"	15' 13.94"	260° 52' 13"	0.77008
5	284° 09' 38"	-4° 45' 24"	285° 56' 26"	-27° 24' 54"	0° 55' 56"	15' 14.42"	260° 36' 01"	0.77363
6	284° 41' 17"	-4° 44' 07"	286° 31' 34"	-27° 20' 06"	0° 55' 57"	15' 14.90"	260° 19' 51"	0.77717
7	285° 12' 58"	-4° 42' 49"	287° 06' 41"	-27° 15' 10"	0° 55' 59"	15' 15.39"	260° 3' 44"	0.78069
8	285° 44' 41"	-4° 41' 29"	287° 41' 48"	-27° 10' 05"	0° 56' 01"	15' 15.88"	259° 47' 40"	0.78419
9	286° 16' 26"	-4° 40' 08"	288° 16' 54"	-27° 04' 50"	0° 56' 03"	15' 16.37"	259° 31' 39"	0.78767
10	286° 48' 13"	-4° 38' 46"	288° 51' 59"	-26° 59' 27"	0° 56' 05"	15' 16.87"	259° 15' 41"	0.79114
11	287° 20' 02"	-4° 37' 22"	289° 27' 03"	-26° 53' 54"	0° 56' 06"	15' 17.37"	258° 59' 46"	0.79460
12	287° 51' 53"	-4° 35' 56"	290° 02' 05"	-26° 48' 12"	0° 56' 08"	15' 17.87"	258° 43' 54"	0.79803
13	288° 23' 46"	-4° 34' 29"	290° 37' 07"	-26° 42' 21"	0° 56' 10"	15' 18.37"	258° 28' 06"	0.80145
14	288° 55' 42"	-4° 32' 60"	291° 12' 08"	-26° 36' 22"	0° 56' 12"	15' 18.88"	258° 12' 21"	0.80485
15	289° 27' 40"	-4° 31' 30"	291° 47' 07"	-26° 30' 13"	0° 56' 14"	15' 19.38"	257° 56' 40"	0.80823
16	289° 59' 39"	-4° 29' 58"	292° 22' 05"	-26° 23' 55"	0° 56' 16"	15' 19.89"	257° 41' 02"	0.81160
17	290° 31' 41"	-4° 28' 25"	292° 57' 02"	-26° 17' 29"	0° 56' 18"	15' 20.41"	257° 25' 28"	0.81494
18	291° 03' 45"	-4° 26' 50"	293° 31' 57"	-26° 10' 53"	0° 56' 20"	15' 20.92"	257° 9' 59"	0.81827
19	291° 35' 52"	-4° 25' 14"	294° 06' 51"	-26° 04' 08"	0° 56' 21"	15' 21.44"	256° 54' 33"	0.82158
20	292° 08' 00"	-4° 23' 36"	294° 41' 43"	-25° 57' 15"	0° 56' 23"	15' 21.96"	256° 39' 11"	0.82486
21	292° 40' 11"	-4° 21' 56"	295° 16' 34"	-25° 50' 13"	0° 56' 25"	15' 22.48"	256° 23' 54"	0.82813
22	293° 12' 23"	-4° 20' 16"	295° 51' 23"	-25° 43' 02"	0° 56' 27"	15' 23.00"	256° 8' 40"	0.83138
23	293° 44' 38"	-4° 18' 33"	296° 26' 10"	-25° 35' 42"	0° 56' 29"	15' 23.53"	255° 53' 32"	0.83460
24	294° 16' 56"	-4° 16' 50"	297° 00' 56"	-25° 28' 13"	0° 56' 31"	15' 24.05"	255° 38' 27"	0.83781

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	161° 44' 14"	-0.56"	163° 09' 04"	7° 09' 44"	1.0085167	15'51.53"	23° 26' 19"	0 m 52 s
1	161° 46' 39"	-0.56"	163° 11' 19"	7° 08' 48"	1.0085063	15'51.54"	23° 26' 19"	0 m 53 s
2	161° 49' 04"	-0.55"	163° 13' 34"	7° 07' 53"	1.0084960	15'51.55"	23° 26' 19"	0 m 54 s
3	161° 51' 30"	-0.55"	163° 15' 50"	7° 06' 58"	1.0084856	15'51.56"	23° 26' 19"	0 m 55 s
4	161° 53' 55"	-0.54"	163° 18' 05"	7° 06' 02"	1.0084753	15'51.57"	23° 26' 19"	0 m 55 s
5	161° 56' 20"	-0.54"	163° 20' 21"	7° 05' 07"	1.0084649	15'51.57"	23° 26' 19"	0 m 56 s
6	161° 58' 46"	-0.54"	163° 22' 36"	7° 04' 12"	1.0084546	15'51.58"	23° 26' 19"	0 m 57 s
7	162° 01' 11"	-0.53"	163° 24' 51"	7° 03' 16"	1.0084442	15'51.59"	23° 26' 19"	0 m 58 s
8	162° 03' 36"	-0.53"	163° 27' 07"	7° 02' 21"	1.0084338	15'51.60"	23° 26' 19"	0 m 59 s
9	162° 06' 02"	-0.52"	163° 29' 22"	7° 01' 25"	1.0084235	15'51.61"	23° 26' 19"	0 m 60 s
10	162° 08' 27"	-0.52"	163° 31' 37"	7° 00' 30"	1.0084131	15'51.62"	23° 26' 19"	1 m 00 s
11	162° 10' 52"	-0.52"	163° 33' 53"	6° 59' 35"	1.0084027	15'51.63"	23° 26' 19"	1 m 01 s
12	162° 13' 18"	-0.51"	163° 36' 08"	6° 58' 39"	1.0083923	15'51.64"	23° 26' 19"	1 m 02 s
13	162° 15' 43"	-0.51"	163° 38' 23"	6° 57' 44"	1.0083819	15'51.65"	23° 26' 19"	1 m 03 s
14	162° 18' 08"	-0.50"	163° 40' 39"	6° 56' 48"	1.0083716	15'51.66"	23° 26' 19"	1 m 04 s
15	162° 20' 34"	-0.50"	163° 42' 54"	6° 55' 53"	1.0083612	15'51.67"	23° 26' 19"	1 m 05 s
16	162° 22' 59"	-0.49"	163° 45' 09"	6° 54' 57"	1.0083508	15'51.68"	23° 26' 19"	1 m 05 s
17	162° 25' 24"	-0.49"	163° 47' 25"	6° 54' 02"	1.0083404	15'51.69"	23° 26' 19"	1 m 06 s
18	162° 27' 50"	-0.48"	163° 49' 40"	6° 53' 06"	1.0083300	15'51.70"	23° 26' 19"	1 m 07 s
19	162° 30' 15"	-0.48"	163° 51' 55"	6° 52' 11"	1.0083196	15'51.71"	23° 26' 19"	1 m 08 s
20	162° 32' 40"	-0.48"	163° 54' 11"	6° 51' 15"	1.0083092	15'51.72"	23° 26' 19"	1 m 09 s
21	162° 35' 06"	-0.47"	163° 56' 26"	6° 50' 20"	1.0082988	15'51.73"	23° 26' 19"	1 m 10 s
22	162° 37' 31"	-0.47"	163° 58' 41"	6° 49' 24"	1.0082884	15'51.74"	23° 26' 19"	1 m 10 s
23	162° 39' 56"	-0.46"	164° 00' 56"	6° 48' 28"	1.0082780	15'51.75"	23° 26' 19"	1 m 11 s
24	162° 42' 22"	-0.46"	164° 03' 12"	6° 47' 33"	1.0082676	15'51.76"	23° 26' 19"	1 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	294° 16' 56"	-4° 16' 50"	297° 00' 56"	-25° 28' 13"	0° 56' 31"	15' 24.05"	255° 38' 27"	0.83781
1	294° 49' 15"	-4° 15' 04"	297° 35' 39"	-25° 20' 36"	0° 56' 33"	15' 24.58"	255° 23' 28"	0.84099
2	295° 21' 37"	-4° 13' 18"	298° 10' 21"	-25° 12' 50"	0° 56' 35"	15' 25.11"	255° 8' 32"	0.84416
3	295° 54' 01"	-4° 11' 29"	298° 45' 01"	-25° 04' 55"	0° 56' 37"	15' 25.64"	254° 53' 42"	0.84730
4	296° 26' 27"	-4° 09' 40"	299° 19' 39"	-24° 56' 52"	0° 56' 39"	15' 26.18"	254° 38' 57"	0.85042
5	296° 58' 55"	-4° 07' 49"	299° 54' 15"	-24° 48' 40"	0° 56' 41"	15' 26.71"	254° 24' 16"	0.85351
6	297° 31' 26"	-4° 05' 56"	300° 28' 49"	-24° 40' 19"	0° 56' 43"	15' 27.25"	254° 9' 40"	0.85659
7	298° 03' 59"	-4° 04' 02"	301° 03' 21"	-24° 31' 50"	0° 56' 45"	15' 27.79"	253° 55' 10"	0.85964
8	298° 36' 34"	-4° 02' 06"	301° 37' 50"	-24° 23' 13"	0° 56' 47"	15' 28.33"	253° 40' 45"	0.86267
9	299° 09' 12"	-4° 00' 09"	302° 12' 18"	-24° 14' 27"	0° 56' 49"	15' 28.87"	253° 26' 25"	0.86567
10	299° 41' 51"	-3° 58' 11"	302° 46' 43"	-24° 05' 32"	0° 56' 51"	15' 29.41"	253° 12' 10"	0.86865
11	300° 14' 33"	-3° 56' 11"	303° 21' 06"	-23° 56' 29"	0° 56' 53"	15' 29.95"	252° 58' 00"	0.87160
12	300° 47' 18"	-3° 54' 10"	303° 55' 27"	-23° 47' 18"	0° 56' 55"	15' 30.49"	252° 43' 56"	0.87453
13	301° 20' 04"	-3° 52' 07"	304° 29' 45"	-23° 37' 59"	0° 56' 57"	15' 31.04"	252° 29' 58"	0.87744
14	301° 52' 53"	-3° 50' 03"	305° 04' 01"	-23° 28' 31"	0° 56' 59"	15' 31.59"	252° 16' 05"	0.88032
15	302° 25' 45"	-3° 47' 57"	305° 38' 15"	-23° 18' 55"	0° 57' 01"	15' 32.13"	252° 2' 18"	0.88317
16	302° 58' 38"	-3° 45' 50"	306° 12' 26"	-23° 09' 11"	0° 57' 03"	15' 32.68"	251° 48' 37"	0.88600
17	303° 31' 34"	-3° 43' 42"	306° 46' 35"	-22° 59' 19"	0° 57' 05"	15' 33.23"	251° 35' 01"	0.88880
18	304° 04' 32"	-3° 41' 32"	307° 20' 42"	-22° 49' 19"	0° 57' 07"	15' 33.78"	251° 21' 31"	0.89157
19	304° 37' 33"	-3° 39' 21"	307° 54' 46"	-22° 39' 11"	0° 57' 09"	15' 34.32"	251° 8' 07"	0.89432
20	305° 10' 35"	-3° 37' 09"	308° 28' 47"	-22° 28' 55"	0° 57' 11"	15' 34.87"	250° 54' 49"	0.89704
21	305° 43' 40"	-3° 34' 55"	309° 02' 46"	-22° 18' 31"	0° 57' 13"	15' 35.42"	250° 41' 37"	0.89973
22	306° 16' 48"	-3° 32' 39"	309° 36' 42"	-22° 07' 59"	0° 57' 15"	15' 35.97"	250° 28' 31"	0.90239
23	306° 49' 58"	-3° 30' 23"	310° 10' 36"	-21° 57' 19"	0° 57' 17"	15' 36.52"	250° 15' 31"	0.90503
24	307° 23' 10"	-3° 28' 05"	310° 44' 27"	-21° 46' 32"	0° 57' 19"	15' 37.07"	250° 2' 38"	0.90763

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	162° 42' 22"	-0.46"	164° 03' 12"	6° 47' 33"	1.0082676	15'51.76"	23° 26' 19"	1 m 12 s
1	162° 44' 47"	-0.45"	164° 05' 27"	6° 46' 37"	1.0082572	15'51.77"	23° 26' 19"	1 m 13 s
2	162° 47' 12"	-0.45"	164° 07' 42"	6° 45' 42"	1.0082468	15'51.78"	23° 26' 19"	1 m 14 s
3	162° 49' 38"	-0.44"	164° 09' 57"	6° 44' 46"	1.0082364	15'51.79"	23° 26' 19"	1 m 15 s
4	162° 52' 03"	-0.44"	164° 12' 13"	6° 43' 50"	1.0082259	15'51.80"	23° 26' 19"	1 m 15 s
5	162° 54' 29"	-0.43"	164° 14' 28"	6° 42' 55"	1.0082155	15'51.81"	23° 26' 19"	1 m 16 s
6	162° 56' 54"	-0.43"	164° 16' 43"	6° 41' 59"	1.0082051	15'51.82"	23° 26' 19"	1 m 17 s
7	162° 59' 19"	-0.42"	164° 18' 58"	6° 41' 03"	1.0081947	15'51.83"	23° 26' 19"	1 m 18 s
8	163° 01' 45"	-0.42"	164° 21' 14"	6° 40' 08"	1.0081843	15'51.84"	23° 26' 19"	1 m 19 s
9	163° 04' 10"	-0.41"	164° 23' 29"	6° 39' 12"	1.0081738	15'51.85"	23° 26' 19"	1 m 20 s
10	163° 06' 35"	-0.41"	164° 25' 44"	6° 38' 16"	1.0081634	15'51.86"	23° 26' 19"	1 m 20 s
11	163° 09' 01"	-0.40"	164° 27' 59"	6° 37' 21"	1.0081530	15'51.87"	23° 26' 19"	1 m 21 s
12	163° 11' 26"	-0.40"	164° 30' 14"	6° 36' 25"	1.0081425	15'51.88"	23° 26' 19"	1 m 22 s
13	163° 13' 52"	-0.39"	164° 32' 30"	6° 35' 29"	1.0081321	15'51.89"	23° 26' 19"	1 m 23 s
14	163° 16' 17"	-0.39"	164° 34' 45"	6° 34' 34"	1.0081217	15'51.90"	23° 26' 19"	1 m 24 s
15	163° 18' 42"	-0.38"	164° 36' 60"	6° 33' 38"	1.0081112	15'51.91"	23° 26' 19"	1 m 25 s
16	163° 21' 08"	-0.38"	164° 39' 15"	6° 32' 42"	1.0081008	15'51.92"	23° 26' 19"	1 m 25 s
17	163° 23' 33"	-0.37"	164° 41' 30"	6° 31' 46"	1.0080903	15'51.93"	23° 26' 19"	1 m 26 s
18	163° 25' 59"	-0.37"	164° 43' 45"	6° 30' 50"	1.0080799	15'51.94"	23° 26' 19"	1 m 27 s
19	163° 28' 24"	-0.36"	164° 46' 00"	6° 29' 55"	1.0080694	15'51.95"	23° 26' 19"	1 m 28 s
20	163° 30' 49"	-0.36"	164° 48' 16"	6° 28' 59"	1.0080590	15'51.96"	23° 26' 19"	1 m 29 s
21	163° 33' 15"	-0.35"	164° 50' 31"	6° 28' 03"	1.0080485	15'51.97"	23° 26' 19"	1 m 30 s
22	163° 35' 40"	-0.35"	164° 52' 46"	6° 27' 07"	1.0080381	15'51.98"	23° 26' 19"	1 m 31 s
23	163° 38' 06"	-0.34"	164° 55' 01"	6° 26' 11"	1.0080276	15'51.99"	23° 26' 19"	1 m 31 s
24	163° 40' 31"	-0.34"	164° 57' 16"	6° 25' 16"	1.0080171	15'52.00"	23° 26' 19"	1 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	307° 23' 10"	-3° 28' 05"	310° 44' 27"	-21° 46' 32"	0° 57' 19"	15' 37.07"	250° 2' 38"	0.90763
1	307° 56' 24"	-3° 25' 45"	311° 18' 16"	-21° 35' 37"	0° 57' 21"	15' 37.63"	249° 49' 50"	0.91021
2	308° 29' 41"	-3° 23' 25"	311° 52' 02"	-21° 24' 34"	0° 57' 23"	15' 38.18"	249° 37' 09"	0.91276
3	309° 02' 60"	-3° 21' 03"	312° 25' 45"	-21° 13' 23"	0° 57' 25"	15' 38.73"	249° 24' 33"	0.91527
4	309° 36' 21"	-3° 18' 40"	312° 59' 26"	-21° 02' 06"	0° 57' 27"	15' 39.28"	249° 12' 04"	0.91776
5	310° 09' 45"	-3° 16' 15"	313° 33' 04"	-20° 50' 40"	0° 57' 29"	15' 39.83"	248° 59' 42"	0.92022
6	310° 43' 11"	-3° 13' 49"	314° 06' 40"	-20° 39' 07"	0° 57' 31"	15' 40.38"	248° 47' 25"	0.92264
7	311° 16' 39"	-3° 11' 22"	314° 40' 13"	-20° 27' 27"	0° 57' 33"	15' 40.93"	248° 35' 15"	0.92504
8	311° 50' 10"	-3° 08' 54"	315° 13' 43"	-20° 15' 40"	0° 57' 35"	15' 41.47"	248° 23' 12"	0.92740
9	312° 23' 43"	-3° 06' 24"	315° 47' 11"	-20° 03' 45"	0° 57' 37"	15' 42.02"	248° 11' 14"	0.92973
10	312° 57' 18"	-3° 03' 53"	316° 20' 36"	-19° 51' 43"	0° 57' 39"	15' 42.57"	247° 59' 23"	0.93203
11	313° 30' 56"	-3° 01' 21"	316° 53' 58"	-19° 39' 34"	0° 57' 41"	15' 43.12"	247° 47' 38"	0.93429
12	314° 04' 36"	-2° 58' 48"	317° 27' 18"	-19° 27' 18"	0° 57' 43"	15' 43.66"	247° 35' 60"	0.93653
13	314° 38' 18"	-2° 56' 13"	318° 00' 35"	-19° 14' 55"	0° 57' 45"	15' 44.21"	247° 24' 28"	0.93873
14	315° 12' 03"	-2° 53' 37"	318° 33' 49"	-19° 02' 25"	0° 57' 47"	15' 44.75"	247° 13' 02"	0.94089
15	315° 45' 50"	-2° 51' 00"	319° 07' 01"	-18° 49' 49"	0° 57' 49"	15' 45.30"	247° 1' 42"	0.94303
16	316° 19' 39"	-2° 48' 22"	319° 40' 11"	-18° 37' 05"	0° 57' 51"	15' 45.84"	246° 50' 29"	0.94513
17	316° 53' 30"	-2° 45' 42"	320° 13' 17"	-18° 24' 15"	0° 57' 53"	15' 46.38"	246° 39' 22"	0.94719
18	317° 27' 24"	-2° 43' 02"	320° 46' 21"	-18° 11' 18"	0° 57' 55"	15' 46.92"	246° 28' 21"	0.94922
19	318° 01' 20"	-2° 40' 20"	321° 19' 23"	-17° 58' 14"	0° 57' 57"	15' 47.46"	246° 17' 26"	0.95121
20	318° 35' 18"	-2° 37' 37"	321° 52' 22"	-17° 45' 04"	0° 57' 59"	15' 47.99"	246° 6' 37"	0.95317
21	319° 09' 19"	-2° 34' 54"	322° 25' 19"	-17° 31' 48"	0° 58' 01"	15' 48.53"	245° 55' 54"	0.95509
22	319° 43' 22"	-2° 32' 09"	322° 58' 13"	-17° 18' 25"	0° 58' 03"	15' 49.06"	245° 45' 16"	0.95698
23	320° 17' 27"	-2° 29' 22"	323° 31' 04"	-17° 04' 56"	0° 58' 05"	15' 49.60"	245° 34' 45"	0.95883
24	320° 51' 34"	-2° 26' 35"	324° 03' 53"	-16° 51' 20"	0° 58' 07"	15' 50.13"	245° 24' 19"	0.96064

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	163° 40' 31"	-0.34"	164° 57' 16"	6° 25' 16"	1.0080171	15'52.00"	23° 26' 19"	1 m 32 s
1	163° 42' 56"	-0.33"	164° 59' 31"	6° 24' 20"	1.0080067	15'52.01"	23° 26' 19"	1 m 33 s
2	163° 45' 22"	-0.33"	165° 01' 46"	6° 23' 24"	1.0079962	15'52.02"	23° 26' 19"	1 m 34 s
3	163° 47' 47"	-0.32"	165° 04' 01"	6° 22' 28"	1.0079858	15'52.03"	23° 26' 19"	1 m 35 s
4	163° 50' 13"	-0.32"	165° 06' 17"	6° 21' 32"	1.0079753	15'52.04"	23° 26' 19"	1 m 36 s
5	163° 52' 38"	-0.31"	165° 08' 32"	6° 20' 36"	1.0079648	15'52.05"	23° 26' 19"	1 m 36 s
6	163° 55' 04"	-0.31"	165° 10' 47"	6° 19' 40"	1.0079544	15'52.06"	23° 26' 19"	1 m 37 s
7	163° 57' 29"	-0.30"	165° 13' 02"	6° 18' 44"	1.0079439	15'52.07"	23° 26' 19"	1 m 38 s
8	163° 59' 55"	-0.29"	165° 15' 17"	6° 17' 48"	1.0079334	15'52.08"	23° 26' 19"	1 m 39 s
9	164° 02' 20"	-0.29"	165° 17' 32"	6° 16' 52"	1.0079229	15'52.09"	23° 26' 19"	1 m 40 s
10	164° 04' 45"	-0.28"	165° 19' 47"	6° 15' 56"	1.0079125	15'52.10"	23° 26' 19"	1 m 41 s
11	164° 07' 11"	-0.28"	165° 22' 02"	6° 15' 00"	1.0079020	15'52.11"	23° 26' 19"	1 m 42 s
12	164° 09' 36"	-0.27"	165° 24' 17"	6° 14' 05"	1.0078915	15'52.12"	23° 26' 19"	1 m 42 s
13	164° 12' 02"	-0.27"	165° 26' 32"	6° 13' 09"	1.0078810	15'52.13"	23° 26' 19"	1 m 43 s
14	164° 14' 27"	-0.26"	165° 28' 47"	6° 12' 13"	1.0078705	15'52.14"	23° 26' 19"	1 m 44 s
15	164° 16' 53"	-0.26"	165° 31' 02"	6° 11' 17"	1.0078600	15'52.15"	23° 26' 19"	1 m 45 s
16	164° 19' 18"	-0.25"	165° 33' 17"	6° 10' 20"	1.0078496	15'52.16"	23° 26' 19"	1 m 46 s
17	164° 21' 44"	-0.24"	165° 35' 32"	6° 09' 24"	1.0078391	15'52.17"	23° 26' 19"	1 m 47 s
18	164° 24' 09"	-0.24"	165° 37' 47"	6° 08' 28"	1.0078286	15'52.18"	23° 26' 19"	1 m 47 s
19	164° 26' 35"	-0.23"	165° 40' 02"	6° 07' 32"	1.0078181	15'52.19"	23° 26' 19"	1 m 48 s
20	164° 29' 00"	-0.23"	165° 42' 17"	6° 06' 36"	1.0078076	15'52.20"	23° 26' 19"	1 m 49 s
21	164° 31' 26"	-0.22"	165° 44' 32"	6° 05' 40"	1.0077971	15'52.21"	23° 26' 19"	1 m 50 s
22	164° 33' 51"	-0.22"	165° 46' 47"	6° 04' 44"	1.0077866	15'52.22"	23° 26' 19"	1 m 51 s
23	164° 36' 16"	-0.21"	165° 49' 02"	6° 03' 48"	1.0077761	15'52.23"	23° 26' 19"	1 m 52 s
24	164° 38' 42"	-0.21"	165° 51' 17"	6° 02' 52"	1.0077656	15'52.24"	23° 26' 19"	1 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	320° 51' 34"	-2° 26' 35"	324° 03' 53"	-16° 51' 20"	0° 58' 07"	15' 50.13"	245° 24' 19"	0.96064
1	321° 25' 44"	-2° 23' 47"	324° 36' 40"	-16° 37' 39"	0° 58' 09"	15' 50.66"	245° 13' 58"	0.96242
2	321° 59' 56"	-2° 20' 58"	325° 09' 24"	-16° 23' 51"	0° 58' 11"	15' 51.18"	245° 3' 43"	0.96416
3	322° 34' 10"	-2° 18' 07"	325° 42' 06"	-16° 09' 57"	0° 58' 13"	15' 51.71"	244° 53' 32"	0.96586
4	323° 08' 27"	-2° 15' 16"	326° 14' 46"	-15° 55' 57"	0° 58' 14"	15' 52.23"	244° 43' 27"	0.96753
5	323° 42' 45"	-2° 12' 23"	326° 47' 23"	-15° 41' 52"	0° 58' 16"	15' 52.75"	244° 33' 26"	0.96915
6	324° 17' 06"	-2° 09' 30"	327° 19' 58"	-15° 27' 41"	0° 58' 18"	15' 53.27"	244° 23' 30"	0.97074
7	324° 51' 29"	-2° 06' 36"	327° 52' 30"	-15° 13' 23"	0° 58' 20"	15' 53.78"	244° 13' 38"	0.97229
8	325° 25' 54"	-2° 03' 40"	328° 25' 01"	-14° 59' 01"	0° 58' 22"	15' 54.30"	244° 3' 49"	0.97380
9	326° 00' 21"	-2° 00' 44"	328° 57' 29"	-14° 44' 32"	0° 58' 24"	15' 54.81"	243° 54' 04"	0.97526
10	326° 34' 51"	-1° 57' 47"	329° 29' 55"	-14° 29' 59"	0° 58' 26"	15' 55.32"	243° 44' 22"	0.97669
11	327° 09' 23"	-1° 54' 49"	330° 02' 19"	-14° 15' 19"	0° 58' 28"	15' 55.82"	243° 34' 42"	0.97808
12	327° 43' 57"	-1° 51' 50"	330° 34' 41"	-14° 00' 35"	0° 58' 29"	15' 56.32"	243° 25' 04"	0.97943
13	328° 18' 33"	-1° 48' 50"	331° 07' 01"	-13° 45' 45"	0° 58' 31"	15' 56.82"	243° 15' 27"	0.98074
14	328° 53' 11"	-1° 45' 49"	331° 39' 18"	-13° 30' 50"	0° 58' 33"	15' 57.32"	243° 5' 51"	0.98201
15	329° 27' 51"	-1° 42' 48"	332° 11' 34"	-13° 15' 50"	0° 58' 35"	15' 57.82"	242° 56' 14"	0.98324
16	330° 02' 33"	-1° 39' 46"	332° 43' 48"	-13° 00' 45"	0° 58' 37"	15' 58.31"	242° 46' 35"	0.98442
17	330° 37' 18"	-1° 36' 42"	333° 15' 60"	-12° 45' 35"	0° 58' 39"	15' 58.80"	242° 36' 55"	0.98557
18	331° 12' 04"	-1° 33' 38"	333° 48' 10"	-12° 30' 20"	0° 58' 40"	15' 59.28"	242° 27' 10"	0.98667
19	331° 46' 53"	-1° 30' 34"	334° 20' 18"	-12° 15' 00"	0° 58' 42"	15' 59.76"	242° 17' 19"	0.98773
20	332° 21' 44"	-1° 27' 28"	334° 52' 25"	-11° 59' 36"	0° 58' 44"	16' 00.24"	242° 7' 21"	0.98875
21	332° 56' 36"	-1° 24' 22"	335° 24' 30"	-11° 44' 07"	0° 58' 46"	16' 00.72"	241° 57' 13"	0.98972
22	333° 31' 31"	-1° 21' 15"	335° 56' 33"	-11° 28' 34"	0° 58' 47"	16' 01.19"	241° 46' 53"	0.99066
23	334° 06' 28"	-1° 18' 07"	336° 28' 35"	-11° 12' 56"	0° 58' 49"	16' 01.66"	241° 36' 17"	0.99155
24	334° 41' 27"	-1° 14' 59"	337° 00' 35"	-10° 57' 14"	0° 58' 51"	16' 02.12"	241° 25' 21"	0.99239

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	164° 38' 42"	-0.21"	165° 51' 17"	6° 02' 52"	1.0077656	15'52.24"	23° 26' 19"	1 m 53 s
1	164° 41' 07"	-0.20"	165° 53' 32"	6° 01' 56"	1.0077551	15'52.25"	23° 26' 19"	1 m 53 s
2	164° 43' 33"	-0.19"	165° 55' 47"	6° 00' 60"	1.0077446	15'52.26"	23° 26' 19"	1 m 54 s
3	164° 45' 58"	-0.19"	165° 58' 02"	6° 00' 04"	1.0077341	15'52.27"	23° 26' 19"	1 m 55 s
4	164° 48' 24"	-0.18"	166° 00' 17"	5° 59' 07"	1.0077236	15'52.28"	23° 26' 19"	1 m 56 s
5	164° 50' 49"	-0.18"	166° 02' 32"	5° 58' 11"	1.0077131	15'52.28"	23° 26' 19"	1 m 57 s
6	164° 53' 15"	-0.17"	166° 04' 47"	5° 57' 15"	1.0077026	15'52.29"	23° 26' 19"	1 m 58 s
7	164° 55' 40"	-0.17"	166° 07' 02"	5° 56' 19"	1.0076920	15'52.30"	23° 26' 19"	1 m 59 s
8	164° 58' 06"	-0.16"	166° 09' 17"	5° 55' 23"	1.0076815	15'52.31"	23° 26' 19"	1 m 59 s
9	165° 00' 32"	-0.15"	166° 11' 32"	5° 54' 27"	1.0076710	15'52.32"	23° 26' 19"	2 m 00 s
10	165° 02' 57"	-0.15"	166° 13' 47"	5° 53' 30"	1.0076605	15'52.33"	23° 26' 19"	2 m 01 s
11	165° 05' 23"	-0.14"	166° 16' 02"	5° 52' 34"	1.0076500	15'52.34"	23° 26' 19"	2 m 02 s
12	165° 07' 48"	-0.14"	166° 18' 17"	5° 51' 38"	1.0076395	15'52.35"	23° 26' 19"	2 m 03 s
13	165° 10' 14"	-0.13"	166° 20' 32"	5° 50' 42"	1.0076289	15'52.36"	23° 26' 19"	2 m 04 s
14	165° 12' 39"	-0.13"	166° 22' 46"	5° 49' 45"	1.0076184	15'52.37"	23° 26' 19"	2 m 05 s
15	165° 15' 05"	-0.12"	166° 25' 01"	5° 48' 49"	1.0076079	15'52.38"	23° 26' 19"	2 m 05 s
16	165° 17' 30"	-0.12"	166° 27' 16"	5° 47' 53"	1.0075974	15'52.39"	23° 26' 19"	2 m 06 s
17	165° 19' 56"	-0.11"	166° 29' 31"	5° 46' 57"	1.0075869	15'52.40"	23° 26' 19"	2 m 07 s
18	165° 22' 21"	-0.10"	166° 31' 46"	5° 46' 00"	1.0075763	15'52.41"	23° 26' 19"	2 m 08 s
19	165° 24' 47"	-0.10"	166° 34' 01"	5° 45' 04"	1.0075658	15'52.42"	23° 26' 19"	2 m 09 s
20	165° 27' 12"	-0.09"	166° 36' 16"	5° 44' 08"	1.0075553	15'52.43"	23° 26' 19"	2 m 10 s
21	165° 29' 38"	-0.09"	166° 38' 31"	5° 43' 11"	1.0075447	15'52.44"	23° 26' 19"	2 m 11 s
22	165° 32' 03"	-0.08"	166° 40' 46"	5° 42' 15"	1.0075342	15'52.45"	23° 26' 19"	2 m 11 s
23	165° 34' 29"	-0.08"	166° 43' 01"	5° 41' 19"	1.0075237	15'52.46"	23° 26' 19"	2 m 12 s
24	165° 36' 55"	-0.07"	166° 45' 15"	5° 40' 22"	1.0075131	15'52.47"	23° 26' 19"	2 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	334° 41' 27"	-1° 14' 59"	337° 00' 35"	-10° 57' 14"	0° 58' 51"	16' 02.12"	241° 25' 21"	0.99239
1	335° 16' 27"	-1° 11' 50"	337° 32' 33"	-10° 41' 27"	0° 58' 52"	16' 02.58"	241° 14' 00"	0.99320
2	335° 51' 30"	-1° 08' 41"	338° 04' 30"	-10° 25' 36"	0° 58' 54"	16' 03.04"	241° 2' 08"	0.99396
3	336° 26' 35"	-1° 05' 30"	338° 36' 26"	-10° 09' 42"	0° 58' 56"	16' 03.49"	240° 49' 38"	0.99467
4	337° 01' 41"	-1° 02' 20"	339° 08' 20"	-9° 53' 43"	0° 58' 57"	16' 03.94"	240° 36' 18"	0.99534
5	337° 36' 50"	0°-59' 08"	339° 40' 13"	-9° 37' 40"	0° 58' 59"	16' 04.39"	240° 21' 57"	0.99597
6	338° 12' 00"	0°-55' 56"	340° 12' 05"	-9° 21' 34"	0° 59' 01"	16' 04.83"	240° 6' 16"	0.99655
7	338° 47' 13"	0°-52' 44"	340° 43' 56"	-9° 05' 23"	0° 59' 02"	16' 05.26"	239° 48' 52"	0.99709
8	339° 22' 27"	0°-49' 31"	341° 15' 45"	-8° 49' 09"	0° 59' 04"	16' 05.70"	239° 29' 12"	0.99758
9	339° 57' 43"	0°-46' 17"	341° 47' 33"	-8° 32' 52"	0° 59' 05"	16' 06.13"	239° 6' 30"	0.99803
10	340° 33' 01"	0°-43' 04"	342° 19' 21"	-8° 16' 31"	0° 59' 07"	16' 06.55"	238° 39' 35"	0.99843
11	341° 08' 21"	0°-39' 49"	342° 51' 07"	-8° 00' 07"	0° 59' 09"	16' 06.97"	238° 6' 39"	0.99878
12	341° 43' 42"	0°-36' 34"	343° 22' 53"	-7° 43' 39"	0° 59' 10"	16' 07.39"	237° 24' 44"	0.99910
13	342° 19' 06"	0°-33' 19"	343° 54' 37"	-7° 27' 08"	0° 59' 12"	16' 07.80"	236° 28' 38"	0.99936
14	342° 54' 31"	0°-30' 04"	344° 26' 21"	-7° 10' 34"	0° 59' 13"	16' 08.20"	235° 8' 16"	0.99958
15	343° 29' 58"	0°-26' 48"	344° 58' 05"	-6° 53' 57"	0° 59' 15"	16' 08.60"	233° 1' 16"	0.99975
16	344° 05' 27"	0°-23' 34"	345° 29' 48"	-6° 37' 19"	0° 59' 16"	16' 09.00"	229° 4' 56"	0.99988
17	344° 40' 57"	0°-20' 17"	346° 01' 30"	-6° 20' 37"	0° 59' 17"	16' 09.39"	219° 22' 54"	0.99996
18	345° 16' 29"	0°-17' 00"	346° 33' 12"	-6° 03' 51"	0° 59' 19"	16' 09.78"	174° 12' 17"	0.99999
19	345° 52' 03"	0°-13' 43"	347° 04' 52"	-5° 47' 03"	0° 59' 20"	16' 10.16"	93° 20' 17"	0.99998
20	346° 27' 38"	0°-10' 26"	347° 36' 33"	-5° 30' 13"	0° 59' 22"	16' 10.54"	76° 49' 30"	0.99992
21	347° 03' 15"	0° -7' 08"	348° 08' 13"	-5° 13' 20"	0° 59' 23"	16' 10.91"	71° 25' 08"	0.99981
22	347° 38' 53"	0° -3' 51"	348° 39' 53"	-4° 56' 24"	0° 59' 24"	16' 11.28"	68° 46' 12"	0.99966
23	348° 14' 34"	0° 00'-33"	349° 11' 33"	-4° 39' 26"	0° 59' 26"	16' 11.64"	67° 11' 40"	0.99946
24	348° 50' 15"	0° 02' 46"	349° 43' 13"	-4° 22' 27"	0° 59' 27"	16' 12.00"	66° 8' 44"	0.99921

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	165° 36' 55"	-0.07"	166° 45' 15"	5° 40' 22"	1.0075131	15'52.47"	23° 26' 19"	2 m 13 s
1	165° 39' 20"	-0.06"	166° 47' 30"	5° 39' 26"	1.0075026	15'52.48"	23° 26' 19"	2 m 14 s
2	165° 41' 46"	-0.06"	166° 49' 45"	5° 38' 30"	1.0074921	15'52.49"	23° 26' 19"	2 m 15 s
3	165° 44' 11"	-0.05"	166° 51' 60"	5° 37' 33"	1.0074815	15'52.50"	23° 26' 19"	2 m 16 s
4	165° 46' 37"	-0.05"	166° 54' 15"	5° 36' 37"	1.0074710	15'52.51"	23° 26' 19"	2 m 17 s
5	165° 49' 02"	-0.04"	166° 56' 30"	5° 35' 41"	1.0074604	15'52.52"	23° 26' 19"	2 m 17 s
6	165° 51' 28"	-0.04"	166° 58' 45"	5° 34' 44"	1.0074499	15'52.53"	23° 26' 19"	2 m 18 s
7	165° 53' 54"	-0.03"	167° 00' 59"	5° 33' 48"	1.0074393	15'52.54"	23° 26' 19"	2 m 19 s
8	165° 56' 19"	-0.02"	167° 03' 14"	5° 32' 51"	1.0074288	15'52.55"	23° 26' 19"	2 m 20 s
9	165° 58' 45"	-0.02"	167° 05' 29"	5° 31' 55"	1.0074183	15'52.56"	23° 26' 19"	2 m 21 s
10	166° 01' 10"	-0.01"	167° 07' 44"	5° 30' 58"	1.0074077	15'52.57"	23° 26' 19"	2 m 22 s
11	166° 03' 36"	-0.01"	167° 09' 59"	5° 30' 02"	1.0073972	15'52.58"	23° 26' 19"	2 m 23 s
12	166° 06' 02"	-0.00"	167° 12' 13"	5° 29' 05"	1.0073866	15'52.59"	23° 26' 19"	2 m 23 s
13	166° 08' 27"	0.00"	167° 14' 28"	5° 28' 09"	1.0073761	15'52.60"	23° 26' 19"	2 m 24 s
14	166° 10' 53"	0.01"	167° 16' 43"	5° 27' 13"	1.0073655	15'52.61"	23° 26' 19"	2 m 25 s
15	166° 13' 18"	0.01"	167° 18' 58"	5° 26' 16"	1.0073549	15'52.62"	23° 26' 19"	2 m 26 s
16	166° 15' 44"	0.02"	167° 21' 13"	5° 25' 20"	1.0073444	15'52.63"	23° 26' 19"	2 m 27 s
17	166° 18' 10"	0.03"	167° 23' 27"	5° 24' 23"	1.0073338	15'52.64"	23° 26' 19"	2 m 28 s
18	166° 20' 35"	0.03"	167° 25' 42"	5° 23' 26"	1.0073233	15'52.65"	23° 26' 19"	2 m 29 s
19	166° 23' 01"	0.04"	167° 27' 57"	5° 22' 30"	1.0073127	15'52.66"	23° 26' 19"	2 m 29 s
20	166° 25' 26"	0.04"	167° 30' 12"	5° 21' 33"	1.0073022	15'52.67"	23° 26' 19"	2 m 30 s
21	166° 27' 52"	0.05"	167° 32' 27"	5° 20' 37"	1.0072916	15'52.68"	23° 26' 19"	2 m 31 s
22	166° 30' 18"	0.05"	167° 34' 41"	5° 19' 40"	1.0072810	15'52.69"	23° 26' 19"	2 m 32 s
23	166° 32' 43"	0.06"	167° 36' 56"	5° 18' 44"	1.0072705	15'52.70"	23° 26' 19"	2 m 33 s
24	166° 35' 09"	0.06"	167° 39' 11"	5° 17' 47"	1.0072599	15'52.71"	23° 26' 19"	2 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	348° 50' 15"	0° 02' 46"	349° 43' 13"	-4° 22' 27"	0° 59' 27"	16' 12.00"	66° 8' 44"	0.99921
1	349° 25' 59"	0° 06' 04"	350° 14' 52"	-4° 05' 25"	0° 59' 28"	16' 12.35"	65° 23' 39"	0.99892
2	350° 01' 44"	0° 09' 22"	350° 46' 32"	-3° 48' 21"	0° 59' 30"	16' 12.70"	64° 49' 39"	0.99858
3	350° 37' 30"	0° 12' 41"	351° 18' 11"	-3° 31' 15"	0° 59' 31"	16' 13.04"	64° 23' 01"	0.99819
4	351° 13' 18"	0° 15' 59"	351° 49' 51"	-3° 14' 07"	0° 59' 32"	16' 13.38"	64° 1' 34"	0.99775
5	351° 49' 07"	0° 19' 18"	352° 21' 31"	-2° 56' 58"	0° 59' 33"	16' 13.71"	63° 43' 53"	0.99726
6	352° 24' 58"	0° 22' 36"	352° 53' 11"	-2° 39' 47"	0° 59' 34"	16' 14.04"	63° 29' 05"	0.99673
7	353° 00' 50"	0° 25' 55"	353° 24' 52"	-2° 22' 35"	0° 59' 36"	16' 14.36"	63° 16' 30"	0.99615
8	353° 36' 43"	0° 29' 13"	353° 56' 33"	-2° 05' 21"	0° 59' 37"	16' 14.67"	63° 5' 42"	0.99553
9	354° 12' 38"	0° 32' 31"	354° 28' 14"	-1° 48' 06"	0° 59' 38"	16' 14.98"	62° 56' 22"	0.99485
10	354° 48' 35"	0° 35' 50"	354° 59' 56"	-1° 30' 50"	0° 59' 39"	16' 15.28"	62° 48' 14"	0.99413
11	355° 24' 32"	0° 39' 08"	355° 31' 39"	-1° 13' 33"	0° 59' 40"	16' 15.58"	62° 41' 07"	0.99336
12	356° 00' 31"	0° 42' 26"	356° 03' 23"	0°-56' 15"	0° 59' 41"	16' 15.87"	62° 34' 52"	0.99254
13	356° 36' 31"	0° 45' 44"	356° 35' 07"	0°-38' 56"	0° 59' 42"	16' 16.16"	62° 29' 23"	0.99167
14	357° 12' 33"	0° 49' 01"	357° 06' 52"	0°-21' 36"	0° 59' 43"	16' 16.44"	62° 24' 35"	0.99076
15	357° 48' 35"	0° 52' 19"	357° 38' 38"	0° -4' 15"	0° 59' 44"	16' 16.72"	62° 20' 22"	0.98980
16	358° 24' 39"	0° 55' 36"	358° 10' 24"	0° 13' 06"	0° 59' 45"	16' 16.98"	62° 16' 42"	0.98879
17	359° 00' 44"	0° 58' 53"	358° 42' 12"	0° 30' 27"	0° 59' 46"	16' 17.25"	62° 13' 30"	0.98774
18	359° 36' 50"	1° 02' 10"	359° 14' 01"	0° 47' 49"	0° 59' 47"	16' 17.51"	62° 10' 46"	0.98663
19	0° 12' 58"	1° 05' 26"	359° 45' 52"	1° 05' 11"	0° 59' 48"	16' 17.76"	62° 8' 26"	0.98548
20	0° 49' 06"	1° 08' 42"	0° 17' 43"	1° 22' 34"	0° 59' 49"	16' 18.00"	62° 6' 29"	0.98428
21	1° 25' 16"	1° 11' 58"	0° 49' 36"	1° 39' 56"	0° 59' 50"	16' 18.24"	62° 4' 54"	0.98303
22	2° 01' 26"	1° 15' 13"	1° 21' 30"	1° 57' 19"	0° 59' 51"	16' 18.48"	62° 3' 39"	0.98174
23	2° 37' 38"	1° 18' 28"	1° 53' 26"	2° 14' 41"	0° 59' 52"	16' 18.70"	62° 2' 43"	0.98040
24	3° 13' 50"	1° 21' 42"	2° 25' 23"	2° 32' 03"	0° 59' 52"	16' 18.93"	62° 2' 05"	0.97901

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	166° 35' 09"	0.06"	167° 39' 11"	5° 17' 47"	1.0072599	15'52.71"	23° 26' 19"	2 m 34 s
1	166° 37' 35"	0.07"	167° 41' 26"	5° 16' 51"	1.0072493	15'52.72"	23° 26' 19"	2 m 35 s
2	166° 40' 00"	0.07"	167° 43' 40"	5° 15' 54"	1.0072388	15'52.73"	23° 26' 19"	2 m 36 s
3	166° 42' 26"	0.08"	167° 45' 55"	5° 14' 57"	1.0072282	15'52.74"	23° 26' 19"	2 m 36 s
4	166° 44' 52"	0.09"	167° 48' 10"	5° 14' 01"	1.0072176	15'52.75"	23° 26' 19"	2 m 37 s
5	166° 47' 17"	0.09"	167° 50' 25"	5° 13' 04"	1.0072070	15'52.76"	23° 26' 19"	2 m 38 s
6	166° 49' 43"	0.10"	167° 52' 39"	5° 12' 07"	1.0071965	15'52.77"	23° 26' 19"	2 m 39 s
7	166° 52' 09"	0.10"	167° 54' 54"	5° 11' 11"	1.0071859	15'52.78"	23° 26' 19"	2 m 40 s
8	166° 54' 34"	0.11"	167° 57' 09"	5° 10' 14"	1.0071753	15'52.79"	23° 26' 19"	2 m 41 s
9	166° 56' 60"	0.11"	167° 59' 24"	5° 09' 18"	1.0071647	15'52.80"	23° 26' 19"	2 m 42 s
10	166° 59' 26"	0.12"	168° 01' 38"	5° 08' 21"	1.0071542	15'52.81"	23° 26' 19"	2 m 42 s
11	167° 01' 51"	0.12"	168° 03' 53"	5° 07' 24"	1.0071436	15'52.82"	23° 26' 19"	2 m 43 s
12	167° 04' 17"	0.13"	168° 06' 08"	5° 06' 27"	1.0071330	15'52.83"	23° 26' 19"	2 m 44 s
13	167° 06' 43"	0.13"	168° 08' 23"	5° 05' 31"	1.0071224	15'52.84"	23° 26' 19"	2 m 45 s
14	167° 09' 08"	0.14"	168° 10' 37"	5° 04' 34"	1.0071118	15'52.85"	23° 26' 19"	2 m 46 s
15	167° 11' 34"	0.14"	168° 12' 52"	5° 03' 37"	1.0071012	15'52.86"	23° 26' 19"	2 m 47 s
16	167° 13' 60"	0.15"	168° 15' 07"	5° 02' 41"	1.0070907	15'52.87"	23° 26' 19"	2 m 48 s
17	167° 16' 25"	0.15"	168° 17' 21"	5° 01' 44"	1.0070801	15'52.88"	23° 26' 19"	2 m 49 s
18	167° 18' 51"	0.16"	168° 19' 36"	5° 00' 47"	1.0070695	15'52.89"	23° 26' 19"	2 m 49 s
19	167° 21' 17"	0.16"	168° 21' 51"	4° 59' 50"	1.0070589	15'52.90"	23° 26' 19"	2 m 50 s
20	167° 23' 42"	0.17"	168° 24' 06"	4° 58' 54"	1.0070483	15'52.91"	23° 26' 19"	2 m 51 s
21	167° 26' 08"	0.17"	168° 26' 20"	4° 57' 57"	1.0070377	15'52.92"	23° 26' 19"	2 m 52 s
22	167° 28' 34"	0.18"	168° 28' 35"	4° 57' 00"	1.0070271	15'52.93"	23° 26' 19"	2 m 53 s
23	167° 30' 60"	0.18"	168° 30' 50"	4° 56' 03"	1.0070165	15'52.94"	23° 26' 19"	2 m 54 s
24	167° 33' 25"	0.19"	168° 33' 04"	4° 55' 07"	1.0070059	15'52.95"	23° 26' 19"	2 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	3° 13' 50"	1° 21' 42"	2° 25' 23"	2° 32' 03"	0° 59' 52"	16' 18.93"	62° 2' 05"	0.97901
1	3° 50' 04"	1° 24' 56"	2° 57' 22"	2° 49' 24"	0° 59' 53"	16' 19.14"	62° 1' 45"	0.97758
2	4° 26' 19"	1° 28' 10"	3° 29' 23"	3° 06' 46"	0° 59' 54"	16' 19.35"	62° 1' 42"	0.97610
3	5° 02' 34"	1° 31' 23"	4° 01' 26"	3° 24' 06"	0° 59' 55"	16' 19.56"	62° 1' 54"	0.97457
4	5° 38' 51"	1° 34' 35"	4° 33' 30"	3° 41' 26"	0° 59' 55"	16' 19.75"	62° 2' 22"	0.97299
5	6° 15' 08"	1° 37' 47"	5° 05' 36"	3° 58' 45"	0° 59' 56"	16' 19.94"	62° 3' 05"	0.97137
6	6° 51' 26"	1° 40' 58"	5° 37' 45"	4° 16' 03"	0° 59' 57"	16' 20.13"	62° 4' 03"	0.96970
7	7° 27' 45"	1° 44' 09"	6° 09' 55"	4° 33' 21"	0° 59' 57"	16' 20.31"	62° 5' 15"	0.96798
8	8° 04' 05"	1° 47' 19"	6° 42' 07"	4° 50' 37"	0° 59' 58"	16' 20.48"	62° 6' 40"	0.96622
9	8° 40' 25"	1° 50' 28"	7° 14' 22"	5° 07' 52"	0° 59' 59"	16' 20.65"	62° 8' 20"	0.96442
10	9° 16' 47"	1° 53' 37"	7° 46' 39"	5° 25' 05"	0° 59' 59"	16' 20.81"	62° 10' 12"	0.96256
11	9° 53' 09"	1° 56' 45"	8° 18' 59"	5° 42' 17"	0° 59' 60"	16' 20.97"	62° 12' 18"	0.96066
12	10° 29' 31"	1° 59' 52"	8° 51' 20"	5° 59' 28"	1° 00' 00"	16' 21.11"	62° 14' 36"	0.95872
13	11° 05' 55"	2° 02' 59"	9° 23' 45"	6° 16' 37"	1° 00' 01"	16' 21.26"	62° 17' 08"	0.95673
14	11° 42' 19"	2° 06' 04"	9° 56' 12"	6° 33' 44"	1° 00' 01"	16' 21.39"	62° 19' 51"	0.95469
15	12° 18' 43"	2° 09' 09"	10° 28' 41"	6° 50' 49"	1° 00' 02"	16' 21.52"	62° 22' 47"	0.95261
16	12° 55' 09"	2° 12' 13"	11° 01' 14"	7° 07' 53"	1° 00' 02"	16' 21.65"	62° 25' 55"	0.95049
17	13° 31' 35"	2° 15' 16"	11° 33' 49"	7° 24' 54"	1° 00' 03"	16' 21.77"	62° 29' 15"	0.94832
18	14° 08' 01"	2° 18' 19"	12° 06' 27"	7° 41' 53"	1° 00' 03"	16' 21.88"	62° 32' 47"	0.94610
19	14° 44' 28"	2° 21' 20"	12° 39' 08"	7° 58' 50"	1° 00' 04"	16' 21.98"	62° 36' 31"	0.94384
20	15° 20' 55"	2° 24' 21"	13° 11' 52"	8° 15' 44"	1° 00' 04"	16' 22.08"	62° 40' 27"	0.94154
21	15° 57' 23"	2° 27' 20"	13° 44' 39"	8° 32' 36"	1° 00' 04"	16' 22.18"	62° 44' 34"	0.93920
22	16° 33' 51"	2° 30' 19"	14° 17' 29"	8° 49' 25"	1° 00' 05"	16' 22.26"	62° 48' 52"	0.93681
23	17° 10' 20"	2° 33' 16"	14° 50' 22"	9° 06' 12"	1° 00' 05"	16' 22.35"	62° 53' 22"	0.93437
24	17° 46' 49"	2° 36' 13"	15° 23' 19"	9° 22' 55"	1° 00' 05"	16' 22.42"	62° 58' 04"	0.93190

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	167° 33' 25"	0.19"	168° 33' 04"	4° 55' 07"	1.0070059	15'52.95"	23° 26' 19"	2 m 55 s
1	167° 35' 51"	0.19"	168° 35' 19"	4° 54' 10"	1.0069953	15'52.96"	23° 26' 19"	2 m 56 s
2	167° 38' 17"	0.20"	168° 37' 34"	4° 53' 13"	1.0069847	15'52.97"	23° 26' 19"	2 m 56 s
3	167° 40' 42"	0.20"	168° 39' 48"	4° 52' 16"	1.0069741	15'52.98"	23° 26' 19"	2 m 57 s
4	167° 43' 08"	0.21"	168° 42' 03"	4° 51' 19"	1.0069635	15'52.99"	23° 26' 19"	2 m 58 s
5	167° 45' 34"	0.21"	168° 44' 18"	4° 50' 22"	1.0069529	15'53.00"	23° 26' 19"	2 m 59 s
6	167° 47' 60"	0.22"	168° 46' 32"	4° 49' 26"	1.0069423	15'53.01"	23° 26' 19"	2 m 60 s
7	167° 50' 25"	0.22"	168° 48' 47"	4° 48' 29"	1.0069317	15'53.02"	23° 26' 19"	3 m 01 s
8	167° 52' 51"	0.23"	168° 51' 02"	4° 47' 32"	1.0069211	15'53.03"	23° 26' 19"	3 m 02 s
9	167° 55' 17"	0.23"	168° 53' 16"	4° 46' 35"	1.0069105	15'53.04"	23° 26' 19"	3 m 02 s
10	167° 57' 43"	0.24"	168° 55' 31"	4° 45' 38"	1.0068999	15'53.05"	23° 26' 19"	3 m 03 s
11	168° 00' 08"	0.24"	168° 57' 46"	4° 44' 41"	1.0068893	15'53.06"	23° 26' 19"	3 m 04 s
12	168° 02' 34"	0.25"	169° 00' 00"	4° 43' 44"	1.0068786	15'53.07"	23° 26' 19"	3 m 05 s
13	168° 04' 60"	0.25"	169° 02' 15"	4° 42' 47"	1.0068680	15'53.08"	23° 26' 19"	3 m 06 s
14	168° 07' 26"	0.25"	169° 04' 30"	4° 41' 50"	1.0068574	15'53.09"	23° 26' 19"	3 m 07 s
15	168° 09' 51"	0.26"	169° 06' 44"	4° 40' 53"	1.0068468	15'53.10"	23° 26' 19"	3 m 08 s
16	168° 12' 17"	0.26"	169° 08' 59"	4° 39' 57"	1.0068362	15'53.11"	23° 26' 19"	3 m 09 s
17	168° 14' 43"	0.27"	169° 11' 13"	4° 38' 60"	1.0068256	15'53.12"	23° 26' 19"	3 m 09 s
18	168° 17' 09"	0.27"	169° 13' 28"	4° 38' 03"	1.0068149	15'53.13"	23° 26' 19"	3 m 10 s
19	168° 19' 34"	0.28"	169° 15' 43"	4° 37' 06"	1.0068043	15'53.14"	23° 26' 19"	3 m 11 s
20	168° 22' 00"	0.28"	169° 17' 57"	4° 36' 09"	1.0067937	15'53.15"	23° 26' 19"	3 m 12 s
21	168° 24' 26"	0.28"	169° 20' 12"	4° 35' 12"	1.0067831	15'53.16"	23° 26' 19"	3 m 13 s
22	168° 26' 52"	0.29"	169° 22' 27"	4° 34' 15"	1.0067724	15'53.17"	23° 26' 19"	3 m 14 s
23	168° 29' 18"	0.29"	169° 24' 41"	4° 33' 18"	1.0067618	15'53.18"	23° 26' 19"	3 m 15 s
24	168° 31' 43"	0.30"	169° 26' 56"	4° 32' 21"	1.0067512	15'53.19"	23° 26' 19"	3 m 16 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	17° 46' 49"	2° 36' 13"	15° 23' 19"	9° 22' 55"	1° 00' 05"	16' 22.42"	62° 58' 04"	0.93190
1	18° 23' 18"	2° 39' 08"	15° 56' 19"	9° 39' 36"	1° 00' 05"	16' 22.49"	63° 2' 56"	0.92938
2	18° 59' 48"	2° 42' 03"	16° 29' 22"	9° 56' 13"	1° 00' 06"	16' 22.55"	63° 8' 00"	0.92682
3	19° 36' 18"	2° 44' 56"	17° 02' 29"	10° 12' 48"	1° 00' 06"	16' 22.61"	63° 13' 15"	0.92422
4	20° 12' 49"	2° 47' 48"	17° 35' 39"	10° 29' 19"	1° 00' 06"	16' 22.66"	63° 18' 42"	0.92157
5	20° 49' 19"	2° 50' 39"	18° 08' 53"	10° 45' 47"	1° 00' 06"	16' 22.71"	63° 24' 19"	0.91888
6	21° 25' 50"	2° 53' 29"	18° 42' 11"	11° 02' 11"	1° 00' 06"	16' 22.75"	63° 30' 07"	0.91616
7	22° 02' 21"	2° 56' 18"	19° 15' 32"	11° 18' 31"	1° 00' 07"	16' 22.78"	63° 36' 06"	0.91339
8	22° 38' 52"	2° 59' 06"	19° 48' 58"	11° 34' 48"	1° 00' 07"	16' 22.81"	63° 42' 16"	0.91058
9	23° 15' 24"	3° 01' 52"	20° 22' 27"	11° 51' 01"	1° 00' 07"	16' 22.83"	63° 48' 37"	0.90773
10	23° 51' 55"	3° 04' 38"	20° 55' 60"	12° 07' 10"	1° 00' 07"	16' 22.84"	63° 55' 09"	0.90484
11	24° 28' 27"	3° 07' 21"	21° 29' 37"	12° 23' 15"	1° 00' 07"	16' 22.85"	64° 1' 51"	0.90191
12	25° 04' 58"	3° 10' 04"	22° 03' 18"	12° 39' 15"	1° 00' 07"	16' 22.86"	64° 8' 45"	0.89894
13	25° 41' 30"	3° 12' 45"	22° 37' 03"	12° 55' 12"	1° 00' 07"	16' 22.86"	64° 15' 49"	0.89593
14	26° 18' 02"	3° 15' 25"	23° 10' 52"	13° 11' 04"	1° 00' 07"	16' 22.85"	64° 23' 04"	0.89289
15	26° 54' 33"	3° 18' 04"	23° 44' 45"	13° 26' 51"	1° 00' 07"	16' 22.83"	64° 30' 29"	0.88980
16	27° 31' 05"	3° 20' 42"	24° 18' 43"	13° 42' 34"	1° 00' 07"	16' 22.82"	64° 38' 05"	0.88668
17	28° 07' 37"	3° 23' 18"	24° 52' 45"	13° 58' 12"	1° 00' 07"	16' 22.79"	64° 45' 52"	0.88352
18	28° 44' 08"	3° 25' 52"	25° 26' 51"	14° 13' 45"	1° 00' 06"	16' 22.76"	64° 53' 49"	0.88032
19	29° 20' 39"	3° 28' 25"	26° 01' 02"	14° 29' 13"	1° 00' 06"	16' 22.72"	65° 1' 57"	0.87709
20	29° 57' 11"	3° 30' 57"	26° 35' 17"	14° 44' 36"	1° 00' 06"	16' 22.68"	65° 10' 15"	0.87382
21	30° 33' 42"	3° 33' 27"	27° 09' 37"	14° 59' 54"	1° 00' 06"	16' 22.64"	65° 18' 44"	0.87051
22	31° 10' 13"	3° 35' 56"	27° 44' 01"	15° 15' 07"	1° 00' 06"	16' 22.58"	65° 27' 23"	0.86717
23	31° 46' 44"	3° 38' 23"	28° 18' 30"	15° 30' 14"	1° 00' 06"	16' 22.53"	65° 36' 12"	0.86379
24	32° 23' 14"	3° 40' 49"	28° 53' 03"	15° 45' 16"	1° 00' 05"	16' 22.46"	65° 45' 12"	0.86037

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	168° 31' 43"	0.30"	169° 26' 56"	4° 32' 21"	1.0067512	15'53.19"	23° 26' 19"	3 m 16 s
1	168° 34' 09"	0.30"	169° 29' 10"	4° 31' 24"	1.0067405	15'53.20"	23° 26' 19"	3 m 17 s
2	168° 36' 35"	0.31"	169° 31' 25"	4° 30' 27"	1.0067299	15'53.21"	23° 26' 19"	3 m 17 s
3	168° 39' 01"	0.31"	169° 33' 40"	4° 29' 30"	1.0067193	15'53.23"	23° 26' 19"	3 m 18 s
4	168° 41' 27"	0.31"	169° 35' 54"	4° 28' 33"	1.0067086	15'53.24"	23° 26' 19"	3 m 19 s
5	168° 43' 52"	0.32"	169° 38' 09"	4° 27' 36"	1.0066980	15'53.25"	23° 26' 19"	3 m 20 s
6	168° 46' 18"	0.32"	169° 40' 23"	4° 26' 39"	1.0066873	15'53.26"	23° 26' 19"	3 m 21 s
7	168° 48' 44"	0.33"	169° 42' 38"	4° 25' 41"	1.0066767	15'53.27"	23° 26' 19"	3 m 22 s
8	168° 51' 10"	0.33"	169° 44' 53"	4° 24' 44"	1.0066661	15'53.28"	23° 26' 19"	3 m 23 s
9	168° 53' 36"	0.33"	169° 47' 07"	4° 23' 47"	1.0066554	15'53.29"	23° 26' 19"	3 m 24 s
10	168° 56' 02"	0.34"	169° 49' 22"	4° 22' 50"	1.0066448	15'53.30"	23° 26' 19"	3 m 24 s
11	168° 58' 27"	0.34"	169° 51' 36"	4° 21' 53"	1.0066341	15'53.31"	23° 26' 19"	3 m 25 s
12	169° 00' 53"	0.34"	169° 53' 51"	4° 20' 56"	1.0066235	15'53.32"	23° 26' 19"	3 m 26 s
13	169° 03' 19"	0.35"	169° 56' 05"	4° 19' 59"	1.0066128	15'53.33"	23° 26' 19"	3 m 27 s
14	169° 05' 45"	0.35"	169° 58' 20"	4° 19' 02"	1.0066022	15'53.34"	23° 26' 19"	3 m 28 s
15	169° 08' 11"	0.35"	170° 00' 35"	4° 18' 05"	1.0065915	15'53.35"	23° 26' 19"	3 m 29 s
16	169° 10' 37"	0.36"	170° 02' 49"	4° 17' 08"	1.0065808	15'53.36"	23° 26' 19"	3 m 30 s
17	169° 13' 03"	0.36"	170° 05' 04"	4° 16' 10"	1.0065702	15'53.37"	23° 26' 19"	3 m 31 s
18	169° 15' 28"	0.37"	170° 07' 18"	4° 15' 13"	1.0065595	15'53.38"	23° 26' 19"	3 m 31 s
19	169° 17' 54"	0.37"	170° 09' 33"	4° 14' 16"	1.0065489	15'53.39"	23° 26' 19"	3 m 32 s
20	169° 20' 20"	0.37"	170° 11' 48"	4° 13' 19"	1.0065382	15'53.40"	23° 26' 19"	3 m 33 s
21	169° 22' 46"	0.38"	170° 14' 02"	4° 12' 22"	1.0065275	15'53.41"	23° 26' 19"	3 m 34 s
22	169° 25' 12"	0.38"	170° 16' 17"	4° 11' 25"	1.0065169	15'53.42"	23° 26' 19"	3 m 35 s
23	169° 27' 38"	0.38"	170° 18' 31"	4° 10' 27"	1.0065062	15'53.43"	23° 26' 19"	3 m 36 s
24	169° 30' 04"	0.38"	170° 20' 46"	4° 09' 30"	1.0064955	15'53.44"	23° 26' 19"	3 m 37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	32° 23' 14"	3° 40' 49"	28° 53' 03"	15° 45' 16"	1° 00' 05"	16' 22.46"	65° 45' 12"	0.86037
1	32° 59' 44"	3° 43' 14"	29° 27' 41"	16° 00' 12"	1° 00' 05"	16' 22.39"	65° 54' 22"	0.85693
2	33° 36' 14"	3° 45' 36"	30° 02' 24"	16° 15' 02"	1° 00' 05"	16' 22.32"	66° 3' 43"	0.85344
3	34° 12' 44"	3° 47' 58"	30° 37' 12"	16° 29' 46"	1° 00' 05"	16' 22.24"	66° 13' 14"	0.84993
4	34° 49' 13"	3° 50' 17"	31° 12' 04"	16° 44' 25"	1° 00' 04"	16' 22.15"	66° 22' 55"	0.84638
5	35° 25' 42"	3° 52' 35"	31° 47' 01"	16° 58' 57"	1° 00' 04"	16' 22.07"	66° 32' 46"	0.84280
6	36° 02' 11"	3° 54' 52"	32° 22' 03"	17° 13' 23"	1° 00' 04"	16' 21.97"	66° 42' 48"	0.83918
7	36° 38' 39"	3° 57' 07"	32° 57' 10"	17° 27' 43"	1° 00' 03"	16' 21.87"	66° 52' 60"	0.83553
8	37° 15' 07"	3° 59' 20"	33° 32' 22"	17° 41' 56"	1° 00' 03"	16' 21.76"	67° 3' 21"	0.83185
9	37° 51' 35"	4° 01' 31"	34° 07' 39"	17° 56' 03"	1° 00' 02"	16' 21.65"	67° 13' 53"	0.82814
10	38° 28' 02"	4° 03' 41"	34° 43' 01"	18° 10' 03"	1° 00' 02"	16' 21.54"	67° 24' 35"	0.82440
11	39° 04' 28"	4° 05' 49"	35° 18' 28"	18° 23' 57"	1° 00' 02"	16' 21.42"	67° 35' 27"	0.82063
12	39° 40' 54"	4° 07' 56"	35° 53' 60"	18° 37' 43"	1° 00' 01"	16' 21.29"	67° 46' 29"	0.81683
13	40° 17' 19"	4° 10' 01"	36° 29' 37"	18° 51' 23"	1° 00' 01"	16' 21.16"	67° 57' 40"	0.81300
14	40° 53' 44"	4° 12' 04"	37° 05' 19"	19° 04' 56"	1° 00' 00"	16' 21.03"	68° 9' 02"	0.80914
15	41° 30' 09"	4° 14' 05"	37° 41' 06"	19° 18' 21"	0° 59' 60"	16' 20.89"	68° 20' 33"	0.80525
16	42° 06' 32"	4° 16' 05"	38° 16' 58"	19° 31' 39"	0° 59' 59"	16' 20.75"	68° 32' 14"	0.80133
17	42° 42' 56"	4° 18' 03"	38° 52' 55"	19° 44' 50"	0° 59' 59"	16' 20.60"	68° 44' 05"	0.79739
18	43° 19' 18"	4° 19' 59"	39° 28' 57"	19° 57' 53"	0° 59' 58"	16' 20.45"	68° 56' 05"	0.79342
19	43° 55' 40"	4° 21' 53"	40° 05' 05"	20° 10' 49"	0° 59' 57"	16' 20.29"	69° 8' 15"	0.78942
20	44° 32' 01"	4° 23' 46"	40° 41' 17"	20° 23' 37"	0° 59' 57"	16' 20.13"	69° 20' 35"	0.78539
21	45° 08' 21"	4° 25' 36"	41° 17' 35"	20° 36' 17"	0° 59' 56"	16' 19.96"	69° 33' 04"	0.78134
22	45° 44' 41"	4° 27' 25"	41° 53' 58"	20° 48' 50"	0° 59' 56"	16' 19.79"	69° 45' 43"	0.77726
23	46° 21' 00"	4° 29' 12"	42° 30' 25"	21° 01' 14"	0° 59' 55"	16' 19.61"	69° 58' 30"	0.77316
24	46° 57' 18"	4° 30' 58"	43° 06' 58"	21° 13' 30"	0° 59' 54"	16' 19.43"	70° 11' 28"	0.76904

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	169° 30' 04"	0.38"	170° 20' 46"	4° 09' 30"	1.0064955	15'53.44"	23° 26' 19"	3 m 37 s
1	169° 32' 30"	0.39"	170° 23' 00"	4° 08' 33"	1.0064848	15'53.45"	23° 26' 19"	3 m 38 s
2	169° 34' 55"	0.39"	170° 25' 15"	4° 07' 36"	1.0064742	15'53.46"	23° 26' 19"	3 m 39 s
3	169° 37' 21"	0.39"	170° 27' 29"	4° 06' 39"	1.0064635	15'53.47"	23° 26' 19"	3 m 39 s
4	169° 39' 47"	0.40"	170° 29' 44"	4° 05' 41"	1.0064528	15'53.48"	23° 26' 19"	3 m 40 s
5	169° 42' 13"	0.40"	170° 31' 58"	4° 04' 44"	1.0064421	15'53.49"	23° 26' 19"	3 m 41 s
6	169° 44' 39"	0.40"	170° 34' 13"	4° 03' 47"	1.0064314	15'53.50"	23° 26' 19"	3 m 42 s
7	169° 47' 05"	0.41"	170° 36' 28"	4° 02' 50"	1.0064208	15'53.51"	23° 26' 19"	3 m 43 s
8	169° 49' 31"	0.41"	170° 38' 42"	4° 01' 52"	1.0064101	15'53.52"	23° 26' 19"	3 m 44 s
9	169° 51' 57"	0.41"	170° 40' 57"	4° 00' 55"	1.0063994	15'53.53"	23° 26' 19"	3 m 45 s
10	169° 54' 23"	0.41"	170° 43' 11"	3° 59' 58"	1.0063887	15'53.54"	23° 26' 19"	3 m 46 s
11	169° 56' 49"	0.42"	170° 45' 26"	3° 59' 00"	1.0063780	15'53.55"	23° 26' 19"	3 m 46 s
12	169° 59' 15"	0.42"	170° 47' 40"	3° 58' 03"	1.0063673	15'53.56"	23° 26' 19"	3 m 47 s
13	170° 01' 40"	0.42"	170° 49' 55"	3° 57' 06"	1.0063566	15'53.57"	23° 26' 19"	3 m 48 s
14	170° 04' 06"	0.42"	170° 52' 09"	3° 56' 09"	1.0063459	15'53.58"	23° 26' 19"	3 m 49 s
15	170° 06' 32"	0.43"	170° 54' 24"	3° 55' 11"	1.0063352	15'53.59"	23° 26' 19"	3 m 50 s
16	170° 08' 58"	0.43"	170° 56' 38"	3° 54' 14"	1.0063245	15'53.60"	23° 26' 19"	3 m 51 s
17	170° 11' 24"	0.43"	170° 58' 53"	3° 53' 17"	1.0063138	15'53.61"	23° 26' 19"	3 m 52 s
18	170° 13' 50"	0.43"	171° 01' 07"	3° 52' 19"	1.0063031	15'53.62"	23° 26' 19"	3 m 53 s
19	170° 16' 16"	0.44"	171° 03' 22"	3° 51' 22"	1.0062924	15'53.63"	23° 26' 19"	3 m 54 s
20	170° 18' 42"	0.44"	171° 05' 36"	3° 50' 25"	1.0062816	15'53.64"	23° 26' 19"	3 m 54 s
21	170° 21' 08"	0.44"	171° 07' 51"	3° 49' 27"	1.0062709	15'53.65"	23° 26' 19"	3 m 55 s
22	170° 23' 34"	0.44"	171° 10' 06"	3° 48' 30"	1.0062602	15'53.66"	23° 26' 19"	3 m 56 s
23	170° 25' 60"	0.44"	171° 12' 20"	3° 47' 32"	1.0062495	15'53.67"	23° 26' 19"	3 m 57 s
24	170° 28' 26"	0.45"	171° 14' 35"	3° 46' 35"	1.0062388	15'53.68"	23° 26' 19"	3 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	46° 57' 18"	4° 30' 58"	43° 06' 58"	21° 13' 30"	0° 59' 54"	16' 19.43"	70° 11' 28"	0.76904
1	47° 33' 36"	4° 32' 41"	43° 43' 36"	21° 25' 38"	0° 59' 54"	16' 19.25"	70° 24' 34"	0.76489
2	48° 09' 53"	4° 34' 22"	44° 20' 20"	21° 37' 38"	0° 59' 53"	16' 19.06"	70° 37' 49"	0.76071
3	48° 46' 09"	4° 36' 02"	44° 57' 08"	21° 49' 29"	0° 59' 52"	16' 18.87"	70° 51' 14"	0.75651
4	49° 22' 24"	4° 37' 40"	45° 34' 01"	22° 01' 12"	0° 59' 51"	16' 18.67"	71° 4' 48"	0.75229
5	49° 58' 38"	4° 39' 16"	46° 10' 59"	22° 12' 46"	0° 59' 51"	16' 18.47"	71° 18' 30"	0.74805
6	50° 34' 51"	4° 40' 50"	46° 48' 03"	22° 24' 12"	0° 59' 50"	16' 18.27"	71° 32' 22"	0.74379
7	51° 10' 60"	4° 42' 22"	47° 25' 08"	22° 35' 27"	0° 59' 49"	16' 18.06"	71° 46' 20"	0.73951
8	51° 47' 12"	4° 43' 52"	48° 02' 21"	22° 46' 35"	0° 59' 48"	16' 17.85"	72° 0' 29"	0.73521
9	52° 23' 22"	4° 45' 20"	48° 39' 39"	22° 57' 34"	0° 59' 48"	16' 17.64"	72° 14' 47"	0.73088
10	52° 59' 32"	4° 46' 46"	49° 17' 02"	23° 08' 24"	0° 59' 47"	16' 17.42"	72° 29' 13"	0.72653
11	53° 35' 41"	4° 48' 11"	49° 54' 30"	23° 19' 04"	0° 59' 46"	16' 17.19"	72° 43' 47"	0.72217
12	54° 11' 48"	4° 49' 33"	50° 32' 03"	23° 29' 36"	0° 59' 45"	16' 16.97"	72° 58' 30"	0.71778
13	54° 47' 55"	4° 50' 53"	51° 09' 40"	23° 39' 58"	0° 59' 44"	16' 16.74"	73° 13' 21"	0.71338
14	55° 24' 01"	4° 52' 12"	51° 47' 23"	23° 50' 10"	0° 59' 44"	16' 16.50"	73° 28' 20"	0.70896
15	56° 00' 06"	4° 53' 28"	52° 25' 10"	24° 00' 13"	0° 59' 43"	16' 16.27"	73° 43' 28"	0.70452
16	56° 36' 09"	4° 54' 43"	53° 03' 01"	24° 10' 07"	0° 59' 42"	16' 16.03"	73° 58' 43"	0.70007
17	57° 12' 12"	4° 55' 56"	53° 40' 58"	24° 19' 51"	0° 59' 41"	16' 15.78"	74° 14' 06"	0.69560
18	57° 48' 13"	4° 57' 06"	54° 18' 58"	24° 29' 25"	0° 59' 40"	16' 15.54"	74° 29' 36"	0.69111
19	58° 24' 14"	4° 58' 15"	54° 57' 03"	24° 38' 49"	0° 59' 39"	16' 15.29"	74° 45' 15"	0.68661
20	59° 00' 13"	4° 59' 21"	55° 35' 13"	24° 48' 03"	0° 59' 38"	16' 15.03"	75° 1' 01"	0.68209
21	59° 36' 12"	5° 00' 26"	56° 13' 27"	24° 57' 07"	0° 59' 37"	16' 14.78"	75° 16' 54"	0.67756
22	60° 12' 09"	5° 01' 29"	56° 51' 45"	25° 06' 02"	0° 59' 36"	16' 14.52"	75° 32' 54"	0.67301
23	60° 48' 05"	5° 02' 29"	57° 30' 07"	25° 14' 45"	0° 59' 35"	16' 14.26"	75° 49' 02"	0.66845
24	61° 23' 60"	5° 03' 28"	58° 08' 34"	25° 23' 19"	0° 59' 34"	16' 13.99"	76° 5' 16"	0.66388

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	170° 28' 26"	0.45"	171° 14' 35"	3° 46' 35"	1.0062388	15'53.68"	23° 26' 19"	3 m 58 s
1	170° 30' 52"	0.45"	171° 16' 49"	3° 45' 38"	1.0062280	15'53.69"	23° 26' 19"	3 m 59 s
2	170° 33' 18"	0.45"	171° 19' 04"	3° 44' 40"	1.0062173	15'53.70"	23° 26' 19"	3 m 60 s
3	170° 35' 44"	0.45"	171° 21' 18"	3° 43' 43"	1.0062066	15'53.71"	23° 26' 19"	4 m 01 s
4	170° 38' 10"	0.45"	171° 23' 33"	3° 42' 45"	1.0061959	15'53.72"	23° 26' 19"	4 m 02 s
5	170° 40' 36"	0.46"	171° 25' 47"	3° 41' 48"	1.0061851	15'53.73"	23° 26' 19"	4 m 02 s
6	170° 43' 02"	0.46"	171° 28' 02"	3° 40' 51"	1.0061744	15'53.74"	23° 26' 19"	4 m 03 s
7	170° 45' 28"	0.46"	171° 30' 16"	3° 39' 53"	1.0061636	15'53.75"	23° 26' 19"	4 m 04 s
8	170° 47' 54"	0.46"	171° 32' 31"	3° 38' 56"	1.0061529	15'53.76"	23° 26' 19"	4 m 05 s
9	170° 50' 20"	0.46"	171° 34' 45"	3° 37' 58"	1.0061422	15'53.77"	23° 26' 19"	4 m 06 s
10	170° 52' 46"	0.46"	171° 36' 60"	3° 37' 01"	1.0061314	15'53.78"	23° 26' 19"	4 m 07 s
11	170° 55' 12"	0.47"	171° 39' 14"	3° 36' 03"	1.0061207	15'53.79"	23° 26' 19"	4 m 08 s
12	170° 57' 38"	0.47"	171° 41' 29"	3° 35' 06"	1.0061099	15'53.80"	23° 26' 19"	4 m 09 s
13	171° 00' 04"	0.47"	171° 43' 43"	3° 34' 08"	1.0060992	15'53.81"	23° 26' 19"	4 m 09 s
14	171° 02' 30"	0.47"	171° 45' 58"	3° 33' 11"	1.0060884	15'53.82"	23° 26' 19"	4 m 10 s
15	171° 04' 56"	0.47"	171° 48' 12"	3° 32' 13"	1.0060776	15'53.83"	23° 26' 19"	4 m 11 s
16	171° 07' 22"	0.47"	171° 50' 27"	3° 31' 16"	1.0060669	15'53.84"	23° 26' 19"	4 m 12 s
17	171° 09' 48"	0.47"	171° 52' 41"	3° 30' 18"	1.0060561	15'53.85"	23° 26' 19"	4 m 13 s
18	171° 12' 14"	0.47"	171° 54' 56"	3° 29' 21"	1.0060453	15'53.86"	23° 26' 19"	4 m 14 s
19	171° 14' 40"	0.47"	171° 57' 10"	3° 28' 23"	1.0060346	15'53.87"	23° 26' 19"	4 m 15 s
20	171° 17' 06"	0.48"	171° 59' 25"	3° 27' 26"	1.0060238	15'53.88"	23° 26' 19"	4 m 16 s
21	171° 19' 32"	0.48"	172° 01' 39"	3° 26' 28"	1.0060130	15'53.89"	23° 26' 19"	4 m 17 s
22	171° 21' 58"	0.48"	172° 03' 54"	3° 25' 31"	1.0060022	15'53.90"	23° 26' 19"	4 m 17 s
23	171° 24' 24"	0.48"	172° 06' 08"	3° 24' 33"	1.0059915	15'53.91"	23° 26' 19"	4 m 18 s
24	171° 26' 50"	0.48"	172° 08' 23"	3° 23' 36"	1.0059807	15'53.92"	23° 26' 19"	4 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	61° 23' 60"	5° 03' 28"	58° 08' 34"	25° 23' 19"	0° 59' 34"	16' 13.99"	76° 5' 16"	0.66388
1	61° 59' 53"	5° 04' 25"	58° 47' 04"	25° 31' 43"	0° 59' 33"	16' 13.72"	76° 21' 38"	0.65930
2	62° 35' 46"	5° 05' 19"	59° 25' 39"	25° 39' 56"	0° 59' 32"	16' 13.45"	76° 38' 06"	0.65470
3	63° 11' 37"	5° 06' 12"	60° 04' 17"	25° 47' 58"	0° 59' 31"	16' 13.18"	76° 54' 41"	0.65009
4	63° 47' 27"	5° 07' 02"	60° 42' 59"	25° 55' 50"	0° 59' 30"	16' 12.90"	77° 11' 22"	0.64547
5	64° 23' 16"	5° 07' 51"	61° 21' 45"	26° 03' 32"	0° 59' 29"	16' 12.62"	77° 28' 10"	0.64084
6	64° 59' 04"	5° 08' 37"	62° 00' 34"	26° 11' 03"	0° 59' 28"	16' 12.34"	77° 45' 04"	0.63620
7	65° 34' 50"	5° 09' 22"	62° 39' 27"	26° 18' 23"	0° 59' 27"	16' 12.06"	78° 2' 04"	0.63155
8	66° 10' 35"	5° 10' 04"	63° 18' 24"	26° 25' 32"	0° 59' 26"	16' 11.77"	78° 19' 09"	0.62689
9	66° 46' 19"	5° 10' 45"	63° 57' 23"	26° 32' 31"	0° 59' 25"	16' 11.48"	78° 36' 21"	0.62222
10	67° 22' 02"	5° 11' 23"	64° 36' 26"	26° 39' 18"	0° 59' 24"	16' 11.19"	78° 53' 38"	0.61754
11	67° 57' 43"	5° 11' 60"	65° 15' 32"	26° 45' 55"	0° 59' 23"	16' 10.89"	79° 11' 01"	0.61286
12	68° 33' 23"	5° 12' 34"	65° 54' 41"	26° 52' 21"	0° 59' 22"	16' 10.60"	79° 28' 29"	0.60817
13	69° 09' 02"	5° 13' 06"	66° 33' 53"	26° 58' 36"	0° 59' 21"	16' 10.30"	79° 46' 02"	0.60347
14	69° 44' 39"	5° 13' 37"	67° 13' 07"	27° 04' 39"	0° 59' 20"	16' 10.00"	80° 3' 40"	0.59876
15	70° 20' 15"	5° 14' 05"	67° 52' 25"	27° 10' 32"	0° 59' 19"	16' 09.70"	80° 21' 23"	0.59405
16	70° 55' 50"	5° 14' 31"	68° 31' 44"	27° 16' 13"	0° 59' 17"	16' 09.39"	80° 39' 10"	0.58933
17	71° 31' 23"	5° 14' 55"	69° 11' 06"	27° 21' 43"	0° 59' 16"	16' 09.08"	80° 57' 02"	0.58461
18	72° 06' 55"	5° 15' 17"	69° 50' 31"	27° 27' 02"	0° 59' 15"	16' 08.77"	81° 14' 58"	0.57989
19	72° 42' 26"	5° 15' 38"	70° 29' 57"	27° 32' 09"	0° 59' 14"	16' 08.46"	81° 32' 59"	0.57516
20	73° 17' 55"	5° 15' 56"	71° 09' 26"	27° 37' 05"	0° 59' 13"	16' 08.15"	81° 51' 03"	0.57042
21	73° 53' 23"	5° 16' 12"	71° 48' 57"	27° 41' 50"	0° 59' 12"	16' 07.83"	82° 9' 11"	0.56569
22	74° 28' 49"	5° 16' 26"	72° 28' 29"	27° 46' 23"	0° 59' 11"	16' 07.52"	82° 27' 23"	0.56095
23	75° 04' 14"	5° 16' 38"	73° 08' 03"	27° 50' 45"	0° 59' 09"	16' 07.20"	82° 45' 38"	0.55620
24	75° 39' 38"	5° 16' 48"	73° 47' 38"	27° 54' 56"	0° 59' 08"	16' 06.88"	83° 3' 56"	0.55146

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	171° 26' 50"	0.48"	172° 08' 23"	3° 23' 36"	1.0059807	15'53.92"	23° 26' 19"	4 m 19 s
1	171° 29' 16"	0.48"	172° 10' 37"	3° 22' 38"	1.0059699	15'53.94"	23° 26' 19"	4 m 20 s
2	171° 31' 43"	0.48"	172° 12' 52"	3° 21' 41"	1.0059591	15'53.95"	23° 26' 19"	4 m 21 s
3	171° 34' 09"	0.48"	172° 15' 06"	3° 20' 43"	1.0059483	15'53.96"	23° 26' 19"	4 m 22 s
4	171° 36' 35"	0.48"	172° 17' 20"	3° 19' 46"	1.0059375	15'53.97"	23° 26' 19"	4 m 23 s
5	171° 39' 01"	0.48"	172° 19' 35"	3° 18' 48"	1.0059267	15'53.98"	23° 26' 19"	4 m 24 s
6	171° 41' 27"	0.48"	172° 21' 49"	3° 17' 50"	1.0059159	15'53.99"	23° 26' 19"	4 m 25 s
7	171° 43' 53"	0.48"	172° 24' 04"	3° 16' 53"	1.0059051	15'54.00"	23° 26' 19"	4 m 25 s
8	171° 46' 19"	0.48"	172° 26' 18"	3° 15' 55"	1.0058943	15'54.01"	23° 26' 19"	4 m 26 s
9	171° 48' 45"	0.48"	172° 28' 33"	3° 14' 58"	1.0058835	15'54.02"	23° 26' 19"	4 m 27 s
10	171° 51' 11"	0.48"	172° 30' 47"	3° 13' 60"	1.0058727	15'54.03"	23° 26' 19"	4 m 28 s
11	171° 53' 37"	0.48"	172° 33' 02"	3° 13' 02"	1.0058619	15'54.04"	23° 26' 19"	4 m 29 s
12	171° 56' 03"	0.48"	172° 35' 16"	3° 12' 05"	1.0058510	15'54.05"	23° 26' 19"	4 m 30 s
13	171° 58' 30"	0.48"	172° 37' 31"	3° 11' 07"	1.0058402	15'54.06"	23° 26' 19"	4 m 31 s
14	172° 00' 56"	0.48"	172° 39' 45"	3° 10' 09"	1.0058294	15'54.07"	23° 26' 19"	4 m 32 s
15	172° 03' 22"	0.48"	172° 41' 60"	3° 09' 12"	1.0058186	15'54.08"	23° 26' 19"	4 m 33 s
16	172° 05' 48"	0.48"	172° 44' 14"	3° 08' 14"	1.0058077	15'54.09"	23° 26' 19"	4 m 33 s
17	172° 08' 14"	0.48"	172° 46' 29"	3° 07' 16"	1.0057969	15'54.10"	23° 26' 19"	4 m 34 s
18	172° 10' 40"	0.48"	172° 48' 43"	3° 06' 19"	1.0057861	15'54.11"	23° 26' 19"	4 m 35 s
19	172° 13' 06"	0.48"	172° 50' 58"	3° 05' 21"	1.0057752	15'54.12"	23° 26' 19"	4 m 36 s
20	172° 15' 32"	0.48"	172° 53' 12"	3° 04' 23"	1.0057644	15'54.13"	23° 26' 19"	4 m 37 s
21	172° 17' 59"	0.48"	172° 55' 27"	3° 03' 26"	1.0057535	15'54.14"	23° 26' 19"	4 m 38 s
22	172° 20' 25"	0.48"	172° 57' 41"	3° 02' 28"	1.0057427	15'54.15"	23° 26' 19"	4 m 39 s
23	172° 22' 51"	0.48"	172° 59' 56"	3° 01' 30"	1.0057318	15'54.16"	23° 26' 19"	4 m 40 s
24	172° 25' 17"	0.48"	173° 02' 10"	3° 00' 33"	1.0057210	15'54.17"	23° 26' 19"	4 m 41 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	75° 39' 38"	5° 16' 48"	73° 47' 38"	27° 54' 56"	0° 59' 08"	16' 06.88"	83° 3' 56"	0.55146
1	76° 14' 60"	5° 16' 56"	74° 27' 15"	27° 58' 55"	0° 59' 07"	16' 06.56"	83° 22' 18"	0.54672
2	76° 50' 21"	5° 17' 02"	75° 06' 53"	28° 02' 42"	0° 59' 06"	16' 06.23"	83° 40' 42"	0.54197
3	77° 25' 40"	5° 17' 07"	75° 46' 32"	28° 06' 18"	0° 59' 05"	16' 05.91"	83° 59' 09"	0.53722
4	78° 00' 58"	5° 17' 09"	76° 26' 13"	28° 09' 42"	0° 59' 03"	16' 05.58"	84° 17' 38"	0.53248
5	78° 36' 14"	5° 17' 09"	77° 05' 54"	28° 12' 55"	0° 59' 02"	16' 05.25"	84° 36' 10"	0.52773
6	79° 11' 29"	5° 17' 07"	77° 45' 35"	28° 15' 56"	0° 59' 01"	16' 04.92"	84° 54' 44"	0.52299
7	79° 46' 43"	5° 17' 03"	78° 25' 17"	28° 18' 46"	0° 58' 60"	16' 04.59"	85° 13' 20"	0.51824
8	80° 21' 55"	5° 16' 57"	79° 04' 60"	28° 21' 24"	0° 58' 59"	16' 04.26"	85° 31' 58"	0.51350
9	80° 57' 05"	5° 16' 49"	79° 44' 43"	28° 23' 50"	0° 58' 57"	16' 03.92"	85° 50' 37"	0.50876
10	81° 32' 14"	5° 16' 39"	80° 24' 25"	28° 26' 05"	0° 58' 56"	16' 03.59"	86° 9' 18"	0.50403
11	82° 07' 22"	5° 16' 28"	81° 04' 08"	28° 28' 08"	0° 58' 55"	16' 03.25"	86° 27' 60"	0.49929
12	82° 42' 28"	5° 16' 14"	81° 43' 51"	28° 29' 60"	0° 58' 54"	16' 02.91"	86° 46' 42"	0.49456
13	83° 17' 32"	5° 15' 58"	82° 23' 33"	28° 31' 40"	0° 58' 52"	16' 02.57"	87° 5' 26"	0.48983
14	83° 52' 35"	5° 15' 41"	83° 03' 15"	28° 33' 08"	0° 58' 51"	16' 02.23"	87° 24' 10"	0.48511
15	84° 27' 37"	5° 15' 21"	83° 42' 56"	28° 34' 25"	0° 58' 50"	16' 01.89"	87° 42' 55"	0.48040
16	85° 02' 37"	5° 14' 59"	84° 22' 36"	28° 35' 30"	0° 58' 49"	16' 01.55"	88° 1' 40"	0.47568
17	85° 37' 35"	5° 14' 36"	85° 02' 16"	28° 36' 24"	0° 58' 47"	16' 01.21"	88° 20' 24"	0.47098
18	86° 12' 32"	5° 14' 11"	85° 41' 54"	28° 37' 06"	0° 58' 46"	16' 00.86"	88° 39' 09"	0.46628
19	86° 47' 27"	5° 13' 43"	86° 21' 31"	28° 37' 36"	0° 58' 45"	16' 00.52"	88° 57' 54"	0.46158
20	87° 22' 21"	5° 13' 14"	87° 01' 07"	28° 37' 55"	0° 58' 44"	16' 00.17"	89° 16' 37"	0.45690
21	87° 57' 13"	5° 12' 43"	87° 40' 41"	28° 38' 02"	0° 58' 42"	15' 59.82"	89° 35' 20"	0.45222
22	88° 32' 04"	5° 12' 10"	88° 20' 14"	28° 37' 58"	0° 58' 41"	15' 59.48"	89° 54' 03"	0.44755
23	89° 06' 53"	5° 11' 35"	88° 59' 45"	28° 37' 43"	0° 58' 40"	15' 59.13"	90° 12' 44"	0.44288
24	89° 41' 41"	5° 10' 58"	89° 39' 13"	28° 37' 16"	0° 58' 38"	15' 58.78"	90° 31' 23"	0.43823

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	172° 25' 17"	0.48"	173° 02' 10"	3° 00' 33"	1.0057210	15'54.17"	23° 26' 19"	4 m 41 s
1	172° 27' 43"	0.48"	173° 04' 24"	2° 59' 35"	1.0057101	15'54.18"	23° 26' 19"	4 m 42 s
2	172° 30' 09"	0.48"	173° 06' 39"	2° 58' 37"	1.0056992	15'54.19"	23° 26' 19"	4 m 42 s
3	172° 32' 35"	0.48"	173° 08' 53"	2° 57' 39"	1.0056884	15'54.20"	23° 26' 19"	4 m 43 s
4	172° 35' 02"	0.48"	173° 11' 08"	2° 56' 42"	1.0056775	15'54.21"	23° 26' 19"	4 m 44 s
5	172° 37' 28"	0.48"	173° 13' 22"	2° 55' 44"	1.0056666	15'54.22"	23° 26' 19"	4 m 45 s
6	172° 39' 54"	0.48"	173° 15' 37"	2° 54' 46"	1.0056557	15'54.23"	23° 26' 19"	4 m 46 s
7	172° 42' 20"	0.48"	173° 17' 51"	2° 53' 48"	1.0056449	15'54.24"	23° 26' 19"	4 m 47 s
8	172° 44' 46"	0.48"	173° 20' 06"	2° 52' 51"	1.0056340	15'54.25"	23° 26' 19"	4 m 48 s
9	172° 47' 13"	0.47"	173° 22' 20"	2° 51' 53"	1.0056231	15'54.26"	23° 26' 19"	4 m 49 s
10	172° 49' 39"	0.47"	173° 24' 35"	2° 50' 55"	1.0056122	15'54.27"	23° 26' 19"	4 m 50 s
11	172° 52' 05"	0.47"	173° 26' 49"	2° 49' 57"	1.0056013	15'54.28"	23° 26' 19"	4 m 50 s
12	172° 54' 31"	0.47"	173° 29' 04"	2° 48' 60"	1.0055904	15'54.30"	23° 26' 19"	4 m 51 s
13	172° 56' 57"	0.47"	173° 31' 18"	2° 48' 02"	1.0055795	15'54.31"	23° 26' 19"	4 m 52 s
14	172° 59' 24"	0.47"	173° 33' 33"	2° 47' 04"	1.0055686	15'54.32"	23° 26' 19"	4 m 53 s
15	173° 01' 50"	0.47"	173° 35' 47"	2° 46' 06"	1.0055577	15'54.33"	23° 26' 19"	4 m 54 s
16	173° 04' 16"	0.47"	173° 38' 01"	2° 45' 08"	1.0055468	15'54.34"	23° 26' 19"	4 m 55 s
17	173° 06' 42"	0.46"	173° 40' 16"	2° 44' 11"	1.0055359	15'54.35"	23° 26' 19"	4 m 56 s
18	173° 09' 08"	0.46"	173° 42' 30"	2° 43' 13"	1.0055249	15'54.36"	23° 26' 19"	4 m 57 s
19	173° 11' 35"	0.46"	173° 44' 45"	2° 42' 15"	1.0055140	15'54.37"	23° 26' 19"	4 m 58 s
20	173° 14' 01"	0.46"	173° 46' 59"	2° 41' 17"	1.0055031	15'54.38"	23° 26' 19"	4 m 58 s
21	173° 16' 27"	0.46"	173° 49' 14"	2° 40' 19"	1.0054922	15'54.39"	23° 26' 19"	4 m 59 s
22	173° 18' 53"	0.46"	173° 51' 28"	2° 39' 22"	1.0054812	15'54.40"	23° 26' 19"	5 m 00 s
23	173° 21' 20"	0.46"	173° 53' 43"	2° 38' 24"	1.0054703	15'54.41"	23° 26' 19"	5 m 01 s
24	173° 23' 46"	0.45"	173° 55' 57"	2° 37' 26"	1.0054593	15'54.42"	23° 26' 19"	5 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	89° 41' 41"	5° 10' 58"	89° 39' 13"	28° 37' 16"	0° 58' 38"	15' 58.78"	90° 31' 23"	0.43823
1	90° 16' 27"	5° 10' 20"	90° 18' 40"	28° 36' 37"	0° 58' 37"	15' 58.43"	90° 50' 02"	0.43358
2	90° 51' 12"	5° 09' 39"	90° 58' 04"	28° 35' 47"	0° 58' 36"	15' 58.07"	91° 8' 38"	0.42894
3	91° 25' 55"	5° 08' 57"	91° 37' 27"	28° 34' 46"	0° 58' 35"	15' 57.72"	91° 27' 13"	0.42431
4	92° 00' 36"	5° 08' 12"	92° 16' 46"	28° 33' 34"	0° 58' 33"	15' 57.37"	91° 45' 46"	0.41970
5	92° 35' 16"	5° 07' 26"	92° 56' 03"	28° 32' 10"	0° 58' 32"	15' 57.02"	92° 4' 16"	0.41509
6	93° 09' 54"	5° 06' 39"	93° 35' 17"	28° 30' 35"	0° 58' 31"	15' 56.66"	92° 22' 44"	0.41049
7	93° 44' 31"	5° 05' 49"	94° 14' 28"	28° 28' 49"	0° 58' 29"	15' 56.31"	92° 41' 10"	0.40591
8	94° 19' 06"	5° 04' 57"	94° 53' 36"	28° 26' 52"	0° 58' 28"	15' 55.95"	92° 59' 32"	0.40134
9	94° 53' 40"	5° 04' 04"	95° 32' 41"	28° 24' 44"	0° 58' 27"	15' 55.60"	93° 17' 52"	0.39677
10	95° 28' 12"	5° 03' 09"	96° 11' 43"	28° 22' 24"	0° 58' 25"	15' 55.24"	93° 36' 09"	0.39223
11	96° 02' 42"	5° 02' 12"	96° 50' 41"	28° 19' 54"	0° 58' 24"	15' 54.88"	93° 54' 22"	0.38769
12	96° 37' 11"	5° 01' 13"	97° 29' 36"	28° 17' 13"	0° 58' 23"	15' 54.53"	94° 12' 32"	0.38317
13	97° 11' 38"	5° 00' 13"	98° 08' 27"	28° 14' 21"	0° 58' 22"	15' 54.17"	94° 30' 38"	0.37866
14	97° 46' 04"	4° 59' 11"	98° 47' 14"	28° 11' 18"	0° 58' 20"	15' 53.81"	94° 48' 41"	0.37416
15	98° 20' 28"	4° 58' 07"	99° 25' 57"	28° 08' 04"	0° 58' 19"	15' 53.45"	95° 6' 39"	0.36968
16	98° 54' 51"	4° 57' 01"	100° 04' 36"	28° 04' 39"	0° 58' 18"	15' 53.10"	95° 24' 34"	0.36521
17	99° 29' 11"	4° 55' 54"	100° 43' 11"	28° 01' 04"	0° 58' 16"	15' 52.74"	95° 42' 24"	0.36076
18	100° 03' 31"	4° 54' 45"	101° 21' 42"	27° 57' 18"	0° 58' 15"	15' 52.38"	96° 0' 10"	0.35632
19	100° 37' 49"	4° 53' 34"	102° 00' 08"	27° 53' 22"	0° 58' 14"	15' 52.02"	96° 17' 51"	0.35190
20	101° 12' 05"	4° 52' 21"	102° 38' 30"	27° 49' 15"	0° 58' 12"	15' 51.66"	96° 35' 27"	0.34750
21	101° 46' 19"	4° 51' 07"	103° 16' 47"	27° 44' 58"	0° 58' 11"	15' 51.30"	96° 52' 59"	0.34311
22	102° 20' 32"	4° 49' 51"	103° 54' 59"	27° 40' 31"	0° 58' 10"	15' 50.94"	97° 10' 26"	0.33873
23	102° 54' 44"	4° 48' 34"	104° 33' 07"	27° 35' 53"	0° 58' 08"	15' 50.58"	97° 27' 47"	0.33438
24	103° 28' 53"	4° 47' 15"	105° 11' 10"	27° 31' 05"	0° 58' 07"	15' 50.22"	97° 45' 03"	0.33004

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	173° 23' 46"	0.45"	173° 55' 57"	2° 37' 26"	1.0054593	15'54.42"	23° 26' 19"	5 m 02 s
1	173° 26' 12"	0.45"	173° 58' 12"	2° 36' 28"	1.0054484	15'54.43"	23° 26' 19"	5 m 03 s
2	173° 28' 38"	0.45"	174° 00' 26"	2° 35' 30"	1.0054374	15'54.44"	23° 26' 19"	5 m 04 s
3	173° 31' 05"	0.45"	174° 02' 41"	2° 34' 32"	1.0054265	15'54.45"	23° 26' 19"	5 m 05 s
4	173° 33' 31"	0.45"	174° 04' 55"	2° 33' 34"	1.0054155	15'54.46"	23° 26' 19"	5 m 06 s
5	173° 35' 57"	0.44"	174° 07' 09"	2° 32' 37"	1.0054046	15'54.47"	23° 26' 19"	5 m 06 s
6	173° 38' 23"	0.44"	174° 09' 24"	2° 31' 39"	1.0053936	15'54.48"	23° 26' 19"	5 m 07 s
7	173° 40' 50"	0.44"	174° 11' 38"	2° 30' 41"	1.0053826	15'54.49"	23° 26' 19"	5 m 08 s
8	173° 43' 16"	0.44"	174° 13' 53"	2° 29' 43"	1.0053717	15'54.50"	23° 26' 19"	5 m 09 s
9	173° 45' 42"	0.44"	174° 16' 07"	2° 28' 45"	1.0053607	15'54.51"	23° 26' 19"	5 m 10 s
10	173° 48' 08"	0.43"	174° 18' 22"	2° 27' 47"	1.0053497	15'54.52"	23° 26' 19"	5 m 11 s
11	173° 50' 35"	0.43"	174° 20' 36"	2° 26' 49"	1.0053387	15'54.53"	23° 26' 19"	5 m 12 s
12	173° 53' 01"	0.43"	174° 22' 51"	2° 25' 51"	1.0053277	15'54.54"	23° 26' 19"	5 m 13 s
13	173° 55' 27"	0.43"	174° 25' 05"	2° 24' 53"	1.0053167	15'54.55"	23° 26' 19"	5 m 14 s
14	173° 57' 54"	0.42"	174° 27' 20"	2° 23' 55"	1.0053057	15'54.57"	23° 26' 19"	5 m 15 s
15	174° 00' 20"	0.42"	174° 29' 34"	2° 22' 58"	1.0052947	15'54.58"	23° 26' 19"	5 m 15 s
16	174° 02' 46"	0.42"	174° 31' 49"	2° 21' 60"	1.0052837	15'54.59"	23° 26' 19"	5 m 16 s
17	174° 05' 13"	0.42"	174° 34' 03"	2° 21' 02"	1.0052727	15'54.60"	23° 26' 19"	5 m 17 s
18	174° 07' 39"	0.41"	174° 36' 17"	2° 20' 04"	1.0052617	15'54.61"	23° 26' 19"	5 m 18 s
19	174° 10' 05"	0.41"	174° 38' 32"	2° 19' 06"	1.0052507	15'54.62"	23° 26' 19"	5 m 19 s
20	174° 12' 31"	0.41"	174° 40' 46"	2° 18' 08"	1.0052397	15'54.63"	23° 26' 19"	5 m 20 s
21	174° 14' 58"	0.41"	174° 43' 01"	2° 17' 10"	1.0052286	15'54.64"	23° 26' 19"	5 m 21 s
22	174° 17' 24"	0.40"	174° 45' 15"	2° 16' 12"	1.0052176	15'54.65"	23° 26' 19"	5 m 22 s
23	174° 19' 50"	0.40"	174° 47' 30"	2° 15' 14"	1.0052066	15'54.66"	23° 26' 19"	5 m 23 s
24	174° 22' 17"	0.40"	174° 49' 44"	2° 14' 16"	1.0051955	15'54.67"	23° 26' 19"	5 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	103° 28' 53"	4° 47' 15"	105° 11' 10"	27° 31' 05"	0° 58' 07"	15' 50.22"	97° 45' 03"	0.33004
1	104° 03' 02"	4° 45' 54"	105° 49' 08"	27° 26' 07"	0° 58' 06"	15' 49.86"	98° 2' 13"	0.32572
2	104° 37' 08"	4° 44' 31"	106° 27' 00"	27° 20' 59"	0° 58' 04"	15' 49.49"	98° 19' 18"	0.32142
3	105° 11' 13"	4° 43' 07"	107° 04' 48"	27° 15' 40"	0° 58' 03"	15' 49.13"	98° 36' 18"	0.31713
4	105° 45' 17"	4° 41' 42"	107° 42' 30"	27° 10' 12"	0° 58' 02"	15' 48.77"	98° 53' 11"	0.31287
5	106° 19' 19"	4° 40' 14"	108° 20' 07"	27° 04' 35"	0° 58' 00"	15' 48.41"	99° 9' 58"	0.30862
6	106° 53' 19"	4° 38' 46"	108° 57' 38"	26° 58' 47"	0° 57' 59"	15' 48.05"	99° 26' 40"	0.30439
7	107° 27' 18"	4° 37' 15"	109° 35' 04"	26° 52' 50"	0° 57' 58"	15' 47.69"	99° 43' 15"	0.30018
8	108° 01' 15"	4° 35' 43"	110° 12' 25"	26° 46' 43"	0° 57' 56"	15' 47.33"	99° 59' 43"	0.29600
9	108° 35' 10"	4° 34' 10"	110° 49' 40"	26° 40' 27"	0° 57' 55"	15' 46.97"	100° 16' 05"	0.29183
10	109° 09' 04"	4° 32' 35"	111° 26' 49"	26° 34' 01"	0° 57' 54"	15' 46.60"	100° 32' 21"	0.28768
11	109° 42' 56"	4° 30' 59"	112° 03' 52"	26° 27' 26"	0° 57' 52"	15' 46.24"	100° 48' 30"	0.28355
12	110° 16' 47"	4° 29' 21"	112° 40' 49"	26° 20' 42"	0° 57' 51"	15' 45.88"	101° 4' 32"	0.27945
13	110° 50' 36"	4° 27' 41"	113° 17' 41"	26° 13' 48"	0° 57' 50"	15' 45.52"	101° 20' 27"	0.27536
14	111° 24' 24"	4° 26' 00"	113° 54' 26"	26° 06' 46"	0° 57' 48"	15' 45.16"	101° 36' 15"	0.27130
15	111° 58' 10"	4° 24' 18"	114° 31' 06"	25° 59' 34"	0° 57' 47"	15' 44.80"	101° 51' 56"	0.26726
16	112° 31' 55"	4° 22' 34"	115° 07' 39"	25° 52' 14"	0° 57' 46"	15' 44.44"	102° 7' 29"	0.26324
17	113° 05' 37"	4° 20' 49"	115° 44' 07"	25° 44' 44"	0° 57' 45"	15' 44.07"	102° 22' 56"	0.25925
18	113° 39' 19"	4° 19' 02"	116° 20' 28"	25° 37' 06"	0° 57' 43"	15' 43.71"	102° 38' 14"	0.25527
19	114° 12' 59"	4° 17' 14"	116° 56' 43"	25° 29' 20"	0° 57' 42"	15' 43.35"	102° 53' 26"	0.25132
20	114° 46' 37"	4° 15' 24"	117° 32' 52"	25° 21' 25"	0° 57' 41"	15' 42.99"	103° 8' 29"	0.24740
21	115° 20' 13"	4° 13' 33"	118° 08' 54"	25° 13' 21"	0° 57' 39"	15' 42.63"	103° 23' 26"	0.24349
22	115° 53' 48"	4° 11' 41"	118° 44' 50"	25° 05' 09"	0° 57' 38"	15' 42.27"	103° 38' 14"	0.23961
23	116° 27' 22"	4° 09' 47"	119° 20' 40"	24° 56' 48"	0° 57' 37"	15' 41.91"	103° 52' 54"	0.23576
24	117° 00' 54"	4° 07' 52"	119° 56' 23"	24° 48' 20"	0° 57' 35"	15' 41.55"	104° 7' 26"	0.23193

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	174° 22' 17"	0.40"	174° 49' 44"	2° 14' 16"	1.0051955	15'54.67"	23° 26' 19"	5 m 23 s
1	174° 24' 43"	0.39"	174° 51' 59"	2° 13' 18"	1.0051845	15'54.68"	23° 26' 19"	5 m 24 s
2	174° 27' 09"	0.39"	174° 54' 13"	2° 12' 20"	1.0051735	15'54.69"	23° 26' 19"	5 m 25 s
3	174° 29' 36"	0.39"	174° 56' 28"	2° 11' 22"	1.0051624	15'54.70"	23° 26' 19"	5 m 26 s
4	174° 32' 02"	0.38"	174° 58' 42"	2° 10' 24"	1.0051513	15'54.71"	23° 26' 19"	5 m 27 s
5	174° 34' 28"	0.38"	175° 00' 57"	2° 09' 26"	1.0051403	15'54.72"	23° 26' 19"	5 m 28 s
6	174° 36' 55"	0.38"	175° 03' 11"	2° 08' 28"	1.0051292	15'54.73"	23° 26' 19"	5 m 29 s
7	174° 39' 21"	0.38"	175° 05' 26"	2° 07' 30"	1.0051182	15'54.74"	23° 26' 19"	5 m 30 s
8	174° 41' 48"	0.37"	175° 07' 40"	2° 06' 32"	1.0051071	15'54.75"	23° 26' 19"	5 m 31 s
9	174° 44' 14"	0.37"	175° 09' 54"	2° 05' 34"	1.0050960	15'54.76"	23° 26' 19"	5 m 31 s
10	174° 46' 40"	0.37"	175° 12' 09"	2° 04' 36"	1.0050849	15'54.78"	23° 26' 19"	5 m 32 s
11	174° 49' 07"	0.36"	175° 14' 23"	2° 03' 38"	1.0050738	15'54.79"	23° 26' 19"	5 m 33 s
12	174° 51' 33"	0.36"	175° 16' 38"	2° 02' 40"	1.0050628	15'54.80"	23° 26' 19"	5 m 34 s
13	174° 53' 59"	0.36"	175° 18' 52"	2° 01' 42"	1.0050517	15'54.81"	23° 26' 19"	5 m 35 s
14	174° 56' 26"	0.35"	175° 21' 07"	2° 00' 44"	1.0050406	15'54.82"	23° 26' 19"	5 m 36 s
15	174° 58' 52"	0.35"	175° 23' 21"	1° 59' 46"	1.0050295	15'54.83"	23° 26' 19"	5 m 37 s
16	175° 01' 19"	0.34"	175° 25' 36"	1° 58' 48"	1.0050184	15'54.84"	23° 26' 19"	5 m 38 s
17	175° 03' 45"	0.34"	175° 27' 50"	1° 57' 50"	1.0050072	15'54.85"	23° 26' 19"	5 m 39 s
18	175° 06' 11"	0.34"	175° 30' 05"	1° 56' 52"	1.0049961	15'54.86"	23° 26' 19"	5 m 40 s
19	175° 08' 38"	0.33"	175° 32' 19"	1° 55' 54"	1.0049850	15'54.87"	23° 26' 19"	5 m 40 s
20	175° 11' 04"	0.33"	175° 34' 34"	1° 54' 56"	1.0049739	15'54.88"	23° 26' 19"	5 m 41 s
21	175° 13' 31"	0.33"	175° 36' 48"	1° 53' 58"	1.0049628	15'54.89"	23° 26' 19"	5 m 42 s
22	175° 15' 57"	0.32"	175° 39' 03"	1° 52' 59"	1.0049516	15'54.90"	23° 26' 19"	5 m 43 s
23	175° 18' 23"	0.32"	175° 41' 17"	1° 52' 01"	1.0049405	15'54.91"	23° 26' 19"	5 m 44 s
24	175° 20' 50"	0.31"	175° 43' 32"	1° 51' 03"	1.0049293	15'54.92"	23° 26' 19"	5 m 45 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	117° 00' 54"	4° 07' 52"	119° 56' 23"	24° 48' 20"	0° 57' 35"	15' 41.55"	104° 7' 26"	0.23193
1	117° 34' 24"	4° 05' 56"	120° 32' 00"	24° 39' 43"	0° 57' 34"	15' 41.19"	104° 21' 51"	0.22812
2	118° 07' 53"	4° 03' 58"	121° 07' 31"	24° 30' 59"	0° 57' 33"	15' 40.83"	104° 36' 07"	0.22434
3	118° 41' 20"	4° 01' 60"	121° 42' 55"	24° 22' 06"	0° 57' 31"	15' 40.47"	104° 50' 15"	0.22059
4	119° 14' 46"	3° 59' 59"	122° 18' 13"	24° 13' 06"	0° 57' 30"	15' 40.11"	105° 4' 15"	0.21686
5	119° 48' 10"	3° 57' 58"	122° 53' 24"	24° 03' 58"	0° 57' 29"	15' 39.75"	105° 18' 06"	0.21316
6	120° 21' 33"	3° 55' 55"	123° 28' 29"	23° 54' 42"	0° 57' 27"	15' 39.39"	105° 31' 49"	0.20948
7	120° 54' 54"	3° 53' 51"	124° 03' 27"	23° 45' 19"	0° 57' 26"	15' 39.04"	105° 45' 24"	0.20583
8	121° 28' 13"	3° 51' 46"	124° 38' 19"	23° 35' 48"	0° 57' 25"	15' 38.68"	105° 58' 50"	0.20220
9	122° 01' 31"	3° 49' 40"	125° 13' 04"	23° 26' 10"	0° 57' 23"	15' 38.32"	106° 12' 08"	0.19860
10	122° 34' 48"	3° 47' 32"	125° 47' 43"	23° 16' 25"	0° 57' 22"	15' 37.96"	106° 25' 17"	0.19503
11	123° 08' 03"	3° 45' 23"	126° 22' 15"	23° 06' 32"	0° 57' 21"	15' 37.60"	106° 38' 17"	0.19149
12	123° 41' 16"	3° 43' 13"	126° 56' 40"	22° 56' 32"	0° 57' 19"	15' 37.25"	106° 51' 08"	0.18797
13	124° 14' 28"	3° 41' 02"	127° 30' 60"	22° 46' 26"	0° 57' 18"	15' 36.89"	107° 3' 51"	0.18448
14	124° 47' 38"	3° 38' 50"	128° 05' 12"	22° 36' 12"	0° 57' 17"	15' 36.53"	107° 16' 24"	0.18102
15	125° 20' 47"	3° 36' 36"	128° 39' 18"	22° 25' 52"	0° 57' 16"	15' 36.18"	107° 28' 49"	0.17758
16	125° 53' 54"	3° 34' 22"	129° 13' 18"	22° 15' 25"	0° 57' 14"	15' 35.82"	107° 41' 05"	0.17418
17	126° 27' 00"	3° 32' 06"	129° 47' 11"	22° 04' 51"	0° 57' 13"	15' 35.46"	107° 53' 11"	0.17080
18	127° 00' 04"	3° 29' 50"	130° 20' 58"	21° 54' 11"	0° 57' 12"	15' 35.11"	108° 5' 09"	0.16745
19	127° 33' 07"	3° 27' 32"	130° 54' 38"	21° 43' 25"	0° 57' 10"	15' 34.75"	108° 16' 57"	0.16413
20	128° 06' 08"	3° 25' 13"	131° 28' 12"	21° 32' 32"	0° 57' 09"	15' 34.40"	108° 28' 36"	0.16084
21	128° 39' 08"	3° 22' 53"	132° 01' 39"	21° 21' 33"	0° 57' 08"	15' 34.04"	108° 40' 06"	0.15758
22	129° 12' 06"	3° 20' 32"	132° 34' 60"	21° 10' 27"	0° 57' 06"	15' 33.69"	108° 51' 27"	0.15435
23	129° 45' 03"	3° 18' 11"	133° 08' 14"	20° 59' 16"	0° 57' 05"	15' 33.34"	109° 2' 38"	0.15115
24	130° 17' 58"	3° 15' 48"	133° 41' 23"	20° 47' 59"	0° 57' 04"	15' 32.98"	109° 13' 40"	0.14798

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	175° 20' 50"	0.31"	175° 43' 32"	1° 51' 03"	1.0049293	15'54.92"	23° 26' 19"	5 m 45 s
1	175° 23' 16"	0.31"	175° 45' 46"	1° 50' 05"	1.0049182	15'54.93"	23° 26' 19"	5 m 46 s
2	175° 25' 43"	0.31"	175° 48' 01"	1° 49' 07"	1.0049071	15'54.94"	23° 26' 19"	5 m 47 s
3	175° 28' 09"	0.30"	175° 50' 15"	1° 48' 09"	1.0048959	15'54.95"	23° 26' 19"	5 m 48 s
4	175° 30' 36"	0.30"	175° 52' 30"	1° 47' 11"	1.0048847	15'54.97"	23° 26' 19"	5 m 48 s
5	175° 33' 02"	0.29"	175° 54' 44"	1° 46' 13"	1.0048736	15'54.98"	23° 26' 19"	5 m 49 s
6	175° 35' 28"	0.29"	175° 56' 59"	1° 45' 15"	1.0048624	15'54.99"	23° 26' 19"	5 m 50 s
7	175° 37' 55"	0.29"	175° 59' 13"	1° 44' 17"	1.0048512	15'55.00"	23° 26' 19"	5 m 51 s
8	175° 40' 21"	0.28"	176° 01' 27"	1° 43' 18"	1.0048401	15'55.01"	23° 26' 19"	5 m 52 s
9	175° 42' 48"	0.28"	176° 03' 42"	1° 42' 20"	1.0048289	15'55.02"	23° 26' 19"	5 m 53 s
10	175° 45' 14"	0.27"	176° 05' 56"	1° 41' 22"	1.0048177	15'55.03"	23° 26' 19"	5 m 54 s
11	175° 47' 41"	0.27"	176° 08' 11"	1° 40' 24"	1.0048065	15'55.04"	23° 26' 19"	5 m 55 s
12	175° 50' 07"	0.27"	176° 10' 25"	1° 39' 26"	1.0047953	15'55.05"	23° 26' 19"	5 m 56 s
13	175° 52' 34"	0.26"	176° 12' 40"	1° 38' 28"	1.0047841	15'55.06"	23° 26' 19"	5 m 56 s
14	175° 55' 00"	0.26"	176° 14' 54"	1° 37' 30"	1.0047729	15'55.07"	23° 26' 19"	5 m 57 s
15	175° 57' 27"	0.25"	176° 17' 09"	1° 36' 32"	1.0047617	15'55.08"	23° 26' 19"	5 m 58 s
16	175° 59' 53"	0.25"	176° 19' 23"	1° 35' 33"	1.0047505	15'55.09"	23° 26' 19"	5 m 59 s
17	176° 02' 20"	0.24"	176° 21' 38"	1° 34' 35"	1.0047393	15'55.10"	23° 26' 19"	6 m 00 s
18	176° 04' 46"	0.24"	176° 23' 52"	1° 33' 37"	1.0047280	15'55.11"	23° 26' 19"	6 m 01 s
19	176° 07' 13"	0.23"	176° 26' 07"	1° 32' 39"	1.0047168	15'55.12"	23° 26' 19"	6 m 02 s
20	176° 09' 39"	0.23"	176° 28' 21"	1° 31' 41"	1.0047056	15'55.14"	23° 26' 19"	6 m 03 s
21	176° 12' 06"	0.23"	176° 30' 36"	1° 30' 43"	1.0046943	15'55.15"	23° 26' 19"	6 m 04 s
22	176° 14' 32"	0.22"	176° 32' 50"	1° 29' 44"	1.0046831	15'55.16"	23° 26' 19"	6 m 04 s
23	176° 16' 59"	0.22"	176° 35' 05"	1° 28' 46"	1.0046719	15'55.17"	23° 26' 19"	6 m 05 s
24	176° 19' 25"	0.21"	176° 37' 19"	1° 27' 48"	1.0046606	15'55.18"	23° 26' 19"	6 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	130° 17' 58"	3° 15' 48"	133° 41' 23"	20° 47' 59"	0° 57' 04"	15' 32.98"	109° 13' 40"	0.14798
1	130° 50' 52"	3° 13' 24"	134° 14' 25"	20° 36' 35"	0° 57' 03"	15' 32.63"	109° 24' 33"	0.14484
2	131° 23' 44"	3° 10' 59"	134° 47' 20"	20° 25' 06"	0° 57' 01"	15' 32.28"	109° 35' 16"	0.14173
3	131° 56' 35"	3° 08' 33"	135° 20' 10"	20° 13' 32"	0° 56' 60"	15' 31.92"	109° 45' 49"	0.13865
4	132° 29' 24"	3° 06' 07"	135° 52' 53"	20° 01' 51"	0° 56' 59"	15' 31.57"	109° 56' 13"	0.13560
5	133° 02' 12"	3° 03' 39"	136° 25' 30"	19° 50' 06"	0° 56' 57"	15' 31.22"	110° 6' 28"	0.13258
6	133° 34' 58"	3° 01' 11"	136° 58' 00"	19° 38' 14"	0° 56' 56"	15' 30.87"	110° 16' 32"	0.12959
7	134° 07' 43"	2° 58' 41"	137° 30' 25"	19° 26' 18"	0° 56' 55"	15' 30.52"	110° 26' 27"	0.12663
8	134° 40' 26"	2° 56' 11"	138° 02' 44"	19° 14' 16"	0° 56' 53"	15' 30.17"	110° 36' 12"	0.12371
9	135° 13' 08"	2° 53' 40"	138° 34' 56"	19° 02' 09"	0° 56' 52"	15' 29.82"	110° 45' 47"	0.12081
10	135° 45' 48"	2° 51' 08"	139° 07' 03"	18° 49' 57"	0° 56' 51"	15' 29.47"	110° 55' 13"	0.11795
11	136° 18' 27"	2° 48' 36"	139° 39' 03"	18° 37' 40"	0° 56' 50"	15' 29.12"	111° 4' 28"	0.11512
12	136° 51' 05"	2° 46' 02"	140° 10' 58"	18° 25' 18"	0° 56' 48"	15' 28.77"	111° 13' 34"	0.11232
13	137° 23' 41"	2° 43' 28"	140° 42' 47"	18° 12' 51"	0° 56' 47"	15' 28.42"	111° 22' 29"	0.10955
14	137° 56' 15"	2° 40' 53"	141° 14' 29"	18° 00' 20"	0° 56' 46"	15' 28.07"	111° 31' 14"	0.10682
15	138° 28' 49"	2° 38' 17"	141° 46' 07"	17° 47' 44"	0° 56' 45"	15' 27.73"	111° 39' 49"	0.10412
16	139° 01' 20"	2° 35' 40"	142° 17' 38"	17° 35' 03"	0° 56' 43"	15' 27.38"	111° 48' 14"	0.10145
17	139° 33' 50"	2° 33' 03"	142° 49' 04"	17° 22' 18"	0° 56' 42"	15' 27.03"	111° 56' 29"	0.09881
18	140° 06' 19"	2° 30' 25"	143° 20' 24"	17° 09' 28"	0° 56' 41"	15' 26.69"	112° 4' 33"	0.09621
19	140° 38' 47"	2° 27' 46"	143° 51' 38"	16° 56' 34"	0° 56' 39"	15' 26.34"	112° 12' 27"	0.09364
20	141° 11' 13"	2° 25' 07"	144° 22' 47"	16° 43' 36"	0° 56' 38"	15' 25.99"	112° 20' 10"	0.09110
21	141° 43' 37"	2° 22' 27"	144° 53' 50"	16° 30' 34"	0° 56' 37"	15' 25.65"	112° 27' 43"	0.08859
22	142° 16' 00"	2° 19' 46"	145° 24' 48"	16° 17' 28"	0° 56' 36"	15' 25.30"	112° 35' 05"	0.08612
23	142° 48' 22"	2° 17' 05"	145° 55' 41"	16° 04' 18"	0° 56' 34"	15' 24.96"	112° 42' 16"	0.08368
24	143° 20' 42"	2° 14' 23"	146° 26' 28"	15° 51' 04"	0° 56' 33"	15' 24.62"	112° 49' 16"	0.08128

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	176° 19' 25"	0.21"	176° 37' 19"	1° 27' 48"	1.0046606	15'55.18"	23° 26' 19"	6 m 06 s
1	176° 21' 52"	0.21"	176° 39' 34"	1° 26' 50"	1.0046494	15'55.19"	23° 26' 19"	6 m 07 s
2	176° 24' 18"	0.20"	176° 41' 48"	1° 25' 52"	1.0046381	15'55.20"	23° 26' 19"	6 m 08 s
3	176° 26' 45"	0.20"	176° 44' 03"	1° 24' 54"	1.0046268	15'55.21"	23° 26' 19"	6 m 09 s
4	176° 29' 11"	0.19"	176° 46' 17"	1° 23' 55"	1.0046156	15'55.22"	23° 26' 19"	6 m 10 s
5	176° 31' 38"	0.19"	176° 48' 32"	1° 22' 57"	1.0046043	15'55.23"	23° 26' 19"	6 m 11 s
6	176° 34' 04"	0.18"	176° 50' 47"	1° 21' 59"	1.0045930	15'55.24"	23° 26' 19"	6 m 12 s
7	176° 36' 31"	0.18"	176° 53' 01"	1° 21' 01"	1.0045817	15'55.25"	23° 26' 19"	6 m 13 s
8	176° 38' 57"	0.17"	176° 55' 16"	1° 20' 03"	1.0045704	15'55.26"	23° 26' 19"	6 m 13 s
9	176° 41' 24"	0.17"	176° 57' 30"	1° 19' 04"	1.0045592	15'55.27"	23° 26' 19"	6 m 14 s
10	176° 43' 50"	0.16"	176° 59' 45"	1° 18' 06"	1.0045479	15'55.29"	23° 26' 19"	6 m 15 s
11	176° 46' 17"	0.16"	177° 01' 59"	1° 17' 08"	1.0045366	15'55.30"	23° 26' 19"	6 m 16 s
12	176° 48' 44"	0.15"	177° 04' 14"	1° 16' 10"	1.0045253	15'55.31"	23° 26' 19"	6 m 17 s
13	176° 51' 10"	0.15"	177° 06' 28"	1° 15' 11"	1.0045139	15'55.32"	23° 26' 19"	6 m 18 s
14	176° 53' 37"	0.14"	177° 08' 43"	1° 14' 13"	1.0045026	15'55.33"	23° 26' 19"	6 m 19 s
15	176° 56' 03"	0.14"	177° 10' 57"	1° 13' 15"	1.0044913	15'55.34"	23° 26' 19"	6 m 20 s
16	176° 58' 30"	0.13"	177° 13' 12"	1° 12' 17"	1.0044800	15'55.35"	23° 26' 19"	6 m 21 s
17	177° 00' 56"	0.13"	177° 15' 26"	1° 11' 19"	1.0044687	15'55.36"	23° 26' 19"	6 m 21 s
18	177° 03' 23"	0.12"	177° 17' 41"	1° 10' 20"	1.0044573	15'55.37"	23° 26' 19"	6 m 22 s
19	177° 05' 49"	0.12"	177° 19' 55"	1° 09' 22"	1.0044460	15'55.38"	23° 26' 19"	6 m 23 s
20	177° 08' 16"	0.11"	177° 22' 10"	1° 08' 24"	1.0044346	15'55.39"	23° 26' 19"	6 m 24 s
21	177° 10' 43"	0.11"	177° 24' 24"	1° 07' 26"	1.0044233	15'55.40"	23° 26' 19"	6 m 25 s
22	177° 13' 09"	0.10"	177° 26' 39"	1° 06' 27"	1.0044119	15'55.41"	23° 26' 19"	6 m 26 s
23	177° 15' 36"	0.10"	177° 28' 53"	1° 05' 29"	1.0044006	15'55.43"	23° 26' 19"	6 m 27 s
24	177° 18' 02"	0.09"	177° 31' 08"	1° 04' 31"	1.0043892	15'55.44"	23° 26' 19"	6 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	143° 20' 42"	2° 14' 23"	146° 26' 28"	15° 51' 04"	0° 56' 33"	15' 24.62"	112° 49' 16"	0.08128
1	143° 53' 01"	2° 11' 40"	146° 57' 10"	15° 37' 46"	0° 56' 32"	15' 24.27"	112° 56' 05"	0.07891
2	144° 25' 18"	2° 08' 57"	147° 27' 47"	15° 24' 25"	0° 56' 31"	15' 23.93"	113° 2' 43"	0.07657
3	144° 57' 34"	2° 06' 13"	147° 58' 19"	15° 10' 59"	0° 56' 29"	15' 23.59"	113° 9' 10"	0.07427
4	145° 29' 49"	2° 03' 29"	148° 28' 45"	14° 57' 31"	0° 56' 28"	15' 23.25"	113° 15' 26"	0.07200
5	146° 02' 02"	2° 00' 44"	148° 59' 07"	14° 43' 58"	0° 56' 27"	15' 22.91"	113° 21' 30"	0.06977
6	146° 34' 14"	1° 57' 59"	149° 29' 23"	14° 30' 23"	0° 56' 26"	15' 22.56"	113° 27' 23"	0.06756
7	147° 06' 24"	1° 55' 13"	149° 59' 35"	14° 16' 44"	0° 56' 24"	15' 22.22"	113° 33' 03"	0.06540
8	147° 38' 33"	1° 52' 27"	150° 29' 41"	14° 03' 02"	0° 56' 23"	15' 21.88"	113° 38' 32"	0.06327
9	148° 10' 41"	1° 49' 40"	150° 59' 43"	13° 49' 16"	0° 56' 22"	15' 21.55"	113° 43' 49"	0.06117
10	148° 42' 47"	1° 46' 53"	151° 29' 40"	13° 35' 28"	0° 56' 21"	15' 21.21"	113° 48' 53"	0.05911
11	149° 14' 52"	1° 44' 05"	151° 59' 33"	13° 21' 36"	0° 56' 19"	15' 20.87"	113° 53' 45"	0.05708
12	149° 46' 55"	1° 41' 17"	152° 29' 20"	13° 07' 42"	0° 56' 18"	15' 20.53"	113° 58' 24"	0.05508
13	150° 18' 57"	1° 38' 29"	152° 59' 04"	12° 53' 45"	0° 56' 17"	15' 20.19"	114° 2' 51"	0.05313
14	150° 50' 58"	1° 35' 40"	153° 28' 42"	12° 39' 45"	0° 56' 16"	15' 19.86"	114° 7' 04"	0.05120
15	151° 22' 57"	1° 32' 50"	153° 58' 17"	12° 25' 42"	0° 56' 14"	15' 19.52"	114° 11' 03"	0.04931
16	151° 54' 55"	1° 30' 01"	154° 27' 47"	12° 11' 37"	0° 56' 13"	15' 19.19"	114° 14' 49"	0.04746
17	152° 26' 52"	1° 27' 11"	154° 57' 12"	11° 57' 29"	0° 56' 12"	15' 18.85"	114° 18' 21"	0.04564
18	152° 58' 47"	1° 24' 20"	155° 26' 34"	11° 43' 18"	0° 56' 11"	15' 18.52"	114° 21' 38"	0.04386
19	153° 30' 41"	1° 21' 30"	155° 55' 51"	11° 29' 06"	0° 56' 09"	15' 18.18"	114° 24' 40"	0.04211
20	154° 02' 33"	1° 18' 39"	156° 25' 04"	11° 14' 50"	0° 56' 08"	15' 17.85"	114° 27' 28"	0.04040
21	154° 34' 25"	1° 15' 47"	156° 54' 13"	11° 00' 33"	0° 56' 07"	15' 17.52"	114° 29' 59"	0.03872
22	155° 06' 15"	1° 12' 56"	157° 23' 18"	10° 46' 13"	0° 56' 06"	15' 17.19"	114° 32' 15"	0.03708
23	155° 38' 03"	1° 10' 04"	157° 52' 19"	10° 31' 52"	0° 56' 05"	15' 16.86"	114° 34' 13"	0.03547
24	156° 09' 50"	1° 07' 12"	158° 21' 16"	10° 17' 28"	0° 56' 03"	15' 16.53"	114° 35' 55"	0.03390

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	177° 18' 02"	0.09"	177° 31' 08"	1° 04' 31"	1.0043892	15'55.44"	23° 26' 19"	6 m 28 s
1	177° 20' 29"	0.09"	177° 33' 23"	1° 03' 33"	1.0043779	15'55.45"	23° 26' 19"	6 m 29 s
2	177° 22' 56"	0.08"	177° 35' 37"	1° 02' 34"	1.0043665	15'55.46"	23° 26' 19"	6 m 29 s
3	177° 25' 22"	0.08"	177° 37' 52"	1° 01' 36"	1.0043551	15'55.47"	23° 26' 19"	6 m 30 s
4	177° 27' 49"	0.07"	177° 40' 06"	1° 00' 38"	1.0043437	15'55.48"	23° 26' 19"	6 m 31 s
5	177° 30' 15"	0.07"	177° 42' 21"	0° 59' 39"	1.0043324	15'55.49"	23° 26' 19"	6 m 32 s
6	177° 32' 42"	0.06"	177° 44' 35"	0° 58' 41"	1.0043210	15'55.50"	23° 26' 19"	6 m 33 s
7	177° 35' 09"	0.06"	177° 46' 50"	0° 57' 43"	1.0043096	15'55.51"	23° 26' 19"	6 m 34 s
8	177° 37' 35"	0.05"	177° 49' 04"	0° 56' 45"	1.0042982	15'55.52"	23° 26' 19"	6 m 35 s
9	177° 40' 02"	0.05"	177° 51' 19"	0° 55' 46"	1.0042868	15'55.53"	23° 26' 19"	6 m 36 s
10	177° 42' 29"	0.04"	177° 53' 34"	0° 54' 48"	1.0042754	15'55.54"	23° 26' 19"	6 m 37 s
11	177° 44' 55"	0.04"	177° 55' 48"	0° 53' 50"	1.0042640	15'55.56"	23° 26' 19"	6 m 37 s
12	177° 47' 22"	0.03"	177° 58' 03"	0° 52' 51"	1.0042525	15'55.57"	23° 26' 19"	6 m 38 s
13	177° 49' 48"	0.02"	178° 00' 17"	0° 51' 53"	1.0042411	15'55.58"	23° 26' 19"	6 m 39 s
14	177° 52' 15"	0.02"	178° 02' 32"	0° 50' 55"	1.0042297	15'55.59"	23° 26' 19"	6 m 40 s
15	177° 54' 42"	0.01"	178° 04' 46"	0° 49' 57"	1.0042183	15'55.60"	23° 26' 19"	6 m 41 s
16	177° 57' 08"	0.01"	178° 07' 01"	0° 48' 58"	1.0042068	15'55.61"	23° 26' 19"	6 m 42 s
17	177° 59' 35"	0.00"	178° 09' 15"	0° 47' 60"	1.0041954	15'55.62"	23° 26' 19"	6 m 43 s
18	178° 02' 02"	-0.00"	178° 11' 30"	0° 47' 02"	1.0041840	15'55.63"	23° 26' 19"	6 m 44 s
19	178° 04' 28"	-0.01"	178° 13' 45"	0° 46' 03"	1.0041725	15'55.64"	23° 26' 19"	6 m 45 s
20	178° 06' 55"	-0.01"	178° 15' 59"	0° 45' 05"	1.0041611	15'55.65"	23° 26' 19"	6 m 45 s
21	178° 09' 22"	-0.02"	178° 18' 14"	0° 44' 07"	1.0041496	15'55.66"	23° 26' 19"	6 m 46 s
22	178° 11' 48"	-0.02"	178° 20' 28"	0° 43' 08"	1.0041381	15'55.68"	23° 26' 19"	6 m 47 s
23	178° 14' 15"	-0.03"	178° 22' 43"	0° 42' 10"	1.0041267	15'55.69"	23° 26' 19"	6 m 48 s
24	178° 16' 42"	-0.03"	178° 24' 58"	0° 41' 12"	1.0041152	15'55.70"	23° 26' 19"	6 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	156° 09' 50"	1° 07' 12"	158° 21' 16"	10° 17' 28"	0° 56' 03"	15' 16.53"	114° 35' 55"	0.03390
1	156° 41' 36"	1° 04' 20"	158° 50' 09"	10° 03' 02"	0° 56' 02"	15' 16.20"	114° 37' 18"	0.03236
2	157° 13' 21"	1° 01' 27"	159° 18' 59"	9° 48' 34"	0° 56' 01"	15' 15.87"	114° 38' 23"	0.03086
3	157° 45' 04"	0° 58' 35"	159° 47' 45"	9° 34' 05"	0° 55' 60"	15' 15.54"	114° 39' 09"	0.02940
4	158° 16' 46"	0° 55' 42"	160° 16' 28"	9° 19' 33"	0° 55' 59"	15' 15.21"	114° 39' 34"	0.02797
5	158° 48' 26"	0° 52' 49"	160° 45' 07"	9° 05' 00"	0° 55' 57"	15' 14.88"	114° 39' 38"	0.02658
6	159° 20' 06"	0° 49' 56"	161° 13' 42"	8° 50' 26"	0° 55' 56"	15' 14.56"	114° 39' 20"	0.02522
7	159° 51' 44"	0° 47' 02"	161° 42' 14"	8° 35' 49"	0° 55' 55"	15' 14.23"	114° 38' 39"	0.02390
8	160° 23' 20"	0° 44' 09"	162° 10' 43"	8° 21' 12"	0° 55' 54"	15' 13.91"	114° 37' 32"	0.02261
9	160° 54' 56"	0° 41' 15"	162° 39' 08"	8° 06' 32"	0° 55' 53"	15' 13.58"	114° 35' 60"	0.02136
10	161° 26' 30"	0° 38' 22"	163° 07' 31"	7° 51' 52"	0° 55' 51"	15' 13.26"	114° 33' 60"	0.02015
11	161° 58' 03"	0° 35' 28"	163° 35' 50"	7° 37' 10"	0° 55' 50"	15' 12.93"	114° 31' 30"	0.01897
12	162° 29' 34"	0° 32' 34"	164° 04' 06"	7° 22' 27"	0° 55' 49"	15' 12.61"	114° 28' 29"	0.01783
13	163° 01' 04"	0° 29' 41"	164° 32' 19"	7° 07' 42"	0° 55' 48"	15' 12.29"	114° 24' 53"	0.01672
14	163° 32' 33"	0° 26' 47"	165° 00' 29"	6° 52' 57"	0° 55' 47"	15' 11.97"	114° 20' 42"	0.01565
15	164° 04' 01"	0° 23' 53"	165° 28' 36"	6° 38' 10"	0° 55' 46"	15' 11.65"	114° 15' 50"	0.01461
16	164° 35' 27"	0° 20' 59"	165° 56' 41"	6° 23' 23"	0° 55' 44"	15' 11.33"	114° 10' 16"	0.01361
17	165° 06' 52"	0° 18' 05"	166° 24' 42"	6° 08' 34"	0° 55' 43"	15' 11.01"	114° 3' 54"	0.01265
18	165° 38' 16"	0° 15' 12"	166° 52' 41"	5° 53' 45"	0° 55' 42"	15' 10.70"	113° 56' 42"	0.01172
19	166° 09' 39"	0° 12' 18"	167° 20' 38"	5° 38' 55"	0° 55' 41"	15' 10.38"	113° 48' 32"	0.01083
20	166° 41' 00"	0° 09' 24"	167° 48' 32"	5° 24' 04"	0° 55' 40"	15' 10.06"	113° 39' 20"	0.00997
21	167° 12' 20"	0° 06' 31"	168° 16' 23"	5° 09' 12"	0° 55' 39"	15' 09.75"	113° 28' 57"	0.00915
22	167° 43' 39"	0° 03' 37"	168° 44' 12"	4° 54' 20"	0° 55' 37"	15' 09.44"	113° 17' 16"	0.00837
23	168° 14' 57"	0° 00' 44"	169° 11' 59"	4° 39' 28"	0° 55' 36"	15' 09.12"	113° 4' 06"	0.00762
24	168° 46' 13"	0° -2' 10"	169° 39' 43"	4° 24' 34"	0° 55' 35"	15' 08.81"	112° 49' 15"	0.00690

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	178° 16' 42"	-0.03"	178° 24' 58"	0° 41' 12"	1.0041152	15'55.70"	23° 26' 19"	6 m 49 s
1	178° 19' 08"	-0.04"	178° 27' 12"	0° 40' 13"	1.0041037	15'55.71"	23° 26' 19"	6 m 50 s
2	178° 21' 35"	-0.05"	178° 29' 27"	0° 39' 15"	1.0040922	15'55.72"	23° 26' 19"	6 m 51 s
3	178° 24' 02"	-0.05"	178° 31' 41"	0° 38' 17"	1.0040808	15'55.73"	23° 26' 19"	6 m 52 s
4	178° 26' 29"	-0.06"	178° 33' 56"	0° 37' 18"	1.0040693	15'55.74"	23° 26' 19"	6 m 53 s
5	178° 28' 55"	-0.06"	178° 36' 11"	0° 36' 20"	1.0040578	15'55.75"	23° 26' 19"	6 m 53 s
6	178° 31' 22"	-0.07"	178° 38' 25"	0° 35' 22"	1.0040463	15'55.76"	23° 26' 19"	6 m 54 s
7	178° 33' 49"	-0.07"	178° 40' 40"	0° 34' 23"	1.0040348	15'55.77"	23° 26' 19"	6 m 55 s
8	178° 36' 15"	-0.08"	178° 42' 54"	0° 33' 25"	1.0040233	15'55.78"	23° 26' 19"	6 m 56 s
9	178° 38' 42"	-0.08"	178° 45' 09"	0° 32' 27"	1.0040118	15'55.80"	23° 26' 19"	6 m 57 s
10	178° 41' 09"	-0.09"	178° 47' 24"	0° 31' 28"	1.0040002	15'55.81"	23° 26' 19"	6 m 58 s
11	178° 43' 35"	-0.09"	178° 49' 38"	0° 30' 30"	1.0039887	15'55.82"	23° 26' 19"	6 m 59 s
12	178° 46' 02"	-0.10"	178° 51' 53"	0° 29' 32"	1.0039772	15'55.83"	23° 26' 19"	6 m 60 s
13	178° 48' 29"	-0.10"	178° 54' 07"	0° 28' 33"	1.0039657	15'55.84"	23° 26' 19"	7 m 00 s
14	178° 50' 56"	-0.11"	178° 56' 22"	0° 27' 35"	1.0039541	15'55.85"	23° 26' 19"	7 m 01 s
15	178° 53' 22"	-0.12"	178° 58' 37"	0° 26' 37"	1.0039426	15'55.86"	23° 26' 19"	7 m 02 s
16	178° 55' 49"	-0.12"	179° 00' 51"	0° 25' 38"	1.0039311	15'55.87"	23° 26' 19"	7 m 03 s
17	178° 58' 16"	-0.13"	179° 03' 06"	0° 24' 40"	1.0039195	15'55.88"	23° 26' 19"	7 m 04 s
18	179° 00' 43"	-0.13"	179° 05' 21"	0° 23' 42"	1.0039080	15'55.89"	23° 26' 19"	7 m 05 s
19	179° 03' 09"	-0.14"	179° 07' 35"	0° 22' 43"	1.0038964	15'55.91"	23° 26' 19"	7 m 06 s
20	179° 05' 36"	-0.14"	179° 09' 50"	0° 21' 45"	1.0038848	15'55.92"	23° 26' 19"	7 m 07 s
21	179° 08' 03"	-0.15"	179° 12' 04"	0° 20' 46"	1.0038733	15'55.93"	23° 26' 19"	7 m 08 s
22	179° 10' 30"	-0.15"	179° 14' 19"	0° 19' 48"	1.0038617	15'55.94"	23° 26' 19"	7 m 08 s
23	179° 12' 56"	-0.16"	179° 16' 34"	0° 18' 50"	1.0038501	15'55.95"	23° 26' 19"	7 m 09 s
24	179° 15' 23"	-0.16"	179° 18' 48"	0° 17' 51"	1.0038386	15'55.96"	23° 26' 19"	7 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	168° 46' 13"	0° -2' 10"	169° 39' 43"	4° 24' 34"	0° 55' 35"	15' 08.81"	112° 49' 15"	0.00690
1	169° 17' 28"	0° -5' 03"	170° 07' 26"	4° 09' 41"	0° 55' 34"	15' 08.50"	112° 32' 28"	0.00623
2	169° 48' 42"	0° -7' 56"	170° 35' 06"	3° 54' 47"	0° 55' 33"	15' 08.19"	112° 13' 27"	0.00558
3	170° 19' 55"	0°-10' 49"	171° 02' 44"	3° 39' 52"	0° 55' 32"	15' 07.88"	111° 51' 49"	0.00498
4	170° 51' 07"	0°-13' 41"	171° 30' 20"	3° 24' 58"	0° 55' 31"	15' 07.57"	111° 27' 08"	0.00441
5	171° 22' 17"	0°-16' 34"	171° 57' 54"	3° 10' 03"	0° 55' 29"	15' 07.27"	110° 58' 47"	0.00387
6	171° 53' 26"	0°-19' 26"	172° 25' 26"	2° 55' 08"	0° 55' 28"	15' 06.96"	110° 26' 01"	0.00337
7	172° 24' 34"	0°-22' 18"	172° 52' 56"	2° 40' 13"	0° 55' 27"	15' 06.66"	109° 47' 52"	0.00291
8	172° 55' 40"	0°-25' 10"	173° 20' 25"	2° 25' 18"	0° 55' 26"	15' 06.35"	109° 3' 02"	0.00248
9	173° 26' 46"	0°-28' 02"	173° 47' 52"	2° 10' 23"	0° 55' 25"	15' 06.05"	108° 9' 44"	0.00208
10	173° 57' 50"	0°-30' 53"	174° 15' 17"	1° 55' 28"	0° 55' 24"	15' 05.75"	107° 5' 32"	0.00173
11	174° 28' 53"	0°-33' 44"	174° 42' 41"	1° 40' 33"	0° 55' 23"	15' 05.45"	105° 46' 56"	0.00140
12	174° 59' 55"	0°-36' 35"	175° 10' 03"	1° 25' 39"	0° 55' 22"	15' 05.15"	104° 8' 48"	0.00111
13	175° 30' 56"	0°-39' 26"	175° 37' 24"	1° 10' 45"	0° 55' 21"	15' 04.85"	102° 3' 17"	0.00086
14	176° 01' 55"	0°-42' 16"	176° 04' 44"	0° 55' 51"	0° 55' 19"	15' 04.55"	99° 17' 51"	0.00064
15	176° 32' 54"	0°-45' 06"	176° 32' 02"	0° 40' 57"	0° 55' 18"	15' 04.25"	95° 31' 28"	0.00046
16	177° 03' 51"	0°-47' 55"	176° 59' 19"	0° 26' 04"	0° 55' 17"	15' 03.96"	90° 6' 51"	0.00032
17	177° 34' 47"	0°-50' 45"	177° 26' 35"	0° 11' 11"	0° 55' 16"	15' 03.66"	81° 54' 56"	0.00020
18	178° 05' 42"	0°-53' 33"	177° 53' 50"	0° -3' 41"	0° 55' 15"	15' 03.37"	68° 49' 44"	0.00013
19	178° 36' 36"	0°-56' 22"	178° 21' 04"	0°-18' 33"	0° 55' 14"	15' 03.08"	48° 4' 40"	0.00008
20	179° 07' 28"	0°-59' 10"	178° 48' 16"	0°-33' 23"	0° 55' 13"	15' 02.79"	20° 56' 46"	0.00007
21	179° 38' 20"	-1° 01' 58"	179° 15' 28"	0°-48' 14"	0° 55' 12"	15' 02.50"	356° 52' 08"	0.00010
22	180° 09' 10"	-1° 04' 45"	179° 42' 39"	-1° 03' 03"	0° 55' 11"	15' 02.21"	340° 54' 51"	0.00016
23	180° 39' 59"	-1° 07' 32"	180° 09' 50"	-1° 17' 52"	0° 55' 10"	15' 01.93"	331° 0' 51"	0.00026
24	181° 10' 48"	-1° 10' 18"	180° 36' 59"	-1° 32' 40"	0° 55' 09"	15' 01.64"	324° 37' 29"	0.00039

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	179° 15' 23"	-0.16"	179° 18' 48"	0° 17' 51"	1.0038386	15'55.96"	23° 26' 19"	7 m 10 s
1	179° 17' 50"	-0.17"	179° 21' 03"	0° 16' 53"	1.0038270	15'55.97"	23° 26' 19"	7 m 11 s
2	179° 20' 17"	-0.17"	179° 23' 18"	0° 15' 55"	1.0038154	15'55.98"	23° 26' 19"	7 m 12 s
3	179° 22' 43"	-0.18"	179° 25' 32"	0° 14' 56"	1.0038038	15'55.99"	23° 26' 19"	7 m 13 s
4	179° 25' 10"	-0.18"	179° 27' 47"	0° 13' 58"	1.0037922	15'56.00"	23° 26' 19"	7 m 14 s
5	179° 27' 37"	-0.19"	179° 30' 02"	0° 12' 59"	1.0037806	15'56.02"	23° 26' 19"	7 m 15 s
6	179° 30' 04"	-0.20"	179° 32' 16"	0° 12' 01"	1.0037690	15'56.03"	23° 26' 19"	7 m 16 s
7	179° 32' 30"	-0.20"	179° 34' 31"	0° 11' 03"	1.0037574	15'56.04"	23° 26' 19"	7 m 16 s
8	179° 34' 57"	-0.21"	179° 36' 46"	0° 10' 04"	1.0037458	15'56.05"	23° 26' 19"	7 m 17 s
9	179° 37' 24"	-0.21"	179° 39' 00"	0° 09' 06"	1.0037342	15'56.06"	23° 26' 19"	7 m 18 s
10	179° 39' 51"	-0.22"	179° 41' 15"	0° 08' 07"	1.0037226	15'56.07"	23° 26' 19"	7 m 19 s
11	179° 42' 18"	-0.22"	179° 43' 30"	0° 07' 09"	1.0037109	15'56.08"	23° 26' 19"	7 m 20 s
12	179° 44' 44"	-0.23"	179° 45' 44"	0° 06' 11"	1.0036993	15'56.09"	23° 26' 19"	7 m 21 s
13	179° 47' 11"	-0.23"	179° 47' 59"	0° 05' 12"	1.0036877	15'56.10"	23° 26' 19"	7 m 22 s
14	179° 49' 38"	-0.24"	179° 50' 14"	0° 04' 14"	1.0036760	15'56.12"	23° 26' 19"	7 m 23 s
15	179° 52' 05"	-0.24"	179° 52' 28"	0° 03' 16"	1.0036644	15'56.13"	23° 26' 19"	7 m 23 s
16	179° 54' 32"	-0.25"	179° 54' 43"	0° 02' 17"	1.0036527	15'56.14"	23° 26' 19"	7 m 24 s
17	179° 56' 58"	-0.25"	179° 56' 58"	0° 01' 19"	1.0036411	15'56.15"	23° 26' 19"	7 m 25 s
18	179° 59' 25"	-0.26"	179° 59' 12"	0° 00' 20"	1.0036294	15'56.16"	23° 26' 19"	7 m 26 s
19	180° 01' 52"	-0.26"	180° 01' 27"	0° 00'-38"	1.0036178	15'56.17"	23° 26' 19"	7 m 27 s
20	180° 04' 19"	-0.27"	180° 03' 42"	0° -1' 36"	1.0036061	15'56.18"	23° 26' 19"	7 m 28 s
21	180° 06' 46"	-0.27"	180° 05' 57"	0° -2' 35"	1.0035944	15'56.19"	23° 26' 19"	7 m 29 s
22	180° 09' 13"	-0.28"	180° 08' 11"	0° -3' 33"	1.0035828	15'56.20"	23° 26' 19"	7 m 30 s
23	180° 11' 39"	-0.28"	180° 10' 26"	0° -4' 32"	1.0035711	15'56.22"	23° 26' 19"	7 m 30 s
24	180° 14' 06"	-0.29"	180° 12' 41"	0° -5' 30"	1.0035594	15'56.23"	23° 26' 19"	7 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	181° 10' 48"	-1° 10' 18"	180° 36' 59"	-1° 32' 40"	0° 55' 09"	15' 01.64"	324° 37' 29"	0.00039
1	181° 41' 35"	-1° 13' 04"	181° 04' 08"	-1° 47' 26"	0° 55' 08"	15' 01.36"	320° 15' 24"	0.00055
2	182° 12' 20"	-1° 15' 50"	181° 31' 16"	-2° 02' 12"	0° 55' 07"	15' 01.08"	317° 6' 46"	0.00075
3	182° 43' 05"	-1° 18' 35"	181° 58' 24"	-2° 16' 57"	0° 55' 06"	15' 00.80"	314° 45' 07"	0.00099
4	183° 13' 49"	-1° 21' 19"	182° 25' 31"	-2° 31' 41"	0° 55' 05"	15' 00.52"	312° 55' 03"	0.00125
5	183° 44' 31"	-1° 24' 03"	182° 52' 38"	-2° 46' 24"	0° 55' 04"	15' 00.24"	311° 27' 06"	0.00155
6	184° 15' 13"	-1° 26' 47"	183° 19' 45"	-3° 01' 05"	0° 55' 03"	14' 59.96"	310° 15' 11"	0.00189
7	184° 45' 53"	-1° 29' 30"	183° 46' 51"	-3° 15' 45"	0° 55' 02"	14' 59.69"	309° 15' 13"	0.00226
8	185° 16' 33"	-1° 32' 12"	184° 13' 57"	-3° 30' 24"	0° 55' 01"	14' 59.41"	308° 24' 21"	0.00266
9	185° 47' 11"	-1° 34' 54"	184° 41' 03"	-3° 45' 02"	0° 54' 60"	14' 59.14"	307° 40' 38"	0.00310
10	186° 17' 49"	-1° 37' 36"	185° 08' 09"	-3° 59' 38"	0° 54' 59"	14' 58.87"	307° 2' 34"	0.00357
11	186° 48' 25"	-1° 40' 16"	185° 35' 14"	-4° 14' 13"	0° 54' 58"	14' 58.60"	306° 29' 03"	0.00407
12	187° 18' 60"	-1° 42' 57"	186° 02' 20"	-4° 28' 46"	0° 54' 57"	14' 58.34"	305° 59' 14"	0.00461
13	187° 49' 34"	-1° 45' 36"	186° 29' 26"	-4° 43' 18"	0° 54' 56"	14' 58.07"	305° 32' 29"	0.00518
14	188° 20' 07"	-1° 48' 15"	186° 56' 32"	-4° 57' 48"	0° 54' 55"	14' 57.81"	305° 8' 16"	0.00578
15	188° 50' 39"	-1° 50' 54"	187° 23' 38"	-5° 12' 17"	0° 54' 54"	14' 57.55"	304° 46' 12"	0.00642
16	189° 21' 10"	-1° 53' 32"	187° 50' 44"	-5° 26' 44"	0° 54' 53"	14' 57.28"	304° 25' 57"	0.00708
17	189° 51' 40"	-1° 56' 09"	188° 17' 51"	-5° 41' 09"	0° 54' 52"	14' 57.03"	304° 7' 15"	0.00779
18	190° 22' 09"	-1° 58' 45"	188° 44' 58"	-5° 55' 32"	0° 54' 51"	14' 56.77"	303° 49' 52"	0.00852
19	190° 52' 37"	-2° 01' 21"	189° 12' 06"	-6° 09' 54"	0° 54' 50"	14' 56.51"	303° 33' 37"	0.00929
20	191° 23' 04"	-2° 03' 56"	189° 39' 14"	-6° 24' 13"	0° 54' 49"	14' 56.26"	303° 18' 22"	0.01009
21	191° 53' 30"	-2° 06' 31"	190° 06' 22"	-6° 38' 31"	0° 54' 48"	14' 56.01"	303° 3' 58"	0.01092
22	192° 23' 55"	-2° 09' 05"	190° 33' 31"	-6° 52' 47"	0° 54' 47"	14' 55.76"	302° 50' 20"	0.01178
23	192° 54' 19"	-2° 11' 38"	191° 00' 41"	-7° 07' 00"	0° 54' 46"	14' 55.51"	302° 37' 21"	0.01268
24	193° 24' 42"	-2° 14' 10"	191° 27' 52"	-7° 21' 12"	0° 54' 45"	14' 55.27"	302° 24' 56"	0.01361

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	180° 14' 06"	-0.29"	180° 12' 41"	0° -5' 30"	1.0035594	15'56.23"	23° 26' 19"	7 m 31 s
1	180° 16' 33"	-0.29"	180° 14' 55"	0° -6' 29"	1.0035477	15'56.24"	23° 26' 19"	7 m 32 s
2	180° 18' 60"	-0.30"	180° 17' 10"	0° -7' 27"	1.0035361	15'56.25"	23° 26' 19"	7 m 33 s
3	180° 21' 27"	-0.30"	180° 19' 25"	0° -8' 25"	1.0035244	15'56.26"	23° 26' 19"	7 m 34 s
4	180° 23' 54"	-0.31"	180° 21' 40"	0° -9' 24"	1.0035127	15'56.27"	23° 26' 19"	7 m 35 s
5	180° 26' 21"	-0.31"	180° 23' 54"	0°-10' 22"	1.0035010	15'56.28"	23° 26' 19"	7 m 36 s
6	180° 28' 47"	-0.32"	180° 26' 09"	0°-11' 21"	1.0034893	15'56.29"	23° 26' 19"	7 m 37 s
7	180° 31' 14"	-0.32"	180° 28' 24"	0°-12' 19"	1.0034776	15'56.30"	23° 26' 19"	7 m 38 s
8	180° 33' 41"	-0.33"	180° 30' 39"	0°-13' 17"	1.0034658	15'56.32"	23° 26' 19"	7 m 38 s
9	180° 36' 08"	-0.33"	180° 32' 53"	0°-14' 16"	1.0034541	15'56.33"	23° 26' 19"	7 m 39 s
10	180° 38' 35"	-0.34"	180° 35' 08"	0°-15' 14"	1.0034424	15'56.34"	23° 26' 19"	7 m 40 s
11	180° 41' 02"	-0.34"	180° 37' 23"	0°-16' 13"	1.0034307	15'56.35"	23° 26' 19"	7 m 41 s
12	180° 43' 29"	-0.35"	180° 39' 38"	0°-17' 11"	1.0034190	15'56.36"	23° 26' 19"	7 m 42 s
13	180° 45' 56"	-0.35"	180° 41' 52"	0°-18' 10"	1.0034072	15'56.37"	23° 26' 19"	7 m 43 s
14	180° 48' 22"	-0.36"	180° 44' 07"	0°-19' 08"	1.0033955	15'56.38"	23° 26' 19"	7 m 44 s
15	180° 50' 49"	-0.36"	180° 46' 22"	0°-20' 06"	1.0033838	15'56.39"	23° 26' 19"	7 m 45 s
16	180° 53' 16"	-0.36"	180° 48' 37"	0°-21' 05"	1.0033720	15'56.40"	23° 26' 19"	7 m 45 s
17	180° 55' 43"	-0.37"	180° 50' 51"	0°-22' 03"	1.0033603	15'56.42"	23° 26' 19"	7 m 46 s
18	180° 58' 10"	-0.37"	180° 53' 06"	0°-23' 02"	1.0033485	15'56.43"	23° 26' 19"	7 m 47 s
19	181° 00' 37"	-0.38"	180° 55' 21"	0°-24' 00"	1.0033368	15'56.44"	23° 26' 19"	7 m 48 s
20	181° 03' 04"	-0.38"	180° 57' 36"	0°-24' 59"	1.0033250	15'56.45"	23° 26' 19"	7 m 49 s
21	181° 05' 31"	-0.39"	180° 59' 51"	0°-25' 57"	1.0033132	15'56.46"	23° 26' 19"	7 m 50 s
22	181° 07' 58"	-0.39"	181° 02' 05"	0°-26' 55"	1.0033015	15'56.47"	23° 26' 19"	7 m 51 s
23	181° 10' 25"	-0.40"	181° 04' 20"	0°-27' 54"	1.0032897	15'56.48"	23° 26' 19"	7 m 52 s
24	181° 12' 51"	-0.40"	181° 06' 35"	0°-28' 52"	1.0032779	15'56.49"	23° 26' 19"	7 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	193° 24' 42"	-2° 14' 10"	191° 27' 52"	-7° 21' 12"	0° 54' 45"	14' 55.27"	302° 24' 56"	0.01361
1	193° 55' 04"	-2° 16' 42"	191° 55' 03"	-7° 35' 21"	0° 54' 44"	14' 55.02"	302° 13' 01"	0.01457
2	194° 25' 25"	-2° 19' 13"	192° 22' 15"	-7° 49' 29"	0° 54' 44"	14' 54.78"	302° 1' 33"	0.01556
3	194° 55' 45"	-2° 21' 43"	192° 49' 28"	-8° 03' 33"	0° 54' 43"	14' 54.54"	301° 50' 29"	0.01658
4	195° 26' 04"	-2° 24' 12"	193° 16' 42"	-8° 17' 36"	0° 54' 42"	14' 54.30"	301° 39' 45"	0.01764
5	195° 56' 23"	-2° 26' 41"	193° 43' 58"	-8° 31' 36"	0° 54' 41"	14' 54.07"	301° 29' 20"	0.01872
6	196° 26' 40"	-2° 29' 09"	194° 11' 14"	-8° 45' 34"	0° 54' 40"	14' 53.83"	301° 19' 11"	0.01984
7	196° 56' 56"	-2° 31' 36"	194° 38' 31"	-8° 59' 30"	0° 54' 39"	14' 53.60"	301° 9' 16"	0.02099
8	197° 27' 12"	-2° 34' 02"	195° 05' 49"	-9° 13' 23"	0° 54' 38"	14' 53.37"	300° 59' 33"	0.02217
9	197° 57' 26"	-2° 36' 28"	195° 33' 09"	-9° 27' 13"	0° 54' 38"	14' 53.14"	300° 50' 01"	0.02338
10	198° 27' 40"	-2° 38' 53"	196° 00' 30"	-9° 41' 01"	0° 54' 37"	14' 52.92"	300° 40' 39"	0.02462
11	198° 57' 53"	-2° 41' 16"	196° 27' 52"	-9° 54' 47"	0° 54' 36"	14' 52.69"	300° 31' 25"	0.02589
12	199° 28' 05"	-2° 43' 39"	196° 55' 16"	-10° 08' 29"	0° 54' 35"	14' 52.47"	300° 22' 19"	0.02720
13	199° 58' 16"	-2° 46' 02"	197° 22' 41"	-10° 22' 09"	0° 54' 34"	14' 52.25"	300° 13' 18"	0.02853
14	200° 28' 26"	-2° 48' 23"	197° 50' 07"	-10° 35' 46"	0° 54' 34"	14' 52.03"	300° 4' 23"	0.02989
15	200° 58' 36"	-2° 50' 44"	198° 17' 36"	-10° 49' 21"	0° 54' 33"	14' 51.82"	299° 55' 33"	0.03128
16	201° 28' 44"	-2° 53' 03"	198° 45' 05"	-11° 02' 52"	0° 54' 32"	14' 51.61"	299° 46' 46"	0.03271
17	201° 58' 52"	-2° 55' 22"	199° 12' 37"	-11° 16' 20"	0° 54' 31"	14' 51.40"	299° 38' 02"	0.03416
18	202° 28' 59"	-2° 57' 40"	199° 40' 10"	-11° 29' 46"	0° 54' 30"	14' 51.19"	299° 29' 21"	0.03564
19	202° 59' 05"	-2° 59' 57"	200° 07' 45"	-11° 43' 08"	0° 54' 30"	14' 50.99"	299° 20' 42"	0.03715
20	203° 29' 10"	-3° 02' 13"	200° 35' 21"	-11° 56' 28"	0° 54' 29"	14' 50.78"	299° 12' 04"	0.03869
21	203° 59' 15"	-3° 04' 28"	201° 02' 60"	-12° 09' 44"	0° 54' 28"	14' 50.58"	299° 3' 26"	0.04026
22	204° 29' 18"	-3° 06' 42"	201° 30' 40"	-12° 22' 57"	0° 54' 27"	14' 50.38"	298° 54' 50"	0.04186
23	204° 59' 21"	-3° 08' 56"	201° 58' 23"	-12° 36' 07"	0° 54' 27"	14' 50.19"	298° 46' 13"	0.04349
24	205° 29' 23"	-3° 11' 08"	202° 26' 07"	-12° 49' 14"	0° 54' 26"	14' 50.00"	298° 37' 36"	0.04515

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	181° 12' 51"	-0.40"	181° 06' 35"	0°-28' 52"	1.0032779	15'56.49"	23° 26' 19"	7 m 52 s
1	181° 15' 18"	-0.40"	181° 08' 50"	0°-29' 51"	1.0032662	15'56.51"	23° 26' 19"	7 m 53 s
2	181° 17' 45"	-0.41"	181° 11' 05"	0°-30' 49"	1.0032544	15'56.52"	23° 26' 19"	7 m 54 s
3	181° 20' 12"	-0.41"	181° 13' 19"	0°-31' 48"	1.0032426	15'56.53"	23° 26' 19"	7 m 55 s
4	181° 22' 39"	-0.42"	181° 15' 34"	0°-32' 46"	1.0032308	15'56.54"	23° 26' 19"	7 m 56 s
5	181° 25' 06"	-0.42"	181° 17' 49"	0°-33' 44"	1.0032190	15'56.55"	23° 26' 19"	7 m 57 s
6	181° 27' 33"	-0.43"	181° 20' 04"	0°-34' 43"	1.0032072	15'56.56"	23° 26' 19"	7 m 58 s
7	181° 29' 60"	-0.43"	181° 22' 19"	0°-35' 41"	1.0031954	15'56.57"	23° 26' 19"	7 m 59 s
8	181° 32' 27"	-0.43"	181° 24' 33"	0°-36' 40"	1.0031836	15'56.58"	23° 26' 19"	7 m 59 s
9	181° 34' 54"	-0.44"	181° 26' 48"	0°-37' 38"	1.0031718	15'56.60"	23° 26' 19"	8 m 00 s
10	181° 37' 21"	-0.44"	181° 29' 03"	0°-38' 37"	1.0031600	15'56.61"	23° 26' 19"	8 m 01 s
11	181° 39' 48"	-0.45"	181° 31' 18"	0°-39' 35"	1.0031482	15'56.62"	23° 26' 19"	8 m 02 s
12	181° 42' 15"	-0.45"	181° 33' 33"	0°-40' 33"	1.0031364	15'56.63"	23° 26' 19"	8 m 03 s
13	181° 44' 42"	-0.45"	181° 35' 48"	0°-41' 32"	1.0031246	15'56.64"	23° 26' 19"	8 m 04 s
14	181° 47' 09"	-0.46"	181° 38' 03"	0°-42' 30"	1.0031127	15'56.65"	23° 26' 19"	8 m 05 s
15	181° 49' 36"	-0.46"	181° 40' 17"	0°-43' 29"	1.0031009	15'56.66"	23° 26' 19"	8 m 05 s
16	181° 52' 03"	-0.47"	181° 42' 32"	0°-44' 27"	1.0030891	15'56.67"	23° 26' 19"	8 m 06 s
17	181° 54' 30"	-0.47"	181° 44' 47"	0°-45' 26"	1.0030772	15'56.69"	23° 26' 19"	8 m 07 s
18	181° 56' 56"	-0.47"	181° 47' 02"	0°-46' 24"	1.0030654	15'56.70"	23° 26' 19"	8 m 08 s
19	181° 59' 23"	-0.48"	181° 49' 17"	0°-47' 22"	1.0030536	15'56.71"	23° 26' 19"	8 m 09 s
20	182° 01' 50"	-0.48"	181° 51' 32"	0°-48' 21"	1.0030417	15'56.72"	23° 26' 19"	8 m 10 s
21	182° 04' 17"	-0.48"	181° 53' 47"	0°-49' 19"	1.0030299	15'56.73"	23° 26' 19"	8 m 11 s
22	182° 06' 44"	-0.49"	181° 56' 01"	0°-50' 18"	1.0030180	15'56.74"	23° 26' 19"	8 m 12 s
23	182° 09' 11"	-0.49"	181° 58' 16"	0°-51' 16"	1.0030061	15'56.75"	23° 26' 19"	8 m 12 s
24	182° 11' 38"	-0.49"	182° 00' 31"	0°-52' 15"	1.0029943	15'56.77"	23° 26' 19"	8 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	205° 29' 23"	-3° 11' 08"	202° 26' 07"	-12° 49' 14"	0° 54' 26"	14' 50.00"	298° 37' 36"	0.04515
1	205° 59' 24"	-3° 13' 20"	202° 53' 54"	-13° 02' 17"	0° 54' 25"	14' 49.81"	298° 28' 58"	0.04683
2	206° 29' 25"	-3° 15' 30"	203° 21' 42"	-13° 15' 18"	0° 54' 25"	14' 49.62"	298° 20' 19"	0.04854
3	206° 59' 25"	-3° 17' 40"	203° 49' 33"	-13° 28' 14"	0° 54' 24"	14' 49.43"	298° 11' 39"	0.05029
4	207° 29' 24"	-3° 19' 48"	204° 17' 26"	-13° 41' 07"	0° 54' 23"	14' 49.25"	298° 2' 58"	0.05206
5	207° 59' 22"	-3° 21' 56"	204° 45' 21"	-13° 53' 57"	0° 54' 23"	14' 49.07"	297° 54' 14"	0.05385
6	208° 29' 20"	-3° 24' 02"	205° 13' 19"	-14° 06' 43"	0° 54' 22"	14' 48.89"	297° 45' 29"	0.05568
7	208° 59' 17"	-3° 26' 08"	205° 41' 19"	-14° 19' 26"	0° 54' 21"	14' 48.72"	297° 36' 41"	0.05753
8	209° 29' 13"	-3° 28' 13"	206° 09' 21"	-14° 32' 05"	0° 54' 21"	14' 48.55"	297° 27' 51"	0.05941
9	209° 59' 08"	-3° 30' 16"	206° 37' 25"	-14° 44' 40"	0° 54' 20"	14' 48.38"	297° 18' 58"	0.06132
10	210° 29' 03"	-3° 32' 19"	207° 05' 33"	-14° 57' 11"	0° 54' 19"	14' 48.21"	297° 10' 02"	0.06326
11	210° 58' 57"	-3° 34' 20"	207° 33' 42"	-15° 09' 39"	0° 54' 19"	14' 48.05"	297° 1' 03"	0.06522
12	211° 28' 51"	-3° 36' 21"	208° 01' 55"	-15° 22' 03"	0° 54' 18"	14' 47.89"	296° 52' 01"	0.06721
13	211° 58' 44"	-3° 38' 20"	208° 30' 09"	-15° 34' 23"	0° 54' 18"	14' 47.73"	296° 42' 55"	0.06923
14	212° 28' 36"	-3° 40' 19"	208° 58' 27"	-15° 46' 39"	0° 54' 17"	14' 47.58"	296° 33' 46"	0.07127
15	212° 58' 28"	-3° 42' 16"	209° 26' 47"	-15° 58' 51"	0° 54' 17"	14' 47.42"	296° 24' 34"	0.07334
16	213° 28' 19"	-3° 44' 13"	209° 55' 10"	-16° 10' 59"	0° 54' 16"	14' 47.27"	296° 15' 18"	0.07543
17	213° 58' 09"	-3° 46' 08"	210° 23' 36"	-16° 23' 03"	0° 54' 16"	14' 47.13"	296° 5' 57"	0.07755
18	214° 27' 59"	-3° 48' 02"	210° 52' 05"	-16° 35' 03"	0° 54' 15"	14' 46.99"	295° 56' 33"	0.07970
19	214° 57' 48"	-3° 49' 55"	211° 20' 36"	-16° 46' 59"	0° 54' 14"	14' 46.85"	295° 47' 05"	0.08188
20	215° 27' 36"	-3° 51' 47"	211° 49' 10"	-16° 58' 50"	0° 54' 14"	14' 46.71"	295° 37' 33"	0.08407
21	215° 57' 25"	-3° 53' 38"	212° 17' 48"	-17° 10' 37"	0° 54' 13"	14' 46.58"	295° 27' 57"	0.08630
22	216° 27' 12"	-3° 55' 28"	212° 46' 28"	-17° 22' 20"	0° 54' 13"	14' 46.45"	295° 18' 16"	0.08855
23	216° 56' 59"	-3° 57' 17"	213° 15' 11"	-17° 33' 59"	0° 54' 13"	14' 46.32"	295° 8' 31"	0.09082
24	217° 26' 46"	-3° 59' 04"	213° 43' 58"	-17° 45' 33"	0° 54' 12"	14' 46.19"	294° 58' 42"	0.09312

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	182° 11' 38"	-0.49"	182° 00' 31"	0°-52' 15"	1.0029943	15'56.77"	23° 26' 19"	8 m 13 s
1	182° 14' 05"	-0.50"	182° 02' 46"	0°-53' 13"	1.0029824	15'56.78"	23° 26' 19"	8 m 14 s
2	182° 16' 32"	-0.50"	182° 05' 01"	0°-54' 12"	1.0029706	15'56.79"	23° 26' 19"	8 m 15 s
3	182° 18' 59"	-0.51"	182° 07' 16"	0°-55' 10"	1.0029587	15'56.80"	23° 26' 19"	8 m 16 s
4	182° 21' 26"	-0.51"	182° 09' 31"	0°-56' 08"	1.0029468	15'56.81"	23° 26' 19"	8 m 17 s
5	182° 23' 53"	-0.51"	182° 11' 46"	0°-57' 07"	1.0029349	15'56.82"	23° 26' 19"	8 m 18 s
6	182° 26' 20"	-0.51"	182° 14' 01"	0°-58' 05"	1.0029231	15'56.83"	23° 26' 19"	8 m 19 s
7	182° 28' 47"	-0.52"	182° 16' 16"	0°-59' 04"	1.0029112	15'56.84"	23° 26' 19"	8 m 19 s
8	182° 31' 14"	-0.52"	182° 18' 31"	-1° 00' 02"	1.0028993	15'56.86"	23° 26' 19"	8 m 20 s
9	182° 33' 41"	-0.52"	182° 20' 45"	-1° 01' 01"	1.0028874	15'56.87"	23° 26' 19"	8 m 21 s
10	182° 36' 09"	-0.53"	182° 23' 00"	-1° 01' 59"	1.0028755	15'56.88"	23° 26' 19"	8 m 22 s
11	182° 38' 36"	-0.53"	182° 25' 15"	-1° 02' 57"	1.0028636	15'56.89"	23° 26' 19"	8 m 23 s
12	182° 41' 03"	-0.53"	182° 27' 30"	-1° 03' 56"	1.0028517	15'56.90"	23° 26' 19"	8 m 24 s
13	182° 43' 30"	-0.54"	182° 29' 45"	-1° 04' 54"	1.0028398	15'56.91"	23° 26' 19"	8 m 25 s
14	182° 45' 57"	-0.54"	182° 32' 00"	-1° 05' 53"	1.0028279	15'56.92"	23° 26' 19"	8 m 25 s
15	182° 48' 24"	-0.54"	182° 34' 15"	-1° 06' 51"	1.0028160	15'56.94"	23° 26' 19"	8 m 26 s
16	182° 50' 51"	-0.55"	182° 36' 30"	-1° 07' 50"	1.0028041	15'56.95"	23° 26' 19"	8 m 27 s
17	182° 53' 18"	-0.55"	182° 38' 45"	-1° 08' 48"	1.0027922	15'56.96"	23° 26' 19"	8 m 28 s
18	182° 55' 45"	-0.55"	182° 41' 00"	-1° 09' 46"	1.0027803	15'56.97"	23° 26' 19"	8 m 29 s
19	182° 58' 12"	-0.55"	182° 43' 15"	-1° 10' 45"	1.0027683	15'56.98"	23° 26' 19"	8 m 30 s
20	183° 00' 39"	-0.56"	182° 45' 30"	-1° 11' 43"	1.0027564	15'56.99"	23° 26' 19"	8 m 31 s
21	183° 03' 06"	-0.56"	182° 47' 45"	-1° 12' 42"	1.0027445	15'57.00"	23° 26' 19"	8 m 31 s
22	183° 05' 33"	-0.56"	182° 49' 60"	-1° 13' 40"	1.0027326	15'57.01"	23° 26' 19"	8 m 32 s
23	183° 08' 00"	-0.56"	182° 52' 15"	-1° 14' 39"	1.0027206	15'57.03"	23° 26' 19"	8 m 33 s
24	183° 10' 27"	-0.57"	182° 54' 30"	-1° 15' 37"	1.0027087	15'57.04"	23° 26' 19"	8 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	217° 26' 46"	-3° 59' 04"	213° 43' 58"	-17° 45' 33"	0° 54' 12"	14' 46.19"	294° 58' 42"	0.09312
1	217° 56' 31"	-4° 00' 51"	214° 12' 47"	-17° 57' 03"	0° 54' 12"	14' 46.07"	294° 48' 48"	0.09545
2	218° 26' 17"	-4° 02' 36"	214° 41' 40"	-18° 08' 28"	0° 54' 11"	14' 45.95"	294° 38' 49"	0.09780
3	218° 56' 02"	-4° 04' 21"	215° 10' 35"	-18° 19' 48"	0° 54' 11"	14' 45.84"	294° 28' 46"	0.10017
4	219° 25' 46"	-4° 06' 04"	215° 39' 34"	-18° 31' 04"	0° 54' 10"	14' 45.73"	294° 18' 38"	0.10257
5	219° 55' 30"	-4° 07' 46"	216° 08' 36"	-18° 42' 16"	0° 54' 10"	14' 45.62"	294° 8' 25"	0.10499
6	220° 25' 14"	-4° 09' 27"	216° 37' 42"	-18° 53' 22"	0° 54' 10"	14' 45.52"	293° 58' 08"	0.10744
7	220° 54' 57"	-4° 11' 06"	217° 06' 50"	-19° 04' 24"	0° 54' 09"	14' 45.41"	293° 47' 46"	0.10991
8	221° 24' 40"	-4° 12' 45"	217° 36' 03"	-19° 15' 21"	0° 54' 09"	14' 45.32"	293° 37' 19"	0.11240
9	221° 54' 22"	-4° 14' 22"	218° 05' 18"	-19° 26' 14"	0° 54' 09"	14' 45.22"	293° 26' 47"	0.11492
10	222° 24' 04"	-4° 15' 59"	218° 34' 37"	-19° 37' 01"	0° 54' 08"	14' 45.13"	293° 16' 10"	0.11746
11	222° 53' 45"	-4° 17' 34"	219° 03' 59"	-19° 47' 43"	0° 54' 08"	14' 45.04"	293° 5' 28"	0.12003
12	223° 23' 26"	-4° 19' 07"	219° 33' 25"	-19° 58' 21"	0° 54' 08"	14' 44.96"	292° 54' 42"	0.12261
13	223° 53' 07"	-4° 20' 40"	220° 02' 54"	-20° 08' 53"	0° 54' 07"	14' 44.88"	292° 43' 50"	0.12522
14	224° 22' 47"	-4° 22' 12"	220° 32' 26"	-20° 19' 20"	0° 54' 07"	14' 44.80"	292° 32' 53"	0.12786
15	224° 52' 27"	-4° 23' 42"	221° 02' 02"	-20° 29' 43"	0° 54' 07"	14' 44.73"	292° 21' 51"	0.13051
16	225° 22' 07"	-4° 25' 11"	221° 31' 42"	-20° 39' 59"	0° 54' 06"	14' 44.66"	292° 10' 44"	0.13319
17	225° 51' 46"	-4° 26' 39"	222° 01' 25"	-20° 50' 11"	0° 54' 06"	14' 44.59"	291° 59' 32"	0.13589
18	226° 21' 26"	-4° 28' 06"	222° 31' 12"	-21° 00' 18"	0° 54' 06"	14' 44.53"	291° 48' 15"	0.13861
19	226° 51' 04"	-4° 29' 31"	223° 01' 03"	-21° 10' 19"	0° 54' 06"	14' 44.47"	291° 36' 53"	0.14135
20	227° 20' 43"	-4° 30' 55"	223° 30' 57"	-21° 20' 14"	0° 54' 06"	14' 44.41"	291° 25' 26"	0.14412
21	227° 50' 21"	-4° 32' 18"	224° 00' 55"	-21° 30' 05"	0° 54' 05"	14' 44.36"	291° 13' 53"	0.14691
22	228° 19' 59"	-4° 33' 40"	224° 30' 56"	-21° 39' 50"	0° 54' 05"	14' 44.32"	291° 2' 16"	0.14972
23	228° 49' 37"	-4° 35' 01"	225° 01' 01"	-21° 49' 29"	0° 54' 05"	14' 44.27"	290° 50' 33"	0.15255
24	229° 19' 15"	-4° 36' 20"	225° 31' 10"	-21° 59' 03"	0° 54' 05"	14' 44.23"	290° 38' 45"	0.15540

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	183° 10' 27"	-0.57"	182° 54' 30"	-1° 15' 37"	1.0027087	15'57.04"	23° 26' 19"	8 m 34 s
1	183° 12' 54"	-0.57"	182° 56' 45"	-1° 16' 35"	1.0026968	15'57.05"	23° 26' 19"	8 m 35 s
2	183° 15' 21"	-0.57"	182° 58' 60"	-1° 17' 34"	1.0026848	15'57.06"	23° 26' 19"	8 m 36 s
3	183° 17' 48"	-0.57"	183° 01' 15"	-1° 18' 32"	1.0026729	15'57.07"	23° 26' 19"	8 m 37 s
4	183° 20' 16"	-0.58"	183° 03' 30"	-1° 19' 31"	1.0026609	15'57.08"	23° 26' 19"	8 m 37 s
5	183° 22' 43"	-0.58"	183° 05' 45"	-1° 20' 29"	1.0026490	15'57.09"	23° 26' 19"	8 m 38 s
6	183° 25' 10"	-0.58"	183° 08' 00"	-1° 21' 28"	1.0026370	15'57.11"	23° 26' 19"	8 m 39 s
7	183° 27' 37"	-0.58"	183° 10' 15"	-1° 22' 26"	1.0026251	15'57.12"	23° 26' 19"	8 m 40 s
8	183° 30' 04"	-0.58"	183° 12' 30"	-1° 23' 24"	1.0026131	15'57.13"	23° 26' 19"	8 m 41 s
9	183° 32' 31"	-0.59"	183° 14' 45"	-1° 24' 23"	1.0026011	15'57.14"	23° 26' 19"	8 m 42 s
10	183° 34' 58"	-0.59"	183° 17' 00"	-1° 25' 21"	1.0025892	15'57.15"	23° 26' 19"	8 m 43 s
11	183° 37' 25"	-0.59"	183° 19' 15"	-1° 26' 20"	1.0025772	15'57.16"	23° 26' 19"	8 m 43 s
12	183° 39' 52"	-0.59"	183° 21' 30"	-1° 27' 18"	1.0025652	15'57.17"	23° 26' 19"	8 m 44 s
13	183° 42' 19"	-0.59"	183° 23' 45"	-1° 28' 17"	1.0025533	15'57.19"	23° 26' 19"	8 m 45 s
14	183° 44' 47"	-0.60"	183° 26' 00"	-1° 29' 15"	1.0025413	15'57.20"	23° 26' 19"	8 m 46 s
15	183° 47' 14"	-0.60"	183° 28' 15"	-1° 30' 13"	1.0025293	15'57.21"	23° 26' 19"	8 m 47 s
16	183° 49' 41"	-0.60"	183° 30' 31"	-1° 31' 12"	1.0025173	15'57.22"	23° 26' 19"	8 m 48 s
17	183° 52' 08"	-0.60"	183° 32' 46"	-1° 32' 10"	1.0025054	15'57.23"	23° 26' 19"	8 m 49 s
18	183° 54' 35"	-0.60"	183° 35' 01"	-1° 33' 09"	1.0024934	15'57.24"	23° 26' 19"	8 m 49 s
19	183° 57' 02"	-0.60"	183° 37' 16"	-1° 34' 07"	1.0024814	15'57.25"	23° 26' 19"	8 m 50 s
20	183° 59' 29"	-0.60"	183° 39' 31"	-1° 35' 05"	1.0024694	15'57.27"	23° 26' 19"	8 m 51 s
21	184° 01' 56"	-0.61"	183° 41' 46"	-1° 36' 04"	1.0024574	15'57.28"	23° 26' 19"	8 m 52 s
22	184° 04' 24"	-0.61"	183° 44' 01"	-1° 37' 02"	1.0024454	15'57.29"	23° 26' 19"	8 m 53 s
23	184° 06' 51"	-0.61"	183° 46' 16"	-1° 38' 01"	1.0024334	15'57.30"	23° 26' 19"	8 m 54 s
24	184° 09' 18"	-0.61"	183° 48' 31"	-1° 38' 59"	1.0024214	15'57.31"	23° 26' 19"	8 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	229° 19' 15"	-4° 36' 20"	225° 31' 10"	-21° 59' 03"	0° 54' 05"	14' 44.23"	290° 38' 45"	0.15540
1	229° 48' 52"	-4° 37' 38"	226° 01' 23"	-22° 08' 31"	0° 54' 05"	14' 44.19"	290° 26' 52"	0.15827
2	230° 18' 29"	-4° 38' 55"	226° 31' 39"	-22° 17' 53"	0° 54' 05"	14' 44.16"	290° 14' 54"	0.16116
3	230° 48' 06"	-4° 40' 10"	227° 01' 59"	-22° 27' 10"	0° 54' 05"	14' 44.13"	290° 2' 51"	0.16407
4	231° 17' 43"	-4° 41' 24"	227° 32' 23"	-22° 36' 21"	0° 54' 04"	14' 44.11"	289° 50' 42"	0.16701
5	231° 47' 20"	-4° 42' 38"	228° 02' 51"	-22° 45' 26"	0° 54' 04"	14' 44.09"	289° 38' 29"	0.16996
6	232° 16' 56"	-4° 43' 49"	228° 33' 22"	-22° 54' 25"	0° 54' 04"	14' 44.07"	289° 26' 10"	0.17294
7	232° 46' 33"	-4° 44' 60"	229° 03' 58"	-23° 03' 18"	0° 54' 04"	14' 44.06"	289° 13' 46"	0.17593
8	233° 16' 09"	-4° 46' 09"	229° 34' 37"	-23° 12' 06"	0° 54' 04"	14' 44.05"	289° 1' 18"	0.17894
9	233° 45' 45"	-4° 47' 17"	230° 05' 20"	-23° 20' 47"	0° 54' 04"	14' 44.04"	288° 48' 44"	0.18198
10	234° 15' 22"	-4° 48' 24"	230° 36' 06"	-23° 29' 23"	0° 54' 04"	14' 44.04"	288° 36' 05"	0.18503
11	234° 44' 58"	-4° 49' 29"	231° 06' 57"	-23° 37' 52"	0° 54' 04"	14' 44.04"	288° 23' 21"	0.18810
12	235° 14' 34"	-4° 50' 33"	231° 37' 51"	-23° 46' 15"	0° 54' 04"	14' 44.05"	288° 10' 32"	0.19119
13	235° 44' 10"	-4° 51' 36"	232° 08' 50"	-23° 54' 32"	0° 54' 04"	14' 44.06"	287° 57' 38"	0.19430
14	236° 13' 46"	-4° 52' 37"	232° 39' 52"	-24° 02' 42"	0° 54' 04"	14' 44.08"	287° 44' 40"	0.19743
15	236° 43' 22"	-4° 53' 37"	233° 10' 58"	-24° 10' 47"	0° 54' 04"	14' 44.10"	287° 31' 36"	0.20058
16	237° 12' 58"	-4° 54' 36"	233° 42' 07"	-24° 18' 45"	0° 54' 04"	14' 44.12"	287° 18' 27"	0.20374
17	237° 42' 34"	-4° 55' 34"	234° 13' 21"	-24° 26' 36"	0° 54' 05"	14' 44.15"	287° 5' 13"	0.20692
18	238° 12' 11"	-4° 56' 30"	234° 44' 38"	-24° 34' 21"	0° 54' 05"	14' 44.18"	286° 51' 55"	0.21013
19	238° 41' 47"	-4° 57' 25"	235° 15' 60"	-24° 41' 60"	0° 54' 05"	14' 44.21"	286° 38' 32"	0.21335
20	239° 11' 23"	-4° 58' 19"	235° 47' 25"	-24° 49' 32"	0° 54' 05"	14' 44.25"	286° 25' 04"	0.21658
21	239° 40' 60"	-4° 59' 11"	236° 18' 54"	-24° 56' 58"	0° 54' 05"	14' 44.30"	286° 11' 31"	0.21984
22	240° 10' 36"	-5° 00' 02"	236° 50' 27"	-25° 04' 17"	0° 54' 05"	14' 44.35"	285° 57' 53"	0.22311
23	240° 40' 13"	-5° 00' 51"	237° 22' 03"	-25° 11' 29"	0° 54' 06"	14' 44.40"	285° 44' 11"	0.22640
24	241° 09' 50"	-5° 01' 40"	237° 53' 44"	-25° 18' 34"	0° 54' 06"	14' 44.46"	285° 30' 24"	0.22971

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	184° 09' 18"	-0.61"	183° 48' 31"	-1° 38' 59"	1.0024214	15'57.31"	23° 26' 19"	8 m 55 s
1	184° 11' 45"	-0.61"	183° 50' 46"	-1° 39' 57"	1.0024094	15'57.32"	23° 26' 19"	8 m 55 s
2	184° 14' 12"	-0.61"	183° 53' 02"	-1° 40' 56"	1.0023974	15'57.33"	23° 26' 19"	8 m 56 s
3	184° 16' 39"	-0.61"	183° 55' 17"	-1° 41' 54"	1.0023854	15'57.35"	23° 26' 19"	8 m 57 s
4	184° 19' 06"	-0.61"	183° 57' 32"	-1° 42' 53"	1.0023734	15'57.36"	23° 26' 19"	8 m 58 s
5	184° 21' 34"	-0.62"	183° 59' 47"	-1° 43' 51"	1.0023614	15'57.37"	23° 26' 19"	8 m 59 s
6	184° 24' 01"	-0.62"	184° 02' 02"	-1° 44' 49"	1.0023493	15'57.38"	23° 26' 19"	8 m 60 s
7	184° 26' 28"	-0.62"	184° 04' 17"	-1° 45' 48"	1.0023373	15'57.39"	23° 26' 19"	9 m 01 s
8	184° 28' 55"	-0.62"	184° 06' 32"	-1° 46' 46"	1.0023253	15'57.40"	23° 26' 19"	9 m 01 s
9	184° 31' 22"	-0.62"	184° 08' 48"	-1° 47' 45"	1.0023133	15'57.42"	23° 26' 19"	9 m 02 s
10	184° 33' 49"	-0.62"	184° 11' 03"	-1° 48' 43"	1.0023012	15'57.43"	23° 26' 19"	9 m 03 s
11	184° 36' 17"	-0.62"	184° 13' 18"	-1° 49' 41"	1.0022892	15'57.44"	23° 26' 19"	9 m 04 s
12	184° 38' 44"	-0.62"	184° 15' 33"	-1° 50' 40"	1.0022772	15'57.45"	23° 26' 19"	9 m 05 s
13	184° 41' 11"	-0.62"	184° 17' 48"	-1° 51' 38"	1.0022652	15'57.46"	23° 26' 19"	9 m 06 s
14	184° 43' 38"	-0.62"	184° 20' 03"	-1° 52' 36"	1.0022531	15'57.47"	23° 26' 19"	9 m 07 s
15	184° 46' 05"	-0.62"	184° 22' 19"	-1° 53' 35"	1.0022411	15'57.48"	23° 26' 19"	9 m 07 s
16	184° 48' 33"	-0.62"	184° 24' 34"	-1° 54' 33"	1.0022290	15'57.50"	23° 26' 19"	9 m 08 s
17	184° 50' 60"	-0.62"	184° 26' 49"	-1° 55' 32"	1.0022170	15'57.51"	23° 26' 19"	9 m 09 s
18	184° 53' 27"	-0.62"	184° 29' 04"	-1° 56' 30"	1.0022050	15'57.52"	23° 26' 19"	9 m 10 s
19	184° 55' 54"	-0.62"	184° 31' 19"	-1° 57' 28"	1.0021929	15'57.53"	23° 26' 19"	9 m 11 s
20	184° 58' 21"	-0.62"	184° 33' 35"	-1° 58' 27"	1.0021809	15'57.54"	23° 26' 19"	9 m 12 s
21	185° 00' 49"	-0.62"	184° 35' 50"	-1° 59' 25"	1.0021688	15'57.55"	23° 26' 19"	9 m 12 s
22	185° 03' 16"	-0.62"	184° 38' 05"	-2° 00' 23"	1.0021568	15'57.56"	23° 26' 19"	9 m 13 s
23	185° 05' 43"	-0.62"	184° 40' 20"	-2° 01' 22"	1.0021447	15'57.58"	23° 26' 19"	9 m 14 s
24	185° 08' 10"	-0.62"	184° 42' 36"	-2° 02' 20"	1.0021326	15'57.59"	23° 26' 19"	9 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	241° 09' 50"	-5° 01' 40"	237° 53' 44"	-25° 18' 34"	0° 54' 06"	14' 44.46"	285° 30' 24"	0.22971
1	241° 39' 27"	-5° 02' 27"	238° 25' 28"	-25° 25' 33"	0° 54' 06"	14' 44.52"	285° 16' 33"	0.23303
2	242° 09' 04"	-5° 03' 12"	238° 57' 16"	-25° 32' 25"	0° 54' 06"	14' 44.59"	285° 2' 37"	0.23637
3	242° 38' 42"	-5° 03' 56"	239° 29' 08"	-25° 39' 10"	0° 54' 06"	14' 44.66"	284° 48' 36"	0.23973
4	243° 08' 19"	-5° 04' 39"	240° 01' 03"	-25° 45' 48"	0° 54' 07"	14' 44.73"	284° 34' 31"	0.24310
5	243° 37' 57"	-5° 05' 21"	240° 33' 02"	-25° 52' 20"	0° 54' 07"	14' 44.81"	284° 20' 22"	0.24649
6	244° 07' 35"	-5° 06' 01"	241° 05' 05"	-25° 58' 44"	0° 54' 07"	14' 44.89"	284° 6' 08"	0.24990
7	244° 37' 14"	-5° 06' 40"	241° 37' 12"	-26° 05' 01"	0° 54' 08"	14' 44.98"	283° 51' 50"	0.25332
8	245° 06' 52"	-5° 07' 17"	242° 09' 22"	-26° 11' 11"	0° 54' 08"	14' 45.07"	283° 37' 28"	0.25676
9	245° 36' 31"	-5° 07' 54"	242° 41' 36"	-26° 17' 15"	0° 54' 08"	14' 45.17"	283° 23' 01"	0.26021
10	246° 06' 10"	-5° 08' 28"	243° 13' 53"	-26° 23' 10"	0° 54' 09"	14' 45.27"	283° 8' 30"	0.26368
11	246° 35' 50"	-5° 09' 02"	243° 46' 14"	-26° 28' 59"	0° 54' 09"	14' 45.38"	282° 53' 55"	0.26716
12	247° 05' 30"	-5° 09' 34"	244° 18' 39"	-26° 34' 41"	0° 54' 09"	14' 45.49"	282° 39' 16"	0.27066
13	247° 35' 10"	-5° 10' 04"	244° 51' 07"	-26° 40' 15"	0° 54' 10"	14' 45.60"	282° 24' 34"	0.27417
14	248° 04' 51"	-5° 10' 34"	245° 23' 39"	-26° 45' 42"	0° 54' 10"	14' 45.72"	282° 9' 47"	0.27770
15	248° 34' 32"	-5° 11' 02"	245° 56' 14"	-26° 51' 01"	0° 54' 11"	14' 45.85"	281° 54' 56"	0.28125
16	249° 04' 14"	-5° 11' 28"	246° 28' 53"	-26° 56' 13"	0° 54' 11"	14' 45.97"	281° 40' 01"	0.28480
17	249° 33' 56"	-5° 11' 53"	247° 01' 35"	-27° 01' 18"	0° 54' 12"	14' 46.11"	281° 25' 03"	0.28837
18	250° 03' 39"	-5° 12' 17"	247° 34' 20"	-27° 06' 15"	0° 54' 12"	14' 46.24"	281° 10' 01"	0.29196
19	250° 33' 21"	-5° 12' 39"	248° 07' 09"	-27° 11' 04"	0° 54' 13"	14' 46.39"	280° 54' 56"	0.29556
20	251° 03' 05"	-5° 13' 00"	248° 40' 01"	-27° 15' 46"	0° 54' 13"	14' 46.53"	280° 39' 47"	0.29917
21	251° 32' 49"	-5° 13' 20"	249° 12' 57"	-27° 20' 20"	0° 54' 14"	14' 46.68"	280° 24' 34"	0.30280
22	252° 02' 33"	-5° 13' 38"	249° 45' 56"	-27° 24' 47"	0° 54' 14"	14' 46.84"	280° 9' 18"	0.30644
23	252° 32' 19"	-5° 13' 55"	250° 18' 57"	-27° 29' 06"	0° 54' 15"	14' 47.00"	279° 53' 59"	0.31009
24	253° 02' 04"	-5° 14' 10"	250° 52' 03"	-27° 33' 17"	0° 54' 16"	14' 47.17"	279° 38' 37"	0.31376

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	185° 08' 10"	-0.62"	184° 42' 36"	-2° 02' 20"	1.0021326	15'57.59"	23° 26' 19"	9 m 15 s
1	185° 10' 37"	-0.62"	184° 44' 51"	-2° 03' 19"	1.0021206	15'57.60"	23° 26' 19"	9 m 16 s
2	185° 13' 05"	-0.62"	184° 47' 06"	-2° 04' 17"	1.0021085	15'57.61"	23° 26' 19"	9 m 17 s
3	185° 15' 32"	-0.62"	184° 49' 21"	-2° 05' 15"	1.0020965	15'57.62"	23° 26' 19"	9 m 18 s
4	185° 17' 59"	-0.62"	184° 51' 37"	-2° 06' 14"	1.0020844	15'57.63"	23° 26' 19"	9 m 18 s
5	185° 20' 26"	-0.62"	184° 53' 52"	-2° 07' 12"	1.0020723	15'57.65"	23° 26' 19"	9 m 19 s
6	185° 22' 54"	-0.62"	184° 56' 07"	-2° 08' 10"	1.0020603	15'57.66"	23° 26' 19"	9 m 20 s
7	185° 25' 21"	-0.62"	184° 58' 22"	-2° 09' 09"	1.0020482	15'57.67"	23° 26' 19"	9 m 21 s
8	185° 27' 48"	-0.62"	185° 00' 38"	-2° 10' 07"	1.0020361	15'57.68"	23° 26' 19"	9 m 22 s
9	185° 30' 15"	-0.62"	185° 02' 53"	-2° 11' 05"	1.0020240	15'57.69"	23° 26' 19"	9 m 23 s
10	185° 32' 43"	-0.62"	185° 05' 08"	-2° 12' 04"	1.0020120	15'57.70"	23° 26' 19"	9 m 23 s
11	185° 35' 10"	-0.62"	185° 07' 24"	-2° 13' 02"	1.0019999	15'57.71"	23° 26' 19"	9 m 24 s
12	185° 37' 37"	-0.62"	185° 09' 39"	-2° 14' 00"	1.0019878	15'57.73"	23° 26' 19"	9 m 25 s
13	185° 40' 04"	-0.62"	185° 11' 54"	-2° 14' 59"	1.0019757	15'57.74"	23° 26' 19"	9 m 26 s
14	185° 42' 32"	-0.62"	185° 14' 10"	-2° 15' 57"	1.0019636	15'57.75"	23° 26' 19"	9 m 27 s
15	185° 44' 59"	-0.62"	185° 16' 25"	-2° 16' 55"	1.0019516	15'57.76"	23° 26' 19"	9 m 28 s
16	185° 47' 26"	-0.62"	185° 18' 40"	-2° 17' 54"	1.0019395	15'57.77"	23° 26' 19"	9 m 28 s
17	185° 49' 53"	-0.62"	185° 20' 56"	-2° 18' 52"	1.0019274	15'57.78"	23° 26' 19"	9 m 29 s
18	185° 52' 21"	-0.62"	185° 23' 11"	-2° 19' 50"	1.0019153	15'57.80"	23° 26' 19"	9 m 30 s
19	185° 54' 48"	-0.61"	185° 25' 26"	-2° 20' 49"	1.0019032	15'57.81"	23° 26' 19"	9 m 31 s
20	185° 57' 15"	-0.61"	185° 27' 42"	-2° 21' 47"	1.0018911	15'57.82"	23° 26' 19"	9 m 32 s
21	185° 59' 42"	-0.61"	185° 29' 57"	-2° 22' 45"	1.0018790	15'57.83"	23° 26' 19"	9 m 33 s
22	186° 02' 10"	-0.61"	185° 32' 12"	-2° 23' 44"	1.0018669	15'57.84"	23° 26' 19"	9 m 33 s
23	186° 04' 37"	-0.61"	185° 34' 28"	-2° 24' 42"	1.0018548	15'57.85"	23° 26' 19"	9 m 34 s
24	186° 07' 04"	-0.61"	185° 36' 43"	-2° 25' 40"	1.0018427	15'57.86"	23° 26' 19"	9 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	253° 02' 04"	-5° 14' 10"	250° 52' 03"	-27° 33' 17"	0° 54' 16"	14' 47.17"	279° 38' 37"	0.31376
1	253° 31' 50"	-5° 14' 24"	251° 25' 11"	-27° 37' 21"	0° 54' 16"	14' 47.34"	279° 23' 11"	0.31744
2	254° 01' 37"	-5° 14' 37"	251° 58' 22"	-27° 41' 16"	0° 54' 17"	14' 47.51"	279° 7' 42"	0.32113
3	254° 31' 25"	-5° 14' 48"	252° 31' 36"	-27° 45' 04"	0° 54' 18"	14' 47.69"	278° 52' 11"	0.32483
4	255° 01' 13"	-5° 14' 57"	253° 04' 53"	-27° 48' 44"	0° 54' 18"	14' 47.87"	278° 36' 36"	0.32855
5	255° 31' 02"	-5° 15' 06"	253° 38' 14"	-27° 52' 16"	0° 54' 19"	14' 48.06"	278° 20' 59"	0.33228
6	256° 00' 51"	-5° 15' 13"	254° 11' 37"	-27° 55' 40"	0° 54' 20"	14' 48.26"	278° 5' 18"	0.33602
7	256° 30' 41"	-5° 15' 18"	254° 45' 02"	-27° 58' 56"	0° 54' 20"	14' 48.45"	277° 49' 36"	0.33977
8	257° 00' 32"	-5° 15' 22"	255° 18' 31"	-28° 02' 04"	0° 54' 21"	14' 48.66"	277° 33' 50"	0.34354
9	257° 30' 24"	-5° 15' 25"	255° 52' 02"	-28° 05' 04"	0° 54' 22"	14' 48.87"	277° 18' 02"	0.34731
10	258° 00' 16"	-5° 15' 26"	256° 25' 37"	-28° 07' 56"	0° 54' 23"	14' 49.08"	277° 2' 12"	0.35110
11	258° 30' 09"	-5° 15' 26"	256° 59' 13"	-28° 10' 40"	0° 54' 23"	14' 49.29"	276° 46' 19"	0.35490
12	259° 00' 03"	-5° 15' 24"	257° 32' 53"	-28° 13' 16"	0° 54' 24"	14' 49.52"	276° 30' 24"	0.35871
13	259° 29' 58"	-5° 15' 21"	258° 06' 34"	-28° 15' 43"	0° 54' 25"	14' 49.74"	276° 14' 27"	0.36253
14	259° 59' 53"	-5° 15' 17"	258° 40' 19"	-28° 18' 03"	0° 54' 26"	14' 49.97"	275° 58' 28"	0.36636
15	260° 29' 50"	-5° 15' 11"	259° 14' 05"	-28° 20' 14"	0° 54' 27"	14' 50.21"	275° 42' 27"	0.37020
16	260° 59' 47"	-5° 15' 03"	259° 47' 54"	-28° 22' 16"	0° 54' 28"	14' 50.45"	275° 26' 24"	0.37405
17	261° 29' 45"	-5° 14' 55"	260° 21' 45"	-28° 24' 11"	0° 54' 29"	14' 50.70"	275° 10' 20"	0.37791
18	261° 59' 45"	-5° 14' 44"	260° 55' 39"	-28° 25' 57"	0° 54' 30"	14' 50.95"	274° 54' 13"	0.38178
19	262° 29' 45"	-5° 14' 33"	261° 29' 35"	-28° 27' 35"	0° 54' 30"	14' 51.20"	274° 38' 06"	0.38566
20	262° 59' 46"	-5° 14' 20"	262° 03' 32"	-28° 29' 04"	0° 54' 31"	14' 51.46"	274° 21' 56"	0.38955
21	263° 29' 48"	-5° 14' 05"	262° 37' 32"	-28° 30' 25"	0° 54' 32"	14' 51.73"	274° 5' 46"	0.39345
22	263° 59' 50"	-5° 13' 49"	263° 11' 34"	-28° 31' 38"	0° 54' 33"	14' 52.00"	273° 49' 34"	0.39736
23	264° 29' 54"	-5° 13' 32"	263° 45' 38"	-28° 32' 42"	0° 54' 34"	14' 52.27"	273° 33' 21"	0.40127
24	264° 59' 59"	-5° 13' 13"	264° 19' 43"	-28° 33' 37"	0° 54' 35"	14' 52.55"	273° 17' 07"	0.40520

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	186° 07' 04"	-0.61"	185° 36' 43"	-2° 25' 40"	1.0018427	15'57.86"	23° 26' 19"	9 m 35 s
1	186° 09' 32"	-0.61"	185° 38' 58"	-2° 26' 39"	1.0018306	15'57.88"	23° 26' 19"	9 m 36 s
2	186° 11' 59"	-0.61"	185° 41' 14"	-2° 27' 37"	1.0018185	15'57.89"	23° 26' 19"	9 m 37 s
3	186° 14' 26"	-0.60"	185° 43' 29"	-2° 28' 35"	1.0018064	15'57.90"	23° 26' 19"	9 m 38 s
4	186° 16' 54"	-0.60"	185° 45' 45"	-2° 29' 33"	1.0017943	15'57.91"	23° 26' 19"	9 m 38 s
5	186° 19' 21"	-0.60"	185° 48' 00"	-2° 30' 32"	1.0017822	15'57.92"	23° 26' 19"	9 m 39 s
6	186° 21' 48"	-0.60"	185° 50' 16"	-2° 31' 30"	1.0017701	15'57.93"	23° 26' 19"	9 m 40 s
7	186° 24' 15"	-0.60"	185° 52' 31"	-2° 32' 28"	1.0017580	15'57.95"	23° 26' 19"	9 m 41 s
8	186° 26' 43"	-0.60"	185° 54' 46"	-2° 33' 27"	1.0017459	15'57.96"	23° 26' 19"	9 m 42 s
9	186° 29' 10"	-0.59"	185° 57' 02"	-2° 34' 25"	1.0017338	15'57.97"	23° 26' 19"	9 m 43 s
10	186° 31' 37"	-0.59"	185° 59' 17"	-2° 35' 23"	1.0017217	15'57.98"	23° 26' 19"	9 m 43 s
11	186° 34' 05"	-0.59"	186° 01' 33"	-2° 36' 21"	1.0017095	15'57.99"	23° 26' 19"	9 m 44 s
12	186° 36' 32"	-0.59"	186° 03' 48"	-2° 37' 20"	1.0016974	15'58.00"	23° 26' 19"	9 m 45 s
13	186° 38' 59"	-0.59"	186° 06' 04"	-2° 38' 18"	1.0016853	15'58.02"	23° 26' 19"	9 m 46 s
14	186° 41' 27"	-0.59"	186° 08' 19"	-2° 39' 16"	1.0016732	15'58.03"	23° 26' 19"	9 m 47 s
15	186° 43' 54"	-0.58"	186° 10' 35"	-2° 40' 15"	1.0016611	15'58.04"	23° 26' 19"	9 m 48 s
16	186° 46' 21"	-0.58"	186° 12' 50"	-2° 41' 13"	1.0016489	15'58.05"	23° 26' 19"	9 m 48 s
17	186° 48' 49"	-0.58"	186° 15' 06"	-2° 42' 11"	1.0016368	15'58.06"	23° 26' 19"	9 m 49 s
18	186° 51' 16"	-0.58"	186° 17' 21"	-2° 43' 09"	1.0016247	15'58.07"	23° 26' 19"	9 m 50 s
19	186° 53' 43"	-0.57"	186° 19' 37"	-2° 44' 08"	1.0016126	15'58.09"	23° 26' 19"	9 m 51 s
20	186° 56' 11"	-0.57"	186° 21' 52"	-2° 45' 06"	1.0016005	15'58.10"	23° 26' 19"	9 m 52 s
21	186° 58' 38"	-0.57"	186° 24' 08"	-2° 46' 04"	1.0015883	15'58.11"	23° 26' 19"	9 m 53 s
22	187° 01' 05"	-0.57"	186° 26' 23"	-2° 47' 02"	1.0015762	15'58.12"	23° 26' 19"	9 m 53 s
23	187° 03' 33"	-0.57"	186° 28' 39"	-2° 48' 01"	1.0015641	15'58.13"	23° 26' 19"	9 m 54 s
24	187° 06' 00"	-0.56"	186° 30' 54"	-2° 48' 59"	1.0015519	15'58.14"	23° 26' 19"	9 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	264° 59' 59"	-5° 13' 13"	264° 19' 43"	-28° 33' 37"	0° 54' 35"	14' 52.55"	273° 17' 07"	0.40520
1	265° 30' 05"	-5° 12' 53"	264° 53' 50"	-28° 34' 25"	0° 54' 36"	14' 52.83"	273° 0' 52"	0.40913
2	266° 00' 13"	-5° 12' 31"	265° 27' 59"	-28° 35' 03"	0° 54' 38"	14' 53.12"	272° 44' 36"	0.41308
3	266° 30' 21"	-5° 12' 08"	266° 02' 10"	-28° 35' 33"	0° 54' 39"	14' 53.42"	272° 28' 19"	0.41703
4	267° 00' 30"	-5° 11' 43"	266° 36' 22"	-28° 35' 55"	0° 54' 40"	14' 53.71"	272° 12' 02"	0.42099
5	267° 30' 40"	-5° 11' 17"	267° 10' 36"	-28° 36' 08"	0° 54' 41"	14' 54.02"	271° 55' 45"	0.42495
6	268° 00' 52"	-5° 10' 49"	267° 44' 51"	-28° 36' 12"	0° 54' 42"	14' 54.33"	271° 39' 26"	0.42893
7	268° 31' 05"	-5° 10' 20"	268° 19' 08"	-28° 36' 08"	0° 54' 43"	14' 54.64"	271° 23' 08"	0.43291
8	269° 01' 19"	-5° 09' 50"	268° 53' 26"	-28° 35' 55"	0° 54' 44"	14' 54.96"	271° 6' 50"	0.43690
9	269° 31' 34"	-5° 09' 18"	269° 27' 45"	-28° 35' 34"	0° 54' 45"	14' 55.28"	270° 50' 31"	0.44089
10	270° 01' 50"	-5° 08' 45"	270° 02' 05"	-28° 35' 03"	0° 54' 47"	14' 55.60"	270° 34' 12"	0.44490
11	270° 32' 08"	-5° 08' 10"	270° 36' 26"	-28° 34' 25"	0° 54' 48"	14' 55.94"	270° 17' 54"	0.44891
12	271° 02' 27"	-5° 07' 34"	271° 10' 49"	-28° 33' 37"	0° 54' 49"	14' 56.27"	270° 1' 36"	0.45292
13	271° 32' 47"	-5° 06' 56"	271° 45' 12"	-28° 32' 41"	0° 54' 50"	14' 56.61"	269° 45' 18"	0.45694
14	272° 03' 08"	-5° 06' 17"	272° 19' 36"	-28° 31' 36"	0° 54' 52"	14' 56.96"	269° 29' 00"	0.46097
15	272° 33' 31"	-5° 05' 36"	272° 54' 01"	-28° 30' 22"	0° 54' 53"	14' 57.31"	269° 12' 44"	0.46501
16	273° 03' 55"	-5° 04' 54"	273° 28' 27"	-28° 28' 60"	0° 54' 54"	14' 57.66"	268° 56' 28"	0.46904
17	273° 34' 21"	-5° 04' 10"	274° 02' 54"	-28° 27' 28"	0° 54' 55"	14' 58.02"	268° 40' 12"	0.47309
18	274° 04' 47"	-5° 03' 25"	274° 37' 21"	-28° 25' 49"	0° 54' 57"	14' 58.39"	268° 23' 58"	0.47714
19	274° 35' 16"	-5° 02' 39"	275° 11' 48"	-28° 23' 60"	0° 54' 58"	14' 58.76"	268° 7' 45"	0.48119
20	275° 05' 45"	-5° 01' 51"	275° 46' 16"	-28° 22' 02"	0° 54' 60"	14' 59.13"	267° 51' 33"	0.48525
21	275° 36' 17"	-5° 01' 02"	276° 20' 45"	-28° 19' 56"	0° 55' 01"	14' 59.51"	267° 35' 22"	0.48932
22	276° 06' 49"	-5° 00' 11"	276° 55' 14"	-28° 17' 41"	0° 55' 02"	14' 59.89"	267° 19' 12"	0.49339
23	276° 37' 23"	-4° 59' 18"	277° 29' 43"	-28° 15' 17"	0° 55' 04"	15' 00.28"	267° 3' 04"	0.49746
24	277° 07' 59"	-4° 58' 25"	278° 04' 12"	-28° 12' 45"	0° 55' 05"	15' 00.67"	266° 46' 58"	0.50153

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	187° 06' 00"	-0.56"	186° 30' 54"	-2° 48' 59"	1.0015519	15'58.14"	23° 26' 19"	9 m 55 s
1	187° 08' 28"	-0.56"	186° 33' 10"	-2° 49' 57"	1.0015398	15'58.15"	23° 26' 19"	9 m 56 s
2	187° 10' 55"	-0.56"	186° 35' 25"	-2° 50' 55"	1.0015277	15'58.17"	23° 26' 19"	9 m 57 s
3	187° 13' 22"	-0.56"	186° 37' 41"	-2° 51' 53"	1.0015155	15'58.18"	23° 26' 19"	9 m 58 s
4	187° 15' 50"	-0.55"	186° 39' 56"	-2° 52' 52"	1.0015034	15'58.19"	23° 26' 19"	9 m 58 s
5	187° 18' 17"	-0.55"	186° 42' 12"	-2° 53' 50"	1.0014913	15'58.20"	23° 26' 19"	9 m 59 s
6	187° 20' 44"	-0.55"	186° 44' 27"	-2° 54' 48"	1.0014791	15'58.21"	23° 26' 19"	9 m 60 s
7	187° 23' 12"	-0.54"	186° 46' 43"	-2° 55' 46"	1.0014670	15'58.22"	23° 26' 19"	10 m 01 s
8	187° 25' 39"	-0.54"	186° 48' 59"	-2° 56' 45"	1.0014549	15'58.24"	23° 26' 19"	10 m 02 s
9	187° 28' 07"	-0.54"	186° 51' 14"	-2° 57' 43"	1.0014427	15'58.25"	23° 26' 19"	10 m 02 s
10	187° 30' 34"	-0.54"	186° 53' 30"	-2° 58' 41"	1.0014306	15'58.26"	23° 26' 19"	10 m 03 s
11	187° 33' 01"	-0.53"	186° 55' 45"	-2° 59' 39"	1.0014185	15'58.27"	23° 26' 19"	10 m 04 s
12	187° 35' 29"	-0.53"	186° 58' 01"	-3° 00' 37"	1.0014063	15'58.28"	23° 26' 19"	10 m 05 s
13	187° 37' 56"	-0.53"	187° 00' 17"	-3° 01' 36"	1.0013942	15'58.29"	23° 26' 19"	10 m 06 s
14	187° 40' 24"	-0.52"	187° 02' 32"	-3° 02' 34"	1.0013820	15'58.31"	23° 26' 19"	10 m 07 s
15	187° 42' 51"	-0.52"	187° 04' 48"	-3° 03' 32"	1.0013699	15'58.32"	23° 26' 19"	10 m 07 s
16	187° 45' 18"	-0.52"	187° 07' 04"	-3° 04' 30"	1.0013578	15'58.33"	23° 26' 19"	10 m 08 s
17	187° 47' 46"	-0.51"	187° 09' 19"	-3° 05' 28"	1.0013456	15'58.34"	23° 26' 19"	10 m 09 s
18	187° 50' 13"	-0.51"	187° 11' 35"	-3° 06' 26"	1.0013335	15'58.35"	23° 26' 19"	10 m 10 s
19	187° 52' 41"	-0.51"	187° 13' 51"	-3° 07' 25"	1.0013213	15'58.36"	23° 26' 19"	10 m 11 s
20	187° 55' 08"	-0.50"	187° 16' 06"	-3° 08' 23"	1.0013092	15'58.38"	23° 26' 19"	10 m 11 s
21	187° 57' 36"	-0.50"	187° 18' 22"	-3° 09' 21"	1.0012970	15'58.39"	23° 26' 19"	10 m 12 s
22	188° 00' 03"	-0.50"	187° 20' 38"	-3° 10' 19"	1.0012849	15'58.40"	23° 26' 19"	10 m 13 s
23	188° 02' 30"	-0.49"	187° 22' 53"	-3° 11' 17"	1.0012728	15'58.41"	23° 26' 19"	10 m 14 s
24	188° 04' 58"	-0.49"	187° 25' 09"	-3° 12' 15"	1.0012606	15'58.42"	23° 26' 19"	10 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	277° 07' 59"	-4° 58' 25"	278° 04' 12"	-28° 12' 45"	0° 55' 05"	15' 00.67"	266° 46' 58"	0.50153
1	277° 38' 36"	-4° 57' 29"	278° 38' 41"	-28° 10' 03"	0° 55' 07"	15' 01.07"	266° 30' 54"	0.50561
2	278° 09' 15"	-4° 56' 33"	279° 13' 11"	-28° 07' 13"	0° 55' 08"	15' 01.47"	266° 14' 51"	0.50970
3	278° 39' 55"	-4° 55' 35"	279° 47' 40"	-28° 04' 14"	0° 55' 10"	15' 01.87"	265° 58' 50"	0.51378
4	279° 10' 37"	-4° 54' 35"	280° 22' 10"	-28° 01' 07"	0° 55' 11"	15' 02.28"	265° 42' 51"	0.51787
5	279° 41' 20"	-4° 53' 34"	280° 56' 39"	-27° 57' 50"	0° 55' 13"	15' 02.70"	265° 26' 55"	0.52197
6	280° 12' 05"	-4° 52' 31"	281° 31' 08"	-27° 54' 25"	0° 55' 14"	15' 03.12"	265° 11' 01"	0.52606
7	280° 42' 52"	-4° 51' 27"	282° 05' 37"	-27° 50' 51"	0° 55' 16"	15' 03.54"	264° 55' 09"	0.53016
8	281° 13' 40"	-4° 50' 22"	282° 40' 05"	-27° 47' 08"	0° 55' 17"	15' 03.97"	264° 39' 20"	0.53426
9	281° 44' 30"	-4° 49' 15"	283° 14' 33"	-27° 43' 16"	0° 55' 19"	15' 04.40"	264° 23' 33"	0.53836
10	282° 15' 22"	-4° 48' 07"	283° 49' 00"	-27° 39' 16"	0° 55' 21"	15' 04.84"	264° 7' 49"	0.54246
11	282° 46' 15"	-4° 46' 57"	284° 23' 27"	-27° 35' 07"	0° 55' 22"	15' 05.28"	263° 52' 09"	0.54657
12	283° 17' 10"	-4° 45' 46"	284° 57' 54"	-27° 30' 49"	0° 55' 24"	15' 05.72"	263° 36' 31"	0.55067
13	283° 48' 07"	-4° 44' 33"	285° 32' 19"	-27° 26' 22"	0° 55' 25"	15' 06.17"	263° 20' 56"	0.55478
14	284° 19' 06"	-4° 43' 19"	286° 06' 44"	-27° 21' 47"	0° 55' 27"	15' 06.63"	263° 5' 24"	0.55889
15	284° 50' 07"	-4° 42' 03"	286° 41' 09"	-27° 17' 03"	0° 55' 29"	15' 07.09"	262° 49' 56"	0.56299
16	285° 21' 09"	-4° 40' 46"	287° 15' 32"	-27° 12' 10"	0° 55' 30"	15' 07.55"	262° 34' 31"	0.56710
17	285° 52' 13"	-4° 39' 28"	287° 49' 54"	-27° 07' 09"	0° 55' 32"	15' 08.02"	262° 19' 10"	0.57121
18	286° 23' 19"	-4° 38' 08"	288° 24' 16"	-27° 01' 59"	0° 55' 34"	15' 08.49"	262° 3' 52"	0.57532
19	286° 54' 27"	-4° 36' 46"	288° 58' 36"	-26° 56' 40"	0° 55' 36"	15' 08.96"	261° 48' 38"	0.57942
20	287° 25' 37"	-4° 35' 23"	289° 32' 56"	-26° 51' 12"	0° 55' 37"	15' 09.44"	261° 33' 28"	0.58353
21	287° 56' 48"	-4° 33' 59"	290° 07' 14"	-26° 45' 36"	0° 55' 39"	15' 09.93"	261° 18' 22"	0.58764
22	288° 28' 02"	-4° 32' 33"	290° 41' 31"	-26° 39' 51"	0° 55' 41"	15' 10.41"	261° 3' 20"	0.59174
23	288° 59' 18"	-4° 31' 06"	291° 15' 47"	-26° 33' 58"	0° 55' 43"	15' 10.90"	260° 48' 22"	0.59584
24	289° 30' 35"	-4° 29' 37"	291° 50' 02"	-26° 27' 56"	0° 55' 45"	15' 11.40"	260° 33' 28"	0.59994

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	188° 04' 58"	-0.49"	187° 25' 09"	-3° 12' 15"	1.0012606	15'58.42"	23° 26' 19"	10 m 15 s
1	188° 07' 25"	-0.49"	187° 27' 25"	-3° 13' 14"	1.0012485	15'58.43"	23° 26' 19"	10 m 16 s
2	188° 09' 53"	-0.48"	187° 29' 40"	-3° 14' 12"	1.0012363	15'58.45"	23° 26' 19"	10 m 16 s
3	188° 12' 20"	-0.48"	187° 31' 56"	-3° 15' 10"	1.0012242	15'58.46"	23° 26' 19"	10 m 17 s
4	188° 14' 48"	-0.47"	187° 34' 12"	-3° 16' 08"	1.0012120	15'58.47"	23° 26' 19"	10 m 18 s
5	188° 17' 15"	-0.47"	187° 36' 27"	-3° 17' 06"	1.0011999	15'58.48"	23° 26' 19"	10 m 19 s
6	188° 19' 42"	-0.47"	187° 38' 43"	-3° 18' 04"	1.0011877	15'58.49"	23° 26' 19"	10 m 20 s
7	188° 22' 10"	-0.46"	187° 40' 59"	-3° 19' 02"	1.0011756	15'58.50"	23° 26' 19"	10 m 20 s
8	188° 24' 37"	-0.46"	187° 43' 15"	-3° 20' 01"	1.0011634	15'58.51"	23° 26' 19"	10 m 21 s
9	188° 27' 05"	-0.46"	187° 45' 30"	-3° 20' 59"	1.0011513	15'58.53"	23° 26' 19"	10 m 22 s
10	188° 29' 32"	-0.45"	187° 47' 46"	-3° 21' 57"	1.0011391	15'58.54"	23° 26' 19"	10 m 23 s
11	188° 31' 60"	-0.45"	187° 50' 02"	-3° 22' 55"	1.0011270	15'58.55"	23° 26' 19"	10 m 24 s
12	188° 34' 27"	-0.44"	187° 52' 18"	-3° 23' 53"	1.0011149	15'58.56"	23° 26' 19"	10 m 24 s
13	188° 36' 55"	-0.44"	187° 54' 34"	-3° 24' 51"	1.0011027	15'58.57"	23° 26' 19"	10 m 25 s
14	188° 39' 22"	-0.44"	187° 56' 49"	-3° 25' 49"	1.0010906	15'58.58"	23° 26' 19"	10 m 26 s
15	188° 41' 50"	-0.43"	187° 59' 05"	-3° 26' 47"	1.0010784	15'58.60"	23° 26' 19"	10 m 27 s
16	188° 44' 17"	-0.43"	188° 01' 21"	-3° 27' 45"	1.0010663	15'58.61"	23° 26' 19"	10 m 28 s
17	188° 46' 45"	-0.42"	188° 03' 37"	-3° 28' 43"	1.0010541	15'58.62"	23° 26' 19"	10 m 28 s
18	188° 49' 12"	-0.42"	188° 05' 53"	-3° 29' 42"	1.0010420	15'58.63"	23° 26' 19"	10 m 29 s
19	188° 51' 40"	-0.41"	188° 08' 08"	-3° 30' 40"	1.0010298	15'58.64"	23° 26' 19"	10 m 30 s
20	188° 54' 07"	-0.41"	188° 10' 24"	-3° 31' 38"	1.0010177	15'58.65"	23° 26' 19"	10 m 31 s
21	188° 56' 35"	-0.41"	188° 12' 40"	-3° 32' 36"	1.0010055	15'58.67"	23° 26' 19"	10 m 32 s
22	188° 59' 02"	-0.40"	188° 14' 56"	-3° 33' 34"	1.0009934	15'58.68"	23° 26' 19"	10 m 32 s
23	189° 01' 30"	-0.40"	188° 17' 12"	-3° 34' 32"	1.0009812	15'58.69"	23° 26' 19"	10 m 33 s
24	189° 03' 57"	-0.39"	188° 19' 28"	-3° 35' 30"	1.0009691	15'58.70"	23° 26' 19"	10 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	289° 30' 35"	-4° 29' 37"	291° 50' 02"	-26° 27' 56"	0° 55' 45"	15' 11.40"	260° 33' 28"	0.59994
1	290° 01' 55"	-4° 28' 07"	292° 24' 15"	-26° 21' 45"	0° 55' 46"	15' 11.90"	260° 18' 39"	0.60404
2	290° 33' 16"	-4° 26' 36"	292° 58' 27"	-26° 15' 26"	0° 55' 48"	15' 12.40"	260° 3' 55"	0.60814
3	291° 04' 40"	-4° 25' 03"	293° 32' 38"	-26° 08' 59"	0° 55' 50"	15' 12.91"	259° 49' 15"	0.61223
4	291° 36' 05"	-4° 23' 29"	294° 06' 47"	-26° 02' 23"	0° 55' 52"	15' 13.42"	259° 34' 39"	0.61632
5	292° 07' 33"	-4° 21' 53"	294° 40' 55"	-25° 55' 38"	0° 55' 54"	15' 13.94"	259° 20' 09"	0.62041
6	292° 39' 03"	-4° 20' 16"	295° 15' 01"	-25° 48' 45"	0° 55' 56"	15' 14.45"	259° 5' 43"	0.62449
7	293° 10' 34"	-4° 18' 37"	295° 49' 05"	-25° 41' 43"	0° 55' 58"	15' 14.98"	258° 51' 23"	0.62857
8	293° 42' 08"	-4° 16' 57"	296° 23' 08"	-25° 34' 34"	0° 55' 60"	15' 15.50"	258° 37' 08"	0.63265
9	294° 13' 44"	-4° 15' 16"	296° 57' 09"	-25° 27' 15"	0° 56' 02"	15' 16.03"	258° 22' 57"	0.63672
10	294° 45' 23"	-4° 13' 33"	297° 31' 08"	-25° 19' 49"	0° 56' 04"	15' 16.56"	258° 8' 53"	0.64078
11	295° 17' 03"	-4° 11' 48"	298° 05' 06"	-25° 12' 14"	0° 56' 06"	15' 17.10"	257° 54' 53"	0.64485
12	295° 48' 45"	-4° 10' 03"	298° 39' 02"	-25° 04' 30"	0° 56' 08"	15' 17.64"	257° 40' 59"	0.64890
13	296° 20' 30"	-4° 08' 16"	299° 12' 56"	-24° 56' 39"	0° 56' 09"	15' 18.19"	257° 27' 11"	0.65296
14	296° 52' 17"	-4° 06' 27"	299° 46' 48"	-24° 48' 39"	0° 56' 12"	15' 18.73"	257° 13' 29"	0.65700
15	297° 24' 06"	-4° 04' 37"	300° 20' 39"	-24° 40' 31"	0° 56' 14"	15' 19.28"	256° 59' 52"	0.66104
16	297° 55' 58"	-4° 02' 46"	300° 54' 27"	-24° 32' 15"	0° 56' 16"	15' 19.84"	256° 46' 21"	0.66507
17	298° 27' 51"	-4° 00' 54"	301° 28' 14"	-24° 23' 50"	0° 56' 18"	15' 20.39"	256° 32' 57"	0.66910
18	298° 59' 47"	-3° 58' 60"	302° 01' 58"	-24° 15' 18"	0° 56' 20"	15' 20.95"	256° 19' 38"	0.67312
19	299° 31' 46"	-3° 57' 04"	302° 35' 41"	-24° 06' 37"	0° 56' 22"	15' 21.52"	256° 6' 26"	0.67713
20	300° 03' 46"	-3° 55' 07"	303° 09' 21"	-23° 57' 48"	0° 56' 24"	15' 22.08"	255° 53' 20"	0.68114
21	300° 35' 49"	-3° 53' 09"	303° 42' 60"	-23° 48' 52"	0° 56' 26"	15' 22.65"	255° 40' 20"	0.68514
22	301° 07' 54"	-3° 51' 10"	304° 16' 36"	-23° 39' 47"	0° 56' 28"	15' 23.23"	255° 27' 27"	0.68912
23	301° 40' 02"	-3° 49' 09"	304° 50' 11"	-23° 30' 34"	0° 56' 30"	15' 23.80"	255° 14' 40"	0.69310
24	302° 12' 12"	-3° 47' 07"	305° 23' 43"	-23° 21' 14"	0° 56' 32"	15' 24.38"	255° 2' 00"	0.69708

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	189° 03' 57"	-0.39"	188° 19' 28"	-3° 35' 30"	1.0009691	15'58.70"	23° 26' 19"	10 m 34 s
1	189° 06' 25"	-0.39"	188° 21' 44"	-3° 36' 28"	1.0009569	15'58.71"	23° 26' 19"	10 m 35 s
2	189° 08' 52"	-0.38"	188° 23' 60"	-3° 37' 26"	1.0009448	15'58.72"	23° 26' 19"	10 m 36 s
3	189° 11' 20"	-0.38"	188° 26' 15"	-3° 38' 24"	1.0009327	15'58.74"	23° 26' 19"	10 m 36 s
4	189° 13' 47"	-0.37"	188° 28' 31"	-3° 39' 22"	1.0009205	15'58.75"	23° 26' 19"	10 m 37 s
5	189° 16' 15"	-0.37"	188° 30' 47"	-3° 40' 20"	1.0009084	15'58.76"	23° 26' 19"	10 m 38 s
6	189° 18' 42"	-0.36"	188° 33' 03"	-3° 41' 18"	1.0008962	15'58.77"	23° 26' 19"	10 m 39 s
7	189° 21' 10"	-0.36"	188° 35' 19"	-3° 42' 16"	1.0008841	15'58.78"	23° 26' 19"	10 m 40 s
8	189° 23' 37"	-0.36"	188° 37' 35"	-3° 43' 14"	1.0008719	15'58.79"	23° 26' 19"	10 m 40 s
9	189° 26' 05"	-0.35"	188° 39' 51"	-3° 44' 12"	1.0008598	15'58.81"	23° 26' 19"	10 m 41 s
10	189° 28' 32"	-0.35"	188° 42' 07"	-3° 45' 10"	1.0008477	15'58.82"	23° 26' 19"	10 m 42 s
11	189° 30' 60"	-0.34"	188° 44' 23"	-3° 46' 08"	1.0008355	15'58.83"	23° 26' 19"	10 m 43 s
12	189° 33' 28"	-0.34"	188° 46' 39"	-3° 47' 06"	1.0008234	15'58.84"	23° 26' 19"	10 m 44 s
13	189° 35' 55"	-0.33"	188° 48' 55"	-3° 48' 04"	1.0008112	15'58.85"	23° 26' 19"	10 m 44 s
14	189° 38' 23"	-0.33"	188° 51' 11"	-3° 49' 02"	1.0007991	15'58.86"	23° 26' 19"	10 m 45 s
15	189° 40' 50"	-0.32"	188° 53' 27"	-3° 50' 00"	1.0007870	15'58.88"	23° 26' 19"	10 m 46 s
16	189° 43' 18"	-0.32"	188° 55' 43"	-3° 50' 58"	1.0007748	15'58.89"	23° 26' 19"	10 m 47 s
17	189° 45' 45"	-0.31"	188° 57' 59"	-3° 51' 56"	1.0007627	15'58.90"	23° 26' 19"	10 m 48 s
18	189° 48' 13"	-0.31"	189° 00' 15"	-3° 52' 54"	1.0007505	15'58.91"	23° 26' 19"	10 m 48 s
19	189° 50' 40"	-0.30"	189° 02' 31"	-3° 53' 52"	1.0007384	15'58.92"	23° 26' 19"	10 m 49 s
20	189° 53' 08"	-0.30"	189° 04' 47"	-3° 54' 50"	1.0007263	15'58.93"	23° 26' 19"	10 m 50 s
21	189° 55' 36"	-0.29"	189° 07' 03"	-3° 55' 48"	1.0007141	15'58.95"	23° 26' 19"	10 m 51 s
22	189° 58' 03"	-0.29"	189° 09' 19"	-3° 56' 46"	1.0007020	15'58.96"	23° 26' 19"	10 m 52 s
23	190° 00' 31"	-0.28"	189° 11' 35"	-3° 57' 44"	1.0006899	15'58.97"	23° 26' 19"	10 m 52 s
24	190° 02' 58"	-0.28"	189° 13' 51"	-3° 58' 42"	1.0006777	15'58.98"	23° 26' 19"	10 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	302° 12' 12"	-3° 47' 07"	305° 23' 43"	-23° 21' 14"	0° 56' 32"	15' 24.38"	255° 2' 00"	0.69708
1	302° 44' 24"	-3° 45' 03"	305° 57' 13"	-23° 11' 45"	0° 56' 34"	15' 24.96"	254° 49' 27"	0.70104
2	303° 16' 39"	-3° 42' 58"	306° 30' 41"	-23° 02' 09"	0° 56' 37"	15' 25.55"	254° 37' 01"	0.70499
3	303° 48' 56"	-3° 40' 52"	307° 04' 07"	-22° 52' 25"	0° 56' 39"	15' 26.13"	254° 24' 41"	0.70893
4	304° 21' 15"	-3° 38' 44"	307° 37' 31"	-22° 42' 33"	0° 56' 41"	15' 26.72"	254° 12' 29"	0.71287
5	304° 53' 37"	-3° 36' 35"	308° 10' 53"	-22° 32' 34"	0° 56' 43"	15' 27.31"	254° 0' 24"	0.71679
6	305° 26' 02"	-3° 34' 25"	308° 44' 12"	-22° 22' 27"	0° 56' 45"	15' 27.91"	253° 48' 26"	0.72070
7	305° 58' 29"	-3° 32' 14"	309° 17' 29"	-22° 12' 12"	0° 56' 47"	15' 28.51"	253° 36' 35"	0.72460
8	306° 30' 58"	-3° 30' 01"	309° 50' 44"	-22° 01' 49"	0° 56' 50"	15' 29.11"	253° 24' 52"	0.72849
9	307° 03' 30"	-3° 27' 47"	310° 23' 57"	-21° 51' 19"	0° 56' 52"	15' 29.71"	253° 13' 16"	0.73237
10	307° 36' 05"	-3° 25' 31"	310° 57' 08"	-21° 40' 42"	0° 56' 54"	15' 30.31"	253° 1' 48"	0.73623
11	308° 08' 42"	-3° 23' 15"	311° 30' 17"	-21° 29' 57"	0° 56' 56"	15' 30.92"	252° 50' 28"	0.74009
12	308° 41' 21"	-3° 20' 57"	312° 03' 23"	-21° 19' 05"	0° 56' 58"	15' 31.53"	252° 39' 15"	0.74393
13	309° 14' 03"	-3° 18' 37"	312° 36' 27"	-21° 08' 05"	0° 57' 01"	15' 32.14"	252° 28' 10"	0.74775
14	309° 46' 48"	-3° 16' 17"	313° 09' 29"	-20° 56' 58"	0° 57' 03"	15' 32.75"	252° 17' 13"	0.75156
15	310° 19' 35"	-3° 13' 55"	313° 42' 29"	-20° 45' 43"	0° 57' 05"	15' 33.36"	252° 6' 24"	0.75536
16	310° 52' 25"	-3° 11' 32"	314° 15' 26"	-20° 34' 22"	0° 57' 07"	15' 33.98"	251° 55' 44"	0.75915
17	311° 25' 17"	-3° 09' 08"	314° 48' 22"	-20° 22' 53"	0° 57' 10"	15' 34.60"	251° 45' 11"	0.76292
18	311° 58' 12"	-3° 06' 42"	315° 21' 15"	-20° 11' 17"	0° 57' 12"	15' 35.22"	251° 34' 47"	0.76667
19	312° 31' 09"	-3° 04' 15"	315° 54' 06"	-19° 59' 34"	0° 57' 14"	15' 35.84"	251° 24' 31"	0.77041
20	313° 04' 10"	-3° 01' 47"	316° 26' 55"	-19° 47' 44"	0° 57' 17"	15' 36.46"	251° 14' 24"	0.77414
21	313° 37' 12"	-2° 59' 18"	316° 59' 42"	-19° 35' 47"	0° 57' 19"	15' 37.09"	251° 4' 25"	0.77784
22	314° 10' 18"	-2° 56' 48"	317° 32' 26"	-19° 23' 44"	0° 57' 21"	15' 37.71"	250° 54' 35"	0.78153
23	314° 43' 26"	-2° 54' 16"	318° 05' 09"	-19° 11' 33"	0° 57' 23"	15' 38.34"	250° 44' 54"	0.78521
24	315° 16' 37"	-2° 51' 44"	318° 37' 50"	-18° 59' 15"	0° 57' 26"	15' 38.97"	250° 35' 21"	0.78887

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	190° 02' 58"	-0.28"	189° 13' 51"	-3° 58' 42"	1.0006777	15'58.98"	23° 26' 19"	10 m 53 s
1	190° 05' 26"	-0.27"	189° 16' 07"	-3° 59' 40"	1.0006656	15'58.99"	23° 26' 19"	10 m 54 s
2	190° 07' 53"	-0.27"	189° 18' 23"	-4° 00' 38"	1.0006535	15'59.00"	23° 26' 19"	10 m 55 s
3	190° 10' 21"	-0.26"	189° 20' 39"	-4° 01' 36"	1.0006413	15'59.01"	23° 26' 19"	10 m 55 s
4	190° 12' 49"	-0.26"	189° 22' 55"	-4° 02' 34"	1.0006292	15'59.03"	23° 26' 19"	10 m 56 s
5	190° 15' 16"	-0.25"	189° 25' 11"	-4° 03' 31"	1.0006171	15'59.04"	23° 26' 19"	10 m 57 s
6	190° 17' 44"	-0.25"	189° 27' 27"	-4° 04' 29"	1.0006050	15'59.05"	23° 26' 19"	10 m 58 s
7	190° 20' 11"	-0.24"	189° 29' 44"	-4° 05' 27"	1.0005928	15'59.06"	23° 26' 19"	10 m 59 s
8	190° 22' 39"	-0.23"	189° 31' 60"	-4° 06' 25"	1.0005807	15'59.07"	23° 26' 19"	10 m 59 s
9	190° 25' 07"	-0.23"	189° 34' 16"	-4° 07' 23"	1.0005686	15'59.08"	23° 26' 19"	11 m 00 s
10	190° 27' 34"	-0.22"	189° 36' 32"	-4° 08' 21"	1.0005565	15'59.10"	23° 26' 19"	11 m 01 s
11	190° 30' 02"	-0.22"	189° 38' 48"	-4° 09' 19"	1.0005443	15'59.11"	23° 26' 19"	11 m 02 s
12	190° 32' 30"	-0.21"	189° 41' 04"	-4° 10' 17"	1.0005322	15'59.12"	23° 26' 19"	11 m 03 s
13	190° 34' 57"	-0.21"	189° 43' 20"	-4° 11' 15"	1.0005201	15'59.13"	23° 26' 19"	11 m 03 s
14	190° 37' 25"	-0.20"	189° 45' 37"	-4° 12' 12"	1.0005080	15'59.14"	23° 26' 19"	11 m 04 s
15	190° 39' 52"	-0.20"	189° 47' 53"	-4° 13' 10"	1.0004959	15'59.15"	23° 26' 19"	11 m 05 s
16	190° 42' 20"	-0.19"	189° 50' 09"	-4° 14' 08"	1.0004838	15'59.17"	23° 26' 19"	11 m 06 s
17	190° 44' 48"	-0.19"	189° 52' 25"	-4° 15' 06"	1.0004716	15'59.18"	23° 26' 19"	11 m 06 s
18	190° 47' 15"	-0.18"	189° 54' 41"	-4° 16' 04"	1.0004595	15'59.19"	23° 26' 19"	11 m 07 s
19	190° 49' 43"	-0.17"	189° 56' 58"	-4° 17' 02"	1.0004474	15'59.20"	23° 26' 19"	11 m 08 s
20	190° 52' 11"	-0.17"	189° 59' 14"	-4° 17' 60"	1.0004353	15'59.21"	23° 26' 19"	11 m 09 s
21	190° 54' 38"	-0.16"	190° 01' 30"	-4° 18' 57"	1.0004232	15'59.22"	23° 26' 19"	11 m 10 s
22	190° 57' 06"	-0.16"	190° 03' 46"	-4° 19' 55"	1.0004111	15'59.24"	23° 26' 19"	11 m 10 s
23	190° 59' 34"	-0.15"	190° 06' 03"	-4° 20' 53"	1.0003990	15'59.25"	23° 26' 19"	11 m 11 s
24	191° 02' 01"	-0.15"	190° 08' 19"	-4° 21' 51"	1.0003869	15'59.26"	23° 26' 19"	11 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	315° 16' 37"	-2° 51' 44"	318° 37' 50"	-18° 59' 15"	0° 57' 26"	15' 38.97"	250° 35' 21"	0.78887
1	315° 49' 50"	-2° 49' 10"	319° 10' 28"	-18° 46' 51"	0° 57' 28"	15' 39.60"	250° 25' 58"	0.79250
2	316° 23' 06"	-2° 46' 35"	319° 43' 04"	-18° 34' 20"	0° 57' 30"	15' 40.23"	250° 16' 44"	0.79613
3	316° 56' 25"	-2° 43' 58"	320° 15' 39"	-18° 21' 42"	0° 57' 33"	15' 40.86"	250° 7' 39"	0.79973
4	317° 29' 46"	-2° 41' 21"	320° 48' 11"	-18° 08' 58"	0° 57' 35"	15' 41.49"	249° 58' 43"	0.80331
5	318° 03' 11"	-2° 38' 42"	321° 20' 41"	-17° 56' 07"	0° 57' 37"	15' 42.13"	249° 49' 56"	0.80688
6	318° 36' 38"	-2° 36' 03"	321° 53' 10"	-17° 43' 10"	0° 57' 40"	15' 42.76"	249° 41' 19"	0.81042
7	319° 10' 07"	-2° 33' 22"	322° 25' 36"	-17° 30' 06"	0° 57' 42"	15' 43.40"	249° 32' 52"	0.81395
8	319° 43' 39"	-2° 30' 40"	322° 58' 01"	-17° 16' 56"	0° 57' 44"	15' 44.03"	249° 24' 34"	0.81745
9	320° 17' 15"	-2° 27' 57"	323° 30' 23"	-17° 03' 39"	0° 57' 47"	15' 44.67"	249° 16' 26"	0.82094
10	320° 50' 52"	-2° 25' 13"	324° 02' 44"	-16° 50' 16"	0° 57' 49"	15' 45.30"	249° 8' 28"	0.82440
11	321° 24' 33"	-2° 22' 28"	324° 35' 03"	-16° 36' 47"	0° 57' 51"	15' 45.94"	249° 0' 40"	0.82784
12	321° 58' 16"	-2° 19' 42"	325° 07' 20"	-16° 23' 12"	0° 57' 54"	15' 46.58"	248° 53' 02"	0.83126
13	322° 32' 02"	-2° 16' 55"	325° 39' 36"	-16° 09' 31"	0° 57' 56"	15' 47.21"	248° 45' 34"	0.83466
14	323° 05' 51"	-2° 14' 07"	326° 11' 49"	-15° 55' 44"	0° 57' 58"	15' 47.85"	248° 38' 17"	0.83803
15	323° 39' 43"	-2° 11' 18"	326° 44' 01"	-15° 41' 51"	0° 58' 01"	15' 48.49"	248° 31' 11"	0.84139
16	324° 13' 37"	-2° 08' 28"	327° 16' 12"	-15° 27' 52"	0° 58' 03"	15' 49.13"	248° 24' 14"	0.84471
17	324° 47' 34"	-2° 05' 37"	327° 48' 21"	-15° 13' 47"	0° 58' 05"	15' 49.76"	248° 17' 29"	0.84802
18	325° 21' 34"	-2° 02' 44"	328° 20' 28"	-14° 59' 36"	0° 58' 08"	15' 50.40"	248° 10' 55"	0.85130
19	325° 55' 36"	-1° 59' 51"	328° 52' 33"	-14° 45' 20"	0° 58' 10"	15' 51.03"	248° 4' 32"	0.85455
20	326° 29' 42"	-1° 56' 57"	329° 24' 37"	-14° 30' 58"	0° 58' 12"	15' 51.67"	247° 58' 20"	0.85778
21	327° 03' 50"	-1° 54' 02"	329° 56' 40"	-14° 16' 30"	0° 58' 15"	15' 52.30"	247° 52' 19"	0.86098
22	327° 38' 01"	-1° 51' 07"	330° 28' 41"	-14° 01' 57"	0° 58' 17"	15' 52.94"	247° 46' 30"	0.86416
23	328° 12' 14"	-1° 48' 10"	331° 00' 41"	-13° 47' 19"	0° 58' 19"	15' 53.57"	247° 40' 52"	0.86731
24	328° 46' 31"	-1° 45' 12"	331° 32' 40"	-13° 32' 35"	0° 58' 22"	15' 54.20"	247° 35' 27"	0.87044

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	191° 02' 01"	-0.15"	190° 08' 19"	-4° 21' 51"	1.0003869	15'59.26"	23° 26' 19"	11 m 12 s
1	191° 04' 29"	-0.14"	190° 10' 35"	-4° 22' 49"	1.0003748	15'59.27"	23° 26' 19"	11 m 13 s
2	191° 06' 57"	-0.14"	190° 12' 51"	-4° 23' 46"	1.0003627	15'59.28"	23° 26' 19"	11 m 13 s
3	191° 09' 24"	-0.13"	190° 15' 08"	-4° 24' 44"	1.0003506	15'59.29"	23° 26' 19"	11 m 14 s
4	191° 11' 52"	-0.13"	190° 17' 24"	-4° 25' 42"	1.0003385	15'59.31"	23° 26' 19"	11 m 15 s
5	191° 14' 20"	-0.12"	190° 19' 40"	-4° 26' 40"	1.0003264	15'59.32"	23° 26' 19"	11 m 16 s
6	191° 16' 47"	-0.11"	190° 21' 57"	-4° 27' 38"	1.0003143	15'59.33"	23° 26' 19"	11 m 17 s
7	191° 19' 15"	-0.11"	190° 24' 13"	-4° 28' 35"	1.0003022	15'59.34"	23° 26' 19"	11 m 17 s
8	191° 21' 43"	-0.10"	190° 26' 29"	-4° 29' 33"	1.0002901	15'59.35"	23° 26' 19"	11 m 18 s
9	191° 24' 10"	-0.10"	190° 28' 46"	-4° 30' 31"	1.0002780	15'59.36"	23° 26' 19"	11 m 19 s
10	191° 26' 38"	-0.09"	190° 31' 02"	-4° 31' 29"	1.0002659	15'59.37"	23° 26' 19"	11 m 20 s
11	191° 29' 06"	-0.09"	190° 33' 18"	-4° 32' 26"	1.0002539	15'59.39"	23° 26' 19"	11 m 20 s
12	191° 31' 33"	-0.08"	190° 35' 35"	-4° 33' 24"	1.0002418	15'59.40"	23° 26' 19"	11 m 21 s
13	191° 34' 01"	-0.07"	190° 37' 51"	-4° 34' 22"	1.0002297	15'59.41"	23° 26' 19"	11 m 22 s
14	191° 36' 29"	-0.07"	190° 40' 07"	-4° 35' 20"	1.0002176	15'59.42"	23° 26' 19"	11 m 23 s
15	191° 38' 56"	-0.06"	190° 42' 24"	-4° 36' 17"	1.0002055	15'59.43"	23° 26' 19"	11 m 23 s
16	191° 41' 24"	-0.06"	190° 44' 40"	-4° 37' 15"	1.0001934	15'59.44"	23° 26' 19"	11 m 24 s
17	191° 43' 52"	-0.05"	190° 46' 57"	-4° 38' 13"	1.0001814	15'59.46"	23° 26' 19"	11 m 25 s
18	191° 46' 20"	-0.05"	190° 49' 13"	-4° 39' 11"	1.0001693	15'59.47"	23° 26' 19"	11 m 26 s
19	191° 48' 47"	-0.04"	190° 51' 29"	-4° 40' 08"	1.0001572	15'59.48"	23° 26' 19"	11 m 26 s
20	191° 51' 15"	-0.04"	190° 53' 46"	-4° 41' 06"	1.0001452	15'59.49"	23° 26' 19"	11 m 27 s
21	191° 53' 43"	-0.03"	190° 56' 02"	-4° 42' 04"	1.0001331	15'59.50"	23° 26' 19"	11 m 28 s
22	191° 56' 10"	-0.02"	190° 58' 19"	-4° 43' 01"	1.0001210	15'59.51"	23° 26' 19"	11 m 29 s
23	191° 58' 38"	-0.02"	191° 00' 35"	-4° 43' 59"	1.0001090	15'59.53"	23° 26' 19"	11 m 30 s
24	192° 01' 06"	-0.01"	191° 02' 52"	-4° 44' 57"	1.0000969	15'59.54"	23° 26' 19"	11 m 30 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	328° 46' 31"	-1° 45' 12"	331° 32' 40"	-13° 32' 35"	0° 58' 22"	15' 54.20"	247° 35' 27"	0.87044
1	329° 20' 50"	-1° 42' 14"	332° 04' 37"	-13° 17' 46"	0° 58' 24"	15' 54.84"	247° 30' 13"	0.87353
2	329° 55' 12"	-1° 39' 14"	332° 36' 33"	-13° 02' 52"	0° 58' 26"	15' 55.47"	247° 25' 12"	0.87660
3	330° 29' 37"	-1° 36' 14"	333° 08' 28"	-12° 47' 52"	0° 58' 29"	15' 56.10"	247° 20' 23"	0.87965
4	331° 04' 04"	-1° 33' 13"	333° 40' 22"	-12° 32' 48"	0° 58' 31"	15' 56.72"	247° 15' 47"	0.88266
5	331° 38' 35"	-1° 30' 11"	334° 12' 14"	-12° 17' 38"	0° 58' 33"	15' 57.35"	247° 11' 24"	0.88564
6	332° 13' 08"	-1° 27' 09"	334° 44' 06"	-12° 02' 24"	0° 58' 36"	15' 57.98"	247° 7' 13"	0.88860
7	332° 47' 44"	-1° 24' 05"	335° 15' 57"	-11° 47' 04"	0° 58' 38"	15' 58.60"	247° 3' 16"	0.89152
8	333° 22' 22"	-1° 21' 01"	335° 47' 46"	-11° 31' 40"	0° 58' 40"	15' 59.22"	246° 59' 33"	0.89442
9	333° 57' 04"	-1° 17' 56"	336° 19' 35"	-11° 16' 11"	0° 58' 42"	15' 59.84"	246° 56' 03"	0.89728
10	334° 31' 48"	-1° 14' 51"	336° 51' 23"	-11° 00' 38"	0° 58' 45"	16' 00.46"	246° 52' 48"	0.90011
11	335° 06' 35"	-1° 11' 44"	337° 23' 10"	-10° 44' 59"	0° 58' 47"	16' 01.07"	246° 49' 46"	0.90292
12	335° 41' 24"	-1° 08' 37"	337° 54' 57"	-10° 29' 17"	0° 58' 49"	16' 01.69"	246° 46' 60"	0.90569
13	336° 16' 17"	-1° 05' 30"	338° 26' 42"	-10° 13' 30"	0° 58' 51"	16' 02.30"	246° 44' 28"	0.90842
14	336° 51' 12"	-1° 02' 22"	338° 58' 28"	-9° 57' 38"	0° 58' 54"	16' 02.91"	246° 42' 12"	0.91113
15	337° 26' 10"	0°-59' 13"	339° 30' 12"	-9° 41' 43"	0° 58' 56"	16' 03.52"	246° 40' 11"	0.91380
16	338° 01' 10"	0°-56' 03"	340° 01' 56"	-9° 25' 43"	0° 58' 58"	16' 04.12"	246° 38' 27"	0.91644
17	338° 36' 13"	0°-52' 53"	340° 33' 40"	-9° 09' 39"	0° 59' 00"	16' 04.72"	246° 36' 59"	0.91904
18	339° 11' 19"	0°-49' 42"	341° 05' 23"	-8° 53' 31"	0° 59' 02"	16' 05.32"	246° 35' 48"	0.92161
19	339° 46' 28"	0°-46' 31"	341° 37' 06"	-8° 37' 19"	0° 59' 05"	16' 05.92"	246° 34' 54"	0.92415
20	340° 21' 39"	0°-43' 19"	342° 08' 49"	-8° 21' 04"	0° 59' 07"	16' 06.51"	246° 34' 18"	0.92665
21	340° 56' 53"	0°-40' 07"	342° 40' 32"	-8° 04' 44"	0° 59' 09"	16' 07.10"	246° 33' 60"	0.92912
22	341° 32' 10"	0°-36' 57"	343° 12' 15"	-7° 48' 23"	0° 59' 11"	16' 07.69"	246° 33' 57"	0.93154
23	342° 07' 30"	0°-33' 43"	343° 43' 58"	-7° 31' 56"	0° 59' 13"	16' 08.27"	246° 34' 17"	0.93394
24	342° 42' 51"	0°-30' 30"	344° 15' 40"	-7° 15' 26"	0° 59' 15"	16' 08.85"	246° 34' 58"	0.93629

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	192° 01' 06"	-0.01"	191° 02' 52"	-4° 44' 57"	1.0000969	15'59.54"	23° 26' 19"	11 m 30 s
1	192° 03' 34"	-0.01"	191° 05' 08"	-4° 45' 54"	1.0000848	15'59.55"	23° 26' 19"	11 m 31 s
2	192° 06' 01"	-0.00"	191° 07' 25"	-4° 46' 52"	1.0000728	15'59.56"	23° 26' 19"	11 m 32 s
3	192° 08' 29"	0.00"	191° 09' 41"	-4° 47' 50"	1.0000607	15'59.57"	23° 26' 19"	11 m 33 s
4	192° 10' 57"	0.01"	191° 11' 58"	-4° 48' 47"	1.0000487	15'59.58"	23° 26' 19"	11 m 33 s
5	192° 13' 25"	0.02"	191° 14' 14"	-4° 49' 45"	1.0000366	15'59.59"	23° 26' 19"	11 m 34 s
6	192° 15' 52"	0.02"	191° 16' 31"	-4° 50' 43"	1.0000246	15'59.61"	23° 26' 19"	11 m 35 s
7	192° 18' 20"	0.03"	191° 18' 47"	-4° 51' 40"	1.0000125	15'59.62"	23° 26' 19"	11 m 36 s
8	192° 20' 48"	0.03"	191° 21' 04"	-4° 52' 38"	1.0000005	15'59.63"	23° 26' 19"	11 m 36 s
9	192° 23' 16"	0.04"	191° 23' 20"	-4° 53' 35"	0.9999884	15'59.64"	23° 26' 19"	11 m 37 s
10	192° 25' 43"	0.04"	191° 25' 37"	-4° 54' 33"	0.9999764	15'59.65"	23° 26' 19"	11 m 38 s
11	192° 28' 11"	0.05"	191° 27' 54"	-4° 55' 31"	0.9999644	15'59.66"	23° 26' 19"	11 m 39 s
12	192° 30' 39"	0.06"	191° 30' 10"	-4° 56' 28"	0.9999523	15'59.68"	23° 26' 19"	11 m 39 s
13	192° 33' 07"	0.06"	191° 32' 27"	-4° 57' 26"	0.9999403	15'59.69"	23° 26' 19"	11 m 40 s
14	192° 35' 35"	0.07"	191° 34' 43"	-4° 58' 23"	0.9999283	15'59.70"	23° 26' 19"	11 m 41 s
15	192° 38' 02"	0.07"	191° 36' 60"	-4° 59' 21"	0.9999162	15'59.71"	23° 26' 19"	11 m 42 s
16	192° 40' 30"	0.08"	191° 39' 17"	-5° 00' 19"	0.9999042	15'59.72"	23° 26' 19"	11 m 42 s
17	192° 42' 58"	0.08"	191° 41' 33"	-5° 01' 16"	0.9998922	15'59.73"	23° 26' 19"	11 m 43 s
18	192° 45' 26"	0.09"	191° 43' 50"	-5° 02' 14"	0.9998802	15'59.75"	23° 26' 19"	11 m 44 s
19	192° 47' 54"	0.09"	191° 46' 07"	-5° 03' 11"	0.9998681	15'59.76"	23° 26' 19"	11 m 45 s
20	192° 50' 21"	0.10"	191° 48' 23"	-5° 04' 09"	0.9998561	15'59.77"	23° 26' 19"	11 m 45 s
21	192° 52' 49"	0.11"	191° 50' 40"	-5° 05' 06"	0.9998441	15'59.78"	23° 26' 19"	11 m 46 s
22	192° 55' 17"	0.11"	191° 52' 57"	-5° 06' 04"	0.9998321	15'59.79"	23° 26' 19"	11 m 47 s
23	192° 57' 45"	0.12"	191° 55' 13"	-5° 07' 01"	0.9998201	15'59.80"	23° 26' 19"	11 m 48 s
24	193° 00' 13"	0.12"	191° 57' 30"	-5° 07' 59"	0.9998081	15'59.81"	23° 26' 19"	11 m 48 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	342° 42' 51"	0°-30' 30"	344° 15' 40"	-7° 15' 26"	0° 59' 15"	16' 08.85"	246° 34' 58"	0.93629
1	343° 18' 16"	0°-27' 16"	344° 47' 23"	-6° 58' 52"	0° 59' 18"	16' 09.43"	246° 35' 59"	0.93861
2	343° 53' 43"	0°-24' 01"	345° 19' 05"	-6° 42' 15"	0° 59' 20"	16' 10.00"	246° 37' 22"	0.94089
3	344° 29' 13"	0°-20' 46"	345° 50' 48"	-6° 25' 35"	0° 59' 22"	16' 10.57"	246° 39' 07"	0.94314
4	345° 04' 46"	0°-17' 31"	346° 22' 31"	-6° 08' 51"	0° 59' 24"	16' 11.14"	246° 41' 16"	0.94534
5	345° 40' 21"	0°-14' 15"	346° 54' 15"	-5° 52' 05"	0° 59' 26"	16' 11.70"	246° 43' 48"	0.94751
6	346° 15' 58"	0°-10' 59"	347° 25' 58"	-5° 35' 15"	0° 59' 28"	16' 12.26"	246° 46' 46"	0.94964
7	346° 51' 38"	0° -7' 43"	347° 57' 43"	-5° 18' 23"	0° 59' 30"	16' 12.81"	246° 50' 10"	0.95172
8	347° 27' 21"	0° -4' 27"	348° 29' 27"	-5° 01' 27"	0° 59' 32"	16' 13.36"	246° 54' 01"	0.95377
9	348° 03' 06"	0° -1' 10"	349° 01' 13"	-4° 44' 29"	0° 59' 34"	16' 13.90"	246° 58' 21"	0.95578
10	348° 38' 54"	0° 02' 07"	349° 32' 59"	-4° 27' 28"	0° 59' 36"	16' 14.45"	247° 3' 11"	0.95775
11	349° 14' 44"	0° 05' 24"	350° 04' 46"	-4° 10' 25"	0° 59' 38"	16' 14.98"	247° 8' 33"	0.95968
12	349° 50' 37"	0° 08' 42"	350° 36' 33"	-3° 53' 19"	0° 59' 40"	16' 15.51"	247° 14' 28"	0.96156
13	350° 26' 32"	0° 11' 59"	351° 08' 22"	-3° 36' 11"	0° 59' 42"	16' 16.04"	247° 20' 58"	0.96340
14	351° 02' 30"	0° 15' 17"	351° 40' 11"	-3° 19' 01"	0° 59' 44"	16' 16.56"	247° 28' 06"	0.96521
15	351° 38' 30"	0° 18' 35"	352° 12' 02"	-3° 01' 49"	0° 59' 46"	16' 17.08"	247° 35' 53"	0.96697
16	352° 14' 32"	0° 21' 52"	352° 43' 53"	-2° 44' 34"	0° 59' 48"	16' 17.59"	247° 44' 22"	0.96868
17	352° 50' 37"	0° 25' 10"	353° 15' 46"	-2° 27' 18"	0° 59' 49"	16' 18.10"	247° 53' 37"	0.97036
18	353° 26' 44"	0° 28' 28"	353° 47' 40"	-2° 09' 59"	0° 59' 51"	16' 18.60"	248° 3' 39"	0.97199
19	354° 02' 54"	0° 31' 46"	354° 19' 36"	-1° 52' 39"	0° 59' 53"	16' 19.10"	248° 14' 33"	0.97357
20	354° 39' 06"	0° 35' 04"	354° 51' 32"	-1° 35' 17"	0° 59' 55"	16' 19.59"	248° 26' 23"	0.97512
21	355° 15' 20"	0° 38' 22"	355° 23' 30"	-1° 17' 54"	0° 59' 57"	16' 20.07"	248° 39' 13"	0.97661
22	355° 51' 36"	0° 41' 40"	355° 55' 30"	-1° 00' 29"	0° 59' 58"	16' 20.55"	248° 53' 08"	0.97807
23	356° 27' 55"	0° 44' 58"	356° 27' 31"	0°-43' 03"	1° 00' 00"	16' 21.03"	249° 8' 14"	0.97948
24	357° 04' 16"	0° 48' 15"	356° 59' 34"	0°-25' 35"	1° 00' 02"	16' 21.50"	249° 24' 38"	0.98084

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	193° 00' 13"	0.12"	191° 57' 30"	-5° 07' 59"	0.9998081	15'59.81"	23° 26' 19"	11 m 48 s
1	193° 02' 40"	0.13"	191° 59' 47"	-5° 08' 56"	0.9997961	15'59.83"	23° 26' 19"	11 m 49 s
2	193° 05' 08"	0.13"	192° 02' 03"	-5° 09' 54"	0.9997841	15'59.84"	23° 26' 19"	11 m 50 s
3	193° 07' 36"	0.14"	192° 04' 20"	-5° 10' 51"	0.9997721	15'59.85"	23° 26' 19"	11 m 51 s
4	193° 10' 04"	0.14"	192° 06' 37"	-5° 11' 49"	0.9997601	15'59.86"	23° 26' 19"	11 m 51 s
5	193° 12' 32"	0.15"	192° 08' 54"	-5° 12' 46"	0.9997481	15'59.87"	23° 26' 19"	11 m 52 s
6	193° 14' 60"	0.15"	192° 11' 10"	-5° 13' 44"	0.9997361	15'59.88"	23° 26' 19"	11 m 53 s
7	193° 17' 27"	0.16"	192° 13' 27"	-5° 14' 41"	0.9997241	15'59.89"	23° 26' 19"	11 m 54 s
8	193° 19' 55"	0.16"	192° 15' 44"	-5° 15' 39"	0.9997121	15'59.91"	23° 26' 19"	11 m 54 s
9	193° 22' 23"	0.17"	192° 18' 01"	-5° 16' 36"	0.9997001	15'59.92"	23° 26' 19"	11 m 55 s
10	193° 24' 51"	0.18"	192° 20' 18"	-5° 17' 34"	0.9996881	15'59.93"	23° 26' 19"	11 m 56 s
11	193° 27' 19"	0.18"	192° 22' 34"	-5° 18' 31"	0.9996761	15'59.94"	23° 26' 19"	11 m 56 s
12	193° 29' 47"	0.19"	192° 24' 51"	-5° 19' 29"	0.9996642	15'59.95"	23° 26' 19"	11 m 57 s
13	193° 32' 14"	0.19"	192° 27' 08"	-5° 20' 26"	0.9996522	15'59.96"	23° 26' 19"	11 m 58 s
14	193° 34' 42"	0.20"	192° 29' 25"	-5° 21' 23"	0.9996402	15'59.98"	23° 26' 19"	11 m 59 s
15	193° 37' 10"	0.20"	192° 31' 42"	-5° 22' 21"	0.9996282	15'59.99"	23° 26' 19"	11 m 59 s
16	193° 39' 38"	0.21"	192° 33' 59"	-5° 23' 18"	0.9996163	15'60.00"	23° 26' 19"	12 m 00 s
17	193° 42' 06"	0.21"	192° 36' 15"	-5° 24' 16"	0.9996043	16'00.01"	23° 26' 19"	12 m 01 s
18	193° 44' 34"	0.22"	192° 38' 32"	-5° 25' 13"	0.9995923	16'00.02"	23° 26' 19"	12 m 02 s
19	193° 47' 02"	0.22"	192° 40' 49"	-5° 26' 10"	0.9995804	16'00.03"	23° 26' 19"	12 m 02 s
20	193° 49' 30"	0.23"	192° 43' 06"	-5° 27' 08"	0.9995684	16'00.04"	23° 26' 19"	12 m 03 s
21	193° 51' 57"	0.23"	192° 45' 23"	-5° 28' 05"	0.9995565	16'00.06"	23° 26' 19"	12 m 04 s
22	193° 54' 25"	0.24"	192° 47' 40"	-5° 29' 02"	0.9995445	16'00.07"	23° 26' 19"	12 m 05 s
23	193° 56' 53"	0.24"	192° 49' 57"	-5° 29' 60"	0.9995326	16'00.08"	23° 26' 19"	12 m 05 s
24	193° 59' 21"	0.25"	192° 52' 14"	-5° 30' 57"	0.9995206	16'00.09"	23° 26' 19"	12 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	357° 04' 16"	0° 48' 15"	356° 59' 34"	0°-25' 35"	1° 00' 02"	16' 21.50"	249° 24' 38"	0.98084
1	357° 40' 39"	0° 51' 33"	357° 31' 39"	0° -8' 07"	1° 00' 04"	16' 21.96"	249° 42' 26"	0.98216
2	358° 17' 05"	0° 54' 50"	358° 03' 46"	0° 09' 23"	1° 00' 05"	16' 22.42"	250° 1' 48"	0.98343
3	358° 53' 32"	0° 58' 07"	358° 35' 54"	0° 26' 53"	1° 00' 07"	16' 22.87"	250° 22' 53"	0.98466
4	359° 30' 02"	1° 01' 24"	359° 08' 05"	0° 44' 25"	1° 00' 09"	16' 23.31"	250° 45' 54"	0.98583
5	0° 06' 34"	1° 04' 41"	359° 40' 17"	1° 01' 57"	1° 00' 10"	16' 23.75"	251° 11' 03"	0.98697
6	0° 43' 07"	1° 07' 57"	0° 12' 32"	1° 19' 30"	1° 00' 12"	16' 24.18"	251° 38' 37"	0.98805
7	1° 19' 43"	1° 11' 13"	0° 44' 49"	1° 37' 03"	1° 00' 13"	16' 24.61"	252° 8' 55"	0.98909
8	1° 56' 21"	1° 14' 29"	1° 17' 08"	1° 54' 37"	1° 00' 15"	16' 25.03"	252° 42' 19"	0.99008
9	2° 33' 01"	1° 17' 45"	1° 49' 30"	2° 12' 11"	1° 00' 16"	16' 25.44"	253° 19' 16"	0.99103
10	3° 09' 43"	1° 20' 60"	2° 21' 54"	2° 29' 45"	1° 00' 18"	16' 25.85"	254° 0' 19"	0.99192
11	3° 46' 27"	1° 24' 14"	2° 54' 20"	2° 47' 20"	1° 00' 19"	16' 26.25"	254° 46' 09"	0.99277
12	4° 23' 13"	1° 27' 28"	3° 26' 49"	3° 04' 54"	1° 00' 21"	16' 26.64"	255° 37' 36"	0.99357
13	5° 00' 01"	1° 30' 42"	3° 59' 21"	3° 22' 28"	1° 00' 22"	16' 27.03"	256° 35' 40"	0.99432
14	5° 36' 50"	1° 33' 55"	4° 31' 55"	3° 40' 02"	1° 00' 24"	16' 27.40"	257° 41' 41"	0.99502
15	6° 13' 42"	1° 37' 08"	5° 04' 33"	3° 57' 36"	1° 00' 25"	16' 27.78"	258° 57' 18"	0.99567
16	6° 50' 35"	1° 40' 21"	5° 37' 13"	4° 15' 09"	1° 00' 26"	16' 28.14"	260° 24' 42"	0.99627
17	7° 27' 30"	1° 43' 32"	6° 09' 56"	4° 32' 41"	1° 00' 28"	16' 28.50"	262° 6' 43"	0.99683
18	8° 04' 27"	1° 46' 43"	6° 42' 42"	4° 50' 13"	1° 00' 29"	16' 28.85"	264° 7' 07"	0.99733
19	8° 41' 25"	1° 49' 54"	7° 15' 31"	5° 07' 43"	1° 00' 30"	16' 29.19"	266° 31' 03"	0.99778
20	9° 18' 25"	1° 53' 04"	7° 48' 24"	5° 25' 13"	1° 00' 31"	16' 29.53"	269° 25' 34"	0.99819
21	9° 55' 27"	1° 56' 13"	8° 21' 19"	5° 42' 42"	1° 00' 33"	16' 29.86"	273° 0' 26"	0.99854
22	10° 32' 31"	1° 59' 21"	8° 54' 18"	6° 00' 10"	1° 00' 34"	16' 30.18"	277° 29' 16"	0.99884
23	11° 09' 36"	2° 02' 29"	9° 27' 21"	6° 17' 36"	1° 00' 35"	16' 30.49"	283° 10' 50"	0.99910
24	11° 46' 42"	2° 05' 36"	10° 00' 27"	6° 35' 01"	1° 00' 36"	16' 30.80"	290° 29' 26"	0.99930

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	193° 59' 21"	0.25"	192° 52' 14"	-5° 30' 57"	0.9995206	16'00.09"	23° 26' 19"	12 m 06 s
1	194° 01' 49"	0.25"	192° 54' 31"	-5° 31' 54"	0.9995087	16'00.10"	23° 26' 19"	12 m 07 s
2	194° 04' 17"	0.26"	192° 56' 48"	-5° 32' 52"	0.9994967	16'00.11"	23° 26' 19"	12 m 07 s
3	194° 06' 45"	0.26"	192° 59' 05"	-5° 33' 49"	0.9994848	16'00.12"	23° 26' 19"	12 m 08 s
4	194° 09' 13"	0.27"	193° 01' 22"	-5° 34' 46"	0.9994729	16'00.14"	23° 26' 19"	12 m 09 s
5	194° 11' 41"	0.27"	193° 03' 39"	-5° 35' 44"	0.9994609	16'00.15"	23° 26' 19"	12 m 10 s
6	194° 14' 09"	0.28"	193° 05' 56"	-5° 36' 41"	0.9994490	16'00.16"	23° 26' 19"	12 m 10 s
7	194° 16' 37"	0.28"	193° 08' 13"	-5° 37' 38"	0.9994371	16'00.17"	23° 26' 19"	12 m 11 s
8	194° 19' 04"	0.29"	193° 10' 30"	-5° 38' 36"	0.9994252	16'00.18"	23° 26' 19"	12 m 12 s
9	194° 21' 32"	0.29"	193° 12' 47"	-5° 39' 33"	0.9994132	16'00.19"	23° 26' 19"	12 m 13 s
10	194° 24' 00"	0.30"	193° 15' 04"	-5° 40' 30"	0.9994013	16'00.20"	23° 26' 19"	12 m 13 s
11	194° 26' 28"	0.30"	193° 17' 21"	-5° 41' 27"	0.9993894	16'00.22"	23° 26' 19"	12 m 14 s
12	194° 28' 56"	0.31"	193° 19' 38"	-5° 42' 25"	0.9993775	16'00.23"	23° 26' 19"	12 m 15 s
13	194° 31' 24"	0.31"	193° 21' 55"	-5° 43' 22"	0.9993656	16'00.24"	23° 26' 19"	12 m 15 s
14	194° 33' 52"	0.32"	193° 24' 12"	-5° 44' 19"	0.9993537	16'00.25"	23° 26' 19"	12 m 16 s
15	194° 36' 20"	0.32"	193° 26' 30"	-5° 45' 16"	0.9993418	16'00.26"	23° 26' 19"	12 m 17 s
16	194° 38' 48"	0.32"	193° 28' 47"	-5° 46' 14"	0.9993299	16'00.27"	23° 26' 19"	12 m 18 s
17	194° 41' 16"	0.33"	193° 31' 04"	-5° 47' 11"	0.9993180	16'00.28"	23° 26' 19"	12 m 18 s
18	194° 43' 44"	0.33"	193° 33' 21"	-5° 48' 08"	0.9993061	16'00.30"	23° 26' 19"	12 m 19 s
19	194° 46' 12"	0.34"	193° 35' 38"	-5° 49' 05"	0.9992942	16'00.31"	23° 26' 19"	12 m 20 s
20	194° 48' 40"	0.34"	193° 37' 55"	-5° 50' 03"	0.9992823	16'00.32"	23° 26' 19"	12 m 20 s
21	194° 51' 08"	0.35"	193° 40' 12"	-5° 50' 60"	0.9992704	16'00.33"	23° 26' 19"	12 m 21 s
22	194° 53' 36"	0.35"	193° 42' 30"	-5° 51' 57"	0.9992585	16'00.34"	23° 26' 19"	12 m 22 s
23	194° 56' 04"	0.36"	193° 44' 47"	-5° 52' 54"	0.9992466	16'00.35"	23° 26' 19"	12 m 23 s
24	194° 58' 32"	0.36"	193° 47' 04"	-5° 53' 51"	0.9992347	16'00.36"	23° 26' 19"	12 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	11° 46' 42"	2° 05' 36"	10° 00' 27"	6° 35' 01"	1° 00' 36"	16' 30.80"	290° 29' 26"	0.99930
1	12° 23' 50"	2° 08' 42"	10° 33' 36"	6° 52' 24"	1° 00' 37"	16' 31.09"	299° 52' 03"	0.99945
2	13° 00' 60"	2° 11' 48"	11° 06' 49"	7° 09' 46"	1° 00' 38"	16' 31.38"	311° 35' 57"	0.99955
3	13° 38' 11"	2° 14' 52"	11° 40' 06"	7° 27' 06"	1° 00' 39"	16' 31.67"	325° 22' 39"	0.99960
4	14° 15' 23"	2° 17' 56"	12° 13' 27"	7° 44' 24"	1° 00' 40"	16' 31.94"	339° 57' 27"	0.99960
5	14° 52' 37"	2° 20' 59"	12° 46' 51"	8° 01' 40"	1° 00' 41"	16' 32.21"	353° 36' 52"	0.99955
6	15° 29' 52"	2° 24' 01"	13° 20' 19"	8° 18' 54"	1° 00' 42"	16' 32.47"	5° 10' 24"	0.99944
7	16° 07' 09"	2° 27' 02"	13° 53' 51"	8° 36' 05"	1° 00' 43"	16' 32.72"	14° 23' 28"	0.99929
8	16° 44' 26"	2° 30' 02"	14° 27' 28"	8° 53' 14"	1° 00' 44"	16' 32.96"	21° 34' 52"	0.99908
9	17° 21' 45"	2° 33' 01"	15° 01' 08"	9° 10' 21"	1° 00' 45"	16' 33.20"	27° 11' 40"	0.99882
10	17° 59' 05"	2° 35' 59"	15° 34' 53"	9° 27' 25"	1° 00' 46"	16' 33.42"	31° 37' 46"	0.99851
11	18° 36' 27"	2° 38' 56"	16° 08' 41"	9° 44' 26"	1° 00' 46"	16' 33.64"	35° 11' 29"	0.99815
12	19° 13' 49"	2° 41' 52"	16° 42' 35"	10° 01' 24"	1° 00' 47"	16' 33.85"	38° 6' 04"	0.99774
13	19° 51' 13"	2° 44' 47"	17° 16' 32"	10° 18' 19"	1° 00' 48"	16' 34.05"	40° 31' 04"	0.99728
14	20° 28' 37"	2° 47' 40"	17° 50' 34"	10° 35' 11"	1° 00' 49"	16' 34.25"	42° 33' 21"	0.99676
15	21° 06' 03"	2° 50' 33"	18° 24' 40"	10° 51' 59"	1° 00' 49"	16' 34.43"	44° 17' 55"	0.99620
16	21° 43' 29"	2° 53' 24"	18° 58' 51"	11° 08' 45"	1° 00' 50"	16' 34.61"	45° 48' 29"	0.99558
17	22° 20' 57"	2° 56' 15"	19° 33' 07"	11° 25' 26"	1° 00' 51"	16' 34.78"	47° 7' 48"	0.99491
18	22° 58' 25"	2° 59' 04"	20° 07' 27"	11° 42' 04"	1° 00' 51"	16' 34.94"	48° 18' 00"	0.99419
19	23° 35' 54"	3° 01' 52"	20° 41' 52"	11° 58' 38"	1° 00' 52"	16' 35.10"	49° 20' 43"	0.99342
20	24° 13' 24"	3° 04' 38"	21° 16' 22"	12° 15' 09"	1° 00' 52"	16' 35.24"	50° 17' 15"	0.99259
21	24° 50' 55"	3° 07' 23"	21° 50' 57"	12° 31' 35"	1° 00' 53"	16' 35.38"	51° 8' 34"	0.99172
22	25° 28' 27"	3° 10' 07"	22° 25' 36"	12° 47' 57"	1° 00' 53"	16' 35.50"	51° 55' 32"	0.99079
23	26° 05' 59"	3° 12' 50"	23° 00' 21"	13° 04' 14"	1° 00' 54"	16' 35.62"	52° 38' 47"	0.98981
24	26° 43' 32"	3° 15' 31"	23° 35' 10"	13° 20' 27"	1° 00' 54"	16' 35.73"	53° 18' 51"	0.98878

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	194° 58' 32"	0.36"	193° 47' 04"	-5° 53' 51"	0.9992347	16'00.36"	23° 26' 19"	12 m 23 s
1	195° 00' 60"	0.36"	193° 49' 21"	-5° 54' 48"	0.9992229	16'00.38"	23° 26' 19"	12 m 24 s
2	195° 03' 28"	0.37"	193° 51' 39"	-5° 55' 46"	0.9992110	16'00.39"	23° 26' 19"	12 m 25 s
3	195° 05' 56"	0.37"	193° 53' 56"	-5° 56' 43"	0.9991991	16'00.40"	23° 26' 19"	12 m 25 s
4	195° 08' 24"	0.38"	193° 56' 13"	-5° 57' 40"	0.9991873	16'00.41"	23° 26' 19"	12 m 26 s
5	195° 10' 52"	0.38"	193° 58' 30"	-5° 58' 37"	0.9991754	16'00.42"	23° 26' 19"	12 m 27 s
6	195° 13' 20"	0.38"	194° 00' 48"	-5° 59' 34"	0.9991635	16'00.43"	23° 26' 19"	12 m 28 s
7	195° 15' 48"	0.39"	194° 03' 05"	-6° 00' 31"	0.9991517	16'00.44"	23° 26' 19"	12 m 28 s
8	195° 18' 16"	0.39"	194° 05' 22"	-6° 01' 28"	0.9991398	16'00.46"	23° 26' 19"	12 m 29 s
9	195° 20' 44"	0.40"	194° 07' 40"	-6° 02' 25"	0.9991280	16'00.47"	23° 26' 19"	12 m 30 s
10	195° 23' 12"	0.40"	194° 09' 57"	-6° 03' 22"	0.9991161	16'00.48"	23° 26' 19"	12 m 30 s
11	195° 25' 40"	0.40"	194° 12' 14"	-6° 04' 20"	0.9991043	16'00.49"	23° 26' 19"	12 m 31 s
12	195° 28' 08"	0.41"	194° 14' 32"	-6° 05' 17"	0.9990924	16'00.50"	23° 26' 19"	12 m 32 s
13	195° 30' 36"	0.41"	194° 16' 49"	-6° 06' 14"	0.9990806	16'00.51"	23° 26' 19"	12 m 32 s
14	195° 33' 04"	0.42"	194° 19' 06"	-6° 07' 11"	0.9990687	16'00.52"	23° 26' 19"	12 m 33 s
15	195° 35' 32"	0.42"	194° 21' 24"	-6° 08' 08"	0.9990569	16'00.54"	23° 26' 19"	12 m 34 s
16	195° 37' 60"	0.42"	194° 23' 41"	-6° 09' 05"	0.9990451	16'00.55"	23° 26' 19"	12 m 35 s
17	195° 40' 28"	0.43"	194° 25' 58"	-6° 10' 02"	0.9990332	16'00.56"	23° 26' 19"	12 m 35 s
18	195° 42' 56"	0.43"	194° 28' 16"	-6° 10' 59"	0.9990214	16'00.57"	23° 26' 19"	12 m 36 s
19	195° 45' 24"	0.43"	194° 30' 33"	-6° 11' 56"	0.9990096	16'00.58"	23° 26' 19"	12 m 37 s
20	195° 47' 52"	0.44"	194° 32' 51"	-6° 12' 53"	0.9989978	16'00.59"	23° 26' 19"	12 m 37 s
21	195° 50' 20"	0.44"	194° 35' 08"	-6° 13' 50"	0.9989859	16'00.60"	23° 26' 19"	12 m 38 s
22	195° 52' 48"	0.44"	194° 37' 26"	-6° 14' 47"	0.9989741	16'00.62"	23° 26' 19"	12 m 39 s
23	195° 55' 16"	0.45"	194° 39' 43"	-6° 15' 44"	0.9989623	16'00.63"	23° 26' 19"	12 m 39 s
24	195° 57' 44"	0.45"	194° 42' 01"	-6° 16' 41"	0.9989505	16'00.64"	23° 26' 19"	12 m 40 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	26° 43' 32"	3° 15' 31"	23° 35' 10"	13° 20' 27"	1° 00' 54"	16' 35.73"	53° 18' 51"	0.98878
1	27° 21' 05"	3° 18' 11"	24° 10' 05"	13° 36' 36"	1° 00' 54"	16' 35.83"	53° 56' 12"	0.98770
2	27° 58' 39"	3° 20' 49"	24° 45' 05"	13° 52' 40"	1° 00' 55"	16' 35.93"	54° 31' 11"	0.98657
3	28° 36' 14"	3° 23' 27"	25° 20' 10"	14° 08' 39"	1° 00' 55"	16' 36.01"	55° 4' 07"	0.98539
4	29° 13' 49"	3° 26' 02"	25° 55' 20"	14° 24' 33"	1° 00' 55"	16' 36.09"	55° 35' 16"	0.98416
5	29° 51' 25"	3° 28' 36"	26° 30' 35"	14° 40' 22"	1° 00' 56"	16' 36.16"	56° 4' 52"	0.98288
6	30° 29' 01"	3° 31' 09"	27° 05' 56"	14° 56' 05"	1° 00' 56"	16' 36.22"	56° 33' 05"	0.98155
7	31° 06' 37"	3° 33' 40"	27° 41' 22"	15° 11' 43"	1° 00' 56"	16' 36.27"	57° 0' 06"	0.98016
8	31° 44' 14"	3° 36' 10"	28° 16' 53"	15° 27' 16"	1° 00' 56"	16' 36.31"	57° 26' 03"	0.97873
9	32° 21' 51"	3° 38' 38"	28° 52' 30"	15° 42' 43"	1° 00' 56"	16' 36.35"	57° 51' 03"	0.97725
10	32° 59' 28"	3° 41' 04"	29° 28' 12"	15° 58' 04"	1° 00' 56"	16' 36.38"	58° 15' 13"	0.97571
11	33° 37' 05"	3° 43' 29"	30° 03' 60"	16° 13' 20"	1° 00' 57"	16' 36.39"	58° 38' 39"	0.97413
12	34° 14' 43"	3° 45' 52"	30° 39' 53"	16° 28' 29"	1° 00' 57"	16' 36.40"	59° 1' 25"	0.97250
13	34° 52' 21"	3° 48' 14"	31° 15' 52"	16° 43' 32"	1° 00' 57"	16' 36.41"	59° 23' 36"	0.97082
14	35° 29' 59"	3° 50' 34"	31° 51' 56"	16° 58' 29"	1° 00' 57"	16' 36.40"	59° 45' 15"	0.96909
15	36° 07' 37"	3° 52' 52"	32° 28' 06"	17° 13' 19"	1° 00' 56"	16' 36.38"	60° 6' 27"	0.96731
16	36° 45' 15"	3° 55' 09"	33° 04' 21"	17° 28' 03"	1° 00' 56"	16' 36.36"	60° 27' 14"	0.96548
17	37° 22' 52"	3° 57' 24"	33° 40' 42"	17° 42' 40"	1° 00' 56"	16' 36.33"	60° 47' 39"	0.96361
18	38° 00' 30"	3° 59' 37"	34° 17' 09"	17° 57' 11"	1° 00' 56"	16' 36.29"	61° 7' 45"	0.96168
19	38° 38' 08"	4° 01' 48"	34° 53' 42"	18° 11' 34"	1° 00' 56"	16' 36.24"	61° 27' 33"	0.95971
20	39° 15' 46"	4° 03' 58"	35° 30' 20"	18° 25' 51"	1° 00' 56"	16' 36.18"	61° 47' 06"	0.95770
21	39° 53' 23"	4° 06' 06"	36° 07' 04"	18° 39' 60"	1° 00' 56"	16' 36.12"	62° 6' 25"	0.95563
22	40° 31' 00"	4° 08' 12"	36° 43' 53"	18° 54' 02"	1° 00' 55"	16' 36.05"	62° 25' 33"	0.95352
23	41° 08' 37"	4° 10' 16"	37° 20' 48"	19° 07' 56"	1° 00' 55"	16' 35.96"	62° 44' 30"	0.95136
24	41° 46' 14"	4° 12' 18"	37° 57' 49"	19° 21' 43"	1° 00' 55"	16' 35.88"	63° 3' 17"	0.94915

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	195° 57' 44"	0.45"	194° 42' 01"	-6° 16' 41"	0.9989505	16'00.64"	23° 26' 19"	12 m 40 s
1	196° 00' 12"	0.45"	194° 44' 18"	-6° 17' 38"	0.9989387	16'00.65"	23° 26' 19"	12 m 41 s
2	196° 02' 41"	0.46"	194° 46' 36"	-6° 18' 35"	0.9989269	16'00.66"	23° 26' 19"	12 m 41 s
3	196° 05' 09"	0.46"	194° 48' 53"	-6° 19' 32"	0.9989151	16'00.67"	23° 26' 19"	12 m 42 s
4	196° 07' 37"	0.46"	194° 51' 11"	-6° 20' 29"	0.9989033	16'00.68"	23° 26' 19"	12 m 43 s
5	196° 10' 05"	0.47"	194° 53' 28"	-6° 21' 26"	0.9988915	16'00.69"	23° 26' 19"	12 m 44 s
6	196° 12' 33"	0.47"	194° 55' 46"	-6° 22' 22"	0.9988797	16'00.71"	23° 26' 19"	12 m 44 s
7	196° 15' 01"	0.47"	194° 58' 03"	-6° 23' 19"	0.9988679	16'00.72"	23° 26' 19"	12 m 45 s
8	196° 17' 29"	0.48"	195° 00' 21"	-6° 24' 16"	0.9988561	16'00.73"	23° 26' 19"	12 m 46 s
9	196° 19' 57"	0.48"	195° 02' 39"	-6° 25' 13"	0.9988443	16'00.74"	23° 26' 19"	12 m 46 s
10	196° 22' 25"	0.48"	195° 04' 56"	-6° 26' 10"	0.9988326	16'00.75"	23° 26' 19"	12 m 47 s
11	196° 24' 53"	0.49"	195° 07' 14"	-6° 27' 07"	0.9988208	16'00.76"	23° 26' 19"	12 m 48 s
12	196° 27' 22"	0.49"	195° 09' 32"	-6° 28' 04"	0.9988090	16'00.77"	23° 26' 19"	12 m 48 s
13	196° 29' 50"	0.49"	195° 11' 49"	-6° 29' 01"	0.9987972	16'00.79"	23° 26' 19"	12 m 49 s
14	196° 32' 18"	0.49"	195° 14' 07"	-6° 29' 57"	0.9987855	16'00.80"	23° 26' 19"	12 m 50 s
15	196° 34' 46"	0.50"	195° 16' 25"	-6° 30' 54"	0.9987737	16'00.81"	23° 26' 19"	12 m 50 s
16	196° 37' 14"	0.50"	195° 18' 42"	-6° 31' 51"	0.9987619	16'00.82"	23° 26' 19"	12 m 51 s
17	196° 39' 42"	0.50"	195° 20' 60"	-6° 32' 48"	0.9987502	16'00.83"	23° 26' 19"	12 m 52 s
18	196° 42' 10"	0.50"	195° 23' 18"	-6° 33' 45"	0.9987384	16'00.84"	23° 26' 19"	12 m 52 s
19	196° 44' 38"	0.51"	195° 25' 35"	-6° 34' 42"	0.9987266	16'00.85"	23° 26' 19"	12 m 53 s
20	196° 47' 07"	0.51"	195° 27' 53"	-6° 35' 38"	0.9987149	16'00.86"	23° 26' 19"	12 m 54 s
21	196° 49' 35"	0.51"	195° 30' 11"	-6° 36' 35"	0.9987031	16'00.88"	23° 26' 19"	12 m 54 s
22	196° 52' 03"	0.51"	195° 32' 29"	-6° 37' 32"	0.9986914	16'00.89"	23° 26' 19"	12 m 55 s
23	196° 54' 31"	0.52"	195° 34' 46"	-6° 38' 29"	0.9986796	16'00.90"	23° 26' 19"	12 m 56 s
24	196° 56' 59"	0.52"	195° 37' 04"	-6° 39' 26"	0.9986679	16'00.91"	23° 26' 19"	12 m 57 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	41° 46' 14"	4° 12' 18"	37° 57' 49"	19° 21' 43"	1° 00' 55"	16' 35.88"	63° 3' 17"	0.94915
1	42° 23' 50"	4° 14' 19"	38° 34' 56"	19° 35' 22"	1° 00' 54"	16' 35.78"	63° 21' 57"	0.94690
2	43° 01' 26"	4° 16' 18"	39° 12' 08"	19° 48' 53"	1° 00' 54"	16' 35.67"	63° 40' 31"	0.94460
3	43° 39' 01"	4° 18' 14"	39° 49' 26"	20° 02' 16"	1° 00' 53"	16' 35.56"	63° 58' 58"	0.94226
4	44° 16' 36"	4° 20' 09"	40° 26' 50"	20° 15' 31"	1° 00' 53"	16' 35.44"	64° 17' 20"	0.93987
5	44° 54' 10"	4° 22' 02"	41° 04' 19"	20° 28' 38"	1° 00' 53"	16' 35.31"	64° 35' 39"	0.93744
6	45° 31' 44"	4° 23' 53"	41° 41' 54"	20° 41' 37"	1° 00' 52"	16' 35.18"	64° 53' 54"	0.93497
7	46° 09' 18"	4° 25' 43"	42° 19' 35"	20° 54' 27"	1° 00' 52"	16' 35.03"	65° 12' 06"	0.93244
8	46° 46' 50"	4° 27' 30"	42° 57' 21"	21° 07' 09"	1° 00' 51"	16' 34.88"	65° 30' 17"	0.92988
9	47° 24' 22"	4° 29' 15"	43° 35' 13"	21° 19' 42"	1° 00' 50"	16' 34.72"	65° 48' 26"	0.92727
10	48° 01' 54"	4° 30' 58"	44° 13' 10"	21° 32' 06"	1° 00' 50"	16' 34.56"	66° 6' 35"	0.92462
11	48° 39' 24"	4° 32' 40"	44° 51' 13"	21° 44' 21"	1° 00' 49"	16' 34.38"	66° 24' 43"	0.92193
12	49° 16' 54"	4° 34' 19"	45° 29' 22"	21° 56' 27"	1° 00' 48"	16' 34.20"	66° 42' 51"	0.91919
13	49° 54' 23"	4° 35' 56"	46° 07' 36"	22° 08' 24"	1° 00' 48"	16' 34.01"	67° 0' 59"	0.91641
14	50° 31' 51"	4° 37' 32"	46° 45' 55"	22° 20' 12"	1° 00' 47"	16' 33.82"	67° 19' 09"	0.91359
15	51° 09' 19"	4° 39' 05"	47° 24' 20"	22° 31' 51"	1° 00' 46"	16' 33.61"	67° 37' 20"	0.91073
16	51° 46' 45"	4° 40' 36"	48° 02' 50"	22° 43' 20"	1° 00' 46"	16' 33.40"	67° 55' 32"	0.90783
17	52° 24' 10"	4° 42' 05"	48° 41' 25"	22° 54' 39"	1° 00' 45"	16' 33.19"	68° 13' 46"	0.90489
18	53° 01' 35"	4° 43' 33"	49° 20' 06"	23° 05' 49"	1° 00' 44"	16' 32.96"	68° 32' 01"	0.90191
19	53° 38' 58"	4° 44' 58"	49° 58' 51"	23° 16' 49"	1° 00' 43"	16' 32.73"	68° 50' 20"	0.89889
20	54° 16' 18"	4° 46' 21"	50° 37' 39"	23° 27' 38"	1° 00' 42"	16' 32.49"	69° 8' 39"	0.89584
21	54° 53' 39"	4° 47' 42"	51° 16' 35"	23° 38' 18"	1° 00' 41"	16' 32.25"	69° 27' 02"	0.89274
22	55° 30' 59"	4° 49' 00"	51° 55' 36"	23° 48' 47"	1° 00' 40"	16' 31.99"	69° 45' 27"	0.88960
23	56° 08' 18"	4° 50' 17"	52° 34' 41"	23° 59' 07"	1° 00' 39"	16' 31.74"	70° 3' 56"	0.88643
24	56° 45' 36"	4° 51' 32"	53° 13' 52"	24° 09' 16"	1° 00' 38"	16' 31.47"	70° 22' 28"	0.88322

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	196° 56' 59"	0.52"	195° 37' 04"	-6° 39' 26"	0.9986679	16'00.91"	23° 26' 19"	12 m 57 s
1	196° 59' 27"	0.52"	195° 39' 22"	-6° 40' 22"	0.9986562	16'00.92"	23° 26' 19"	12 m 57 s
2	197° 01' 56"	0.52"	195° 41' 40"	-6° 41' 19"	0.9986444	16'00.93"	23° 26' 19"	12 m 58 s
3	197° 04' 24"	0.52"	195° 43' 58"	-6° 42' 16"	0.9986327	16'00.94"	23° 26' 19"	12 m 59 s
4	197° 06' 52"	0.53"	195° 46' 15"	-6° 43' 12"	0.9986209	16'00.96"	23° 26' 19"	12 m 59 s
5	197° 09' 20"	0.53"	195° 48' 33"	-6° 44' 09"	0.9986092	16'00.97"	23° 26' 19"	12 m 60 s
6	197° 11' 48"	0.53"	195° 50' 51"	-6° 45' 06"	0.9985975	16'00.98"	23° 26' 19"	13 m 01 s
7	197° 14' 16"	0.53"	195° 53' 09"	-6° 46' 03"	0.9985858	16'00.99"	23° 26' 19"	13 m 01 s
8	197° 16' 45"	0.53"	195° 55' 27"	-6° 46' 59"	0.9985740	16'01.00"	23° 26' 19"	13 m 02 s
9	197° 19' 13"	0.54"	195° 57' 45"	-6° 47' 56"	0.9985623	16'01.01"	23° 26' 19"	13 m 03 s
10	197° 21' 41"	0.54"	196° 00' 03"	-6° 48' 53"	0.9985506	16'01.02"	23° 26' 19"	13 m 03 s
11	197° 24' 09"	0.54"	196° 02' 21"	-6° 49' 49"	0.9985389	16'01.03"	23° 26' 19"	13 m 04 s
12	197° 26' 37"	0.54"	196° 04' 39"	-6° 50' 46"	0.9985272	16'01.05"	23° 26' 19"	13 m 05 s
13	197° 29' 06"	0.54"	196° 06' 57"	-6° 51' 43"	0.9985155	16'01.06"	23° 26' 19"	13 m 05 s
14	197° 31' 34"	0.54"	196° 09' 15"	-6° 52' 39"	0.9985037	16'01.07"	23° 26' 19"	13 m 06 s
15	197° 34' 02"	0.55"	196° 11' 32"	-6° 53' 36"	0.9984920	16'01.08"	23° 26' 19"	13 m 07 s
16	197° 36' 30"	0.55"	196° 13' 50"	-6° 54' 32"	0.9984803	16'01.09"	23° 26' 19"	13 m 07 s
17	197° 38' 59"	0.55"	196° 16' 08"	-6° 55' 29"	0.9984686	16'01.10"	23° 26' 19"	13 m 08 s
18	197° 41' 27"	0.55"	196° 18' 27"	-6° 56' 26"	0.9984569	16'01.11"	23° 26' 19"	13 m 09 s
19	197° 43' 55"	0.55"	196° 20' 45"	-6° 57' 22"	0.9984452	16'01.12"	23° 26' 19"	13 m 09 s
20	197° 46' 23"	0.55"	196° 23' 03"	-6° 58' 19"	0.9984336	16'01.14"	23° 26' 19"	13 m 10 s
21	197° 48' 52"	0.55"	196° 25' 21"	-6° 59' 15"	0.9984219	16'01.15"	23° 26' 19"	13 m 10 s
22	197° 51' 20"	0.55"	196° 27' 39"	-7° 00' 12"	0.9984102	16'01.16"	23° 26' 19"	13 m 11 s
23	197° 53' 48"	0.56"	196° 29' 57"	-7° 01' 08"	0.9983985	16'01.17"	23° 26' 19"	13 m 12 s
24	197° 56' 16"	0.56"	196° 32' 15"	-7° 02' 05"	0.9983868	16'01.18"	23° 26' 19"	13 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	56° 45' 36"	4° 51' 32"	53° 13' 52"	24° 09' 16"	1° 00' 38"	16' 31.47"	70° 22' 28"	0.88322
1	57° 22' 52"	4° 52' 44"	53° 53' 07"	24° 19' 15"	1° 00' 37"	16' 31.20"	70° 41' 03"	0.87997
2	58° 00' 07"	4° 53' 55"	54° 32' 27"	24° 29' 04"	1° 00' 36"	16' 30.92"	70° 59' 41"	0.87669
3	58° 37' 21"	4° 55' 03"	55° 11' 52"	24° 38' 42"	1° 00' 35"	16' 30.64"	71° 18' 22"	0.87337
4	59° 14' 34"	4° 56' 10"	55° 51' 21"	24° 48' 09"	1° 00' 34"	16' 30.35"	71° 37' 07"	0.87001
5	59° 51' 45"	4° 57' 14"	56° 30' 54"	24° 57' 25"	1° 00' 33"	16' 30.05"	71° 55' 55"	0.86662
6	60° 28' 55"	4° 58' 16"	57° 10' 32"	25° 06' 31"	1° 00' 32"	16' 29.75"	72° 14' 46"	0.86320
7	61° 06' 03"	4° 59' 15"	57° 50' 14"	25° 15' 25"	1° 00' 31"	16' 29.44"	72° 33' 41"	0.85974
8	61° 43' 11"	5° 00' 13"	58° 29' 60"	25° 24' 09"	1° 00' 30"	16' 29.12"	72° 52' 39"	0.85624
9	62° 20' 16"	5° 01' 09"	59° 09' 50"	25° 32' 42"	1° 00' 29"	16' 28.80"	73° 11' 40"	0.85272
10	62° 57' 20"	5° 02' 02"	59° 49' 44"	25° 41' 03"	1° 00' 27"	16' 28.48"	73° 30' 45"	0.84916
11	63° 34' 22"	5° 02' 54"	60° 29' 42"	25° 49' 13"	1° 00' 26"	16' 28.14"	73° 49' 54"	0.84557
12	64° 11' 23"	5° 03' 43"	61° 09' 43"	25° 57' 12"	1° 00' 25"	16' 27.81"	74° 9' 05"	0.84195
13	64° 48' 23"	5° 04' 30"	61° 49' 48"	26° 04' 59"	1° 00' 24"	16' 27.46"	74° 28' 20"	0.83829
14	65° 25' 20"	5° 05' 15"	62° 29' 56"	26° 12' 35"	1° 00' 22"	16' 27.11"	74° 47' 38"	0.83461
15	66° 02' 16"	5° 05' 57"	63° 10' 08"	26° 19' 60"	1° 00' 21"	16' 26.76"	75° 6' 59"	0.83090
16	66° 39' 11"	5° 06' 38"	63° 50' 22"	26° 27' 13"	1° 00' 20"	16' 26.40"	75° 26' 24"	0.82715
17	67° 16' 03"	5° 07' 16"	64° 30' 40"	26° 34' 14"	1° 00' 19"	16' 26.03"	75° 45' 51"	0.82338
18	67° 52' 54"	5° 07' 52"	65° 11' 01"	26° 41' 03"	1° 00' 17"	16' 25.66"	76° 5' 21"	0.81958
19	68° 29' 43"	5° 08' 27"	65° 51' 24"	26° 47' 41"	1° 00' 16"	16' 25.29"	76° 24' 54"	0.81575
20	69° 06' 31"	5° 08' 59"	66° 31' 50"	26° 54' 07"	1° 00' 14"	16' 24.91"	76° 44' 30"	0.81189
21	69° 43' 16"	5° 09' 28"	67° 12' 19"	27° 00' 21"	1° 00' 13"	16' 24.53"	77° 4' 09"	0.80800
22	70° 20' 00"	5° 09' 56"	67° 52' 50"	27° 06' 23"	1° 00' 12"	16' 24.14"	77° 23' 49"	0.80409
23	70° 56' 42"	5° 10' 22"	68° 33' 23"	27° 12' 13"	1° 00' 10"	16' 23.74"	77° 43' 33"	0.80015
24	71° 33' 22"	5° 10' 45"	69° 13' 58"	27° 17' 52"	1° 00' 09"	16' 23.34"	78° 3' 18"	0.79619

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	197° 56' 16"	0.56"	196° 32' 15"	-7° 02' 05"	0.9983868	16'01.18"	23° 26' 19"	13 m 12 s
1	197° 58' 45"	0.56"	196° 34' 33"	-7° 03' 02"	0.9983751	16'01.19"	23° 26' 19"	13 m 13 s
2	198° 01' 13"	0.56"	196° 36' 51"	-7° 03' 58"	0.9983634	16'01.20"	23° 26' 19"	13 m 14 s
3	198° 03' 41"	0.56"	196° 39' 09"	-7° 04' 55"	0.9983518	16'01.21"	23° 26' 19"	13 m 14 s
4	198° 06' 09"	0.56"	196° 41' 27"	-7° 05' 51"	0.9983401	16'01.23"	23° 26' 19"	13 m 15 s
5	198° 08' 38"	0.56"	196° 43' 46"	-7° 06' 48"	0.9983284	16'01.24"	23° 26' 19"	13 m 16 s
6	198° 11' 06"	0.56"	196° 46' 04"	-7° 07' 44"	0.9983168	16'01.25"	23° 26' 19"	13 m 16 s
7	198° 13' 34"	0.56"	196° 48' 22"	-7° 08' 41"	0.9983051	16'01.26"	23° 26' 19"	13 m 17 s
8	198° 16' 03"	0.56"	196° 50' 40"	-7° 09' 37"	0.9982934	16'01.27"	23° 26' 19"	13 m 18 s
9	198° 18' 31"	0.56"	196° 52' 58"	-7° 10' 33"	0.9982818	16'01.28"	23° 26' 19"	13 m 18 s
10	198° 20' 59"	0.56"	196° 55' 17"	-7° 11' 30"	0.9982701	16'01.29"	23° 26' 19"	13 m 19 s
11	198° 23' 27"	0.56"	196° 57' 35"	-7° 12' 26"	0.9982584	16'01.30"	23° 26' 19"	13 m 20 s
12	198° 25' 56"	0.56"	196° 59' 53"	-7° 13' 23"	0.9982468	16'01.32"	23° 26' 19"	13 m 20 s
13	198° 28' 24"	0.56"	197° 02' 11"	-7° 14' 19"	0.9982351	16'01.33"	23° 26' 19"	13 m 21 s
14	198° 30' 52"	0.56"	197° 04' 30"	-7° 15' 16"	0.9982235	16'01.34"	23° 26' 19"	13 m 22 s
15	198° 33' 21"	0.56"	197° 06' 48"	-7° 16' 12"	0.9982118	16'01.35"	23° 26' 19"	13 m 22 s
16	198° 35' 49"	0.56"	197° 09' 06"	-7° 17' 08"	0.9982002	16'01.36"	23° 26' 19"	13 m 23 s
17	198° 38' 17"	0.56"	197° 11' 25"	-7° 18' 05"	0.9981885	16'01.37"	23° 26' 19"	13 m 23 s
18	198° 40' 46"	0.57"	197° 13' 43"	-7° 19' 01"	0.9981769	16'01.38"	23° 26' 19"	13 m 24 s
19	198° 43' 14"	0.57"	197° 16' 01"	-7° 19' 57"	0.9981652	16'01.39"	23° 26' 19"	13 m 25 s
20	198° 45' 42"	0.56"	197° 18' 20"	-7° 20' 54"	0.9981536	16'01.41"	23° 26' 19"	13 m 25 s
21	198° 48' 11"	0.56"	197° 20' 38"	-7° 21' 50"	0.9981420	16'01.42"	23° 26' 19"	13 m 26 s
22	198° 50' 39"	0.56"	197° 22' 56"	-7° 22' 46"	0.9981303	16'01.43"	23° 26' 19"	13 m 27 s
23	198° 53' 07"	0.56"	197° 25' 15"	-7° 23' 43"	0.9981187	16'01.44"	23° 26' 19"	13 m 27 s
24	198° 55' 36"	0.56"	197° 27' 33"	-7° 24' 39"	0.9981071	16'01.45"	23° 26' 18"	13 m 28 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	71° 33' 22"	5° 10' 45"	69° 13' 58"	27° 17' 52"	1° 00' 09"	16' 23.34"	78° 3' 18"	0.79619
1	72° 10' 00"	5° 11' 06"	69° 54' 35"	27° 23' 18"	1° 00' 07"	16' 22.94"	78° 23' 06"	0.79220
2	72° 46' 36"	5° 11' 25"	70° 35' 14"	27° 28' 32"	1° 00' 06"	16' 22.53"	78° 42' 56"	0.78819
3	73° 23' 10"	5° 11' 42"	71° 15' 55"	27° 33' 34"	1° 00' 04"	16' 22.12"	79° 2' 48"	0.78415
4	73° 59' 43"	5° 11' 57"	71° 56' 36"	27° 38' 24"	1° 00' 03"	16' 21.71"	79° 22' 41"	0.78009
5	74° 36' 13"	5° 12' 10"	72° 37' 19"	27° 43' 02"	1° 00' 01"	16' 21.29"	79° 42' 36"	0.77600
6	75° 12' 41"	5° 12' 21"	73° 18' 04"	27° 47' 28"	0° 59' 60"	16' 20.86"	80° 2' 32"	0.77190
7	75° 49' 07"	5° 12' 29"	73° 58' 49"	27° 51' 41"	0° 59' 58"	16' 20.43"	80° 22' 30"	0.76777
8	76° 25' 32"	5° 12' 36"	74° 39' 35"	27° 55' 42"	0° 59' 56"	16' 20.00"	80° 42' 29"	0.76361
9	77° 01' 54"	5° 12' 40"	75° 20' 21"	27° 59' 31"	0° 59' 55"	16' 19.57"	81° 2' 29"	0.75944
10	77° 38' 14"	5° 12' 42"	76° 01' 09"	28° 03' 08"	0° 59' 53"	16' 19.13"	81° 22' 30"	0.75525
11	78° 14' 32"	5° 12' 42"	76° 41' 56"	28° 06' 32"	0° 59' 52"	16' 18.69"	81° 42' 31"	0.75104
12	78° 50' 48"	5° 12' 40"	77° 22' 43"	28° 09' 44"	0° 59' 50"	16' 18.24"	82° 2' 33"	0.74680
13	79° 27' 01"	5° 12' 36"	78° 03' 31"	28° 12' 44"	0° 59' 48"	16' 17.79"	82° 22' 35"	0.74255
14	80° 03' 13"	5° 12' 30"	78° 44' 18"	28° 15' 32"	0° 59' 47"	16' 17.34"	82° 42' 37"	0.73828
15	80° 39' 22"	5° 12' 22"	79° 25' 05"	28° 18' 07"	0° 59' 45"	16' 16.88"	83° 2' 40"	0.73399
16	81° 15' 30"	5° 12' 12"	80° 05' 52"	28° 20' 30"	0° 59' 43"	16' 16.42"	83° 22' 42"	0.72968
17	81° 51' 35"	5° 11' 59"	80° 46' 37"	28° 22' 41"	0° 59' 42"	16' 15.96"	83° 42' 43"	0.72536
18	82° 27' 37"	5° 11' 45"	81° 27' 22"	28° 24' 40"	0° 59' 40"	16' 15.50"	84° 2' 44"	0.72102
19	83° 03' 38"	5° 11' 29"	82° 08' 06"	28° 26' 26"	0° 59' 38"	16' 15.03"	84° 22' 45"	0.71666
20	83° 39' 36"	5° 11' 10"	82° 48' 48"	28° 27' 60"	0° 59' 36"	16' 14.56"	84° 42' 44"	0.71229
21	84° 15' 32"	5° 10' 50"	83° 29' 30"	28° 29' 22"	0° 59' 35"	16' 14.08"	85° 2' 43"	0.70790
22	84° 51' 26"	5° 10' 28"	84° 10' 09"	28° 30' 32"	0° 59' 33"	16' 13.61"	85° 22' 40"	0.70350
23	85° 27' 18"	5° 10' 03"	84° 50' 47"	28° 31' 29"	0° 59' 31"	16' 13.13"	85° 42' 35"	0.69909
24	86° 03' 07"	5° 09' 37"	85° 31' 23"	28° 32' 14"	0° 59' 29"	16' 12.65"	86° 2' 30"	0.69466

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	198° 55' 36"	0.56"	197° 27' 33"	-7° 24' 39"	0.9981071	16'01.45"	23° 26' 18"	13 m 28 s
1	198° 58' 04"	0.56"	197° 29' 52"	-7° 25' 35"	0.9980954	16'01.46"	23° 26' 18"	13 m 29 s
2	199° 00' 32"	0.56"	197° 32' 10"	-7° 26' 32"	0.9980838	16'01.47"	23° 26' 18"	13 m 29 s
3	199° 03' 01"	0.56"	197° 34' 28"	-7° 27' 28"	0.9980722	16'01.48"	23° 26' 18"	13 m 30 s
4	199° 05' 29"	0.56"	197° 36' 47"	-7° 28' 24"	0.9980606	16'01.49"	23° 26' 18"	13 m 30 s
5	199° 07' 58"	0.56"	197° 39' 05"	-7° 29' 20"	0.9980489	16'01.51"	23° 26' 18"	13 m 31 s
6	199° 10' 26"	0.56"	197° 41' 24"	-7° 30' 17"	0.9980373	16'01.52"	23° 26' 18"	13 m 32 s
7	199° 12' 54"	0.56"	197° 43' 42"	-7° 31' 13"	0.9980257	16'01.53"	23° 26' 18"	13 m 32 s
8	199° 15' 23"	0.56"	197° 46' 01"	-7° 32' 09"	0.9980141	16'01.54"	23° 26' 18"	13 m 33 s
9	199° 17' 51"	0.56"	197° 48' 19"	-7° 33' 05"	0.9980025	16'01.55"	23° 26' 18"	13 m 34 s
10	199° 20' 19"	0.56"	197° 50' 38"	-7° 34' 01"	0.9979909	16'01.56"	23° 26' 18"	13 m 34 s
11	199° 22' 48"	0.56"	197° 52' 57"	-7° 34' 58"	0.9979792	16'01.57"	23° 26' 18"	13 m 35 s
12	199° 25' 16"	0.56"	197° 55' 15"	-7° 35' 54"	0.9979676	16'01.58"	23° 26' 18"	13 m 35 s
13	199° 27' 45"	0.56"	197° 57' 34"	-7° 36' 50"	0.9979560	16'01.60"	23° 26' 18"	13 m 36 s
14	199° 30' 13"	0.55"	197° 59' 52"	-7° 37' 46"	0.9979444	16'01.61"	23° 26' 18"	13 m 37 s
15	199° 32' 41"	0.55"	198° 02' 11"	-7° 38' 42"	0.9979328	16'01.62"	23° 26' 18"	13 m 37 s
16	199° 35' 10"	0.55"	198° 04' 30"	-7° 39' 38"	0.9979212	16'01.63"	23° 26' 18"	13 m 38 s
17	199° 37' 38"	0.55"	198° 06' 48"	-7° 40' 34"	0.9979096	16'01.64"	23° 26' 18"	13 m 39 s
18	199° 40' 07"	0.55"	198° 09' 07"	-7° 41' 31"	0.9978980	16'01.65"	23° 26' 18"	13 m 39 s
19	199° 42' 35"	0.55"	198° 11' 26"	-7° 42' 27"	0.9978864	16'01.66"	23° 26' 18"	13 m 40 s
20	199° 45' 04"	0.55"	198° 13' 44"	-7° 43' 23"	0.9978748	16'01.67"	23° 26' 18"	13 m 40 s
21	199° 47' 32"	0.55"	198° 16' 03"	-7° 44' 19"	0.9978632	16'01.68"	23° 26' 18"	13 m 41 s
22	199° 50' 00"	0.54"	198° 18' 22"	-7° 45' 15"	0.9978516	16'01.70"	23° 26' 18"	13 m 42 s
23	199° 52' 29"	0.54"	198° 20' 40"	-7° 46' 11"	0.9978400	16'01.71"	23° 26' 18"	13 m 42 s
24	199° 54' 57"	0.54"	198° 22' 59"	-7° 47' 07"	0.9978285	16'01.72"	23° 26' 18"	13 m 43 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	86° 03' 07"	5° 09' 37"	85° 31' 23"	28° 32' 14"	0° 59' 29"	16' 12.65"	86° 2' 30"	0.69466
1	86° 38' 54"	5° 09' 08"	86° 11' 57"	28° 32' 48"	0° 59' 28"	16' 12.16"	86° 22' 22"	0.69021
2	87° 14' 39"	5° 08' 38"	86° 52' 29"	28° 33' 09"	0° 59' 26"	16' 11.68"	86° 42' 12"	0.68576
3	87° 50' 21"	5° 08' 06"	87° 32' 59"	28° 33' 18"	0° 59' 24"	16' 11.19"	87° 1' 60"	0.68129
4	88° 26' 01"	5° 07' 31"	88° 13' 26"	28° 33' 15"	0° 59' 22"	16' 10.70"	87° 21' 46"	0.67681
5	89° 01' 39"	5° 06' 55"	88° 53' 50"	28° 33' 00"	0° 59' 20"	16' 10.21"	87° 41' 29"	0.67232
6	89° 37' 14"	5° 06' 17"	89° 34' 11"	28° 32' 33"	0° 59' 19"	16' 09.72"	88° 1' 09"	0.66782
7	90° 12' 47"	5° 05' 37"	90° 14' 30"	28° 31' 55"	0° 59' 17"	16' 09.22"	88° 20' 46"	0.66331
8	90° 48' 18"	5° 04' 55"	90° 54' 45"	28° 31' 04"	0° 59' 15"	16' 08.72"	88° 40' 21"	0.65878
9	91° 23' 46"	5° 04' 11"	91° 34' 57"	28° 30' 02"	0° 59' 13"	16' 08.22"	88° 59' 52"	0.65425
10	91° 59' 12"	5° 03' 25"	92° 15' 05"	28° 28' 48"	0° 59' 11"	16' 07.72"	89° 19' 20"	0.64971
11	92° 34' 35"	5° 02' 38"	92° 55' 10"	28° 27' 22"	0° 59' 09"	16' 07.22"	89° 38' 44"	0.64516
12	93° 09' 57"	5° 01' 48"	93° 35' 11"	28° 25' 45"	0° 59' 08"	16' 06.72"	89° 58' 04"	0.64061
13	93° 45' 15"	5° 00' 57"	94° 15' 09"	28° 23' 56"	0° 59' 06"	16' 06.21"	90° 17' 20"	0.63604
14	94° 20' 32"	5° 00' 04"	94° 55' 02"	28° 21' 55"	0° 59' 04"	16' 05.71"	90° 36' 33"	0.63147
15	94° 55' 46"	4° 59' 09"	95° 34' 51"	28° 19' 44"	0° 59' 02"	16' 05.20"	90° 55' 41"	0.62689
16	95° 30' 57"	4° 58' 12"	96° 14' 35"	28° 17' 20"	0° 59' 00"	16' 04.69"	91° 14' 44"	0.62231
17	96° 06' 06"	4° 57' 13"	96° 54' 16"	28° 14' 46"	0° 58' 58"	16' 04.18"	91° 33' 43"	0.61772
18	96° 41' 13"	4° 56' 13"	97° 33' 51"	28° 11' 60"	0° 58' 56"	16' 03.67"	91° 52' 37"	0.61313
19	97° 16' 18"	4° 55' 11"	98° 13' 22"	28° 09' 03"	0° 58' 55"	16' 03.16"	92° 11' 26"	0.60853
20	97° 51' 19"	4° 54' 07"	98° 52' 48"	28° 05' 54"	0° 58' 53"	16' 02.65"	92° 30' 10"	0.60392
21	98° 26' 19"	4° 53' 01"	99° 32' 10"	28° 02' 35"	0° 58' 51"	16' 02.13"	92° 48' 49"	0.59932
22	99° 01' 16"	4° 51' 53"	100° 11' 26"	27° 59' 05"	0° 58' 49"	16' 01.62"	93° 7' 23"	0.59471
23	99° 36' 11"	4° 50' 44"	100° 50' 36"	27° 55' 24"	0° 58' 47"	16' 01.11"	93° 25' 51"	0.59009
24	100° 11' 03"	4° 49' 33"	101° 29' 42"	27° 51' 32"	0° 58' 45"	16' 00.59"	93° 44' 13"	0.58548

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	199° 54' 57"	0.54"	198° 22' 59"	-7° 47' 07"	0.9978285	16'01.72"	23° 26' 18"	13 m 43 s
1	199° 57' 26"	0.54"	198° 25' 18"	-7° 48' 03"	0.9978169	16'01.73"	23° 26' 18"	13 m 43 s
2	199° 59' 54"	0.54"	198° 27' 37"	-7° 48' 59"	0.9978053	16'01.74"	23° 26' 18"	13 m 44 s
3	200° 02' 23"	0.54"	198° 29' 56"	-7° 49' 55"	0.9977937	16'01.75"	23° 26' 18"	13 m 45 s
4	200° 04' 51"	0.54"	198° 32' 14"	-7° 50' 51"	0.9977821	16'01.76"	23° 26' 18"	13 m 45 s
5	200° 07' 20"	0.53"	198° 34' 33"	-7° 51' 47"	0.9977705	16'01.77"	23° 26' 18"	13 m 46 s
6	200° 09' 48"	0.53"	198° 36' 52"	-7° 52' 43"	0.9977590	16'01.79"	23° 26' 18"	13 m 47 s
7	200° 12' 17"	0.53"	198° 39' 11"	-7° 53' 39"	0.9977474	16'01.80"	23° 26' 18"	13 m 47 s
8	200° 14' 45"	0.53"	198° 41' 30"	-7° 54' 35"	0.9977358	16'01.81"	23° 26' 18"	13 m 48 s
9	200° 17' 14"	0.53"	198° 43' 49"	-7° 55' 31"	0.9977242	16'01.82"	23° 26' 18"	13 m 48 s
10	200° 19' 42"	0.52"	198° 46' 07"	-7° 56' 27"	0.9977126	16'01.83"	23° 26' 18"	13 m 49 s
11	200° 22' 11"	0.52"	198° 48' 26"	-7° 57' 23"	0.9977011	16'01.84"	23° 26' 18"	13 m 50 s
12	200° 24' 39"	0.52"	198° 50' 45"	-7° 58' 19"	0.9976895	16'01.85"	23° 26' 18"	13 m 50 s
13	200° 27' 08"	0.52"	198° 53' 04"	-7° 59' 15"	0.9976779	16'01.86"	23° 26' 18"	13 m 51 s
14	200° 29' 36"	0.52"	198° 55' 23"	-8° 00' 10"	0.9976664	16'01.87"	23° 26' 18"	13 m 51 s
15	200° 32' 05"	0.51"	198° 57' 42"	-8° 01' 06"	0.9976548	16'01.89"	23° 26' 18"	13 m 52 s
16	200° 34' 33"	0.51"	199° 00' 01"	-8° 02' 02"	0.9976432	16'01.90"	23° 26' 18"	13 m 53 s
17	200° 37' 02"	0.51"	199° 02' 20"	-8° 02' 58"	0.9976316	16'01.91"	23° 26' 18"	13 m 53 s
18	200° 39' 30"	0.51"	199° 04' 39"	-8° 03' 54"	0.9976201	16'01.92"	23° 26' 18"	13 m 54 s
19	200° 41' 59"	0.50"	199° 06' 58"	-8° 04' 50"	0.9976085	16'01.93"	23° 26' 18"	13 m 54 s
20	200° 44' 27"	0.50"	199° 09' 17"	-8° 05' 46"	0.9975970	16'01.94"	23° 26' 18"	13 m 55 s
21	200° 46' 56"	0.50"	199° 11' 36"	-8° 06' 41"	0.9975854	16'01.95"	23° 26' 18"	13 m 55 s
22	200° 49' 24"	0.50"	199° 13' 55"	-8° 07' 37"	0.9975738	16'01.96"	23° 26' 18"	13 m 56 s
23	200° 51' 53"	0.49"	199° 16' 14"	-8° 08' 33"	0.9975623	16'01.98"	23° 26' 18"	13 m 57 s
24	200° 54' 21"	0.49"	199° 18' 33"	-8° 09' 29"	0.9975507	16'01.99"	23° 26' 18"	13 m 57 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	100° 11' 03"	4° 49' 33"	101° 29' 42"	27° 51' 32"	0° 58' 45"	16' 00.59"	93° 44' 13"	0.58548
1	100° 45' 53"	4° 48' 21"	102° 08' 42"	27° 47' 29"	0° 58' 43"	16' 00.07"	94° 2' 29"	0.58086
2	101° 20' 40"	4° 47' 06"	102° 47' 37"	27° 43' 16"	0° 58' 41"	15' 59.56"	94° 20' 40"	0.57624
3	101° 55' 25"	4° 45' 50"	103° 26' 26"	27° 38' 52"	0° 58' 39"	15' 59.04"	94° 38' 44"	0.57162
4	102° 30' 08"	4° 44' 33"	104° 05' 09"	27° 34' 18"	0° 58' 38"	15' 58.52"	94° 56' 42"	0.56699
5	103° 04' 48"	4° 43' 13"	104° 43' 46"	27° 29' 33"	0° 58' 36"	15' 58.01"	95° 14' 34"	0.56237
6	103° 39' 26"	4° 41' 52"	105° 22' 18"	27° 24' 38"	0° 58' 34"	15' 57.49"	95° 32' 19"	0.55775
7	104° 14' 01"	4° 40' 30"	106° 00' 43"	27° 19' 33"	0° 58' 32"	15' 56.97"	95° 49' 57"	0.55312
8	104° 48' 34"	4° 39' 06"	106° 39' 02"	27° 14' 17"	0° 58' 30"	15' 56.46"	96° 7' 29"	0.54850
9	105° 23' 04"	4° 37' 40"	107° 17' 16"	27° 08' 52"	0° 58' 28"	15' 55.94"	96° 24' 54"	0.54388
10	105° 57' 32"	4° 36' 13"	107° 55' 22"	27° 03' 16"	0° 58' 26"	15' 55.42"	96° 42' 12"	0.53926
11	106° 31' 58"	4° 34' 44"	108° 33' 23"	26° 57' 31"	0° 58' 24"	15' 54.90"	96° 59' 23"	0.53465
12	107° 06' 21"	4° 33' 13"	109° 11' 17"	26° 51' 36"	0° 58' 22"	15' 54.39"	97° 16' 26"	0.53003
13	107° 40' 42"	4° 31' 42"	109° 49' 05"	26° 45' 31"	0° 58' 20"	15' 53.87"	97° 33' 23"	0.52542
14	108° 15' 01"	4° 30' 08"	110° 26' 46"	26° 39' 17"	0° 58' 19"	15' 53.35"	97° 50' 11"	0.52081
15	108° 49' 17"	4° 28' 33"	111° 04' 20"	26° 32' 53"	0° 58' 17"	15' 52.84"	98° 6' 53"	0.51621
16	109° 23' 30"	4° 26' 57"	111° 41' 48"	26° 26' 19"	0° 58' 15"	15' 52.32"	98° 23' 26"	0.51161
17	109° 57' 42"	4° 25' 19"	112° 19' 09"	26° 19' 37"	0° 58' 13"	15' 51.81"	98° 39' 52"	0.50701
18	110° 31' 51"	4° 23' 39"	112° 56' 23"	26° 12' 45"	0° 58' 11"	15' 51.29"	98° 56' 10"	0.50242
19	111° 05' 57"	4° 21' 58"	113° 33' 30"	26° 05' 44"	0° 58' 09"	15' 50.78"	99° 12' 20"	0.49783
20	111° 40' 01"	4° 20' 16"	114° 10' 30"	25° 58' 34"	0° 58' 07"	15' 50.26"	99° 28' 23"	0.49325
21	112° 14' 03"	4° 18' 33"	114° 47' 24"	25° 51' 15"	0° 58' 05"	15' 49.75"	99° 44' 17"	0.48867
22	112° 48' 03"	4° 16' 47"	115° 24' 10"	25° 43' 48"	0° 58' 03"	15' 49.24"	100° 0' 03"	0.48410
23	113° 21' 60"	4° 15' 01"	116° 00' 50"	25° 36' 11"	0° 58' 02"	15' 48.72"	100° 15' 40"	0.47954
24	113° 55' 55"	4° 13' 13"	116° 37' 22"	25° 28' 26"	0° 57' 60"	15' 48.21"	100° 31' 10"	0.47498

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	200° 54' 21"	0.49"	199° 18' 33"	-8° 09' 29"	0.9975507	16'01.99"	23° 26' 18"	13 m 57 s
1	200° 56' 50"	0.49"	199° 20' 52"	-8° 10' 24"	0.9975392	16'02.00"	23° 26' 18"	13 m 58 s
2	200° 59' 19"	0.48"	199° 23' 12"	-8° 11' 20"	0.9975276	16'02.01"	23° 26' 18"	13 m 58 s
3	201° 01' 47"	0.48"	199° 25' 31"	-8° 12' 16"	0.9975160	16'02.02"	23° 26' 18"	13 m 59 s
4	201° 04' 16"	0.48"	199° 27' 50"	-8° 13' 12"	0.9975045	16'02.03"	23° 26' 18"	13 m 60 s
5	201° 06' 44"	0.48"	199° 30' 09"	-8° 14' 07"	0.9974929	16'02.04"	23° 26' 18"	14 m 00 s
6	201° 09' 13"	0.47"	199° 32' 28"	-8° 15' 03"	0.9974814	16'02.05"	23° 26' 19"	14 m 01 s
7	201° 11' 41"	0.47"	199° 34' 47"	-8° 15' 59"	0.9974698	16'02.06"	23° 26' 19"	14 m 01 s
8	201° 14' 10"	0.47"	199° 37' 07"	-8° 16' 54"	0.9974583	16'02.08"	23° 26' 19"	14 m 02 s
9	201° 16' 39"	0.46"	199° 39' 26"	-8° 17' 50"	0.9974467	16'02.09"	23° 26' 19"	14 m 03 s
10	201° 19' 07"	0.46"	199° 41' 45"	-8° 18' 46"	0.9974352	16'02.10"	23° 26' 19"	14 m 03 s
11	201° 21' 36"	0.46"	199° 44' 04"	-8° 19' 41"	0.9974236	16'02.11"	23° 26' 19"	14 m 04 s
12	201° 24' 04"	0.45"	199° 46' 24"	-8° 20' 37"	0.9974121	16'02.12"	23° 26' 19"	14 m 04 s
13	201° 26' 33"	0.45"	199° 48' 43"	-8° 21' 33"	0.9974005	16'02.13"	23° 26' 19"	14 m 05 s
14	201° 29' 02"	0.45"	199° 51' 02"	-8° 22' 28"	0.9973890	16'02.14"	23° 26' 19"	14 m 05 s
15	201° 31' 30"	0.44"	199° 53' 21"	-8° 23' 24"	0.9973774	16'02.15"	23° 26' 19"	14 m 06 s
16	201° 33' 59"	0.44"	199° 55' 41"	-8° 24' 19"	0.9973659	16'02.16"	23° 26' 19"	14 m 07 s
17	201° 36' 27"	0.44"	199° 58' 00"	-8° 25' 15"	0.9973544	16'02.18"	23° 26' 19"	14 m 07 s
18	201° 38' 56"	0.43"	200° 00' 19"	-8° 26' 11"	0.9973428	16'02.19"	23° 26' 19"	14 m 08 s
19	201° 41' 25"	0.43"	200° 02' 39"	-8° 27' 06"	0.9973313	16'02.20"	23° 26' 19"	14 m 08 s
20	201° 43' 53"	0.43"	200° 04' 58"	-8° 28' 02"	0.9973197	16'02.21"	23° 26' 19"	14 m 09 s
21	201° 46' 22"	0.42"	200° 07' 18"	-8° 28' 57"	0.9973082	16'02.22"	23° 26' 19"	14 m 09 s
22	201° 48' 51"	0.42"	200° 09' 37"	-8° 29' 53"	0.9972967	16'02.23"	23° 26' 19"	14 m 10 s
23	201° 51' 19"	0.42"	200° 11' 56"	-8° 30' 48"	0.9972851	16'02.24"	23° 26' 19"	14 m 11 s
24	201° 53' 48"	0.41"	200° 14' 16"	-8° 31' 44"	0.9972736	16'02.25"	23° 26' 19"	14 m 11 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	113° 55' 55"	4° 13' 13"	116° 37' 22"	25° 28' 26"	0° 57' 60"	15' 48.21"	100° 31' 10"	0.47498
1	114° 29' 47"	4° 11' 24"	117° 13' 48"	25° 20' 33"	0° 57' 58"	15' 47.70"	100° 46' 31"	0.47043
2	115° 03' 37"	4° 09' 33"	117° 50' 06"	25° 12' 31"	0° 57' 56"	15' 47.19"	101° 1' 43"	0.46589
3	115° 37' 25"	4° 07' 42"	118° 26' 17"	25° 04' 21"	0° 57' 54"	15' 46.69"	101° 16' 47"	0.46136
4	116° 11' 11"	4° 05' 48"	119° 02' 21"	24° 56' 02"	0° 57' 52"	15' 46.18"	101° 31' 42"	0.45683
5	116° 44' 54"	4° 03' 54"	119° 38' 18"	24° 47' 36"	0° 57' 50"	15' 45.67"	101° 46' 29"	0.45232
6	117° 18' 35"	4° 01' 58"	120° 14' 07"	24° 39' 01"	0° 57' 49"	15' 45.17"	102° 1' 07"	0.44781
7	117° 52' 14"	4° 00' 01"	120° 49' 50"	24° 30' 19"	0° 57' 47"	15' 44.66"	102° 15' 36"	0.44331
8	118° 25' 50"	3° 58' 03"	121° 25' 25"	24° 21' 28"	0° 57' 45"	15' 44.16"	102° 29' 57"	0.43882
9	118° 59' 24"	3° 56' 03"	122° 00' 53"	24° 12' 30"	0° 57' 43"	15' 43.66"	102° 44' 08"	0.43435
10	119° 32' 56"	3° 54' 03"	122° 36' 13"	24° 03' 25"	0° 57' 41"	15' 43.16"	102° 58' 10"	0.42988
11	120° 06' 26"	3° 52' 01"	123° 11' 27"	23° 54' 11"	0° 57' 39"	15' 42.66"	103° 12' 04"	0.42542
12	120° 39' 53"	3° 49' 58"	123° 46' 33"	23° 44' 51"	0° 57' 37"	15' 42.16"	103° 25' 48"	0.42097
13	121° 13' 18"	3° 47' 53"	124° 21' 32"	23° 35' 23"	0° 57' 36"	15' 41.66"	103° 39' 24"	0.41654
14	121° 46' 41"	3° 45' 48"	124° 56' 24"	23° 25' 48"	0° 57' 34"	15' 41.17"	103° 52' 50"	0.41212
15	122° 20' 02"	3° 43' 42"	125° 31' 08"	23° 16' 06"	0° 57' 32"	15' 40.67"	104° 6' 07"	0.40770
16	122° 53' 20"	3° 41' 34"	126° 05' 46"	23° 06' 16"	0° 57' 30"	15' 40.18"	104° 19' 15"	0.40330
17	123° 26' 37"	3° 39' 25"	126° 40' 16"	22° 56' 20"	0° 57' 28"	15' 39.69"	104° 32' 14"	0.39892
18	123° 59' 51"	3° 37' 15"	127° 14' 39"	22° 46' 17"	0° 57' 27"	15' 39.20"	104° 45' 03"	0.39454
19	124° 33' 03"	3° 35' 04"	127° 48' 55"	22° 36' 08"	0° 57' 25"	15' 38.71"	104° 57' 43"	0.39018
20	125° 06' 13"	3° 32' 52"	128° 23' 03"	22° 25' 51"	0° 57' 23"	15' 38.22"	105° 10' 14"	0.38583
21	125° 39' 20"	3° 30' 39"	128° 57' 05"	22° 15' 28"	0° 57' 21"	15' 37.74"	105° 22' 36"	0.38150
22	126° 12' 26"	3° 28' 25"	129° 30' 59"	22° 04' 59"	0° 57' 19"	15' 37.26"	105° 34' 48"	0.37718
23	126° 45' 29"	3° 26' 10"	130° 04' 47"	21° 54' 23"	0° 57' 18"	15' 36.77"	105° 46' 50"	0.37288
24	127° 18' 30"	3° 23' 54"	130° 38' 27"	21° 43' 41"	0° 57' 16"	15' 36.29"	105° 58' 43"	0.36858

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	201° 53' 48"	0.41"	200° 14' 16"	-8° 31' 44"	0.9972736	16'02.25"	23° 26' 19"	14 m 11 s
1	201° 56' 16"	0.41"	200° 16' 35"	-8° 32' 39"	0.9972620	16'02.26"	23° 26' 19"	14 m 12 s
2	201° 58' 45"	0.40"	200° 18' 55"	-8° 33' 35"	0.9972505	16'02.28"	23° 26' 19"	14 m 12 s
3	202° 01' 14"	0.40"	200° 21' 14"	-8° 34' 30"	0.9972390	16'02.29"	23° 26' 19"	14 m 13 s
4	202° 03' 42"	0.40"	200° 23' 34"	-8° 35' 26"	0.9972274	16'02.30"	23° 26' 19"	14 m 13 s
5	202° 06' 11"	0.39"	200° 25' 53"	-8° 36' 21"	0.9972159	16'02.31"	23° 26' 19"	14 m 14 s
6	202° 08' 40"	0.39"	200° 28' 13"	-8° 37' 16"	0.9972044	16'02.32"	23° 26' 19"	14 m 15 s
7	202° 11' 08"	0.38"	200° 30' 32"	-8° 38' 12"	0.9971928	16'02.33"	23° 26' 19"	14 m 15 s
8	202° 13' 37"	0.38"	200° 32' 52"	-8° 39' 07"	0.9971813	16'02.34"	23° 26' 19"	14 m 16 s
9	202° 16' 06"	0.38"	200° 35' 12"	-8° 40' 03"	0.9971698	16'02.35"	23° 26' 19"	14 m 16 s
10	202° 18' 35"	0.37"	200° 37' 31"	-8° 40' 58"	0.9971582	16'02.36"	23° 26' 19"	14 m 17 s
11	202° 21' 03"	0.37"	200° 39' 51"	-8° 41' 53"	0.9971467	16'02.38"	23° 26' 19"	14 m 17 s
12	202° 23' 32"	0.36"	200° 42' 10"	-8° 42' 49"	0.9971352	16'02.39"	23° 26' 19"	14 m 18 s
13	202° 26' 01"	0.36"	200° 44' 30"	-8° 43' 44"	0.9971236	16'02.40"	23° 26' 19"	14 m 18 s
14	202° 28' 29"	0.36"	200° 46' 50"	-8° 44' 39"	0.9971121	16'02.41"	23° 26' 19"	14 m 19 s
15	202° 30' 58"	0.35"	200° 49' 09"	-8° 45' 35"	0.9971006	16'02.42"	23° 26' 19"	14 m 20 s
16	202° 33' 27"	0.35"	200° 51' 29"	-8° 46' 30"	0.9970890	16'02.43"	23° 26' 19"	14 m 20 s
17	202° 35' 55"	0.34"	200° 53' 49"	-8° 47' 25"	0.9970775	16'02.44"	23° 26' 19"	14 m 21 s
18	202° 38' 24"	0.34"	200° 56' 08"	-8° 48' 20"	0.9970660	16'02.45"	23° 26' 19"	14 m 21 s
19	202° 40' 53"	0.33"	200° 58' 28"	-8° 49' 16"	0.9970544	16'02.46"	23° 26' 19"	14 m 22 s
20	202° 43' 22"	0.33"	201° 00' 48"	-8° 50' 11"	0.9970429	16'02.48"	23° 26' 19"	14 m 22 s
21	202° 45' 50"	0.33"	201° 03' 08"	-8° 51' 06"	0.9970314	16'02.49"	23° 26' 19"	14 m 23 s
22	202° 48' 19"	0.32"	201° 05' 27"	-8° 52' 01"	0.9970199	16'02.50"	23° 26' 19"	14 m 23 s
23	202° 50' 48"	0.32"	201° 07' 47"	-8° 52' 56"	0.9970083	16'02.51"	23° 26' 19"	14 m 24 s
24	202° 53' 17"	0.31"	201° 10' 07"	-8° 53' 52"	0.9969968	16'02.52"	23° 26' 19"	14 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	127° 18' 30"	3° 23' 54"	130° 38' 27"	21° 43' 41"	0° 57' 16"	15' 36.29"	105° 58' 43"	0.36858
1	127° 51' 30"	3° 21' 37"	131° 12' 00"	21° 32' 53"	0° 57' 14"	15' 35.81"	106° 10' 27"	0.36431
2	128° 24' 27"	3° 19' 19"	131° 45' 27"	21° 21' 59"	0° 57' 12"	15' 35.34"	106° 22' 01"	0.36005
3	128° 57' 22"	3° 16' 59"	132° 18' 46"	21° 10' 59"	0° 57' 11"	15' 34.86"	106° 33' 26"	0.35580
4	129° 30' 15"	3° 14' 39"	132° 51' 59"	20° 59' 54"	0° 57' 09"	15' 34.39"	106° 44' 41"	0.35157
5	130° 03' 06"	3° 12' 19"	133° 25' 05"	20° 48' 42"	0° 57' 07"	15' 33.92"	106° 55' 47"	0.34736
6	130° 35' 54"	3° 09' 57"	133° 58' 03"	20° 37' 25"	0° 57' 06"	15' 33.45"	107° 6' 43"	0.34316
7	131° 08' 41"	3° 07' 34"	134° 30' 55"	20° 26' 02"	0° 57' 04"	15' 32.98"	107° 17' 30"	0.33898
8	131° 41' 26"	3° 05' 10"	135° 03' 41"	20° 14' 33"	0° 57' 02"	15' 32.51"	107° 28' 07"	0.33482
9	132° 14' 09"	3° 02' 46"	135° 36' 19"	20° 02' 59"	0° 57' 00"	15' 32.05"	107° 38' 34"	0.33067
10	132° 46' 50"	3° 00' 21"	136° 08' 51"	19° 51' 20"	0° 56' 59"	15' 31.59"	107° 48' 52"	0.32654
11	133° 19' 29"	2° 57' 55"	136° 41' 17"	19° 39' 36"	0° 56' 57"	15' 31.12"	107° 58' 60"	0.32243
12	133° 52' 05"	2° 55' 28"	137° 13' 35"	19° 27' 47"	0° 56' 55"	15' 30.67"	108° 8' 58"	0.31833
13	134° 24' 40"	2° 52' 60"	137° 45' 48"	19° 15' 52"	0° 56' 54"	15' 30.21"	108° 18' 47"	0.31426
14	134° 57' 13"	2° 50' 31"	138° 17' 53"	19° 03' 53"	0° 56' 52"	15' 29.75"	108° 28' 26"	0.31020
15	135° 29' 44"	2° 48' 02"	138° 49' 53"	18° 51' 48"	0° 56' 50"	15' 29.30"	108° 37' 56"	0.30616
16	136° 02' 13"	2° 45' 32"	139° 21' 46"	18° 39' 39"	0° 56' 49"	15' 28.85"	108° 47' 16"	0.30214
17	136° 34' 40"	2° 43' 01"	139° 53' 33"	18° 27' 25"	0° 56' 47"	15' 28.40"	108° 56' 26"	0.29814
18	137° 07' 06"	2° 40' 30"	140° 25' 13"	18° 15' 07"	0° 56' 45"	15' 27.95"	109° 5' 26"	0.29415
19	137° 39' 29"	2° 37' 57"	140° 56' 47"	18° 02' 44"	0° 56' 44"	15' 27.51"	109° 14' 17"	0.29019
20	138° 11' 51"	2° 35' 24"	141° 28' 15"	17° 50' 17"	0° 56' 42"	15' 27.07"	109° 22' 58"	0.28625
21	138° 44' 10"	2° 32' 51"	141° 59' 37"	17° 37' 45"	0° 56' 40"	15' 26.63"	109° 31' 29"	0.28232
22	139° 16' 28"	2° 30' 17"	142° 30' 53"	17° 25' 09"	0° 56' 39"	15' 26.19"	109° 39' 51"	0.27842
23	139° 48' 44"	2° 27' 42"	143° 02' 03"	17° 12' 29"	0° 56' 37"	15' 25.75"	109° 48' 03"	0.27454
24	140° 20' 59"	2° 25' 06"	143° 33' 08"	16° 59' 45"	0° 56' 36"	15' 25.32"	109° 56' 05"	0.27068

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	202° 53' 17"	0.31"	201° 10' 07"	-8° 53' 52"	0.9969968	16'02.52"	23° 26' 19"	14 m 24 s
1	202° 55' 45"	0.31"	201° 12' 27"	-8° 54' 47"	0.9969853	16'02.53"	23° 26' 19"	14 m 25 s
2	202° 58' 14"	0.30"	201° 14' 47"	-8° 55' 42"	0.9969737	16'02.54"	23° 26' 19"	14 m 26 s
3	203° 00' 43"	0.30"	201° 17' 07"	-8° 56' 37"	0.9969622	16'02.55"	23° 26' 19"	14 m 26 s
4	203° 03' 12"	0.29"	201° 19' 26"	-8° 57' 32"	0.9969507	16'02.57"	23° 26' 19"	14 m 27 s
5	203° 05' 40"	0.29"	201° 21' 46"	-8° 58' 27"	0.9969392	16'02.58"	23° 26' 19"	14 m 27 s
6	203° 08' 09"	0.28"	201° 24' 06"	-8° 59' 22"	0.9969276	16'02.59"	23° 26' 19"	14 m 28 s
7	203° 10' 38"	0.28"	201° 26' 26"	-9° 00' 18"	0.9969161	16'02.60"	23° 26' 19"	14 m 28 s
8	203° 13' 07"	0.27"	201° 28' 46"	-9° 01' 13"	0.9969046	16'02.61"	23° 26' 19"	14 m 29 s
9	203° 15' 35"	0.27"	201° 31' 06"	-9° 02' 08"	0.9968931	16'02.62"	23° 26' 19"	14 m 29 s
10	203° 18' 04"	0.27"	201° 33' 26"	-9° 03' 03"	0.9968815	16'02.63"	23° 26' 19"	14 m 30 s
11	203° 20' 33"	0.26"	201° 35' 46"	-9° 03' 58"	0.9968700	16'02.64"	23° 26' 19"	14 m 30 s
12	203° 23' 02"	0.26"	201° 38' 06"	-9° 04' 53"	0.9968585	16'02.65"	23° 26' 19"	14 m 31 s
13	203° 25' 31"	0.25"	201° 40' 26"	-9° 05' 48"	0.9968470	16'02.67"	23° 26' 19"	14 m 31 s
14	203° 27' 59"	0.25"	201° 42' 46"	-9° 06' 43"	0.9968354	16'02.68"	23° 26' 19"	14 m 32 s
15	203° 30' 28"	0.24"	201° 45' 06"	-9° 07' 38"	0.9968239	16'02.69"	23° 26' 19"	14 m 33 s
16	203° 32' 57"	0.24"	201° 47' 26"	-9° 08' 33"	0.9968124	16'02.70"	23° 26' 19"	14 m 33 s
17	203° 35' 26"	0.23"	201° 49' 46"	-9° 09' 28"	0.9968009	16'02.71"	23° 26' 19"	14 m 34 s
18	203° 37' 55"	0.23"	201° 52' 06"	-9° 10' 23"	0.9967893	16'02.72"	23° 26' 19"	14 m 34 s
19	203° 40' 23"	0.22"	201° 54' 26"	-9° 11' 18"	0.9967778	16'02.73"	23° 26' 19"	14 m 35 s
20	203° 42' 52"	0.22"	201° 56' 46"	-9° 12' 13"	0.9967663	16'02.74"	23° 26' 19"	14 m 35 s
21	203° 45' 21"	0.21"	201° 59' 07"	-9° 13' 07"	0.9967548	16'02.75"	23° 26' 19"	14 m 36 s
22	203° 47' 50"	0.21"	202° 01' 27"	-9° 14' 02"	0.9967432	16'02.77"	23° 26' 19"	14 m 36 s
23	203° 50' 19"	0.20"	202° 03' 47"	-9° 14' 57"	0.9967317	16'02.78"	23° 26' 19"	14 m 37 s
24	203° 52' 48"	0.20"	202° 06' 07"	-9° 15' 52"	0.9967202	16'02.79"	23° 26' 19"	14 m 37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	140° 20' 59"	2° 25' 06"	143° 33' 08"	16° 59' 45"	0° 56' 36"	15' 25.32"	109° 56' 05"	0.27068
1	140° 53' 11"	2° 22' 30"	144° 04' 06"	16° 46' 57"	0° 56' 34"	15' 24.88"	110° 3' 57"	0.26684
2	141° 25' 22"	2° 19' 53"	144° 34' 58"	16° 34' 04"	0° 56' 33"	15' 24.45"	110° 11' 39"	0.26302
3	141° 57' 30"	2° 17' 16"	145° 05' 45"	16° 21' 08"	0° 56' 31"	15' 24.03"	110° 19' 12"	0.25922
4	142° 29' 37"	2° 14' 38"	145° 36' 26"	16° 08' 09"	0° 56' 29"	15' 23.60"	110° 26' 35"	0.25544
5	143° 01' 43"	2° 11' 59"	146° 07' 02"	15° 55' 05"	0° 56' 28"	15' 23.18"	110° 33' 48"	0.25168
6	143° 33' 46"	2° 09' 20"	146° 37' 32"	15° 41' 58"	0° 56' 26"	15' 22.75"	110° 40' 51"	0.24795
7	144° 05' 48"	2° 06' 40"	147° 07' 57"	15° 28' 47"	0° 56' 25"	15' 22.33"	110° 47' 45"	0.24424
8	144° 37' 48"	2° 04' 00"	147° 38' 16"	15° 15' 33"	0° 56' 23"	15' 21.92"	110° 54' 28"	0.24055
9	145° 09' 47"	2° 01' 20"	148° 08' 30"	15° 02' 15"	0° 56' 22"	15' 21.50"	111° 1' 02"	0.23688
10	145° 41' 43"	1° 58' 39"	148° 38' 38"	14° 48' 55"	0° 56' 20"	15' 21.09"	111° 7' 26"	0.23324
11	146° 13' 39"	1° 55' 57"	149° 08' 42"	14° 35' 30"	0° 56' 19"	15' 20.68"	111° 13' 40"	0.22962
12	146° 45' 32"	1° 53' 15"	149° 38' 40"	14° 22' 03"	0° 56' 17"	15' 20.27"	111° 19' 44"	0.22602
13	147° 17' 24"	1° 50' 32"	150° 08' 33"	14° 08' 33"	0° 56' 16"	15' 19.86"	111° 25' 38"	0.22245
14	147° 49' 14"	1° 47' 50"	150° 38' 21"	13° 54' 59"	0° 56' 14"	15' 19.46"	111° 31' 22"	0.21890
15	148° 21' 02"	1° 45' 06"	151° 08' 05"	13° 41' 23"	0° 56' 13"	15' 19.06"	111° 36' 56"	0.21537
16	148° 52' 49"	1° 42' 23"	151° 37' 43"	13° 27' 44"	0° 56' 11"	15' 18.66"	111° 42' 20"	0.21187
17	149° 24' 35"	1° 39' 38"	152° 07' 17"	13° 14' 02"	0° 56' 10"	15' 18.26"	111° 47' 34"	0.20839
18	149° 56' 18"	1° 36' 54"	152° 36' 46"	13° 00' 17"	0° 56' 08"	15' 17.86"	111° 52' 39"	0.20493
19	150° 28' 01"	1° 34' 09"	153° 06' 10"	12° 46' 29"	0° 56' 07"	15' 17.47"	111° 57' 33"	0.20150
20	150° 59' 41"	1° 31' 24"	153° 35' 30"	12° 32' 39"	0° 56' 05"	15' 17.08"	112° 2' 17"	0.19810
21	151° 31' 20"	1° 28' 38"	154° 04' 45"	12° 18' 47"	0° 56' 04"	15' 16.69"	112° 6' 50"	0.19471
22	152° 02' 58"	1° 25' 53"	154° 33' 56"	12° 04' 52"	0° 56' 03"	15' 16.30"	112° 11' 14"	0.19136
23	152° 34' 34"	1° 23' 06"	155° 03' 02"	11° 50' 54"	0° 56' 01"	15' 15.92"	112° 15' 28"	0.18803
24	153° 06' 08"	1° 20' 20"	155° 32' 05"	11° 36' 55"	0° 55' 60"	15' 15.53"	112° 19' 31"	0.18472

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	203° 52' 48"	0.20"	202° 06' 07"	-9° 15' 52"	0.9967202	16'02.79"	23° 26' 19"	14 m 37 s
1	203° 55' 16"	0.19"	202° 08' 27"	-9° 16' 47"	0.9967087	16'02.80"	23° 26' 19"	14 m 38 s
2	203° 57' 45"	0.19"	202° 10' 47"	-9° 17' 42"	0.9966971	16'02.81"	23° 26' 19"	14 m 38 s
3	204° 00' 14"	0.18"	202° 13' 08"	-9° 18' 37"	0.9966856	16'02.82"	23° 26' 19"	14 m 39 s
4	204° 02' 43"	0.17"	202° 15' 28"	-9° 19' 31"	0.9966741	16'02.83"	23° 26' 19"	14 m 39 s
5	204° 05' 12"	0.17"	202° 17' 48"	-9° 20' 26"	0.9966626	16'02.84"	23° 26' 19"	14 m 40 s
6	204° 07' 41"	0.16"	202° 20' 08"	-9° 21' 21"	0.9966510	16'02.85"	23° 26' 19"	14 m 40 s
7	204° 10' 10"	0.16"	202° 22' 29"	-9° 22' 16"	0.9966395	16'02.87"	23° 26' 19"	14 m 41 s
8	204° 12' 38"	0.15"	202° 24' 49"	-9° 23' 10"	0.9966280	16'02.88"	23° 26' 19"	14 m 41 s
9	204° 15' 07"	0.15"	202° 27' 09"	-9° 24' 05"	0.9966165	16'02.89"	23° 26' 19"	14 m 42 s
10	204° 17' 36"	0.14"	202° 29' 30"	-9° 24' 60"	0.9966049	16'02.90"	23° 26' 19"	14 m 42 s
11	204° 20' 05"	0.14"	202° 31' 50"	-9° 25' 55"	0.9965934	16'02.91"	23° 26' 19"	14 m 43 s
12	204° 22' 34"	0.13"	202° 34' 10"	-9° 26' 49"	0.9965819	16'02.92"	23° 26' 19"	14 m 43 s
13	204° 25' 03"	0.13"	202° 36' 31"	-9° 27' 44"	0.9965704	16'02.93"	23° 26' 19"	14 m 44 s
14	204° 27' 32"	0.12"	202° 38' 51"	-9° 28' 39"	0.9965588	16'02.94"	23° 26' 19"	14 m 44 s
15	204° 30' 01"	0.12"	202° 41' 12"	-9° 29' 33"	0.9965473	16'02.95"	23° 26' 19"	14 m 45 s
16	204° 32' 29"	0.11"	202° 43' 32"	-9° 30' 28"	0.9965358	16'02.97"	23° 26' 19"	14 m 45 s
17	204° 34' 58"	0.11"	202° 45' 52"	-9° 31' 23"	0.9965243	16'02.98"	23° 26' 19"	14 m 46 s
18	204° 37' 27"	0.10"	202° 48' 13"	-9° 32' 17"	0.9965127	16'02.99"	23° 26' 19"	14 m 46 s
19	204° 39' 56"	0.10"	202° 50' 33"	-9° 33' 12"	0.9965012	16'03.00"	23° 26' 19"	14 m 47 s
20	204° 42' 25"	0.09"	202° 52' 54"	-9° 34' 06"	0.9964897	16'03.01"	23° 26' 19"	14 m 47 s
21	204° 44' 54"	0.08"	202° 55' 14"	-9° 35' 01"	0.9964782	16'03.02"	23° 26' 19"	14 m 48 s
22	204° 47' 23"	0.08"	202° 57' 35"	-9° 35' 56"	0.9964666	16'03.03"	23° 26' 19"	14 m 48 s
23	204° 49' 52"	0.07"	202° 59' 55"	-9° 36' 50"	0.9964551	16'03.04"	23° 26' 19"	14 m 49 s
24	204° 52' 21"	0.07"	203° 02' 16"	-9° 37' 45"	0.9964436	16'03.06"	23° 26' 19"	14 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	153° 06' 08"	1° 20' 20"	155° 32' 05"	11° 36' 55"	0° 55' 60"	15' 15.53"	112° 19' 31"	0.18472
1	153° 37' 41"	1° 17' 33"	156° 01' 03"	11° 22' 53"	0° 55' 58"	15' 15.15"	112° 23' 24"	0.18144
2	154° 09' 13"	1° 14' 46"	156° 29' 56"	11° 08' 48"	0° 55' 57"	15' 14.78"	112° 27' 06"	0.17819
3	154° 40' 43"	1° 11' 59"	156° 58' 46"	10° 54' 42"	0° 55' 56"	15' 14.40"	112° 30' 39"	0.17496
4	155° 12' 12"	1° 09' 12"	157° 27' 32"	10° 40' 34"	0° 55' 54"	15' 14.03"	112° 34' 01"	0.17176
5	155° 43' 39"	1° 06' 24"	157° 56' 14"	10° 26' 23"	0° 55' 53"	15' 13.66"	112° 37' 12"	0.16858
6	156° 15' 05"	1° 03' 36"	158° 24' 52"	10° 12' 11"	0° 55' 52"	15' 13.29"	112° 40' 13"	0.16543
7	156° 46' 29"	1° 00' 48"	158° 53' 26"	9° 57' 57"	0° 55' 50"	15' 12.92"	112° 43' 03"	0.16230
8	157° 17' 52"	0° 58' 00"	159° 21' 56"	9° 43' 41"	0° 55' 49"	15' 12.56"	112° 45' 43"	0.15921
9	157° 49' 14"	0° 55' 12"	159° 50' 23"	9° 29' 23"	0° 55' 48"	15' 12.19"	112° 48' 12"	0.15614
10	158° 20' 34"	0° 52' 23"	160° 18' 46"	9° 15' 04"	0° 55' 46"	15' 11.83"	112° 50' 31"	0.15309
11	158° 51' 53"	0° 49' 35"	160° 47' 06"	9° 00' 43"	0° 55' 45"	15' 11.48"	112° 52' 38"	0.15008
12	159° 23' 10"	0° 46' 46"	161° 15' 22"	8° 46' 20"	0° 55' 44"	15' 11.12"	112° 54' 35"	0.14709
13	159° 54' 26"	0° 43' 57"	161° 43' 35"	8° 31' 56"	0° 55' 42"	15' 10.77"	112° 56' 20"	0.14412
14	160° 25' 41"	0° 41' 08"	162° 11' 45"	8° 17' 31"	0° 55' 41"	15' 10.42"	112° 57' 55"	0.14119
15	160° 56' 54"	0° 38' 19"	162° 39' 52"	8° 03' 04"	0° 55' 40"	15' 10.07"	112° 59' 18"	0.13828
16	161° 28' 07"	0° 35' 30"	163° 07' 55"	7° 48' 36"	0° 55' 38"	15' 09.72"	113° 0' 30"	0.13540
17	161° 59' 18"	0° 32' 41"	163° 35' 55"	7° 34' 07"	0° 55' 37"	15' 09.38"	113° 1' 31"	0.13255
18	162° 30' 27"	0° 29' 52"	164° 03' 52"	7° 19' 36"	0° 55' 36"	15' 09.03"	113° 2' 20"	0.12973
19	163° 01' 35"	0° 27' 03"	164° 31' 47"	7° 05' 04"	0° 55' 35"	15' 08.69"	113° 2' 58"	0.12693
20	163° 32' 43"	0° 24' 14"	164° 59' 38"	6° 50' 32"	0° 55' 33"	15' 08.36"	113° 3' 24"	0.12416
21	164° 03' 48"	0° 21' 24"	165° 27' 27"	6° 35' 58"	0° 55' 32"	15' 08.02"	113° 3' 38"	0.12142
22	164° 34' 53"	0° 18' 35"	165° 55' 13"	6° 21' 23"	0° 55' 31"	15' 07.69"	113° 3' 41"	0.11871
23	165° 05' 56"	0° 15' 46"	166° 22' 56"	6° 06' 47"	0° 55' 30"	15' 07.35"	113° 3' 31"	0.11603
24	165° 36' 58"	0° 12' 57"	166° 50' 37"	5° 52' 11"	0° 55' 29"	15' 07.02"	113° 3' 09"	0.11338

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	204° 52' 21"	0.07"	203° 02' 16"	-9° 37' 45"	0.9964436	16'03.06"	23° 26' 19"	14 m 49 s
1	204° 54' 50"	0.06"	203° 04' 37"	-9° 38' 39"	0.9964321	16'03.07"	23° 26' 19"	14 m 50 s
2	204° 57' 19"	0.06"	203° 06' 57"	-9° 39' 34"	0.9964205	16'03.08"	23° 26' 19"	14 m 50 s
3	204° 59' 48"	0.05"	203° 09' 18"	-9° 40' 28"	0.9964090	16'03.09"	23° 26' 19"	14 m 51 s
4	205° 02' 17"	0.05"	203° 11' 38"	-9° 41' 23"	0.9963975	16'03.10"	23° 26' 19"	14 m 51 s
5	205° 04' 46"	0.04"	203° 13' 59"	-9° 42' 17"	0.9963859	16'03.11"	23° 26' 19"	14 m 52 s
6	205° 07' 14"	0.04"	203° 16' 20"	-9° 43' 11"	0.9963744	16'03.12"	23° 26' 19"	14 m 52 s
7	205° 09' 43"	0.03"	203° 18' 40"	-9° 44' 06"	0.9963629	16'03.13"	23° 26' 19"	14 m 53 s
8	205° 12' 12"	0.03"	203° 21' 01"	-9° 45' 00"	0.9963514	16'03.14"	23° 26' 19"	14 m 53 s
9	205° 14' 41"	0.02"	203° 23' 22"	-9° 45' 55"	0.9963398	16'03.16"	23° 26' 19"	14 m 54 s
10	205° 17' 10"	0.01"	203° 25' 43"	-9° 46' 49"	0.9963283	16'03.17"	23° 26' 19"	14 m 54 s
11	205° 19' 39"	0.01"	203° 28' 03"	-9° 47' 43"	0.9963168	16'03.18"	23° 26' 19"	14 m 55 s
12	205° 22' 08"	0.00"	203° 30' 24"	-9° 48' 38"	0.9963052	16'03.19"	23° 26' 19"	14 m 55 s
13	205° 24' 37"	-0.00"	203° 32' 45"	-9° 49' 32"	0.9962937	16'03.20"	23° 26' 19"	14 m 56 s
14	205° 27' 06"	-0.01"	203° 35' 06"	-9° 50' 26"	0.9962822	16'03.21"	23° 26' 19"	14 m 56 s
15	205° 29' 35"	-0.01"	203° 37' 26"	-9° 51' 21"	0.9962707	16'03.22"	23° 26' 19"	14 m 57 s
16	205° 32' 04"	-0.02"	203° 39' 47"	-9° 52' 15"	0.9962591	16'03.23"	23° 26' 19"	14 m 57 s
17	205° 34' 33"	-0.02"	203° 42' 08"	-9° 53' 09"	0.9962476	16'03.24"	23° 26' 19"	14 m 58 s
18	205° 37' 02"	-0.03"	203° 44' 29"	-9° 54' 04"	0.9962361	16'03.26"	23° 26' 19"	14 m 58 s
19	205° 39' 31"	-0.03"	203° 46' 50"	-9° 54' 58"	0.9962245	16'03.27"	23° 26' 19"	14 m 59 s
20	205° 42' 00"	-0.04"	203° 49' 11"	-9° 55' 52"	0.9962130	16'03.28"	23° 26' 19"	14 m 59 s
21	205° 44' 29"	-0.05"	203° 51' 32"	-9° 56' 46"	0.9962015	16'03.29"	23° 26' 19"	14 m 60 s
22	205° 46' 58"	-0.05"	203° 53' 53"	-9° 57' 40"	0.9961900	16'03.30"	23° 26' 19"	14 m 60 s
23	205° 49' 27"	-0.06"	203° 56' 13"	-9° 58' 35"	0.9961784	16'03.31"	23° 26' 19"	15 m 00 s
24	205° 51' 56"	-0.06"	203° 58' 34"	-9° 59' 29"	0.9961669	16'03.32"	23° 26' 19"	15 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	165° 36' 58"	0° 12' 57"	166° 50' 37"	5° 52' 11"	0° 55' 29"	15' 07.02"	113° 3' 09"	0.11338
1	166° 07' 59"	0° 10' 08"	167° 18' 15"	5° 37' 34"	0° 55' 27"	15' 06.70"	113° 2' 35"	0.11075
2	166° 38' 59"	0° 07' 19"	167° 45' 51"	5° 22' 56"	0° 55' 26"	15' 06.37"	113° 1' 48"	0.10816
3	167° 09' 58"	0° 04' 30"	168° 13' 24"	5° 08' 17"	0° 55' 25"	15' 06.05"	113° 0' 48"	0.10559
4	167° 40' 55"	0° 01' 42"	168° 40' 55"	4° 53' 38"	0° 55' 24"	15' 05.73"	112° 59' 36"	0.10305
5	168° 11' 51"	0° -1' 07"	169° 08' 24"	4° 38' 58"	0° 55' 23"	15' 05.41"	112° 58' 10"	0.10054
6	168° 42' 47"	0° -3' 56"	169° 35' 51"	4° 24' 18"	0° 55' 21"	15' 05.10"	112° 56' 31"	0.09806
7	169° 13' 41"	0° -6' 44"	170° 03' 16"	4° 09' 37"	0° 55' 20"	15' 04.78"	112° 54' 39"	0.09562
8	169° 44' 33"	0° -9' 32"	170° 30' 38"	3° 54' 56"	0° 55' 19"	15' 04.47"	112° 52' 33"	0.09320
9	170° 15' 25"	0°-12' 20"	170° 57' 59"	3° 40' 14"	0° 55' 18"	15' 04.16"	112° 50' 13"	0.09081
10	170° 46' 16"	0°-15' 08"	171° 25' 18"	3° 25' 32"	0° 55' 17"	15' 03.85"	112° 47' 39"	0.08844
11	171° 17' 05"	0°-17' 56"	171° 52' 35"	3° 10' 50"	0° 55' 16"	15' 03.55"	112° 44' 50"	0.08611
12	171° 47' 54"	0°-20' 43"	172° 19' 50"	2° 56' 08"	0° 55' 15"	15' 03.24"	112° 41' 47"	0.08381
13	172° 18' 41"	0°-23' 31"	172° 47' 04"	2° 41' 26"	0° 55' 14"	15' 02.94"	112° 38' 28"	0.08154
14	172° 49' 28"	0°-26' 18"	173° 14' 16"	2° 26' 43"	0° 55' 12"	15' 02.64"	112° 34' 54"	0.07930
15	173° 20' 13"	0°-29' 05"	173° 41' 26"	2° 12' 01"	0° 55' 11"	15' 02.35"	112° 31' 04"	0.07709
16	173° 50' 57"	0°-31' 51"	174° 08' 35"	1° 57' 18"	0° 55' 10"	15' 02.05"	112° 26' 58"	0.07491
17	174° 21' 41"	0°-34' 38"	174° 35' 43"	1° 42' 36"	0° 55' 09"	15' 01.76"	112° 22' 36"	0.07276
18	174° 52' 23"	0°-37' 24"	175° 02' 49"	1° 27' 53"	0° 55' 08"	15' 01.47"	112° 17' 57"	0.07065
19	175° 23' 04"	0°-40' 09"	175° 29' 54"	1° 13' 11"	0° 55' 07"	15' 01.18"	112° 13' 00"	0.06856
20	175° 53' 44"	0°-42' 55"	175° 56' 58"	0° 58' 30"	0° 55' 06"	15' 00.89"	112° 7' 46"	0.06650
21	176° 24' 23"	0°-45' 40"	176° 24' 00"	0° 43' 48"	0° 55' 05"	15' 00.61"	112° 2' 13"	0.06447
22	176° 55' 02"	0°-48' 25"	176° 51' 02"	0° 29' 07"	0° 55' 04"	15' 00.33"	111° 56' 22"	0.06248
23	177° 25' 39"	0°-51' 09"	177° 18' 02"	0° 14' 26"	0° 55' 03"	15' 00.05"	111° 50' 11"	0.06051
24	177° 56' 15"	0°-53' 53"	177° 45' 02"	0° 00'-14"	0° 55' 02"	14' 59.77"	111° 43' 40"	0.05858

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	205° 51' 56"	-0.06"	203° 58' 34"	-9° 59' 29"	0.9961669	16'03.32"	23° 26' 19"	15 m 01 s
1	205° 54' 25"	-0.07"	204° 00' 55"	-10° 00' 23"	0.9961554	16'03.33"	23° 26' 19"	15 m 01 s
2	205° 56' 54"	-0.07"	204° 03' 16"	-10° 01' 17"	0.9961438	16'03.34"	23° 26' 19"	15 m 02 s
3	205° 59' 23"	-0.08"	204° 05' 37"	-10° 02' 11"	0.9961323	16'03.36"	23° 26' 19"	15 m 02 s
4	206° 01' 52"	-0.08"	204° 07' 58"	-10° 03' 05"	0.9961208	16'03.37"	23° 26' 19"	15 m 03 s
5	206° 04' 21"	-0.09"	204° 10' 19"	-10° 03' 59"	0.9961092	16'03.38"	23° 26' 19"	15 m 03 s
6	206° 06' 50"	-0.09"	204° 12' 40"	-10° 04' 54"	0.9960977	16'03.39"	23° 26' 19"	15 m 04 s
7	206° 09' 19"	-0.10"	204° 15' 02"	-10° 05' 48"	0.9960862	16'03.40"	23° 26' 19"	15 m 04 s
8	206° 11' 49"	-0.10"	204° 17' 23"	-10° 06' 42"	0.9960746	16'03.41"	23° 26' 19"	15 m 05 s
9	206° 14' 18"	-0.11"	204° 19' 44"	-10° 07' 36"	0.9960631	16'03.42"	23° 26' 19"	15 m 05 s
10	206° 16' 47"	-0.12"	204° 22' 05"	-10° 08' 30"	0.9960516	16'03.43"	23° 26' 19"	15 m 06 s
11	206° 19' 16"	-0.12"	204° 24' 26"	-10° 09' 24"	0.9960400	16'03.45"	23° 26' 19"	15 m 06 s
12	206° 21' 45"	-0.13"	204° 26' 47"	-10° 10' 18"	0.9960285	16'03.46"	23° 26' 19"	15 m 06 s
13	206° 24' 14"	-0.13"	204° 29' 08"	-10° 11' 12"	0.9960170	16'03.47"	23° 26' 19"	15 m 07 s
14	206° 26' 43"	-0.14"	204° 31' 30"	-10° 12' 06"	0.9960054	16'03.48"	23° 26' 19"	15 m 07 s
15	206° 29' 12"	-0.14"	204° 33' 51"	-10° 12' 60"	0.9959939	16'03.49"	23° 26' 19"	15 m 08 s
16	206° 31' 41"	-0.15"	204° 36' 12"	-10° 13' 54"	0.9959824	16'03.50"	23° 26' 19"	15 m 08 s
17	206° 34' 10"	-0.15"	204° 38' 33"	-10° 14' 47"	0.9959708	16'03.51"	23° 26' 19"	15 m 09 s
18	206° 36' 39"	-0.16"	204° 40' 54"	-10° 15' 41"	0.9959593	16'03.52"	23° 26' 19"	15 m 09 s
19	206° 39' 08"	-0.16"	204° 43' 16"	-10° 16' 35"	0.9959478	16'03.53"	23° 26' 19"	15 m 10 s
20	206° 41' 37"	-0.17"	204° 45' 37"	-10° 17' 29"	0.9959362	16'03.55"	23° 26' 19"	15 m 10 s
21	206° 44' 07"	-0.17"	204° 47' 58"	-10° 18' 23"	0.9959247	16'03.56"	23° 26' 19"	15 m 10 s
22	206° 46' 36"	-0.18"	204° 50' 20"	-10° 19' 17"	0.9959132	16'03.57"	23° 26' 19"	15 m 11 s
23	206° 49' 05"	-0.18"	204° 52' 41"	-10° 20' 11"	0.9959016	16'03.58"	23° 26' 19"	15 m 11 s
24	206° 51' 34"	-0.19"	204° 55' 02"	-10° 21' 04"	0.9958901	16'03.59"	23° 26' 19"	15 m 12 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	177° 56' 15"	0°-53' 53"	177° 45' 02"	0° 00'-14"	0° 55' 02"	14' 59.77"	111° 43' 40"	0.05858
1	178° 26' 51"	0°-56' 37"	178° 12' 01"	0°-14' 54"	0° 55' 01"	14' 59.49"	111° 36' 49"	0.05668
2	178° 57' 25"	0°-59' 21"	178° 38' 59"	0°-29' 33"	0° 54' 60"	14' 59.22"	111° 29' 36"	0.05480
3	179° 27' 58"	-1° 02' 04"	179° 05' 56"	0°-44' 12"	0° 54' 59"	14' 58.95"	111° 22' 01"	0.05296
4	179° 58' 31"	-1° 04' 46"	179° 32' 52"	0°-58' 50"	0° 54' 58"	14' 58.68"	111° 14' 04"	0.05115
5	180° 29' 03"	-1° 07' 29"	179° 59' 48"	-1° 13' 28"	0° 54' 57"	14' 58.41"	111° 5' 43"	0.04938
6	180° 59' 33"	-1° 10' 10"	180° 26' 44"	-1° 28' 04"	0° 54' 56"	14' 58.14"	110° 56' 57"	0.04763
7	181° 30' 03"	-1° 12' 52"	180° 53' 39"	-1° 42' 40"	0° 54' 55"	14' 57.88"	110° 47' 46"	0.04591
8	182° 00' 32"	-1° 15' 33"	181° 20' 33"	-1° 57' 15"	0° 54' 54"	14' 57.62"	110° 38' 08"	0.04423
9	182° 31' 00"	-1° 18' 13"	181° 47' 27"	-2° 11' 49"	0° 54' 53"	14' 57.36"	110° 28' 03"	0.04258
10	183° 01' 28"	-1° 20' 53"	182° 14' 21"	-2° 26' 22"	0° 54' 52"	14' 57.10"	110° 17' 29"	0.04096
11	183° 31' 54"	-1° 23' 33"	182° 41' 15"	-2° 40' 55"	0° 54' 51"	14' 56.85"	110° 6' 24"	0.03937
12	184° 02' 20"	-1° 26' 12"	183° 08' 08"	-2° 55' 26"	0° 54' 50"	14' 56.59"	109° 54' 48"	0.03781
13	184° 32' 44"	-1° 28' 50"	183° 35' 01"	-3° 09' 56"	0° 54' 49"	14' 56.34"	109° 42' 39"	0.03629
14	185° 03' 08"	-1° 31' 28"	184° 01' 55"	-3° 24' 25"	0° 54' 48"	14' 56.09"	109° 29' 55"	0.03479
15	185° 33' 31"	-1° 34' 06"	184° 28' 48"	-3° 38' 52"	0° 54' 48"	14' 55.85"	109° 16' 35"	0.03333
16	186° 03' 53"	-1° 36' 43"	184° 55' 41"	-3° 53' 19"	0° 54' 47"	14' 55.60"	109° 2' 36"	0.03190
17	186° 34' 15"	-1° 39' 19"	185° 22' 35"	-4° 07' 44"	0° 54' 46"	14' 55.36"	108° 47' 56"	0.03050
18	187° 04' 35"	-1° 41' 55"	185° 49' 29"	-4° 22' 08"	0° 54' 45"	14' 55.12"	108° 32' 33"	0.02914
19	187° 34' 55"	-1° 44' 30"	186° 16' 23"	-4° 36' 30"	0° 54' 44"	14' 54.88"	108° 16' 25"	0.02780
20	188° 05' 14"	-1° 47' 05"	186° 43' 17"	-4° 50' 51"	0° 54' 43"	14' 54.64"	107° 59' 29"	0.02650
21	188° 35' 32"	-1° 49' 39"	187° 10' 12"	-5° 05' 11"	0° 54' 42"	14' 54.41"	107° 41' 41"	0.02523
22	189° 05' 50"	-1° 52' 13"	187° 37' 07"	-5° 19' 29"	0° 54' 41"	14' 54.17"	107° 22' 58"	0.02399
23	189° 36' 07"	-1° 54' 45"	188° 04' 02"	-5° 33' 45"	0° 54' 41"	14' 53.94"	107° 3' 17"	0.02279
24	190° 06' 22"	-1° 57' 18"	188° 30' 59"	-5° 47' 60"	0° 54' 40"	14' 53.72"	106° 42' 34"	0.02161

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	206° 51' 34"	-0.19"	204° 55' 02"	-10° 21' 04"	0.9958901	16'03.59"	23° 26' 19"	15 m 12 s
1	206° 54' 03"	-0.19"	204° 57' 24"	-10° 21' 58"	0.9958785	16'03.60"	23° 26' 19"	15 m 12 s
2	206° 56' 32"	-0.20"	204° 59' 45"	-10° 22' 52"	0.9958670	16'03.61"	23° 26' 19"	15 m 13 s
3	206° 59' 01"	-0.20"	205° 02' 06"	-10° 23' 46"	0.9958555	16'03.62"	23° 26' 19"	15 m 13 s
4	207° 01' 30"	-0.21"	205° 04' 28"	-10° 24' 39"	0.9958439	16'03.63"	23° 26' 19"	15 m 14 s
5	207° 03' 59"	-0.21"	205° 06' 49"	-10° 25' 33"	0.9958324	16'03.65"	23° 26' 19"	15 m 14 s
6	207° 06' 29"	-0.22"	205° 09' 11"	-10° 26' 27"	0.9958209	16'03.66"	23° 26' 19"	15 m 14 s
7	207° 08' 58"	-0.22"	205° 11' 32"	-10° 27' 20"	0.9958093	16'03.67"	23° 26' 19"	15 m 15 s
8	207° 11' 27"	-0.23"	205° 13' 54"	-10° 28' 14"	0.9957978	16'03.68"	23° 26' 19"	15 m 15 s
9	207° 13' 56"	-0.23"	205° 16' 15"	-10° 29' 08"	0.9957863	16'03.69"	23° 26' 19"	15 m 16 s
10	207° 16' 25"	-0.24"	205° 18' 37"	-10° 30' 01"	0.9957747	16'03.70"	23° 26' 19"	15 m 16 s
11	207° 18' 54"	-0.24"	205° 20' 58"	-10° 30' 55"	0.9957632	16'03.71"	23° 26' 19"	15 m 17 s
12	207° 21' 23"	-0.25"	205° 23' 20"	-10° 31' 49"	0.9957516	16'03.72"	23° 26' 19"	15 m 17 s
13	207° 23' 53"	-0.25"	205° 25' 41"	-10° 32' 42"	0.9957401	16'03.74"	23° 26' 19"	15 m 17 s
14	207° 26' 22"	-0.26"	205° 28' 03"	-10° 33' 36"	0.9957286	16'03.75"	23° 26' 19"	15 m 18 s
15	207° 28' 51"	-0.26"	205° 30' 25"	-10° 34' 29"	0.9957170	16'03.76"	23° 26' 19"	15 m 18 s
16	207° 31' 20"	-0.27"	205° 32' 46"	-10° 35' 23"	0.9957055	16'03.77"	23° 26' 19"	15 m 19 s
17	207° 33' 49"	-0.27"	205° 35' 08"	-10° 36' 16"	0.9956940	16'03.78"	23° 26' 19"	15 m 19 s
18	207° 36' 18"	-0.28"	205° 37' 30"	-10° 37' 10"	0.9956824	16'03.79"	23° 26' 19"	15 m 20 s
19	207° 38' 48"	-0.28"	205° 39' 51"	-10° 38' 03"	0.9956709	16'03.80"	23° 26' 19"	15 m 20 s
20	207° 41' 17"	-0.29"	205° 42' 13"	-10° 38' 57"	0.9956593	16'03.81"	23° 26' 19"	15 m 20 s
21	207° 43' 46"	-0.29"	205° 44' 35"	-10° 39' 50"	0.9956478	16'03.82"	23° 26' 19"	15 m 21 s
22	207° 46' 15"	-0.30"	205° 46' 56"	-10° 40' 44"	0.9956363	16'03.84"	23° 26' 19"	15 m 21 s
23	207° 48' 44"	-0.30"	205° 49' 18"	-10° 41' 37"	0.9956247	16'03.85"	23° 26' 19"	15 m 22 s
24	207° 51' 13"	-0.31"	205° 51' 40"	-10° 42' 31"	0.9956132	16'03.86"	23° 26' 19"	15 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	190° 06' 22"	-1° 57' 18"	188° 30' 59"	-5° 47' 60"	0° 54' 40"	14' 53.72"	106° 42' 34"	0.02161
1	190° 36' 38"	-1° 59' 49"	188° 57' 55"	-6° 02' 13"	0° 54' 39"	14' 53.49"	106° 20' 43"	0.02047
2	191° 06' 52"	-2° 02' 20"	189° 24' 53"	-6° 16' 24"	0° 54' 38"	14' 53.26"	105° 57' 40"	0.01936
3	191° 37' 06"	-2° 04' 51"	189° 51' 51"	-6° 30' 34"	0° 54' 37"	14' 53.04"	105° 33' 20"	0.01828
4	192° 07' 19"	-2° 07' 20"	190° 18' 50"	-6° 44' 41"	0° 54' 36"	14' 52.82"	105° 7' 36"	0.01724
5	192° 37' 31"	-2° 09' 49"	190° 45' 50"	-6° 58' 47"	0° 54' 36"	14' 52.60"	104° 40' 20"	0.01623
6	193° 07' 43"	-2° 12' 18"	191° 12' 51"	-7° 12' 51"	0° 54' 35"	14' 52.39"	104° 11' 26"	0.01525
7	193° 37' 54"	-2° 14' 45"	191° 39' 53"	-7° 26' 53"	0° 54' 34"	14' 52.17"	103° 40' 44"	0.01430
8	194° 08' 04"	-2° 17' 12"	192° 06' 56"	-7° 40' 53"	0° 54' 33"	14' 51.96"	103° 8' 05"	0.01338
9	194° 38' 14"	-2° 19' 39"	192° 33' 60"	-7° 54' 51"	0° 54' 32"	14' 51.75"	102° 33' 17"	0.01250
10	195° 08' 22"	-2° 22' 04"	193° 01' 05"	-8° 08' 47"	0° 54' 32"	14' 51.54"	101° 56' 07"	0.01165
11	195° 38' 31"	-2° 24' 29"	193° 28' 11"	-8° 22' 40"	0° 54' 31"	14' 51.34"	101° 16' 20"	0.01083
12	196° 08' 38"	-2° 26' 53"	193° 55' 18"	-8° 36' 32"	0° 54' 30"	14' 51.13"	100° 33' 41"	0.01004
13	196° 38' 45"	-2° 29' 16"	194° 22' 27"	-8° 50' 21"	0° 54' 29"	14' 50.93"	99° 47' 49"	0.00929
14	197° 08' 51"	-2° 31' 39"	194° 49' 37"	-9° 04' 07"	0° 54' 29"	14' 50.73"	98° 58' 22"	0.00857
15	197° 38' 57"	-2° 34' 00"	195° 16' 49"	-9° 17' 52"	0° 54' 28"	14' 50.53"	98° 4' 55"	0.00788
16	198° 09' 02"	-2° 36' 21"	195° 44' 02"	-9° 31' 34"	0° 54' 27"	14' 50.34"	97° 6' 58"	0.00722
17	198° 39' 06"	-2° 38' 41"	196° 11' 17"	-9° 45' 13"	0° 54' 27"	14' 50.14"	96° 3' 54"	0.00660
18	199° 09' 10"	-2° 41' 01"	196° 38' 33"	-9° 58' 50"	0° 54' 26"	14' 49.95"	94° 55' 05"	0.00600
19	199° 39' 13"	-2° 43' 19"	197° 05' 50"	-10° 12' 25"	0° 54' 25"	14' 49.76"	93° 39' 39"	0.00544
20	200° 09' 16"	-2° 45' 37"	197° 33' 10"	-10° 25' 57"	0° 54' 24"	14' 49.58"	92° 16' 41"	0.00492
21	200° 39' 18"	-2° 47' 54"	198° 00' 31"	-10° 39' 26"	0° 54' 24"	14' 49.39"	90° 45' 02"	0.00442
22	201° 09' 19"	-2° 50' 10"	198° 27' 54"	-10° 52' 52"	0° 54' 23"	14' 49.21"	89° 3' 19"	0.00396
23	201° 39' 20"	-2° 52' 25"	198° 55' 19"	-11° 06' 16"	0° 54' 22"	14' 49.03"	87° 9' 56"	0.00353
24	202° 09' 20"	-2° 54' 40"	199° 22' 46"	-11° 19' 37"	0° 54' 22"	14' 48.85"	85° 2' 56"	0.00313

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	207° 51' 13"	-0.31"	205° 51' 40"	-10° 42' 31"	0.9956132	16'03.86"	23° 26' 19"	15 m 22 s
1	207° 53' 43"	-0.31"	205° 54' 02"	-10° 43' 24"	0.9956016	16'03.87"	23° 26' 19"	15 m 22 s
2	207° 56' 12"	-0.31"	205° 56' 24"	-10° 44' 17"	0.9955901	16'03.88"	23° 26' 19"	15 m 23 s
3	207° 58' 41"	-0.32"	205° 58' 45"	-10° 45' 11"	0.9955786	16'03.89"	23° 26' 19"	15 m 23 s
4	208° 01' 10"	-0.32"	206° 01' 07"	-10° 46' 04"	0.9955670	16'03.90"	23° 26' 19"	15 m 24 s
5	208° 03' 40"	-0.33"	206° 03' 29"	-10° 46' 58"	0.9955555	16'03.91"	23° 26' 19"	15 m 24 s
6	208° 06' 09"	-0.33"	206° 05' 51"	-10° 47' 51"	0.9955440	16'03.93"	23° 26' 19"	15 m 25 s
7	208° 08' 38"	-0.34"	206° 08' 13"	-10° 48' 44"	0.9955324	16'03.94"	23° 26' 19"	15 m 25 s
8	208° 11' 07"	-0.34"	206° 10' 35"	-10° 49' 37"	0.9955209	16'03.95"	23° 26' 19"	15 m 25 s
9	208° 13' 36"	-0.34"	206° 12' 57"	-10° 50' 31"	0.9955093	16'03.96"	23° 26' 19"	15 m 26 s
10	208° 16' 06"	-0.35"	206° 15' 19"	-10° 51' 24"	0.9954978	16'03.97"	23° 26' 18"	15 m 26 s
11	208° 18' 35"	-0.35"	206° 17' 41"	-10° 52' 17"	0.9954863	16'03.98"	23° 26' 18"	15 m 27 s
12	208° 21' 04"	-0.36"	206° 20' 03"	-10° 53' 10"	0.9954747	16'03.99"	23° 26' 18"	15 m 27 s
13	208° 23' 33"	-0.36"	206° 22' 24"	-10° 54' 04"	0.9954632	16'04.00"	23° 26' 18"	15 m 27 s
14	208° 26' 03"	-0.37"	206° 24' 47"	-10° 54' 57"	0.9954516	16'04.01"	23° 26' 18"	15 m 28 s
15	208° 28' 32"	-0.37"	206° 27' 09"	-10° 55' 50"	0.9954401	16'04.03"	23° 26' 18"	15 m 28 s
16	208° 31' 01"	-0.37"	206° 29' 31"	-10° 56' 43"	0.9954286	16'04.04"	23° 26' 18"	15 m 29 s
17	208° 33' 30"	-0.38"	206° 31' 53"	-10° 57' 36"	0.9954170	16'04.05"	23° 26' 18"	15 m 29 s
18	208° 35' 60"	-0.38"	206° 34' 15"	-10° 58' 29"	0.9954055	16'04.06"	23° 26' 18"	15 m 29 s
19	208° 38' 29"	-0.39"	206° 36' 37"	-10° 59' 22"	0.9953940	16'04.07"	23° 26' 18"	15 m 30 s
20	208° 40' 58"	-0.39"	206° 38' 59"	-11° 00' 15"	0.9953824	16'04.08"	23° 26' 18"	15 m 30 s
21	208° 43' 27"	-0.39"	206° 41' 21"	-11° 01' 08"	0.9953709	16'04.09"	23° 26' 18"	15 m 30 s
22	208° 45' 57"	-0.40"	206° 43' 43"	-11° 02' 02"	0.9953593	16'04.10"	23° 26' 18"	15 m 31 s
23	208° 48' 26"	-0.40"	206° 46' 05"	-11° 02' 55"	0.9953478	16'04.12"	23° 26' 18"	15 m 31 s
24	208° 50' 55"	-0.40"	206° 48' 28"	-11° 03' 48"	0.9953363	16'04.13"	23° 26' 18"	15 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	202° 09' 20"	-2° 54' 40"	199° 22' 46"	-11° 19' 37"	0° 54' 22"	14' 48.85"	85° 2' 56"	0.00313
1	202° 39' 19"	-2° 56' 53"	199° 50' 14"	-11° 32' 55"	0° 54' 21"	14' 48.67"	82° 39' 60"	0.00276
2	203° 09' 18"	-2° 59' 06"	200° 17' 45"	-11° 46' 10"	0° 54' 21"	14' 48.50"	79° 58' 22"	0.00243
3	203° 39' 17"	-3° 01' 17"	200° 45' 17"	-11° 59' 22"	0° 54' 20"	14' 48.32"	76° 54' 48"	0.00213
4	204° 09' 15"	-3° 03' 28"	201° 12' 52"	-12° 12' 31"	0° 54' 19"	14' 48.15"	73° 25' 35"	0.00186
5	204° 39' 12"	-3° 05' 38"	201° 40' 29"	-12° 25' 37"	0° 54' 19"	14' 47.98"	69° 26' 33"	0.00162
6	205° 09' 09"	-3° 07' 47"	202° 08' 08"	-12° 38' 40"	0° 54' 18"	14' 47.82"	64° 53' 24"	0.00141
7	205° 39' 05"	-3° 09' 55"	202° 35' 49"	-12° 51' 40"	0° 54' 17"	14' 47.65"	59° 42' 09"	0.00124
8	206° 09' 01"	-3° 12' 02"	203° 03' 33"	-13° 04' 37"	0° 54' 17"	14' 47.49"	53° 49' 58"	0.00110
9	206° 38' 56"	-3° 14' 08"	203° 31' 19"	-13° 17' 30"	0° 54' 16"	14' 47.33"	47° 16' 36"	0.00099
10	207° 08' 51"	-3° 16' 14"	203° 59' 07"	-13° 30' 20"	0° 54' 16"	14' 47.18"	40° 5' 46"	0.00091
11	207° 38' 45"	-3° 18' 18"	204° 26' 57"	-13° 43' 07"	0° 54' 15"	14' 47.02"	32° 26' 23"	0.00087
12	208° 08' 39"	-3° 20' 21"	204° 54' 51"	-13° 55' 50"	0° 54' 15"	14' 46.87"	24° 32' 18"	0.00086
13	208° 38' 32"	-3° 22' 24"	205° 22' 46"	-14° 08' 30"	0° 54' 14"	14' 46.72"	16° 40' 19"	0.00088
14	209° 08' 25"	-3° 24' 25"	205° 50' 44"	-14° 21' 06"	0° 54' 13"	14' 46.57"	9° 6' 47"	0.00093
15	209° 38' 18"	-3° 26' 26"	206° 18' 45"	-14° 33' 39"	0° 54' 13"	14' 46.42"	2° 4' 23"	0.00101
16	210° 08' 09"	-3° 28' 25"	206° 46' 48"	-14° 46' 08"	0° 54' 12"	14' 46.28"	355° 40' 39"	0.00112
17	210° 38' 01"	-3° 30' 24"	207° 14' 54"	-14° 58' 34"	0° 54' 12"	14' 46.13"	349° 58' 09"	0.00127
18	211° 07' 52"	-3° 32' 21"	207° 43' 03"	-15° 10' 56"	0° 54' 11"	14' 45.99"	344° 55' 48"	0.00145
19	211° 37' 42"	-3° 34' 17"	208° 11' 15"	-15° 23' 14"	0° 54' 11"	14' 45.86"	340° 30' 23"	0.00166
20	212° 07' 32"	-3° 36' 13"	208° 39' 29"	-15° 35' 28"	0° 54' 10"	14' 45.72"	336° 37' 46"	0.00190
21	212° 37' 22"	-3° 38' 07"	209° 07' 46"	-15° 47' 39"	0° 54' 10"	14' 45.59"	333° 13' 34"	0.00217
22	213° 07' 11"	-3° 40' 01"	209° 36' 06"	-15° 59' 45"	0° 54' 09"	14' 45.46"	330° 13' 52"	0.00248
23	213° 37' 00"	-3° 41' 53"	210° 04' 29"	-16° 11' 48"	0° 54' 09"	14' 45.33"	327° 35' 01"	0.00281
24	214° 06' 49"	-3° 43' 44"	210° 32' 55"	-16° 23' 46"	0° 54' 08"	14' 45.20"	325° 13' 53"	0.00318

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	208° 50' 55"	-0.40"	206° 48' 28"	-11° 03' 48"	0.9953363	16'04.13"	23° 26' 18"	15 m 32 s
1	208° 53' 24"	-0.41"	206° 50' 50"	-11° 04' 41"	0.9953247	16'04.14"	23° 26' 18"	15 m 32 s
2	208° 55' 54"	-0.41"	206° 53' 12"	-11° 05' 34"	0.9953132	16'04.15"	23° 26' 18"	15 m 32 s
3	208° 58' 23"	-0.42"	206° 55' 34"	-11° 06' 26"	0.9953017	16'04.16"	23° 26' 18"	15 m 33 s
4	209° 00' 52"	-0.42"	206° 57' 56"	-11° 07' 19"	0.9952901	16'04.17"	23° 26' 18"	15 m 33 s
5	209° 03' 22"	-0.42"	207° 00' 19"	-11° 08' 12"	0.9952786	16'04.18"	23° 26' 18"	15 m 34 s
6	209° 05' 51"	-0.43"	207° 02' 41"	-11° 09' 05"	0.9952671	16'04.19"	23° 26' 18"	15 m 34 s
7	209° 08' 20"	-0.43"	207° 05' 03"	-11° 09' 58"	0.9952555	16'04.20"	23° 26' 18"	15 m 34 s
8	209° 10' 49"	-0.43"	207° 07' 26"	-11° 10' 51"	0.9952440	16'04.22"	23° 26' 18"	15 m 35 s
9	209° 13' 19"	-0.44"	207° 09' 48"	-11° 11' 44"	0.9952324	16'04.23"	23° 26' 18"	15 m 35 s
10	209° 15' 48"	-0.44"	207° 12' 10"	-11° 12' 37"	0.9952209	16'04.24"	23° 26' 18"	15 m 35 s
11	209° 18' 17"	-0.44"	207° 14' 33"	-11° 13' 29"	0.9952094	16'04.25"	23° 26' 18"	15 m 36 s
12	209° 20' 47"	-0.45"	207° 16' 55"	-11° 14' 22"	0.9951978	16'04.26"	23° 26' 18"	15 m 36 s
13	209° 23' 16"	-0.45"	207° 19' 18"	-11° 15' 15"	0.9951863	16'04.27"	23° 26' 18"	15 m 37 s
14	209° 25' 45"	-0.45"	207° 21' 40"	-11° 16' 08"	0.9951748	16'04.28"	23° 26' 18"	15 m 37 s
15	209° 28' 15"	-0.46"	207° 24' 02"	-11° 17' 01"	0.9951632	16'04.29"	23° 26' 18"	15 m 37 s
16	209° 30' 44"	-0.46"	207° 26' 25"	-11° 17' 53"	0.9951517	16'04.31"	23° 26' 18"	15 m 38 s
17	209° 33' 13"	-0.46"	207° 28' 47"	-11° 18' 46"	0.9951402	16'04.32"	23° 26' 18"	15 m 38 s
18	209° 35' 43"	-0.46"	207° 31' 10"	-11° 19' 39"	0.9951286	16'04.33"	23° 26' 18"	15 m 38 s
19	209° 38' 12"	-0.47"	207° 33' 32"	-11° 20' 31"	0.9951171	16'04.34"	23° 26' 18"	15 m 39 s
20	209° 40' 41"	-0.47"	207° 35' 55"	-11° 21' 24"	0.9951056	16'04.35"	23° 26' 18"	15 m 39 s
21	209° 43' 11"	-0.47"	207° 38' 18"	-11° 22' 17"	0.9950940	16'04.36"	23° 26' 18"	15 m 39 s
22	209° 45' 40"	-0.48"	207° 40' 40"	-11° 23' 09"	0.9950825	16'04.37"	23° 26' 18"	15 m 40 s
23	209° 48' 09"	-0.48"	207° 43' 03"	-11° 24' 02"	0.9950710	16'04.38"	23° 26' 18"	15 m 40 s
24	209° 50' 39"	-0.48"	207° 45' 25"	-11° 24' 54"	0.9950594	16'04.39"	23° 26' 18"	15 m 41 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	214° 06' 49"	-3° 43' 44"	210° 32' 55"	-16° 23' 46"	0° 54' 08"	14' 45.20"	325° 13' 53"	0.00318
1	214° 36' 36"	-3° 45' 34"	211° 01' 24"	-16° 35' 41"	0° 54' 08"	14' 45.08"	323° 7' 50"	0.00358
2	215° 06' 24"	-3° 47' 23"	211° 29' 56"	-16° 47' 31"	0° 54' 08"	14' 44.96"	321° 14' 38"	0.00401
3	215° 36' 11"	-3° 49' 11"	211° 58' 31"	-16° 59' 17"	0° 54' 07"	14' 44.84"	319° 32' 27"	0.00447
4	216° 05' 58"	-3° 50' 58"	212° 27' 09"	-17° 10' 59"	0° 54' 07"	14' 44.72"	317° 59' 44"	0.00496
5	216° 35' 44"	-3° 52' 44"	212° 55' 50"	-17° 22' 37"	0° 54' 06"	14' 44.60"	316° 35' 10"	0.00549
6	217° 05' 30"	-3° 54' 29"	213° 24' 34"	-17° 34' 10"	0° 54' 06"	14' 44.49"	315° 17' 40"	0.00604
7	217° 35' 16"	-3° 56' 13"	213° 53' 22"	-17° 45' 39"	0° 54' 05"	14' 44.38"	314° 6' 19"	0.00663
8	218° 05' 01"	-3° 57' 55"	214° 22' 12"	-17° 57' 04"	0° 54' 05"	14' 44.27"	313° 0' 20"	0.00725
9	218° 34' 46"	-3° 59' 37"	214° 51' 06"	-18° 08' 24"	0° 54' 05"	14' 44.17"	311° 59' 04"	0.00789
10	219° 04' 30"	-4° 01' 17"	215° 20' 03"	-18° 19' 40"	0° 54' 04"	14' 44.07"	311° 1' 57"	0.00857
11	219° 34' 14"	-4° 02' 56"	215° 49' 04"	-18° 30' 51"	0° 54' 04"	14' 43.97"	310° 8' 31"	0.00928
12	220° 03' 58"	-4° 04' 35"	216° 18' 08"	-18° 41' 57"	0° 54' 04"	14' 43.87"	309° 18' 20"	0.01002
13	220° 33' 42"	-4° 06' 11"	216° 47' 15"	-18° 52' 59"	0° 54' 03"	14' 43.77"	308° 31' 04"	0.01079
14	221° 03' 25"	-4° 07' 47"	217° 16' 26"	-19° 03' 56"	0° 54' 03"	14' 43.68"	307° 46' 23"	0.01159
15	221° 33' 08"	-4° 09' 22"	217° 45' 40"	-19° 14' 48"	0° 54' 03"	14' 43.59"	307° 4' 01"	0.01243
16	222° 02' 50"	-4° 10' 55"	218° 14' 57"	-19° 25' 36"	0° 54' 02"	14' 43.50"	306° 23' 45"	0.01329
17	222° 32' 32"	-4° 12' 28"	218° 44' 18"	-19° 36' 18"	0° 54' 02"	14' 43.42"	305° 45' 21"	0.01418
18	223° 02' 14"	-4° 13' 59"	219° 13' 43"	-19° 46' 56"	0° 54' 02"	14' 43.33"	305° 8' 40"	0.01510
19	223° 31' 56"	-4° 15' 29"	219° 43' 11"	-19° 57' 29"	0° 54' 01"	14' 43.25"	304° 33' 30"	0.01606
20	224° 01' 37"	-4° 16' 58"	220° 12' 42"	-20° 07' 56"	0° 54' 01"	14' 43.18"	303° 59' 45"	0.01704
21	224° 31' 19"	-4° 18' 26"	220° 42' 18"	-20° 18' 19"	0° 54' 01"	14' 43.10"	303° 27' 15"	0.01805
22	225° 00' 59"	-4° 19' 52"	221° 11' 56"	-20° 28' 36"	0° 54' 00"	14' 43.03"	302° 55' 55"	0.01910
23	225° 30' 40"	-4° 21' 17"	221° 41' 39"	-20° 38' 49"	0° 54' 00"	14' 42.96"	302° 25' 38"	0.02017
24	226° 00' 20"	-4° 22' 41"	222° 11' 24"	-20° 48' 56"	0° 53' 60"	14' 42.89"	301° 56' 19"	0.02127

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	209° 50' 39"	-0.48"	207° 45' 25"	-11° 24' 54"	0.9950594	16'04.39"	23° 26' 18"	15 m 41 s
1	209° 53' 08"	-0.48"	207° 47' 48"	-11° 25' 47"	0.9950479	16'04.41"	23° 26' 18"	15 m 41 s
2	209° 55' 38"	-0.49"	207° 50' 11"	-11° 26' 40"	0.9950364	16'04.42"	23° 26' 18"	15 m 41 s
3	209° 58' 07"	-0.49"	207° 52' 33"	-11° 27' 32"	0.9950249	16'04.43"	23° 26' 18"	15 m 42 s
4	210° 00' 36"	-0.49"	207° 54' 56"	-11° 28' 25"	0.9950133	16'04.44"	23° 26' 18"	15 m 42 s
5	210° 03' 06"	-0.49"	207° 57' 19"	-11° 29' 17"	0.9950018	16'04.45"	23° 26' 18"	15 m 42 s
6	210° 05' 35"	-0.50"	207° 59' 41"	-11° 30' 10"	0.9949903	16'04.46"	23° 26' 18"	15 m 43 s
7	210° 08' 04"	-0.50"	208° 02' 04"	-11° 31' 02"	0.9949787	16'04.47"	23° 26' 18"	15 m 43 s
8	210° 10' 34"	-0.50"	208° 04' 27"	-11° 31' 54"	0.9949672	16'04.48"	23° 26' 18"	15 m 43 s
9	210° 13' 03"	-0.50"	208° 06' 50"	-11° 32' 47"	0.9949557	16'04.50"	23° 26' 18"	15 m 44 s
10	210° 15' 33"	-0.51"	208° 09' 12"	-11° 33' 39"	0.9949442	16'04.51"	23° 26' 18"	15 m 44 s
11	210° 18' 02"	-0.51"	208° 11' 35"	-11° 34' 32"	0.9949326	16'04.52"	23° 26' 18"	15 m 44 s
12	210° 20' 31"	-0.51"	208° 13' 58"	-11° 35' 24"	0.9949211	16'04.53"	23° 26' 18"	15 m 45 s
13	210° 23' 01"	-0.51"	208° 16' 21"	-11° 36' 16"	0.9949096	16'04.54"	23° 26' 18"	15 m 45 s
14	210° 25' 30"	-0.52"	208° 18' 44"	-11° 37' 09"	0.9948981	16'04.55"	23° 26' 18"	15 m 45 s
15	210° 27' 60"	-0.52"	208° 21' 07"	-11° 38' 01"	0.9948865	16'04.56"	23° 26' 18"	15 m 46 s
16	210° 30' 29"	-0.52"	208° 23' 30"	-11° 38' 53"	0.9948750	16'04.57"	23° 26' 18"	15 m 46 s
17	210° 32' 58"	-0.52"	208° 25' 52"	-11° 39' 46"	0.9948635	16'04.58"	23° 26' 18"	15 m 46 s
18	210° 35' 28"	-0.52"	208° 28' 15"	-11° 40' 38"	0.9948520	16'04.60"	23° 26' 18"	15 m 47 s
19	210° 37' 57"	-0.52"	208° 30' 38"	-11° 41' 30"	0.9948404	16'04.61"	23° 26' 18"	15 m 47 s
20	210° 40' 27"	-0.53"	208° 33' 01"	-11° 42' 22"	0.9948289	16'04.62"	23° 26' 18"	15 m 47 s
21	210° 42' 56"	-0.53"	208° 35' 24"	-11° 43' 14"	0.9948174	16'04.63"	23° 26' 18"	15 m 48 s
22	210° 45' 25"	-0.53"	208° 37' 47"	-11° 44' 07"	0.9948059	16'04.64"	23° 26' 18"	15 m 48 s
23	210° 47' 55"	-0.53"	208° 40' 10"	-11° 44' 59"	0.9947944	16'04.65"	23° 26' 18"	15 m 48 s
24	210° 50' 24"	-0.53"	208° 42' 33"	-11° 45' 51"	0.9947828	16'04.66"	23° 26' 18"	15 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	226° 00' 20"	-4° 22' 41"	222° 11' 24"	-20° 48' 56"	0° 53' 60"	14' 42.89"	301° 56' 19"	0.02127
1	226° 30' 00"	-4° 24' 04"	222° 41' 14"	-20° 58' 57"	0° 53' 60"	14' 42.82"	301° 27' 53"	0.02240
2	226° 59' 40"	-4° 25' 26"	223° 11' 07"	-21° 08' 54"	0° 53' 59"	14' 42.76"	301° 0' 16"	0.02357
3	227° 29' 20"	-4° 26' 46"	223° 41' 04"	-21° 18' 45"	0° 53' 59"	14' 42.70"	300° 33' 23"	0.02476
4	227° 58' 59"	-4° 28' 05"	224° 11' 05"	-21° 28' 30"	0° 53' 59"	14' 42.65"	300° 7' 11"	0.02598
5	228° 28' 39"	-4° 29' 23"	224° 41' 09"	-21° 38' 10"	0° 53' 59"	14' 42.59"	299° 41' 37"	0.02723
6	228° 58' 18"	-4° 30' 40"	225° 11' 17"	-21° 47' 45"	0° 53' 59"	14' 42.54"	299° 16' 38"	0.02851
7	229° 27' 56"	-4° 31' 56"	225° 41' 28"	-21° 57' 14"	0° 53' 58"	14' 42.49"	298° 52' 11"	0.02982
8	229° 57' 35"	-4° 33' 10"	226° 11' 44"	-22° 06' 37"	0° 53' 58"	14' 42.44"	298° 28' 13"	0.03115
9	230° 27' 13"	-4° 34' 23"	226° 42' 03"	-22° 15' 55"	0° 53' 58"	14' 42.40"	298° 4' 43"	0.03252
10	230° 56' 52"	-4° 35' 35"	227° 12' 26"	-22° 25' 07"	0° 53' 58"	14' 42.36"	297° 41' 38"	0.03392
11	231° 26' 30"	-4° 36' 45"	227° 42' 52"	-22° 34' 13"	0° 53' 58"	14' 42.32"	297° 18' 57"	0.03534
12	231° 56' 08"	-4° 37' 55"	228° 13' 22"	-22° 43' 13"	0° 53' 58"	14' 42.29"	296° 56' 37"	0.03679
13	232° 25' 45"	-4° 39' 03"	228° 43' 57"	-22° 52' 08"	0° 53' 58"	14' 42.26"	296° 34' 37"	0.03828
14	232° 55' 23"	-4° 40' 10"	229° 14' 34"	-23° 00' 56"	0° 53' 58"	14' 42.23"	296° 12' 56"	0.03979
15	233° 25' 00"	-4° 41' 15"	229° 45' 16"	-23° 09' 38"	0° 53' 57"	14' 42.20"	295° 51' 33"	0.04133
16	233° 54' 38"	-4° 42' 19"	230° 16' 01"	-23° 18' 15"	0° 53' 57"	14' 42.18"	295° 30' 25"	0.04289
17	234° 24' 15"	-4° 43' 22"	230° 46' 50"	-23° 26' 45"	0° 53' 57"	14' 42.16"	295° 9' 32"	0.04449
18	234° 53' 52"	-4° 44' 24"	231° 17' 43"	-23° 35' 09"	0° 53' 57"	14' 42.14"	294° 48' 53"	0.04611
19	235° 23' 29"	-4° 45' 24"	231° 48' 40"	-23° 43' 27"	0° 53' 57"	14' 42.12"	294° 28' 27"	0.04776
20	235° 53' 06"	-4° 46' 23"	232° 19' 40"	-23° 51' 39"	0° 53' 57"	14' 42.11"	294° 8' 12"	0.04944
21	236° 22' 43"	-4° 47' 21"	232° 50' 44"	-23° 59' 44"	0° 53' 57"	14' 42.10"	293° 48' 09"	0.05115
22	236° 52' 20"	-4° 48' 18"	233° 21' 52"	-24° 07' 44"	0° 53' 57"	14' 42.10"	293° 28' 16"	0.05288
23	237° 21' 57"	-4° 49' 13"	233° 53' 03"	-24° 15' 36"	0° 53' 57"	14' 42.09"	293° 8' 32"	0.05465
24	237° 51' 33"	-4° 50' 07"	234° 24' 18"	-24° 23' 23"	0° 53' 57"	14' 42.09"	292° 48' 58"	0.05643

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	210° 50' 24"	-0.53"	208° 42' 33"	-11° 45' 51"	0.9947828	16'04.66"	23° 26' 18"	15 m 49 s
1	210° 52' 54"	-0.53"	208° 44' 56"	-11° 46' 43"	0.9947713	16'04.67"	23° 26' 18"	15 m 49 s
2	210° 55' 23"	-0.54"	208° 47' 19"	-11° 47' 35"	0.9947598	16'04.69"	23° 26' 18"	15 m 49 s
3	210° 57' 53"	-0.54"	208° 49' 43"	-11° 48' 27"	0.9947483	16'04.70"	23° 26' 18"	15 m 50 s
4	211° 00' 22"	-0.54"	208° 52' 06"	-11° 49' 19"	0.9947368	16'04.71"	23° 26' 18"	15 m 50 s
5	211° 02' 52"	-0.54"	208° 54' 29"	-11° 50' 11"	0.9947253	16'04.72"	23° 26' 18"	15 m 50 s
6	211° 05' 21"	-0.54"	208° 56' 52"	-11° 51' 03"	0.9947138	16'04.73"	23° 26' 18"	15 m 51 s
7	211° 07' 50"	-0.54"	208° 59' 15"	-11° 51' 55"	0.9947022	16'04.74"	23° 26' 18"	15 m 51 s
8	211° 10' 20"	-0.54"	209° 01' 38"	-11° 52' 47"	0.9946907	16'04.75"	23° 26' 18"	15 m 51 s
9	211° 12' 49"	-0.54"	209° 04' 02"	-11° 53' 39"	0.9946792	16'04.76"	23° 26' 18"	15 m 52 s
10	211° 15' 19"	-0.55"	209° 06' 25"	-11° 54' 31"	0.9946677	16'04.77"	23° 26' 18"	15 m 52 s
11	211° 17' 48"	-0.55"	209° 08' 48"	-11° 55' 23"	0.9946562	16'04.79"	23° 26' 18"	15 m 52 s
12	211° 20' 18"	-0.55"	209° 11' 11"	-11° 56' 15"	0.9946447	16'04.80"	23° 26' 18"	15 m 53 s
13	211° 22' 47"	-0.55"	209° 13' 35"	-11° 57' 07"	0.9946332	16'04.81"	23° 26' 18"	15 m 53 s
14	211° 25' 17"	-0.55"	209° 15' 58"	-11° 57' 59"	0.9946217	16'04.82"	23° 26' 18"	15 m 53 s
15	211° 27' 46"	-0.55"	209° 18' 21"	-11° 58' 51"	0.9946102	16'04.83"	23° 26' 18"	15 m 54 s
16	211° 30' 16"	-0.55"	209° 20' 45"	-11° 59' 43"	0.9945987	16'04.84"	23° 26' 18"	15 m 54 s
17	211° 32' 45"	-0.55"	209° 23' 08"	-12° 00' 35"	0.9945872	16'04.85"	23° 26' 18"	15 m 54 s
18	211° 35' 15"	-0.55"	209° 25' 31"	-12° 01' 26"	0.9945757	16'04.86"	23° 26' 18"	15 m 54 s
19	211° 37' 44"	-0.55"	209° 27' 55"	-12° 02' 18"	0.9945642	16'04.87"	23° 26' 18"	15 m 55 s
20	211° 40' 14"	-0.55"	209° 30' 18"	-12° 03' 10"	0.9945527	16'04.89"	23° 26' 18"	15 m 55 s
21	211° 42' 43"	-0.55"	209° 32' 41"	-12° 04' 02"	0.9945412	16'04.90"	23° 26' 18"	15 m 55 s
22	211° 45' 13"	-0.55"	209° 35' 05"	-12° 04' 53"	0.9945297	16'04.91"	23° 26' 18"	15 m 56 s
23	211° 47' 42"	-0.55"	209° 37' 28"	-12° 05' 45"	0.9945182	16'04.92"	23° 26' 18"	15 m 56 s
24	211° 50' 12"	-0.55"	209° 39' 52"	-12° 06' 37"	0.9945067	16'04.93"	23° 26' 18"	15 m 56 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	237° 51' 33"	-4° 50' 07"	234° 24' 18"	-24° 23' 23"	0° 53' 57"	14' 42.09"	292° 48' 58"	0.05643
1	238° 21' 10"	-4° 50' 59"	234° 55' 37"	-24° 31' 03"	0° 53' 57"	14' 42.10"	292° 29' 31"	0.05825
2	238° 50' 46"	-4° 51' 51"	235° 26' 60"	-24° 38' 36"	0° 53' 57"	14' 42.10"	292° 10' 12"	0.06010
3	239° 20' 23"	-4° 52' 40"	235° 58' 26"	-24° 46' 03"	0° 53' 57"	14' 42.11"	291° 51' 00"	0.06197
4	239° 49' 60"	-4° 53' 29"	236° 29' 56"	-24° 53' 23"	0° 53' 57"	14' 42.12"	291° 31' 55"	0.06387
5	240° 19' 36"	-4° 54' 16"	237° 01' 29"	-25° 00' 36"	0° 53' 57"	14' 42.14"	291° 12' 56"	0.06579
6	240° 49' 13"	-4° 55' 02"	237° 33' 06"	-25° 07' 43"	0° 53' 57"	14' 42.16"	290° 54' 02"	0.06774
7	241° 18' 49"	-4° 55' 47"	238° 04' 47"	-25° 14' 43"	0° 53' 57"	14' 42.18"	290° 35' 14"	0.06972
8	241° 48' 26"	-4° 56' 30"	238° 36' 31"	-25° 21' 36"	0° 53' 57"	14' 42.20"	290° 16' 30"	0.07173
9	242° 18' 02"	-4° 57' 13"	239° 08' 19"	-25° 28' 23"	0° 53' 58"	14' 42.23"	289° 57' 51"	0.07376
10	242° 47' 39"	-4° 57' 53"	239° 40' 11"	-25° 35' 02"	0° 53' 58"	14' 42.26"	289° 39' 16"	0.07582
11	243° 17' 16"	-4° 58' 33"	240° 12' 05"	-25° 41' 35"	0° 53' 58"	14' 42.30"	289° 20' 45"	0.07790
12	243° 46' 52"	-4° 59' 11"	240° 44' 04"	-25° 48' 01"	0° 53' 58"	14' 42.33"	289° 2' 17"	0.08001
13	244° 16' 29"	-4° 59' 47"	241° 16' 06"	-25° 54' 19"	0° 53' 58"	14' 42.37"	288° 43' 53"	0.08215
14	244° 46' 06"	-5° 00' 23"	241° 48' 11"	-26° 00' 31"	0° 53' 58"	14' 42.42"	288° 25' 31"	0.08431
15	245° 15' 43"	-5° 00' 57"	242° 20' 20"	-26° 06' 35"	0° 53' 58"	14' 42.47"	288° 7' 13"	0.08650
16	245° 45' 20"	-5° 01' 29"	242° 52' 32"	-26° 12' 32"	0° 53' 59"	14' 42.52"	287° 48' 57"	0.08872
17	246° 14' 57"	-5° 02' 00"	243° 24' 47"	-26° 18' 22"	0° 53' 59"	14' 42.57"	287° 30' 43"	0.09096
18	246° 44' 34"	-5° 02' 30"	243° 57' 06"	-26° 24' 05"	0° 53' 59"	14' 42.63"	287° 12' 31"	0.09322
19	247° 14' 12"	-5° 02' 59"	244° 29' 27"	-26° 29' 41"	0° 53' 59"	14' 42.69"	286° 54' 22"	0.09551
20	247° 43' 49"	-5° 03' 26"	245° 01' 53"	-26° 35' 09"	0° 53' 59"	14' 42.75"	286° 36' 14"	0.09783
21	248° 13' 27"	-5° 03' 52"	245° 34' 21"	-26° 40' 30"	0° 53' 60"	14' 42.82"	286° 18' 08"	0.10017
22	248° 43' 05"	-5° 04' 16"	246° 06' 52"	-26° 45' 44"	0° 53' 60"	14' 42.89"	286° 0' 04"	0.10253
23	249° 12' 43"	-5° 04' 40"	246° 39' 27"	-26° 50' 50"	0° 54' 00"	14' 42.97"	285° 42' 01"	0.10492
24	249° 42' 21"	-5° 05' 01"	247° 12' 05"	-26° 55' 49"	0° 54' 01"	14' 43.04"	285° 23' 59"	0.10734

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	211° 50' 12"	-0.55"	209° 39' 52"	-12° 06' 37"	0.9945067	16'04.93"	23° 26' 18"	15 m 56 s
1	211° 52' 41"	-0.56"	209° 42' 15"	-12° 07' 28"	0.9944952	16'04.94"	23° 26' 18"	15 m 57 s
2	211° 55' 11"	-0.56"	209° 44' 39"	-12° 08' 20"	0.9944837	16'04.95"	23° 26' 18"	15 m 57 s
3	211° 57' 40"	-0.56"	209° 47' 02"	-12° 09' 12"	0.9944722	16'04.96"	23° 26' 18"	15 m 57 s
4	212° 00' 10"	-0.56"	209° 49' 26"	-12° 10' 03"	0.9944607	16'04.98"	23° 26' 18"	15 m 57 s
5	212° 02' 39"	-0.56"	209° 51' 50"	-12° 10' 55"	0.9944492	16'04.99"	23° 26' 18"	15 m 58 s
6	212° 05' 09"	-0.56"	209° 54' 13"	-12° 11' 46"	0.9944377	16'05.00"	23° 26' 18"	15 m 58 s
7	212° 07' 38"	-0.56"	209° 56' 37"	-12° 12' 38"	0.9944262	16'05.01"	23° 26' 18"	15 m 58 s
8	212° 10' 08"	-0.56"	209° 59' 00"	-12° 13' 30"	0.9944147	16'05.02"	23° 26' 18"	15 m 59 s
9	212° 12' 37"	-0.56"	210° 01' 24"	-12° 14' 21"	0.9944032	16'05.03"	23° 26' 18"	15 m 59 s
10	212° 15' 07"	-0.56"	210° 03' 48"	-12° 15' 13"	0.9943917	16'05.04"	23° 26' 18"	15 m 59 s
11	212° 17' 37"	-0.55"	210° 06' 11"	-12° 16' 04"	0.9943803	16'05.05"	23° 26' 18"	15 m 59 s
12	212° 20' 06"	-0.55"	210° 08' 35"	-12° 16' 55"	0.9943688	16'05.06"	23° 26' 18"	15 m 60 s
13	212° 22' 36"	-0.55"	210° 10' 59"	-12° 17' 47"	0.9943573	16'05.08"	23° 26' 18"	16 m 00 s
14	212° 25' 05"	-0.55"	210° 13' 23"	-12° 18' 38"	0.9943458	16'05.09"	23° 26' 18"	16 m 00 s
15	212° 27' 35"	-0.55"	210° 15' 46"	-12° 19' 30"	0.9943343	16'05.10"	23° 26' 18"	16 m 01 s
16	212° 30' 04"	-0.55"	210° 18' 10"	-12° 20' 21"	0.9943229	16'05.11"	23° 26' 18"	16 m 01 s
17	212° 32' 34"	-0.55"	210° 20' 34"	-12° 21' 12"	0.9943114	16'05.12"	23° 26' 18"	16 m 01 s
18	212° 35' 03"	-0.55"	210° 22' 58"	-12° 22' 04"	0.9942999	16'05.13"	23° 26' 18"	16 m 01 s
19	212° 37' 33"	-0.55"	210° 25' 22"	-12° 22' 55"	0.9942884	16'05.14"	23° 26' 18"	16 m 02 s
20	212° 40' 03"	-0.55"	210° 27' 45"	-12° 23' 46"	0.9942770	16'05.15"	23° 26' 18"	16 m 02 s
21	212° 42' 32"	-0.55"	210° 30' 09"	-12° 24' 38"	0.9942655	16'05.16"	23° 26' 18"	16 m 02 s
22	212° 45' 02"	-0.55"	210° 32' 33"	-12° 25' 29"	0.9942540	16'05.18"	23° 26' 18"	16 m 02 s
23	212° 47' 31"	-0.55"	210° 34' 57"	-12° 26' 20"	0.9942425	16'05.19"	23° 26' 18"	16 m 03 s
24	212° 50' 01"	-0.55"	210° 37' 21"	-12° 27' 11"	0.9942311	16'05.20"	23° 26' 18"	16 m 03 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	249° 42' 21"	-5° 05' 01"	247° 12' 05"	-26° 55' 49"	0° 54' 01"	14' 43.04"	285° 23' 59"	0.10734
1	250° 11' 60"	-5° 05' 22"	247° 44' 45"	-27° 00' 40"	0° 54' 01"	14' 43.13"	285° 5' 59"	0.10978
2	250° 41' 38"	-5° 05' 41"	248° 17' 29"	-27° 05' 23"	0° 54' 01"	14' 43.21"	284° 47' 59"	0.11224
3	251° 11' 17"	-5° 05' 58"	248° 50' 16"	-27° 09' 59"	0° 54' 01"	14' 43.30"	284° 30' 01"	0.11473
4	251° 40' 56"	-5° 06' 15"	249° 23' 05"	-27° 14' 28"	0° 54' 02"	14' 43.39"	284° 12' 04"	0.11724
5	252° 10' 36"	-5° 06' 30"	249° 55' 58"	-27° 18' 49"	0° 54' 02"	14' 43.49"	283° 54' 07"	0.11978
6	252° 40' 15"	-5° 06' 43"	250° 28' 53"	-27° 23' 02"	0° 54' 03"	14' 43.58"	283° 36' 12"	0.12234
7	253° 09' 55"	-5° 06' 55"	251° 01' 51"	-27° 27' 07"	0° 54' 03"	14' 43.69"	283° 18' 17"	0.12492
8	253° 39' 35"	-5° 07' 06"	251° 34' 51"	-27° 31' 05"	0° 54' 03"	14' 43.79"	283° 0' 23"	0.12753
9	254° 09' 16"	-5° 07' 15"	252° 07' 55"	-27° 34' 54"	0° 54' 04"	14' 43.90"	282° 42' 30"	0.13016
10	254° 38' 56"	-5° 07' 23"	252° 41' 00"	-27° 38' 37"	0° 54' 04"	14' 44.02"	282° 24' 37"	0.13282
11	255° 08' 37"	-5° 07' 30"	253° 14' 09"	-27° 42' 11"	0° 54' 05"	14' 44.13"	282° 6' 45"	0.13550
12	255° 38' 19"	-5° 07' 35"	253° 47' 20"	-27° 45' 37"	0° 54' 05"	14' 44.26"	281° 48' 54"	0.13820
13	256° 08' 00"	-5° 07' 39"	254° 20' 33"	-27° 48' 55"	0° 54' 05"	14' 44.38"	281° 31' 03"	0.14092
14	256° 37' 43"	-5° 07' 42"	254° 53' 49"	-27° 52' 06"	0° 54' 06"	14' 44.51"	281° 13' 13"	0.14367
15	257° 07' 25"	-5° 07' 43"	255° 27' 07"	-27° 55' 08"	0° 54' 06"	14' 44.64"	280° 55' 24"	0.14644
16	257° 37' 08"	-5° 07' 42"	256° 00' 27"	-27° 58' 03"	0° 54' 07"	14' 44.78"	280° 37' 35"	0.14923
17	258° 06' 51"	-5° 07' 41"	256° 33' 50"	-28° 00' 49"	0° 54' 07"	14' 44.92"	280° 19' 46"	0.15205
18	258° 36' 35"	-5° 07' 38"	257° 07' 14"	-28° 03' 28"	0° 54' 08"	14' 45.06"	280° 1' 59"	0.15488
19	259° 06' 19"	-5° 07' 33"	257° 40' 41"	-28° 05' 58"	0° 54' 08"	14' 45.21"	279° 44' 12"	0.15774
20	259° 36' 03"	-5° 07' 27"	258° 14' 10"	-28° 08' 20"	0° 54' 09"	14' 45.36"	279° 26' 25"	0.16063
21	260° 05' 48"	-5° 07' 20"	258° 47' 40"	-28° 10' 35"	0° 54' 10"	14' 45.51"	279° 8' 40"	0.16353
22	260° 35' 33"	-5° 07' 12"	259° 21' 13"	-28° 12' 41"	0° 54' 10"	14' 45.67"	278° 50' 55"	0.16645
23	261° 05' 19"	-5° 07' 02"	259° 54' 47"	-28° 14' 38"	0° 54' 11"	14' 45.83"	278° 33' 10"	0.16940
24	261° 35' 05"	-5° 06' 50"	260° 28' 23"	-28° 16' 28"	0° 54' 11"	14' 46.00"	278° 15' 27"	0.17237

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	212° 50' 01"	-0.55"	210° 37' 21"	-12° 27' 11"	0.9942311	16'05.20"	23° 26' 18"	16 m 03 s
1	212° 52' 30"	-0.55"	210° 39' 45"	-12° 28' 02"	0.9942196	16'05.21"	23° 26' 18"	16 m 03 s
2	212° 55' 00"	-0.54"	210° 42' 09"	-12° 28' 54"	0.9942081	16'05.22"	23° 26' 18"	16 m 04 s
3	212° 57' 30"	-0.54"	210° 44' 33"	-12° 29' 45"	0.9941967	16'05.23"	23° 26' 18"	16 m 04 s
4	212° 59' 59"	-0.54"	210° 46' 57"	-12° 30' 36"	0.9941852	16'05.24"	23° 26' 18"	16 m 04 s
5	213° 02' 29"	-0.54"	210° 49' 21"	-12° 31' 27"	0.9941738	16'05.25"	23° 26' 18"	16 m 04 s
6	213° 04' 58"	-0.54"	210° 51' 45"	-12° 32' 18"	0.9941623	16'05.26"	23° 26' 18"	16 m 05 s
7	213° 07' 28"	-0.54"	210° 54' 09"	-12° 33' 09"	0.9941508	16'05.28"	23° 26' 18"	16 m 05 s
8	213° 09' 58"	-0.54"	210° 56' 33"	-12° 34' 00"	0.9941394	16'05.29"	23° 26' 18"	16 m 05 s
9	213° 12' 27"	-0.54"	210° 58' 57"	-12° 34' 51"	0.9941279	16'05.30"	23° 26' 18"	16 m 05 s
10	213° 14' 57"	-0.53"	211° 01' 21"	-12° 35' 42"	0.9941165	16'05.31"	23° 26' 18"	16 m 06 s
11	213° 17' 27"	-0.53"	211° 03' 46"	-12° 36' 33"	0.9941050	16'05.32"	23° 26' 18"	16 m 06 s
12	213° 19' 56"	-0.53"	211° 06' 10"	-12° 37' 24"	0.9940936	16'05.33"	23° 26' 18"	16 m 06 s
13	213° 22' 26"	-0.53"	211° 08' 34"	-12° 38' 15"	0.9940821	16'05.34"	23° 26' 18"	16 m 06 s
14	213° 24' 55"	-0.53"	211° 10' 58"	-12° 39' 06"	0.9940707	16'05.35"	23° 26' 18"	16 m 07 s
15	213° 27' 25"	-0.53"	211° 13' 22"	-12° 39' 57"	0.9940592	16'05.37"	23° 26' 18"	16 m 07 s
16	213° 29' 55"	-0.52"	211° 15' 47"	-12° 40' 48"	0.9940478	16'05.38"	23° 26' 18"	16 m 07 s
17	213° 32' 24"	-0.52"	211° 18' 11"	-12° 41' 39"	0.9940364	16'05.39"	23° 26' 18"	16 m 07 s
18	213° 34' 54"	-0.52"	211° 20' 35"	-12° 42' 30"	0.9940249	16'05.40"	23° 26' 18"	16 m 08 s
19	213° 37' 24"	-0.52"	211° 22' 59"	-12° 43' 20"	0.9940135	16'05.41"	23° 26' 18"	16 m 08 s
20	213° 39' 53"	-0.52"	211° 25' 24"	-12° 44' 11"	0.9940020	16'05.42"	23° 26' 18"	16 m 08 s
21	213° 42' 23"	-0.51"	211° 27' 48"	-12° 45' 02"	0.9939906	16'05.43"	23° 26' 18"	16 m 08 s
22	213° 44' 53"	-0.51"	211° 30' 12"	-12° 45' 53"	0.9939792	16'05.44"	23° 26' 18"	16 m 09 s
23	213° 47' 22"	-0.51"	211° 32' 37"	-12° 46' 44"	0.9939678	16'05.45"	23° 26' 18"	16 m 09 s
24	213° 49' 52"	-0.51"	211° 35' 01"	-12° 47' 34"	0.9939563	16'05.46"	23° 26' 18"	16 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	261° 35' 05"	-5° 06' 50"	260° 28' 23"	-28° 16' 28"	0° 54' 11"	14' 46.00"	278° 15' 27"	0.17237
1	262° 04' 52"	-5° 06' 37"	261° 02' 01"	-28° 18' 10"	0° 54' 12"	14' 46.17"	277° 57' 44"	0.17536
2	262° 34' 40"	-5° 06' 23"	261° 35' 41"	-28° 19' 43"	0° 54' 13"	14' 46.35"	277° 40' 02"	0.17837
3	263° 04' 27"	-5° 06' 08"	262° 09' 22"	-28° 21' 08"	0° 54' 13"	14' 46.52"	277° 22' 21"	0.18140
4	263° 34' 16"	-5° 05' 51"	262° 43' 04"	-28° 22' 24"	0° 54' 14"	14' 46.71"	277° 4' 41"	0.18446
5	264° 04' 05"	-5° 05' 32"	263° 16' 48"	-28° 23' 33"	0° 54' 15"	14' 46.89"	276° 47' 02"	0.18753
6	264° 33' 54"	-5° 05' 13"	263° 50' 34"	-28° 24' 33"	0° 54' 15"	14' 47.08"	276° 29' 23"	0.19063
7	265° 03' 44"	-5° 04' 51"	264° 24' 20"	-28° 25' 25"	0° 54' 16"	14' 47.28"	276° 11' 46"	0.19374
8	265° 33' 35"	-5° 04' 29"	264° 58' 08"	-28° 26' 08"	0° 54' 17"	14' 47.48"	275° 54' 10"	0.19688
9	266° 03' 27"	-5° 04' 05"	265° 31' 57"	-28° 26' 43"	0° 54' 18"	14' 47.68"	275° 36' 36"	0.20003
10	266° 33' 19"	-5° 03' 40"	266° 05' 47"	-28° 27' 10"	0° 54' 18"	14' 47.88"	275° 19' 02"	0.20321
11	267° 03' 11"	-5° 03' 13"	266° 39' 38"	-28° 27' 28"	0° 54' 19"	14' 48.10"	275° 1' 30"	0.20641
12	267° 33' 04"	-5° 02' 45"	267° 13' 31"	-28° 27' 38"	0° 54' 20"	14' 48.31"	274° 43' 59"	0.20962
13	268° 02' 58"	-5° 02' 15"	267° 47' 23"	-28° 27' 40"	0° 54' 21"	14' 48.53"	274° 26' 29"	0.21286
14	268° 32' 53"	-5° 01' 44"	268° 21' 17"	-28° 27' 33"	0° 54' 21"	14' 48.75"	274° 9' 01"	0.21611
15	269° 02' 48"	-5° 01' 12"	268° 55' 12"	-28° 27' 18"	0° 54' 22"	14' 48.98"	273° 51' 35"	0.21939
16	269° 32' 44"	-5° 00' 39"	269° 29' 07"	-28° 26' 54"	0° 54' 23"	14' 49.21"	273° 34' 10"	0.22268
17	270° 02' 41"	-5° 00' 04"	270° 03' 03"	-28° 26' 22"	0° 54' 24"	14' 49.44"	273° 16' 47"	0.22599
18	270° 32' 39"	-4° 59' 27"	270° 36' 59"	-28° 25' 41"	0° 54' 25"	14' 49.68"	272° 59' 26"	0.22933
19	271° 02' 37"	-4° 58' 49"	271° 10' 56"	-28° 24' 52"	0° 54' 26"	14' 49.93"	272° 42' 06"	0.23268
20	271° 32' 36"	-4° 58' 10"	271° 44' 53"	-28° 23' 55"	0° 54' 27"	14' 50.18"	272° 24' 49"	0.23605
21	272° 02' 36"	-4° 57' 30"	272° 18' 50"	-28° 22' 49"	0° 54' 28"	14' 50.43"	272° 7' 33"	0.23943
22	272° 32' 37"	-4° 56' 48"	272° 52' 48"	-28° 21' 34"	0° 54' 29"	14' 50.68"	271° 50' 20"	0.24284
23	273° 02' 39"	-4° 56' 04"	273° 26' 46"	-28° 20' 11"	0° 54' 30"	14' 50.94"	271° 33' 09"	0.24626
24	273° 32' 41"	-4° 55' 19"	274° 00' 44"	-28° 18' 40"	0° 54' 30"	14' 51.21"	271° 15' 60"	0.24971

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	213° 49' 52"	-0.51"	211° 35' 01"	-12° 47' 34"	0.9939563	16'05.46"	23° 26' 18"	16 m 09 s
1	213° 52' 22"	-0.51"	211° 37' 25"	-12° 48' 25"	0.9939449	16'05.48"	23° 26' 18"	16 m 09 s
2	213° 54' 51"	-0.50"	211° 39' 50"	-12° 49' 16"	0.9939335	16'05.49"	23° 26' 18"	16 m 10 s
3	213° 57' 21"	-0.50"	211° 42' 14"	-12° 50' 06"	0.9939221	16'05.50"	23° 26' 18"	16 m 10 s
4	213° 59' 51"	-0.50"	211° 44' 39"	-12° 50' 57"	0.9939106	16'05.51"	23° 26' 18"	16 m 10 s
5	214° 02' 20"	-0.50"	211° 47' 03"	-12° 51' 48"	0.9938992	16'05.52"	23° 26' 18"	16 m 10 s
6	214° 04' 50"	-0.49"	211° 49' 28"	-12° 52' 38"	0.9938878	16'05.53"	23° 26' 18"	16 m 10 s
7	214° 07' 20"	-0.49"	211° 51' 52"	-12° 53' 29"	0.9938764	16'05.54"	23° 26' 18"	16 m 11 s
8	214° 09' 49"	-0.49"	211° 54' 17"	-12° 54' 19"	0.9938650	16'05.55"	23° 26' 18"	16 m 11 s
9	214° 12' 19"	-0.49"	211° 56' 41"	-12° 55' 10"	0.9938536	16'05.56"	23° 26' 18"	16 m 11 s
10	214° 14' 49"	-0.48"	211° 59' 06"	-12° 56' 00"	0.9938422	16'05.58"	23° 26' 18"	16 m 11 s
11	214° 17' 18"	-0.48"	212° 01' 31"	-12° 56' 51"	0.9938307	16'05.59"	23° 26' 18"	16 m 12 s
12	214° 19' 48"	-0.48"	212° 03' 55"	-12° 57' 41"	0.9938193	16'05.60"	23° 26' 18"	16 m 12 s
13	214° 22' 18"	-0.47"	212° 06' 20"	-12° 58' 32"	0.9938079	16'05.61"	23° 26' 18"	16 m 12 s
14	214° 24' 47"	-0.47"	212° 08' 44"	-12° 59' 22"	0.9937965	16'05.62"	23° 26' 18"	16 m 12 s
15	214° 27' 17"	-0.47"	212° 11' 09"	-13° 00' 13"	0.9937851	16'05.63"	23° 26' 18"	16 m 12 s
16	214° 29' 47"	-0.47"	212° 13' 34"	-13° 01' 03"	0.9937737	16'05.64"	23° 26' 18"	16 m 13 s
17	214° 32' 16"	-0.46"	212° 15' 59"	-13° 01' 53"	0.9937624	16'05.65"	23° 26' 18"	16 m 13 s
18	214° 34' 46"	-0.46"	212° 18' 23"	-13° 02' 44"	0.9937510	16'05.66"	23° 26' 18"	16 m 13 s
19	214° 37' 16"	-0.46"	212° 20' 48"	-13° 03' 34"	0.9937396	16'05.68"	23° 26' 18"	16 m 13 s
20	214° 39' 46"	-0.45"	212° 23' 13"	-13° 04' 24"	0.9937282	16'05.69"	23° 26' 18"	16 m 13 s
21	214° 42' 15"	-0.45"	212° 25' 38"	-13° 05' 15"	0.9937168	16'05.70"	23° 26' 18"	16 m 14 s
22	214° 44' 45"	-0.45"	212° 28' 02"	-13° 06' 05"	0.9937054	16'05.71"	23° 26' 18"	16 m 14 s
23	214° 47' 15"	-0.44"	212° 30' 27"	-13° 06' 55"	0.9936940	16'05.72"	23° 26' 18"	16 m 14 s
24	214° 49' 45"	-0.44"	212° 32' 52"	-13° 07' 45"	0.9936827	16'05.73"	23° 26' 18"	16 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	273° 32' 41"	-4° 55' 19"	274° 00' 44"	-28° 18' 40"	0° 54' 30"	14' 51.21"	271° 15' 60"	0.24971
1	274° 02' 44"	-4° 54' 33"	274° 34' 42"	-28° 17' 00"	0° 54' 31"	14' 51.48"	270° 58' 53"	0.25317
2	274° 32' 48"	-4° 53' 46"	275° 08' 40"	-28° 15' 12"	0° 54' 32"	14' 51.75"	270° 41' 48"	0.25664
3	275° 02' 54"	-4° 52' 57"	275° 42' 38"	-28° 13' 15"	0° 54' 33"	14' 52.03"	270° 24' 47"	0.26014
4	275° 32' 60"	-4° 52' 07"	276° 16' 36"	-28° 11' 10"	0° 54' 35"	14' 52.31"	270° 7' 47"	0.26365
5	276° 03' 06"	-4° 51' 15"	276° 50' 33"	-28° 08' 56"	0° 54' 36"	14' 52.59"	269° 50' 51"	0.26718
6	276° 33' 14"	-4° 50' 22"	277° 24' 30"	-28° 06' 34"	0° 54' 37"	14' 52.88"	269° 33' 57"	0.27073
7	277° 03' 23"	-4° 49' 28"	277° 58' 27"	-28° 04' 04"	0° 54' 38"	14' 53.18"	269° 17' 05"	0.27429
8	277° 33' 33"	-4° 48' 32"	278° 32' 24"	-28° 01' 24"	0° 54' 39"	14' 53.48"	269° 0' 17"	0.27787
9	278° 03' 44"	-4° 47' 35"	279° 06' 20"	-27° 58' 37"	0° 54' 40"	14' 53.78"	268° 43' 32"	0.28147
10	278° 33' 56"	-4° 46' 36"	279° 40' 15"	-27° 55' 41"	0° 54' 41"	14' 54.09"	268° 26' 50"	0.28508
11	279° 04' 09"	-4° 45' 36"	280° 14' 10"	-27° 52' 37"	0° 54' 42"	14' 54.40"	268° 10' 10"	0.28871
12	279° 34' 23"	-4° 44' 35"	280° 48' 04"	-27° 49' 24"	0° 54' 43"	14' 54.72"	267° 53' 35"	0.29236
13	280° 04' 38"	-4° 43' 33"	281° 21' 57"	-27° 46' 03"	0° 54' 45"	14' 55.04"	267° 37' 02"	0.29602
14	280° 34' 54"	-4° 42' 29"	281° 55' 50"	-27° 42' 33"	0° 54' 46"	14' 55.36"	267° 20' 33"	0.29970
15	281° 05' 11"	-4° 41' 23"	282° 29' 41"	-27° 38' 55"	0° 54' 47"	14' 55.69"	267° 4' 07"	0.30339
16	281° 35' 30"	-4° 40' 17"	283° 03' 32"	-27° 35' 09"	0° 54' 48"	14' 56.02"	266° 47' 45"	0.30710
17	282° 05' 49"	-4° 39' 09"	283° 37' 22"	-27° 31' 14"	0° 54' 49"	14' 56.36"	266° 31' 26"	0.31083
18	282° 36' 10"	-4° 37' 59"	284° 11' 11"	-27° 27' 11"	0° 54' 51"	14' 56.70"	266° 15' 12"	0.31457
19	283° 06' 32"	-4° 36' 49"	284° 44' 58"	-27° 22' 59"	0° 54' 52"	14' 57.05"	265° 59' 01"	0.31832
20	283° 36' 55"	-4° 35' 36"	285° 18' 45"	-27° 18' 40"	0° 54' 53"	14' 57.40"	265° 42' 54"	0.32209
21	284° 07' 19"	-4° 34' 23"	285° 52' 30"	-27° 14' 12"	0° 54' 55"	14' 57.75"	265° 26' 51"	0.32587
22	284° 37' 45"	-4° 33' 08"	286° 26' 14"	-27° 09' 35"	0° 54' 56"	14' 58.11"	265° 10' 52"	0.32967
23	285° 08' 12"	-4° 31' 52"	286° 59' 57"	-27° 04' 51"	0° 54' 57"	14' 58.48"	264° 54' 57"	0.33348
24	285° 38' 40"	-4° 30' 35"	287° 33' 38"	-26° 59' 58"	0° 54' 59"	14' 58.84"	264° 39' 06"	0.33731

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	214° 49' 45"	-0.44"	212° 32' 52"	-13° 07' 45"	0.9936827	16'05.73"	23° 26' 18"	16 m 14 s
1	214° 52' 14"	-0.44"	212° 35' 17"	-13° 08' 35"	0.9936713	16'05.74"	23° 26' 18"	16 m 15 s
2	214° 54' 44"	-0.43"	212° 37' 42"	-13° 09' 26"	0.9936599	16'05.75"	23° 26' 18"	16 m 15 s
3	214° 57' 14"	-0.43"	212° 40' 07"	-13° 10' 16"	0.9936486	16'05.76"	23° 26' 18"	16 m 15 s
4	214° 59' 43"	-0.43"	212° 42' 32"	-13° 11' 06"	0.9936372	16'05.78"	23° 26' 18"	16 m 15 s
5	215° 02' 13"	-0.42"	212° 44' 57"	-13° 11' 56"	0.9936258	16'05.79"	23° 26' 18"	16 m 15 s
6	215° 04' 43"	-0.42"	212° 47' 21"	-13° 12' 46"	0.9936145	16'05.80"	23° 26' 18"	16 m 16 s
7	215° 07' 13"	-0.42"	212° 49' 46"	-13° 13' 36"	0.9936031	16'05.81"	23° 26' 18"	16 m 16 s
8	215° 09' 42"	-0.41"	212° 52' 11"	-13° 14' 26"	0.9935917	16'05.82"	23° 26' 18"	16 m 16 s
9	215° 12' 12"	-0.41"	212° 54' 36"	-13° 15' 16"	0.9935804	16'05.83"	23° 26' 18"	16 m 16 s
10	215° 14' 42"	-0.41"	212° 57' 02"	-13° 16' 06"	0.9935690	16'05.84"	23° 26' 18"	16 m 16 s
11	215° 17' 12"	-0.40"	212° 59' 27"	-13° 16' 56"	0.9935577	16'05.85"	23° 26' 18"	16 m 16 s
12	215° 19' 41"	-0.40"	213° 01' 52"	-13° 17' 46"	0.9935463	16'05.86"	23° 26' 18"	16 m 17 s
13	215° 22' 11"	-0.39"	213° 04' 17"	-13° 18' 36"	0.9935350	16'05.87"	23° 26' 18"	16 m 17 s
14	215° 24' 41"	-0.39"	213° 06' 42"	-13° 19' 26"	0.9935237	16'05.89"	23° 26' 18"	16 m 17 s
15	215° 27' 11"	-0.39"	213° 09' 07"	-13° 20' 16"	0.9935123	16'05.90"	23° 26' 18"	16 m 17 s
16	215° 29' 41"	-0.38"	213° 11' 32"	-13° 21' 06"	0.9935010	16'05.91"	23° 26' 18"	16 m 17 s
17	215° 32' 10"	-0.38"	213° 13' 57"	-13° 21' 56"	0.9934897	16'05.92"	23° 26' 18"	16 m 18 s
18	215° 34' 40"	-0.37"	213° 16' 22"	-13° 22' 45"	0.9934783	16'05.93"	23° 26' 18"	16 m 18 s
19	215° 37' 10"	-0.37"	213° 18' 48"	-13° 23' 35"	0.9934670	16'05.94"	23° 26' 18"	16 m 18 s
20	215° 39' 40"	-0.37"	213° 21' 13"	-13° 24' 25"	0.9934557	16'05.95"	23° 26' 18"	16 m 18 s
21	215° 42' 09"	-0.36"	213° 23' 38"	-13° 25' 15"	0.9934444	16'05.96"	23° 26' 18"	16 m 18 s
22	215° 44' 39"	-0.36"	213° 26' 03"	-13° 26' 04"	0.9934330	16'05.97"	23° 26' 18"	16 m 18 s
23	215° 47' 09"	-0.35"	213° 28' 29"	-13° 26' 54"	0.9934217	16'05.98"	23° 26' 18"	16 m 19 s
24	215° 49' 39"	-0.35"	213° 30' 54"	-13° 27' 44"	0.9934104	16'06.00"	23° 26' 18"	16 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	285° 38' 40"	-4° 30' 35"	287° 33' 38"	-26° 59' 58"	0° 54' 59"	14' 58.84"	264° 39' 06"	0.33731
1	286° 09' 09"	-4° 29' 16"	288° 07' 18"	-26° 54' 57"	0° 54' 60"	14' 59.22"	264° 23' 20"	0.34115
2	286° 39' 40"	-4° 27' 56"	288° 40' 57"	-26° 49' 47"	0° 55' 01"	14' 59.59"	264° 7' 38"	0.34500
3	287° 10' 12"	-4° 26' 34"	289° 14' 33"	-26° 44' 30"	0° 55' 03"	14' 59.97"	263° 52' 01"	0.34887
4	287° 40' 45"	-4° 25' 12"	289° 48' 09"	-26° 39' 04"	0° 55' 04"	15' 00.36"	263° 36' 28"	0.35275
5	288° 11' 20"	-4° 23' 47"	290° 21' 43"	-26° 33' 30"	0° 55' 06"	15' 00.75"	263° 20' 59"	0.35664
6	288° 41' 56"	-4° 22' 22"	290° 55' 15"	-26° 27' 48"	0° 55' 07"	15' 01.14"	263° 5' 36"	0.36055
7	289° 12' 34"	-4° 20' 55"	291° 28' 45"	-26° 21' 58"	0° 55' 08"	15' 01.54"	262° 50' 17"	0.36447
8	289° 43' 13"	-4° 19' 27"	292° 02' 14"	-26° 15' 59"	0° 55' 10"	15' 01.95"	262° 35' 03"	0.36840
9	290° 13' 53"	-4° 17' 58"	292° 35' 41"	-26° 09' 53"	0° 55' 11"	15' 02.35"	262° 19' 55"	0.37234
10	290° 44' 35"	-4° 16' 27"	293° 09' 06"	-26° 03' 39"	0° 55' 13"	15' 02.76"	262° 4' 51"	0.37630
11	291° 15' 19"	-4° 14' 55"	293° 42' 30"	-25° 57' 16"	0° 55' 14"	15' 03.18"	261° 49' 52"	0.38027
12	291° 46' 04"	-4° 13' 22"	294° 15' 51"	-25° 50' 46"	0° 55' 16"	15' 03.60"	261° 34' 59"	0.38425
13	292° 16' 50"	-4° 11' 47"	294° 49' 11"	-25° 44' 07"	0° 55' 18"	15' 04.02"	261° 20' 10"	0.38824
14	292° 47' 38"	-4° 10' 11"	295° 22' 28"	-25° 37' 21"	0° 55' 19"	15' 04.45"	261° 5' 27"	0.39224
15	293° 18' 28"	-4° 08' 34"	295° 55' 44"	-25° 30' 27"	0° 55' 21"	15' 04.89"	260° 50' 50"	0.39626
16	293° 49' 19"	-4° 06' 55"	296° 28' 57"	-25° 23' 25"	0° 55' 22"	15' 05.32"	260° 36' 18"	0.40028
17	294° 20' 11"	-4° 05' 15"	297° 02' 09"	-25° 16' 15"	0° 55' 24"	15' 05.76"	260° 21' 52"	0.40432
18	294° 51' 06"	-4° 03' 34"	297° 35' 18"	-25° 08' 57"	0° 55' 26"	15' 06.21"	260° 7' 31"	0.40836
19	295° 22' 02"	-4° 01' 52"	298° 08' 26"	-25° 01' 31"	0° 55' 27"	15' 06.66"	259° 53' 16"	0.41242
20	295° 52' 60"	-4° 00' 08"	298° 41' 31"	-24° 53' 58"	0° 55' 29"	15' 07.11"	259° 39' 06"	0.41649
21	296° 23' 59"	-3° 58' 23"	299° 14' 34"	-24° 46' 17"	0° 55' 31"	15' 07.57"	259° 25' 03"	0.42056
22	296° 54' 60"	-3° 56' 37"	299° 47' 35"	-24° 38' 28"	0° 55' 32"	15' 08.04"	259° 11' 06"	0.42465
23	297° 26' 03"	-3° 54' 50"	300° 20' 34"	-24° 30' 31"	0° 55' 34"	15' 08.50"	258° 57' 14"	0.42875
24	297° 57' 07"	-3° 53' 01"	300° 53' 30"	-24° 22' 27"	0° 55' 36"	15' 08.97"	258° 43' 29"	0.43285

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	215° 49' 39"	-0.35"	213° 30' 54"	-13° 27' 44"	0.9934104	16'06.00"	23° 26' 18"	16 m 19 s
1	215° 52' 09"	-0.34"	213° 33' 19"	-13° 28' 33"	0.9933991	16'06.01"	23° 26' 18"	16 m 19 s
2	215° 54' 38"	-0.34"	213° 35' 45"	-13° 29' 23"	0.9933878	16'06.02"	23° 26' 18"	16 m 19 s
3	215° 57' 08"	-0.34"	213° 38' 10"	-13° 30' 13"	0.9933765	16'06.03"	23° 26' 18"	16 m 19 s
4	215° 59' 38"	-0.33"	213° 40' 35"	-13° 31' 02"	0.9933652	16'06.04"	23° 26' 18"	16 m 19 s
5	216° 02' 08"	-0.33"	213° 43' 01"	-13° 31' 52"	0.9933539	16'06.05"	23° 26' 18"	16 m 20 s
6	216° 04' 38"	-0.32"	213° 45' 26"	-13° 32' 41"	0.9933426	16'06.06"	23° 26' 18"	16 m 20 s
7	216° 07' 07"	-0.32"	213° 47' 52"	-13° 33' 31"	0.9933313	16'06.07"	23° 26' 18"	16 m 20 s
8	216° 09' 37"	-0.31"	213° 50' 17"	-13° 34' 20"	0.9933200	16'06.08"	23° 26' 18"	16 m 20 s
9	216° 12' 07"	-0.31"	213° 52' 43"	-13° 35' 10"	0.9933087	16'06.09"	23° 26' 18"	16 m 20 s
10	216° 14' 37"	-0.30"	213° 55' 08"	-13° 35' 59"	0.9932975	16'06.11"	23° 26' 18"	16 m 20 s
11	216° 17' 07"	-0.30"	213° 57' 34"	-13° 36' 49"	0.9932862	16'06.12"	23° 26' 18"	16 m 21 s
12	216° 19' 37"	-0.30"	213° 59' 59"	-13° 37' 38"	0.9932749	16'06.13"	23° 26' 18"	16 m 21 s
13	216° 22' 06"	-0.29"	214° 02' 25"	-13° 38' 28"	0.9932636	16'06.14"	23° 26' 18"	16 m 21 s
14	216° 24' 36"	-0.29"	214° 04' 50"	-13° 39' 17"	0.9932524	16'06.15"	23° 26' 18"	16 m 21 s
15	216° 27' 06"	-0.28"	214° 07' 16"	-13° 40' 06"	0.9932411	16'06.16"	23° 26' 18"	16 m 21 s
16	216° 29' 36"	-0.28"	214° 09' 42"	-13° 40' 56"	0.9932298	16'06.17"	23° 26' 18"	16 m 21 s
17	216° 32' 06"	-0.27"	214° 12' 07"	-13° 41' 45"	0.9932186	16'06.18"	23° 26' 18"	16 m 22 s
18	216° 34' 36"	-0.27"	214° 14' 33"	-13° 42' 34"	0.9932073	16'06.19"	23° 26' 18"	16 m 22 s
19	216° 37' 06"	-0.26"	214° 16' 59"	-13° 43' 24"	0.9931961	16'06.20"	23° 26' 18"	16 m 22 s
20	216° 39' 35"	-0.26"	214° 19' 24"	-13° 44' 13"	0.9931848	16'06.21"	23° 26' 18"	16 m 22 s
21	216° 42' 05"	-0.25"	214° 21' 50"	-13° 45' 02"	0.9931736	16'06.23"	23° 26' 18"	16 m 22 s
22	216° 44' 35"	-0.25"	214° 24' 16"	-13° 45' 51"	0.9931623	16'06.24"	23° 26' 18"	16 m 22 s
23	216° 47' 05"	-0.24"	214° 26' 41"	-13° 46' 40"	0.9931511	16'06.25"	23° 26' 18"	16 m 22 s
24	216° 49' 35"	-0.24"	214° 29' 07"	-13° 47' 29"	0.9931399	16'06.26"	23° 26' 18"	16 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	297° 57' 07"	-3° 53' 01"	300° 53' 30"	-24° 22' 27"	0° 55' 36"	15' 08.97"	258° 43' 29"	0.43285
1	298° 28' 14"	-3° 51' 11"	301° 26' 25"	-24° 14' 16"	0° 55' 37"	15' 09.45"	258° 29' 49"	0.43697
2	298° 59' 22"	-3° 49' 20"	301° 59' 17"	-24° 05' 56"	0° 55' 39"	15' 09.93"	258° 16' 16"	0.44109
3	299° 30' 32"	-3° 47' 28"	302° 32' 06"	-23° 57' 29"	0° 55' 41"	15' 10.41"	258° 2' 49"	0.44522
4	300° 01' 43"	-3° 45' 34"	303° 04' 54"	-23° 48' 55"	0° 55' 43"	15' 10.90"	257° 49' 29"	0.44936
5	300° 32' 57"	-3° 43' 39"	303° 37' 39"	-23° 40' 13"	0° 55' 45"	15' 11.39"	257° 36' 15"	0.45351
6	301° 04' 12"	-3° 41' 43"	304° 10' 22"	-23° 31' 24"	0° 55' 46"	15' 11.88"	257° 23' 07"	0.45767
7	301° 35' 30"	-3° 39' 45"	304° 43' 03"	-23° 22' 27"	0° 55' 48"	15' 12.38"	257° 10' 06"	0.46183
8	302° 06' 49"	-3° 37' 47"	305° 15' 41"	-23° 13' 23"	0° 55' 50"	15' 12.89"	256° 57' 12"	0.46600
9	302° 38' 10"	-3° 35' 47"	305° 48' 17"	-23° 04' 11"	0° 55' 52"	15' 13.40"	256° 44' 24"	0.47018
10	303° 09' 33"	-3° 33' 46"	306° 20' 51"	-22° 54' 53"	0° 55' 54"	15' 13.91"	256° 31' 43"	0.47437
11	303° 40' 58"	-3° 31' 44"	306° 53' 22"	-22° 45' 27"	0° 55' 56"	15' 14.42"	256° 19' 08"	0.47856
12	304° 12' 25"	-3° 29' 40"	307° 25' 51"	-22° 35' 54"	0° 55' 58"	15' 14.94"	256° 6' 41"	0.48276
13	304° 43' 54"	-3° 27' 36"	307° 58' 18"	-22° 26' 13"	0° 55' 60"	15' 15.47"	255° 54' 20"	0.48697
14	305° 15' 25"	-3° 25' 30"	308° 30' 43"	-22° 16' 26"	0° 56' 01"	15' 15.99"	255° 42' 06"	0.49118
15	305° 46' 58"	-3° 23' 23"	309° 03' 05"	-22° 06' 31"	0° 56' 03"	15' 16.52"	255° 29' 60"	0.49539
16	306° 18' 33"	-3° 21' 15"	309° 35' 24"	-21° 56' 29"	0° 56' 05"	15' 17.06"	255° 18' 00"	0.49962
17	306° 50' 11"	-3° 19' 05"	310° 07' 42"	-21° 46' 21"	0° 56' 07"	15' 17.60"	255° 6' 08"	0.50385
18	307° 21' 50"	-3° 16' 55"	310° 39' 57"	-21° 36' 05"	0° 56' 09"	15' 18.14"	254° 54' 23"	0.50808
19	307° 53' 31"	-3° 14' 43"	311° 12' 10"	-21° 25' 42"	0° 56' 11"	15' 18.68"	254° 42' 45"	0.51232
20	308° 25' 15"	-3° 12' 30"	311° 44' 21"	-21° 15' 13"	0° 56' 13"	15' 19.23"	254° 31' 14"	0.51656
21	308° 57' 01"	-3° 10' 16"	312° 16' 29"	-21° 04' 36"	0° 56' 15"	15' 19.79"	254° 19' 51"	0.52081
22	309° 28' 49"	-3° 08' 01"	312° 48' 35"	-20° 53' 53"	0° 56' 17"	15' 20.34"	254° 8' 35"	0.52506
23	310° 00' 39"	-3° 05' 45"	313° 20' 39"	-20° 43' 03"	0° 56' 19"	15' 20.90"	253° 57' 26"	0.52931
24	310° 32' 31"	-3° 03' 28"	313° 52' 40"	-20° 32' 07"	0° 56' 22"	15' 21.47"	253° 46' 26"	0.53357

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	216° 49' 35"	-0.24"	214° 29' 07"	-13° 47' 29"	0.9931399	16'06.26"	23° 26' 18"	16 m 23 s
1	216° 52' 05"	-0.23"	214° 31' 33"	-13° 48' 19"	0.9931286	16'06.27"	23° 26' 18"	16 m 23 s
2	216° 54' 35"	-0.23"	214° 33' 59"	-13° 49' 08"	0.9931174	16'06.28"	23° 26' 18"	16 m 23 s
3	216° 57' 04"	-0.22"	214° 36' 25"	-13° 49' 57"	0.9931062	16'06.29"	23° 26' 18"	16 m 23 s
4	216° 59' 34"	-0.22"	214° 38' 51"	-13° 50' 46"	0.9930950	16'06.30"	23° 26' 18"	16 m 23 s
5	217° 02' 04"	-0.21"	214° 41' 16"	-13° 51' 35"	0.9930838	16'06.31"	23° 26' 18"	16 m 23 s
6	217° 04' 34"	-0.21"	214° 43' 42"	-13° 52' 24"	0.9930726	16'06.32"	23° 26' 18"	16 m 23 s
7	217° 07' 04"	-0.20"	214° 46' 08"	-13° 53' 13"	0.9930613	16'06.34"	23° 26' 18"	16 m 23 s
8	217° 09' 34"	-0.20"	214° 48' 34"	-13° 54' 02"	0.9930501	16'06.35"	23° 26' 18"	16 m 24 s
9	217° 12' 04"	-0.19"	214° 51' 00"	-13° 54' 51"	0.9930389	16'06.36"	23° 26' 18"	16 m 24 s
10	217° 14' 34"	-0.19"	214° 53' 26"	-13° 55' 40"	0.9930277	16'06.37"	23° 26' 18"	16 m 24 s
11	217° 17' 03"	-0.18"	214° 55' 52"	-13° 56' 29"	0.9930166	16'06.38"	23° 26' 18"	16 m 24 s
12	217° 19' 33"	-0.18"	214° 58' 18"	-13° 57' 17"	0.9930054	16'06.39"	23° 26' 18"	16 m 24 s
13	217° 22' 03"	-0.17"	215° 00' 44"	-13° 58' 06"	0.9929942	16'06.40"	23° 26' 18"	16 m 24 s
14	217° 24' 33"	-0.17"	215° 03' 10"	-13° 58' 55"	0.9929830	16'06.41"	23° 26' 18"	16 m 24 s
15	217° 27' 03"	-0.16"	215° 05' 36"	-13° 59' 44"	0.9929718	16'06.42"	23° 26' 18"	16 m 24 s
16	217° 29' 33"	-0.15"	215° 08' 02"	-14° 00' 33"	0.9929607	16'06.43"	23° 26' 18"	16 m 25 s
17	217° 32' 03"	-0.15"	215° 10' 29"	-14° 01' 21"	0.9929495	16'06.44"	23° 26' 18"	16 m 25 s
18	217° 34' 33"	-0.14"	215° 12' 55"	-14° 02' 10"	0.9929383	16'06.45"	23° 26' 18"	16 m 25 s
19	217° 37' 03"	-0.14"	215° 15' 21"	-14° 02' 59"	0.9929272	16'06.47"	23° 26' 18"	16 m 25 s
20	217° 39' 33"	-0.13"	215° 17' 47"	-14° 03' 47"	0.9929160	16'06.48"	23° 26' 18"	16 m 25 s
21	217° 42' 03"	-0.13"	215° 20' 13"	-14° 04' 36"	0.9929049	16'06.49"	23° 26' 18"	16 m 25 s
22	217° 44' 33"	-0.12"	215° 22' 39"	-14° 05' 25"	0.9928937	16'06.50"	23° 26' 18"	16 m 25 s
23	217° 47' 02"	-0.12"	215° 25' 06"	-14° 06' 13"	0.9928826	16'06.51"	23° 26' 18"	16 m 25 s
24	217° 49' 32"	-0.11"	215° 27' 32"	-14° 07' 02"	0.9928714	16'06.52"	23° 26' 18"	16 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	310° 32' 31"	-3° 03' 28"	313° 52' 40"	-20° 32' 07"	0° 56' 22"	15' 21.47"	253° 46' 26"	0.53357
1	311° 04' 26"	-3° 01' 09"	314° 24' 39"	-20° 21' 03"	0° 56' 24"	15' 22.04"	253° 35' 32"	0.53783
2	311° 36' 23"	-2° 58' 50"	314° 56' 37"	-20° 09' 53"	0° 56' 26"	15' 22.61"	253° 24' 47"	0.54209
3	312° 08' 22"	-2° 56' 29"	315° 28' 31"	-19° 58' 36"	0° 56' 28"	15' 23.18"	253° 14' 09"	0.54636
4	312° 40' 23"	-2° 54' 07"	316° 00' 24"	-19° 47' 13"	0° 56' 30"	15' 23.76"	253° 3' 39"	0.55063
5	313° 12' 27"	-2° 51' 44"	316° 32' 15"	-19° 35' 43"	0° 56' 32"	15' 24.34"	252° 53' 16"	0.55490
6	313° 44' 33"	-2° 49' 21"	317° 04' 03"	-19° 24' 07"	0° 56' 34"	15' 24.93"	252° 43' 02"	0.55917
7	314° 16' 41"	-2° 46' 56"	317° 35' 50"	-19° 12' 25"	0° 56' 36"	15' 25.51"	252° 32' 55"	0.56345
8	314° 48' 52"	-2° 44' 30"	318° 07' 34"	-19° 00' 36"	0° 56' 39"	15' 26.10"	252° 22' 56"	0.56772
9	315° 21' 05"	-2° 42' 02"	318° 39' 16"	-18° 48' 40"	0° 56' 41"	15' 26.70"	252° 13' 06"	0.57200
10	315° 53' 21"	-2° 39' 34"	319° 10' 56"	-18° 36' 39"	0° 56' 43"	15' 27.30"	252° 3' 23"	0.57627
11	316° 25' 39"	-2° 37' 05"	319° 42' 35"	-18° 24' 31"	0° 56' 45"	15' 27.90"	251° 53' 49"	0.58055
12	316° 57' 59"	-2° 34' 35"	320° 14' 11"	-18° 12' 17"	0° 56' 47"	15' 28.50"	251° 44' 23"	0.58483
13	317° 30' 22"	-2° 32' 04"	320° 45' 45"	-17° 59' 57"	0° 56' 50"	15' 29.10"	251° 35' 05"	0.58910
14	318° 02' 47"	-2° 29' 31"	321° 17' 18"	-17° 47' 30"	0° 56' 52"	15' 29.71"	251° 25' 55"	0.59338
15	318° 35' 15"	-2° 26' 58"	321° 48' 48"	-17° 34' 58"	0° 56' 54"	15' 30.33"	251° 16' 54"	0.59765
16	319° 07' 45"	-2° 24' 24"	322° 20' 17"	-17° 22' 20"	0° 56' 56"	15' 30.94"	251° 8' 01"	0.60193
17	319° 40' 18"	-2° 21' 49"	322° 51' 44"	-17° 09' 35"	0° 56' 59"	15' 31.56"	250° 59' 16"	0.60620
18	320° 12' 53"	-2° 19' 13"	323° 23' 09"	-16° 56' 45"	0° 57' 01"	15' 32.18"	250° 50' 40"	0.61047
19	320° 45' 31"	-2° 16' 36"	323° 54' 33"	-16° 43' 49"	0° 57' 03"	15' 32.80"	250° 42' 13"	0.61474
20	321° 18' 12"	-2° 13' 57"	324° 25' 54"	-16° 30' 47"	0° 57' 05"	15' 33.43"	250° 33' 54"	0.61900
21	321° 50' 55"	-2° 11' 18"	324° 57' 15"	-16° 17' 40"	0° 57' 08"	15' 34.06"	250° 25' 44"	0.62326
22	322° 23' 41"	-2° 08' 39"	325° 28' 33"	-16° 04' 26"	0° 57' 10"	15' 34.69"	250° 17' 43"	0.62752
23	322° 56' 29"	-2° 05' 58"	325° 59' 50"	-15° 51' 07"	0° 57' 12"	15' 35.32"	250° 9' 50"	0.63178
24	323° 29' 20"	-2° 03' 16"	326° 31' 05"	-15° 37' 43"	0° 57' 15"	15' 35.95"	250° 2' 06"	0.63603

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	217° 49' 32"	-0.11"	215° 27' 32"	-14° 07' 02"	0.9928714	16'06.52"	23° 26' 18"	16 m 25 s
1	217° 52' 02"	-0.11"	215° 29' 58"	-14° 07' 51"	0.9928603	16'06.53"	23° 26' 18"	16 m 26 s
2	217° 54' 32"	-0.10"	215° 32' 24"	-14° 08' 39"	0.9928492	16'06.54"	23° 26' 18"	16 m 26 s
3	217° 57' 02"	-0.10"	215° 34' 51"	-14° 09' 28"	0.9928380	16'06.55"	23° 26' 18"	16 m 26 s
4	217° 59' 32"	-0.09"	215° 37' 17"	-14° 10' 16"	0.9928269	16'06.56"	23° 26' 18"	16 m 26 s
5	218° 02' 02"	-0.08"	215° 39' 43"	-14° 11' 05"	0.9928158	16'06.57"	23° 26' 18"	16 m 26 s
6	218° 04' 32"	-0.08"	215° 42' 10"	-14° 11' 53"	0.9928047	16'06.58"	23° 26' 18"	16 m 26 s
7	218° 07' 02"	-0.07"	215° 44' 36"	-14° 12' 41"	0.9927936	16'06.60"	23° 26' 18"	16 m 26 s
8	218° 09' 32"	-0.07"	215° 47' 03"	-14° 13' 30"	0.9927825	16'06.61"	23° 26' 18"	16 m 26 s
9	218° 12' 02"	-0.06"	215° 49' 29"	-14° 14' 18"	0.9927714	16'06.62"	23° 26' 18"	16 m 26 s
10	218° 14' 32"	-0.06"	215° 51' 55"	-14° 15' 06"	0.9927603	16'06.63"	23° 26' 18"	16 m 26 s
11	218° 17' 02"	-0.05"	215° 54' 22"	-14° 15' 55"	0.9927492	16'06.64"	23° 26' 18"	16 m 27 s
12	218° 19' 32"	-0.05"	215° 56' 48"	-14° 16' 43"	0.9927381	16'06.65"	23° 26' 18"	16 m 27 s
13	218° 22' 02"	-0.04"	215° 59' 15"	-14° 17' 31"	0.9927270	16'06.66"	23° 26' 18"	16 m 27 s
14	218° 24' 32"	-0.03"	216° 01' 42"	-14° 18' 20"	0.9927160	16'06.67"	23° 26' 18"	16 m 27 s
15	218° 27' 02"	-0.03"	216° 04' 08"	-14° 19' 08"	0.9927049	16'06.68"	23° 26' 18"	16 m 27 s
16	218° 29' 32"	-0.02"	216° 06' 35"	-14° 19' 56"	0.9926938	16'06.69"	23° 26' 18"	16 m 27 s
17	218° 32' 02"	-0.02"	216° 09' 01"	-14° 20' 44"	0.9926828	16'06.70"	23° 26' 18"	16 m 27 s
18	218° 34' 32"	-0.01"	216° 11' 28"	-14° 21' 32"	0.9926717	16'06.71"	23° 26' 18"	16 m 27 s
19	218° 37' 02"	-0.01"	216° 13' 54"	-14° 22' 21"	0.9926606	16'06.73"	23° 26' 18"	16 m 27 s
20	218° 39' 32"	-0.00"	216° 16' 21"	-14° 23' 09"	0.9926496	16'06.74"	23° 26' 18"	16 m 27 s
21	218° 42' 02"	0.01"	216° 18' 48"	-14° 23' 57"	0.9926386	16'06.75"	23° 26' 18"	16 m 27 s
22	218° 44' 32"	0.01"	216° 21' 14"	-14° 24' 45"	0.9926275	16'06.76"	23° 26' 18"	16 m 27 s
23	218° 47' 02"	0.02"	216° 23' 41"	-14° 25' 33"	0.9926165	16'06.77"	23° 26' 18"	16 m 28 s
24	218° 49' 32"	0.02"	216° 26' 08"	-14° 26' 21"	0.9926055	16'06.78"	23° 26' 18"	16 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	323° 29' 20"	-2° 03' 16"	326° 31' 05"	-15° 37' 43"	0° 57' 15"	15' 35.95"	250° 2' 06"	0.63603
1	324° 02' 13"	-2° 00' 33"	327° 02' 19"	-15° 24' 13"	0° 57' 17"	15' 36.59"	249° 54' 31"	0.64027
2	324° 35' 10"	-1° 57' 50"	327° 33' 32"	-15° 10' 37"	0° 57' 19"	15' 37.23"	249° 47' 06"	0.64452
3	325° 08' 09"	-1° 55' 05"	328° 04' 43"	-14° 56' 56"	0° 57' 22"	15' 37.87"	249° 39' 49"	0.64875
4	325° 41' 10"	-1° 52' 20"	328° 35' 53"	-14° 43' 09"	0° 57' 24"	15' 38.52"	249° 32' 41"	0.65298
5	326° 14' 15"	-1° 49' 34"	329° 07' 01"	-14° 29' 18"	0° 57' 26"	15' 39.16"	249° 25' 42"	0.65721
6	326° 47' 22"	-1° 46' 47"	329° 38' 09"	-14° 15' 21"	0° 57' 29"	15' 39.81"	249° 18' 53"	0.66143
7	327° 20' 32"	-1° 43' 59"	330° 09' 15"	-14° 01' 18"	0° 57' 31"	15' 40.46"	249° 12' 13"	0.66564
8	327° 53' 44"	-1° 41' 10"	330° 40' 20"	-13° 47' 11"	0° 57' 34"	15' 41.11"	249° 5' 42"	0.66985
9	328° 26' 60"	-1° 38' 21"	331° 11' 24"	-13° 32' 58"	0° 57' 36"	15' 41.77"	248° 59' 20"	0.67405
10	329° 00' 18"	-1° 35' 31"	331° 42' 27"	-13° 18' 41"	0° 57' 38"	15' 42.42"	248° 53' 08"	0.67824
11	329° 33' 39"	-1° 32' 40"	332° 13' 28"	-13° 04' 18"	0° 57' 41"	15' 43.08"	248° 47' 05"	0.68242
12	330° 07' 03"	-1° 29' 48"	332° 44' 29"	-12° 49' 50"	0° 57' 43"	15' 43.74"	248° 41' 13"	0.68660
13	330° 40' 29"	-1° 26' 55"	333° 15' 30"	-12° 35' 18"	0° 57' 46"	15' 44.40"	248° 35' 29"	0.69077
14	331° 13' 59"	-1° 24' 02"	333° 46' 29"	-12° 20' 41"	0° 57' 48"	15' 45.06"	248° 29' 56"	0.69492
15	331° 47' 31"	-1° 21' 08"	334° 17' 27"	-12° 05' 59"	0° 57' 51"	15' 45.72"	248° 24' 32"	0.69907
16	332° 21' 06"	-1° 18' 14"	334° 48' 25"	-11° 51' 12"	0° 57' 53"	15' 46.38"	248° 19' 18"	0.70321
17	332° 54' 44"	-1° 15' 18"	335° 19' 22"	-11° 36' 20"	0° 57' 55"	15' 47.05"	248° 14' 14"	0.70734
18	333° 28' 25"	-1° 12' 22"	335° 50' 19"	-11° 21' 24"	0° 57' 58"	15' 47.71"	248° 9' 20"	0.71145
19	334° 02' 09"	-1° 09' 25"	336° 21' 15"	-11° 06' 24"	0° 58' 00"	15' 48.38"	248° 4' 36"	0.71556
20	334° 35' 56"	-1° 06' 28"	336° 52' 11"	-10° 51' 19"	0° 58' 03"	15' 49.05"	248° 0' 02"	0.71965
21	335° 09' 45"	-1° 03' 30"	337° 23' 06"	-10° 36' 09"	0° 58' 05"	15' 49.72"	247° 55' 39"	0.72374
22	335° 43' 38"	-1° 00' 31"	337° 54' 01"	-10° 20' 56"	0° 58' 08"	15' 50.39"	247° 51' 25"	0.72781
23	336° 17' 33"	0°-57' 32"	338° 24' 55"	-10° 05' 37"	0° 58' 10"	15' 51.06"	247° 47' 23"	0.73186
24	336° 51' 32"	0°-54' 32"	338° 55' 50"	-9° 50' 15"	0° 58' 13"	15' 51.73"	247° 43' 30"	0.73591

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	218° 49' 32"	0.02"	216° 26' 08"	-14° 26' 21"	0.9926055	16'06.78"	23° 26' 18"	16 m 28 s
1	218° 52' 02"	0.03"	216° 28' 35"	-14° 27' 09"	0.9925944	16'06.79"	23° 26' 18"	16 m 28 s
2	218° 54' 32"	0.03"	216° 31' 01"	-14° 27' 57"	0.9925834	16'06.80"	23° 26' 18"	16 m 28 s
3	218° 57' 02"	0.04"	216° 33' 28"	-14° 28' 45"	0.9925724	16'06.81"	23° 26' 18"	16 m 28 s
4	218° 59' 32"	0.04"	216° 35' 55"	-14° 29' 33"	0.9925614	16'06.82"	23° 26' 18"	16 m 28 s
5	219° 02' 02"	0.05"	216° 38' 22"	-14° 30' 20"	0.9925504	16'06.83"	23° 26' 18"	16 m 28 s
6	219° 04' 32"	0.06"	216° 40' 49"	-14° 31' 08"	0.9925394	16'06.84"	23° 26' 18"	16 m 28 s
7	219° 07' 02"	0.06"	216° 43' 16"	-14° 31' 56"	0.9925284	16'06.85"	23° 26' 18"	16 m 28 s
8	219° 09' 32"	0.07"	216° 45' 43"	-14° 32' 44"	0.9925174	16'06.86"	23° 26' 18"	16 m 28 s
9	219° 12' 02"	0.07"	216° 48' 09"	-14° 33' 32"	0.9925064	16'06.88"	23° 26' 18"	16 m 28 s
10	219° 14' 32"	0.08"	216° 50' 36"	-14° 34' 20"	0.9924955	16'06.89"	23° 26' 18"	16 m 28 s
11	219° 17' 02"	0.08"	216° 53' 03"	-14° 35' 07"	0.9924845	16'06.90"	23° 26' 18"	16 m 28 s
12	219° 19' 32"	0.09"	216° 55' 30"	-14° 35' 55"	0.9924735	16'06.91"	23° 26' 18"	16 m 28 s
13	219° 22' 02"	0.09"	216° 57' 57"	-14° 36' 43"	0.9924626	16'06.92"	23° 26' 18"	16 m 28 s
14	219° 24' 32"	0.10"	217° 00' 24"	-14° 37' 30"	0.9924516	16'06.93"	23° 26' 18"	16 m 28 s
15	219° 27' 02"	0.11"	217° 02' 51"	-14° 38' 18"	0.9924406	16'06.94"	23° 26' 18"	16 m 29 s
16	219° 29' 32"	0.11"	217° 05' 18"	-14° 39' 06"	0.9924297	16'06.95"	23° 26' 18"	16 m 29 s
17	219° 32' 02"	0.12"	217° 07' 46"	-14° 39' 53"	0.9924188	16'06.96"	23° 26' 18"	16 m 29 s
18	219° 34' 32"	0.12"	217° 10' 13"	-14° 40' 41"	0.9924078	16'06.97"	23° 26' 18"	16 m 29 s
19	219° 37' 02"	0.13"	217° 12' 40"	-14° 41' 28"	0.9923969	16'06.98"	23° 26' 18"	16 m 29 s
20	219° 39' 32"	0.13"	217° 15' 07"	-14° 42' 16"	0.9923860	16'06.99"	23° 26' 18"	16 m 29 s
21	219° 42' 02"	0.14"	217° 17' 34"	-14° 43' 03"	0.9923751	16'07.00"	23° 26' 18"	16 m 29 s
22	219° 44' 32"	0.14"	217° 20' 01"	-14° 43' 51"	0.9923641	16'07.01"	23° 26' 18"	16 m 29 s
23	219° 47' 02"	0.15"	217° 22' 28"	-14° 44' 38"	0.9923532	16'07.02"	23° 26' 18"	16 m 29 s
24	219° 49' 32"	0.16"	217° 24' 56"	-14° 45' 26"	0.9923423	16'07.04"	23° 26' 18"	16 m 29 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	336° 51' 32"	0°-54' 32"	338° 55' 50"	-9° 50' 15"	0° 58' 13"	15' 51.73"	247° 43' 30"	0.73591
1	337° 25' 33"	0°-51' 32"	339° 26' 44"	-9° 34' 49"	0° 58' 15"	15' 52.40"	247° 39' 49"	0.73994
2	337° 59' 38"	0°-48' 31"	339° 57' 38"	-9° 19' 18"	0° 58' 18"	15' 53.07"	247° 36' 18"	0.74395
3	338° 33' 45"	0°-45' 32"	340° 28' 33"	-9° 03' 46"	0° 58' 20"	15' 53.74"	247° 32' 56"	0.74796
4	339° 07' 55"	0°-42' 30"	340° 59' 27"	-8° 48' 07"	0° 58' 22"	15' 54.41"	247° 29' 46"	0.75194
5	339° 42' 09"	0°-39' 27"	341° 30' 22"	-8° 32' 25"	0° 58' 25"	15' 55.08"	247° 26' 48"	0.75591
6	340° 16' 25"	0°-36' 24"	342° 01' 16"	-8° 16' 38"	0° 58' 27"	15' 55.75"	247° 24' 01"	0.75987
7	340° 50' 44"	0°-33' 21"	342° 32' 11"	-8° 00' 48"	0° 58' 30"	15' 56.42"	247° 21' 24"	0.76381
8	341° 25' 06"	0°-30' 17"	343° 03' 06"	-7° 44' 55"	0° 58' 32"	15' 57.09"	247° 18' 59"	0.76773
9	341° 59' 32"	0°-27' 12"	343° 34' 02"	-7° 28' 57"	0° 58' 35"	15' 57.77"	247° 16' 46"	0.77164
10	342° 33' 60"	0°-24' 08"	344° 04' 58"	-7° 12' 56"	0° 58' 37"	15' 58.44"	247° 14' 44"	0.77553
11	343° 08' 31"	0°-21' 02"	344° 35' 54"	-6° 56' 52"	0° 58' 40"	15' 59.10"	247° 12' 54"	0.77940
12	343° 43' 05"	0°-17' 57"	345° 06' 51"	-6° 40' 44"	0° 58' 42"	15' 59.77"	247° 11' 15"	0.78325
13	344° 17' 43"	0°-14' 51"	345° 37' 49"	-6° 24' 33"	0° 58' 45"	16' 00.44"	247° 9' 48"	0.78708
14	344° 52' 23"	0°-11' 44"	346° 08' 48"	-6° 08' 19"	0° 58' 47"	16' 01.11"	247° 8' 33"	0.79090
15	345° 27' 06"	0° -8' 38"	346° 39' 47"	-5° 52' 01"	0° 58' 49"	16' 01.78"	247° 7' 31"	0.79469
16	346° 01' 53"	0° -5' 31"	347° 10' 47"	-5° 35' 40"	0° 58' 52"	16' 02.44"	247° 6' 40"	0.79847
17	346° 36' 42"	0° -2' 23"	347° 41' 49"	-5° 19' 16"	0° 58' 54"	16' 03.11"	247° 6' 03"	0.80222
18	347° 11' 35"	0° 00' 44"	348° 12' 51"	-5° 02' 50"	0° 58' 57"	16' 03.77"	247° 5' 37"	0.80595
19	347° 46' 30"	0° 03' 52"	348° 43' 54"	-4° 46' 20"	0° 58' 59"	16' 04.43"	247° 5' 25"	0.80966
20	348° 21' 29"	0° 06' 60"	349° 14' 59"	-4° 29' 48"	0° 59' 02"	16' 05.09"	247° 5' 25"	0.81335
21	348° 56' 30"	0° 10' 08"	349° 46' 05"	-4° 13' 12"	0° 59' 04"	16' 05.75"	247° 5' 38"	0.81702
22	349° 31' 35"	0° 13' 17"	350° 17' 12"	-3° 56' 34"	0° 59' 06"	16' 06.41"	247° 6' 05"	0.82066
23	350° 06' 43"	0° 16' 25"	350° 48' 21"	-3° 39' 54"	0° 59' 09"	16' 07.06"	247° 6' 45"	0.82428
24	350° 41' 53"	0° 19' 34"	351° 19' 31"	-3° 23' 11"	0° 59' 11"	16' 07.71"	247° 7' 39"	0.82788

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	219° 49' 32"	0.16"	217° 24' 56"	-14° 45' 26"	0.9923423	16'07.04"	23° 26' 18"	16 m 29 s
1	219° 52' 02"	0.16"	217° 27' 23"	-14° 46' 13"	0.9923314	16'07.05"	23° 26' 18"	16 m 29 s
2	219° 54' 33"	0.17"	217° 29' 50"	-14° 47' 00"	0.9923206	16'07.06"	23° 26' 18"	16 m 29 s
3	219° 57' 03"	0.17"	217° 32' 18"	-14° 47' 48"	0.9923097	16'07.07"	23° 26' 18"	16 m 29 s
4	219° 59' 33"	0.18"	217° 34' 45"	-14° 48' 35"	0.9922988	16'07.08"	23° 26' 18"	16 m 29 s
5	220° 02' 03"	0.18"	217° 37' 12"	-14° 49' 22"	0.9922879	16'07.09"	23° 26' 18"	16 m 29 s
6	220° 04' 33"	0.19"	217° 39' 40"	-14° 50' 10"	0.9922770	16'07.10"	23° 26' 18"	16 m 29 s
7	220° 07' 03"	0.19"	217° 42' 07"	-14° 50' 57"	0.9922662	16'07.11"	23° 26' 18"	16 m 29 s
8	220° 09' 33"	0.20"	217° 44' 34"	-14° 51' 44"	0.9922553	16'07.12"	23° 26' 18"	16 m 29 s
9	220° 12' 03"	0.20"	217° 47' 02"	-14° 52' 31"	0.9922445	16'07.13"	23° 26' 18"	16 m 29 s
10	220° 14' 33"	0.21"	217° 49' 29"	-14° 53' 18"	0.9922336	16'07.14"	23° 26' 18"	16 m 29 s
11	220° 17' 03"	0.22"	217° 51' 57"	-14° 54' 06"	0.9922228	16'07.15"	23° 26' 18"	16 m 29 s
12	220° 19' 33"	0.22"	217° 54' 24"	-14° 54' 53"	0.9922120	16'07.16"	23° 26' 18"	16 m 29 s
13	220° 22' 04"	0.23"	217° 56' 52"	-14° 55' 40"	0.9922011	16'07.17"	23° 26' 18"	16 m 29 s
14	220° 24' 34"	0.23"	217° 59' 19"	-14° 56' 27"	0.9921903	16'07.18"	23° 26' 18"	16 m 29 s
15	220° 27' 04"	0.24"	218° 01' 47"	-14° 57' 14"	0.9921795	16'07.19"	23° 26' 18"	16 m 29 s
16	220° 29' 34"	0.24"	218° 04' 14"	-14° 58' 01"	0.9921687	16'07.20"	23° 26' 18"	16 m 29 s
17	220° 32' 04"	0.25"	218° 06' 42"	-14° 58' 48"	0.9921579	16'07.22"	23° 26' 18"	16 m 29 s
18	220° 34' 34"	0.25"	218° 09' 09"	-14° 59' 35"	0.9921471	16'07.23"	23° 26' 18"	16 m 29 s
19	220° 37' 04"	0.26"	218° 11' 37"	-15° 00' 22"	0.9921363	16'07.24"	23° 26' 18"	16 m 29 s
20	220° 39' 34"	0.26"	218° 14' 05"	-15° 01' 09"	0.9921255	16'07.25"	23° 26' 18"	16 m 29 s
21	220° 42' 04"	0.27"	218° 16' 32"	-15° 01' 56"	0.9921147	16'07.26"	23° 26' 18"	16 m 29 s
22	220° 44' 35"	0.27"	218° 18' 60"	-15° 02' 42"	0.9921040	16'07.27"	23° 26' 18"	16 m 29 s
23	220° 47' 05"	0.28"	218° 21' 28"	-15° 03' 29"	0.9920932	16'07.28"	23° 26' 18"	16 m 29 s
24	220° 49' 35"	0.28"	218° 23' 55"	-15° 04' 16"	0.9920824	16'07.29"	23° 26' 18"	16 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	350° 41' 53"	0° 19' 34"	351° 19' 31"	-3° 23' 11"	0° 59' 11"	16' 07.71"	247° 7' 39"	0.82788
1	351° 17' 07"	0° 22' 43"	351° 50' 43"	-3° 06' 26"	0° 59' 14"	16' 08.36"	247° 8' 46"	0.83145
2	351° 52' 24"	0° 25' 52"	352° 21' 57"	-2° 49' 38"	0° 59' 16"	16' 09.01"	247° 10' 07"	0.83499
3	352° 27' 44"	0° 29' 01"	352° 53' 12"	-2° 32' 48"	0° 59' 18"	16' 09.66"	247° 11' 43"	0.83851
4	353° 03' 06"	0° 32' 10"	353° 24' 29"	-2° 15' 56"	0° 59' 21"	16' 10.30"	247° 13' 33"	0.84201
5	353° 38' 32"	0° 35' 19"	353° 55' 48"	-1° 59' 02"	0° 59' 23"	16' 10.95"	247° 15' 38"	0.84548
6	354° 14' 01"	0° 38' 29"	354° 27' 09"	-1° 42' 06"	0° 59' 25"	16' 11.59"	247° 17' 57"	0.84892
7	354° 49' 33"	0° 41' 38"	354° 58' 32"	-1° 25' 07"	0° 59' 28"	16' 12.22"	247° 20' 32"	0.85234
8	355° 25' 08"	0° 44' 47"	355° 29' 57"	-1° 08' 08"	0° 59' 30"	16' 12.86"	247° 23' 22"	0.85572
9	356° 00' 45"	0° 47' 56"	356° 01' 25"	0°-51' 06"	0° 59' 32"	16' 13.49"	247° 26' 28"	0.85908
10	356° 36' 26"	0° 51' 05"	356° 32' 54"	0°-34' 03"	0° 59' 35"	16' 14.11"	247° 29' 50"	0.86241
11	357° 12' 10"	0° 54' 14"	357° 04' 27"	0°-16' 58"	0° 59' 37"	16' 14.74"	247° 33' 28"	0.86571
12	357° 47' 57"	0° 57' 23"	357° 36' 01"	0° 00' 09"	0° 59' 39"	16' 15.36"	247° 37' 23"	0.86898
13	358° 23' 46"	1° 00' 32"	358° 07' 38"	0° 17' 16"	0° 59' 42"	16' 15.98"	247° 41' 34"	0.87222
14	358° 59' 39"	1° 03' 41"	358° 39' 18"	0° 34' 25"	0° 59' 44"	16' 16.59"	247° 46' 03"	0.87544
15	359° 35' 34"	1° 06' 49"	359° 11' 01"	0° 51' 35"	0° 59' 46"	16' 17.20"	247° 50' 50"	0.87861
16	0° 11' 33"	1° 09' 57"	359° 42' 46"	1° 08' 46"	0° 59' 48"	16' 17.81"	247° 55' 54"	0.88176
17	0° 47' 34"	1° 13' 05"	0° 14' 34"	1° 25' 59"	0° 59' 51"	16' 18.41"	248° 1' 17"	0.88488
18	1° 23' 39"	1° 16' 13"	0° 46' 26"	1° 43' 12"	0° 59' 53"	16' 19.01"	248° 6' 59"	0.88796
19	1° 59' 46"	1° 19' 20"	1° 18' 20"	2° 00' 26"	0° 59' 55"	16' 19.60"	248° 12' 60"	0.89101
20	2° 35' 56"	1° 22' 27"	1° 50' 17"	2° 17' 40"	0° 59' 57"	16' 20.19"	248° 19' 21"	0.89403
21	3° 12' 09"	1° 25' 34"	2° 22' 18"	2° 34' 55"	0° 59' 59"	16' 20.78"	248° 26' 02"	0.89701
22	3° 48' 25"	1° 28' 41"	2° 54' 22"	2° 52' 11"	1° 00' 01"	16' 21.36"	248° 33' 04"	0.89996
23	4° 24' 43"	1° 31' 47"	3° 26' 29"	3° 09' 27"	1° 00' 03"	16' 21.94"	248° 40' 27"	0.90287
24	5° 01' 04"	1° 34' 52"	3° 58' 40"	3° 26' 43"	1° 00' 06"	16' 22.51"	248° 48' 12"	0.90575

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	220° 49' 35"	0.28"	218° 23' 55"	-15° 04' 16"	0.9920824	16'07.29"	23° 26' 18"	16 m 29 s
1	220° 52' 05"	0.29"	218° 26' 23"	-15° 05' 03"	0.9920717	16'07.30"	23° 26' 18"	16 m 29 s
2	220° 54' 35"	0.29"	218° 28' 51"	-15° 05' 50"	0.9920609	16'07.31"	23° 26' 18"	16 m 29 s
3	220° 57' 05"	0.30"	218° 31' 19"	-15° 06' 36"	0.9920502	16'07.32"	23° 26' 18"	16 m 29 s
4	220° 59' 35"	0.30"	218° 33' 46"	-15° 07' 23"	0.9920394	16'07.33"	23° 26' 18"	16 m 29 s
5	221° 02' 06"	0.31"	218° 36' 14"	-15° 08' 10"	0.9920287	16'07.34"	23° 26' 18"	16 m 29 s
6	221° 04' 36"	0.31"	218° 38' 42"	-15° 08' 56"	0.9920180	16'07.35"	23° 26' 18"	16 m 29 s
7	221° 07' 06"	0.32"	218° 41' 10"	-15° 09' 43"	0.9920073	16'07.36"	23° 26' 18"	16 m 29 s
8	221° 09' 36"	0.32"	218° 43' 38"	-15° 10' 30"	0.9919966	16'07.37"	23° 26' 18"	16 m 29 s
9	221° 12' 06"	0.33"	218° 46' 06"	-15° 11' 16"	0.9919859	16'07.38"	23° 26' 18"	16 m 29 s
10	221° 14' 36"	0.33"	218° 48' 34"	-15° 12' 03"	0.9919752	16'07.39"	23° 26' 18"	16 m 29 s
11	221° 17' 07"	0.34"	218° 51' 02"	-15° 12' 49"	0.9919645	16'07.40"	23° 26' 18"	16 m 29 s
12	221° 19' 37"	0.34"	218° 53' 30"	-15° 13' 36"	0.9919538	16'07.41"	23° 26' 18"	16 m 29 s
13	221° 22' 07"	0.35"	218° 55' 58"	-15° 14' 22"	0.9919431	16'07.42"	23° 26' 18"	16 m 29 s
14	221° 24' 37"	0.35"	218° 58' 26"	-15° 15' 09"	0.9919324	16'07.43"	23° 26' 18"	16 m 29 s
15	221° 27' 07"	0.36"	219° 00' 54"	-15° 15' 55"	0.9919218	16'07.45"	23° 26' 18"	16 m 29 s
16	221° 29' 37"	0.36"	219° 03' 22"	-15° 16' 41"	0.9919111	16'07.46"	23° 26' 18"	16 m 29 s
17	221° 32' 08"	0.37"	219° 05' 50"	-15° 17' 28"	0.9919005	16'07.47"	23° 26' 18"	16 m 29 s
18	221° 34' 38"	0.37"	219° 08' 18"	-15° 18' 14"	0.9918898	16'07.48"	23° 26' 18"	16 m 29 s
19	221° 37' 08"	0.38"	219° 10' 46"	-15° 19' 00"	0.9918792	16'07.49"	23° 26' 18"	16 m 29 s
20	221° 39' 38"	0.38"	219° 13' 14"	-15° 19' 47"	0.9918685	16'07.50"	23° 26' 18"	16 m 29 s
21	221° 42' 08"	0.38"	219° 15' 42"	-15° 20' 33"	0.9918579	16'07.51"	23° 26' 18"	16 m 29 s
22	221° 44' 39"	0.39"	219° 18' 11"	-15° 21' 19"	0.9918473	16'07.52"	23° 26' 18"	16 m 29 s
23	221° 47' 09"	0.39"	219° 20' 39"	-15° 22' 05"	0.9918367	16'07.53"	23° 26' 18"	16 m 29 s
24	221° 49' 39"	0.40"	219° 23' 07"	-15° 22' 52"	0.9918261	16'07.54"	23° 26' 18"	16 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	5° 01' 04"	1° 34' 52"	3° 58' 40"	3° 26' 43"	1° 00' 06"	16' 22.51"	248° 48' 12"	0.90575
1	5° 37' 29"	1° 37' 58"	4° 30' 54"	3° 43' 59"	1° 00' 08"	16' 23.08"	248° 56' 20"	0.90859
2	6° 13' 56"	1° 41' 02"	5° 03' 12"	4° 01' 16"	1° 00' 10"	16' 23.64"	249° 4' 51"	0.91140
3	6° 50' 25"	1° 44' 07"	5° 35' 34"	4° 18' 32"	1° 00' 12"	16' 24.20"	249° 13' 46"	0.91417
4	7° 26' 58"	1° 47' 11"	6° 07' 59"	4° 35' 49"	1° 00' 14"	16' 24.75"	249° 23' 05"	0.91690
5	8° 03' 33"	1° 50' 14"	6° 40' 29"	4° 53' 05"	1° 00' 16"	16' 25.30"	249° 32' 50"	0.91960
6	8° 40' 11"	1° 53' 17"	7° 13' 02"	5° 10' 20"	1° 00' 18"	16' 25.84"	249° 43' 02"	0.92225
7	9° 16' 51"	1° 56' 19"	7° 45' 40"	5° 27' 36"	1° 00' 20"	16' 26.37"	249° 53' 41"	0.92487
8	9° 53' 35"	1° 59' 20"	8° 18' 21"	5° 44' 50"	1° 00' 22"	16' 26.90"	250° 4' 48"	0.92745
9	10° 30' 21"	2° 02' 21"	8° 51' 07"	6° 02' 04"	1° 00' 24"	16' 27.43"	250° 16' 24"	0.92999
10	11° 07' 09"	2° 05' 21"	9° 23' 57"	6° 19' 17"	1° 00' 26"	16' 27.95"	250° 28' 31"	0.93249
11	11° 44' 00"	2° 08' 21"	9° 56' 52"	6° 36' 29"	1° 00' 27"	16' 28.46"	250° 41' 09"	0.93495
12	12° 20' 54"	2° 11' 20"	10° 29' 50"	6° 53' 40"	1° 00' 29"	16' 28.97"	250° 54' 21"	0.93737
13	12° 57' 50"	2° 14' 18"	11° 02' 54"	7° 10' 50"	1° 00' 31"	16' 29.47"	251° 8' 07"	0.93975
14	13° 34' 48"	2° 17' 15"	11° 36' 02"	7° 27' 59"	1° 00' 33"	16' 29.96"	251° 22' 29"	0.94208
15	14° 11' 50"	2° 20' 12"	12° 09' 15"	7° 45' 06"	1° 00' 35"	16' 30.45"	251° 37' 28"	0.94438
16	14° 48' 53"	2° 23' 08"	12° 42' 32"	8° 02' 12"	1° 00' 36"	16' 30.93"	251° 53' 07"	0.94663
17	15° 25' 59"	2° 26' 03"	13° 15' 55"	8° 19' 16"	1° 00' 38"	16' 31.40"	252° 9' 27"	0.94884
18	16° 03' 08"	2° 28' 57"	13° 49' 22"	8° 36' 18"	1° 00' 40"	16' 31.87"	252° 26' 31"	0.95100
19	16° 40' 19"	2° 31' 50"	14° 22' 54"	8° 53' 18"	1° 00' 42"	16' 32.33"	252° 44' 20"	0.95313
20	17° 17' 32"	2° 34' 42"	14° 56' 32"	9° 10' 17"	1° 00' 43"	16' 32.78"	253° 2' 58"	0.95520
21	17° 54' 47"	2° 37' 33"	15° 30' 15"	9° 27' 13"	1° 00' 45"	16' 33.23"	253° 22' 26"	0.95724
22	18° 32' 05"	2° 40' 24"	16° 04' 02"	9° 44' 07"	1° 00' 47"	16' 33.67"	253° 42' 49"	0.95923
23	19° 09' 25"	2° 43' 13"	16° 37' 56"	10° 00' 58"	1° 00' 48"	16' 34.10"	254° 4' 09"	0.96117
24	19° 46' 47"	2° 46' 01"	17° 11' 54"	10° 17' 47"	1° 00' 50"	16' 34.53"	254° 26' 30"	0.96307

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	221° 49' 39"	0.40"	219° 23' 07"	-15° 22' 52"	0.9918261	16'07.54"	23° 26' 18"	16 m 29 s
1	221° 52' 09"	0.40"	219° 25' 35"	-15° 23' 38"	0.9918155	16'07.55"	23° 26' 18"	16 m 29 s
2	221° 54' 39"	0.41"	219° 28' 04"	-15° 24' 24"	0.9918049	16'07.56"	23° 26' 18"	16 m 29 s
3	221° 57' 10"	0.41"	219° 30' 32"	-15° 25' 10"	0.9917943	16'07.57"	23° 26' 18"	16 m 29 s
4	221° 59' 40"	0.42"	219° 33' 00"	-15° 25' 56"	0.9917837	16'07.58"	23° 26' 18"	16 m 29 s
5	222° 02' 10"	0.42"	219° 35' 29"	-15° 26' 42"	0.9917731	16'07.59"	23° 26' 18"	16 m 29 s
6	222° 04' 40"	0.42"	219° 37' 57"	-15° 27' 28"	0.9917626	16'07.60"	23° 26' 18"	16 m 29 s
7	222° 07' 10"	0.43"	219° 40' 25"	-15° 28' 14"	0.9917520	16'07.61"	23° 26' 18"	16 m 29 s
8	222° 09' 41"	0.43"	219° 42' 54"	-15° 29' 00"	0.9917414	16'07.62"	23° 26' 18"	16 m 29 s
9	222° 12' 11"	0.44"	219° 45' 22"	-15° 29' 46"	0.9917309	16'07.63"	23° 26' 18"	16 m 29 s
10	222° 14' 41"	0.44"	219° 47' 51"	-15° 30' 32"	0.9917204	16'07.64"	23° 26' 18"	16 m 29 s
11	222° 17' 11"	0.44"	219° 50' 19"	-15° 31' 18"	0.9917098	16'07.65"	23° 26' 18"	16 m 29 s
12	222° 19' 42"	0.45"	219° 52' 47"	-15° 32' 04"	0.9916993	16'07.66"	23° 26' 18"	16 m 29 s
13	222° 22' 12"	0.45"	219° 55' 16"	-15° 32' 50"	0.9916888	16'07.67"	23° 26' 18"	16 m 29 s
14	222° 24' 42"	0.46"	219° 57' 45"	-15° 33' 35"	0.9916783	16'07.68"	23° 26' 18"	16 m 28 s
15	222° 27' 12"	0.46"	220° 00' 13"	-15° 34' 21"	0.9916677	16'07.69"	23° 26' 18"	16 m 28 s
16	222° 29' 43"	0.46"	220° 02' 42"	-15° 35' 07"	0.9916572	16'07.70"	23° 26' 18"	16 m 28 s
17	222° 32' 13"	0.47"	220° 05' 10"	-15° 35' 53"	0.9916468	16'07.71"	23° 26' 18"	16 m 28 s
18	222° 34' 43"	0.47"	220° 07' 39"	-15° 36' 38"	0.9916363	16'07.72"	23° 26' 18"	16 m 28 s
19	222° 37' 13"	0.48"	220° 10' 07"	-15° 37' 24"	0.9916258	16'07.73"	23° 26' 18"	16 m 28 s
20	222° 39' 44"	0.48"	220° 12' 36"	-15° 38' 10"	0.9916153	16'07.74"	23° 26' 18"	16 m 28 s
21	222° 42' 14"	0.48"	220° 15' 05"	-15° 38' 55"	0.9916049	16'07.75"	23° 26' 18"	16 m 28 s
22	222° 44' 44"	0.49"	220° 17' 34"	-15° 39' 41"	0.9915944	16'07.76"	23° 26' 18"	16 m 28 s
23	222° 47' 14"	0.49"	220° 20' 02"	-15° 40' 27"	0.9915839	16'07.77"	23° 26' 18"	16 m 28 s
24	222° 49' 45"	0.49"	220° 22' 31"	-15° 41' 12"	0.9915735	16'07.79"	23° 26' 18"	16 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	19° 46' 47"	2° 46' 01"	17° 11' 54"	10° 17' 47"	1° 00' 50"	16' 34.53"	254° 26' 30"	0.96307
1	20° 24' 12"	2° 48' 48"	17° 45' 58"	10° 34' 33"	1° 00' 51"	16' 34.94"	254° 49' 55"	0.96492
2	21° 01' 38"	2° 51' 35"	18° 20' 08"	10° 51' 17"	1° 00' 53"	16' 35.35"	255° 14' 30"	0.96673
3	21° 39' 07"	2° 54' 20"	18° 54' 23"	11° 07' 57"	1° 00' 54"	16' 35.76"	255° 40' 20"	0.96849
4	22° 16' 38"	2° 57' 04"	19° 28' 44"	11° 24' 34"	1° 00' 56"	16' 36.15"	256° 7' 29"	0.97020
5	22° 54' 11"	2° 59' 47"	20° 03' 10"	11° 41' 09"	1° 00' 57"	16' 36.54"	256° 36' 04"	0.97187
6	23° 31' 45"	3° 02' 28"	20° 37' 43"	11° 57' 40"	1° 00' 58"	16' 36.91"	257° 6' 11"	0.97349
7	24° 09' 22"	3° 05' 09"	21° 12' 21"	12° 14' 07"	1° 00' 60"	16' 37.28"	257° 37' 59"	0.97506
8	24° 47' 01"	3° 07' 48"	21° 47' 05"	12° 30' 31"	1° 01' 01"	16' 37.65"	258° 11' 36"	0.97658
9	25° 24' 42"	3° 10' 26"	22° 21' 55"	12° 46' 51"	1° 01' 02"	16' 38.00"	258° 47' 12"	0.97805
10	26° 02' 24"	3° 13' 02"	22° 56' 52"	13° 03' 07"	1° 01' 04"	16' 38.35"	259° 24' 57"	0.97948
11	26° 40' 09"	3° 15' 38"	23° 31' 54"	13° 19' 19"	1° 01' 05"	16' 38.68"	260° 5' 05"	0.98085
12	27° 17' 55"	3° 18' 12"	24° 07' 03"	13° 35' 27"	1° 01' 06"	16' 39.01"	260° 47' 49"	0.98218
13	27° 55' 43"	3° 20' 45"	24° 42' 17"	13° 51' 31"	1° 01' 07"	16' 39.33"	261° 33' 26"	0.98346
14	28° 33' 32"	3° 23' 16"	25° 17' 39"	14° 07' 30"	1° 01' 08"	16' 39.65"	262° 22' 14"	0.98468
15	29° 11' 24"	3° 25' 46"	25° 53' 06"	14° 23' 25"	1° 01' 10"	16' 39.95"	263° 14' 36"	0.98586
16	29° 49' 16"	3° 28' 14"	26° 28' 40"	14° 39' 15"	1° 01' 11"	16' 40.24"	264° 10' 56"	0.98699
17	30° 27' 11"	3° 30' 41"	27° 04' 20"	14° 55' 00"	1° 01' 12"	16' 40.53"	265° 11' 44"	0.98806
18	31° 05' 07"	3° 33' 07"	27° 40' 07"	15° 10' 40"	1° 01' 13"	16' 40.81"	266° 17' 35"	0.98909
19	31° 43' 05"	3° 35' 31"	28° 16' 00"	15° 26' 15"	1° 01' 14"	16' 41.07"	267° 29' 08"	0.99006
20	32° 21' 03"	3° 37' 54"	28° 52' 00"	15° 41' 45"	1° 01' 15"	16' 41.33"	268° 47' 11"	0.99098
21	32° 59' 04"	3° 40' 15"	29° 28' 07"	15° 57' 09"	1° 01' 16"	16' 41.58"	270° 12' 42"	0.99185
22	33° 37' 06"	3° 42' 34"	30° 04' 20"	16° 12' 28"	1° 01' 16"	16' 41.82"	271° 46' 47"	0.99267
23	34° 15' 09"	3° 44' 52"	30° 40' 40"	16° 27' 41"	1° 01' 17"	16' 42.05"	273° 30' 48"	0.99344
24	34° 53' 13"	3° 47' 08"	31° 17' 06"	16° 42' 48"	1° 01' 18"	16' 42.28"	275° 26' 21"	0.99415

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	222° 49' 45"	0.49"	220° 22' 31"	-15° 41' 12"	0.9915735	16'07.79"	23° 26' 18"	16 m 28 s
1	222° 52' 15"	0.50"	220° 24' 60"	-15° 41' 58"	0.9915631	16'07.80"	23° 26' 18"	16 m 28 s
2	222° 54' 45"	0.50"	220° 27' 29"	-15° 42' 43"	0.9915526	16'07.81"	23° 26' 18"	16 m 28 s
3	222° 57' 16"	0.50"	220° 29' 57"	-15° 43' 29"	0.9915422	16'07.82"	23° 26' 18"	16 m 28 s
4	222° 59' 46"	0.51"	220° 32' 26"	-15° 44' 14"	0.9915318	16'07.83"	23° 26' 18"	16 m 28 s
5	223° 02' 16"	0.51"	220° 34' 55"	-15° 44' 59"	0.9915214	16'07.84"	23° 26' 18"	16 m 28 s
6	223° 04' 47"	0.51"	220° 37' 24"	-15° 45' 45"	0.9915110	16'07.85"	23° 26' 18"	16 m 27 s
7	223° 07' 17"	0.52"	220° 39' 53"	-15° 46' 30"	0.9915006	16'07.86"	23° 26' 18"	16 m 27 s
8	223° 09' 47"	0.52"	220° 42' 22"	-15° 47' 16"	0.9914902	16'07.87"	23° 26' 18"	16 m 27 s
9	223° 12' 17"	0.52"	220° 44' 51"	-15° 48' 01"	0.9914798	16'07.88"	23° 26' 18"	16 m 27 s
10	223° 14' 48"	0.53"	220° 47' 20"	-15° 48' 46"	0.9914694	16'07.89"	23° 26' 18"	16 m 27 s
11	223° 17' 18"	0.53"	220° 49' 49"	-15° 49' 31"	0.9914591	16'07.90"	23° 26' 18"	16 m 27 s
12	223° 19' 48"	0.53"	220° 52' 18"	-15° 50' 17"	0.9914487	16'07.91"	23° 26' 18"	16 m 27 s
13	223° 22' 19"	0.54"	220° 54' 47"	-15° 51' 02"	0.9914383	16'07.92"	23° 26' 18"	16 m 27 s
14	223° 24' 49"	0.54"	220° 57' 16"	-15° 51' 47"	0.9914280	16'07.93"	23° 26' 18"	16 m 27 s
15	223° 27' 19"	0.54"	220° 59' 45"	-15° 52' 32"	0.9914177	16'07.94"	23° 26' 18"	16 m 27 s
16	223° 29' 50"	0.54"	221° 02' 14"	-15° 53' 17"	0.9914073	16'07.95"	23° 26' 18"	16 m 27 s
17	223° 32' 20"	0.55"	221° 04' 43"	-15° 54' 02"	0.9913970	16'07.96"	23° 26' 18"	16 m 27 s
18	223° 34' 50"	0.55"	221° 07' 12"	-15° 54' 47"	0.9913867	16'07.97"	23° 26' 18"	16 m 26 s
19	223° 37' 21"	0.55"	221° 09' 41"	-15° 55' 32"	0.9913764	16'07.98"	23° 26' 18"	16 m 26 s
20	223° 39' 51"	0.55"	221° 12' 10"	-15° 56' 17"	0.9913661	16'07.99"	23° 26' 18"	16 m 26 s
21	223° 42' 21"	0.56"	221° 14' 40"	-15° 57' 02"	0.9913558	16'08.00"	23° 26' 18"	16 m 26 s
22	223° 44' 52"	0.56"	221° 17' 09"	-15° 57' 47"	0.9913455	16'08.01"	23° 26' 18"	16 m 26 s
23	223° 47' 22"	0.56"	221° 19' 38"	-15° 58' 32"	0.9913352	16'08.02"	23° 26' 18"	16 m 26 s
24	223° 49' 52"	0.56"	221° 22' 07"	-15° 59' 17"	0.9913249	16'08.03"	23° 26' 18"	16 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	34° 53' 13"	3° 47' 08"	31° 17' 06"	16° 42' 48"	1° 01' 18"	16' 42.28"	275° 26' 21"	0.99415
1	35° 31' 19"	3° 49' 23"	31° 53' 40"	16° 57' 49"	1° 01' 19"	16' 42.49"	277° 35' 22"	0.99481
2	36° 09' 26"	3° 51' 36"	32° 30' 20"	17° 12' 44"	1° 01' 20"	16' 42.69"	280° 0' 12"	0.99542
3	36° 47' 33"	3° 53' 47"	33° 07' 07"	17° 27' 32"	1° 01' 20"	16' 42.89"	282° 43' 38"	0.99598
4	37° 25' 42"	3° 55' 57"	33° 44' 01"	17° 42' 15"	1° 01' 21"	16' 43.07"	285° 48' 58"	0.99649
5	38° 03' 53"	3° 58' 05"	34° 21' 02"	17° 56' 50"	1° 01' 22"	16' 43.24"	289° 20' 04"	0.99694
6	38° 42' 04"	4° 00' 11"	34° 58' 09"	18° 11' 19"	1° 01' 22"	16' 43.41"	293° 21' 18"	0.99734
7	39° 20' 16"	4° 02' 15"	35° 35' 24"	18° 25' 41"	1° 01' 23"	16' 43.57"	297° 57' 18"	0.99768
8	39° 58' 29"	4° 04' 18"	36° 12' 45"	18° 39' 56"	1° 01' 23"	16' 43.71"	303° 12' 35"	0.99798
9	40° 36' 42"	4° 06' 19"	36° 50' 13"	18° 54' 03"	1° 01' 24"	16' 43.85"	309° 10' 37"	0.99822
10	41° 14' 57"	4° 08' 18"	37° 27' 49"	19° 08' 04"	1° 01' 24"	16' 43.98"	315° 52' 23"	0.99840
11	41° 53' 12"	4° 10' 15"	38° 05' 31"	19° 21' 56"	1° 01' 25"	16' 44.09"	323° 14' 47"	0.99853
12	42° 31' 28"	4° 12' 10"	38° 43' 20"	19° 35' 42"	1° 01' 25"	16' 44.20"	331° 9' 05"	0.99861
13	43° 09' 45"	4° 14' 04"	39° 21' 16"	19° 49' 19"	1° 01' 26"	16' 44.30"	339° 20' 56"	0.99864
14	43° 48' 02"	4° 15' 55"	39° 59' 19"	20° 02' 49"	1° 01' 26"	16' 44.39"	347° 32' 18"	0.99861
15	44° 26' 20"	4° 17' 45"	40° 37' 28"	20° 16' 10"	1° 01' 26"	16' 44.47"	355° 25' 21"	0.99853
16	45° 04' 39"	4° 19' 33"	41° 15' 45"	20° 29' 23"	1° 01' 26"	16' 44.53"	2° 46' 01"	0.99839
17	45° 42' 58"	4° 21' 19"	41° 54' 09"	20° 42' 28"	1° 01' 27"	16' 44.59"	9° 26' 02"	0.99821
18	46° 21' 17"	4° 23' 02"	42° 32' 39"	20° 55' 25"	1° 01' 27"	16' 44.64"	15° 22' 37"	0.99796
19	46° 59' 37"	4° 24' 44"	43° 11' 16"	21° 08' 13"	1° 01' 27"	16' 44.68"	20° 36' 60"	0.99767
20	47° 37' 57"	4° 26' 24"	43° 50' 00"	21° 20' 52"	1° 01' 27"	16' 44.71"	25° 12' 45"	0.99732
21	48° 16' 17"	4° 28' 02"	44° 28' 51"	21° 33' 22"	1° 01' 27"	16' 44.73"	29° 14' 24"	0.99691
22	48° 54' 37"	4° 29' 38"	45° 07' 49"	21° 45' 43"	1° 01' 27"	16' 44.74"	32° 46' 37"	0.99646
23	49° 32' 58"	4° 31' 12"	45° 46' 53"	21° 57' 55"	1° 01' 27"	16' 44.74"	35° 53' 42"	0.99595
24	50° 11' 18"	4° 32' 44"	46° 26' 04"	22° 09' 58"	1° 01' 27"	16' 44.73"	38° 39' 29"	0.99539

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	223° 49' 52"	0.56"	221° 22' 07"	-15° 59' 17"	0.9913249	16'08.03"	23° 26' 18"	16 m 26 s
1	223° 52' 23"	0.57"	221° 24' 37"	-16° 00' 02"	0.9913146	16'08.04"	23° 26' 18"	16 m 26 s
2	223° 54' 53"	0.57"	221° 27' 06"	-16° 00' 47"	0.9913044	16'08.05"	23° 26' 18"	16 m 26 s
3	223° 57' 23"	0.57"	221° 29' 35"	-16° 01' 32"	0.9912941	16'08.06"	23° 26' 18"	16 m 26 s
4	223° 59' 54"	0.57"	221° 32' 05"	-16° 02' 16"	0.9912839	16'08.07"	23° 26' 18"	16 m 25 s
5	224° 02' 24"	0.58"	221° 34' 34"	-16° 03' 01"	0.9912736	16'08.08"	23° 26' 18"	16 m 25 s
6	224° 04' 55"	0.58"	221° 37' 03"	-16° 03' 46"	0.9912634	16'08.09"	23° 26' 18"	16 m 25 s
7	224° 07' 25"	0.58"	221° 39' 33"	-16° 04' 31"	0.9912532	16'08.10"	23° 26' 18"	16 m 25 s
8	224° 09' 55"	0.58"	221° 42' 02"	-16° 05' 15"	0.9912430	16'08.11"	23° 26' 18"	16 m 25 s
9	224° 12' 26"	0.58"	221° 44' 32"	-16° 05' 60"	0.9912327	16'08.12"	23° 26' 18"	16 m 25 s
10	224° 14' 56"	0.59"	221° 47' 01"	-16° 06' 44"	0.9912225	16'08.13"	23° 26' 18"	16 m 25 s
11	224° 17' 26"	0.59"	221° 49' 31"	-16° 07' 29"	0.9912123	16'08.14"	23° 26' 18"	16 m 25 s
12	224° 19' 57"	0.59"	221° 52' 00"	-16° 08' 14"	0.9912021	16'08.15"	23° 26' 18"	16 m 25 s
13	224° 22' 27"	0.59"	221° 54' 30"	-16° 08' 58"	0.9911920	16'08.16"	23° 26' 18"	16 m 24 s
14	224° 24' 58"	0.59"	221° 56' 59"	-16° 09' 43"	0.9911818	16'08.17"	23° 26' 18"	16 m 24 s
15	224° 27' 28"	0.60"	221° 59' 29"	-16° 10' 27"	0.9911716	16'08.18"	23° 26' 18"	16 m 24 s
16	224° 29' 58"	0.60"	222° 01' 59"	-16° 11' 12"	0.9911614	16'08.19"	23° 26' 18"	16 m 24 s
17	224° 32' 29"	0.60"	222° 04' 28"	-16° 11' 56"	0.9911513	16'08.20"	23° 26' 18"	16 m 24 s
18	224° 34' 59"	0.60"	222° 06' 58"	-16° 12' 40"	0.9911411	16'08.21"	23° 26' 18"	16 m 24 s
19	224° 37' 30"	0.60"	222° 09' 28"	-16° 13' 25"	0.9911310	16'08.22"	23° 26' 18"	16 m 24 s
20	224° 40' 00"	0.60"	222° 11' 57"	-16° 14' 09"	0.9911209	16'08.23"	23° 26' 18"	16 m 24 s
21	224° 42' 31"	0.60"	222° 14' 27"	-16° 14' 53"	0.9911107	16'08.24"	23° 26' 18"	16 m 23 s
22	224° 45' 01"	0.61"	222° 16' 57"	-16° 15' 38"	0.9911006	16'08.25"	23° 26' 18"	16 m 23 s
23	224° 47' 31"	0.61"	222° 19' 27"	-16° 16' 22"	0.9910905	16'08.26"	23° 26' 18"	16 m 23 s
24	224° 50' 02"	0.61"	222° 21' 56"	-16° 17' 06"	0.9910804	16'08.27"	23° 26' 18"	16 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	50° 11' 18"	4° 32' 44"	46° 26' 04"	22° 09' 58"	1° 01' 27"	16' 44.73"	38° 39' 29"	0.99539
1	50° 49' 39"	4° 34' 13"	47° 05' 21"	22° 21' 51"	1° 01' 27"	16' 44.71"	41° 7' 14"	0.99477
2	51° 28' 00"	4° 35' 41"	47° 44' 45"	22° 33' 35"	1° 01' 27"	16' 44.68"	43° 19' 42"	0.99410
3	52° 06' 21"	4° 37' 07"	48° 24' 15"	22° 45' 09"	1° 01' 27"	16' 44.64"	45° 19' 12"	0.99338
4	52° 44' 41"	4° 38' 30"	49° 03' 52"	22° 56' 33"	1° 01' 27"	16' 44.59"	47° 7' 37"	0.99260
5	53° 23' 02"	4° 39' 52"	49° 43' 35"	23° 07' 47"	1° 01' 26"	16' 44.53"	48° 46' 34"	0.99177
6	54° 01' 22"	4° 41' 11"	50° 23' 24"	23° 18' 51"	1° 01' 26"	16' 44.47"	50° 17' 22"	0.99089
7	54° 39' 42"	4° 42' 28"	51° 03' 20"	23° 29' 45"	1° 01' 26"	16' 44.39"	51° 41' 08"	0.98996
8	55° 18' 02"	4° 43' 43"	51° 43' 22"	23° 40' 29"	1° 01' 26"	16' 44.30"	52° 58' 47"	0.98897
9	55° 56' 21"	4° 44' 56"	52° 23' 29"	23° 51' 02"	1° 01' 25"	16' 44.20"	54° 11' 07"	0.98793
10	56° 34' 38"	4° 46' 07"	53° 03' 40"	24° 01' 23"	1° 01' 25"	16' 44.09"	55° 18' 43"	0.98684
11	57° 12' 56"	4° 47' 15"	53° 43' 60"	24° 11' 35"	1° 01' 24"	16' 43.98"	56° 22' 18"	0.98570
12	57° 51' 14"	4° 48' 22"	54° 24' 25"	24° 21' 36"	1° 01' 24"	16' 43.85"	57° 22' 17"	0.98451
13	58° 29' 32"	4° 49' 26"	55° 04' 56"	24° 31' 26"	1° 01' 23"	16' 43.72"	58° 19' 03"	0.98326
14	59° 07' 49"	4° 50' 28"	55° 45' 32"	24° 41' 05"	1° 01' 23"	16' 43.57"	59° 12' 59"	0.98197
15	59° 46' 05"	4° 51' 28"	56° 26' 14"	24° 50' 33"	1° 01' 22"	16' 43.42"	60° 4' 23"	0.98062
16	60° 24' 20"	4° 52' 26"	57° 07' 01"	24° 59' 49"	1° 01' 22"	16' 43.25"	60° 53' 30"	0.97922
17	61° 02' 35"	4° 53' 21"	57° 47' 53"	25° 08' 55"	1° 01' 21"	16' 43.08"	61° 40' 35"	0.97777
18	61° 40' 49"	4° 54' 14"	58° 28' 51"	25° 17' 48"	1° 01' 20"	16' 42.90"	62° 25' 50"	0.97627
19	62° 19' 02"	4° 55' 05"	59° 09' 53"	25° 26' 30"	1° 01' 20"	16' 42.71"	63° 9' 26"	0.97472
20	62° 57' 15"	4° 55' 54"	59° 50' 60"	25° 35' 01"	1° 01' 19"	16' 42.51"	63° 51' 33"	0.97312
21	63° 35' 26"	4° 56' 41"	60° 32' 12"	25° 43' 19"	1° 01' 18"	16' 42.30"	64° 32' 17"	0.97147
22	64° 13' 36"	4° 57' 25"	61° 13' 28"	25° 51' 26"	1° 01' 17"	16' 42.08"	65° 11' 48"	0.96977
23	64° 51' 45"	4° 58' 07"	61° 54' 49"	25° 59' 21"	1° 01' 17"	16' 41.85"	65° 50' 11"	0.96803
24	65° 29' 54"	4° 58' 47"	62° 36' 14"	26° 07' 04"	1° 01' 16"	16' 41.61"	66° 27' 33"	0.96623

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	224° 50' 02"	0.61"	222° 21' 56"	-16° 17' 06"	0.9910804	16'08.27"	23° 26' 18"	16 m 23 s
1	224° 52' 32"	0.61"	222° 24' 26"	-16° 17' 50"	0.9910703	16'08.28"	23° 26' 18"	16 m 23 s
2	224° 55' 03"	0.61"	222° 26' 56"	-16° 18' 35"	0.9910602	16'08.29"	23° 26' 18"	16 m 23 s
3	224° 57' 33"	0.61"	222° 29' 26"	-16° 19' 19"	0.9910501	16'08.30"	23° 26' 18"	16 m 23 s
4	225° 00' 04"	0.61"	222° 31' 56"	-16° 20' 03"	0.9910400	16'08.31"	23° 26' 18"	16 m 22 s
5	225° 02' 34"	0.61"	222° 34' 26"	-16° 20' 47"	0.9910300	16'08.32"	23° 26' 18"	16 m 22 s
6	225° 05' 04"	0.61"	222° 36' 56"	-16° 21' 31"	0.9910199	16'08.33"	23° 26' 18"	16 m 22 s
7	225° 07' 35"	0.62"	222° 39' 26"	-16° 22' 15"	0.9910099	16'08.34"	23° 26' 18"	16 m 22 s
8	225° 10' 05"	0.62"	222° 41' 55"	-16° 22' 59"	0.9909998	16'08.35"	23° 26' 18"	16 m 22 s
9	225° 12' 36"	0.62"	222° 44' 25"	-16° 23' 43"	0.9909898	16'08.36"	23° 26' 18"	16 m 22 s
10	225° 15' 06"	0.62"	222° 46' 56"	-16° 24' 27"	0.9909797	16'08.36"	23° 26' 18"	16 m 22 s
11	225° 17' 37"	0.62"	222° 49' 26"	-16° 25' 11"	0.9909697	16'08.37"	23° 26' 18"	16 m 21 s
12	225° 20' 07"	0.62"	222° 51' 56"	-16° 25' 55"	0.9909597	16'08.38"	23° 26' 18"	16 m 21 s
13	225° 22' 38"	0.62"	222° 54' 26"	-16° 26' 38"	0.9909497	16'08.39"	23° 26' 18"	16 m 21 s
14	225° 25' 08"	0.62"	222° 56' 56"	-16° 27' 22"	0.9909397	16'08.40"	23° 26' 18"	16 m 21 s
15	225° 27' 39"	0.62"	222° 59' 26"	-16° 28' 06"	0.9909297	16'08.41"	23° 26' 18"	16 m 21 s
16	225° 30' 09"	0.62"	223° 01' 56"	-16° 28' 50"	0.9909197	16'08.42"	23° 26' 18"	16 m 21 s
17	225° 32' 40"	0.62"	223° 04' 26"	-16° 29' 34"	0.9909097	16'08.43"	23° 26' 18"	16 m 20 s
18	225° 35' 10"	0.62"	223° 06' 56"	-16° 30' 17"	0.9908997	16'08.44"	23° 26' 18"	16 m 20 s
19	225° 37' 41"	0.62"	223° 09' 27"	-16° 31' 01"	0.9908897	16'08.45"	23° 26' 18"	16 m 20 s
20	225° 40' 11"	0.62"	223° 11' 57"	-16° 31' 45"	0.9908798	16'08.46"	23° 26' 18"	16 m 20 s
21	225° 42' 42"	0.62"	223° 14' 27"	-16° 32' 28"	0.9908698	16'08.47"	23° 26' 18"	16 m 20 s
22	225° 45' 12"	0.62"	223° 16' 57"	-16° 33' 12"	0.9908598	16'08.48"	23° 26' 18"	16 m 20 s
23	225° 47' 43"	0.62"	223° 19' 28"	-16° 33' 55"	0.9908499	16'08.49"	23° 26' 18"	16 m 19 s
24	225° 50' 13"	0.62"	223° 21' 58"	-16° 34' 39"	0.9908400	16'08.50"	23° 26' 18"	16 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	65° 29' 54"	4° 58' 47"	62° 36' 14"	26° 07' 04"	1° 01' 16"	16' 41.61"	66° 27' 33"	0.96623
1	66° 08' 01"	4° 59' 25"	63° 17' 43"	26° 14' 35"	1° 01' 15"	16' 41.37"	67° 3' 58"	0.96439
2	66° 46' 07"	5° 00' 00"	63° 59' 16"	26° 21' 53"	1° 01' 14"	16' 41.11"	67° 39' 32"	0.96249
3	67° 24' 11"	5° 00' 33"	64° 40' 53"	26° 28' 60"	1° 01' 13"	16' 40.85"	68° 14' 17"	0.96055
4	68° 02' 15"	5° 01' 04"	65° 22' 33"	26° 35' 53"	1° 01' 12"	16' 40.58"	68° 48' 19"	0.95857
5	68° 40' 17"	5° 01' 33"	66° 04' 17"	26° 42' 35"	1° 01' 11"	16' 40.30"	69° 21' 41"	0.95653
6	69° 18' 17"	5° 01' 59"	66° 46' 04"	26° 49' 04"	1° 01' 10"	16' 40.01"	69° 54' 25"	0.95445
7	69° 56' 17"	5° 02' 23"	67° 27' 54"	26° 55' 20"	1° 01' 09"	16' 39.71"	70° 26' 35"	0.95232
8	70° 34' 15"	5° 02' 45"	68° 09' 47"	27° 01' 24"	1° 01' 08"	16' 39.41"	70° 58' 12"	0.95015
9	71° 12' 11"	5° 03' 05"	68° 51' 43"	27° 07' 15"	1° 01' 06"	16' 39.09"	71° 29' 19"	0.94793
10	71° 50' 06"	5° 03' 23"	69° 33' 42"	27° 12' 54"	1° 01' 05"	16' 38.77"	71° 59' 59"	0.94567
11	72° 27' 59"	5° 03' 38"	70° 15' 43"	27° 18' 19"	1° 01' 04"	16' 38.44"	72° 30' 12"	0.94336
12	73° 05' 51"	5° 03' 51"	70° 57' 46"	27° 23' 32"	1° 01' 03"	16' 38.10"	73° 0' 01"	0.94100
13	73° 43' 41"	5° 04' 02"	71° 39' 51"	27° 28' 32"	1° 01' 02"	16' 37.76"	73° 29' 28"	0.93860
14	74° 21' 29"	5° 04' 10"	72° 21' 58"	27° 33' 19"	1° 01' 00"	16' 37.40"	73° 58' 33"	0.93616
15	74° 59' 15"	5° 04' 17"	73° 04' 06"	27° 37' 53"	1° 00' 59"	16' 37.04"	74° 27' 17"	0.93368
16	75° 37' 00"	5° 04' 21"	73° 46' 16"	27° 42' 15"	1° 00' 58"	16' 36.67"	74° 55' 43"	0.93115
17	76° 14' 43"	5° 04' 23"	74° 28' 28"	27° 46' 23"	1° 00' 56"	16' 36.30"	75° 23' 50"	0.92858
18	76° 52' 24"	5° 04' 22"	75° 10' 40"	27° 50' 18"	1° 00' 55"	16' 35.91"	75° 51' 40"	0.92597
19	77° 30' 03"	5° 04' 20"	75° 52' 53"	27° 53' 60"	1° 00' 53"	16' 35.52"	76° 19' 14"	0.92331
20	78° 07' 40"	5° 04' 15"	76° 35' 07"	27° 57' 29"	1° 00' 52"	16' 35.12"	76° 46' 33"	0.92062
21	78° 45' 15"	5° 04' 08"	77° 17' 21"	28° 00' 45"	1° 00' 50"	16' 34.72"	77° 13' 37"	0.91788
22	79° 22' 49"	5° 03' 59"	77° 59' 35"	28° 03' 48"	1° 00' 49"	16' 34.30"	77° 40' 26"	0.91510
23	80° 00' 20"	5° 03' 48"	78° 41' 50"	28° 06' 37"	1° 00' 47"	16' 33.88"	78° 7' 02"	0.91229
24	80° 37' 49"	5° 03' 35"	79° 24' 04"	28° 09' 14"	1° 00' 46"	16' 33.46"	78° 33' 25"	0.90943

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	225° 50' 13"	0.62"	223° 21' 58"	-16° 34' 39"	0.9908400	16'08.50"	23° 26' 18"	16 m 19 s
1	225° 52' 44"	0.62"	223° 24' 28"	-16° 35' 22"	0.9908300	16'08.51"	23° 26' 18"	16 m 19 s
2	225° 55' 14"	0.62"	223° 26' 59"	-16° 36' 06"	0.9908201	16'08.52"	23° 26' 18"	16 m 19 s
3	225° 57' 45"	0.62"	223° 29' 29"	-16° 36' 49"	0.9908102	16'08.53"	23° 26' 18"	16 m 19 s
4	226° 00' 15"	0.62"	223° 31' 60"	-16° 37' 33"	0.9908003	16'08.54"	23° 26' 18"	16 m 19 s
5	226° 02' 46"	0.62"	223° 34' 30"	-16° 38' 16"	0.9907904	16'08.55"	23° 26' 18"	16 m 18 s
6	226° 05' 16"	0.62"	223° 37' 00"	-16° 38' 60"	0.9907805	16'08.56"	23° 26' 18"	16 m 18 s
7	226° 07' 47"	0.62"	223° 39' 31"	-16° 39' 43"	0.9907706	16'08.57"	23° 26' 18"	16 m 18 s
8	226° 10' 17"	0.62"	223° 42' 01"	-16° 40' 26"	0.9907607	16'08.58"	23° 26' 18"	16 m 18 s
9	226° 12' 48"	0.62"	223° 44' 32"	-16° 41' 10"	0.9907508	16'08.59"	23° 26' 18"	16 m 18 s
10	226° 15' 18"	0.62"	223° 47' 03"	-16° 41' 53"	0.9907410	16'08.60"	23° 26' 18"	16 m 18 s
11	226° 17' 49"	0.62"	223° 49' 33"	-16° 42' 36"	0.9907311	16'08.61"	23° 26' 18"	16 m 17 s
12	226° 20' 20"	0.62"	223° 52' 04"	-16° 43' 19"	0.9907212	16'08.62"	23° 26' 18"	16 m 17 s
13	226° 22' 50"	0.62"	223° 54' 34"	-16° 44' 02"	0.9907114	16'08.63"	23° 26' 18"	16 m 17 s
14	226° 25' 21"	0.62"	223° 57' 05"	-16° 44' 45"	0.9907016	16'08.64"	23° 26' 18"	16 m 17 s
15	226° 27' 51"	0.62"	223° 59' 36"	-16° 45' 29"	0.9906917	16'08.65"	23° 26' 18"	16 m 17 s
16	226° 30' 22"	0.61"	224° 02' 06"	-16° 46' 12"	0.9906819	16'08.66"	23° 26' 18"	16 m 16 s
17	226° 32' 52"	0.61"	224° 04' 37"	-16° 46' 55"	0.9906721	16'08.67"	23° 26' 18"	16 m 16 s
18	226° 35' 23"	0.61"	224° 07' 08"	-16° 47' 38"	0.9906623	16'08.68"	23° 26' 18"	16 m 16 s
19	226° 37' 53"	0.61"	224° 09' 38"	-16° 48' 21"	0.9906524	16'08.68"	23° 26' 18"	16 m 16 s
20	226° 40' 24"	0.61"	224° 12' 09"	-16° 49' 04"	0.9906426	16'08.69"	23° 26' 18"	16 m 16 s
21	226° 42' 55"	0.61"	224° 14' 40"	-16° 49' 47"	0.9906328	16'08.70"	23° 26' 18"	16 m 15 s
22	226° 45' 25"	0.61"	224° 17' 11"	-16° 50' 29"	0.9906231	16'08.71"	23° 26' 18"	16 m 15 s
23	226° 47' 56"	0.61"	224° 19' 42"	-16° 51' 12"	0.9906133	16'08.72"	23° 26' 18"	16 m 15 s
24	226° 50' 26"	0.61"	224° 22' 13"	-16° 51' 55"	0.9906035	16'08.73"	23° 26' 18"	16 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	80° 37' 49"	5° 03' 35"	79° 24' 04"	28° 09' 14"	1° 00' 46"	16' 33.46"	78° 33' 25"	0.90943
1	81° 15' 16"	5° 03' 19"	80° 06' 18"	28° 11' 37"	1° 00' 44"	16' 33.02"	78° 59' 36"	0.90654
2	81° 52' 40"	5° 03' 01"	80° 48' 31"	28° 13' 48"	1° 00' 43"	16' 32.59"	79° 25' 34"	0.90360
3	82° 30' 03"	5° 02' 41"	81° 30' 43"	28° 15' 45"	1° 00' 41"	16' 32.14"	79° 51' 21"	0.90063
4	83° 07' 23"	5° 02' 19"	82° 12' 55"	28° 17' 29"	1° 00' 39"	16' 31.69"	80° 16' 56"	0.89763
5	83° 44' 41"	5° 01' 55"	82° 55' 05"	28° 19' 00"	1° 00' 38"	16' 31.23"	80° 42' 20"	0.89458
6	84° 21' 57"	5° 01' 29"	83° 37' 14"	28° 20' 18"	1° 00' 36"	16' 30.76"	81° 7' 33"	0.89150
7	84° 59' 11"	5° 01' 01"	84° 19' 21"	28° 21' 23"	1° 00' 34"	16' 30.29"	81° 32' 36"	0.88838
8	85° 36' 22"	5° 00' 30"	85° 01' 26"	28° 22' 15"	1° 00' 32"	16' 29.81"	81° 57' 28"	0.88523
9	86° 13' 31"	4° 59' 58"	85° 43' 30"	28° 22' 54"	1° 00' 31"	16' 29.33"	82° 22' 10"	0.88204
10	86° 50' 37"	4° 59' 23"	86° 25' 31"	28° 23' 20"	1° 00' 29"	16' 28.84"	82° 46' 43"	0.87881
11	87° 27' 41"	4° 58' 47"	87° 07' 29"	28° 23' 33"	1° 00' 27"	16' 28.35"	83° 11' 05"	0.87556
12	88° 04' 42"	4° 58' 08"	87° 49' 25"	28° 23' 34"	1° 00' 25"	16' 27.85"	83° 35' 18"	0.87226
13	88° 41' 41"	4° 57' 27"	88° 31' 19"	28° 23' 21"	1° 00' 23"	16' 27.34"	83° 59' 21"	0.86894
14	89° 18' 38"	4° 56' 45"	89° 13' 09"	28° 22' 56"	1° 00' 21"	16' 26.83"	84° 23' 14"	0.86558
15	89° 55' 31"	4° 55' 60"	89° 54' 56"	28° 22' 18"	1° 00' 20"	16' 26.32"	84° 46' 59"	0.86219
16	90° 32' 23"	4° 55' 13"	90° 36' 39"	28° 21' 27"	1° 00' 18"	16' 25.80"	85° 10' 33"	0.85877
17	91° 09' 11"	4° 54' 24"	91° 18' 19"	28° 20' 23"	1° 00' 16"	16' 25.27"	85° 33' 59"	0.85532
18	91° 45' 57"	4° 53' 34"	91° 59' 56"	28° 19' 07"	1° 00' 14"	16' 24.74"	85° 57' 15"	0.85184
19	92° 22' 41"	4° 52' 41"	92° 41' 28"	28° 17' 39"	1° 00' 12"	16' 24.20"	86° 20' 22"	0.84832
20	92° 59' 22"	4° 51' 46"	93° 22' 56"	28° 15' 58"	1° 00' 10"	16' 23.66"	86° 43' 20"	0.84478
21	93° 35' 60"	4° 50' 50"	94° 04' 20"	28° 14' 05"	1° 00' 08"	16' 23.12"	87° 6' 09"	0.84121
22	94° 12' 35"	4° 49' 51"	94° 45' 39"	28° 11' 59"	1° 00' 06"	16' 22.57"	87° 28' 48"	0.83761
23	94° 49' 08"	4° 48' 51"	95° 26' 54"	28° 09' 41"	1° 00' 04"	16' 22.02"	87° 51' 18"	0.83398
24	95° 25' 38"	4° 47' 49"	96° 08' 04"	28° 07' 11"	1° 00' 02"	16' 21.46"	88° 13' 39"	0.83032

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	226° 50' 26"	0.61"	224° 22' 13"	-16° 51' 55"	0.9906035	16'08.73"	23° 26' 18"	16 m 15 s
1	226° 52' 57"	0.60"	224° 24' 43"	-16° 52' 38"	0.9905937	16'08.74"	23° 26' 18"	16 m 15 s
2	226° 55' 28"	0.60"	224° 27' 14"	-16° 53' 21"	0.9905840	16'08.75"	23° 26' 18"	16 m 14 s
3	226° 57' 58"	0.60"	224° 29' 45"	-16° 54' 03"	0.9905742	16'08.76"	23° 26' 18"	16 m 14 s
4	227° 00' 29"	0.60"	224° 32' 16"	-16° 54' 46"	0.9905645	16'08.77"	23° 26' 18"	16 m 14 s
5	227° 02' 59"	0.60"	224° 34' 47"	-16° 55' 29"	0.9905547	16'08.78"	23° 26' 18"	16 m 14 s
6	227° 05' 30"	0.60"	224° 37' 18"	-16° 56' 12"	0.9905450	16'08.79"	23° 26' 18"	16 m 13 s
7	227° 08' 01"	0.59"	224° 39' 49"	-16° 56' 54"	0.9905353	16'08.80"	23° 26' 18"	16 m 13 s
8	227° 10' 31"	0.59"	224° 42' 20"	-16° 57' 37"	0.9905255	16'08.81"	23° 26' 18"	16 m 13 s
9	227° 13' 02"	0.59"	224° 44' 51"	-16° 58' 19"	0.9905158	16'08.82"	23° 26' 18"	16 m 13 s
10	227° 15' 33"	0.59"	224° 47' 22"	-16° 59' 02"	0.9905061	16'08.83"	23° 26' 18"	16 m 13 s
11	227° 18' 03"	0.59"	224° 49' 54"	-16° 59' 44"	0.9904964	16'08.84"	23° 26' 18"	16 m 12 s
12	227° 20' 34"	0.59"	224° 52' 25"	-17° 00' 27"	0.9904867	16'08.85"	23° 26' 18"	16 m 12 s
13	227° 23' 04"	0.58"	224° 54' 56"	-17° 01' 09"	0.9904770	16'08.86"	23° 26' 18"	16 m 12 s
14	227° 25' 35"	0.58"	224° 57' 27"	-17° 01' 52"	0.9904673	16'08.87"	23° 26' 18"	16 m 12 s
15	227° 28' 06"	0.58"	224° 59' 58"	-17° 02' 34"	0.9904577	16'08.88"	23° 26' 18"	16 m 11 s
16	227° 30' 36"	0.58"	225° 02' 29"	-17° 03' 17"	0.9904480	16'08.88"	23° 26' 18"	16 m 11 s
17	227° 33' 07"	0.58"	225° 05' 01"	-17° 03' 59"	0.9904383	16'08.89"	23° 26' 18"	16 m 11 s
18	227° 35' 38"	0.57"	225° 07' 32"	-17° 04' 41"	0.9904287	16'08.90"	23° 26' 18"	16 m 11 s
19	227° 38' 08"	0.57"	225° 10' 03"	-17° 05' 23"	0.9904190	16'08.91"	23° 26' 18"	16 m 11 s
20	227° 40' 39"	0.57"	225° 12' 35"	-17° 06' 06"	0.9904094	16'08.92"	23° 26' 18"	16 m 10 s
21	227° 43' 10"	0.57"	225° 15' 06"	-17° 06' 48"	0.9903997	16'08.93"	23° 26' 18"	16 m 10 s
22	227° 45' 40"	0.56"	225° 17' 37"	-17° 07' 30"	0.9903901	16'08.94"	23° 26' 18"	16 m 10 s
23	227° 48' 11"	0.56"	225° 20' 09"	-17° 08' 12"	0.9903805	16'08.95"	23° 26' 18"	16 m 10 s
24	227° 50' 42"	0.56"	225° 22' 40"	-17° 08' 54"	0.9903709	16'08.96"	23° 26' 18"	16 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	95° 25' 38"	4° 47' 49"	96° 08' 04"	28° 07' 11"	1° 00' 02"	16' 21.46"	88° 13' 39"	0.83032
1	96° 02' 05"	4° 46' 44"	96° 49' 09"	28° 04' 29"	0° 59' 60"	16' 20.90"	88° 35' 51"	0.82664
2	96° 38' 29"	4° 45' 38"	97° 30' 08"	28° 01' 34"	0° 59' 58"	16' 20.33"	88° 57' 54"	0.82293
3	97° 14' 50"	4° 44' 31"	98° 11' 03"	27° 58' 28"	0° 59' 55"	16' 19.76"	89° 19' 47"	0.81919
4	97° 51' 09"	4° 43' 21"	98° 51' 52"	27° 55' 10"	0° 59' 53"	16' 19.19"	89° 41' 31"	0.81543
5	98° 27' 25"	4° 42' 09"	99° 32' 35"	27° 51' 40"	0° 59' 51"	16' 18.62"	90° 3' 06"	0.81164
6	99° 03' 38"	4° 40' 56"	100° 13' 13"	27° 47' 59"	0° 59' 49"	16' 18.04"	90° 24' 31"	0.80783
7	99° 39' 48"	4° 39' 41"	100° 53' 44"	27° 44' 06"	0° 59' 47"	16' 17.45"	90° 45' 47"	0.80399
8	100° 15' 55"	4° 38' 24"	101° 34' 10"	27° 40' 01"	0° 59' 45"	16' 16.87"	91° 6' 53"	0.80013
9	100° 51' 60"	4° 37' 06"	102° 14' 29"	27° 35' 45"	0° 59' 43"	16' 16.28"	91° 27' 50"	0.79625
10	101° 28' 01"	4° 35' 45"	102° 54' 42"	27° 31' 18"	0° 59' 41"	16' 15.68"	91° 48' 37"	0.79234
11	102° 03' 60"	4° 34' 23"	103° 34' 49"	27° 26' 40"	0° 59' 38"	16' 15.09"	92° 9' 15"	0.78842
12	102° 39' 55"	4° 32' 60"	104° 14' 49"	27° 21' 50"	0° 59' 36"	16' 14.49"	92° 29' 43"	0.78447
13	103° 15' 48"	4° 31' 34"	104° 54' 43"	27° 16' 50"	0° 59' 34"	16' 13.89"	92° 50' 01"	0.78050
14	103° 51' 38"	4° 30' 07"	105° 34' 29"	27° 11' 38"	0° 59' 32"	16' 13.29"	93° 10' 10"	0.77651
15	104° 27' 24"	4° 28' 38"	106° 14' 09"	27° 06' 16"	0° 59' 29"	16' 12.68"	93° 30' 08"	0.77249
16	105° 03' 08"	4° 27' 08"	106° 53' 42"	27° 00' 43"	0° 59' 27"	16' 12.07"	93° 49' 57"	0.76846
17	105° 38' 49"	4° 25' 36"	107° 33' 08"	26° 54' 60"	0° 59' 25"	16' 11.46"	94° 9' 36"	0.76441
18	106° 14' 27"	4° 24' 02"	108° 12' 26"	26° 49' 06"	0° 59' 23"	16' 10.85"	94° 29' 05"	0.76035
19	106° 50' 01"	4° 22' 27"	108° 51' 37"	26° 43' 02"	0° 59' 21"	16' 10.23"	94° 48' 25"	0.75626
20	107° 25' 33"	4° 20' 51"	109° 30' 41"	26° 36' 47"	0° 59' 18"	16' 09.62"	95° 7' 34"	0.75215
21	108° 01' 02"	4° 19' 12"	110° 09' 38"	26° 30' 22"	0° 59' 16"	16' 09.00"	95° 26' 33"	0.74803
22	108° 36' 28"	4° 17' 33"	110° 48' 27"	26° 23' 48"	0° 59' 14"	16' 08.38"	95° 45' 22"	0.74390
23	109° 11' 50"	4° 15' 51"	111° 27' 08"	26° 17' 03"	0° 59' 11"	16' 07.76"	96° 4' 00"	0.73974
24	109° 47' 10"	4° 14' 08"	112° 05' 41"	26° 10' 09"	0° 59' 09"	16' 07.13"	96° 22' 29"	0.73557

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	227° 50' 42"	0.56"	225° 22' 40"	-17° 08' 54"	0.9903709	16'08.96"	23° 26' 18"	16 m 09 s
1	227° 53' 12"	0.56"	225° 25' 11"	-17° 09' 36"	0.9903612	16'08.97"	23° 26' 18"	16 m 09 s
2	227° 55' 43"	0.55"	225° 27' 43"	-17° 10' 18"	0.9903516	16'08.98"	23° 26' 18"	16 m 09 s
3	227° 58' 14"	0.55"	225° 30' 14"	-17° 11' 00"	0.9903420	16'08.99"	23° 26' 18"	16 m 09 s
4	228° 00' 44"	0.55"	225° 32' 46"	-17° 11' 42"	0.9903324	16'09.00"	23° 26' 18"	16 m 08 s
5	228° 03' 15"	0.55"	225° 35' 17"	-17° 12' 24"	0.9903229	16'09.01"	23° 26' 18"	16 m 08 s
6	228° 05' 46"	0.54"	225° 37' 49"	-17° 13' 06"	0.9903133	16'09.02"	23° 26' 18"	16 m 08 s
7	228° 08' 16"	0.54"	225° 40' 20"	-17° 13' 48"	0.9903037	16'09.03"	23° 26' 18"	16 m 08 s
8	228° 10' 47"	0.54"	225° 42' 52"	-17° 14' 30"	0.9902941	16'09.04"	23° 26' 18"	16 m 07 s
9	228° 13' 18"	0.53"	225° 45' 24"	-17° 15' 12"	0.9902846	16'09.04"	23° 26' 18"	16 m 07 s
10	228° 15' 49"	0.53"	225° 47' 55"	-17° 15' 54"	0.9902750	16'09.05"	23° 26' 18"	16 m 07 s
11	228° 18' 19"	0.53"	225° 50' 27"	-17° 16' 36"	0.9902655	16'09.06"	23° 26' 18"	16 m 07 s
12	228° 20' 50"	0.53"	225° 52' 59"	-17° 17' 17"	0.9902559	16'09.07"	23° 26' 18"	16 m 06 s
13	228° 23' 21"	0.52"	225° 55' 30"	-17° 17' 59"	0.9902464	16'09.08"	23° 26' 18"	16 m 06 s
14	228° 25' 51"	0.52"	225° 58' 02"	-17° 18' 41"	0.9902368	16'09.09"	23° 26' 18"	16 m 06 s
15	228° 28' 22"	0.52"	226° 00' 34"	-17° 19' 22"	0.9902273	16'09.10"	23° 26' 18"	16 m 05 s
16	228° 30' 53"	0.51"	226° 03' 05"	-17° 20' 04"	0.9902178	16'09.11"	23° 26' 18"	16 m 05 s
17	228° 33' 24"	0.51"	226° 05' 37"	-17° 20' 46"	0.9902083	16'09.12"	23° 26' 18"	16 m 05 s
18	228° 35' 54"	0.51"	226° 08' 09"	-17° 21' 27"	0.9901988	16'09.13"	23° 26' 18"	16 m 05 s
19	228° 38' 25"	0.50"	226° 10' 41"	-17° 22' 09"	0.9901893	16'09.14"	23° 26' 18"	16 m 04 s
20	228° 40' 56"	0.50"	226° 13' 13"	-17° 22' 50"	0.9901798	16'09.15"	23° 26' 18"	16 m 04 s
21	228° 43' 27"	0.50"	226° 15' 45"	-17° 23' 32"	0.9901703	16'09.16"	23° 26' 18"	16 m 04 s
22	228° 45' 57"	0.49"	226° 18' 16"	-17° 24' 13"	0.9901608	16'09.17"	23° 26' 18"	16 m 04 s
23	228° 48' 28"	0.49"	226° 20' 48"	-17° 24' 55"	0.9901513	16'09.18"	23° 26' 18"	16 m 03 s
24	228° 50' 59"	0.49"	226° 23' 20"	-17° 25' 36"	0.9901418	16'09.18"	23° 26' 18"	16 m 03 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	109° 47' 10"	4° 14' 08"	112° 05' 41"	26° 10' 09"	0° 59' 09"	16' 07.13"	96° 22' 29"	0.73557
1	110° 22' 27"	4° 12' 24"	112° 44' 07"	26° 03' 05"	0° 59' 07"	16' 06.51"	96° 40' 47"	0.73139
2	110° 57' 40"	4° 10' 38"	113° 22' 25"	25° 55' 51"	0° 59' 05"	16' 05.88"	96° 58' 55"	0.72719
3	111° 32' 51"	4° 08' 51"	114° 00' 35"	25° 48' 28"	0° 59' 02"	16' 05.26"	97° 16' 53"	0.72297
4	112° 07' 58"	4° 07' 03"	114° 38' 38"	25° 40' 55"	0° 58' 60"	16' 04.63"	97° 34' 40"	0.71874
5	112° 43' 03"	4° 05' 13"	115° 16' 32"	25° 33' 14"	0° 58' 58"	16' 04.00"	97° 52' 17"	0.71450
6	113° 18' 04"	4° 03' 21"	115° 54' 18"	25° 25' 23"	0° 58' 55"	16' 03.37"	98° 9' 43"	0.71025
7	113° 53' 03"	4° 01' 29"	116° 31' 56"	25° 17' 23"	0° 58' 53"	16' 02.74"	98° 26' 59"	0.70598
8	114° 27' 58"	3° 59' 35"	117° 09' 26"	25° 09' 15"	0° 58' 51"	16' 02.10"	98° 44' 05"	0.70170
9	115° 02' 51"	3° 57' 39"	117° 46' 48"	25° 00' 57"	0° 58' 48"	16' 01.47"	99° 1' 00"	0.69741
10	115° 37' 40"	3° 55' 42"	118° 24' 02"	24° 52' 31"	0° 58' 46"	16' 00.84"	99° 17' 45"	0.69311
11	116° 12' 26"	3° 53' 44"	119° 01' 08"	24° 43' 57"	0° 58' 44"	16' 00.20"	99° 34' 19"	0.68880
12	116° 47' 09"	3° 51' 45"	119° 38' 05"	24° 35' 14"	0° 58' 41"	15' 59.57"	99° 50' 42"	0.68447
13	117° 21' 50"	3° 49' 45"	120° 14' 54"	24° 26' 23"	0° 58' 39"	15' 58.94"	100° 6' 55"	0.68014
14	117° 56' 27"	3° 47' 43"	120° 51' 35"	24° 17' 24"	0° 58' 37"	15' 58.30"	100° 22' 57"	0.67580
15	118° 31' 01"	3° 45' 40"	121° 28' 08"	24° 08' 16"	0° 58' 34"	15' 57.67"	100° 38' 49"	0.67145
16	119° 05' 32"	3° 43' 36"	122° 04' 33"	23° 59' 01"	0° 58' 32"	15' 57.03"	100° 54' 30"	0.66709
17	119° 40' 01"	3° 41' 30"	122° 40' 49"	23° 49' 38"	0° 58' 30"	15' 56.40"	101° 10' 00"	0.66272
18	120° 14' 26"	3° 39' 24"	123° 16' 57"	23° 40' 07"	0° 58' 27"	15' 55.76"	101° 25' 20"	0.65835
19	120° 48' 48"	3° 37' 16"	123° 52' 56"	23° 30' 29"	0° 58' 25"	15' 55.13"	101° 40' 29"	0.65397
20	121° 23' 07"	3° 35' 07"	124° 28' 48"	23° 20' 43"	0° 58' 23"	15' 54.50"	101° 55' 28"	0.64958
21	121° 57' 23"	3° 32' 57"	125° 04' 31"	23° 10' 50"	0° 58' 20"	15' 53.86"	102° 10' 16"	0.64519
22	122° 31' 36"	3° 30' 46"	125° 40' 06"	23° 00' 50"	0° 58' 18"	15' 53.23"	102° 24' 53"	0.64078
23	123° 05' 47"	3° 28' 34"	126° 15' 33"	22° 50' 43"	0° 58' 16"	15' 52.60"	102° 39' 19"	0.63638
24	123° 39' 54"	3° 26' 21"	126° 50' 51"	22° 40' 28"	0° 58' 13"	15' 51.97"	102° 53' 35"	0.63197

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	228° 50' 59"	0.49"	226° 23' 20"	-17° 25' 36"	0.9901418	16'09.18"	23° 26' 18"	16 m 03 s
1	228° 53' 30"	0.48"	226° 25' 52"	-17° 26' 17"	0.9901324	16'09.19"	23° 26' 18"	16 m 03 s
2	228° 56' 00"	0.48"	226° 28' 24"	-17° 26' 59"	0.9901229	16'09.20"	23° 26' 18"	16 m 02 s
3	228° 58' 31"	0.47"	226° 30' 56"	-17° 27' 40"	0.9901134	16'09.21"	23° 26' 18"	16 m 02 s
4	229° 01' 02"	0.47"	226° 33' 28"	-17° 28' 21"	0.9901040	16'09.22"	23° 26' 18"	16 m 02 s
5	229° 03' 33"	0.47"	226° 36' 00"	-17° 29' 02"	0.9900945	16'09.23"	23° 26' 18"	16 m 02 s
6	229° 06' 04"	0.46"	226° 38' 32"	-17° 29' 44"	0.9900851	16'09.24"	23° 26' 18"	16 m 01 s
7	229° 08' 34"	0.46"	226° 41' 05"	-17° 30' 25"	0.9900757	16'09.25"	23° 26' 18"	16 m 01 s
8	229° 11' 05"	0.46"	226° 43' 37"	-17° 31' 06"	0.9900662	16'09.26"	23° 26' 18"	16 m 01 s
9	229° 13' 36"	0.45"	226° 46' 09"	-17° 31' 47"	0.9900568	16'09.27"	23° 26' 18"	16 m 00 s
10	229° 16' 07"	0.45"	226° 48' 41"	-17° 32' 28"	0.9900474	16'09.28"	23° 26' 18"	16 m 00 s
11	229° 18' 37"	0.44"	226° 51' 13"	-17° 33' 09"	0.9900380	16'09.29"	23° 26' 18"	15 m 60 s
12	229° 21' 08"	0.44"	226° 53' 45"	-17° 33' 50"	0.9900286	16'09.30"	23° 26' 18"	15 m 60 s
13	229° 23' 39"	0.44"	226° 56' 18"	-17° 34' 31"	0.9900192	16'09.30"	23° 26' 18"	15 m 59 s
14	229° 26' 10"	0.43"	226° 58' 50"	-17° 35' 12"	0.9900098	16'09.31"	23° 26' 18"	15 m 59 s
15	229° 28' 41"	0.43"	227° 01' 22"	-17° 35' 53"	0.9900004	16'09.32"	23° 26' 18"	15 m 59 s
16	229° 31' 12"	0.42"	227° 03' 54"	-17° 36' 34"	0.9899910	16'09.33"	23° 26' 18"	15 m 58 s
17	229° 33' 42"	0.42"	227° 06' 27"	-17° 37' 15"	0.9899816	16'09.34"	23° 26' 18"	15 m 58 s
18	229° 36' 13"	0.41"	227° 08' 59"	-17° 37' 56"	0.9899723	16'09.35"	23° 26' 18"	15 m 58 s
19	229° 38' 44"	0.41"	227° 11' 31"	-17° 38' 36"	0.9899629	16'09.36"	23° 26' 18"	15 m 57 s
20	229° 41' 15"	0.41"	227° 14' 04"	-17° 39' 17"	0.9899535	16'09.37"	23° 26' 18"	15 m 57 s
21	229° 43' 46"	0.40"	227° 16' 36"	-17° 39' 58"	0.9899442	16'09.38"	23° 26' 18"	15 m 57 s
22	229° 46' 16"	0.40"	227° 19' 09"	-17° 40' 39"	0.9899348	16'09.39"	23° 26' 18"	15 m 56 s
23	229° 48' 47"	0.39"	227° 21' 41"	-17° 41' 19"	0.9899255	16'09.40"	23° 26' 18"	15 m 56 s
24	229° 51' 18"	0.39"	227° 24' 14"	-17° 41' 60"	0.9899161	16'09.41"	23° 26' 18"	15 m 56 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	123° 39' 54"	3° 26' 21"	126° 50' 51"	22° 40' 28"	0° 58' 13"	15' 51.97"	102° 53' 35"	0.63197
1	124° 13' 58"	3° 24' 07"	127° 26' 01"	22° 30' 07"	0° 58' 11"	15' 51.34"	103° 7' 41"	0.62755
2	124° 47' 60"	3° 21' 51"	128° 01' 04"	22° 19' 39"	0° 58' 09"	15' 50.71"	103° 21' 35"	0.62313
3	125° 21' 58"	3° 19' 35"	128° 35' 58"	22° 09' 04"	0° 58' 07"	15' 50.08"	103° 35' 19"	0.61871
4	125° 55' 54"	3° 17' 18"	129° 10' 44"	21° 58' 23"	0° 58' 04"	15' 49.45"	103° 48' 53"	0.61428
5	126° 29' 46"	3° 14' 60"	129° 45' 21"	21° 47' 36"	0° 58' 02"	15' 48.82"	104° 2' 15"	0.60985
6	127° 03' 36"	3° 12' 40"	130° 19' 51"	21° 36' 42"	0° 57' 60"	15' 48.20"	104° 15' 28"	0.60542
7	127° 37' 23"	3° 10' 20"	130° 54' 13"	21° 25' 42"	0° 57' 57"	15' 47.57"	104° 28' 29"	0.60098
8	128° 11' 07"	3° 07' 59"	131° 28' 27"	21° 14' 35"	0° 57' 55"	15' 46.95"	104° 41' 20"	0.59654
9	128° 44' 48"	3° 05' 38"	132° 02' 33"	21° 03' 23"	0° 57' 53"	15' 46.33"	104° 54' 01"	0.59210
10	129° 18' 26"	3° 03' 15"	132° 36' 31"	20° 52' 05"	0° 57' 50"	15' 45.71"	105° 6' 31"	0.58766
11	129° 52' 01"	3° 00' 51"	133° 10' 21"	20° 40' 41"	0° 57' 48"	15' 45.09"	105° 18' 50"	0.58322
12	130° 25' 34"	2° 58' 27"	133° 44' 03"	20° 29' 12"	0° 57' 46"	15' 44.47"	105° 30' 59"	0.57878
13	130° 59' 03"	2° 56' 01"	134° 17' 38"	20° 17' 37"	0° 57' 44"	15' 43.85"	105° 42' 57"	0.57434
14	131° 32' 30"	2° 53' 35"	134° 51' 05"	20° 05' 56"	0° 57' 41"	15' 43.24"	105° 54' 45"	0.56990
15	132° 05' 54"	2° 51' 08"	135° 24' 24"	19° 54' 11"	0° 57' 39"	15' 42.62"	106° 6' 23"	0.56546
16	132° 39' 15"	2° 48' 41"	135° 57' 36"	19° 42' 19"	0° 57' 37"	15' 42.01"	106° 17' 50"	0.56102
17	133° 12' 34"	2° 46' 12"	136° 30' 40"	19° 30' 23"	0° 57' 35"	15' 41.40"	106° 29' 07"	0.55658
18	133° 45' 50"	2° 43' 43"	137° 03' 37"	19° 18' 22"	0° 57' 32"	15' 40.80"	106° 40' 13"	0.55214
19	134° 19' 03"	2° 41' 13"	137° 36' 26"	19° 06' 16"	0° 57' 30"	15' 40.19"	106° 51' 10"	0.54771
20	134° 52' 13"	2° 38' 43"	138° 09' 08"	18° 54' 05"	0° 57' 28"	15' 39.59"	107° 1' 55"	0.54327
21	135° 25' 20"	2° 36' 11"	138° 41' 42"	18° 41' 49"	0° 57' 26"	15' 38.98"	107° 12' 31"	0.53884
22	135° 58' 25"	2° 33' 39"	139° 14' 09"	18° 29' 28"	0° 57' 24"	15' 38.38"	107° 22' 56"	0.53442
23	136° 31' 27"	2° 31' 07"	139° 46' 30"	18° 17' 03"	0° 57' 21"	15' 37.79"	107° 33' 11"	0.52999
24	137° 04' 27"	2° 28' 33"	140° 18' 43"	18° 04' 34"	0° 57' 19"	15' 37.19"	107° 43' 16"	0.52557

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	229° 51' 18"	0.39"	227° 24' 14"	-17° 41' 60"	0.9899161	16'09.41"	23° 26' 18"	15 m 56 s
1	229° 53' 49"	0.38"	227° 26' 46"	-17° 42' 40"	0.9899068	16'09.41"	23° 26' 18"	15 m 56 s
2	229° 56' 20"	0.38"	227° 29' 19"	-17° 43' 21"	0.9898975	16'09.42"	23° 26' 18"	15 m 55 s
3	229° 58' 51"	0.38"	227° 31' 51"	-17° 44' 02"	0.9898881	16'09.43"	23° 26' 18"	15 m 55 s
4	230° 01' 22"	0.37"	227° 34' 24"	-17° 44' 42"	0.9898788	16'09.44"	23° 26' 18"	15 m 55 s
5	230° 03' 52"	0.37"	227° 36' 56"	-17° 45' 22"	0.9898695	16'09.45"	23° 26' 18"	15 m 54 s
6	230° 06' 23"	0.36"	227° 39' 29"	-17° 46' 03"	0.9898602	16'09.46"	23° 26' 18"	15 m 54 s
7	230° 08' 54"	0.36"	227° 42' 02"	-17° 46' 43"	0.9898509	16'09.47"	23° 26' 18"	15 m 54 s
8	230° 11' 25"	0.35"	227° 44' 34"	-17° 47' 24"	0.9898416	16'09.48"	23° 26' 18"	15 m 53 s
9	230° 13' 56"	0.35"	227° 47' 07"	-17° 48' 04"	0.9898323	16'09.49"	23° 26' 18"	15 m 53 s
10	230° 16' 27"	0.34"	227° 49' 40"	-17° 48' 44"	0.9898230	16'09.50"	23° 26' 18"	15 m 53 s
11	230° 18' 58"	0.34"	227° 52' 12"	-17° 49' 25"	0.9898137	16'09.51"	23° 26' 18"	15 m 52 s
12	230° 21' 29"	0.33"	227° 54' 45"	-17° 50' 05"	0.9898045	16'09.51"	23° 26' 18"	15 m 52 s
13	230° 23' 59"	0.33"	227° 57' 18"	-17° 50' 45"	0.9897952	16'09.52"	23° 26' 18"	15 m 52 s
14	230° 26' 30"	0.32"	227° 59' 51"	-17° 51' 25"	0.9897859	16'09.53"	23° 26' 18"	15 m 51 s
15	230° 29' 01"	0.32"	228° 02' 24"	-17° 52' 05"	0.9897767	16'09.54"	23° 26' 18"	15 m 51 s
16	230° 31' 32"	0.31"	228° 04' 56"	-17° 52' 46"	0.9897674	16'09.55"	23° 26' 18"	15 m 51 s
17	230° 34' 03"	0.31"	228° 07' 29"	-17° 53' 26"	0.9897582	16'09.56"	23° 26' 18"	15 m 50 s
18	230° 36' 34"	0.30"	228° 10' 02"	-17° 54' 06"	0.9897489	16'09.57"	23° 26' 18"	15 m 50 s
19	230° 39' 05"	0.30"	228° 12' 35"	-17° 54' 46"	0.9897397	16'09.58"	23° 26' 18"	15 m 50 s
20	230° 41' 36"	0.29"	228° 15' 08"	-17° 55' 26"	0.9897304	16'09.59"	23° 26' 18"	15 m 49 s
21	230° 44' 07"	0.29"	228° 17' 41"	-17° 56' 06"	0.9897212	16'09.60"	23° 26' 18"	15 m 49 s
22	230° 46' 38"	0.28"	228° 20' 14"	-17° 56' 46"	0.9897120	16'09.61"	23° 26' 18"	15 m 49 s
23	230° 49' 08"	0.28"	228° 22' 47"	-17° 57' 26"	0.9897028	16'09.61"	23° 26' 18"	15 m 48 s
24	230° 51' 39"	0.27"	228° 25' 20"	-17° 58' 05"	0.9896935	16'09.62"	23° 26' 18"	15 m 48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	137° 04' 27"	2° 28' 33"	140° 18' 43"	18° 04' 34"	0° 57' 19"	15' 37.19"	107° 43' 16"	0.52557
1	137° 37' 24"	2° 25' 59"	140° 50' 49"	17° 51' 60"	0° 57' 17"	15' 36.60"	107° 53' 11"	0.52116
2	138° 10' 18"	2° 23' 25"	141° 22' 47"	17° 39' 22"	0° 57' 15"	15' 36.01"	108° 2' 55"	0.51675
3	138° 43' 09"	2° 20' 50"	141° 54' 40"	17° 26' 39"	0° 57' 13"	15' 35.42"	108° 12' 30"	0.51234
4	139° 15' 58"	2° 18' 14"	142° 26' 25"	17° 13' 53"	0° 57' 11"	15' 34.83"	108° 21' 54"	0.50794
5	139° 48' 45"	2° 15' 38"	142° 58' 03"	17° 01' 03"	0° 57' 08"	15' 34.25"	108° 31' 08"	0.50354
6	140° 21' 29"	2° 13' 01"	143° 29' 35"	16° 48' 08"	0° 57' 06"	15' 33.67"	108° 40' 13"	0.49915
7	140° 54' 10"	2° 10' 24"	144° 00' 60"	16° 35' 10"	0° 57' 04"	15' 33.09"	108° 49' 07"	0.49476
8	141° 26' 49"	2° 07' 46"	144° 32' 18"	16° 22' 08"	0° 57' 02"	15' 32.51"	108° 57' 51"	0.49039
9	141° 59' 25"	2° 05' 08"	145° 03' 30"	16° 09' 03"	0° 56' 60"	15' 31.94"	109° 6' 26"	0.48601
10	142° 31' 59"	2° 02' 29"	145° 34' 36"	15° 55' 54"	0° 56' 58"	15' 31.37"	109° 14' 51"	0.48165
11	143° 04' 30"	1° 59' 50"	146° 05' 35"	15° 42' 41"	0° 56' 56"	15' 30.80"	109° 23' 05"	0.47729
12	143° 36' 59"	1° 57' 10"	146° 36' 28"	15° 29' 25"	0° 56' 54"	15' 30.23"	109° 31' 10"	0.47294
13	144° 09' 25"	1° 54' 30"	147° 07' 15"	15° 16' 06"	0° 56' 52"	15' 29.67"	109° 39' 05"	0.46859
14	144° 41' 49"	1° 51' 49"	147° 37' 56"	15° 02' 43"	0° 56' 50"	15' 29.11"	109° 46' 51"	0.46426
15	145° 14' 10"	1° 49' 08"	148° 08' 30"	14° 49' 18"	0° 56' 48"	15' 28.55"	109° 54' 26"	0.45993
16	145° 46' 30"	1° 46' 27"	148° 38' 59"	14° 35' 49"	0° 56' 46"	15' 28.00"	110° 1' 52"	0.45561
17	146° 18' 46"	1° 43' 45"	149° 09' 22"	14° 22' 17"	0° 56' 43"	15' 27.45"	110° 9' 08"	0.45130
18	146° 51' 01"	1° 41' 03"	149° 39' 39"	14° 08' 43"	0° 56' 41"	15' 26.90"	110° 16' 15"	0.44700
19	147° 23' 13"	1° 38' 21"	150° 09' 50"	13° 55' 05"	0° 56' 39"	15' 26.35"	110° 23' 12"	0.44271
20	147° 55' 22"	1° 35' 38"	150° 39' 56"	13° 41' 25"	0° 56' 37"	15' 25.81"	110° 29' 59"	0.43843
21	148° 27' 30"	1° 32' 55"	151° 09' 56"	13° 27' 42"	0° 56' 35"	15' 25.27"	110° 36' 37"	0.43416
22	148° 59' 35"	1° 30' 12"	151° 39' 50"	13° 13' 57"	0° 56' 34"	15' 24.73"	110° 43' 05"	0.42989
23	149° 31' 38"	1° 27' 28"	152° 09' 40"	13° 00' 09"	0° 56' 32"	15' 24.20"	110° 49' 24"	0.42564
24	150° 03' 39"	1° 24' 44"	152° 39' 23"	12° 46' 19"	0° 56' 30"	15' 23.67"	110° 55' 34"	0.42140

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	230° 51' 39"	0.27"	228° 25' 20"	-17° 58' 05"	0.9896935	16'09.62"	23° 26' 18"	15 m 48 s
1	230° 54' 10"	0.27"	228° 27' 53"	-17° 58' 45"	0.9896843	16'09.63"	23° 26' 18"	15 m 48 s
2	230° 56' 41"	0.26"	228° 30' 26"	-17° 59' 25"	0.9896751	16'09.64"	23° 26' 18"	15 m 47 s
3	230° 59' 12"	0.26"	228° 32' 59"	-18° 00' 05"	0.9896659	16'09.65"	23° 26' 18"	15 m 47 s
4	231° 01' 43"	0.25"	228° 35' 32"	-18° 00' 44"	0.9896567	16'09.66"	23° 26' 18"	15 m 46 s
5	231° 04' 14"	0.25"	228° 38' 05"	-18° 01' 24"	0.9896475	16'09.67"	23° 26' 18"	15 m 46 s
6	231° 06' 45"	0.24"	228° 40' 39"	-18° 02' 04"	0.9896383	16'09.68"	23° 26' 18"	15 m 46 s
7	231° 09' 16"	0.24"	228° 43' 12"	-18° 02' 43"	0.9896292	16'09.69"	23° 26' 18"	15 m 45 s
8	231° 11' 47"	0.23"	228° 45' 45"	-18° 03' 23"	0.9896200	16'09.70"	23° 26' 18"	15 m 45 s
9	231° 14' 18"	0.23"	228° 48' 18"	-18° 04' 03"	0.9896108	16'09.70"	23° 26' 18"	15 m 45 s
10	231° 16' 49"	0.22"	228° 50' 51"	-18° 04' 42"	0.9896016	16'09.71"	23° 26' 18"	15 m 44 s
11	231° 19' 20"	0.22"	228° 53' 25"	-18° 05' 22"	0.9895925	16'09.72"	23° 26' 18"	15 m 44 s
12	231° 21' 51"	0.21"	228° 55' 58"	-18° 06' 01"	0.9895833	16'09.73"	23° 26' 18"	15 m 44 s
13	231° 24' 22"	0.21"	228° 58' 31"	-18° 06' 41"	0.9895742	16'09.74"	23° 26' 18"	15 m 43 s
14	231° 26' 53"	0.20"	229° 01' 05"	-18° 07' 20"	0.9895650	16'09.75"	23° 26' 18"	15 m 43 s
15	231° 29' 24"	0.20"	229° 03' 38"	-18° 07' 59"	0.9895559	16'09.76"	23° 26' 18"	15 m 42 s
16	231° 31' 55"	0.19"	229° 06' 11"	-18° 08' 39"	0.9895467	16'09.77"	23° 26' 18"	15 m 42 s
17	231° 34' 26"	0.19"	229° 08' 45"	-18° 09' 18"	0.9895376	16'09.78"	23° 26' 18"	15 m 42 s
18	231° 36' 57"	0.18"	229° 11' 18"	-18° 09' 57"	0.9895285	16'09.79"	23° 26' 18"	15 m 41 s
19	231° 39' 28"	0.18"	229° 13' 52"	-18° 10' 37"	0.9895194	16'09.79"	23° 26' 18"	15 m 41 s
20	231° 41' 59"	0.17"	229° 16' 25"	-18° 11' 16"	0.9895102	16'09.80"	23° 26' 18"	15 m 41 s
21	231° 44' 30"	0.16"	229° 18' 59"	-18° 11' 55"	0.9895011	16'09.81"	23° 26' 18"	15 m 40 s
22	231° 47' 01"	0.16"	229° 21' 32"	-18° 12' 34"	0.9894920	16'09.82"	23° 26' 18"	15 m 40 s
23	231° 49' 32"	0.15"	229° 24' 06"	-18° 13' 13"	0.9894829	16'09.83"	23° 26' 18"	15 m 39 s
24	231° 52' 03"	0.15"	229° 26' 39"	-18° 13' 52"	0.9894738	16'09.84"	23° 26' 18"	15 m 39 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	150° 03' 39"	1° 24' 44"	152° 39' 23"	12° 46' 19"	0° 56' 30"	15' 23.67"	110° 55' 34"	0.42140
1	150° 35' 37"	1° 22' 00"	153° 09' 02"	12° 32' 26"	0° 56' 28"	15' 23.14"	111° 1' 33"	0.41717
2	151° 07' 33"	1° 19' 16"	153° 38' 35"	12° 18' 31"	0° 56' 26"	15' 22.62"	111° 7' 24"	0.41295
3	151° 39' 27"	1° 16' 31"	154° 08' 04"	12° 04' 33"	0° 56' 24"	15' 22.10"	111° 13' 05"	0.40874
4	152° 11' 19"	1° 13' 46"	154° 37' 27"	11° 50' 34"	0° 56' 22"	15' 21.58"	111° 18' 37"	0.40455
5	152° 43' 09"	1° 11' 01"	155° 06' 46"	11° 36' 32"	0° 56' 20"	15' 21.07"	111° 23' 59"	0.40036
6	153° 14' 56"	1° 08' 16"	155° 35' 59"	11° 22' 28"	0° 56' 18"	15' 20.55"	111° 29' 12"	0.39619
7	153° 46' 42"	1° 05' 31"	156° 05' 08"	11° 08' 23"	0° 56' 16"	15' 20.05"	111° 34' 16"	0.39203
8	154° 18' 25"	1° 02' 45"	156° 34' 12"	10° 54' 15"	0° 56' 14"	15' 19.54"	111° 39' 11"	0.38788
9	154° 50' 07"	0° 59' 60"	157° 03' 12"	10° 40' 06"	0° 56' 13"	15' 19.04"	111° 43' 56"	0.38375
10	155° 21' 46"	0° 57' 14"	157° 32' 07"	10° 25' 55"	0° 56' 11"	15' 18.54"	111° 48' 32"	0.37963
11	155° 53' 23"	0° 54' 28"	158° 00' 57"	10° 11' 42"	0° 56' 09"	15' 18.05"	111° 52' 59"	0.37552
12	156° 24' 59"	0° 51' 42"	158° 29' 44"	9° 57' 27"	0° 56' 07"	15' 17.56"	111° 57' 16"	0.37143
13	156° 56' 32"	0° 48' 56"	158° 58' 26"	9° 43' 11"	0° 56' 05"	15' 17.07"	112° 1' 25"	0.36735
14	157° 28' 03"	0° 46' 10"	159° 27' 03"	9° 28' 54"	0° 56' 04"	15' 16.58"	112° 5' 24"	0.36328
15	157° 59' 33"	0° 43' 24"	159° 55' 37"	9° 14' 35"	0° 56' 02"	15' 16.10"	112° 9' 15"	0.35923
16	158° 31' 00"	0° 40' 37"	160° 24' 07"	9° 00' 15"	0° 56' 00"	15' 15.62"	112° 12' 56"	0.35519
17	159° 02' 26"	0° 37' 51"	160° 52' 32"	8° 45' 53"	0° 55' 58"	15' 15.15"	112° 16' 28"	0.35117
18	159° 33' 49"	0° 35' 05"	161° 20' 54"	8° 31' 30"	0° 55' 57"	15' 14.68"	112° 19' 51"	0.34716
19	160° 05' 11"	0° 32' 19"	161° 49' 12"	8° 17' 06"	0° 55' 55"	15' 14.21"	112° 23' 05"	0.34316
20	160° 36' 31"	0° 29' 32"	162° 17' 27"	8° 02' 40"	0° 55' 53"	15' 13.75"	112° 26' 09"	0.33918
21	161° 07' 49"	0° 26' 46"	162° 45' 37"	7° 48' 14"	0° 55' 52"	15' 13.29"	112° 29' 05"	0.33522
22	161° 39' 06"	0° 23' 60"	163° 13' 44"	7° 33' 47"	0° 55' 50"	15' 12.83"	112° 31' 52"	0.33127
23	162° 10' 20"	0° 21' 14"	163° 41' 48"	7° 19' 18"	0° 55' 48"	15' 12.38"	112° 34' 30"	0.32734
24	162° 41' 33"	0° 18' 28"	164° 09' 48"	7° 04' 49"	0° 55' 47"	15' 11.93"	112° 36' 58"	0.32343

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	231° 52' 03"	0.15"	229° 26' 39"	-18° 13' 52"	0.9894738	16'09.84"	23° 26' 18"	15 m 39 s
1	231° 54' 34"	0.14"	229° 29' 13"	-18° 14' 31"	0.9894647	16'09.85"	23° 26' 18"	15 m 39 s
2	231° 57' 05"	0.14"	229° 31' 47"	-18° 15' 10"	0.9894556	16'09.86"	23° 26' 18"	15 m 38 s
3	231° 59' 36"	0.13"	229° 34' 20"	-18° 15' 49"	0.9894465	16'09.87"	23° 26' 18"	15 m 38 s
4	232° 02' 07"	0.13"	229° 36' 54"	-18° 16' 28"	0.9894374	16'09.87"	23° 26' 18"	15 m 37 s
5	232° 04' 38"	0.12"	229° 39' 27"	-18° 17' 07"	0.9894284	16'09.88"	23° 26' 18"	15 m 37 s
6	232° 07' 09"	0.12"	229° 42' 01"	-18° 17' 46"	0.9894193	16'09.89"	23° 26' 18"	15 m 37 s
7	232° 09' 40"	0.11"	229° 44' 35"	-18° 18' 25"	0.9894102	16'09.90"	23° 26' 18"	15 m 36 s
8	232° 12' 11"	0.10"	229° 47' 09"	-18° 19' 04"	0.9894012	16'09.91"	23° 26' 18"	15 m 36 s
9	232° 14' 42"	0.10"	229° 49' 42"	-18° 19' 42"	0.9893921	16'09.92"	23° 26' 18"	15 m 35 s
10	232° 17' 13"	0.09"	229° 52' 16"	-18° 20' 21"	0.9893830	16'09.93"	23° 26' 18"	15 m 35 s
11	232° 19' 44"	0.09"	229° 54' 50"	-18° 20' 60"	0.9893740	16'09.94"	23° 26' 18"	15 m 35 s
12	232° 22' 15"	0.08"	229° 57' 24"	-18° 21' 39"	0.9893649	16'09.95"	23° 26' 18"	15 m 34 s
13	232° 24' 46"	0.08"	229° 59' 58"	-18° 22' 17"	0.9893559	16'09.95"	23° 26' 18"	15 m 34 s
14	232° 27' 17"	0.07"	230° 02' 32"	-18° 22' 56"	0.9893469	16'09.96"	23° 26' 18"	15 m 33 s
15	232° 29' 48"	0.07"	230° 05' 05"	-18° 23' 34"	0.9893378	16'09.97"	23° 26' 18"	15 m 33 s
16	232° 32' 19"	0.06"	230° 07' 39"	-18° 24' 13"	0.9893288	16'09.98"	23° 26' 18"	15 m 33 s
17	232° 34' 50"	0.06"	230° 10' 13"	-18° 24' 51"	0.9893198	16'09.99"	23° 26' 18"	15 m 32 s
18	232° 37' 21"	0.05"	230° 12' 47"	-18° 25' 30"	0.9893107	16'10.00"	23° 26' 18"	15 m 32 s
19	232° 39' 52"	0.04"	230° 15' 21"	-18° 26' 08"	0.9893017	16'10.01"	23° 26' 18"	15 m 31 s
20	232° 42' 23"	0.04"	230° 17' 55"	-18° 26' 47"	0.9892927	16'10.02"	23° 26' 18"	15 m 31 s
21	232° 44' 54"	0.03"	230° 20' 29"	-18° 27' 25"	0.9892837	16'10.03"	23° 26' 18"	15 m 31 s
22	232° 47' 26"	0.03"	230° 23' 03"	-18° 28' 03"	0.9892747	16'10.03"	23° 26' 18"	15 m 30 s
23	232° 49' 57"	0.02"	230° 25' 37"	-18° 28' 42"	0.9892657	16'10.04"	23° 26' 18"	15 m 30 s
24	232° 52' 28"	0.02"	230° 28' 12"	-18° 29' 20"	0.9892567	16'10.05"	23° 26' 18"	15 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	162° 41' 33"	0° 18' 28"	164° 09' 48"	7° 04' 49"	0° 55' 47"	15' 11.93"	112° 36' 58"	0.32343
1	163° 12' 44"	0° 15' 42"	164° 37' 45"	6° 50' 19"	0° 55' 45"	15' 11.48"	112° 39' 18"	0.31953
2	163° 43' 53"	0° 12' 56"	165° 05' 39"	6° 35' 48"	0° 55' 43"	15' 11.04"	112° 41' 29"	0.31565
3	164° 15' 01"	0° 10' 10"	165° 33' 30"	6° 21' 16"	0° 55' 42"	15' 10.60"	112° 43' 31"	0.31178
4	164° 46' 07"	0° 07' 24"	166° 01' 17"	6° 06' 44"	0° 55' 40"	15' 10.16"	112° 45' 23"	0.30793
5	165° 17' 11"	0° 04' 38"	166° 29' 02"	5° 52' 11"	0° 55' 38"	15' 09.73"	112° 47' 07"	0.30410
6	165° 48' 14"	0° 01' 53"	166° 56' 43"	5° 37' 37"	0° 55' 37"	15' 09.30"	112° 48' 42"	0.30029
7	166° 19' 14"	0° 00'-53"	167° 24' 22"	5° 23' 03"	0° 55' 35"	15' 08.87"	112° 50' 08"	0.29649
8	166° 50' 14"	0° -3' 38"	167° 51' 58"	5° 08' 28"	0° 55' 34"	15' 08.45"	112° 51' 25"	0.29271
9	167° 21' 12"	0° -6' 23"	168° 19' 32"	4° 53' 53"	0° 55' 32"	15' 08.03"	112° 52' 32"	0.28895
10	167° 52' 08"	0° -9' 08"	168° 47' 02"	4° 39' 18"	0° 55' 31"	15' 07.62"	112° 53' 31"	0.28520
11	168° 23' 02"	0°-11' 52"	169° 14' 31"	4° 24' 42"	0° 55' 29"	15' 07.21"	112° 54' 21"	0.28148
12	168° 53' 55"	0°-14' 37"	169° 41' 57"	4° 10' 06"	0° 55' 28"	15' 06.80"	112° 55' 02"	0.27777
13	169° 24' 47"	0°-17' 21"	170° 09' 20"	3° 55' 30"	0° 55' 26"	15' 06.40"	112° 55' 34"	0.27408
14	169° 55' 37"	0°-20' 05"	170° 36' 41"	3° 40' 53"	0° 55' 25"	15' 06.00"	112° 55' 56"	0.27041
15	170° 26' 26"	0°-22' 49"	171° 04' 00"	3° 26' 17"	0° 55' 23"	15' 05.60"	112° 56' 10"	0.26676
16	170° 57' 13"	0°-25' 32"	171° 31' 17"	3° 11' 40"	0° 55' 22"	15' 05.21"	112° 56' 15"	0.26313
17	171° 27' 59"	0°-28' 15"	171° 58' 32"	2° 57' 03"	0° 55' 20"	15' 04.82"	112° 56' 11"	0.25952
18	171° 58' 43"	0°-30' 58"	172° 25' 44"	2° 42' 27"	0° 55' 19"	15' 04.43"	112° 55' 57"	0.25592
19	172° 29' 26"	0°-33' 41"	172° 52' 55"	2° 27' 50"	0° 55' 18"	15' 04.05"	112° 55' 35"	0.25235
20	173° 00' 07"	0°-36' 23"	173° 20' 04"	2° 13' 14"	0° 55' 16"	15' 03.67"	112° 55' 03"	0.24880
21	173° 30' 47"	0°-39' 06"	173° 47' 11"	1° 58' 38"	0° 55' 15"	15' 03.30"	112° 54' 22"	0.24526
22	174° 01' 26"	0°-41' 47"	174° 14' 17"	1° 44' 02"	0° 55' 13"	15' 02.93"	112° 53' 32"	0.24175
23	174° 32' 04"	0°-44' 29"	174° 41' 21"	1° 29' 26"	0° 55' 12"	15' 02.56"	112° 52' 33"	0.23825
24	175° 02' 40"	0°-47' 10"	175° 08' 23"	1° 14' 51"	0° 55' 11"	15' 02.19"	112° 51' 25"	0.23478

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	232° 52' 28"	0.02"	230° 28' 12"	-18° 29' 20"	0.9892567	16' 10.05"	23° 26' 18"	15 m 29 s
1	232° 54' 59"	0.01"	230° 30' 46"	-18° 29' 58"	0.9892477	16' 10.06"	23° 26' 18"	15 m 29 s
2	232° 57' 30"	0.01"	230° 33' 20"	-18° 30' 36"	0.9892387	16' 10.07"	23° 26' 18"	15 m 28 s
3	233° 00' 01"	0.00"	230° 35' 54"	-18° 31' 15"	0.9892298	16' 10.08"	23° 26' 18"	15 m 28 s
4	233° 02' 32"	-0.00"	230° 38' 28"	-18° 31' 53"	0.9892208	16' 10.09"	23° 26' 18"	15 m 28 s
5	233° 05' 03"	-0.01"	230° 41' 02"	-18° 32' 31"	0.9892118	16' 10.10"	23° 26' 18"	15 m 27 s
6	233° 07' 34"	-0.02"	230° 43' 37"	-18° 33' 09"	0.9892028	16' 10.10"	23° 26' 18"	15 m 27 s
7	233° 10' 05"	-0.02"	230° 46' 11"	-18° 33' 47"	0.9891939	16' 10.11"	23° 26' 18"	15 m 26 s
8	233° 12' 37"	-0.03"	230° 48' 45"	-18° 34' 25"	0.9891849	16' 10.12"	23° 26' 18"	15 m 26 s
9	233° 15' 08"	-0.03"	230° 51' 20"	-18° 35' 03"	0.9891760	16' 10.13"	23° 26' 18"	15 m 25 s
10	233° 17' 39"	-0.04"	230° 53' 54"	-18° 35' 41"	0.9891670	16' 10.14"	23° 26' 18"	15 m 25 s
11	233° 20' 10"	-0.04"	230° 56' 28"	-18° 36' 19"	0.9891581	16' 10.15"	23° 26' 18"	15 m 25 s
12	233° 22' 41"	-0.05"	230° 59' 03"	-18° 36' 57"	0.9891491	16' 10.16"	23° 26' 18"	15 m 24 s
13	233° 25' 12"	-0.05"	231° 01' 37"	-18° 37' 34"	0.9891402	16' 10.17"	23° 26' 18"	15 m 24 s
14	233° 27' 43"	-0.06"	231° 04' 11"	-18° 38' 12"	0.9891312	16' 10.17"	23° 26' 18"	15 m 23 s
15	233° 30' 14"	-0.06"	231° 06' 46"	-18° 38' 50"	0.9891223	16' 10.18"	23° 26' 18"	15 m 23 s
16	233° 32' 46"	-0.07"	231° 09' 20"	-18° 39' 28"	0.9891134	16' 10.19"	23° 26' 18"	15 m 22 s
17	233° 35' 17"	-0.07"	231° 11' 55"	-18° 40' 05"	0.9891045	16' 10.20"	23° 26' 18"	15 m 22 s
18	233° 37' 48"	-0.08"	231° 14' 29"	-18° 40' 43"	0.9890955	16' 10.21"	23° 26' 18"	15 m 21 s
19	233° 40' 19"	-0.09"	231° 17' 04"	-18° 41' 21"	0.9890866	16' 10.22"	23° 26' 18"	15 m 21 s
20	233° 42' 50"	-0.09"	231° 19' 38"	-18° 41' 58"	0.9890777	16' 10.23"	23° 26' 18"	15 m 21 s
21	233° 45' 21"	-0.10"	231° 22' 13"	-18° 42' 36"	0.9890688	16' 10.24"	23° 26' 18"	15 m 20 s
22	233° 47' 52"	-0.10"	231° 24' 48"	-18° 43' 13"	0.9890599	16' 10.24"	23° 26' 18"	15 m 20 s
23	233° 50' 24"	-0.11"	231° 27' 22"	-18° 43' 51"	0.9890510	16' 10.25"	23° 26' 18"	15 m 19 s
24	233° 52' 55"	-0.11"	231° 29' 57"	-18° 44' 28"	0.9890421	16' 10.26"	23° 26' 18"	15 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	175° 02' 40"	0°-47' 10"	175° 08' 23"	1° 14' 51"	0° 55' 11"	15' 02.19"	112° 51' 25"	0.23478
1	175° 33' 15"	0°-49' 50"	175° 35' 24"	1° 00' 16"	0° 55' 09"	15' 01.83"	112° 50' 07"	0.23133
2	176° 03' 48"	0°-52' 31"	176° 02' 24"	0° 45' 41"	0° 55' 08"	15' 01.48"	112° 48' 40"	0.22790
3	176° 34' 21"	0°-55' 11"	176° 29' 22"	0° 31' 07"	0° 55' 07"	15' 01.12"	112° 47' 04"	0.22448
4	177° 04' 52"	0°-57' 50"	176° 56' 19"	0° 16' 33"	0° 55' 06"	15' 00.77"	112° 45' 18"	0.22109
5	177° 35' 22"	-1° 00' 30"	177° 23' 15"	0° 02' 00"	0° 55' 04"	15' 00.43"	112° 43' 23"	0.21773
6	178° 05' 51"	-1° 03' 08"	177° 50' 09"	0°-12' 32"	0° 55' 03"	15' 00.08"	112° 41' 19"	0.21438
7	178° 36' 18"	-1° 05' 47"	178° 17' 03"	0°-27' 04"	0° 55' 02"	14' 59.74"	112° 39' 05"	0.21105
8	179° 06' 44"	-1° 08' 25"	178° 43' 56"	0°-41' 35"	0° 55' 01"	14' 59.41"	112° 36' 42"	0.20775
9	179° 37' 10"	-1° 11' 02"	179° 10' 47"	0°-56' 05"	0° 54' 59"	14' 59.07"	112° 34' 09"	0.20446
10	180° 07' 34"	-1° 13' 39"	179° 37' 38"	-1° 10' 35"	0° 54' 58"	14' 58.75"	112° 31' 26"	0.20120
11	180° 37' 57"	-1° 16' 16"	180° 04' 29"	-1° 25' 04"	0° 54' 57"	14' 58.42"	112° 28' 34"	0.19796
12	181° 08' 19"	-1° 18' 52"	180° 31' 18"	-1° 39' 32"	0° 54' 56"	14' 58.10"	112° 25' 32"	0.19475
13	181° 38' 40"	-1° 21' 27"	180° 58' 07"	-1° 53' 59"	0° 54' 55"	14' 57.78"	112° 22' 21"	0.19155
14	182° 08' 59"	-1° 24' 03"	181° 24' 55"	-2° 08' 25"	0° 54' 53"	14' 57.47"	112° 18' 59"	0.18838
15	182° 39' 18"	-1° 26' 37"	181° 51' 43"	-2° 22' 50"	0° 54' 52"	14' 57.15"	112° 15' 28"	0.18523
16	183° 09' 36"	-1° 29' 11"	182° 18' 31"	-2° 37' 13"	0° 54' 51"	14' 56.85"	112° 11' 46"	0.18211
17	183° 39' 52"	-1° 31' 45"	182° 45' 18"	-2° 51' 36"	0° 54' 50"	14' 56.54"	112° 7' 55"	0.17900
18	184° 10' 08"	-1° 34' 18"	183° 12' 05"	-3° 05' 58"	0° 54' 49"	14' 56.24"	112° 3' 53"	0.17592
19	184° 40' 23"	-1° 36' 50"	183° 38' 52"	-3° 20' 18"	0° 54' 48"	14' 55.94"	111° 59' 41"	0.17287
20	185° 10' 37"	-1° 39' 22"	184° 05' 38"	-3° 34' 38"	0° 54' 47"	14' 55.65"	111° 55' 19"	0.16983
21	185° 40' 49"	-1° 41' 54"	184° 32' 25"	-3° 48' 56"	0° 54' 46"	14' 55.36"	111° 50' 47"	0.16682
22	186° 11' 01"	-1° 44' 25"	184° 59' 12"	-4° 03' 12"	0° 54' 45"	14' 55.07"	111° 46' 04"	0.16384
23	186° 41' 12"	-1° 46' 55"	185° 25' 58"	-4° 17' 28"	0° 54' 44"	14' 54.79"	111° 41' 10"	0.16087
24	187° 11' 22"	-1° 49' 24"	185° 52' 45"	-4° 31' 42"	0° 54' 43"	14' 54.51"	111° 36' 06"	0.15793

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	233° 52' 55"	-0.11"	231° 29' 57"	-18° 44' 28"	0.9890421	16' 10.26"	23° 26' 18"	15 m 19 s
1	233° 55' 26"	-0.12"	231° 32' 31"	-18° 45' 06"	0.9890332	16' 10.27"	23° 26' 18"	15 m 18 s
2	233° 57' 57"	-0.12"	231° 35' 06"	-18° 45' 43"	0.9890243	16' 10.28"	23° 26' 18"	15 m 18 s
3	234° 00' 28"	-0.13"	231° 37' 41"	-18° 46' 20"	0.9890155	16' 10.29"	23° 26' 18"	15 m 17 s
4	234° 02' 59"	-0.13"	231° 40' 16"	-18° 46' 58"	0.9890066	16' 10.30"	23° 26' 18"	15 m 17 s
5	234° 05' 31"	-0.14"	231° 42' 50"	-18° 47' 35"	0.9889977	16' 10.31"	23° 26' 18"	15 m 16 s
6	234° 08' 02"	-0.14"	231° 45' 25"	-18° 48' 12"	0.9889888	16' 10.31"	23° 26' 18"	15 m 16 s
7	234° 10' 33"	-0.15"	231° 47' 60"	-18° 48' 50"	0.9889800	16' 10.32"	23° 26' 18"	15 m 15 s
8	234° 13' 04"	-0.15"	231° 50' 35"	-18° 49' 27"	0.9889711	16' 10.33"	23° 26' 18"	15 m 15 s
9	234° 15' 35"	-0.16"	231° 53' 10"	-18° 50' 04"	0.9889622	16' 10.34"	23° 26' 18"	15 m 15 s
10	234° 18' 06"	-0.16"	231° 55' 44"	-18° 50' 41"	0.9889534	16' 10.35"	23° 26' 18"	15 m 14 s
11	234° 20' 38"	-0.17"	231° 58' 19"	-18° 51' 18"	0.9889445	16' 10.36"	23° 26' 18"	15 m 14 s
12	234° 23' 09"	-0.17"	232° 00' 54"	-18° 51' 55"	0.9889357	16' 10.37"	23° 26' 18"	15 m 13 s
13	234° 25' 40"	-0.18"	232° 03' 29"	-18° 52' 32"	0.9889269	16' 10.38"	23° 26' 18"	15 m 13 s
14	234° 28' 11"	-0.18"	232° 06' 04"	-18° 53' 09"	0.9889180	16' 10.38"	23° 26' 18"	15 m 12 s
15	234° 30' 43"	-0.19"	232° 08' 39"	-18° 53' 46"	0.9889092	16' 10.39"	23° 26' 18"	15 m 12 s
16	234° 33' 14"	-0.19"	232° 11' 14"	-18° 54' 23"	0.9889004	16' 10.40"	23° 26' 18"	15 m 11 s
17	234° 35' 45"	-0.20"	232° 13' 49"	-18° 54' 60"	0.9888915	16' 10.41"	23° 26' 18"	15 m 11 s
18	234° 38' 16"	-0.20"	232° 16' 24"	-18° 55' 36"	0.9888827	16' 10.42"	23° 26' 18"	15 m 10 s
19	234° 40' 47"	-0.21"	232° 18' 59"	-18° 56' 13"	0.9888739	16' 10.43"	23° 26' 18"	15 m 10 s
20	234° 43' 19"	-0.21"	232° 21' 34"	-18° 56' 50"	0.9888651	16' 10.44"	23° 26' 18"	15 m 09 s
21	234° 45' 50"	-0.22"	232° 24' 09"	-18° 57' 27"	0.9888563	16' 10.44"	23° 26' 18"	15 m 09 s
22	234° 48' 21"	-0.22"	232° 26' 44"	-18° 58' 03"	0.9888475	16' 10.45"	23° 26' 18"	15 m 08 s
23	234° 50' 52"	-0.23"	232° 29' 20"	-18° 58' 40"	0.9888387	16' 10.46"	23° 26' 18"	15 m 08 s
24	234° 53' 24"	-0.23"	232° 31' 55"	-18° 59' 17"	0.9888299	16' 10.47"	23° 26' 18"	15 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	187° 11' 22"	-1° 49' 24"	185° 52' 45"	-4° 31' 42"	0° 54' 43"	14' 54.51"	111° 36' 06"	0.15793
1	187° 41' 32"	-1° 51' 53"	186° 19' 32"	-4° 45' 54"	0° 54' 42"	14' 54.23"	111° 30' 51"	0.15502
2	188° 11' 40"	-1° 54' 22"	186° 46' 19"	-5° 00' 05"	0° 54' 41"	14' 53.96"	111° 25' 26"	0.15213
3	188° 41' 47"	-1° 56' 50"	187° 13' 07"	-5° 14' 14"	0° 54' 40"	14' 53.68"	111° 19' 49"	0.14926
4	189° 11' 54"	-1° 59' 17"	187° 39' 55"	-5° 28' 22"	0° 54' 39"	14' 53.42"	111° 14' 01"	0.14642
5	189° 41' 60"	-2° 01' 43"	188° 06' 43"	-5° 42' 28"	0° 54' 38"	14' 53.15"	111° 8' 02"	0.14360
6	190° 12' 05"	-2° 04' 09"	188° 33' 32"	-5° 56' 33"	0° 54' 37"	14' 52.89"	111° 1' 51"	0.14081
7	190° 42' 09"	-2° 06' 34"	189° 00' 22"	-6° 10' 35"	0° 54' 36"	14' 52.64"	110° 55' 30"	0.13804
8	191° 12' 13"	-2° 08' 59"	189° 27' 12"	-6° 24' 36"	0° 54' 35"	14' 52.38"	110° 48' 56"	0.13530
9	191° 42' 15"	-2° 11' 23"	189° 54' 03"	-6° 38' 36"	0° 54' 34"	14' 52.13"	110° 42' 11"	0.13258
10	192° 12' 17"	-2° 13' 46"	190° 20' 55"	-6° 52' 33"	0° 54' 33"	14' 51.88"	110° 35' 13"	0.12989
11	192° 42' 18"	-2° 16' 09"	190° 47' 47"	-7° 06' 28"	0° 54' 32"	14' 51.64"	110° 28' 04"	0.12722
12	193° 12' 19"	-2° 18' 30"	191° 14' 41"	-7° 20' 22"	0° 54' 31"	14' 51.40"	110° 20' 42"	0.12457
13	193° 42' 19"	-2° 20' 51"	191° 41' 35"	-7° 34' 13"	0° 54' 30"	14' 51.16"	110° 13' 08"	0.12196
14	194° 12' 18"	-2° 23' 12"	192° 08' 30"	-7° 48' 03"	0° 54' 29"	14' 50.93"	110° 5' 22"	0.11937
15	194° 42' 16"	-2° 25' 31"	192° 35' 27"	-8° 01' 50"	0° 54' 29"	14' 50.70"	109° 57' 22"	0.11680
16	195° 12' 14"	-2° 27' 50"	193° 02' 25"	-8° 15' 35"	0° 54' 28"	14' 50.47"	109° 49' 09"	0.11426
17	195° 42' 11"	-2° 30' 08"	193° 29' 24"	-8° 29' 18"	0° 54' 27"	14' 50.25"	109° 40' 44"	0.11174
18	196° 12' 08"	-2° 32' 26"	193° 56' 24"	-8° 42' 59"	0° 54' 26"	14' 50.02"	109° 32' 04"	0.10926
19	196° 42' 04"	-2° 34' 42"	194° 23' 25"	-8° 56' 38"	0° 54' 25"	14' 49.81"	109° 23' 11"	0.10679
20	197° 11' 59"	-2° 36' 58"	194° 50' 28"	-9° 10' 14"	0° 54' 25"	14' 49.59"	109° 14' 04"	0.10436
21	197° 41' 54"	-2° 39' 13"	195° 17' 32"	-9° 23' 48"	0° 54' 24"	14' 49.38"	109° 4' 43"	0.10195
22	198° 11' 48"	-2° 41' 27"	195° 44' 38"	-9° 37' 20"	0° 54' 23"	14' 49.17"	108° 55' 07"	0.09957
23	198° 41' 41"	-2° 43' 41"	196° 11' 46"	-9° 50' 49"	0° 54' 22"	14' 48.96"	108° 45' 17"	0.09721
24	199° 11' 34"	-2° 45' 53"	196° 38' 55"	-10° 04' 15"	0° 54' 22"	14' 48.76"	108° 35' 11"	0.09488

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	234° 53' 24"	-0.23"	232° 31' 55"	-18° 59' 17"	0.9888299	16'10.47"	23° 26' 18"	15 m 07 s
1	234° 55' 55"	-0.24"	232° 34' 30"	-18° 59' 53"	0.9888211	16'10.48"	23° 26' 18"	15 m 07 s
2	234° 58' 26"	-0.24"	232° 37' 05"	-19° 00' 30"	0.9888123	16'10.49"	23° 26' 18"	15 m 06 s
3	235° 00' 57"	-0.25"	232° 39' 40"	-19° 01' 06"	0.9888035	16'10.50"	23° 26' 18"	15 m 06 s
4	235° 03' 28"	-0.25"	232° 42' 16"	-19° 01' 43"	0.9887947	16'10.50"	23° 26' 18"	15 m 05 s
5	235° 05' 60"	-0.25"	232° 44' 51"	-19° 02' 19"	0.9887859	16'10.51"	23° 26' 18"	15 m 05 s
6	235° 08' 31"	-0.26"	232° 47' 26"	-19° 02' 56"	0.9887772	16'10.52"	23° 26' 18"	15 m 04 s
7	235° 11' 02"	-0.26"	232° 50' 02"	-19° 03' 32"	0.9887684	16'10.53"	23° 26' 18"	15 m 04 s
8	235° 13' 33"	-0.27"	232° 52' 37"	-19° 04' 08"	0.9887596	16'10.54"	23° 26' 18"	15 m 03 s
9	235° 16' 05"	-0.27"	232° 55' 12"	-19° 04' 45"	0.9887509	16'10.55"	23° 26' 18"	15 m 03 s
10	235° 18' 36"	-0.28"	232° 57' 48"	-19° 05' 21"	0.9887421	16'10.56"	23° 26' 18"	15 m 02 s
11	235° 21' 07"	-0.28"	233° 00' 23"	-19° 05' 57"	0.9887334	16'10.56"	23° 26' 18"	15 m 02 s
12	235° 23' 39"	-0.29"	233° 02' 59"	-19° 06' 33"	0.9887246	16'10.57"	23° 26' 18"	15 m 01 s
13	235° 26' 10"	-0.29"	233° 05' 34"	-19° 07' 09"	0.9887159	16'10.58"	23° 26' 18"	15 m 01 s
14	235° 28' 41"	-0.29"	233° 08' 09"	-19° 07' 46"	0.9887071	16'10.59"	23° 26' 18"	15 m 00 s
15	235° 31' 12"	-0.30"	233° 10' 45"	-19° 08' 22"	0.9886984	16'10.60"	23° 26' 18"	14 m 60 s
16	235° 33' 44"	-0.30"	233° 13' 21"	-19° 08' 58"	0.9886897	16'10.61"	23° 26' 18"	14 m 59 s
17	235° 36' 15"	-0.31"	233° 15' 56"	-19° 09' 34"	0.9886809	16'10.62"	23° 26' 18"	14 m 59 s
18	235° 38' 46"	-0.31"	233° 18' 32"	-19° 10' 10"	0.9886722	16'10.63"	23° 26' 18"	14 m 58 s
19	235° 41' 18"	-0.32"	233° 21' 07"	-19° 10' 46"	0.9886635	16'10.63"	23° 26' 18"	14 m 58 s
20	235° 43' 49"	-0.32"	233° 23' 43"	-19° 11' 22"	0.9886548	16'10.64"	23° 26' 18"	14 m 57 s
21	235° 46' 20"	-0.32"	233° 26' 18"	-19° 11' 57"	0.9886461	16'10.65"	23° 26' 18"	14 m 57 s
22	235° 48' 51"	-0.33"	233° 28' 54"	-19° 12' 33"	0.9886373	16'10.66"	23° 26' 18"	14 m 56 s
23	235° 51' 23"	-0.33"	233° 31' 30"	-19° 13' 09"	0.9886286	16'10.67"	23° 26' 18"	14 m 56 s
24	235° 53' 54"	-0.34"	233° 34' 06"	-19° 13' 45"	0.9886199	16'10.68"	23° 26' 18"	14 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	199° 11' 34"	-2° 45' 53"	196° 38' 55"	-10° 04' 15"	0° 54' 22"	14' 48.76"	108° 35' 11"	0.09488
1	199° 41' 27"	-2° 48' 05"	197° 06' 05"	-10° 17' 40"	0° 54' 21"	14' 48.56"	108° 24' 51"	0.09258
2	200° 11' 19"	-2° 50' 16"	197° 33' 18"	-10° 31' 01"	0° 54' 20"	14' 48.37"	108° 14' 14"	0.09030
3	200° 41' 10"	-2° 52' 26"	198° 00' 32"	-10° 44' 20"	0° 54' 19"	14' 48.17"	108° 3' 21"	0.08805
4	201° 11' 01"	-2° 54' 35"	198° 27' 48"	-10° 57' 36"	0° 54' 19"	14' 47.98"	107° 52' 12"	0.08583
5	201° 40' 51"	-2° 56' 44"	198° 55' 06"	-11° 10' 50"	0° 54' 18"	14' 47.79"	107° 40' 46"	0.08363
6	202° 10' 41"	-2° 58' 51"	199° 22' 26"	-11° 24' 00"	0° 54' 17"	14' 47.61"	107° 29' 03"	0.08146
7	202° 40' 31"	-3° 00' 58"	199° 49' 48"	-11° 37' 08"	0° 54' 17"	14' 47.43"	107° 17' 02"	0.07932
8	203° 10' 20"	-3° 03' 04"	200° 17' 12"	-11° 50' 13"	0° 54' 16"	14' 47.25"	107° 4' 43"	0.07721
9	203° 40' 08"	-3° 05' 09"	200° 44' 38"	-12° 03' 16"	0° 54' 15"	14' 47.08"	106° 52' 06"	0.07512
10	204° 09' 56"	-3° 07' 13"	201° 12' 06"	-12° 16' 15"	0° 54' 15"	14' 46.90"	106° 39' 09"	0.07307
11	204° 39' 44"	-3° 09' 16"	201° 39' 37"	-12° 29' 11"	0° 54' 14"	14' 46.73"	106° 25' 53"	0.07103
12	205° 09' 31"	-3° 11' 18"	202° 07' 09"	-12° 42' 04"	0° 54' 13"	14' 46.57"	106° 12' 16"	0.06903
13	205° 39' 18"	-3° 13' 19"	202° 34' 44"	-12° 54' 54"	0° 54' 13"	14' 46.40"	105° 58' 19"	0.06706
14	206° 09' 04"	-3° 15' 20"	203° 02' 22"	-13° 07' 41"	0° 54' 12"	14' 46.24"	105° 44' 00"	0.06511
15	206° 38' 50"	-3° 17' 19"	203° 30' 01"	-13° 20' 25"	0° 54' 12"	14' 46.09"	105° 29' 19"	0.06319
16	207° 08' 36"	-3° 19' 18"	203° 57' 44"	-13° 33' 06"	0° 54' 11"	14' 45.93"	105° 14' 16"	0.06130
17	207° 38' 21"	-3° 21' 15"	204° 25' 28"	-13° 45' 43"	0° 54' 11"	14' 45.78"	104° 58' 49"	0.05944
18	208° 08' 06"	-3° 23' 12"	204° 53' 16"	-13° 58' 17"	0° 54' 10"	14' 45.63"	104° 42' 57"	0.05761
19	208° 37' 51"	-3° 25' 07"	205° 21' 06"	-14° 10' 47"	0° 54' 09"	14' 45.48"	104° 26' 40"	0.05580
20	209° 07' 35"	-3° 27' 02"	205° 48' 58"	-14° 23' 15"	0° 54' 09"	14' 45.34"	104° 9' 57"	0.05402
21	209° 37' 19"	-3° 28' 56"	206° 16' 54"	-14° 35' 38"	0° 54' 08"	14' 45.20"	103° 52' 47"	0.05227
22	210° 07' 03"	-3° 30' 48"	206° 44' 52"	-14° 47' 58"	0° 54' 08"	14' 45.06"	103° 35' 09"	0.05055
23	210° 36' 46"	-3° 32' 40"	207° 12' 53"	-15° 00' 15"	0° 54' 07"	14' 44.93"	103° 17' 02"	0.04886
24	211° 06' 30"	-3° 34' 31"	207° 40' 56"	-15° 12' 28"	0° 54' 07"	14' 44.80"	102° 58' 24"	0.04720

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	235° 53' 54"	-0.34"	233° 34' 06"	-19° 13' 45"	0.9886199	16' 10.68"	23° 26' 18"	14 m 55 s
1	235° 56' 25"	-0.34"	233° 36' 41"	-19° 14' 21"	0.9886112	16' 10.68"	23° 26' 18"	14 m 54 s
2	235° 58' 57"	-0.34"	233° 39' 17"	-19° 14' 56"	0.9886025	16' 10.69"	23° 26' 18"	14 m 54 s
3	236° 01' 28"	-0.35"	233° 41' 53"	-19° 15' 32"	0.9885939	16' 10.70"	23° 26' 18"	14 m 53 s
4	236° 03' 59"	-0.35"	233° 44' 29"	-19° 16' 07"	0.9885852	16' 10.71"	23° 26' 18"	14 m 53 s
5	236° 06' 31"	-0.36"	233° 47' 04"	-19° 16' 43"	0.9885765	16' 10.72"	23° 26' 18"	14 m 52 s
6	236° 09' 02"	-0.36"	233° 49' 40"	-19° 17' 19"	0.9885678	16' 10.73"	23° 26' 18"	14 m 52 s
7	236° 11' 33"	-0.36"	233° 52' 16"	-19° 17' 54"	0.9885591	16' 10.74"	23° 26' 18"	14 m 51 s
8	236° 14' 05"	-0.37"	233° 54' 52"	-19° 18' 30"	0.9885505	16' 10.74"	23° 26' 18"	14 m 51 s
9	236° 16' 36"	-0.37"	233° 57' 28"	-19° 19' 05"	0.9885418	16' 10.75"	23° 26' 18"	14 m 50 s
10	236° 19' 07"	-0.37"	234° 00' 04"	-19° 19' 40"	0.9885331	16' 10.76"	23° 26' 18"	14 m 50 s
11	236° 21' 39"	-0.38"	234° 02' 40"	-19° 20' 16"	0.9885245	16' 10.77"	23° 26' 18"	14 m 49 s
12	236° 24' 10"	-0.38"	234° 05' 16"	-19° 20' 51"	0.9885158	16' 10.78"	23° 26' 18"	14 m 49 s
13	236° 26' 41"	-0.38"	234° 07' 52"	-19° 21' 26"	0.9885072	16' 10.79"	23° 26' 18"	14 m 48 s
14	236° 29' 13"	-0.39"	234° 10' 28"	-19° 22' 02"	0.9884985	16' 10.80"	23° 26' 18"	14 m 47 s
15	236° 31' 44"	-0.39"	234° 13' 04"	-19° 22' 37"	0.9884899	16' 10.80"	23° 26' 18"	14 m 47 s
16	236° 34' 15"	-0.39"	234° 15' 40"	-19° 23' 12"	0.9884812	16' 10.81"	23° 26' 18"	14 m 46 s
17	236° 36' 47"	-0.40"	234° 18' 16"	-19° 23' 47"	0.9884726	16' 10.82"	23° 26' 18"	14 m 46 s
18	236° 39' 18"	-0.40"	234° 20' 52"	-19° 24' 22"	0.9884640	16' 10.83"	23° 26' 18"	14 m 45 s
19	236° 41' 49"	-0.40"	234° 23' 28"	-19° 24' 57"	0.9884553	16' 10.84"	23° 26' 18"	14 m 45 s
20	236° 44' 21"	-0.41"	234° 26' 04"	-19° 25' 32"	0.9884467	16' 10.85"	23° 26' 18"	14 m 44 s
21	236° 46' 52"	-0.41"	234° 28' 40"	-19° 26' 07"	0.9884381	16' 10.85"	23° 26' 18"	14 m 44 s
22	236° 49' 23"	-0.41"	234° 31' 16"	-19° 26' 42"	0.9884295	16' 10.86"	23° 26' 18"	14 m 43 s
23	236° 51' 55"	-0.42"	234° 33' 53"	-19° 27' 17"	0.9884209	16' 10.87"	23° 26' 18"	14 m 42 s
24	236° 54' 26"	-0.42"	234° 36' 29"	-19° 27' 52"	0.9884123	16' 10.88"	23° 26' 18"	14 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	211° 06' 30"	-3° 34' 31"	207° 40' 56"	-15° 12' 28"	0° 54' 07"	14' 44.80"	102° 58' 24"	0.04720
1	211° 36' 12"	-3° 36' 21"	208° 09' 03"	-15° 24' 37"	0° 54' 06"	14' 44.67"	102° 39' 14"	0.04557
2	212° 05' 55"	-3° 38' 09"	208° 37' 12"	-15° 36' 43"	0° 54' 06"	14' 44.54"	102° 19' 31"	0.04396
3	212° 35' 37"	-3° 39' 57"	209° 05' 25"	-15° 48' 44"	0° 54' 06"	14' 44.42"	101° 59' 14"	0.04239
4	213° 05' 19"	-3° 41' 43"	209° 33' 40"	-16° 00' 42"	0° 54' 05"	14' 44.30"	101° 38' 21"	0.04084
5	213° 35' 01"	-3° 43' 29"	210° 01' 59"	-16° 12' 36"	0° 54' 05"	14' 44.18"	101° 16' 50"	0.03932
6	214° 04' 43"	-3° 45' 14"	210° 30' 20"	-16° 24' 27"	0° 54' 04"	14' 44.06"	100° 54' 39"	0.03783
7	214° 34' 24"	-3° 46' 57"	210° 58' 45"	-16° 36' 13"	0° 54' 04"	14' 43.95"	100° 31' 47"	0.03637
8	215° 04' 05"	-3° 48' 39"	211° 27' 13"	-16° 47' 55"	0° 54' 03"	14' 43.84"	100° 8' 11"	0.03494
9	215° 33' 46"	-3° 50' 21"	211° 55' 44"	-16° 59' 33"	0° 54' 03"	14' 43.73"	99° 43' 49"	0.03354
10	216° 03' 27"	-3° 52' 01"	212° 24' 18"	-17° 11' 07"	0° 54' 03"	14' 43.63"	99° 18' 39"	0.03217
11	216° 33' 07"	-3° 53' 40"	212° 52' 56"	-17° 22' 37"	0° 54' 02"	14' 43.53"	98° 52' 37"	0.03083
12	217° 02' 47"	-3° 55' 18"	213° 21' 36"	-17° 34' 02"	0° 54' 02"	14' 43.43"	98° 25' 42"	0.02952
13	217° 32' 27"	-3° 56' 55"	213° 50' 21"	-17° 45' 24"	0° 54' 02"	14' 43.33"	97° 57' 50"	0.02824
14	218° 02' 07"	-3° 58' 31"	214° 19' 08"	-17° 56' 41"	0° 54' 01"	14' 43.24"	97° 28' 57"	0.02699
15	218° 31' 47"	-4° 00' 06"	214° 47' 59"	-18° 07' 53"	0° 54' 01"	14' 43.14"	96° 58' 60"	0.02576
16	219° 01' 27"	-4° 01' 40"	215° 16' 54"	-18° 19' 01"	0° 54' 01"	14' 43.06"	96° 27' 54"	0.02457
17	219° 31' 06"	-4° 03' 12"	215° 45' 52"	-18° 30' 05"	0° 54' 00"	14' 42.97"	95° 55' 36"	0.02341
18	220° 00' 46"	-4° 04' 44"	216° 14' 53"	-18° 41' 04"	0° 53' 60"	14' 42.89"	95° 21' 60"	0.02227
19	220° 30' 25"	-4° 06' 14"	216° 43' 58"	-18° 51' 59"	0° 53' 60"	14' 42.81"	94° 47' 00"	0.02117
20	221° 00' 04"	-4° 07' 44"	217° 13' 06"	-19° 02' 49"	0° 53' 59"	14' 42.73"	94° 10' 32"	0.02010
21	221° 29' 43"	-4° 09' 12"	217° 42' 18"	-19° 13' 34"	0° 53' 59"	14' 42.65"	93° 32' 28"	0.01906
22	221° 59' 22"	-4° 10' 39"	218° 11' 34"	-19° 24' 14"	0° 53' 59"	14' 42.58"	92° 52' 42"	0.01804
23	222° 29' 01"	-4° 12' 04"	218° 40' 53"	-19° 34' 50"	0° 53' 59"	14' 42.51"	92° 11' 05"	0.01706
24	222° 58' 40"	-4° 13' 29"	219° 10' 16"	-19° 45' 21"	0° 53' 58"	14' 42.44"	91° 27' 28"	0.01611

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	236° 54' 26"	-0.42"	234° 36' 29"	-19° 27' 52"	0.9884123	16'10.88"	23° 26' 18"	14 m 42 s
1	236° 56' 58"	-0.42"	234° 39' 05"	-19° 28' 27"	0.9884037	16'10.89"	23° 26' 18"	14 m 41 s
2	236° 59' 29"	-0.42"	234° 41' 41"	-19° 29' 02"	0.9883951	16'10.90"	23° 26' 18"	14 m 41 s
3	237° 02' 00"	-0.43"	234° 44' 18"	-19° 29' 37"	0.9883865	16'10.91"	23° 26' 18"	14 m 40 s
4	237° 04' 32"	-0.43"	234° 46' 54"	-19° 30' 11"	0.9883779	16'10.91"	23° 26' 18"	14 m 40 s
5	237° 07' 03"	-0.43"	234° 49' 30"	-19° 30' 46"	0.9883693	16'10.92"	23° 26' 18"	14 m 39 s
6	237° 09' 34"	-0.44"	234° 52' 07"	-19° 31' 21"	0.9883607	16'10.93"	23° 26' 18"	14 m 39 s
7	237° 12' 06"	-0.44"	234° 54' 43"	-19° 31' 55"	0.9883521	16'10.94"	23° 26' 18"	14 m 38 s
8	237° 14' 37"	-0.44"	234° 57' 19"	-19° 32' 30"	0.9883435	16'10.95"	23° 26' 18"	14 m 37 s
9	237° 17' 09"	-0.44"	234° 59' 56"	-19° 33' 05"	0.9883350	16'10.96"	23° 26' 18"	14 m 37 s
10	237° 19' 40"	-0.45"	235° 02' 32"	-19° 33' 39"	0.9883264	16'10.96"	23° 26' 18"	14 m 36 s
11	237° 22' 11"	-0.45"	235° 05' 09"	-19° 34' 14"	0.9883178	16'10.97"	23° 26' 18"	14 m 36 s
12	237° 24' 43"	-0.45"	235° 07' 45"	-19° 34' 48"	0.9883093	16'10.98"	23° 26' 18"	14 m 35 s
13	237° 27' 14"	-0.45"	235° 10' 22"	-19° 35' 22"	0.9883007	16'10.99"	23° 26' 18"	14 m 34 s
14	237° 29' 46"	-0.46"	235° 12' 58"	-19° 35' 57"	0.9882922	16'11.00"	23° 26' 18"	14 m 34 s
15	237° 32' 17"	-0.46"	235° 15' 35"	-19° 36' 31"	0.9882836	16'11.01"	23° 26' 18"	14 m 33 s
16	237° 34' 49"	-0.46"	235° 18' 11"	-19° 37' 06"	0.9882751	16'11.02"	23° 26' 18"	14 m 33 s
17	237° 37' 20"	-0.46"	235° 20' 48"	-19° 37' 40"	0.9882665	16'11.02"	23° 26' 18"	14 m 32 s
18	237° 39' 51"	-0.46"	235° 23' 24"	-19° 38' 14"	0.9882580	16'11.03"	23° 26' 18"	14 m 32 s
19	237° 42' 23"	-0.47"	235° 26' 01"	-19° 38' 48"	0.9882495	16'11.04"	23° 26' 18"	14 m 31 s
20	237° 44' 54"	-0.47"	235° 28' 38"	-19° 39' 22"	0.9882409	16'11.05"	23° 26' 18"	14 m 30 s
21	237° 47' 26"	-0.47"	235° 31' 14"	-19° 39' 56"	0.9882324	16'11.06"	23° 26' 18"	14 m 30 s
22	237° 49' 57"	-0.47"	235° 33' 51"	-19° 40' 31"	0.9882239	16'11.07"	23° 26' 18"	14 m 29 s
23	237° 52' 29"	-0.47"	235° 36' 28"	-19° 41' 05"	0.9882154	16'11.07"	23° 26' 18"	14 m 29 s
24	237° 54' 60"	-0.48"	235° 39' 05"	-19° 41' 39"	0.9882069	16'11.08"	23° 26' 18"	14 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	222° 58' 40"	-4° 13' 29"	219° 10' 16"	-19° 45' 21"	0° 53' 58"	14' 42.44"	91° 27' 28"	0.01611
1	223° 28' 18"	-4° 14' 52"	219° 39' 43"	-19° 55' 47"	0° 53' 58"	14' 42.37"	90° 41' 42"	0.01519
2	223° 57' 57"	-4° 16' 15"	220° 09' 13"	-20° 06' 08"	0° 53' 58"	14' 42.31"	89° 53' 36"	0.01429
3	224° 27' 35"	-4° 17' 36"	220° 38' 47"	-20° 16' 24"	0° 53' 58"	14' 42.25"	89° 2' 57"	0.01343
4	224° 57' 14"	-4° 18' 56"	221° 08' 25"	-20° 26' 35"	0° 53' 57"	14' 42.19"	88° 9' 33"	0.01260
5	225° 26' 52"	-4° 20' 15"	221° 38' 07"	-20° 36' 41"	0° 53' 57"	14' 42.14"	87° 13' 07"	0.01180
6	225° 56' 30"	-4° 21' 32"	222° 07' 52"	-20° 46' 41"	0° 53' 57"	14' 42.09"	86° 13' 23"	0.01103
7	226° 26' 08"	-4° 22' 49"	222° 37' 41"	-20° 56' 37"	0° 53' 57"	14' 42.04"	85° 10' 01"	0.01029
8	226° 55' 47"	-4° 24' 04"	223° 07' 34"	-21° 06' 27"	0° 53' 57"	14' 41.99"	84° 2' 40"	0.00958
9	227° 25' 25"	-4° 25' 18"	223° 37' 31"	-21° 16' 12"	0° 53' 56"	14' 41.94"	82° 50' 55"	0.00890
10	227° 55' 03"	-4° 26' 30"	224° 07' 31"	-21° 25' 51"	0° 53' 56"	14' 41.90"	81° 34' 19"	0.00825
11	228° 24' 41"	-4° 27' 42"	224° 37' 36"	-21° 35' 26"	0° 53' 56"	14' 41.86"	80° 12' 20"	0.00764
12	228° 54' 19"	-4° 28' 52"	225° 07' 44"	-21° 44' 54"	0° 53' 56"	14' 41.82"	78° 44' 23"	0.00705
13	229° 23' 57"	-4° 30' 01"	225° 37' 56"	-21° 54' 17"	0° 53' 56"	14' 41.79"	77° 9' 48"	0.00649
14	229° 53' 36"	-4° 31' 09"	226° 08' 12"	-22° 03' 35"	0° 53' 56"	14' 41.76"	75° 27' 50"	0.00597
15	230° 23' 14"	-4° 32' 16"	226° 38' 32"	-22° 12' 47"	0° 53' 56"	14' 41.73"	73° 37' 38"	0.00547
16	230° 52' 52"	-4° 33' 21"	227° 08' 56"	-22° 21' 53"	0° 53' 56"	14' 41.70"	71° 38' 15"	0.00501
17	231° 22' 30"	-4° 34' 25"	227° 39' 24"	-22° 30' 53"	0° 53' 55"	14' 41.67"	69° 28' 37"	0.00458
18	231° 52' 08"	-4° 35' 28"	228° 09' 56"	-22° 39' 48"	0° 53' 55"	14' 41.65"	67° 7' 33"	0.00417
19	232° 21' 47"	-4° 36' 30"	228° 40' 31"	-22° 48' 37"	0° 53' 55"	14' 41.63"	64° 33' 46"	0.00380
20	232° 51' 25"	-4° 37' 30"	229° 11' 11"	-22° 57' 20"	0° 53' 55"	14' 41.61"	61° 45' 55"	0.00346
21	233° 21' 03"	-4° 38' 30"	229° 41' 54"	-23° 05' 57"	0° 53' 55"	14' 41.60"	58° 42' 35"	0.00315
22	233° 50' 41"	-4° 39' 27"	230° 12' 41"	-23° 14' 28"	0° 53' 55"	14' 41.58"	55° 22' 20"	0.00287
23	234° 20' 20"	-4° 40' 24"	230° 43' 32"	-23° 22' 53"	0° 53' 55"	14' 41.57"	51° 43' 56"	0.00262
24	234° 49' 58"	-4° 41' 19"	231° 14' 27"	-23° 31' 12"	0° 53' 55"	14' 41.56"	47° 46' 19"	0.00241

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	237° 54' 60"	-0.48"	235° 39' 05"	-19° 41' 39"	0.9882069	16' 11.08"	23° 26' 18"	14 m 28 s
1	237° 57' 31"	-0.48"	235° 41' 41"	-19° 42' 13"	0.9881984	16' 11.09"	23° 26' 18"	14 m 27 s
2	238° 00' 03"	-0.48"	235° 44' 18"	-19° 42' 46"	0.9881899	16' 11.10"	23° 26' 18"	14 m 27 s
3	238° 02' 34"	-0.48"	235° 46' 55"	-19° 43' 20"	0.9881814	16' 11.11"	23° 26' 18"	14 m 26 s
4	238° 05' 06"	-0.48"	235° 49' 32"	-19° 43' 54"	0.9881729	16' 11.12"	23° 26' 18"	14 m 26 s
5	238° 07' 37"	-0.49"	235° 52' 09"	-19° 44' 28"	0.9881644	16' 11.12"	23° 26' 18"	14 m 25 s
6	238° 10' 09"	-0.49"	235° 54' 45"	-19° 45' 02"	0.9881559	16' 11.13"	23° 26' 18"	14 m 24 s
7	238° 12' 40"	-0.49"	235° 57' 22"	-19° 45' 36"	0.9881474	16' 11.14"	23° 26' 18"	14 m 24 s
8	238° 15' 12"	-0.49"	235° 59' 59"	-19° 46' 09"	0.9881389	16' 11.15"	23° 26' 18"	14 m 23 s
9	238° 17' 43"	-0.49"	236° 02' 36"	-19° 46' 43"	0.9881304	16' 11.16"	23° 26' 18"	14 m 23 s
10	238° 20' 14"	-0.49"	236° 05' 13"	-19° 47' 17"	0.9881220	16' 11.17"	23° 26' 18"	14 m 22 s
11	238° 22' 46"	-0.49"	236° 07' 50"	-19° 47' 50"	0.9881135	16' 11.17"	23° 26' 18"	14 m 21 s
12	238° 25' 17"	-0.50"	236° 10' 27"	-19° 48' 24"	0.9881050	16' 11.18"	23° 26' 18"	14 m 21 s
13	238° 27' 49"	-0.50"	236° 13' 04"	-19° 48' 57"	0.9880966	16' 11.19"	23° 26' 18"	14 m 20 s
14	238° 30' 20"	-0.50"	236° 15' 41"	-19° 49' 31"	0.9880881	16' 11.20"	23° 26' 18"	14 m 20 s
15	238° 32' 52"	-0.50"	236° 18' 18"	-19° 50' 04"	0.9880797	16' 11.21"	23° 26' 18"	14 m 19 s
16	238° 35' 23"	-0.50"	236° 20' 55"	-19° 50' 38"	0.9880712	16' 11.22"	23° 26' 18"	14 m 18 s
17	238° 37' 55"	-0.50"	236° 23' 32"	-19° 51' 11"	0.9880628	16' 11.22"	23° 26' 18"	14 m 18 s
18	238° 40' 26"	-0.50"	236° 26' 09"	-19° 51' 44"	0.9880544	16' 11.23"	23° 26' 18"	14 m 17 s
19	238° 42' 58"	-0.50"	236° 28' 47"	-19° 52' 18"	0.9880459	16' 11.24"	23° 26' 18"	14 m 16 s
20	238° 45' 29"	-0.50"	236° 31' 24"	-19° 52' 51"	0.9880375	16' 11.25"	23° 26' 18"	14 m 16 s
21	238° 48' 01"	-0.50"	236° 34' 01"	-19° 53' 24"	0.9880291	16' 11.26"	23° 26' 18"	14 m 15 s
22	238° 50' 32"	-0.50"	236° 36' 38"	-19° 53' 57"	0.9880206	16' 11.27"	23° 26' 18"	14 m 15 s
23	238° 53' 04"	-0.51"	236° 39' 15"	-19° 54' 30"	0.9880122	16' 11.27"	23° 26' 18"	14 m 14 s
24	238° 55' 35"	-0.51"	236° 41' 53"	-19° 55' 04"	0.9880038	16' 11.28"	23° 26' 18"	14 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	234° 49' 58"	-4° 41' 19"	231° 14' 27"	-23° 31' 12"	0° 53' 55"	14' 41.56"	47° 46' 19"	0.00241
1	235° 19' 37"	-4° 42' 13"	231° 45' 26"	-23° 39' 25"	0° 53' 55"	14' 41.56"	43° 28' 58"	0.00222
2	235° 49' 16"	-4° 43' 06"	232° 16' 29"	-23° 47' 31"	0° 53' 55"	14' 41.56"	38° 52' 01"	0.00207
3	236° 18' 54"	-4° 43' 58"	232° 47' 36"	-23° 55' 32"	0° 53' 55"	14' 41.55"	33° 56' 32"	0.00194
4	236° 48' 33"	-4° 44' 48"	233° 18' 46"	-24° 03' 26"	0° 53' 55"	14' 41.56"	28° 44' 46"	0.00185
5	237° 18' 12"	-4° 45' 37"	233° 50' 00"	-24° 11' 13"	0° 53' 55"	14' 41.56"	23° 20' 10"	0.00179
6	237° 47' 51"	-4° 46' 24"	234° 21' 19"	-24° 18' 54"	0° 53' 55"	14' 41.57"	17° 47' 17"	0.00175
7	238° 17' 30"	-4° 47' 11"	234° 52' 40"	-24° 26' 29"	0° 53' 55"	14' 41.58"	12° 11' 30"	0.00175
8	238° 47' 09"	-4° 47' 56"	235° 24' 06"	-24° 33' 58"	0° 53' 55"	14' 41.59"	6° 38' 27"	0.00178
9	239° 16' 48"	-4° 48' 39"	235° 55' 36"	-24° 41' 19"	0° 53' 55"	14' 41.60"	1° 13' 30"	0.00184
10	239° 46' 28"	-4° 49' 22"	236° 27' 10"	-24° 48' 35"	0° 53' 55"	14' 41.62"	356° 1' 06"	0.00194
11	240° 16' 08"	-4° 50' 03"	236° 58' 47"	-24° 55' 43"	0° 53' 55"	14' 41.64"	351° 4' 56"	0.00206
12	240° 45' 48"	-4° 50' 43"	237° 30' 28"	-25° 02' 45"	0° 53' 55"	14' 41.66"	346° 27' 07"	0.00221
13	241° 15' 27"	-4° 51' 21"	238° 02' 12"	-25° 09' 40"	0° 53' 56"	14' 41.68"	342° 8' 43"	0.00240
14	241° 45' 07"	-4° 51' 58"	238° 34' 00"	-25° 16' 28"	0° 53' 56"	14' 41.71"	338° 9' 54"	0.00261
15	242° 14' 47"	-4° 52' 34"	239° 05' 52"	-25° 23' 10"	0° 53' 56"	14' 41.74"	334° 30' 05"	0.00286
16	242° 44' 28"	-4° 53' 08"	239° 37' 47"	-25° 29' 44"	0° 53' 56"	14' 41.77"	331° 8' 17"	0.00314
17	243° 14' 08"	-4° 53' 41"	240° 09' 46"	-25° 36' 12"	0° 53' 56"	14' 41.80"	328° 3' 11"	0.00345
18	243° 43' 48"	-4° 54' 13"	240° 41' 49"	-25° 42' 33"	0° 53' 56"	14' 41.84"	325° 13' 25"	0.00379
19	244° 13' 29"	-4° 54' 44"	241° 13' 55"	-25° 48' 46"	0° 53' 56"	14' 41.87"	322° 37' 32"	0.00416
20	244° 43' 10"	-4° 55' 13"	241° 46' 05"	-25° 54' 53"	0° 53' 56"	14' 41.92"	320° 14' 11"	0.00456
21	245° 12' 51"	-4° 55' 41"	242° 18' 18"	-26° 00' 52"	0° 53' 57"	14' 41.96"	318° 2' 05"	0.00499
22	245° 42' 32"	-4° 56' 07"	242° 50' 34"	-26° 06' 45"	0° 53' 57"	14' 42.00"	316° 0' 04"	0.00545
23	246° 12' 14"	-4° 56' 32"	243° 22' 54"	-26° 12' 30"	0° 53' 57"	14' 42.05"	314° 7' 04"	0.00595
24	246° 41' 55"	-4° 56' 56"	243° 55' 17"	-26° 18' 08"	0° 53' 57"	14' 42.10"	312° 22' 07"	0.00647

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	238° 55' 35"	-0.51"	236° 41' 53"	-19° 55' 04"	0.9880038	16'11.28"	23° 26' 18"	14 m 13 s
1	238° 58' 07"	-0.51"	236° 44' 30"	-19° 55' 37"	0.9879954	16'11.29"	23° 26' 18"	14 m 13 s
2	239° 00' 38"	-0.51"	236° 47' 07"	-19° 56' 10"	0.9879870	16'11.30"	23° 26' 18"	14 m 12 s
3	239° 03' 10"	-0.51"	236° 49' 44"	-19° 56' 43"	0.9879786	16'11.31"	23° 26' 18"	14 m 11 s
4	239° 05' 41"	-0.51"	236° 52' 22"	-19° 57' 16"	0.9879702	16'11.31"	23° 26' 18"	14 m 11 s
5	239° 08' 13"	-0.51"	236° 54' 59"	-19° 57' 48"	0.9879618	16'11.32"	23° 26' 18"	14 m 10 s
6	239° 10' 44"	-0.51"	236° 57' 37"	-19° 58' 21"	0.9879534	16'11.33"	23° 26' 18"	14 m 09 s
7	239° 13' 16"	-0.51"	237° 00' 14"	-19° 58' 54"	0.9879450	16'11.34"	23° 26' 18"	14 m 09 s
8	239° 15' 47"	-0.51"	237° 02' 51"	-19° 59' 27"	0.9879366	16'11.35"	23° 26' 18"	14 m 08 s
9	239° 18' 19"	-0.51"	237° 05' 29"	-19° 59' 60"	0.9879283	16'11.36"	23° 26' 18"	14 m 08 s
10	239° 20' 50"	-0.51"	237° 08' 06"	-20° 00' 32"	0.9879199	16'11.36"	23° 26' 18"	14 m 07 s
11	239° 23' 22"	-0.51"	237° 10' 44"	-20° 01' 05"	0.9879115	16'11.37"	23° 26' 18"	14 m 06 s
12	239° 25' 53"	-0.51"	237° 13' 21"	-20° 01' 38"	0.9879032	16'11.38"	23° 26' 18"	14 m 06 s
13	239° 28' 25"	-0.51"	237° 15' 59"	-20° 02' 10"	0.9878948	16'11.39"	23° 26' 18"	14 m 05 s
14	239° 30' 57"	-0.51"	237° 18' 36"	-20° 02' 43"	0.9878864	16'11.40"	23° 26' 18"	14 m 04 s
15	239° 33' 28"	-0.51"	237° 21' 14"	-20° 03' 16"	0.9878781	16'11.41"	23° 26' 18"	14 m 04 s
16	239° 35' 60"	-0.51"	237° 23' 51"	-20° 03' 48"	0.9878698	16'11.41"	23° 26' 18"	14 m 03 s
17	239° 38' 31"	-0.51"	237° 26' 29"	-20° 04' 20"	0.9878614	16'11.42"	23° 26' 18"	14 m 02 s
18	239° 41' 03"	-0.51"	237° 29' 07"	-20° 04' 53"	0.9878531	16'11.43"	23° 26' 18"	14 m 02 s
19	239° 43' 34"	-0.51"	237° 31' 44"	-20° 05' 25"	0.9878447	16'11.44"	23° 26' 18"	14 m 01 s
20	239° 46' 06"	-0.51"	237° 34' 22"	-20° 05' 58"	0.9878364	16'11.45"	23° 26' 18"	14 m 00 s
21	239° 48' 37"	-0.51"	237° 36' 60"	-20° 06' 30"	0.9878281	16'11.45"	23° 26' 18"	13 m 60 s
22	239° 51' 09"	-0.51"	237° 39' 37"	-20° 07' 02"	0.9878198	16'11.46"	23° 26' 18"	13 m 59 s
23	239° 53' 40"	-0.51"	237° 42' 15"	-20° 07' 34"	0.9878114	16'11.47"	23° 26' 18"	13 m 58 s
24	239° 56' 12"	-0.50"	237° 44' 53"	-20° 08' 07"	0.9878031	16'11.48"	23° 26' 18"	13 m 58 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	246° 41' 55"	-4° 56' 56"	243° 55' 17"	-26° 18' 08"	0° 53' 57"	14' 42.10"	312° 22' 07"	0.00647
1	247° 11' 37"	-4° 57' 18"	244° 27' 44"	-26° 23' 39"	0° 53' 57"	14' 42.16"	310° 44' 23"	0.00703
2	247° 41' 19"	-4° 57' 39"	245° 00' 13"	-26° 29' 02"	0° 53' 57"	14' 42.21"	309° 13' 07"	0.00761
3	248° 11' 02"	-4° 57' 59"	245° 32' 46"	-26° 34' 18"	0° 53' 58"	14' 42.27"	307° 47' 38"	0.00823
4	248° 40' 44"	-4° 58' 18"	246° 05' 22"	-26° 39' 26"	0° 53' 58"	14' 42.33"	306° 27' 22"	0.00888
5	249° 10' 27"	-4° 58' 35"	246° 38' 02"	-26° 44' 27"	0° 53' 58"	14' 42.39"	305° 11' 47"	0.00956
6	249° 40' 10"	-4° 58' 50"	247° 10' 44"	-26° 49' 21"	0° 53' 58"	14' 42.46"	304° 0' 26"	0.01026
7	250° 09' 53"	-4° 59' 04"	247° 43' 29"	-26° 54' 07"	0° 53' 59"	14' 42.53"	302° 52' 54"	0.01100
8	250° 39' 36"	-4° 59' 17"	248° 16' 17"	-26° 58' 46"	0° 53' 59"	14' 42.60"	301° 48' 49"	0.01177
9	251° 09' 20"	-4° 59' 29"	248° 49' 09"	-27° 03' 17"	0° 53' 59"	14' 42.67"	300° 47' 53"	0.01257
10	251° 39' 04"	-4° 59' 39"	249° 22' 03"	-27° 07' 40"	0° 53' 59"	14' 42.74"	299° 49' 49"	0.01340
11	252° 08' 48"	-4° 59' 48"	249° 54' 60"	-27° 11' 55"	0° 53' 60"	14' 42.82"	298° 54' 21"	0.01427
12	252° 38' 32"	-4° 59' 55"	250° 27' 59"	-27° 16' 03"	0° 54' 00"	14' 42.90"	298° 1' 16"	0.01516
13	253° 08' 17"	-5° 00' 02"	251° 01' 02"	-27° 20' 04"	0° 54' 00"	14' 42.99"	297° 10' 21"	0.01608
14	253° 38' 02"	-5° 00' 06"	251° 34' 07"	-27° 23' 56"	0° 54' 01"	14' 43.07"	296° 21' 26"	0.01703
15	254° 07' 47"	-5° 00' 10"	252° 07' 15"	-27° 27' 41"	0° 54' 01"	14' 43.16"	295° 34' 21"	0.01802
16	254° 37' 32"	-5° 00' 12"	252° 40' 25"	-27° 31' 17"	0° 54' 01"	14' 43.25"	294° 48' 57"	0.01903
17	255° 07' 18"	-5° 00' 12"	253° 13' 37"	-27° 34' 46"	0° 54' 02"	14' 43.34"	294° 5' 07"	0.02007
18	255° 37' 04"	-5° 00' 12"	253° 46' 52"	-27° 38' 07"	0° 54' 02"	14' 43.44"	293° 22' 43"	0.02115
19	256° 06' 51"	-5° 00' 09"	254° 20' 10"	-27° 41' 20"	0° 54' 02"	14' 43.54"	292° 41' 39"	0.02225
20	256° 36' 37"	-5° 00' 06"	254° 53' 29"	-27° 44' 25"	0° 54' 03"	14' 43.64"	292° 1' 49"	0.02338
21	257° 06' 24"	-5° 00' 01"	255° 26' 51"	-27° 47' 22"	0° 54' 03"	14' 43.74"	291° 23' 08"	0.02455
22	257° 36' 12"	-4° 59' 55"	256° 00' 15"	-27° 50' 12"	0° 54' 03"	14' 43.85"	290° 45' 31"	0.02574
23	258° 05' 59"	-4° 59' 47"	256° 33' 41"	-27° 52' 53"	0° 54' 04"	14' 43.95"	290° 8' 53"	0.02696
24	258° 35' 47"	-4° 59' 38"	257° 07' 09"	-27° 55' 26"	0° 54' 04"	14' 44.07"	289° 33' 11"	0.02822

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	239° 56' 12"	-0.50"	237° 44' 53"	-20° 08' 07"	0.9878031	16' 11.48"	23° 26' 18"	13 m 58 s
1	239° 58' 44"	-0.50"	237° 47' 30"	-20° 08' 39"	0.9877948	16' 11.49"	23° 26' 18"	13 m 57 s
2	240° 01' 15"	-0.50"	237° 50' 08"	-20° 09' 11"	0.9877865	16' 11.50"	23° 26' 18"	13 m 56 s
3	240° 03' 47"	-0.50"	237° 52' 46"	-20° 09' 43"	0.9877782	16' 11.50"	23° 26' 18"	13 m 56 s
4	240° 06' 18"	-0.50"	237° 55' 24"	-20° 10' 15"	0.9877699	16' 11.51"	23° 26' 18"	13 m 55 s
5	240° 08' 50"	-0.50"	237° 58' 02"	-20° 10' 47"	0.9877616	16' 11.52"	23° 26' 18"	13 m 54 s
6	240° 11' 21"	-0.50"	238° 00' 40"	-20° 11' 19"	0.9877533	16' 11.53"	23° 26' 18"	13 m 54 s
7	240° 13' 53"	-0.50"	238° 03' 17"	-20° 11' 51"	0.9877451	16' 11.54"	23° 26' 18"	13 m 53 s
8	240° 16' 25"	-0.50"	238° 05' 55"	-20° 12' 23"	0.9877368	16' 11.54"	23° 26' 18"	13 m 52 s
9	240° 18' 56"	-0.50"	238° 08' 33"	-20° 12' 55"	0.9877285	16' 11.55"	23° 26' 18"	13 m 52 s
10	240° 21' 28"	-0.49"	238° 11' 11"	-20° 13' 26"	0.9877202	16' 11.56"	23° 26' 18"	13 m 51 s
11	240° 23' 59"	-0.49"	238° 13' 49"	-20° 13' 58"	0.9877120	16' 11.57"	23° 26' 18"	13 m 50 s
12	240° 26' 31"	-0.49"	238° 16' 27"	-20° 14' 30"	0.9877037	16' 11.58"	23° 26' 18"	13 m 50 s
13	240° 29' 02"	-0.49"	238° 19' 05"	-20° 15' 02"	0.9876955	16' 11.58"	23° 26' 18"	13 m 49 s
14	240° 31' 34"	-0.49"	238° 21' 43"	-20° 15' 33"	0.9876872	16' 11.59"	23° 26' 18"	13 m 48 s
15	240° 34' 06"	-0.49"	238° 24' 21"	-20° 16' 05"	0.9876790	16' 11.60"	23° 26' 18"	13 m 48 s
16	240° 36' 37"	-0.49"	238° 26' 59"	-20° 16' 36"	0.9876707	16' 11.61"	23° 26' 18"	13 m 47 s
17	240° 39' 09"	-0.48"	238° 29' 37"	-20° 17' 08"	0.9876625	16' 11.62"	23° 26' 18"	13 m 46 s
18	240° 41' 40"	-0.48"	238° 32' 16"	-20° 17' 39"	0.9876543	16' 11.63"	23° 26' 18"	13 m 46 s
19	240° 44' 12"	-0.48"	238° 34' 54"	-20° 18' 11"	0.9876460	16' 11.63"	23° 26' 18"	13 m 45 s
20	240° 46' 44"	-0.48"	238° 37' 32"	-20° 18' 42"	0.9876378	16' 11.64"	23° 26' 18"	13 m 44 s
21	240° 49' 15"	-0.48"	238° 40' 10"	-20° 19' 14"	0.9876296	16' 11.65"	23° 26' 18"	13 m 43 s
22	240° 51' 47"	-0.48"	238° 42' 48"	-20° 19' 45"	0.9876214	16' 11.66"	23° 26' 18"	13 m 43 s
23	240° 54' 18"	-0.47"	238° 45' 26"	-20° 20' 16"	0.9876132	16' 11.67"	23° 26' 18"	13 m 42 s
24	240° 56' 50"	-0.47"	238° 48' 05"	-20° 20' 48"	0.9876050	16' 11.67"	23° 26' 18"	13 m 41 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	258° 35' 47"	-4° 59' 38"	257° 07' 09"	-27° 55' 26"	0° 54' 04"	14' 44.07"	289° 33' 11"	0.02822
1	259° 05' 36"	-4° 59' 28"	257° 40' 39"	-27° 57' 50"	0° 54' 05"	14' 44.18"	288° 58' 21"	0.02950
2	259° 35' 24"	-4° 59' 16"	258° 14' 11"	-28° 00' 07"	0° 54' 05"	14' 44.30"	288° 24' 19"	0.03081
3	260° 05' 13"	-4° 59' 03"	258° 47' 45"	-28° 02' 16"	0° 54' 06"	14' 44.42"	287° 51' 03"	0.03216
4	260° 35' 03"	-4° 58' 49"	259° 21' 21"	-28° 04' 16"	0° 54' 06"	14' 44.54"	287° 18' 29"	0.03353
5	261° 04' 52"	-4° 58' 33"	259° 54' 58"	-28° 06' 09"	0° 54' 06"	14' 44.66"	286° 46' 36"	0.03493
6	261° 34' 43"	-4° 58' 16"	260° 28' 36"	-28° 07' 53"	0° 54' 07"	14' 44.79"	286° 15' 21"	0.03636
7	262° 04' 33"	-4° 57' 57"	261° 02' 16"	-28° 09' 29"	0° 54' 07"	14' 44.92"	285° 44' 41"	0.03782
8	262° 34' 24"	-4° 57' 37"	261° 35' 58"	-28° 10' 56"	0° 54' 08"	14' 45.05"	285° 14' 35"	0.03932
9	263° 04' 15"	-4° 57' 16"	262° 09' 41"	-28° 12' 15"	0° 54' 08"	14' 45.19"	284° 45' 00"	0.04084
10	263° 34' 07"	-4° 56' 53"	262° 43' 25"	-28° 13' 27"	0° 54' 09"	14' 45.32"	284° 15' 56"	0.04238
11	264° 03' 59"	-4° 56' 29"	263° 17' 11"	-28° 14' 29"	0° 54' 09"	14' 45.46"	283° 47' 20"	0.04396
12	264° 33' 52"	-4° 56' 04"	263° 50' 57"	-28° 15' 24"	0° 54' 10"	14' 45.61"	283° 19' 11"	0.04557
13	265° 03' 45"	-4° 55' 37"	264° 24' 45"	-28° 16' 10"	0° 54' 10"	14' 45.75"	282° 51' 27"	0.04721
14	265° 33' 38"	-4° 55' 09"	264° 58' 34"	-28° 16' 48"	0° 54' 11"	14' 45.90"	282° 24' 08"	0.04887
15	266° 03' 32"	-4° 54' 39"	265° 32' 23"	-28° 17' 17"	0° 54' 12"	14' 46.05"	281° 57' 13"	0.05057
16	266° 33' 26"	-4° 54' 08"	266° 06' 13"	-28° 17' 38"	0° 54' 12"	14' 46.21"	281° 30' 39"	0.05229
17	267° 03' 21"	-4° 53' 36"	266° 40' 05"	-28° 17' 51"	0° 54' 13"	14' 46.36"	281° 4' 27"	0.05404
18	267° 33' 16"	-4° 53' 02"	267° 13' 56"	-28° 17' 56"	0° 54' 13"	14' 46.52"	280° 38' 35"	0.05582
19	268° 03' 11"	-4° 52' 27"	267° 47' 49"	-28° 17' 52"	0° 54' 14"	14' 46.68"	280° 13' 02"	0.05763
20	268° 33' 08"	-4° 51' 51"	268° 21' 41"	-28° 17' 39"	0° 54' 14"	14' 46.85"	279° 47' 48"	0.05947
21	269° 03' 04"	-4° 51' 13"	268° 55' 35"	-28° 17' 18"	0° 54' 15"	14' 47.02"	279° 22' 51"	0.06134
22	269° 33' 01"	-4° 50' 34"	269° 29' 28"	-28° 16' 49"	0° 54' 16"	14' 47.19"	278° 58' 12"	0.06323
23	270° 02' 59"	-4° 49' 54"	270° 03' 22"	-28° 16' 12"	0° 54' 16"	14' 47.36"	278° 33' 49"	0.06516
24	270° 32' 57"	-4° 49' 12"	270° 37' 17"	-28° 15' 26"	0° 54' 17"	14' 47.54"	278° 9' 42"	0.06711

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	240° 56' 50"	-0.47"	238° 48' 05"	-20° 20' 48"	0.9876050	16'11.67"	23° 26' 18"	13 m 41 s
1	240° 59' 22"	-0.47"	238° 50' 43"	-20° 21' 19"	0.9875968	16'11.68"	23° 26' 18"	13 m 41 s
2	241° 01' 53"	-0.47"	238° 53' 21"	-20° 21' 50"	0.9875886	16'11.69"	23° 26' 18"	13 m 40 s
3	241° 04' 25"	-0.47"	238° 55' 59"	-20° 22' 21"	0.9875804	16'11.70"	23° 26' 18"	13 m 39 s
4	241° 06' 57"	-0.46"	238° 58' 38"	-20° 22' 52"	0.9875722	16'11.71"	23° 26' 18"	13 m 39 s
5	241° 09' 28"	-0.46"	239° 01' 16"	-20° 23' 23"	0.9875640	16'11.71"	23° 26' 18"	13 m 38 s
6	241° 11' 60"	-0.46"	239° 03' 54"	-20° 23' 54"	0.9875558	16'11.72"	23° 26' 18"	13 m 37 s
7	241° 14' 31"	-0.46"	239° 06' 33"	-20° 24' 25"	0.9875476	16'11.73"	23° 26' 18"	13 m 37 s
8	241° 17' 03"	-0.46"	239° 09' 11"	-20° 24' 56"	0.9875395	16'11.74"	23° 26' 18"	13 m 36 s
9	241° 19' 35"	-0.45"	239° 11' 50"	-20° 25' 27"	0.9875313	16'11.75"	23° 26' 18"	13 m 35 s
10	241° 22' 06"	-0.45"	239° 14' 28"	-20° 25' 58"	0.9875231	16'11.75"	23° 26' 18"	13 m 34 s
11	241° 24' 38"	-0.45"	239° 17' 07"	-20° 26' 29"	0.9875150	16'11.76"	23° 26' 18"	13 m 34 s
12	241° 27' 10"	-0.45"	239° 19' 45"	-20° 26' 60"	0.9875068	16'11.77"	23° 26' 18"	13 m 33 s
13	241° 29' 41"	-0.44"	239° 22' 23"	-20° 27' 30"	0.9874987	16'11.78"	23° 26' 18"	13 m 32 s
14	241° 32' 13"	-0.44"	239° 25' 02"	-20° 28' 01"	0.9874906	16'11.79"	23° 26' 18"	13 m 32 s
15	241° 34' 45"	-0.44"	239° 27' 41"	-20° 28' 32"	0.9874824	16'11.79"	23° 26' 18"	13 m 31 s
16	241° 37' 16"	-0.44"	239° 30' 19"	-20° 29' 02"	0.9874743	16'11.80"	23° 26' 18"	13 m 30 s
17	241° 39' 48"	-0.43"	239° 32' 58"	-20° 29' 33"	0.9874662	16'11.81"	23° 26' 18"	13 m 29 s
18	241° 42' 20"	-0.43"	239° 35' 36"	-20° 30' 03"	0.9874580	16'11.82"	23° 26' 18"	13 m 29 s
19	241° 44' 51"	-0.43"	239° 38' 15"	-20° 30' 34"	0.9874499	16'11.83"	23° 26' 18"	13 m 28 s
20	241° 47' 23"	-0.42"	239° 40' 53"	-20° 31' 04"	0.9874418	16'11.83"	23° 26' 18"	13 m 27 s
21	241° 49' 55"	-0.42"	239° 43' 32"	-20° 31' 35"	0.9874337	16'11.84"	23° 26' 18"	13 m 26 s
22	241° 52' 26"	-0.42"	239° 46' 11"	-20° 32' 05"	0.9874256	16'11.85"	23° 26' 18"	13 m 26 s
23	241° 54' 58"	-0.42"	239° 48' 49"	-20° 32' 36"	0.9874175	16'11.86"	23° 26' 18"	13 m 25 s
24	241° 57' 30"	-0.41"	239° 51' 28"	-20° 33' 06"	0.9874094	16'11.87"	23° 26' 18"	13 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	270° 32' 57"	-4° 49' 12"	270° 37' 17"	-28° 15' 26"	0° 54' 17"	14' 47.54"	278° 9' 42"	0.06711
1	271° 02' 56"	-4° 48' 29"	271° 11' 11"	-28° 14' 31"	0° 54' 18"	14' 47.72"	277° 45' 50"	0.06909
2	271° 32' 55"	-4° 47' 45"	271° 45' 05"	-28° 13' 28"	0° 54' 18"	14' 47.90"	277° 22' 13"	0.07110
3	272° 02' 54"	-4° 46' 59"	272° 18' 59"	-28° 12' 17"	0° 54' 19"	14' 48.09"	276° 58' 50"	0.07313
4	272° 32' 55"	-4° 46' 12"	272° 52' 53"	-28° 10' 58"	0° 54' 20"	14' 48.27"	276° 35' 41"	0.07520
5	273° 02' 55"	-4° 45' 23"	273° 26' 47"	-28° 09' 30"	0° 54' 20"	14' 48.47"	276° 12' 46"	0.07729
6	273° 32' 57"	-4° 44' 33"	274° 00' 41"	-28° 07' 53"	0° 54' 21"	14' 48.66"	275° 50' 03"	0.07941
7	274° 02' 59"	-4° 43' 42"	274° 34' 35"	-28° 06' 08"	0° 54' 22"	14' 48.86"	275° 27' 33"	0.08155
8	274° 33' 01"	-4° 42' 50"	275° 08' 28"	-28° 04' 15"	0° 54' 23"	14' 49.06"	275° 5' 16"	0.08373
9	275° 03' 04"	-4° 41' 56"	275° 42' 20"	-28° 02' 14"	0° 54' 23"	14' 49.26"	274° 43' 10"	0.08593
10	275° 33' 08"	-4° 41' 01"	276° 16' 12"	-28° 00' 04"	0° 54' 24"	14' 49.46"	274° 21' 16"	0.08816
11	276° 03' 12"	-4° 40' 04"	276° 50' 03"	-27° 57' 45"	0° 54' 25"	14' 49.67"	273° 59' 33"	0.09041
12	276° 33' 17"	-4° 39' 06"	277° 23' 54"	-27° 55' 19"	0° 54' 26"	14' 49.88"	273° 38' 02"	0.09270
13	277° 03' 22"	-4° 38' 07"	277° 57' 44"	-27° 52' 44"	0° 54' 26"	14' 50.10"	273° 16' 41"	0.09501
14	277° 33' 29"	-4° 37' 07"	278° 31' 33"	-27° 50' 00"	0° 54' 27"	14' 50.32"	272° 55' 31"	0.09735
15	278° 03' 35"	-4° 36' 05"	279° 05' 21"	-27° 47' 09"	0° 54' 28"	14' 50.54"	272° 34' 31"	0.09971
16	278° 33' 43"	-4° 35' 02"	279° 39' 08"	-27° 44' 09"	0° 54' 29"	14' 50.76"	272° 13' 42"	0.10210
17	279° 03' 51"	-4° 33' 58"	280° 12' 54"	-27° 41' 00"	0° 54' 30"	14' 50.99"	271° 53' 02"	0.10452
18	279° 33' 60"	-4° 32' 52"	280° 46' 39"	-27° 37' 44"	0° 54' 31"	14' 51.22"	271° 32' 33"	0.10696
19	280° 04' 09"	-4° 31' 45"	281° 20' 22"	-27° 34' 19"	0° 54' 31"	14' 51.45"	271° 12' 13"	0.10943
20	280° 34' 19"	-4° 30' 37"	281° 54' 05"	-27° 30' 46"	0° 54' 32"	14' 51.69"	270° 52' 03"	0.11193
21	281° 04' 30"	-4° 29' 27"	282° 27' 46"	-27° 27' 04"	0° 54' 33"	14' 51.93"	270° 32' 02"	0.11445
22	281° 34' 42"	-4° 28' 16"	283° 01' 25"	-27° 23' 15"	0° 54' 34"	14' 52.17"	270° 12' 10"	0.11700
23	282° 04' 54"	-4° 27' 04"	283° 35' 04"	-27° 19' 17"	0° 54' 35"	14' 52.41"	269° 52' 28"	0.11958
24	282° 35' 07"	-4° 25' 50"	284° 08' 40"	-27° 15' 11"	0° 54' 36"	14' 52.66"	269° 32' 55"	0.12218

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	241° 57' 30"	-0.41"	239° 51' 28"	-20° 33' 06"	0.9874094	16' 11.87"	23° 26' 18"	13 m 24 s
1	242° 00' 01"	-0.41"	239° 54' 07"	-20° 33' 36"	0.9874013	16' 11.87"	23° 26' 18"	13 m 24 s
2	242° 02' 33"	-0.41"	239° 56' 46"	-20° 34' 06"	0.9873932	16' 11.88"	23° 26' 18"	13 m 23 s
3	242° 05' 05"	-0.40"	239° 59' 24"	-20° 34' 37"	0.9873852	16' 11.89"	23° 26' 18"	13 m 22 s
4	242° 07' 36"	-0.40"	240° 02' 03"	-20° 35' 07"	0.9873771	16' 11.90"	23° 26' 18"	13 m 21 s
5	242° 10' 08"	-0.40"	240° 04' 42"	-20° 35' 37"	0.9873690	16' 11.91"	23° 26' 18"	13 m 21 s
6	242° 12' 40"	-0.39"	240° 07' 21"	-20° 36' 07"	0.9873610	16' 11.91"	23° 26' 18"	13 m 20 s
7	242° 15' 11"	-0.39"	240° 09' 60"	-20° 36' 37"	0.9873529	16' 11.92"	23° 26' 18"	13 m 19 s
8	242° 17' 43"	-0.39"	240° 12' 39"	-20° 37' 07"	0.9873448	16' 11.93"	23° 26' 18"	13 m 18 s
9	242° 20' 15"	-0.38"	240° 15' 17"	-20° 37' 37"	0.9873368	16' 11.94"	23° 26' 18"	13 m 18 s
10	242° 22' 46"	-0.38"	240° 17' 56"	-20° 38' 07"	0.9873287	16' 11.95"	23° 26' 18"	13 m 17 s
11	242° 25' 18"	-0.38"	240° 20' 35"	-20° 38' 37"	0.9873207	16' 11.95"	23° 26' 18"	13 m 16 s
12	242° 27' 50"	-0.37"	240° 23' 14"	-20° 39' 07"	0.9873127	16' 11.96"	23° 26' 18"	13 m 15 s
13	242° 30' 21"	-0.37"	240° 25' 53"	-20° 39' 36"	0.9873046	16' 11.97"	23° 26' 18"	13 m 15 s
14	242° 32' 53"	-0.36"	240° 28' 32"	-20° 40' 06"	0.9872966	16' 11.98"	23° 26' 18"	13 m 14 s
15	242° 35' 25"	-0.36"	240° 31' 11"	-20° 40' 36"	0.9872886	16' 11.99"	23° 26' 18"	13 m 13 s
16	242° 37' 56"	-0.36"	240° 33' 50"	-20° 41' 05"	0.9872806	16' 11.99"	23° 26' 18"	13 m 12 s
17	242° 40' 28"	-0.35"	240° 36' 29"	-20° 41' 35"	0.9872726	16' 12.00"	23° 26' 18"	13 m 12 s
18	242° 42' 60"	-0.35"	240° 39' 08"	-20° 42' 05"	0.9872646	16' 12.01"	23° 26' 18"	13 m 11 s
19	242° 45' 32"	-0.35"	240° 41' 47"	-20° 42' 34"	0.9872566	16' 12.02"	23° 26' 18"	13 m 10 s
20	242° 48' 03"	-0.34"	240° 44' 26"	-20° 43' 04"	0.9872486	16' 12.02"	23° 26' 18"	13 m 09 s
21	242° 50' 35"	-0.34"	240° 47' 06"	-20° 43' 33"	0.9872406	16' 12.03"	23° 26' 18"	13 m 09 s
22	242° 53' 07"	-0.33"	240° 49' 45"	-20° 44' 03"	0.9872326	16' 12.04"	23° 26' 18"	13 m 08 s
23	242° 55' 38"	-0.33"	240° 52' 24"	-20° 44' 32"	0.9872246	16' 12.05"	23° 26' 18"	13 m 07 s
24	242° 58' 10"	-0.33"	240° 55' 03"	-20° 45' 01"	0.9872167	16' 12.06"	23° 26' 18"	13 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	282° 35' 07"	-4° 25' 50"	284° 08' 40"	-27° 15' 11"	0° 54' 36"	14' 52.66"	269° 32' 55"	0.12218
1	283° 05' 21"	-4° 24' 36"	284° 42' 16"	-27° 10' 57"	0° 54' 37"	14' 52.91"	269° 13' 31"	0.12481
2	283° 35' 36"	-4° 23' 19"	285° 15' 49"	-27° 06' 35"	0° 54' 38"	14' 53.17"	268° 54' 15"	0.12746
3	284° 05' 51"	-4° 22' 02"	285° 49' 21"	-27° 02' 04"	0° 54' 39"	14' 53.43"	268° 35' 09"	0.13014
4	284° 36' 07"	-4° 20' 44"	286° 22' 51"	-26° 57' 26"	0° 54' 40"	14' 53.69"	268° 16' 11"	0.13284
5	285° 06' 24"	-4° 19' 24"	286° 56' 19"	-26° 52' 39"	0° 54' 41"	14' 53.95"	267° 57' 22"	0.13557
6	285° 36' 42"	-4° 18' 03"	287° 29' 46"	-26° 47' 45"	0° 54' 42"	14' 54.22"	267° 38' 41"	0.13832
7	286° 07' 00"	-4° 16' 40"	288° 03' 10"	-26° 42' 42"	0° 54' 43"	14' 54.49"	267° 20' 09"	0.14110
8	286° 37' 20"	-4° 15' 16"	288° 36' 33"	-26° 37' 31"	0° 54' 44"	14' 54.77"	267° 1' 45"	0.14391
9	287° 07' 40"	-4° 13' 52"	289° 09' 53"	-26° 32' 13"	0° 54' 45"	14' 55.04"	266° 43' 30"	0.14674
10	287° 38' 01"	-4° 12' 25"	289° 43' 12"	-26° 26' 46"	0° 54' 46"	14' 55.32"	266° 25' 23"	0.14959
11	288° 08' 23"	-4° 10' 58"	290° 16' 28"	-26° 21' 12"	0° 54' 47"	14' 55.61"	266° 7' 25"	0.15247
12	288° 38' 46"	-4° 09' 29"	290° 49' 42"	-26° 15' 30"	0° 54' 48"	14' 55.89"	265° 49' 34"	0.15537
13	289° 09' 10"	-4° 07' 59"	291° 22' 54"	-26° 09' 39"	0° 54' 49"	14' 56.18"	265° 31' 52"	0.15830
14	289° 39' 34"	-4° 06' 28"	291° 56' 04"	-26° 03' 41"	0° 54' 50"	14' 56.48"	265° 14' 18"	0.16125
15	290° 09' 60"	-4° 04' 56"	292° 29' 12"	-25° 57' 36"	0° 54' 51"	14' 56.78"	264° 56' 53"	0.16422
16	290° 40' 26"	-4° 03' 23"	293° 02' 17"	-25° 51' 22"	0° 54' 52"	14' 57.08"	264° 39' 35"	0.16722
17	291° 10' 54"	-4° 01' 48"	293° 35' 20"	-25° 45' 01"	0° 54' 53"	14' 57.38"	264° 22' 26"	0.17025
18	291° 41' 22"	-4° 00' 12"	294° 08' 20"	-25° 38' 32"	0° 54' 54"	14' 57.69"	264° 5' 25"	0.17329
19	292° 11' 52"	-3° 58' 35"	294° 41' 18"	-25° 31' 55"	0° 54' 55"	14' 58.00"	263° 48' 31"	0.17636
20	292° 42' 22"	-3° 56' 56"	295° 14' 14"	-25° 25' 11"	0° 54' 57"	14' 58.31"	263° 31' 46"	0.17946
21	293° 12' 53"	-3° 55' 17"	295° 47' 07"	-25° 18' 19"	0° 54' 58"	14' 58.63"	263° 15' 09"	0.18257
22	293° 43' 26"	-3° 53' 36"	296° 19' 57"	-25° 11' 20"	0° 54' 59"	14' 58.95"	262° 58' 40"	0.18571
23	294° 13' 59"	-3° 51' 54"	296° 52' 45"	-25° 04' 13"	0° 55' 00"	14' 59.27"	262° 42' 19"	0.18888
24	294° 44' 34"	-3° 50' 11"	297° 25' 30"	-24° 56' 59"	0° 55' 01"	14' 59.60"	262° 26' 07"	0.19206

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	242° 58' 10"	-0.33"	240° 55' 03"	-20° 45' 01"	0.9872167	16'12.06"	23° 26' 18"	13 m 06 s
1	243° 00' 42"	-0.32"	240° 57' 42"	-20° 45' 31"	0.9872087	16'12.06"	23° 26' 18"	13 m 06 s
2	243° 03' 14"	-0.32"	241° 00' 21"	-20° 45' 60"	0.9872007	16'12.07"	23° 26' 18"	13 m 05 s
3	243° 05' 45"	-0.31"	241° 03' 01"	-20° 46' 29"	0.9871928	16'12.08"	23° 26' 18"	13 m 04 s
4	243° 08' 17"	-0.31"	241° 05' 40"	-20° 46' 58"	0.9871848	16'12.09"	23° 26' 18"	13 m 03 s
5	243° 10' 49"	-0.31"	241° 08' 19"	-20° 47' 28"	0.9871769	16'12.10"	23° 26' 18"	13 m 03 s
6	243° 13' 20"	-0.30"	241° 10' 59"	-20° 47' 57"	0.9871690	16'12.10"	23° 26' 18"	13 m 02 s
7	243° 15' 52"	-0.30"	241° 13' 38"	-20° 48' 26"	0.9871610	16'12.11"	23° 26' 18"	13 m 01 s
8	243° 18' 24"	-0.29"	241° 16' 17"	-20° 48' 55"	0.9871531	16'12.12"	23° 26' 18"	13 m 00 s
9	243° 20' 56"	-0.29"	241° 18' 57"	-20° 49' 24"	0.9871452	16'12.13"	23° 26' 18"	12 m 60 s
10	243° 23' 27"	-0.28"	241° 21' 36"	-20° 49' 53"	0.9871372	16'12.13"	23° 26' 18"	12 m 59 s
11	243° 25' 59"	-0.28"	241° 24' 15"	-20° 50' 22"	0.9871293	16'12.14"	23° 26' 18"	12 m 58 s
12	243° 28' 31"	-0.27"	241° 26' 55"	-20° 50' 50"	0.9871214	16'12.15"	23° 26' 18"	12 m 57 s
13	243° 31' 03"	-0.27"	241° 29' 34"	-20° 51' 19"	0.9871135	16'12.16"	23° 26' 18"	12 m 56 s
14	243° 33' 34"	-0.27"	241° 32' 14"	-20° 51' 48"	0.9871056	16'12.17"	23° 26' 18"	12 m 56 s
15	243° 36' 06"	-0.26"	241° 34' 53"	-20° 52' 17"	0.9870977	16'12.17"	23° 26' 18"	12 m 55 s
16	243° 38' 38"	-0.26"	241° 37' 32"	-20° 52' 45"	0.9870899	16'12.18"	23° 26' 18"	12 m 54 s
17	243° 41' 10"	-0.25"	241° 40' 12"	-20° 53' 14"	0.9870820	16'12.19"	23° 26' 18"	12 m 53 s
18	243° 43' 41"	-0.25"	241° 42' 51"	-20° 53' 43"	0.9870741	16'12.20"	23° 26' 18"	12 m 53 s
19	243° 46' 13"	-0.24"	241° 45' 31"	-20° 54' 11"	0.9870662	16'12.20"	23° 26' 18"	12 m 52 s
20	243° 48' 45"	-0.24"	241° 48' 11"	-20° 54' 40"	0.9870584	16'12.21"	23° 26' 18"	12 m 51 s
21	243° 51' 17"	-0.23"	241° 50' 50"	-20° 55' 08"	0.9870505	16'12.22"	23° 26' 18"	12 m 50 s
22	243° 53' 48"	-0.23"	241° 53' 30"	-20° 55' 37"	0.9870427	16'12.23"	23° 26' 18"	12 m 49 s
23	243° 56' 20"	-0.22"	241° 56' 09"	-20° 56' 05"	0.9870348	16'12.24"	23° 26' 18"	12 m 49 s
24	243° 58' 52"	-0.22"	241° 58' 49"	-20° 56' 34"	0.9870270	16'12.24"	23° 26' 18"	12 m 48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	294° 44' 34"	-3° 50' 11"	297° 25' 30"	-24° 56' 59"	0° 55' 01"	14' 59.60"	262° 26' 07"	0.19206
1	295° 15' 09"	-3° 48' 27"	297° 58' 13"	-24° 49' 37"	0° 55' 02"	14' 59.93"	262° 10' 02"	0.19527
2	295° 45' 46"	-3° 46' 41"	298° 30' 53"	-24° 42' 08"	0° 55' 04"	15' 00.26"	261° 54' 05"	0.19850
3	296° 16' 23"	-3° 44' 54"	299° 03' 30"	-24° 34' 31"	0° 55' 05"	15' 00.60"	261° 38' 16"	0.20175
4	296° 47' 02"	-3° 43' 07"	299° 36' 05"	-24° 26' 47"	0° 55' 06"	15' 00.94"	261° 22' 35"	0.20503
5	297° 17' 42"	-3° 41' 18"	300° 08' 37"	-24° 18' 56"	0° 55' 07"	15' 01.28"	261° 7' 03"	0.20833
6	297° 48' 23"	-3° 39' 28"	300° 41' 06"	-24° 10' 57"	0° 55' 09"	15' 01.63"	260° 51' 38"	0.21165
7	298° 19' 05"	-3° 37' 36"	301° 13' 32"	-24° 02' 51"	0° 55' 10"	15' 01.98"	260° 36' 21"	0.21499
8	298° 49' 48"	-3° 35' 44"	301° 45' 56"	-23° 54' 38"	0° 55' 11"	15' 02.34"	260° 21' 13"	0.21835
9	299° 20' 33"	-3° 33' 50"	302° 18' 17"	-23° 46' 18"	0° 55' 13"	15' 02.69"	260° 6' 12"	0.22174
10	299° 51' 19"	-3° 31' 56"	302° 50' 35"	-23° 37' 51"	0° 55' 14"	15' 03.06"	259° 51' 19"	0.22514
11	300° 22' 05"	-3° 30' 00"	303° 22' 50"	-23° 29' 17"	0° 55' 15"	15' 03.42"	259° 36' 35"	0.22857
12	300° 52' 53"	-3° 28' 03"	303° 55' 03"	-23° 20' 36"	0° 55' 17"	15' 03.79"	259° 21' 58"	0.23202
13	301° 23' 43"	-3° 26' 05"	304° 27' 13"	-23° 11' 47"	0° 55' 18"	15' 04.16"	259° 7' 30"	0.23549
14	301° 54' 33"	-3° 24' 06"	304° 59' 19"	-23° 02' 52"	0° 55' 19"	15' 04.54"	258° 53' 09"	0.23898
15	302° 25' 25"	-3° 22' 06"	305° 31' 23"	-22° 53' 50"	0° 55' 21"	15' 04.91"	258° 38' 57"	0.24249
16	302° 56' 18"	-3° 20' 05"	306° 03' 25"	-22° 44' 41"	0° 55' 22"	15' 05.30"	258° 24' 53"	0.24602
17	303° 27' 13"	-3° 18' 03"	306° 35' 23"	-22° 35' 25"	0° 55' 24"	15' 05.68"	258° 10' 57"	0.24957
18	303° 58' 09"	-3° 15' 59"	307° 07' 19"	-22° 26' 03"	0° 55' 25"	15' 06.07"	257° 57' 09"	0.25314
19	304° 29' 06"	-3° 13' 55"	307° 39' 11"	-22° 16' 34"	0° 55' 26"	15' 06.46"	257° 43' 29"	0.25673
20	305° 00' 04"	-3° 11' 50"	308° 11' 01"	-22° 06' 58"	0° 55' 28"	15' 06.86"	257° 29' 57"	0.26035
21	305° 31' 04"	-3° 09' 43"	308° 42' 48"	-21° 57' 15"	0° 55' 29"	15' 07.26"	257° 16' 33"	0.26398
22	306° 02' 05"	-3° 07' 35"	309° 14' 32"	-21° 47' 26"	0° 55' 31"	15' 07.66"	257° 3' 18"	0.26763
23	306° 33' 08"	-3° 05' 27"	309° 46' 14"	-21° 37' 30"	0° 55' 32"	15' 08.07"	256° 50' 10"	0.27129
24	307° 04' 12"	-3° 03' 17"	310° 17' 52"	-21° 27' 28"	0° 55' 34"	15' 08.48"	256° 37' 11"	0.27498

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	243° 58' 52"	-0.22"	241° 58' 49"	-20° 56' 34"	0.9870270	16' 12.24"	23° 26' 18"	12 m 48 s
1	244° 01' 24"	-0.21"	242° 01' 29"	-20° 57' 02"	0.9870191	16' 12.25"	23° 26' 18"	12 m 47 s
2	244° 03' 55"	-0.21"	242° 04' 08"	-20° 57' 30"	0.9870113	16' 12.26"	23° 26' 18"	12 m 46 s
3	244° 06' 27"	-0.20"	242° 06' 48"	-20° 57' 59"	0.9870035	16' 12.27"	23° 26' 18"	12 m 45 s
4	244° 08' 59"	-0.20"	242° 09' 28"	-20° 58' 27"	0.9869957	16' 12.27"	23° 26' 18"	12 m 45 s
5	244° 11' 31"	-0.19"	242° 12' 07"	-20° 58' 55"	0.9869879	16' 12.28"	23° 26' 18"	12 m 44 s
6	244° 14' 03"	-0.19"	242° 14' 47"	-20° 59' 23"	0.9869800	16' 12.29"	23° 26' 18"	12 m 43 s
7	244° 16' 34"	-0.18"	242° 17' 27"	-20° 59' 51"	0.9869722	16' 12.30"	23° 26' 18"	12 m 42 s
8	244° 19' 06"	-0.18"	242° 20' 07"	-21° 00' 19"	0.9869645	16' 12.30"	23° 26' 18"	12 m 41 s
9	244° 21' 38"	-0.17"	242° 22' 47"	-21° 00' 47"	0.9869567	16' 12.31"	23° 26' 18"	12 m 41 s
10	244° 24' 10"	-0.17"	242° 25' 26"	-21° 01' 15"	0.9869489	16' 12.32"	23° 26' 18"	12 m 40 s
11	244° 26' 41"	-0.16"	242° 28' 06"	-21° 01' 43"	0.9869411	16' 12.33"	23° 26' 18"	12 m 39 s
12	244° 29' 13"	-0.16"	242° 30' 46"	-21° 02' 11"	0.9869333	16' 12.34"	23° 26' 18"	12 m 38 s
13	244° 31' 45"	-0.15"	242° 33' 26"	-21° 02' 39"	0.9869256	16' 12.34"	23° 26' 18"	12 m 37 s
14	244° 34' 17"	-0.15"	242° 36' 06"	-21° 03' 07"	0.9869178	16' 12.35"	23° 26' 18"	12 m 37 s
15	244° 36' 49"	-0.14"	242° 38' 46"	-21° 03' 34"	0.9869101	16' 12.36"	23° 26' 18"	12 m 36 s
16	244° 39' 20"	-0.14"	242° 41' 26"	-21° 04' 02"	0.9869023	16' 12.37"	23° 26' 18"	12 m 35 s
17	244° 41' 52"	-0.13"	242° 44' 06"	-21° 04' 30"	0.9868946	16' 12.37"	23° 26' 18"	12 m 34 s
18	244° 44' 24"	-0.13"	242° 46' 46"	-21° 04' 57"	0.9868868	16' 12.38"	23° 26' 18"	12 m 33 s
19	244° 46' 56"	-0.12"	242° 49' 26"	-21° 05' 25"	0.9868791	16' 12.39"	23° 26' 18"	12 m 33 s
20	244° 49' 28"	-0.12"	242° 52' 06"	-21° 05' 53"	0.9868714	16' 12.40"	23° 26' 18"	12 m 32 s
21	244° 51' 59"	-0.11"	242° 54' 46"	-21° 06' 20"	0.9868637	16' 12.40"	23° 26' 18"	12 m 31 s
22	244° 54' 31"	-0.11"	242° 57' 26"	-21° 06' 48"	0.9868560	16' 12.41"	23° 26' 18"	12 m 30 s
23	244° 57' 03"	-0.10"	243° 00' 06"	-21° 07' 15"	0.9868483	16' 12.42"	23° 26' 18"	12 m 29 s
24	244° 59' 35"	-0.10"	243° 02' 46"	-21° 07' 42"	0.9868406	16' 12.43"	23° 26' 18"	12 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	307° 04' 12"	-3° 03' 17"	310° 17' 52"	-21° 27' 28"	0° 55' 34"	15' 08.48"	256° 37' 11"	0.27498
1	307° 35' 17"	-3° 01' 07"	310° 49' 28"	-21° 17' 20"	0° 55' 35"	15' 08.89"	256° 24' 20"	0.27869
2	308° 06' 24"	-2° 58' 55"	311° 21' 01"	-21° 07' 04"	0° 55' 37"	15' 09.31"	256° 11' 37"	0.28242
3	308° 37' 32"	-2° 56' 42"	311° 52' 31"	-20° 56' 43"	0° 55' 38"	15' 09.73"	255° 59' 02"	0.28616
4	309° 08' 42"	-2° 54' 29"	312° 23' 59"	-20° 46' 15"	0° 55' 40"	15' 10.15"	255° 46' 35"	0.28992
5	309° 39' 53"	-2° 52' 14"	312° 55' 23"	-20° 35' 41"	0° 55' 42"	15' 10.58"	255° 34' 17"	0.29370
6	310° 11' 06"	-2° 49' 58"	313° 26' 45"	-20° 25' 01"	0° 55' 43"	15' 11.01"	255° 22' 07"	0.29750
7	310° 42' 20"	-2° 47' 42"	313° 58' 05"	-20° 14' 15"	0° 55' 45"	15' 11.44"	255° 10' 05"	0.30132
8	311° 13' 36"	-2° 45' 24"	314° 29' 21"	-20° 03' 22"	0° 55' 46"	15' 11.88"	254° 58' 11"	0.30515
9	311° 44' 54"	-2° 43' 06"	315° 00' 35"	-19° 52' 23"	0° 55' 48"	15' 12.32"	254° 46' 26"	0.30900
10	312° 16' 13"	-2° 40' 46"	315° 31' 46"	-19° 41' 19"	0° 55' 50"	15' 12.76"	254° 34' 49"	0.31287
11	312° 47' 33"	-2° 38' 26"	316° 02' 55"	-19° 30' 08"	0° 55' 51"	15' 13.21"	254° 23' 20"	0.31676
12	313° 18' 56"	-2° 36' 05"	316° 34' 01"	-19° 18' 51"	0° 55' 53"	15' 13.66"	254° 11' 59"	0.32066
13	313° 50' 20"	-2° 33' 42"	317° 05' 04"	-19° 07' 28"	0° 55' 55"	15' 14.12"	254° 0' 47"	0.32458
14	314° 21' 45"	-2° 31' 19"	317° 36' 05"	-18° 56' 00"	0° 55' 56"	15' 14.57"	253° 49' 43"	0.32851
15	314° 53' 12"	-2° 28' 55"	318° 07' 04"	-18° 44' 26"	0° 55' 58"	15' 15.04"	253° 38' 47"	0.33246
16	315° 24' 41"	-2° 26' 30"	318° 37' 60"	-18° 32' 46"	0° 55' 60"	15' 15.50"	253° 28' 00"	0.33643
17	315° 56' 12"	-2° 24' 04"	319° 08' 53"	-18° 21' 00"	0° 56' 01"	15' 15.97"	253° 17' 21"	0.34041
18	316° 27' 44"	-2° 21' 38"	319° 39' 44"	-18° 09' 09"	0° 56' 03"	15' 16.44"	253° 6' 51"	0.34441
19	316° 59' 19"	-2° 19' 10"	320° 10' 33"	-17° 57' 12"	0° 56' 05"	15' 16.91"	252° 56' 28"	0.34843
20	317° 30' 54"	-2° 16' 42"	320° 41' 19"	-17° 45' 09"	0° 56' 07"	15' 17.39"	252° 46' 15"	0.35245
21	318° 02' 32"	-2° 14' 12"	321° 12' 03"	-17° 33' 01"	0° 56' 08"	15' 17.87"	252° 36' 09"	0.35650
22	318° 34' 12"	-2° 11' 42"	321° 42' 45"	-17° 20' 47"	0° 56' 10"	15' 18.36"	252° 26' 12"	0.36056
23	319° 05' 53"	-2° 09' 11"	322° 13' 24"	-17° 08' 28"	0° 56' 12"	15' 18.85"	252° 16' 24"	0.36463
24	319° 37' 36"	-2° 06' 40"	322° 44' 02"	-16° 56' 04"	0° 56' 14"	15' 19.34"	252° 6' 44"	0.36872

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	244° 59' 35"	-0.10"	243° 02' 46"	-21° 07' 42"	0.9868406	16'12.43"	23° 26' 18"	12 m 28 s
1	245° 02' 07"	-0.09"	243° 05' 26"	-21° 08' 10"	0.9868329	16'12.43"	23° 26' 18"	12 m 28 s
2	245° 04' 38"	-0.09"	243° 08' 06"	-21° 08' 37"	0.9868252	16'12.44"	23° 26' 18"	12 m 27 s
3	245° 07' 10"	-0.08"	243° 10' 46"	-21° 09' 04"	0.9868175	16'12.45"	23° 26' 18"	12 m 26 s
4	245° 09' 42"	-0.07"	243° 13' 26"	-21° 09' 31"	0.9868098	16'12.46"	23° 26' 18"	12 m 25 s
5	245° 12' 14"	-0.07"	243° 16' 06"	-21° 09' 59"	0.9868022	16'12.46"	23° 26' 18"	12 m 24 s
6	245° 14' 46"	-0.06"	243° 18' 47"	-21° 10' 26"	0.9867945	16'12.47"	23° 26' 18"	12 m 24 s
7	245° 17' 18"	-0.06"	243° 21' 27"	-21° 10' 53"	0.9867869	16'12.48"	23° 26' 18"	12 m 23 s
8	245° 19' 49"	-0.05"	243° 24' 07"	-21° 11' 20"	0.9867792	16'12.49"	23° 26' 18"	12 m 22 s
9	245° 22' 21"	-0.05"	243° 26' 47"	-21° 11' 47"	0.9867716	16'12.49"	23° 26' 18"	12 m 21 s
10	245° 24' 53"	-0.04"	243° 29' 27"	-21° 12' 14"	0.9867640	16'12.50"	23° 26' 18"	12 m 20 s
11	245° 27' 25"	-0.04"	243° 32' 08"	-21° 12' 41"	0.9867563	16'12.51"	23° 26' 18"	12 m 19 s
12	245° 29' 57"	-0.03"	243° 34' 48"	-21° 13' 08"	0.9867487	16'12.52"	23° 26' 18"	12 m 19 s
13	245° 32' 28"	-0.03"	243° 37' 28"	-21° 13' 35"	0.9867411	16'12.52"	23° 26' 18"	12 m 18 s
14	245° 35' 00"	-0.02"	243° 40' 09"	-21° 14' 01"	0.9867335	16'12.53"	23° 26' 18"	12 m 17 s
15	245° 37' 32"	-0.01"	243° 42' 49"	-21° 14' 28"	0.9867259	16'12.54"	23° 26' 18"	12 m 16 s
16	245° 40' 04"	-0.01"	243° 45' 29"	-21° 14' 55"	0.9867183	16'12.55"	23° 26' 18"	12 m 15 s
17	245° 42' 36"	-0.00"	243° 48' 10"	-21° 15' 22"	0.9867107	16'12.55"	23° 26' 18"	12 m 14 s
18	245° 45' 08"	0.00"	243° 50' 50"	-21° 15' 48"	0.9867031	16'12.56"	23° 26' 18"	12 m 13 s
19	245° 47' 39"	0.01"	243° 53' 31"	-21° 16' 15"	0.9866955	16'12.57"	23° 26' 18"	12 m 13 s
20	245° 50' 11"	0.01"	243° 56' 11"	-21° 16' 41"	0.9866880	16'12.58"	23° 26' 18"	12 m 12 s
21	245° 52' 43"	0.02"	243° 58' 51"	-21° 17' 08"	0.9866804	16'12.58"	23° 26' 18"	12 m 11 s
22	245° 55' 15"	0.02"	244° 01' 32"	-21° 17' 34"	0.9866729	16'12.59"	23° 26' 18"	12 m 10 s
23	245° 57' 47"	0.03"	244° 04' 12"	-21° 18' 01"	0.9866653	16'12.60"	23° 26' 18"	12 m 09 s
24	246° 00' 19"	0.04"	244° 06' 53"	-21° 18' 27"	0.9866578	16'12.61"	23° 26' 18"	12 m 08 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	319° 37' 36"	-2° 06' 40"	322° 44' 02"	-16° 56' 04"	0° 56' 14"	15' 19.34"	252° 6' 44"	0.36872
1	320° 09' 21"	-2° 04' 07"	323° 14' 37"	-16° 43' 34"	0° 56' 16"	15' 19.83"	251° 57' 12"	0.37282
2	320° 41' 08"	-2° 01' 34"	323° 45' 10"	-16° 30' 59"	0° 56' 17"	15' 20.33"	251° 47' 49"	0.37693
3	321° 12' 56"	-1° 58' 59"	324° 15' 41"	-16° 18' 19"	0° 56' 19"	15' 20.83"	251° 38' 34"	0.38106
4	321° 44' 47"	-1° 56' 24"	324° 46' 09"	-16° 05' 33"	0° 56' 21"	15' 21.33"	251° 29' 28"	0.38520
5	322° 16' 40"	-1° 53' 49"	325° 16' 36"	-15° 52' 43"	0° 56' 23"	15' 21.84"	251° 20' 30"	0.38936
6	322° 48' 34"	-1° 51' 12"	325° 47' 01"	-15° 39' 47"	0° 56' 25"	15' 22.35"	251° 11' 41"	0.39353
7	323° 20' 31"	-1° 48' 35"	326° 17' 24"	-15° 26' 47"	0° 56' 27"	15' 22.86"	251° 3' 01"	0.39771
8	323° 52' 29"	-1° 45' 57"	326° 47' 45"	-15° 13' 41"	0° 56' 29"	15' 23.38"	250° 54' 29"	0.40190
9	324° 24' 29"	-1° 43' 18"	327° 18' 05"	-15° 00' 30"	0° 56' 30"	15' 23.90"	250° 46' 05"	0.40611
10	324° 56' 32"	-1° 40' 39"	327° 48' 22"	-14° 47' 15"	0° 56' 32"	15' 24.42"	250° 37' 51"	0.41032
11	325° 28' 36"	-1° 37' 59"	328° 18' 38"	-14° 33' 54"	0° 56' 34"	15' 24.95"	250° 29' 44"	0.41455
12	326° 00' 43"	-1° 35' 18"	328° 48' 52"	-14° 20' 29"	0° 56' 36"	15' 25.48"	250° 21' 47"	0.41879
13	326° 32' 52"	-1° 32' 36"	329° 19' 05"	-14° 06' 59"	0° 56' 38"	15' 26.01"	250° 13' 58"	0.42304
14	327° 05' 02"	-1° 29' 54"	329° 49' 16"	-13° 53' 25"	0° 56' 40"	15' 26.54"	250° 6' 18"	0.42730
15	327° 37' 15"	-1° 27' 11"	330° 19' 26"	-13° 39' 46"	0° 56' 42"	15' 27.08"	249° 58' 46"	0.43158
16	328° 09' 30"	-1° 24' 28"	330° 49' 34"	-13° 26' 02"	0° 56' 44"	15' 27.62"	249° 51' 23"	0.43586
17	328° 41' 47"	-1° 21' 43"	331° 19' 40"	-13° 12' 14"	0° 56' 46"	15' 28.17"	249° 44' 09"	0.44015
18	329° 14' 06"	-1° 18' 59"	331° 49' 46"	-12° 58' 21"	0° 56' 48"	15' 28.71"	249° 37' 04"	0.44445
19	329° 46' 28"	-1° 16' 13"	332° 19' 50"	-12° 44' 24"	0° 56' 50"	15' 29.26"	249° 30' 07"	0.44877
20	330° 18' 51"	-1° 13' 27"	332° 49' 53"	-12° 30' 22"	0° 56' 52"	15' 29.81"	249° 23' 19"	0.45309
21	330° 51' 17"	-1° 10' 41"	333° 19' 55"	-12° 16' 17"	0° 56' 54"	15' 30.37"	249° 16' 40"	0.45742
22	331° 23' 45"	-1° 07' 54"	333° 49' 55"	-12° 02' 06"	0° 56' 56"	15' 30.92"	249° 10' 10"	0.46176
23	331° 56' 16"	-1° 05' 06"	334° 19' 55"	-11° 47' 52"	0° 56' 58"	15' 31.48"	249° 3' 49"	0.46611
24	332° 28' 48"	-1° 02' 18"	334° 49' 54"	-11° 33' 34"	0° 57' 00"	15' 32.05"	248° 57' 36"	0.47046

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	246° 00' 19"	0.04"	244° 06' 53"	-21° 18' 27"	0.9866578	16' 12.61"	23° 26' 18"	12 m 08 s
1	246° 02' 51"	0.04"	244° 09' 33"	-21° 18' 53"	0.9866503	16' 12.61"	23° 26' 18"	12 m 08 s
2	246° 05' 22"	0.05"	244° 12' 14"	-21° 19' 20"	0.9866427	16' 12.62"	23° 26' 18"	12 m 07 s
3	246° 07' 54"	0.05"	244° 14' 55"	-21° 19' 46"	0.9866352	16' 12.63"	23° 26' 18"	12 m 06 s
4	246° 10' 26"	0.06"	244° 17' 35"	-21° 20' 12"	0.9866277	16' 12.64"	23° 26' 18"	12 m 05 s
5	246° 12' 58"	0.06"	244° 20' 16"	-21° 20' 38"	0.9866202	16' 12.64"	23° 26' 18"	12 m 04 s
6	246° 15' 30"	0.07"	244° 22' 56"	-21° 21' 05"	0.9866127	16' 12.65"	23° 26' 18"	12 m 03 s
7	246° 18' 02"	0.07"	244° 25' 37"	-21° 21' 31"	0.9866052	16' 12.66"	23° 26' 18"	12 m 02 s
8	246° 20' 34"	0.08"	244° 28' 18"	-21° 21' 57"	0.9865977	16' 12.67"	23° 26' 18"	12 m 02 s
9	246° 23' 05"	0.09"	244° 30' 58"	-21° 22' 23"	0.9865902	16' 12.67"	23° 26' 18"	12 m 01 s
10	246° 25' 37"	0.09"	244° 33' 39"	-21° 22' 49"	0.9865828	16' 12.68"	23° 26' 18"	11 m 60 s
11	246° 28' 09"	0.10"	244° 36' 20"	-21° 23' 15"	0.9865753	16' 12.69"	23° 26' 18"	11 m 59 s
12	246° 30' 41"	0.10"	244° 39' 00"	-21° 23' 40"	0.9865679	16' 12.70"	23° 26' 18"	11 m 58 s
13	246° 33' 13"	0.11"	244° 41' 41"	-21° 24' 06"	0.9865604	16' 12.70"	23° 26' 18"	11 m 57 s
14	246° 35' 45"	0.11"	244° 44' 22"	-21° 24' 32"	0.9865530	16' 12.71"	23° 26' 18"	11 m 56 s
15	246° 38' 17"	0.12"	244° 47' 03"	-21° 24' 58"	0.9865455	16' 12.72"	23° 26' 18"	11 m 55 s
16	246° 40' 49"	0.12"	244° 49' 43"	-21° 25' 24"	0.9865381	16' 12.72"	23° 26' 18"	11 m 55 s
17	246° 43' 20"	0.13"	244° 52' 24"	-21° 25' 49"	0.9865307	16' 12.73"	23° 26' 18"	11 m 54 s
18	246° 45' 52"	0.14"	244° 55' 05"	-21° 26' 15"	0.9865233	16' 12.74"	23° 26' 18"	11 m 53 s
19	246° 48' 24"	0.14"	244° 57' 46"	-21° 26' 40"	0.9865159	16' 12.75"	23° 26' 18"	11 m 52 s
20	246° 50' 56"	0.15"	245° 00' 27"	-21° 27' 06"	0.9865085	16' 12.75"	23° 26' 18"	11 m 51 s
21	246° 53' 28"	0.15"	245° 03' 08"	-21° 27' 31"	0.9865011	16' 12.76"	23° 26' 18"	11 m 50 s
22	246° 55' 60"	0.16"	245° 05' 49"	-21° 27' 57"	0.9864937	16' 12.77"	23° 26' 18"	11 m 49 s
23	246° 58' 32"	0.16"	245° 08' 29"	-21° 28' 22"	0.9864863	16' 12.78"	23° 26' 18"	11 m 48 s
24	247° 01' 04"	0.17"	245° 11' 10"	-21° 28' 48"	0.9864790	16' 12.78"	23° 26' 18"	11 m 48 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	332° 28' 48"	-1° 02' 18"	334° 49' 54"	-11° 33' 34"	0° 57' 00"	15' 32.05"	248° 57' 36"	0.47046
1	333° 01' 23"	0°-59' 29"	335° 19' 51"	-11° 19' 11"	0° 57' 02"	15' 32.61"	248° 51' 33"	0.47482
2	333° 34' 00"	0°-56' 39"	335° 49' 48"	-11° 04' 44"	0° 57' 05"	15' 33.18"	248° 45' 38"	0.47920
3	334° 06' 40"	0°-53' 50"	336° 19' 44"	-10° 50' 14"	0° 57' 07"	15' 33.75"	248° 39' 52"	0.48357
4	334° 39' 22"	0°-50' 59"	336° 49' 40"	-10° 35' 39"	0° 57' 09"	15' 34.32"	248° 34' 15"	0.48796
5	335° 12' 06"	0°-48' 08"	337° 19' 34"	-10° 21' 00"	0° 57' 11"	15' 34.90"	248° 28' 48"	0.49235
6	335° 44' 52"	0°-45' 17"	337° 49' 29"	-10° 06' 18"	0° 57' 13"	15' 35.47"	248° 23' 29"	0.49675
7	336° 17' 41"	0°-42' 25"	338° 19' 22"	-9° 51' 32"	0° 57' 15"	15' 36.05"	248° 18' 19"	0.50115
8	336° 50' 33"	0°-39' 36"	338° 49' 16"	-9° 36' 44"	0° 57' 17"	15' 36.64"	248° 13' 18"	0.50556
9	337° 23' 27"	0°-36' 43"	339° 19' 09"	-9° 21' 51"	0° 57' 19"	15' 37.22"	248° 8' 27"	0.50998
10	337° 56' 23"	0°-33' 50"	339° 49' 01"	-9° 06' 53"	0° 57' 22"	15' 37.81"	248° 3' 44"	0.51440
11	338° 29' 22"	0°-30' 56"	340° 18' 54"	-8° 51' 53"	0° 57' 24"	15' 38.40"	247° 59' 11"	0.51883
12	339° 02' 23"	0°-28' 03"	340° 48' 46"	-8° 36' 48"	0° 57' 26"	15' 38.99"	247° 54' 47"	0.52326
13	339° 35' 26"	0°-25' 08"	341° 18' 38"	-8° 21' 41"	0° 57' 28"	15' 39.58"	247° 50' 32"	0.52769
14	340° 08' 32"	0°-22' 14"	341° 48' 29"	-8° 06' 30"	0° 57' 30"	15' 40.18"	247° 46' 27"	0.53213
15	340° 41' 41"	0°-19' 19"	342° 18' 21"	-7° 51' 15"	0° 57' 32"	15' 40.77"	247° 42' 30"	0.53657
16	341° 14' 52"	0°-16' 24"	342° 48' 13"	-7° 35' 57"	0° 57' 35"	15' 41.37"	247° 38' 44"	0.54101
17	341° 48' 06"	0°-13' 28"	343° 18' 05"	-7° 20' 36"	0° 57' 37"	15' 41.97"	247° 35' 06"	0.54546
18	342° 21' 22"	0°-10' 32"	343° 47' 58"	-7° 05' 12"	0° 57' 39"	15' 42.57"	247° 31' 38"	0.54991
19	342° 54' 41"	0° -7' 36"	344° 17' 51"	-6° 49' 45"	0° 57' 41"	15' 43.18"	247° 28' 19"	0.55436
20	343° 28' 03"	0° -4' 39"	344° 47' 44"	-6° 34' 15"	0° 57' 43"	15' 43.78"	247° 25' 10"	0.55882
21	344° 01' 27"	0° -1' 43"	345° 17' 37"	-6° 18' 42"	0° 57' 46"	15' 44.39"	247° 22' 10"	0.56327
22	344° 34' 53"	0° 01' 14"	345° 47' 31"	-6° 03' 05"	0° 57' 48"	15' 45.00"	247° 19' 20"	0.56773
23	345° 08' 23"	0° 04' 11"	346° 17' 26"	-5° 47' 26"	0° 57' 50"	15' 45.61"	247° 16' 39"	0.57218
24	345° 41' 55"	0° 07' 09"	346° 47' 22"	-5° 31' 44"	0° 57' 52"	15' 46.22"	247° 14' 08"	0.57664

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	247° 01' 04"	0.17"	245° 11' 10"	-21° 28' 48"	0.9864790	16'12.78"	23° 26' 18"	11 m 48 s
1	247° 03' 36"	0.17"	245° 13' 51"	-21° 29' 13"	0.9864716	16'12.79"	23° 26' 18"	11 m 47 s
2	247° 06' 07"	0.18"	245° 16' 32"	-21° 29' 38"	0.9864643	16'12.80"	23° 26' 18"	11 m 46 s
3	247° 08' 39"	0.19"	245° 19' 13"	-21° 30' 04"	0.9864569	16'12.80"	23° 26' 18"	11 m 45 s
4	247° 11' 11"	0.19"	245° 21' 54"	-21° 30' 29"	0.9864496	16'12.81"	23° 26' 18"	11 m 44 s
5	247° 13' 43"	0.20"	245° 24' 35"	-21° 30' 54"	0.9864422	16'12.82"	23° 26' 18"	11 m 43 s
6	247° 16' 15"	0.20"	245° 27' 16"	-21° 31' 19"	0.9864349	16'12.83"	23° 26' 18"	11 m 42 s
7	247° 18' 47"	0.21"	245° 29' 57"	-21° 31' 44"	0.9864276	16'12.83"	23° 26' 18"	11 m 41 s
8	247° 21' 19"	0.21"	245° 32' 38"	-21° 32' 09"	0.9864203	16'12.84"	23° 26' 18"	11 m 41 s
9	247° 23' 51"	0.22"	245° 35' 19"	-21° 32' 34"	0.9864130	16'12.85"	23° 26' 18"	11 m 40 s
10	247° 26' 23"	0.22"	245° 38' 01"	-21° 32' 59"	0.9864057	16'12.86"	23° 26' 18"	11 m 39 s
11	247° 28' 55"	0.23"	245° 40' 42"	-21° 33' 24"	0.9863984	16'12.86"	23° 26' 18"	11 m 38 s
12	247° 31' 26"	0.23"	245° 43' 23"	-21° 33' 49"	0.9863912	16'12.87"	23° 26' 18"	11 m 37 s
13	247° 33' 58"	0.24"	245° 46' 04"	-21° 34' 14"	0.9863839	16'12.88"	23° 26' 18"	11 m 36 s
14	247° 36' 30"	0.25"	245° 48' 45"	-21° 34' 38"	0.9863766	16'12.88"	23° 26' 18"	11 m 35 s
15	247° 39' 02"	0.25"	245° 51' 26"	-21° 35' 03"	0.9863694	16'12.89"	23° 26' 18"	11 m 34 s
16	247° 41' 34"	0.26"	245° 54' 08"	-21° 35' 28"	0.9863621	16'12.90"	23° 26' 18"	11 m 33 s
17	247° 44' 06"	0.26"	245° 56' 49"	-21° 35' 52"	0.9863549	16'12.91"	23° 26' 18"	11 m 32 s
18	247° 46' 38"	0.27"	245° 59' 30"	-21° 36' 17"	0.9863477	16'12.91"	23° 26' 18"	11 m 32 s
19	247° 49' 10"	0.27"	246° 02' 11"	-21° 36' 42"	0.9863405	16'12.92"	23° 26' 18"	11 m 31 s
20	247° 51' 42"	0.28"	246° 04' 53"	-21° 37' 06"	0.9863333	16'12.93"	23° 26' 18"	11 m 30 s
21	247° 54' 14"	0.28"	246° 07' 34"	-21° 37' 31"	0.9863260	16'12.93"	23° 26' 18"	11 m 29 s
22	247° 56' 46"	0.29"	246° 10' 15"	-21° 37' 55"	0.9863189	16'12.94"	23° 26' 18"	11 m 28 s
23	247° 59' 18"	0.29"	246° 12' 56"	-21° 38' 19"	0.9863117	16'12.95"	23° 26' 18"	11 m 27 s
24	248° 01' 49"	0.30"	246° 15' 38"	-21° 38' 44"	0.9863045	16'12.96"	23° 26' 18"	11 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	345° 41' 55"	0° 07' 09"	346° 47' 22"	-5° 31' 44"	0° 57' 52"	15' 46.22"	247° 14' 08"	0.57664
1	346° 15' 29"	0° 10' 06"	347° 17' 18"	-5° 15' 60"	0° 57' 55"	15' 46.84"	247° 11' 47"	0.58110
2	346° 49' 07"	0° 13' 04"	347° 47' 15"	-5° 00' 13"	0° 57' 57"	15' 47.45"	247° 9' 35"	0.58555
3	347° 22' 47"	0° 16' 02"	348° 17' 13"	-4° 44' 23"	0° 57' 59"	15' 48.07"	247° 7' 34"	0.59001
4	347° 56' 29"	0° 18' 60"	348° 47' 12"	-4° 28' 30"	0° 58' 01"	15' 48.69"	247° 5' 42"	0.59446
5	348° 30' 15"	0° 21' 58"	349° 17' 12"	-4° 12' 35"	0° 58' 04"	15' 49.30"	247° 3' 60"	0.59892
6	349° 04' 03"	0° 24' 56"	349° 47' 14"	-3° 56' 38"	0° 58' 06"	15' 49.92"	247° 2' 27"	0.60337
7	349° 37' 54"	0° 27' 54"	350° 17' 16"	-3° 40' 38"	0° 58' 08"	15' 50.54"	247° 1' 05"	0.60782
8	350° 11' 47"	0° 30' 53"	350° 47' 20"	-3° 24' 36"	0° 58' 11"	15' 51.17"	246° 59' 53"	0.61226
9	350° 45' 44"	0° 33' 51"	351° 17' 26"	-3° 08' 32"	0° 58' 13"	15' 51.79"	246° 58' 51"	0.61671
10	351° 19' 43"	0° 36' 50"	351° 47' 33"	-2° 52' 26"	0° 58' 15"	15' 52.41"	246° 57' 59"	0.62115
11	351° 53' 45"	0° 39' 48"	352° 17' 41"	-2° 36' 17"	0° 58' 17"	15' 53.03"	246° 57' 17"	0.62558
12	352° 27' 50"	0° 42' 47"	352° 47' 51"	-2° 20' 07"	0° 58' 20"	15' 53.66"	246° 56' 46"	0.63002
13	353° 01' 57"	0° 45' 45"	353° 18' 03"	-2° 03' 54"	0° 58' 22"	15' 54.28"	246° 56' 25"	0.63444
14	353° 36' 08"	0° 48' 44"	353° 48' 17"	-1° 47' 40"	0° 58' 24"	15' 54.91"	246° 56' 14"	0.63886
15	354° 10' 21"	0° 51' 42"	354° 18' 32"	-1° 31' 24"	0° 58' 27"	15' 55.53"	246° 56' 14"	0.64328
16	354° 44' 37"	0° 54' 40"	354° 48' 50"	-1° 15' 06"	0° 58' 29"	15' 56.16"	246° 56' 24"	0.64769
17	355° 18' 56"	0° 57' 39"	355° 19' 10"	0°-58' 47"	0° 58' 31"	15' 56.79"	246° 56' 44"	0.65210
18	355° 53' 18"	1° 00' 37"	355° 49' 32"	0°-42' 25"	0° 58' 33"	15' 57.41"	246° 57' 16"	0.65649
19	356° 27' 42"	1° 03' 35"	356° 19' 56"	0°-26' 03"	0° 58' 36"	15' 58.04"	246° 57' 58"	0.66088
20	357° 02' 10"	1° 06' 33"	356° 50' 22"	0° -9' 39"	0° 58' 38"	15' 58.66"	246° 58' 51"	0.66527
21	357° 36' 40"	1° 09' 30"	357° 20' 51"	0° 06' 47"	0° 58' 40"	15' 59.29"	246° 59' 54"	0.66964
22	358° 11' 13"	1° 12' 28"	357° 51' 23"	0° 23' 14"	0° 58' 43"	15' 59.92"	247° 1' 09"	0.67401
23	358° 45' 49"	1° 15' 25"	358° 21' 57"	0° 39' 42"	0° 58' 45"	16' 00.54"	247° 2' 35"	0.67836
24	359° 20' 28"	1° 18' 22"	358° 52' 34"	0° 56' 11"	0° 58' 47"	16' 01.17"	247° 4' 11"	0.68271

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	248° 01' 49"	0.30"	246° 15' 38"	-21° 38' 44"	0.9863045	16' 12.96"	23° 26' 18"	11 m 26 s
1	248° 04' 21"	0.30"	246° 18' 19"	-21° 39' 08"	0.9862973	16' 12.96"	23° 26' 18"	11 m 25 s
2	248° 06' 53"	0.31"	246° 21' 00"	-21° 39' 32"	0.9862902	16' 12.97"	23° 26' 18"	11 m 24 s
3	248° 09' 25"	0.31"	246° 23' 42"	-21° 39' 57"	0.9862830	16' 12.98"	23° 26' 18"	11 m 23 s
4	248° 11' 57"	0.32"	246° 26' 23"	-21° 40' 21"	0.9862759	16' 12.98"	23° 26' 18"	11 m 23 s
5	248° 14' 29"	0.32"	246° 29' 05"	-21° 40' 45"	0.9862687	16' 12.99"	23° 26' 18"	11 m 22 s
6	248° 17' 01"	0.33"	246° 31' 46"	-21° 41' 09"	0.9862616	16' 13.00"	23° 26' 18"	11 m 21 s
7	248° 19' 33"	0.33"	246° 34' 28"	-21° 41' 33"	0.9862545	16' 13.00"	23° 26' 18"	11 m 20 s
8	248° 22' 05"	0.34"	246° 37' 09"	-21° 41' 57"	0.9862474	16' 13.01"	23° 26' 18"	11 m 19 s
9	248° 24' 37"	0.34"	246° 39' 51"	-21° 42' 21"	0.9862403	16' 13.02"	23° 26' 18"	11 m 18 s
10	248° 27' 09"	0.35"	246° 42' 32"	-21° 42' 45"	0.9862332	16' 13.03"	23° 26' 18"	11 m 17 s
11	248° 29' 41"	0.35"	246° 45' 14"	-21° 43' 09"	0.9862261	16' 13.03"	23° 26' 18"	11 m 16 s
12	248° 32' 13"	0.36"	246° 47' 55"	-21° 43' 33"	0.9862190	16' 13.04"	23° 26' 18"	11 m 15 s
13	248° 34' 45"	0.36"	246° 50' 37"	-21° 43' 56"	0.9862119	16' 13.05"	23° 26' 18"	11 m 14 s
14	248° 37' 17"	0.37"	246° 53' 18"	-21° 44' 20"	0.9862049	16' 13.05"	23° 26' 18"	11 m 13 s
15	248° 39' 49"	0.37"	246° 55' 60"	-21° 44' 44"	0.9861978	16' 13.06"	23° 26' 18"	11 m 12 s
16	248° 42' 21"	0.38"	246° 58' 41"	-21° 45' 07"	0.9861908	16' 13.07"	23° 26' 18"	11 m 11 s
17	248° 44' 53"	0.38"	247° 01' 23"	-21° 45' 31"	0.9861837	16' 13.07"	23° 26' 18"	11 m 11 s
18	248° 47' 24"	0.39"	247° 04' 05"	-21° 45' 55"	0.9861767	16' 13.08"	23° 26' 18"	11 m 10 s
19	248° 49' 56"	0.39"	247° 06' 46"	-21° 46' 18"	0.9861697	16' 13.09"	23° 26' 18"	11 m 09 s
20	248° 52' 28"	0.40"	247° 09' 28"	-21° 46' 42"	0.9861627	16' 13.10"	23° 26' 18"	11 m 08 s
21	248° 55' 00"	0.40"	247° 12' 10"	-21° 47' 05"	0.9861557	16' 13.10"	23° 26' 18"	11 m 07 s
22	248° 57' 32"	0.41"	247° 14' 51"	-21° 47' 28"	0.9861487	16' 13.11"	23° 26' 18"	11 m 06 s
23	249° 00' 04"	0.41"	247° 17' 33"	-21° 47' 52"	0.9861417	16' 13.12"	23° 26' 18"	11 m 05 s
24	249° 02' 36"	0.41"	247° 20' 15"	-21° 48' 15"	0.9861347	16' 13.12"	23° 26' 18"	11 m 04 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	359° 20' 28"	1° 18' 22"	358° 52' 34"	0° 56' 11"	0° 58' 47"	16' 01.17"	247° 4' 11"	0.68271
1	359° 55' 10"	1° 21' 19"	359° 23' 13"	1° 12' 41"	0° 58' 50"	16' 01.79"	247° 5' 59"	0.68705
2	0° 29' 55"	1° 24' 15"	359° 53' 56"	1° 29' 12"	0° 58' 52"	16' 02.42"	247° 7' 58"	0.69138
3	1° 04' 43"	1° 27' 11"	0° 24' 41"	1° 45' 44"	0° 58' 54"	16' 03.04"	247° 10' 09"	0.69569
4	1° 39' 33"	1° 30' 07"	0° 55' 30"	2° 02' 17"	0° 58' 56"	16' 03.66"	247° 12' 31"	0.70000
5	2° 14' 27"	1° 33' 03"	1° 26' 21"	2° 18' 51"	0° 58' 59"	16' 04.29"	247° 15' 04"	0.70430
6	2° 49' 23"	1° 35' 58"	1° 57' 16"	2° 35' 25"	0° 59' 01"	16' 04.91"	247° 17' 49"	0.70858
7	3° 24' 23"	1° 38' 53"	2° 28' 14"	2° 51' 60"	0° 59' 03"	16' 05.53"	247° 20' 46"	0.71285
8	3° 59' 25"	1° 41' 47"	2° 59' 16"	3° 08' 35"	0° 59' 06"	16' 06.15"	247° 23' 55"	0.71710
9	4° 34' 30"	1° 44' 42"	3° 30' 21"	3° 25' 11"	0° 59' 08"	16' 06.76"	247° 27' 15"	0.72135
10	5° 09' 39"	1° 47' 35"	4° 01' 29"	3° 41' 47"	0° 59' 10"	16' 07.38"	247° 30' 48"	0.72558
11	5° 44' 50"	1° 50' 28"	4° 32' 41"	3° 58' 23"	0° 59' 12"	16' 07.99"	247° 34' 32"	0.72979
12	6° 20' 04"	1° 53' 21"	5° 03' 57"	4° 14' 60"	0° 59' 15"	16' 08.61"	247° 38' 29"	0.73399
13	6° 55' 21"	1° 56' 13"	5° 35' 17"	4° 31' 36"	0° 59' 17"	16' 09.22"	247° 42' 38"	0.73818
14	7° 30' 41"	1° 59' 05"	6° 06' 41"	4° 48' 13"	0° 59' 19"	16' 09.83"	247° 46' 60"	0.74235
15	8° 06' 03"	2° 01' 56"	6° 38' 09"	5° 04' 49"	0° 59' 21"	16' 10.44"	247° 51' 34"	0.74650
16	8° 41' 29"	2° 04' 46"	7° 09' 41"	5° 21' 25"	0° 59' 23"	16' 11.05"	247° 56' 21"	0.75063
17	9° 16' 58"	2° 07' 36"	7° 41' 17"	5° 38' 01"	0° 59' 26"	16' 11.65"	248° 1' 21"	0.75475
18	9° 52' 29"	2° 10' 26"	8° 12' 58"	5° 54' 36"	0° 59' 28"	16' 12.25"	248° 6' 34"	0.75885
19	10° 28' 04"	2° 13' 15"	8° 44' 42"	6° 11' 11"	0° 59' 30"	16' 12.85"	248° 11' 59"	0.76294
20	11° 03' 41"	2° 16' 03"	9° 16' 32"	6° 27' 45"	0° 59' 32"	16' 13.45"	248° 17' 39"	0.76700
21	11° 39' 22"	2° 18' 50"	9° 48' 26"	6° 44' 19"	0° 59' 35"	16' 14.04"	248° 23' 31"	0.77104
22	12° 15' 05"	2° 21' 37"	10° 20' 24"	7° 00' 52"	0° 59' 37"	16' 14.64"	248° 29' 37"	0.77507
23	12° 50' 51"	2° 24' 23"	10° 52' 28"	7° 17' 23"	0° 59' 39"	16' 15.23"	248° 35' 57"	0.77907
24	13° 26' 40"	2° 27' 08"	11° 24' 36"	7° 33' 54"	0° 59' 41"	16' 15.81"	248° 42' 30"	0.78306

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	249° 02' 36"	0.41"	247° 20' 15"	-21° 48' 15"	0.9861347	16'13.12"	23° 26' 18"	11 m 04 s
1	249° 05' 08"	0.42"	247° 22' 57"	-21° 48' 38"	0.9861278	16'13.13"	23° 26' 18"	11 m 03 s
2	249° 07' 40"	0.42"	247° 25' 38"	-21° 49' 02"	0.9861208	16'13.14"	23° 26' 18"	11 m 02 s
3	249° 10' 12"	0.43"	247° 28' 20"	-21° 49' 25"	0.9861139	16'13.14"	23° 26' 18"	11 m 01 s
4	249° 12' 44"	0.43"	247° 31' 02"	-21° 49' 48"	0.9861069	16'13.15"	23° 26' 18"	11 m 00 s
5	249° 15' 16"	0.44"	247° 33' 44"	-21° 50' 11"	0.9861000	16'13.16"	23° 26' 18"	10 m 59 s
6	249° 17' 48"	0.44"	247° 36' 26"	-21° 50' 34"	0.9860931	16'13.16"	23° 26' 18"	10 m 58 s
7	249° 20' 20"	0.45"	247° 39' 07"	-21° 50' 57"	0.9860862	16'13.17"	23° 26' 18"	10 m 57 s
8	249° 22' 52"	0.45"	247° 41' 49"	-21° 51' 20"	0.9860793	16'13.18"	23° 26' 18"	10 m 57 s
9	249° 25' 24"	0.45"	247° 44' 31"	-21° 51' 43"	0.9860724	16'13.18"	23° 26' 18"	10 m 56 s
10	249° 27' 56"	0.46"	247° 47' 13"	-21° 52' 06"	0.9860655	16'13.19"	23° 26' 18"	10 m 55 s
11	249° 30' 28"	0.46"	247° 49' 55"	-21° 52' 29"	0.9860586	16'13.20"	23° 26' 18"	10 m 54 s
12	249° 32' 60"	0.47"	247° 52' 37"	-21° 52' 51"	0.9860518	16'13.20"	23° 26' 18"	10 m 53 s
13	249° 35' 32"	0.47"	247° 55' 19"	-21° 53' 14"	0.9860449	16'13.21"	23° 26' 18"	10 m 52 s
14	249° 38' 04"	0.48"	247° 58' 01"	-21° 53' 37"	0.9860380	16'13.22"	23° 26' 18"	10 m 51 s
15	249° 40' 36"	0.48"	248° 00' 43"	-21° 53' 59"	0.9860312	16'13.22"	23° 26' 18"	10 m 50 s
16	249° 43' 08"	0.48"	248° 03' 25"	-21° 54' 22"	0.9860244	16'13.23"	23° 26' 18"	10 m 49 s
17	249° 45' 40"	0.49"	248° 06' 07"	-21° 54' 45"	0.9860176	16'13.24"	23° 26' 18"	10 m 48 s
18	249° 48' 12"	0.49"	248° 08' 49"	-21° 55' 07"	0.9860108	16'13.24"	23° 26' 18"	10 m 47 s
19	249° 50' 44"	0.50"	248° 11' 31"	-21° 55' 30"	0.9860039	16'13.25"	23° 26' 18"	10 m 46 s
20	249° 53' 16"	0.50"	248° 14' 13"	-21° 55' 52"	0.9859972	16'13.26"	23° 26' 18"	10 m 45 s
21	249° 55' 48"	0.50"	248° 16' 55"	-21° 56' 14"	0.9859904	16'13.27"	23° 26' 18"	10 m 44 s
22	249° 58' 20"	0.51"	248° 19' 37"	-21° 56' 37"	0.9859836	16'13.27"	23° 26' 18"	10 m 43 s
23	250° 00' 52"	0.51"	248° 22' 19"	-21° 56' 59"	0.9859768	16'13.28"	23° 26' 18"	10 m 42 s
24	250° 03' 24"	0.51"	248° 25' 01"	-21° 57' 21"	0.9859701	16'13.29"	23° 26' 18"	10 m 41 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	13° 26' 40"	2° 27' 08"	11° 24' 36"	7° 33' 54"	0° 59' 41"	16' 15.81"	248° 42' 30"	0.78306
1	14° 02' 32"	2° 29' 52"	11° 56' 49"	7° 50' 24"	0° 59' 43"	16' 16.40"	248° 49' 17"	0.78702
2	14° 38' 27"	2° 32' 36"	12° 29' 07"	8° 06' 52"	0° 59' 45"	16' 16.98"	248° 56' 19"	0.79096
3	15° 14' 25"	2° 35' 19"	13° 01' 30"	8° 23' 19"	0° 59' 47"	16' 17.56"	249° 3' 35"	0.79488
4	15° 50' 25"	2° 38' 01"	13° 33' 59"	8° 39' 45"	0° 59' 50"	16' 18.13"	249° 11' 05"	0.79877
5	16° 26' 29"	2° 40' 42"	14° 06' 32"	8° 56' 09"	0° 59' 52"	16' 18.71"	249° 18' 50"	0.80265
6	17° 02' 35"	2° 43' 22"	14° 39' 11"	9° 12' 32"	0° 59' 54"	16' 19.27"	249° 26' 50"	0.80650
7	17° 38' 44"	2° 46' 02"	15° 11' 56"	9° 28' 53"	0° 59' 56"	16' 19.84"	249° 35' 05"	0.81032
8	18° 14' 56"	2° 48' 40"	15° 44' 46"	9° 45' 12"	0° 59' 58"	16' 20.40"	249° 43' 36"	0.81412
9	18° 51' 10"	2° 51' 18"	16° 17' 42"	10° 01' 29"	0° 59' 60"	16' 20.96"	249° 52' 21"	0.81789
10	19° 27' 28"	2° 53' 54"	16° 50' 43"	10° 17' 43"	1° 00' 02"	16' 21.51"	250° 1' 23"	0.82164
11	20° 03' 48"	2° 56' 30"	17° 23' 50"	10° 33' 56"	1° 00' 04"	16' 22.06"	250° 10' 40"	0.82537
12	20° 40' 11"	2° 59' 05"	17° 57' 03"	10° 50' 06"	1° 00' 06"	16' 22.60"	250° 20' 14"	0.82906
13	21° 16' 37"	3° 01' 38"	18° 30' 22"	11° 06' 14"	1° 00' 08"	16' 23.15"	250° 30' 04"	0.83273
14	21° 53' 05"	3° 04' 11"	19° 03' 47"	11° 22' 20"	1° 00' 10"	16' 23.68"	250° 40' 10"	0.83637
15	22° 29' 37"	3° 06' 42"	19° 37' 18"	11° 38' 22"	1° 00' 12"	16' 24.21"	250° 50' 34"	0.83998
16	23° 06' 11"	3° 09' 12"	20° 10' 55"	11° 54' 22"	1° 00' 14"	16' 24.74"	251° 1' 14"	0.84356
17	23° 42' 47"	3° 11' 41"	20° 44' 39"	12° 10' 19"	1° 00' 16"	16' 25.26"	251° 12' 12"	0.84712
18	24° 19' 26"	3° 14' 09"	21° 18' 29"	12° 26' 13"	1° 00' 18"	16' 25.78"	251° 23' 28"	0.85064
19	24° 56' 08"	3° 16' 36"	21° 52' 25"	12° 42' 04"	1° 00' 19"	16' 26.30"	251° 35' 02"	0.85414
20	25° 32' 53"	3° 19' 02"	22° 26' 28"	12° 57' 51"	1° 00' 21"	16' 26.80"	251° 46' 54"	0.85760
21	26° 09' 40"	3° 21' 26"	23° 00' 38"	13° 13' 35"	1° 00' 23"	16' 27.31"	251° 59' 05"	0.86103
22	26° 46' 30"	3° 23' 49"	23° 34' 54"	13° 29' 15"	1° 00' 25"	16' 27.81"	252° 11' 35"	0.86443
23	27° 23' 22"	3° 26' 11"	24° 09' 17"	13° 44' 52"	1° 00' 27"	16' 28.30"	252° 24' 25"	0.86780
24	28° 00' 17"	3° 28' 32"	24° 43' 46"	14° 00' 25"	1° 00' 29"	16' 28.78"	252° 37' 34"	0.87113

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	250° 03' 24"	0.51"	248° 25' 01"	-21° 57' 21"	0.9859701	16' 13.29"	23° 26' 18"	10 m 41 s
1	250° 05' 56"	0.52"	248° 27' 44"	-21° 57' 44"	0.9859633	16' 13.29"	23° 26' 18"	10 m 40 s
2	250° 08' 28"	0.52"	248° 30' 26"	-21° 58' 06"	0.9859566	16' 13.30"	23° 26' 18"	10 m 39 s
3	250° 11' 00"	0.53"	248° 33' 08"	-21° 58' 28"	0.9859499	16' 13.31"	23° 26' 18"	10 m 38 s
4	250° 13' 32"	0.53"	248° 35' 50"	-21° 58' 50"	0.9859432	16' 13.31"	23° 26' 18"	10 m 37 s
5	250° 16' 04"	0.53"	248° 38' 32"	-21° 59' 12"	0.9859364	16' 13.32"	23° 26' 18"	10 m 36 s
6	250° 18' 36"	0.54"	248° 41' 14"	-21° 59' 34"	0.9859297	16' 13.32"	23° 26' 18"	10 m 36 s
7	250° 21' 08"	0.54"	248° 43' 57"	-21° 59' 56"	0.9859231	16' 13.33"	23° 26' 18"	10 m 35 s
8	250° 23' 40"	0.54"	248° 46' 39"	-22° 00' 18"	0.9859164	16' 13.34"	23° 26' 18"	10 m 34 s
9	250° 26' 12"	0.55"	248° 49' 21"	-22° 00' 40"	0.9859097	16' 13.34"	23° 26' 18"	10 m 33 s
10	250° 28' 44"	0.55"	248° 52' 04"	-22° 01' 01"	0.9859031	16' 13.35"	23° 26' 18"	10 m 32 s
11	250° 31' 16"	0.55"	248° 54' 46"	-22° 01' 23"	0.9858964	16' 13.36"	23° 26' 18"	10 m 31 s
12	250° 33' 48"	0.56"	248° 57' 28"	-22° 01' 45"	0.9858898	16' 13.36"	23° 26' 18"	10 m 30 s
13	250° 36' 20"	0.56"	249° 00' 10"	-22° 02' 07"	0.9858831	16' 13.37"	23° 26' 18"	10 m 29 s
14	250° 38' 52"	0.56"	249° 02' 53"	-22° 02' 28"	0.9858765	16' 13.38"	23° 26' 18"	10 m 28 s
15	250° 41' 24"	0.56"	249° 05' 35"	-22° 02' 50"	0.9858699	16' 13.38"	23° 26' 18"	10 m 27 s
16	250° 43' 56"	0.57"	249° 08' 18"	-22° 03' 11"	0.9858633	16' 13.39"	23° 26' 18"	10 m 26 s
17	250° 46' 28"	0.57"	249° 10' 60"	-22° 03' 33"	0.9858567	16' 13.40"	23° 26' 18"	10 m 25 s
18	250° 49' 00"	0.57"	249° 13' 42"	-22° 03' 54"	0.9858501	16' 13.40"	23° 26' 18"	10 m 24 s
19	250° 51' 32"	0.58"	249° 16' 25"	-22° 04' 16"	0.9858435	16' 13.41"	23° 26' 18"	10 m 23 s
20	250° 54' 04"	0.58"	249° 19' 07"	-22° 04' 37"	0.9858370	16' 13.42"	23° 26' 18"	10 m 22 s
21	250° 56' 37"	0.58"	249° 21' 50"	-22° 04' 59"	0.9858304	16' 13.42"	23° 26' 18"	10 m 21 s
22	250° 59' 09"	0.59"	249° 24' 32"	-22° 05' 20"	0.9858239	16' 13.43"	23° 26' 18"	10 m 20 s
23	251° 01' 41"	0.59"	249° 27' 15"	-22° 05' 41"	0.9858174	16' 13.44"	23° 26' 18"	10 m 19 s
24	251° 04' 13"	0.59"	249° 29' 57"	-22° 06' 02"	0.9858108	16' 13.44"	23° 26' 18"	10 m 18 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	28° 00' 17"	3° 28' 32"	24° 43' 46"	14° 00' 25"	1° 00' 29"	16' 28.78"	252° 37' 34"	0.87113
1	28° 37' 14"	3° 30' 51"	25° 18' 23"	14° 15' 54"	1° 00' 30"	16' 29.27"	252° 51' 04"	0.87443
2	29° 14' 14"	3° 33' 09"	25° 53' 06"	14° 31' 19"	1° 00' 32"	16' 29.74"	253° 4' 54"	0.87770
3	29° 51' 16"	3° 35' 25"	26° 27' 57"	14° 46' 40"	1° 00' 34"	16' 30.21"	253° 19' 05"	0.88094
4	30° 28' 21"	3° 37' 40"	27° 02' 54"	15° 01' 57"	1° 00' 36"	16' 30.68"	253° 33' 38"	0.88413
5	31° 05' 28"	3° 39' 54"	27° 37' 59"	15° 17' 09"	1° 00' 37"	16' 31.13"	253° 48' 33"	0.88730
6	31° 42' 38"	3° 42' 06"	28° 13' 10"	15° 32' 16"	1° 00' 39"	16' 31.59"	254° 3' 50"	0.89042
7	32° 19' 50"	3° 44' 17"	28° 48' 30"	15° 47' 19"	1° 00' 41"	16' 32.03"	254° 19' 31"	0.89352
8	32° 57' 04"	3° 46' 27"	29° 23' 56"	16° 02' 17"	1° 00' 42"	16' 32.47"	254° 35' 35"	0.89657
9	33° 34' 21"	3° 48' 35"	29° 59' 29"	16° 17' 09"	1° 00' 44"	16' 32.90"	254° 52' 04"	0.89959
10	34° 11' 40"	3° 50' 41"	30° 35' 11"	16° 31' 57"	1° 00' 45"	16' 33.33"	255° 8' 57"	0.90257
11	34° 49' 01"	3° 52' 46"	31° 10' 59"	16° 46' 39"	1° 00' 47"	16' 33.75"	255° 26' 16"	0.90551
12	35° 26' 24"	3° 54' 49"	31° 46' 55"	17° 01' 16"	1° 00' 48"	16' 34.16"	255° 44' 02"	0.90841
13	36° 03' 50"	3° 56' 51"	32° 22' 59"	17° 15' 48"	1° 00' 50"	16' 34.57"	256° 2' 14"	0.91127
14	36° 41' 17"	3° 58' 51"	32° 59' 10"	17° 30' 13"	1° 00' 51"	16' 34.97"	256° 20' 55"	0.91410
15	37° 18' 47"	4° 00' 50"	33° 35' 28"	17° 44' 33"	1° 00' 53"	16' 35.36"	256° 40' 04"	0.91688
16	37° 56' 19"	4° 02' 47"	34° 11' 55"	17° 58' 47"	1° 00' 54"	16' 35.75"	256° 59' 43"	0.91963
17	38° 33' 53"	4° 04' 42"	34° 48' 29"	18° 12' 55"	1° 00' 56"	16' 36.12"	257° 19' 53"	0.92233
18	39° 11' 29"	4° 06' 35"	35° 25' 11"	18° 26' 56"	1° 00' 57"	16' 36.49"	257° 40' 35"	0.92499
19	39° 49' 07"	4° 08' 27"	36° 02' 00"	18° 40' 51"	1° 00' 58"	16' 36.86"	258° 1' 50"	0.92761
20	40° 26' 47"	4° 10' 17"	36° 38' 58"	18° 54' 39"	1° 00' 60"	16' 37.21"	258° 23' 39"	0.93019
21	41° 04' 28"	4° 12' 06"	37° 16' 03"	19° 08' 21"	1° 01' 01"	16' 37.56"	258° 46' 03"	0.93273
22	41° 42' 12"	4° 13' 52"	37° 53' 16"	19° 21' 56"	1° 01' 02"	16' 37.90"	259° 9' 04"	0.93522
23	42° 19' 58"	4° 15' 37"	38° 30' 37"	19° 35' 23"	1° 01' 03"	16' 38.23"	259° 32' 44"	0.93767
24	42° 57' 45"	4° 17' 20"	39° 08' 05"	19° 48' 44"	1° 01' 04"	16' 38.56"	259° 57' 04"	0.94007

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	251° 04' 13"	0.59"	249° 29' 57"	-22° 06' 02"	0.9858108	16'13.44"	23° 26' 18"	10 m 18 s
1	251° 06' 45"	0.59"	249° 32' 40"	-22° 06' 23"	0.9858043	16'13.45"	23° 26' 18"	10 m 17 s
2	251° 09' 17"	0.60"	249° 35' 22"	-22° 06' 45"	0.9857978	16'13.46"	23° 26' 18"	10 m 16 s
3	251° 11' 49"	0.60"	249° 38' 05"	-22° 07' 06"	0.9857913	16'13.46"	23° 26' 18"	10 m 15 s
4	251° 14' 21"	0.60"	249° 40' 47"	-22° 07' 27"	0.9857848	16'13.47"	23° 26' 18"	10 m 14 s
5	251° 16' 53"	0.60"	249° 43' 30"	-22° 07' 48"	0.9857784	16'13.47"	23° 26' 18"	10 m 13 s
6	251° 19' 25"	0.61"	249° 46' 13"	-22° 08' 09"	0.9857719	16'13.48"	23° 26' 18"	10 m 12 s
7	251° 21' 57"	0.61"	249° 48' 55"	-22° 08' 29"	0.9857654	16'13.49"	23° 26' 18"	10 m 11 s
8	251° 24' 29"	0.61"	249° 51' 38"	-22° 08' 50"	0.9857590	16'13.49"	23° 26' 18"	10 m 10 s
9	251° 27' 01"	0.61"	249° 54' 20"	-22° 09' 11"	0.9857526	16'13.50"	23° 26' 18"	10 m 09 s
10	251° 29' 33"	0.61"	249° 57' 03"	-22° 09' 32"	0.9857461	16'13.51"	23° 26' 18"	10 m 08 s
11	251° 32' 05"	0.62"	249° 59' 46"	-22° 09' 53"	0.9857397	16'13.51"	23° 26' 18"	10 m 07 s
12	251° 34' 37"	0.62"	250° 02' 28"	-22° 10' 13"	0.9857333	16'13.52"	23° 26' 18"	10 m 06 s
13	251° 37' 09"	0.62"	250° 05' 11"	-22° 10' 34"	0.9857269	16'13.53"	23° 26' 18"	10 m 05 s
14	251° 39' 42"	0.62"	250° 07' 54"	-22° 10' 54"	0.9857205	16'13.53"	23° 26' 18"	10 m 04 s
15	251° 42' 14"	0.62"	250° 10' 37"	-22° 11' 15"	0.9857142	16'13.54"	23° 26' 18"	10 m 03 s
16	251° 44' 46"	0.63"	250° 13' 19"	-22° 11' 35"	0.9857078	16'13.54"	23° 26' 18"	10 m 02 s
17	251° 47' 18"	0.63"	250° 16' 02"	-22° 11' 56"	0.9857014	16'13.55"	23° 26' 18"	10 m 01 s
18	251° 49' 50"	0.63"	250° 18' 45"	-22° 12' 16"	0.9856951	16'13.56"	23° 26' 18"	10 m 00 s
19	251° 52' 22"	0.63"	250° 21' 28"	-22° 12' 37"	0.9856888	16'13.56"	23° 26' 18"	9 m 59 s
20	251° 54' 54"	0.63"	250° 24' 10"	-22° 12' 57"	0.9856824	16'13.57"	23° 26' 18"	9 m 58 s
21	251° 57' 26"	0.64"	250° 26' 53"	-22° 13' 17"	0.9856761	16'13.58"	23° 26' 18"	9 m 57 s
22	251° 59' 58"	0.64"	250° 29' 36"	-22° 13' 37"	0.9856698	16'13.58"	23° 26' 18"	9 m 56 s
23	252° 02' 30"	0.64"	250° 32' 19"	-22° 13' 58"	0.9856635	16'13.59"	23° 26' 18"	9 m 55 s
24	252° 05' 02"	0.64"	250° 35' 02"	-22° 14' 18"	0.9856572	16'13.59"	23° 26' 18"	9 m 54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	42° 57' 45"	4° 17' 20"	39° 08' 05"	19° 48' 44"	1° 01' 04"	16' 38.56"	259° 57' 04"	0.94007
1	43° 35' 34"	4° 19' 02"	39° 45' 42"	20° 01' 57"	1° 01' 06"	16' 38.87"	260° 22' 06"	0.94243
2	44° 13' 25"	4° 20' 41"	40° 23' 26"	20° 15' 03"	1° 01' 07"	16' 39.18"	260° 47' 52"	0.94475
3	44° 51' 17"	4° 22' 19"	41° 01' 18"	20° 28' 01"	1° 01' 08"	16' 39.48"	261° 14' 24"	0.94702
4	45° 29' 11"	4° 23' 54"	41° 39' 19"	20° 40' 52"	1° 01' 09"	16' 39.77"	261° 41' 44"	0.94925
5	46° 07' 07"	4° 25' 28"	42° 17' 27"	20° 53' 34"	1° 01' 10"	16' 40.06"	262° 9' 55"	0.95143
6	46° 45' 04"	4° 26' 60"	42° 55' 42"	21° 06' 09"	1° 01' 11"	16' 40.33"	262° 38' 59"	0.95356
7	47° 23' 03"	4° 28' 30"	43° 34' 06"	21° 18' 35"	1° 01' 12"	16' 40.60"	263° 8' 60"	0.95565
8	48° 01' 03"	4° 29' 58"	44° 12' 37"	21° 30' 53"	1° 01' 13"	16' 40.86"	263° 40' 00"	0.95769
9	48° 39' 05"	4° 31' 24"	44° 51' 17"	21° 43' 02"	1° 01' 14"	16' 41.10"	264° 12' 04"	0.95969
10	49° 17' 08"	4° 32' 48"	45° 30' 04"	21° 55' 03"	1° 01' 15"	16' 41.35"	264° 45' 14"	0.96164
11	49° 55' 12"	4° 34' 10"	46° 08' 59"	22° 06' 55"	1° 01' 16"	16' 41.58"	265° 19' 36"	0.96354
12	50° 33' 18"	4° 35' 31"	46° 48' 01"	22° 18' 39"	1° 01' 16"	16' 41.80"	265° 55' 15"	0.96539
13	51° 11' 25"	4° 36' 49"	47° 27' 11"	22° 30' 13"	1° 01' 17"	16' 42.01"	266° 32' 15"	0.96719
14	51° 49' 33"	4° 38' 05"	48° 06' 29"	22° 41' 38"	1° 01' 18"	16' 42.22"	267° 10' 42"	0.96894
15	52° 27' 42"	4° 39' 19"	48° 45' 54"	22° 52' 53"	1° 01' 19"	16' 42.42"	267° 50' 43"	0.97065
16	53° 05' 53"	4° 40' 31"	49° 25' 27"	23° 03' 59"	1° 01' 19"	16' 42.60"	268° 32' 25"	0.97231
17	53° 44' 04"	4° 41' 41"	50° 05' 08"	23° 14' 56"	1° 01' 20"	16' 42.78"	269° 15' 56"	0.97391
18	54° 22' 17"	4° 42' 49"	50° 44' 55"	23° 25' 42"	1° 01' 21"	16' 42.95"	270° 1' 26"	0.97547
19	55° 00' 30"	4° 43' 55"	51° 24' 50"	23° 36' 19"	1° 01' 21"	16' 43.11"	270° 49' 04"	0.97698
20	55° 38' 45"	4° 44' 58"	52° 04' 53"	23° 46' 46"	1° 01' 22"	16' 43.26"	271° 39' 02"	0.97843
21	56° 16' 60"	4° 45' 60"	52° 45' 02"	23° 57' 03"	1° 01' 22"	16' 43.40"	272° 31' 34"	0.97984
22	56° 55' 16"	4° 46' 59"	53° 25' 19"	24° 07' 09"	1° 01' 23"	16' 43.53"	273° 26' 53"	0.98119
23	57° 33' 30"	4° 47' 57"	54° 05' 40"	24° 17' 04"	1° 01' 23"	16' 43.65"	274° 25' 12"	0.98250
24	58° 11' 48"	4° 48' 52"	54° 46' 10"	24° 26' 49"	1° 01' 24"	16' 43.77"	275° 26' 60"	0.98375

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	252° 05' 02"	0.64"	250° 35' 02"	-22° 14' 18"	0.9856572	16' 13.59"	23° 26' 18"	9 m 54 s
1	252° 07' 34"	0.64"	250° 37' 45"	-22° 14' 38"	0.9856510	16' 13.60"	23° 26' 18"	9 m 53 s
2	252° 10' 07"	0.64"	250° 40' 28"	-22° 14' 58"	0.9856447	16' 13.61"	23° 26' 17"	9 m 52 s
3	252° 12' 39"	0.64"	250° 43' 11"	-22° 15' 18"	0.9856385	16' 13.61"	23° 26' 17"	9 m 51 s
4	252° 15' 11"	0.64"	250° 45' 53"	-22° 15' 38"	0.9856322	16' 13.62"	23° 26' 17"	9 m 50 s
5	252° 17' 43"	0.65"	250° 48' 36"	-22° 15' 58"	0.9856260	16' 13.62"	23° 26' 17"	9 m 49 s
6	252° 20' 15"	0.65"	250° 51' 19"	-22° 16' 18"	0.9856198	16' 13.63"	23° 26' 17"	9 m 48 s
7	252° 22' 47"	0.65"	250° 54' 02"	-22° 16' 37"	0.9856135	16' 13.64"	23° 26' 17"	9 m 47 s
8	252° 25' 19"	0.65"	250° 56' 45"	-22° 16' 57"	0.9856073	16' 13.64"	23° 26' 17"	9 m 46 s
9	252° 27' 51"	0.65"	250° 59' 28"	-22° 17' 17"	0.9856012	16' 13.65"	23° 26' 17"	9 m 45 s
10	252° 30' 23"	0.65"	251° 02' 11"	-22° 17' 37"	0.9855950	16' 13.66"	23° 26' 17"	9 m 44 s
11	252° 32' 55"	0.65"	251° 04' 54"	-22° 17' 56"	0.9855888	16' 13.66"	23° 26' 17"	9 m 43 s
12	252° 35' 28"	0.65"	251° 07' 37"	-22° 18' 16"	0.9855826	16' 13.67"	23° 26' 17"	9 m 42 s
13	252° 37' 60"	0.65"	251° 10' 20"	-22° 18' 35"	0.9855765	16' 13.67"	23° 26' 17"	9 m 41 s
14	252° 40' 32"	0.65"	251° 13' 04"	-22° 18' 55"	0.9855703	16' 13.68"	23° 26' 17"	9 m 40 s
15	252° 43' 04"	0.66"	251° 15' 47"	-22° 19' 14"	0.9855642	16' 13.69"	23° 26' 17"	9 m 39 s
16	252° 45' 36"	0.66"	251° 18' 30"	-22° 19' 34"	0.9855581	16' 13.69"	23° 26' 17"	9 m 38 s
17	252° 48' 08"	0.66"	251° 21' 13"	-22° 19' 53"	0.9855520	16' 13.70"	23° 26' 17"	9 m 37 s
18	252° 50' 40"	0.66"	251° 23' 56"	-22° 20' 12"	0.9855459	16' 13.70"	23° 26' 17"	9 m 36 s
19	252° 53' 12"	0.66"	251° 26' 39"	-22° 20' 32"	0.9855398	16' 13.71"	23° 26' 17"	9 m 35 s
20	252° 55' 45"	0.66"	251° 29' 22"	-22° 20' 51"	0.9855337	16' 13.72"	23° 26' 17"	9 m 34 s
21	252° 58' 17"	0.66"	251° 32' 06"	-22° 21' 10"	0.9855276	16' 13.72"	23° 26' 17"	9 m 33 s
22	253° 00' 49"	0.66"	251° 34' 49"	-22° 21' 29"	0.9855216	16' 13.73"	23° 26' 17"	9 m 32 s
23	253° 03' 21"	0.66"	251° 37' 32"	-22° 21' 48"	0.9855155	16' 13.73"	23° 26' 17"	9 m 31 s
24	253° 05' 53"	0.66"	251° 40' 15"	-22° 22' 07"	0.9855095	16' 13.74"	23° 26' 17"	9 m 29 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	58° 11' 48"	4° 48' 52"	54° 46' 10"	24° 26' 49"	1° 01' 24"	16' 43.77"	275° 26' 60"	0.98375
1	58° 50' 06"	4° 49' 45"	55° 26' 48"	24° 36' 24"	1° 01' 24"	16' 43.87"	276° 32' 33"	0.98495
2	59° 28' 25"	4° 50' 36"	56° 07' 32"	24° 45' 47"	1° 01' 24"	16' 43.96"	277° 42' 18"	0.98610
3	60° 06' 44"	4° 51' 24"	56° 48' 23"	24° 55' 00"	1° 01' 25"	16' 44.05"	278° 56' 43"	0.98720
4	60° 45' 04"	4° 52' 11"	57° 29' 20"	25° 04' 02"	1° 01' 25"	16' 44.12"	280° 16' 22"	0.98825
5	61° 23' 24"	4° 52' 55"	58° 10' 24"	25° 12' 52"	1° 01' 25"	16' 44.19"	281° 41' 54"	0.98924
6	62° 01' 45"	4° 53' 37"	58° 51' 33"	25° 21' 31"	1° 01' 25"	16' 44.24"	283° 14' 04"	0.99018
7	62° 40' 06"	4° 54' 17"	59° 32' 50"	25° 29' 59"	1° 01' 25"	16' 44.29"	284° 53' 46"	0.99107
8	63° 18' 28"	4° 54' 55"	60° 14' 12"	25° 38' 15"	1° 01' 26"	16' 44.32"	286° 42' 01"	0.99191
9	63° 56' 49"	4° 55' 30"	60° 55' 40"	25° 46' 20"	1° 01' 26"	16' 44.35"	288° 40' 01"	0.99269
10	64° 35' 11"	4° 56' 04"	61° 37' 13"	25° 54' 12"	1° 01' 26"	16' 44.36"	290° 49' 12"	0.99343
11	65° 13' 34"	4° 56' 35"	62° 18' 53"	26° 01' 53"	1° 01' 26"	16' 44.37"	293° 11' 11"	0.99411
12	65° 51' 56"	4° 57' 04"	63° 00' 37"	26° 09' 22"	1° 01' 26"	16' 44.37"	295° 47' 53"	0.99473
13	66° 30' 18"	4° 57' 30"	63° 42' 28"	26° 16' 39"	1° 01' 26"	16' 44.35"	298° 41' 28"	0.99530
14	67° 08' 40"	4° 57' 54"	64° 24' 23"	26° 23' 43"	1° 01' 26"	16' 44.33"	301° 54' 24"	0.99582
15	67° 47' 02"	4° 58' 16"	65° 06' 23"	26° 30' 36"	1° 01' 26"	16' 44.30"	305° 29' 22"	0.99629
16	68° 25' 25"	4° 58' 36"	65° 48' 28"	26° 37' 16"	1° 01' 25"	16' 44.26"	309° 29' 13"	0.99670
17	69° 03' 47"	4° 58' 54"	66° 30' 38"	26° 43' 43"	1° 01' 25"	16' 44.20"	313° 56' 42"	0.99706
18	69° 42' 08"	4° 59' 09"	67° 12' 52"	26° 49' 58"	1° 01' 25"	16' 44.14"	318° 54' 09"	0.99737
19	70° 20' 30"	4° 59' 22"	67° 55' 10"	26° 56' 00"	1° 01' 25"	16' 44.07"	324° 22' 54"	0.99763
20	70° 58' 51"	4° 59' 33"	68° 37' 32"	27° 01' 50"	1° 01' 24"	16' 43.99"	330° 22' 33"	0.99783
21	71° 37' 12"	4° 59' 42"	69° 19' 59"	27° 07' 26"	1° 01' 24"	16' 43.90"	336° 50' 17"	0.99797
22	72° 15' 32"	4° 59' 48"	70° 02' 29"	27° 12' 50"	1° 01' 24"	16' 43.80"	343° 40' 15"	0.99807
23	72° 53' 52"	4° 59' 52"	70° 45' 02"	27° 18' 01"	1° 01' 23"	16' 43.68"	350° 43' 42"	0.99811
24	73° 32' 11"	4° 59' 54"	71° 27' 39"	27° 22' 59"	1° 01' 23"	16' 43.56"	357° 49' 50"	0.99809

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	253° 05' 53"	0.66"	251° 40' 15"	-22° 22' 07"	0.9855095	16'13.74"	23° 26' 17"	9 m 29 s
1	253° 08' 25"	0.66"	251° 42' 58"	-22° 22' 26"	0.9855035	16'13.75"	23° 26' 17"	9 m 28 s
2	253° 10' 57"	0.66"	251° 45' 42"	-22° 22' 45"	0.9854975	16'13.75"	23° 26' 17"	9 m 27 s
3	253° 13' 29"	0.66"	251° 48' 25"	-22° 23' 04"	0.9854915	16'13.76"	23° 26' 17"	9 m 26 s
4	253° 16' 02"	0.66"	251° 51' 08"	-22° 23' 23"	0.9854855	16'13.76"	23° 26' 17"	9 m 25 s
5	253° 18' 34"	0.66"	251° 53' 51"	-22° 23' 42"	0.9854795	16'13.77"	23° 26' 17"	9 m 24 s
6	253° 21' 06"	0.66"	251° 56' 35"	-22° 24' 01"	0.9854735	16'13.78"	23° 26' 17"	9 m 23 s
7	253° 23' 38"	0.66"	251° 59' 18"	-22° 24' 19"	0.9854675	16'13.78"	23° 26' 17"	9 m 22 s
8	253° 26' 10"	0.66"	252° 02' 01"	-22° 24' 38"	0.9854616	16'13.79"	23° 26' 17"	9 m 21 s
9	253° 28' 42"	0.66"	252° 04' 45"	-22° 24' 57"	0.9854556	16'13.79"	23° 26' 17"	9 m 20 s
10	253° 31' 14"	0.66"	252° 07' 28"	-22° 25' 15"	0.9854497	16'13.80"	23° 26' 17"	9 m 19 s
11	253° 33' 47"	0.66"	252° 10' 12"	-22° 25' 34"	0.9854438	16'13.80"	23° 26' 17"	9 m 18 s
12	253° 36' 19"	0.66"	252° 12' 55"	-22° 25' 52"	0.9854379	16'13.81"	23° 26' 17"	9 m 17 s
13	253° 38' 51"	0.66"	252° 15' 38"	-22° 26' 11"	0.9854320	16'13.82"	23° 26' 17"	9 m 16 s
14	253° 41' 23"	0.66"	252° 18' 22"	-22° 26' 29"	0.9854261	16'13.82"	23° 26' 17"	9 m 15 s
15	253° 43' 55"	0.66"	252° 21' 05"	-22° 26' 48"	0.9854202	16'13.83"	23° 26' 17"	9 m 14 s
16	253° 46' 27"	0.66"	252° 23' 49"	-22° 27' 06"	0.9854143	16'13.83"	23° 26' 17"	9 m 13 s
17	253° 48' 60"	0.65"	252° 26' 32"	-22° 27' 24"	0.9854084	16'13.84"	23° 26' 17"	9 m 12 s
18	253° 51' 32"	0.65"	252° 29' 16"	-22° 27' 43"	0.9854026	16'13.85"	23° 26' 17"	9 m 11 s
19	253° 54' 04"	0.65"	252° 31' 59"	-22° 28' 01"	0.9853967	16'13.85"	23° 26' 17"	9 m 10 s
20	253° 56' 36"	0.65"	252° 34' 43"	-22° 28' 19"	0.9853909	16'13.86"	23° 26' 17"	9 m 09 s
21	253° 59' 08"	0.65"	252° 37' 26"	-22° 28' 37"	0.9853851	16'13.86"	23° 26' 17"	9 m 08 s
22	254° 01' 40"	0.65"	252° 40' 10"	-22° 28' 55"	0.9853793	16'13.87"	23° 26' 17"	9 m 07 s
23	254° 04' 13"	0.65"	252° 42' 53"	-22° 29' 13"	0.9853735	16'13.87"	23° 26' 17"	9 m 05 s
24	254° 06' 45"	0.65"	252° 45' 37"	-22° 29' 31"	0.9853677	16'13.88"	23° 26' 17"	9 m 04 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	73° 32' 11"	4° 59' 54"	71° 27' 39"	27° 22' 59"	1° 01' 23"	16' 43.56"	357° 49' 50"	0.99809
1	74° 10' 30"	4° 59' 53"	72° 10' 19"	27° 27' 44"	1° 01' 22"	16' 43.43"	4° 47' 29"	0.99803
2	74° 48' 48"	4° 59' 50"	72° 53' 02"	27° 32' 16"	1° 01' 22"	16' 43.29"	11° 26' 47"	0.99791
3	75° 27' 06"	4° 59' 46"	73° 35' 47"	27° 36' 34"	1° 01' 21"	16' 43.15"	17° 40' 28"	0.99774
4	76° 05' 23"	4° 59' 38"	74° 18' 35"	27° 40' 40"	1° 01' 21"	16' 42.99"	23° 24' 22"	0.99751
5	76° 43' 39"	4° 59' 29"	75° 01' 26"	27° 44' 32"	1° 01' 20"	16' 42.82"	28° 37' 04"	0.99723
6	77° 21' 54"	4° 59' 17"	75° 44' 18"	27° 48' 10"	1° 01' 19"	16' 42.64"	33° 19' 10"	0.99690
7	78° 00' 08"	4° 59' 03"	76° 27' 12"	27° 51' 36"	1° 01' 19"	16' 42.45"	37° 32' 38"	0.99652
8	78° 38' 22"	4° 58' 47"	77° 10' 08"	27° 54' 48"	1° 01' 18"	16' 42.26"	41° 20' 05"	0.99608
9	79° 16' 34"	4° 58' 29"	77° 53' 05"	27° 57' 47"	1° 01' 17"	16' 42.05"	44° 44' 20"	0.99559
10	79° 54' 45"	4° 58' 08"	78° 36' 04"	28° 00' 32"	1° 01' 16"	16' 41.83"	47° 48' 11"	0.99505
11	80° 32' 56"	4° 57' 45"	79° 19' 03"	28° 03' 03"	1° 01' 16"	16' 41.61"	50° 34' 11"	0.99446
12	81° 11' 05"	4° 57' 20"	80° 02' 03"	28° 05' 22"	1° 01' 15"	16' 41.37"	53° 4' 40"	0.99381
13	81° 49' 13"	4° 56' 53"	80° 45' 03"	28° 07' 26"	1° 01' 14"	16' 41.13"	55° 21' 39"	0.99312
14	82° 27' 19"	4° 56' 24"	81° 28' 04"	28° 09' 18"	1° 01' 13"	16' 40.88"	57° 26' 53"	0.99237
15	83° 05' 25"	4° 55' 52"	82° 11' 05"	28° 10' 55"	1° 01' 12"	16' 40.62"	59° 21' 53"	0.99157
16	83° 43' 29"	4° 55' 18"	82° 54' 05"	28° 12' 19"	1° 01' 11"	16' 40.35"	61° 7' 56"	0.99071
17	84° 21' 32"	4° 54' 42"	83° 37' 05"	28° 13' 30"	1° 01' 10"	16' 40.07"	62° 46' 10"	0.98981
18	84° 59' 33"	4° 54' 04"	84° 20' 05"	28° 14' 27"	1° 01' 09"	16' 39.78"	64° 17' 30"	0.98886
19	85° 37' 33"	4° 53' 24"	85° 03' 03"	28° 15' 11"	1° 01' 08"	16' 39.48"	65° 42' 45"	0.98785
20	86° 15' 31"	4° 52' 41"	85° 46' 01"	28° 15' 41"	1° 01' 07"	16' 39.18"	67° 2' 38"	0.98680
21	86° 53' 28"	4° 51' 57"	86° 28' 57"	28° 15' 58"	1° 01' 06"	16' 38.86"	68° 17' 44"	0.98569
22	87° 31' 23"	4° 51' 10"	87° 11' 51"	28° 16' 01"	1° 01' 04"	16' 38.54"	69° 28' 34"	0.98453
23	88° 09' 16"	4° 50' 21"	87° 54' 44"	28° 15' 51"	1° 01' 03"	16' 38.21"	70° 35' 35"	0.98333
24	88° 47' 08"	4° 49' 30"	88° 37' 34"	28° 15' 27"	1° 01' 02"	16' 37.87"	71° 39' 10"	0.98207

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	254° 06' 45"	0.65"	252° 45' 37"	-22° 29' 31"	0.9853677	16' 13.88"	23° 26' 17"	9 m 04 s
1	254° 09' 17"	0.65"	252° 48' 20"	-22° 29' 49"	0.9853619	16' 13.89"	23° 26' 17"	9 m 03 s
2	254° 11' 49"	0.65"	252° 51' 04"	-22° 30' 07"	0.9853561	16' 13.89"	23° 26' 17"	9 m 02 s
3	254° 14' 21"	0.64"	252° 53' 48"	-22° 30' 25"	0.9853504	16' 13.90"	23° 26' 17"	9 m 01 s
4	254° 16' 54"	0.64"	252° 56' 31"	-22° 30' 42"	0.9853446	16' 13.90"	23° 26' 17"	9 m 00 s
5	254° 19' 26"	0.64"	252° 59' 15"	-22° 31' 00"	0.9853389	16' 13.91"	23° 26' 17"	8 m 59 s
6	254° 21' 58"	0.64"	253° 01' 58"	-22° 31' 18"	0.9853332	16' 13.91"	23° 26' 17"	8 m 58 s
7	254° 24' 30"	0.64"	253° 04' 42"	-22° 31' 35"	0.9853274	16' 13.92"	23° 26' 17"	8 m 57 s
8	254° 27' 02"	0.64"	253° 07' 26"	-22° 31' 53"	0.9853217	16' 13.93"	23° 26' 17"	8 m 56 s
9	254° 29' 35"	0.64"	253° 10' 09"	-22° 32' 11"	0.9853160	16' 13.93"	23° 26' 17"	8 m 55 s
10	254° 32' 07"	0.63"	253° 12' 53"	-22° 32' 28"	0.9853103	16' 13.94"	23° 26' 17"	8 m 54 s
11	254° 34' 39"	0.63"	253° 15' 37"	-22° 32' 46"	0.9853047	16' 13.94"	23° 26' 17"	8 m 53 s
12	254° 37' 11"	0.63"	253° 18' 21"	-22° 33' 03"	0.9852990	16' 13.95"	23° 26' 17"	8 m 52 s
13	254° 39' 43"	0.63"	253° 21' 04"	-22° 33' 20"	0.9852933	16' 13.95"	23° 26' 17"	8 m 51 s
14	254° 42' 16"	0.63"	253° 23' 48"	-22° 33' 38"	0.9852877	16' 13.96"	23° 26' 17"	8 m 50 s
15	254° 44' 48"	0.63"	253° 26' 32"	-22° 33' 55"	0.9852821	16' 13.96"	23° 26' 17"	8 m 48 s
16	254° 47' 20"	0.62"	253° 29' 16"	-22° 34' 12"	0.9852764	16' 13.97"	23° 26' 17"	8 m 47 s
17	254° 49' 52"	0.62"	253° 31' 59"	-22° 34' 29"	0.9852708	16' 13.98"	23° 26' 17"	8 m 46 s
18	254° 52' 24"	0.62"	253° 34' 43"	-22° 34' 47"	0.9852652	16' 13.98"	23° 26' 17"	8 m 45 s
19	254° 54' 57"	0.62"	253° 37' 27"	-22° 35' 04"	0.9852596	16' 13.99"	23° 26' 17"	8 m 44 s
20	254° 57' 29"	0.62"	253° 40' 11"	-22° 35' 21"	0.9852540	16' 13.99"	23° 26' 17"	8 m 43 s
21	255° 00' 01"	0.61"	253° 42' 55"	-22° 35' 38"	0.9852485	16' 14.00"	23° 26' 17"	8 m 42 s
22	255° 02' 33"	0.61"	253° 45' 39"	-22° 35' 55"	0.9852429	16' 14.00"	23° 26' 17"	8 m 41 s
23	255° 05' 06"	0.61"	253° 48' 22"	-22° 36' 12"	0.9852373	16' 14.01"	23° 26' 17"	8 m 40 s
24	255° 07' 38"	0.61"	253° 51' 06"	-22° 36' 28"	0.9852318	16' 14.01"	23° 26' 17"	8 m 39 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	88° 47' 08"	4° 49' 30"	88° 37' 34"	28° 15' 27"	1° 01' 02"	16' 37.87"	71° 39' 10"	0.98207
1	89° 24' 58"	4° 48' 38"	89° 20' 23"	28° 14' 50"	1° 01' 01"	16' 37.52"	72° 39' 40"	0.98077
2	90° 02' 47"	4° 47' 43"	90° 03' 08"	28° 13' 60"	1° 00' 59"	16' 37.16"	73° 37' 23"	0.97942
3	90° 40' 33"	4° 46' 45"	90° 45' 51"	28° 12' 56"	1° 00' 58"	16' 36.80"	74° 32' 33"	0.97802
4	91° 18' 18"	4° 45' 46"	91° 28' 32"	28° 11' 40"	1° 00' 57"	16' 36.42"	75° 25' 25"	0.97657
5	91° 56' 00"	4° 44' 45"	92° 11' 09"	28° 10' 10"	1° 00' 55"	16' 36.04"	76° 16' 10"	0.97507
6	92° 33' 41"	4° 43' 42"	92° 53' 42"	28° 08' 27"	1° 00' 54"	16' 35.65"	77° 5' 00"	0.97352
7	93° 11' 20"	4° 42' 37"	93° 36' 12"	28° 06' 31"	1° 00' 52"	16' 35.26"	77° 52' 04"	0.97193
8	93° 48' 56"	4° 41' 30"	94° 18' 39"	28° 04' 21"	1° 00' 51"	16' 34.85"	78° 37' 29"	0.97029
9	94° 26' 31"	4° 40' 20"	95° 01' 01"	28° 01' 59"	1° 00' 49"	16' 34.44"	79° 21' 25"	0.96860
10	95° 04' 03"	4° 39' 09"	95° 43' 19"	27° 59' 24"	1° 00' 48"	16' 34.02"	80° 3' 56"	0.96687
11	95° 41' 34"	4° 37' 56"	96° 25' 33"	27° 56' 37"	1° 00' 46"	16' 33.59"	80° 45' 10"	0.96509
12	96° 19' 02"	4° 36' 41"	97° 07' 42"	27° 53' 36"	1° 00' 45"	16' 33.16"	81° 25' 12"	0.96326
13	96° 56' 28"	4° 35' 24"	97° 49' 46"	27° 50' 23"	1° 00' 43"	16' 32.71"	82° 4' 06"	0.96139
14	97° 33' 51"	4° 34' 05"	98° 31' 46"	27° 46' 57"	1° 00' 41"	16' 32.26"	82° 41' 57"	0.95948
15	98° 11' 12"	4° 32' 45"	99° 13' 40"	27° 43' 19"	1° 00' 40"	16' 31.81"	83° 18' 49"	0.95751
16	98° 48' 31"	4° 31' 22"	99° 55' 29"	27° 39' 29"	1° 00' 38"	16' 31.34"	83° 54' 46"	0.95551
17	99° 25' 48"	4° 29' 58"	100° 37' 12"	27° 35' 26"	1° 00' 36"	16' 30.87"	84° 29' 50"	0.95346
18	100° 03' 02"	4° 28' 31"	101° 18' 50"	27° 31' 11"	1° 00' 35"	16' 30.40"	85° 4' 05"	0.95137
19	100° 40' 14"	4° 27' 03"	102° 00' 22"	27° 26' 44"	1° 00' 33"	16' 29.91"	85° 37' 33"	0.94923
20	101° 17' 23"	4° 25' 33"	102° 41' 48"	27° 22' 04"	1° 00' 31"	16' 29.42"	86° 10' 16"	0.94705
21	101° 54' 30"	4° 24' 02"	103° 23' 07"	27° 17' 13"	1° 00' 29"	16' 28.93"	86° 42' 18"	0.94483
22	102° 31' 34"	4° 22' 28"	104° 04' 21"	27° 12' 10"	1° 00' 27"	16' 28.42"	87° 13' 39"	0.94257
23	103° 08' 36"	4° 20' 53"	104° 45' 27"	27° 06' 55"	1° 00' 25"	16' 27.91"	87° 44' 23"	0.94027
24	103° 45' 35"	4° 19' 16"	105° 26' 28"	27° 01' 29"	1° 00' 24"	16' 27.40"	88° 14' 29"	0.93792

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	255° 07' 38"	0.61"	253° 51' 06"	-22° 36' 28"	0.9852318	16' 14.01"	23° 26' 17"	8 m 39 s
1	255° 10' 10"	0.60"	253° 53' 50"	-22° 36' 45"	0.9852262	16' 14.02"	23° 26' 17"	8 m 38 s
2	255° 12' 42"	0.60"	253° 56' 34"	-22° 37' 02"	0.9852207	16' 14.03"	23° 26' 17"	8 m 37 s
3	255° 15' 14"	0.60"	253° 59' 18"	-22° 37' 19"	0.9852152	16' 14.03"	23° 26' 17"	8 m 36 s
4	255° 17' 47"	0.60"	254° 02' 02"	-22° 37' 35"	0.9852097	16' 14.04"	23° 26' 17"	8 m 35 s
5	255° 20' 19"	0.59"	254° 04' 46"	-22° 37' 52"	0.9852042	16' 14.04"	23° 26' 17"	8 m 33 s
6	255° 22' 51"	0.59"	254° 07' 30"	-22° 38' 09"	0.9851987	16' 14.05"	23° 26' 17"	8 m 32 s
7	255° 25' 23"	0.59"	254° 10' 14"	-22° 38' 25"	0.9851932	16' 14.05"	23° 26' 17"	8 m 31 s
8	255° 27' 56"	0.59"	254° 12' 58"	-22° 38' 42"	0.9851878	16' 14.06"	23° 26' 17"	8 m 30 s
9	255° 30' 28"	0.58"	254° 15' 42"	-22° 38' 58"	0.9851823	16' 14.06"	23° 26' 17"	8 m 29 s
10	255° 33' 00"	0.58"	254° 18' 26"	-22° 39' 15"	0.9851769	16' 14.07"	23° 26' 17"	8 m 28 s
11	255° 35' 32"	0.58"	254° 21' 10"	-22° 39' 31"	0.9851714	16' 14.07"	23° 26' 17"	8 m 27 s
12	255° 38' 05"	0.58"	254° 23' 54"	-22° 39' 47"	0.9851660	16' 14.08"	23° 26' 17"	8 m 26 s
13	255° 40' 37"	0.57"	254° 26' 38"	-22° 40' 04"	0.9851606	16' 14.08"	23° 26' 17"	8 m 25 s
14	255° 43' 09"	0.57"	254° 29' 22"	-22° 40' 20"	0.9851552	16' 14.09"	23° 26' 17"	8 m 24 s
15	255° 45' 41"	0.57"	254° 32' 06"	-22° 40' 36"	0.9851498	16' 14.10"	23° 26' 17"	8 m 23 s
16	255° 48' 14"	0.56"	254° 34' 50"	-22° 40' 52"	0.9851444	16' 14.10"	23° 26' 17"	8 m 22 s
17	255° 50' 46"	0.56"	254° 37' 34"	-22° 41' 08"	0.9851390	16' 14.11"	23° 26' 17"	8 m 20 s
18	255° 53' 18"	0.56"	254° 40' 19"	-22° 41' 24"	0.9851337	16' 14.11"	23° 26' 17"	8 m 19 s
19	255° 55' 50"	0.55"	254° 43' 03"	-22° 41' 40"	0.9851283	16' 14.12"	23° 26' 17"	8 m 18 s
20	255° 58' 23"	0.55"	254° 45' 47"	-22° 41' 56"	0.9851230	16' 14.12"	23° 26' 17"	8 m 17 s
21	256° 00' 55"	0.55"	254° 48' 31"	-22° 42' 12"	0.9851176	16' 14.13"	23° 26' 17"	8 m 16 s
22	256° 03' 27"	0.55"	254° 51' 15"	-22° 42' 28"	0.9851123	16' 14.13"	23° 26' 17"	8 m 15 s
23	256° 05' 60"	0.54"	254° 53' 59"	-22° 42' 44"	0.9851070	16' 14.14"	23° 26' 17"	8 m 14 s
24	256° 08' 32"	0.54"	254° 56' 44"	-22° 42' 59"	0.9851017	16' 14.14"	23° 26' 17"	8 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	103° 45' 35"	4° 19' 16"	105° 26' 28"	27° 01' 29"	1° 00' 24"	16' 27.40"	88° 14' 29"	0.93792
1	104° 22' 31"	4° 17' 37"	106° 07' 21"	26° 55' 51"	1° 00' 22"	16' 26.88"	88° 44' 01"	0.93554
2	104° 59' 25"	4° 15' 57"	106° 48' 08"	26° 50' 02"	1° 00' 20"	16' 26.35"	89° 12' 60"	0.93311
3	105° 36' 16"	4° 14' 15"	107° 28' 47"	26° 44' 02"	1° 00' 18"	16' 25.81"	89° 41' 26"	0.93064
4	106° 13' 05"	4° 12' 32"	108° 09' 19"	26° 37' 50"	1° 00' 16"	16' 25.28"	90° 9' 21"	0.92814
5	106° 49' 50"	4° 10' 46"	108° 49' 44"	26° 31' 27"	1° 00' 14"	16' 24.73"	90° 36' 47"	0.92559
6	107° 26' 33"	4° 08' 59"	109° 30' 02"	26° 24' 54"	1° 00' 12"	16' 24.18"	91° 3' 44"	0.92301
7	108° 03' 13"	4° 07' 11"	110° 10' 12"	26° 18' 09"	1° 00' 10"	16' 23.63"	91° 30' 13"	0.92039
8	108° 39' 51"	4° 05' 21"	110° 50' 15"	26° 11' 14"	1° 00' 08"	16' 23.07"	91° 56' 15"	0.91773
9	109° 16' 25"	4° 03' 29"	111° 30' 09"	26° 04' 09"	1° 00' 06"	16' 22.50"	92° 21' 51"	0.91504
10	109° 52' 57"	4° 01' 36"	112° 09' 56"	25° 56' 53"	1° 00' 03"	16' 21.93"	92° 47' 02"	0.91230
11	110° 29' 25"	3° 59' 42"	112° 49' 35"	25° 49' 26"	1° 00' 01"	16' 21.35"	93° 11' 48"	0.90953
12	111° 05' 51"	3° 57' 45"	113° 29' 06"	25° 41' 50"	0° 59' 59"	16' 20.77"	93° 36' 11"	0.90673
13	111° 42' 14"	3° 55' 48"	114° 08' 29"	25° 34' 03"	0° 59' 57"	16' 20.19"	94° 0' 10"	0.90389
14	112° 18' 34"	3° 53' 49"	114° 47' 44"	25° 26' 06"	0° 59' 55"	16' 19.60"	94° 23' 46"	0.90101
15	112° 54' 51"	3° 51' 48"	115° 26' 50"	25° 18' 00"	0° 59' 53"	16' 19.01"	94° 47' 00"	0.89810
16	113° 31' 05"	3° 49' 47"	116° 05' 49"	25° 09' 44"	0° 59' 51"	16' 18.41"	95° 9' 53"	0.89516
17	114° 07' 16"	3° 47' 43"	116° 44' 38"	25° 01' 19"	0° 59' 48"	16' 17.81"	95° 32' 25"	0.89218
18	114° 43' 24"	3° 45' 39"	117° 23' 20"	24° 52' 44"	0° 59' 46"	16' 17.20"	95° 54' 35"	0.88917
19	115° 19' 29"	3° 43' 33"	118° 01' 53"	24° 43' 59"	0° 59' 44"	16' 16.59"	96° 16' 26"	0.88613
20	115° 55' 31"	3° 41' 25"	118° 40' 17"	24° 35' 06"	0° 59' 42"	16' 15.98"	96° 37' 57"	0.88306
21	116° 31' 30"	3° 39' 17"	119° 18' 33"	24° 26' 04"	0° 59' 39"	16' 15.36"	96° 59' 08"	0.87995
22	117° 07' 26"	3° 37' 07"	119° 56' 40"	24° 16' 52"	0° 59' 37"	16' 14.74"	97° 19' 60"	0.87681
23	117° 43' 18"	3° 34' 56"	120° 34' 39"	24° 07' 32"	0° 59' 35"	16' 14.12"	97° 40' 33"	0.87364
24	118° 19' 08"	3° 32' 43"	121° 12' 29"	23° 58' 04"	0° 59' 32"	16' 13.49"	98° 0' 48"	0.87044

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	256° 08' 32"	0.54"	254° 56' 44"	-22° 42' 59"	0.9851017	16' 14.14"	23° 26' 17"	8 m 13 s
1	256° 11' 04"	0.53"	254° 59' 28"	-22° 43' 15"	0.9850964	16' 14.15"	23° 26' 17"	8 m 12 s
2	256° 13' 36"	0.53"	255° 02' 12"	-22° 43' 31"	0.9850911	16' 14.15"	23° 26' 17"	8 m 11 s
3	256° 16' 09"	0.53"	255° 04' 56"	-22° 43' 46"	0.9850858	16' 14.16"	23° 26' 17"	8 m 09 s
4	256° 18' 41"	0.52"	255° 07' 41"	-22° 44' 02"	0.9850806	16' 14.16"	23° 26' 17"	8 m 08 s
5	256° 21' 13"	0.52"	255° 10' 25"	-22° 44' 18"	0.9850753	16' 14.17"	23° 26' 17"	8 m 07 s
6	256° 23' 45"	0.52"	255° 13' 09"	-22° 44' 33"	0.9850701	16' 14.17"	23° 26' 17"	8 m 06 s
7	256° 26' 18"	0.51"	255° 15' 53"	-22° 44' 48"	0.9850648	16' 14.18"	23° 26' 17"	8 m 05 s
8	256° 28' 50"	0.51"	255° 18' 38"	-22° 45' 04"	0.9850596	16' 14.18"	23° 26' 17"	8 m 04 s
9	256° 31' 22"	0.51"	255° 21' 22"	-22° 45' 19"	0.9850544	16' 14.19"	23° 26' 17"	8 m 03 s
10	256° 33' 55"	0.50"	255° 24' 06"	-22° 45' 34"	0.9850492	16' 14.20"	23° 26' 17"	8 m 02 s
11	256° 36' 27"	0.50"	255° 26' 51"	-22° 45' 50"	0.9850440	16' 14.20"	23° 26' 17"	8 m 01 s
12	256° 38' 59"	0.49"	255° 29' 35"	-22° 46' 05"	0.9850388	16' 14.21"	23° 26' 17"	7 m 60 s
13	256° 41' 32"	0.49"	255° 32' 19"	-22° 46' 20"	0.9850336	16' 14.21"	23° 26' 17"	7 m 58 s
14	256° 44' 04"	0.49"	255° 35' 04"	-22° 46' 35"	0.9850284	16' 14.22"	23° 26' 17"	7 m 57 s
15	256° 46' 36"	0.48"	255° 37' 48"	-22° 46' 50"	0.9850233	16' 14.22"	23° 26' 17"	7 m 56 s
16	256° 49' 08"	0.48"	255° 40' 32"	-22° 47' 05"	0.9850181	16' 14.23"	23° 26' 17"	7 m 55 s
17	256° 51' 41"	0.47"	255° 43' 17"	-22° 47' 20"	0.9850130	16' 14.23"	23° 26' 17"	7 m 54 s
18	256° 54' 13"	0.47"	255° 46' 01"	-22° 47' 35"	0.9850079	16' 14.24"	23° 26' 17"	7 m 53 s
19	256° 56' 45"	0.47"	255° 48' 46"	-22° 47' 50"	0.9850027	16' 14.24"	23° 26' 17"	7 m 52 s
20	256° 59' 18"	0.46"	255° 51' 30"	-22° 48' 05"	0.9849976	16' 14.25"	23° 26' 17"	7 m 51 s
21	257° 01' 50"	0.46"	255° 54' 15"	-22° 48' 20"	0.9849925	16' 14.25"	23° 26' 17"	7 m 50 s
22	257° 04' 22"	0.45"	255° 56' 59"	-22° 48' 34"	0.9849874	16' 14.26"	23° 26' 17"	7 m 48 s
23	257° 06' 55"	0.45"	255° 59' 44"	-22° 48' 49"	0.9849823	16' 14.26"	23° 26' 17"	7 m 47 s
24	257° 09' 27"	0.45"	256° 02' 28"	-22° 49' 04"	0.9849773	16' 14.27"	23° 26' 17"	7 m 46 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	118° 19' 08"	3° 32' 43"	121° 12' 29"	23° 58' 04"	0° 59' 32"	16' 13.49"	98° 0' 48"	0.87044
1	118° 54' 54"	3° 30' 30"	121° 50' 10"	23° 48' 27"	0° 59' 30"	16' 12.86"	98° 20' 45"	0.86721
2	119° 30' 38"	3° 28' 15"	122° 27' 43"	23° 38' 41"	0° 59' 28"	16' 12.22"	98° 40' 24"	0.86395
3	120° 06' 18"	3° 25' 59"	123° 05' 07"	23° 28' 48"	0° 59' 25"	16' 11.59"	98° 59' 45"	0.86067
4	120° 41' 55"	3° 23' 42"	123° 42' 22"	23° 18' 46"	0° 59' 23"	16' 10.95"	99° 18' 49"	0.85735
5	121° 17' 29"	3° 21' 23"	124° 19' 28"	23° 08' 36"	0° 59' 21"	16' 10.30"	99° 37' 36"	0.85401
6	121° 52' 60"	3° 19' 04"	124° 56' 25"	22° 58' 19"	0° 59' 18"	16' 09.66"	99° 56' 05"	0.85064
7	122° 28' 27"	3° 16' 43"	125° 33' 14"	22° 47' 54"	0° 59' 16"	16' 09.01"	100° 14' 19"	0.84724
8	123° 03' 51"	3° 14' 22"	126° 09' 54"	22° 37' 21"	0° 59' 14"	16' 08.36"	100° 32' 16"	0.84381
9	123° 39' 13"	3° 11' 59"	126° 46' 25"	22° 26' 41"	0° 59' 11"	16' 07.71"	100° 49' 56"	0.84036
10	124° 14' 31"	3° 09' 36"	127° 22' 47"	22° 15' 54"	0° 59' 09"	16' 07.06"	101° 7' 21"	0.83689
11	124° 49' 45"	3° 07' 11"	127° 59' 01"	22° 04' 59"	0° 59' 06"	16' 06.40"	101° 24' 30"	0.83339
12	125° 24' 57"	3° 04' 45"	128° 35' 06"	21° 53' 58"	0° 59' 04"	16' 05.74"	101° 41' 23"	0.82986
13	126° 00' 05"	3° 02' 19"	129° 11' 02"	21° 42' 50"	0° 59' 02"	16' 05.08"	101° 58' 01"	0.82631
14	126° 35' 11"	2° 59' 51"	129° 46' 49"	21° 31' 34"	0° 58' 59"	16' 04.42"	102° 14' 24"	0.82274
15	127° 10' 13"	2° 57' 23"	130° 22' 28"	21° 20' 13"	0° 58' 57"	16' 03.76"	102° 30' 31"	0.81914
16	127° 45' 11"	2° 54' 53"	130° 57' 58"	21° 08' 44"	0° 58' 54"	16' 03.09"	102° 46' 24"	0.81552
17	128° 20' 07"	2° 52' 23"	131° 33' 20"	20° 57' 10"	0° 58' 52"	16' 02.43"	103° 2' 02"	0.81188
18	128° 54' 59"	2° 49' 52"	132° 08' 33"	20° 45' 29"	0° 58' 49"	16' 01.76"	103° 17' 25"	0.80821
19	129° 29' 48"	2° 47' 20"	132° 43' 37"	20° 33' 42"	0° 58' 47"	16' 01.09"	103° 32' 33"	0.80453
20	130° 04' 34"	2° 44' 47"	133° 18' 33"	20° 21' 49"	0° 58' 44"	16' 00.42"	103° 47' 28"	0.80082
21	130° 39' 17"	2° 42' 14"	133° 53' 20"	20° 09' 50"	0° 58' 42"	15' 59.75"	104° 2' 08"	0.79709
22	131° 13' 56"	2° 39' 39"	134° 27' 59"	19° 57' 45"	0° 58' 40"	15' 59.08"	104° 16' 34"	0.79335
23	131° 48' 33"	2° 37' 04"	135° 02' 30"	19° 45' 35"	0° 58' 37"	15' 58.41"	104° 30' 46"	0.78958
24	132° 23' 06"	2° 34' 28"	135° 36' 52"	19° 33' 19"	0° 58' 35"	15' 57.73"	104° 44' 45"	0.78579

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	257° 09' 27"	0.45"	256° 02' 28"	-22° 49' 04"	0.9849773	16'14.27"	23° 26' 17"	7 m 46 s
1	257° 11' 59"	0.44"	256° 05' 13"	-22° 49' 18"	0.9849722	16'14.27"	23° 26' 17"	7 m 45 s
2	257° 14' 32"	0.44"	256° 07' 57"	-22° 49' 33"	0.9849671	16'14.28"	23° 26' 17"	7 m 44 s
3	257° 17' 04"	0.43"	256° 10' 42"	-22° 49' 47"	0.9849621	16'14.28"	23° 26' 17"	7 m 43 s
4	257° 19' 36"	0.43"	256° 13' 26"	-22° 50' 02"	0.9849571	16'14.29"	23° 26' 17"	7 m 42 s
5	257° 22' 09"	0.42"	256° 16' 11"	-22° 50' 16"	0.9849520	16'14.29"	23° 26' 17"	7 m 41 s
6	257° 24' 41"	0.42"	256° 18' 55"	-22° 50' 31"	0.9849470	16'14.30"	23° 26' 17"	7 m 40 s
7	257° 27' 13"	0.41"	256° 21' 40"	-22° 50' 45"	0.9849420	16'14.30"	23° 26' 17"	7 m 38 s
8	257° 29' 46"	0.41"	256° 24' 24"	-22° 50' 59"	0.9849370	16'14.31"	23° 26' 17"	7 m 37 s
9	257° 32' 18"	0.41"	256° 27' 09"	-22° 51' 13"	0.9849320	16'14.31"	23° 26' 17"	7 m 36 s
10	257° 34' 50"	0.40"	256° 29' 54"	-22° 51' 28"	0.9849270	16'14.32"	23° 26' 17"	7 m 35 s
11	257° 37' 23"	0.40"	256° 32' 38"	-22° 51' 42"	0.9849221	16'14.32"	23° 26' 17"	7 m 34 s
12	257° 39' 55"	0.39"	256° 35' 23"	-22° 51' 56"	0.9849171	16'14.33"	23° 26' 17"	7 m 33 s
13	257° 42' 27"	0.39"	256° 38' 08"	-22° 52' 10"	0.9849121	16'14.33"	23° 26' 17"	7 m 32 s
14	257° 44' 60"	0.38"	256° 40' 52"	-22° 52' 24"	0.9849072	16'14.34"	23° 26' 18"	7 m 31 s
15	257° 47' 32"	0.38"	256° 43' 37"	-22° 52' 38"	0.9849023	16'14.34"	23° 26' 18"	7 m 29 s
16	257° 50' 05"	0.37"	256° 46' 22"	-22° 52' 52"	0.9848973	16'14.35"	23° 26' 18"	7 m 28 s
17	257° 52' 37"	0.37"	256° 49' 06"	-22° 53' 06"	0.9848924	16'14.35"	23° 26' 18"	7 m 27 s
18	257° 55' 09"	0.36"	256° 51' 51"	-22° 53' 19"	0.9848875	16'14.35"	23° 26' 18"	7 m 26 s
19	257° 57' 42"	0.36"	256° 54' 36"	-22° 53' 33"	0.9848826	16'14.36"	23° 26' 18"	7 m 25 s
20	258° 00' 14"	0.35"	256° 57' 20"	-22° 53' 47"	0.9848777	16'14.36"	23° 26' 18"	7 m 24 s
21	258° 02' 46"	0.35"	257° 00' 05"	-22° 54' 01"	0.9848728	16'14.37"	23° 26' 18"	7 m 23 s
22	258° 05' 19"	0.34"	257° 02' 50"	-22° 54' 14"	0.9848680	16'14.37"	23° 26' 18"	7 m 22 s
23	258° 07' 51"	0.34"	257° 05' 35"	-22° 54' 28"	0.9848631	16'14.38"	23° 26' 18"	7 m 20 s
24	258° 10' 23"	0.33"	257° 08' 19"	-22° 54' 41"	0.9848582	16'14.38"	23° 26' 18"	7 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	132° 23' 06"	2° 34' 28"	135° 36' 52"	19° 33' 19"	0° 58' 35"	15' 57.73"	104° 44' 45"	0.78579
1	132° 57' 35"	2° 31' 52"	136° 11' 06"	19° 20' 57"	0° 58' 32"	15' 57.06"	104° 58' 30"	0.78199
2	133° 32' 02"	2° 29' 14"	136° 45' 11"	19° 08' 31"	0° 58' 30"	15' 56.39"	105° 12' 01"	0.77816
3	134° 06' 25"	2° 26' 37"	137° 19' 09"	18° 55' 59"	0° 58' 27"	15' 55.71"	105° 25' 19"	0.77432
4	134° 40' 46"	2° 23' 58"	137° 52' 58"	18° 43' 22"	0° 58' 25"	15' 55.04"	105° 38' 24"	0.77046
5	135° 15' 03"	2° 21' 19"	138° 26' 40"	18° 30' 41"	0° 58' 22"	15' 54.37"	105° 51' 15"	0.76659
6	135° 49' 16"	2° 18' 39"	139° 00' 13"	18° 17' 54"	0° 58' 20"	15' 53.69"	106° 3' 54"	0.76270
7	136° 23' 27"	2° 15' 58"	139° 33' 38"	18° 05' 03"	0° 58' 17"	15' 53.02"	106° 16' 19"	0.75879
8	136° 57' 35"	2° 13' 17"	140° 06' 56"	17° 52' 07"	0° 58' 15"	15' 52.34"	106° 28' 32"	0.75486
9	137° 31' 39"	2° 10' 36"	140° 40' 05"	17° 39' 07"	0° 58' 12"	15' 51.67"	106° 40' 32"	0.75093
10	138° 05' 40"	2° 07' 54"	141° 13' 07"	17° 26' 02"	0° 58' 10"	15' 51.00"	106° 52' 19"	0.74697
11	138° 39' 38"	2° 05' 11"	141° 46' 01"	17° 12' 53"	0° 58' 07"	15' 50.32"	107° 3' 54"	0.74300
12	139° 13' 33"	2° 02' 28"	142° 18' 48"	16° 59' 40"	0° 58' 05"	15' 49.65"	107° 15' 16"	0.73902
13	139° 47' 25"	1° 59' 44"	142° 51' 27"	16° 46' 23"	0° 58' 03"	15' 48.98"	107° 26' 26"	0.73502
14	140° 21' 13"	1° 56' 60"	143° 23' 59"	16° 33' 02"	0° 58' 00"	15' 48.31"	107° 37' 24"	0.73101
15	140° 54' 59"	1° 54' 15"	143° 56' 23"	16° 19' 37"	0° 57' 58"	15' 47.64"	107° 48' 10"	0.72699
16	141° 28' 41"	1° 51' 30"	144° 28' 40"	16° 06' 08"	0° 57' 55"	15' 46.97"	107° 58' 44"	0.72296
17	142° 02' 21"	1° 48' 45"	145° 00' 49"	15° 52' 36"	0° 57' 53"	15' 46.30"	108° 9' 06"	0.71891
18	142° 35' 57"	1° 45' 59"	145° 32' 52"	15° 39' 00"	0° 57' 50"	15' 45.64"	108° 19' 16"	0.71485
19	143° 09' 30"	1° 43' 13"	146° 04' 47"	15° 25' 21"	0° 57' 48"	15' 44.97"	108° 29' 14"	0.71078
20	143° 43' 00"	1° 40' 26"	146° 36' 36"	15° 11' 38"	0° 57' 45"	15' 44.31"	108° 39' 01"	0.70670
21	144° 16' 27"	1° 37' 39"	147° 08' 17"	14° 57' 52"	0° 57' 43"	15' 43.64"	108° 48' 36"	0.70261
22	144° 49' 51"	1° 34' 52"	147° 39' 52"	14° 44' 03"	0° 57' 40"	15' 42.98"	108° 58' 00"	0.69851
23	145° 23' 12"	1° 32' 05"	148° 11' 19"	14° 30' 11"	0° 57' 38"	15' 42.32"	109° 7' 13"	0.69440
24	145° 56' 30"	1° 29' 17"	148° 42' 41"	14° 16' 16"	0° 57' 36"	15' 41.66"	109° 16' 14"	0.69028

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	258° 10' 23"	0.33"	257° 08' 19"	-22° 54' 41"	0.9848582	16' 14.38"	23° 26' 18"	7 m 19 s
1	258° 12' 56"	0.33"	257° 11' 04"	-22° 54' 55"	0.9848534	16' 14.39"	23° 26' 18"	7 m 18 s
2	258° 15' 28"	0.32"	257° 13' 49"	-22° 55' 08"	0.9848486	16' 14.39"	23° 26' 18"	7 m 17 s
3	258° 18' 01"	0.32"	257° 16' 34"	-22° 55' 22"	0.9848437	16' 14.40"	23° 26' 18"	7 m 16 s
4	258° 20' 33"	0.31"	257° 19' 19"	-22° 55' 35"	0.9848389	16' 14.40"	23° 26' 18"	7 m 15 s
5	258° 23' 05"	0.31"	257° 22' 04"	-22° 55' 48"	0.9848341	16' 14.41"	23° 26' 18"	7 m 14 s
6	258° 25' 38"	0.30"	257° 24' 48"	-22° 56' 01"	0.9848293	16' 14.41"	23° 26' 18"	7 m 12 s
7	258° 28' 10"	0.30"	257° 27' 33"	-22° 56' 15"	0.9848245	16' 14.42"	23° 26' 18"	7 m 11 s
8	258° 30' 43"	0.29"	257° 30' 18"	-22° 56' 28"	0.9848197	16' 14.42"	23° 26' 18"	7 m 10 s
9	258° 33' 15"	0.29"	257° 33' 03"	-22° 56' 41"	0.9848150	16' 14.43"	23° 26' 18"	7 m 09 s
10	258° 35' 47"	0.28"	257° 35' 48"	-22° 56' 54"	0.9848102	16' 14.43"	23° 26' 18"	7 m 08 s
11	258° 38' 20"	0.28"	257° 38' 33"	-22° 57' 07"	0.9848054	16' 14.44"	23° 26' 18"	7 m 07 s
12	258° 40' 52"	0.27"	257° 41' 18"	-22° 57' 20"	0.9848007	16' 14.44"	23° 26' 18"	7 m 06 s
13	258° 43' 25"	0.27"	257° 44' 03"	-22° 57' 33"	0.9847960	16' 14.45"	23° 26' 18"	7 m 05 s
14	258° 45' 57"	0.26"	257° 46' 47"	-22° 57' 46"	0.9847912	16' 14.45"	23° 26' 18"	7 m 03 s
15	258° 48' 29"	0.26"	257° 49' 32"	-22° 57' 58"	0.9847865	16' 14.45"	23° 26' 18"	7 m 02 s
16	258° 51' 02"	0.25"	257° 52' 17"	-22° 58' 11"	0.9847818	16' 14.46"	23° 26' 18"	7 m 01 s
17	258° 53' 34"	0.25"	257° 55' 02"	-22° 58' 24"	0.9847771	16' 14.46"	23° 26' 18"	6 m 60 s
18	258° 56' 07"	0.24"	257° 57' 47"	-22° 58' 37"	0.9847724	16' 14.47"	23° 26' 18"	6 m 59 s
19	258° 58' 39"	0.24"	258° 00' 32"	-22° 58' 49"	0.9847677	16' 14.47"	23° 26' 18"	6 m 58 s
20	259° 01' 11"	0.23"	258° 03' 17"	-22° 59' 02"	0.9847630	16' 14.48"	23° 26' 18"	6 m 57 s
21	259° 03' 44"	0.23"	258° 06' 02"	-22° 59' 14"	0.9847584	16' 14.48"	23° 26' 18"	6 m 55 s
22	259° 06' 16"	0.22"	258° 08' 47"	-22° 59' 27"	0.9847537	16' 14.49"	23° 26' 18"	6 m 54 s
23	259° 08' 49"	0.21"	258° 11' 32"	-22° 59' 39"	0.9847490	16' 14.49"	23° 26' 18"	6 m 53 s
24	259° 11' 21"	0.21"	258° 14' 17"	-22° 59' 52"	0.9847444	16' 14.50"	23° 26' 18"	6 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	145° 56' 30"	1° 29' 17"	148° 42' 41"	14° 16' 16"	0° 57' 36"	15' 41.66"	109° 16' 14"	0.69028
1	146° 29' 45"	1° 26' 29"	149° 13' 55"	14° 02' 18"	0° 57' 33"	15' 41.00"	109° 25' 04"	0.68616
2	147° 02' 57"	1° 23' 41"	149° 45' 03"	13° 48' 17"	0° 57' 31"	15' 40.35"	109° 33' 42"	0.68202
3	147° 36' 07"	1° 20' 52"	150° 16' 05"	13° 34' 14"	0° 57' 28"	15' 39.70"	109° 42' 10"	0.67787
4	148° 09' 13"	1° 18' 03"	150° 46' 60"	13° 20' 08"	0° 57' 26"	15' 39.04"	109° 50' 27"	0.67372
5	148° 42' 16"	1° 15' 14"	151° 17' 49"	13° 05' 59"	0° 57' 24"	15' 38.39"	109° 58' 33"	0.66956
6	149° 15' 16"	1° 12' 25"	151° 48' 31"	12° 51' 48"	0° 57' 21"	15' 37.75"	110° 6' 28"	0.66539
7	149° 48' 14"	1° 09' 36"	152° 19' 08"	12° 37' 35"	0° 57' 19"	15' 37.10"	110° 14' 13"	0.66122
8	150° 21' 08"	1° 06' 46"	152° 49' 38"	12° 23' 19"	0° 57' 17"	15' 36.46"	110° 21' 46"	0.65704
9	150° 53' 60"	1° 03' 57"	153° 20' 03"	12° 09' 01"	0° 57' 14"	15' 35.82"	110° 29' 10"	0.65286
10	151° 26' 49"	1° 01' 07"	153° 50' 22"	11° 54' 41"	0° 57' 12"	15' 35.18"	110° 36' 22"	0.64866
11	151° 59' 35"	0° 58' 17"	154° 20' 35"	11° 40' 19"	0° 57' 10"	15' 34.54"	110° 43' 25"	0.64447
12	152° 32' 18"	0° 55' 27"	154° 50' 42"	11° 25' 55"	0° 57' 07"	15' 33.91"	110° 50' 17"	0.64027
13	153° 04' 58"	0° 52' 37"	155° 20' 44"	11° 11' 29"	0° 57' 05"	15' 33.27"	110° 56' 58"	0.63606
14	153° 37' 36"	0° 49' 47"	155° 50' 40"	10° 57' 02"	0° 57' 03"	15' 32.64"	111° 3' 30"	0.63185
15	154° 10' 10"	0° 46' 57"	156° 20' 31"	10° 42' 33"	0° 57' 00"	15' 32.02"	111° 9' 51"	0.62763
16	154° 42' 43"	0° 44' 07"	156° 50' 16"	10° 28' 02"	0° 56' 58"	15' 31.39"	111° 16' 02"	0.62342
17	155° 15' 12"	0° 41' 17"	157° 19' 57"	10° 13' 29"	0° 56' 56"	15' 30.77"	111° 22' 04"	0.61920
18	155° 47' 39"	0° 38' 27"	157° 49' 32"	9° 58' 55"	0° 56' 53"	15' 30.15"	111° 27' 55"	0.61497
19	156° 20' 02"	0° 35' 37"	158° 19' 02"	9° 44' 20"	0° 56' 51"	15' 29.54"	111° 33' 36"	0.61074
20	156° 52' 24"	0° 32' 47"	158° 48' 27"	9° 29' 43"	0° 56' 49"	15' 28.93"	111° 39' 08"	0.60652
21	157° 24' 42"	0° 29' 57"	159° 17' 47"	9° 15' 05"	0° 56' 47"	15' 28.32"	111° 44' 30"	0.60229
22	157° 56' 58"	0° 27' 07"	159° 47' 02"	9° 00' 26"	0° 56' 44"	15' 27.71"	111° 49' 42"	0.59805
23	158° 29' 12"	0° 24' 17"	160° 16' 13"	8° 45' 46"	0° 56' 42"	15' 27.11"	111° 54' 44"	0.59382
24	159° 01' 23"	0° 21' 27"	160° 45' 19"	8° 31' 04"	0° 56' 40"	15' 26.50"	111° 59' 37"	0.58958

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	259° 11' 21"	0.21"	258° 14' 17"	-22° 59' 52"	0.9847444	16'14.50"	23° 26' 18"	6 m 52 s
1	259° 13' 54"	0.20"	258° 17' 02"	-23° 00' 04"	0.9847398	16'14.50"	23° 26' 18"	6 m 51 s
2	259° 16' 26"	0.20"	258° 19' 47"	-23° 00' 16"	0.9847351	16'14.51"	23° 26' 18"	6 m 50 s
3	259° 18' 58"	0.19"	258° 22' 32"	-23° 00' 28"	0.9847305	16'14.51"	23° 26' 18"	6 m 48 s
4	259° 21' 31"	0.19"	258° 25' 18"	-23° 00' 41"	0.9847259	16'14.51"	23° 26' 18"	6 m 47 s
5	259° 24' 03"	0.18"	258° 28' 03"	-23° 00' 53"	0.9847213	16'14.52"	23° 26' 18"	6 m 46 s
6	259° 26' 36"	0.18"	258° 30' 48"	-23° 01' 05"	0.9847167	16'14.52"	23° 26' 18"	6 m 45 s
7	259° 29' 08"	0.17"	258° 33' 33"	-23° 01' 17"	0.9847121	16'14.53"	23° 26' 18"	6 m 44 s
8	259° 31' 41"	0.17"	258° 36' 18"	-23° 01' 29"	0.9847076	16'14.53"	23° 26' 18"	6 m 43 s
9	259° 34' 13"	0.16"	258° 39' 03"	-23° 01' 41"	0.9847030	16'14.54"	23° 26' 18"	6 m 42 s
10	259° 36' 45"	0.15"	258° 41' 48"	-23° 01' 53"	0.9846984	16'14.54"	23° 26' 18"	6 m 40 s
11	259° 39' 18"	0.15"	258° 44' 33"	-23° 02' 05"	0.9846939	16'14.55"	23° 26' 18"	6 m 39 s
12	259° 41' 50"	0.14"	258° 47' 19"	-23° 02' 17"	0.9846893	16'14.55"	23° 26' 18"	6 m 38 s
13	259° 44' 23"	0.14"	258° 50' 04"	-23° 02' 28"	0.9846848	16'14.56"	23° 26' 18"	6 m 37 s
14	259° 46' 55"	0.13"	258° 52' 49"	-23° 02' 40"	0.9846803	16'14.56"	23° 26' 18"	6 m 36 s
15	259° 49' 28"	0.13"	258° 55' 34"	-23° 02' 52"	0.9846758	16'14.56"	23° 26' 18"	6 m 35 s
16	259° 52' 00"	0.12"	258° 58' 19"	-23° 03' 03"	0.9846712	16'14.57"	23° 26' 18"	6 m 33 s
17	259° 54' 33"	0.12"	259° 01' 04"	-23° 03' 15"	0.9846667	16'14.57"	23° 26' 18"	6 m 32 s
18	259° 57' 05"	0.11"	259° 03' 50"	-23° 03' 26"	0.9846623	16'14.58"	23° 26' 18"	6 m 31 s
19	259° 59' 38"	0.11"	259° 06' 35"	-23° 03' 38"	0.9846578	16'14.58"	23° 26' 18"	6 m 30 s
20	260° 02' 10"	0.10"	259° 09' 20"	-23° 03' 49"	0.9846533	16'14.59"	23° 26' 18"	6 m 29 s
21	260° 04' 42"	0.09"	259° 12' 05"	-23° 04' 01"	0.9846488	16'14.59"	23° 26' 18"	6 m 28 s
22	260° 07' 15"	0.09"	259° 14' 51"	-23° 04' 12"	0.9846444	16'14.60"	23° 26' 18"	6 m 27 s
23	260° 09' 47"	0.08"	259° 17' 36"	-23° 04' 23"	0.9846399	16'14.60"	23° 26' 18"	6 m 25 s
24	260° 12' 20"	0.08"	259° 20' 21"	-23° 04' 35"	0.9846355	16'14.60"	23° 26' 18"	6 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	159° 01' 23"	0° 21' 27"	160° 45' 19"	8° 31' 04"	0° 56' 40"	15' 26.50"	111° 59' 37"	0.58958
1	159° 33' 31"	0° 18' 37"	161° 14' 21"	8° 16' 22"	0° 56' 38"	15' 25.91"	112° 4' 20"	0.58535
2	160° 05' 36"	0° 15' 48"	161° 43' 18"	8° 01' 39"	0° 56' 36"	15' 25.31"	112° 8' 54"	0.58111
3	160° 37' 40"	0° 12' 59"	162° 12' 10"	7° 46' 55"	0° 56' 33"	15' 24.72"	112° 13' 19"	0.57688
4	161° 09' 40"	0° 10' 09"	162° 40' 59"	7° 32' 10"	0° 56' 31"	15' 24.13"	112° 17' 34"	0.57264
5	161° 41' 38"	0° 07' 20"	163° 09' 43"	7° 17' 24"	0° 56' 29"	15' 23.55"	112° 21' 40"	0.56841
6	162° 13' 34"	0° 04' 31"	163° 38' 23"	7° 02' 38"	0° 56' 27"	15' 22.97"	112° 25' 36"	0.56417
7	162° 45' 27"	0° 01' 43"	164° 06' 59"	6° 47' 51"	0° 56' 25"	15' 22.39"	112° 29' 23"	0.55994
8	163° 17' 18"	0° -1' 06"	164° 35' 31"	6° 33' 03"	0° 56' 23"	15' 21.82"	112° 33' 01"	0.55570
9	163° 49' 06"	0° -3' 54"	165° 03' 59"	6° 18' 15"	0° 56' 21"	15' 21.25"	112° 36' 30"	0.55147
10	164° 20' 52"	0° -6' 42"	165° 32' 24"	6° 03' 27"	0° 56' 19"	15' 20.68"	112° 39' 50"	0.54725
11	164° 52' 36"	0° -9' 30"	166° 00' 45"	5° 48' 38"	0° 56' 17"	15' 20.12"	112° 43' 01"	0.54302
12	165° 24' 17"	0°-12' 18"	166° 29' 02"	5° 33' 49"	0° 56' 15"	15' 19.56"	112° 46' 03"	0.53879
13	165° 55' 56"	0°-15' 05"	166° 57' 16"	5° 18' 59"	0° 56' 12"	15' 19.00"	112° 48' 56"	0.53457
14	166° 27' 33"	0°-17' 52"	167° 25' 26"	5° 04' 09"	0° 56' 10"	15' 18.45"	112° 51' 40"	0.53036
15	166° 59' 07"	0°-20' 39"	167° 53' 33"	4° 49' 20"	0° 56' 08"	15' 17.90"	112° 54' 15"	0.52614
16	167° 30' 39"	0°-23' 25"	168° 21' 37"	4° 34' 30"	0° 56' 06"	15' 17.35"	112° 56' 42"	0.52193
17	168° 02' 09"	0°-26' 12"	168° 49' 37"	4° 19' 40"	0° 56' 04"	15' 16.81"	112° 58' 59"	0.51772
18	168° 33' 37"	0°-28' 57"	169° 17' 35"	4° 04' 50"	0° 56' 02"	15' 16.27"	113° 1' 08"	0.51352
19	169° 05' 02"	0°-31' 43"	169° 45' 29"	3° 50' 00"	0° 56' 01"	15' 15.74"	113° 3' 09"	0.50932
20	169° 36' 26"	0°-34' 28"	170° 13' 21"	3° 35' 11"	0° 55' 59"	15' 15.21"	113° 5' 00"	0.50512
21	170° 07' 47"	0°-37' 13"	170° 41' 10"	3° 20' 21"	0° 55' 57"	15' 14.68"	113° 6' 43"	0.50093
22	170° 39' 06"	0°-39' 57"	171° 08' 56"	3° 05' 32"	0° 55' 55"	15' 14.16"	113° 8' 17"	0.49675
23	171° 10' 23"	0°-42' 41"	171° 36' 39"	2° 50' 43"	0° 55' 53"	15' 13.64"	113° 9' 43"	0.49257
24	171° 41' 38"	0°-45' 25"	172° 04' 20"	2° 35' 55"	0° 55' 51"	15' 13.13"	113° 11' 00"	0.48839

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	260° 12' 20"	0.08"	259° 20' 21"	-23° 04' 35"	0.9846355	16' 14.60"	23° 26' 18"	6 m 24 s
1	260° 14' 52"	0.07"	259° 23' 07"	-23° 04' 46"	0.9846310	16' 14.61"	23° 26' 18"	6 m 23 s
2	260° 17' 25"	0.07"	259° 25' 52"	-23° 04' 57"	0.9846266	16' 14.61"	23° 26' 18"	6 m 22 s
3	260° 19' 57"	0.06"	259° 28' 37"	-23° 05' 08"	0.9846222	16' 14.62"	23° 26' 18"	6 m 21 s
4	260° 22' 30"	0.06"	259° 31' 22"	-23° 05' 19"	0.9846178	16' 14.62"	23° 26' 18"	6 m 20 s
5	260° 25' 02"	0.05"	259° 34' 08"	-23° 05' 30"	0.9846134	16' 14.63"	23° 26' 18"	6 m 18 s
6	260° 27' 35"	0.04"	259° 36' 53"	-23° 05' 41"	0.9846090	16' 14.63"	23° 26' 18"	6 m 17 s
7	260° 30' 07"	0.04"	259° 39' 38"	-23° 05' 52"	0.9846046	16' 14.63"	23° 26' 18"	6 m 16 s
8	260° 32' 40"	0.03"	259° 42' 24"	-23° 06' 03"	0.9846002	16' 14.64"	23° 26' 18"	6 m 15 s
9	260° 35' 12"	0.03"	259° 45' 09"	-23° 06' 14"	0.9845958	16' 14.64"	23° 26' 18"	6 m 14 s
10	260° 37' 45"	0.02"	259° 47' 55"	-23° 06' 25"	0.9845915	16' 14.65"	23° 26' 18"	6 m 13 s
11	260° 40' 17"	0.02"	259° 50' 40"	-23° 06' 35"	0.9845871	16' 14.65"	23° 26' 18"	6 m 11 s
12	260° 42' 50"	0.01"	259° 53' 25"	-23° 06' 46"	0.9845828	16' 14.66"	23° 26' 18"	6 m 10 s
13	260° 45' 22"	0.01"	259° 56' 11"	-23° 06' 57"	0.9845784	16' 14.66"	23° 26' 18"	6 m 09 s
14	260° 47' 55"	0.00"	259° 58' 56"	-23° 07' 07"	0.9845741	16' 14.67"	23° 26' 18"	6 m 08 s
15	260° 50' 27"	-0.00"	260° 01' 42"	-23° 07' 18"	0.9845698	16' 14.67"	23° 26' 18"	6 m 07 s
16	260° 52' 60"	-0.01"	260° 04' 27"	-23° 07' 28"	0.9845654	16' 14.67"	23° 26' 18"	6 m 06 s
17	260° 55' 32"	-0.02"	260° 07' 12"	-23° 07' 39"	0.9845611	16' 14.68"	23° 26' 18"	6 m 04 s
18	260° 58' 05"	-0.02"	260° 09' 58"	-23° 07' 49"	0.9845568	16' 14.68"	23° 26' 18"	6 m 03 s
19	261° 00' 37"	-0.03"	260° 12' 43"	-23° 07' 59"	0.9845525	16' 14.69"	23° 26' 18"	6 m 02 s
20	261° 03' 10"	-0.03"	260° 15' 29"	-23° 08' 10"	0.9845483	16' 14.69"	23° 26' 18"	6 m 01 s
21	261° 05' 42"	-0.04"	260° 18' 14"	-23° 08' 20"	0.9845440	16' 14.69"	23° 26' 18"	5 m 60 s
22	261° 08' 15"	-0.04"	260° 20' 60"	-23° 08' 30"	0.9845397	16' 14.70"	23° 26' 18"	5 m 58 s
23	261° 10' 47"	-0.05"	260° 23' 45"	-23° 08' 40"	0.9845354	16' 14.70"	23° 26' 18"	5 m 57 s
24	261° 13' 20"	-0.05"	260° 26' 31"	-23° 08' 50"	0.9845312	16' 14.71"	23° 26' 18"	5 m 56 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	171° 41' 38"	0°-45' 25"	172° 04' 20"	2° 35' 55"	0° 55' 51"	15' 13.13"	113° 11' 00"	0.48839
1	172° 12' 51"	0°-48' 08"	172° 31' 58"	2° 21' 06"	0° 55' 49"	15' 12.62"	113° 12' 09"	0.48422
2	172° 44' 02"	0°-50' 51"	172° 59' 34"	2° 06' 19"	0° 55' 47"	15' 12.12"	113° 13' 09"	0.48006
3	173° 15' 10"	0°-53' 33"	173° 27' 07"	1° 51' 31"	0° 55' 45"	15' 11.61"	113° 14' 01"	0.47591
4	173° 46' 17"	0°-56' 15"	173° 54' 38"	1° 36' 45"	0° 55' 44"	15' 11.12"	113° 14' 44"	0.47176
5	174° 17' 22"	0°-58' 56"	174° 22' 07"	1° 21' 58"	0° 55' 42"	15' 10.62"	113° 15' 19"	0.46761
6	174° 48' 25"	-1° 01' 37"	174° 49' 34"	1° 07' 13"	0° 55' 40"	15' 10.13"	113° 15' 46"	0.46348
7	175° 19' 26"	-1° 04' 18"	175° 16' 59"	0° 52' 28"	0° 55' 38"	15' 09.65"	113° 16' 05"	0.45935
8	175° 50' 25"	-1° 06' 58"	175° 44' 22"	0° 37' 44"	0° 55' 36"	15' 09.17"	113° 16' 15"	0.45523
9	176° 21' 22"	-1° 09' 37"	176° 11' 43"	0° 23' 01"	0° 55' 35"	15' 08.69"	113° 16' 16"	0.45111
10	176° 52' 18"	-1° 12' 16"	176° 39' 03"	0° 08' 18"	0° 55' 33"	15' 08.22"	113° 16' 10"	0.44701
11	177° 23' 11"	-1° 14' 55"	177° 06' 21"	0° -6' 24"	0° 55' 31"	15' 07.75"	113° 15' 55"	0.44291
12	177° 54' 03"	-1° 17' 33"	177° 33' 37"	0°-21' 04"	0° 55' 29"	15' 07.29"	113° 15' 32"	0.43882
13	178° 24' 53"	-1° 20' 10"	178° 00' 51"	0°-35' 44"	0° 55' 28"	15' 06.83"	113° 15' 01"	0.43474
14	178° 55' 41"	-1° 22' 47"	178° 28' 04"	0°-50' 23"	0° 55' 26"	15' 06.37"	113° 14' 21"	0.43067
15	179° 26' 28"	-1° 25' 24"	178° 55' 16"	-1° 05' 01"	0° 55' 24"	15' 05.92"	113° 13' 34"	0.42660
16	179° 57' 13"	-1° 27' 60"	179° 22' 26"	-1° 19' 37"	0° 55' 23"	15' 05.47"	113° 12' 38"	0.42255
17	180° 27' 56"	-1° 30' 35"	179° 49' 35"	-1° 34' 13"	0° 55' 21"	15' 05.03"	113° 11' 34"	0.41850
18	180° 58' 37"	-1° 33' 09"	180° 16' 43"	-1° 48' 47"	0° 55' 20"	15' 04.59"	113° 10' 22"	0.41447
19	181° 29' 17"	-1° 35' 43"	180° 43' 50"	-2° 03' 20"	0° 55' 18"	15' 04.16"	113° 9' 02"	0.41044
20	181° 59' 55"	-1° 38' 17"	181° 10' 56"	-2° 17' 52"	0° 55' 16"	15' 03.73"	113° 7' 34"	0.40643
21	182° 30' 32"	-1° 40' 50"	181° 38' 01"	-2° 32' 22"	0° 55' 15"	15' 03.30"	113° 5' 58"	0.40242
22	183° 01' 07"	-1° 43' 22"	182° 05' 05"	-2° 46' 52"	0° 55' 13"	15' 02.88"	113° 4' 13"	0.39843
23	183° 31' 40"	-1° 45' 53"	182° 32' 08"	-3° 01' 19"	0° 55' 12"	15' 02.47"	113° 2' 21"	0.39444
24	184° 02' 12"	-1° 48' 24"	182° 59' 11"	-3° 15' 46"	0° 55' 10"	15' 02.06"	113° 0' 21"	0.39047

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	261° 13' 20"	-0.05"	260° 26' 31"	-23° 08' 50"	0.9845312	16'14.71"	23° 26' 18"	5 m 56 s
1	261° 15' 52"	-0.06"	260° 29' 16"	-23° 09' 00"	0.9845269	16'14.71"	23° 26' 18"	5 m 55 s
2	261° 18' 25"	-0.06"	260° 32' 02"	-23° 09' 10"	0.9845227	16'14.72"	23° 26' 18"	5 m 54 s
3	261° 20' 57"	-0.07"	260° 34' 47"	-23° 09' 20"	0.9845185	16'14.72"	23° 26' 18"	5 m 53 s
4	261° 23' 30"	-0.07"	260° 37' 33"	-23° 09' 30"	0.9845142	16'14.72"	23° 26' 18"	5 m 51 s
5	261° 26' 02"	-0.08"	260° 40' 18"	-23° 09' 40"	0.9845100	16'14.73"	23° 26' 18"	5 m 50 s
6	261° 28' 35"	-0.08"	260° 43' 04"	-23° 09' 50"	0.9845058	16'14.73"	23° 26' 18"	5 m 49 s
7	261° 31' 07"	-0.09"	260° 45' 50"	-23° 09' 60"	0.9845016	16'14.74"	23° 26' 18"	5 m 48 s
8	261° 33' 40"	-0.10"	260° 48' 35"	-23° 10' 09"	0.9844974	16'14.74"	23° 26' 18"	5 m 47 s
9	261° 36' 13"	-0.10"	260° 51' 21"	-23° 10' 19"	0.9844932	16'14.75"	23° 26' 18"	5 m 46 s
10	261° 38' 45"	-0.11"	260° 54' 06"	-23° 10' 29"	0.9844891	16'14.75"	23° 26' 18"	5 m 44 s
11	261° 41' 18"	-0.11"	260° 56' 52"	-23° 10' 38"	0.9844849	16'14.75"	23° 26' 18"	5 m 43 s
12	261° 43' 50"	-0.12"	260° 59' 37"	-23° 10' 48"	0.9844807	16'14.76"	23° 26' 18"	5 m 42 s
13	261° 46' 23"	-0.12"	261° 02' 23"	-23° 10' 57"	0.9844766	16'14.76"	23° 26' 18"	5 m 41 s
14	261° 48' 55"	-0.13"	261° 05' 09"	-23° 11' 07"	0.9844724	16'14.77"	23° 26' 18"	5 m 40 s
15	261° 51' 28"	-0.13"	261° 07' 54"	-23° 11' 16"	0.9844683	16'14.77"	23° 26' 18"	5 m 38 s
16	261° 54' 00"	-0.14"	261° 10' 40"	-23° 11' 25"	0.9844641	16'14.77"	23° 26' 18"	5 m 37 s
17	261° 56' 33"	-0.14"	261° 13' 26"	-23° 11' 35"	0.9844600	16'14.78"	23° 26' 18"	5 m 36 s
18	261° 59' 05"	-0.15"	261° 16' 11"	-23° 11' 44"	0.9844559	16'14.78"	23° 26' 18"	5 m 35 s
19	262° 01' 38"	-0.15"	261° 18' 57"	-23° 11' 53"	0.9844518	16'14.79"	23° 26' 18"	5 m 34 s
20	262° 04' 11"	-0.16"	261° 21' 43"	-23° 12' 02"	0.9844477	16'14.79"	23° 26' 18"	5 m 32 s
21	262° 06' 43"	-0.16"	261° 24' 28"	-23° 12' 11"	0.9844436	16'14.79"	23° 26' 18"	5 m 31 s
22	262° 09' 16"	-0.17"	261° 27' 14"	-23° 12' 20"	0.9844395	16'14.80"	23° 26' 18"	5 m 30 s
23	262° 11' 48"	-0.17"	261° 29' 60"	-23° 12' 29"	0.9844354	16'14.80"	23° 26' 18"	5 m 29 s
24	262° 14' 21"	-0.18"	261° 32' 45"	-23° 12' 38"	0.9844313	16'14.81"	23° 26' 18"	5 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	184° 02' 12"	-1° 48' 24"	182° 59' 11"	-3° 15' 46"	0° 55' 10"	15' 02.06"	113° 0' 21"	0.39047
1	184° 32' 42"	-1° 50' 55"	183° 26' 13"	-3° 30' 10"	0° 55' 09"	15' 01.65"	112° 58' 12"	0.38651
2	185° 03' 11"	-1° 53' 24"	183° 53' 14"	-3° 44' 34"	0° 55' 07"	15' 01.25"	112° 55' 55"	0.38256
3	185° 33' 39"	-1° 55' 53"	184° 20' 15"	-3° 58' 55"	0° 55' 06"	15' 00.85"	112° 53' 31"	0.37862
4	186° 04' 05"	-1° 58' 21"	184° 47' 16"	-4° 13' 16"	0° 55' 04"	15' 00.45"	112° 50' 58"	0.37469
5	186° 34' 29"	-2° 00' 49"	185° 14' 16"	-4° 27' 34"	0° 55' 03"	15' 00.06"	112° 48' 17"	0.37077
6	187° 04' 53"	-2° 03' 16"	185° 41' 16"	-4° 41' 51"	0° 55' 02"	14' 59.68"	112° 45' 29"	0.36687
7	187° 35' 14"	-2° 05' 42"	186° 08' 16"	-4° 56' 06"	0° 55' 00"	14' 59.30"	112° 42' 32"	0.36297
8	188° 05' 35"	-2° 08' 08"	186° 35' 15"	-5° 10' 19"	0° 54' 59"	14' 58.92"	112° 39' 27"	0.35909
9	188° 35' 54"	-2° 10' 32"	187° 02' 15"	-5° 24' 31"	0° 54' 57"	14' 58.55"	112° 36' 14"	0.35523
10	189° 06' 12"	-2° 12' 56"	187° 29' 14"	-5° 38' 40"	0° 54' 56"	14' 58.18"	112° 32' 53"	0.35137
11	189° 36' 28"	-2° 15' 20"	187° 56' 14"	-5° 52' 48"	0° 54' 55"	14' 57.82"	112° 29' 24"	0.34753
12	190° 06' 44"	-2° 17' 42"	188° 23' 14"	-6° 06' 54"	0° 54' 53"	14' 57.46"	112° 25' 47"	0.34370
13	190° 36' 58"	-2° 20' 04"	188° 50' 14"	-6° 20' 57"	0° 54' 52"	14' 57.11"	112° 22' 02"	0.33988
14	191° 07' 11"	-2° 22' 25"	189° 17' 14"	-6° 34' 59"	0° 54' 51"	14' 56.76"	112° 18' 09"	0.33608
15	191° 37' 22"	-2° 24' 45"	189° 44' 15"	-6° 48' 59"	0° 54' 50"	14' 56.41"	112° 14' 08"	0.33229
16	192° 07' 33"	-2° 27' 05"	190° 11' 16"	-7° 02' 56"	0° 54' 48"	14' 56.07"	112° 9' 59"	0.32851
17	192° 37' 42"	-2° 29' 24"	190° 38' 17"	-7° 16' 52"	0° 54' 47"	14' 55.74"	112° 5' 41"	0.32475
18	193° 07' 50"	-2° 31' 41"	191° 05' 20"	-7° 30' 45"	0° 54' 46"	14' 55.40"	112° 1' 16"	0.32101
19	193° 37' 57"	-2° 33' 59"	191° 32' 22"	-7° 44' 36"	0° 54' 45"	14' 55.08"	111° 56' 43"	0.31727
20	194° 08' 03"	-2° 36' 15"	191° 59' 26"	-7° 58' 25"	0° 54' 44"	14' 54.75"	111° 52' 01"	0.31355
21	194° 38' 08"	-2° 38' 30"	192° 26' 30"	-8° 12' 11"	0° 54' 42"	14' 54.44"	111° 47' 11"	0.30985
22	195° 08' 12"	-2° 40' 45"	192° 53' 35"	-8° 25' 55"	0° 54' 41"	14' 54.12"	111° 42' 13"	0.30616
23	195° 38' 15"	-2° 42' 59"	193° 20' 42"	-8° 39' 37"	0° 54' 40"	14' 53.81"	111° 37' 07"	0.30249
24	196° 08' 17"	-2° 45' 12"	193° 47' 49"	-8° 53' 17"	0° 54' 39"	14' 53.51"	111° 31' 53"	0.29883

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	262° 14' 21"	-0.18"	261° 32' 45"	-23° 12' 38"	0.9844313	16' 14.81"	23° 26' 18"	5 m 28 s
1	262° 16' 53"	-0.18"	261° 35' 31"	-23° 12' 47"	0.9844273	16' 14.81"	23° 26' 18"	5 m 27 s
2	262° 19' 26"	-0.19"	261° 38' 17"	-23° 12' 56"	0.9844232	16' 14.81"	23° 26' 18"	5 m 25 s
3	262° 21' 58"	-0.19"	261° 41' 03"	-23° 13' 05"	0.9844191	16' 14.82"	23° 26' 18"	5 m 24 s
4	262° 24' 31"	-0.20"	261° 43' 48"	-23° 13' 14"	0.9844151	16' 14.82"	23° 26' 18"	5 m 23 s
5	262° 27' 04"	-0.20"	261° 46' 34"	-23° 13' 22"	0.9844111	16' 14.83"	23° 26' 18"	5 m 22 s
6	262° 29' 36"	-0.20"	261° 49' 20"	-23° 13' 31"	0.9844070	16' 14.83"	23° 26' 18"	5 m 21 s
7	262° 32' 09"	-0.21"	261° 52' 06"	-23° 13' 40"	0.9844030	16' 14.83"	23° 26' 18"	5 m 19 s
8	262° 34' 41"	-0.21"	261° 54' 51"	-23° 13' 48"	0.9843990	16' 14.84"	23° 26' 18"	5 m 18 s
9	262° 37' 14"	-0.22"	261° 57' 37"	-23° 13' 57"	0.9843950	16' 14.84"	23° 26' 18"	5 m 17 s
10	262° 39' 46"	-0.22"	262° 00' 23"	-23° 14' 05"	0.9843910	16' 14.85"	23° 26' 18"	5 m 16 s
11	262° 42' 19"	-0.23"	262° 03' 09"	-23° 14' 14"	0.9843870	16' 14.85"	23° 26' 18"	5 m 15 s
12	262° 44' 52"	-0.23"	262° 05' 55"	-23° 14' 22"	0.9843830	16' 14.85"	23° 26' 18"	5 m 13 s
13	262° 47' 24"	-0.24"	262° 08' 40"	-23° 14' 30"	0.9843790	16' 14.86"	23° 26' 18"	5 m 12 s
14	262° 49' 57"	-0.24"	262° 11' 26"	-23° 14' 39"	0.9843750	16' 14.86"	23° 26' 18"	5 m 11 s
15	262° 52' 29"	-0.25"	262° 14' 12"	-23° 14' 47"	0.9843711	16' 14.87"	23° 26' 18"	5 m 10 s
16	262° 55' 02"	-0.25"	262° 16' 58"	-23° 14' 55"	0.9843671	16' 14.87"	23° 26' 18"	5 m 09 s
17	262° 57' 35"	-0.25"	262° 19' 44"	-23° 15' 03"	0.9843632	16' 14.87"	23° 26' 18"	5 m 07 s
18	263° 00' 07"	-0.26"	262° 22' 30"	-23° 15' 11"	0.9843592	16' 14.88"	23° 26' 18"	5 m 06 s
19	263° 02' 40"	-0.26"	262° 25' 15"	-23° 15' 19"	0.9843553	16' 14.88"	23° 26' 18"	5 m 05 s
20	263° 05' 12"	-0.27"	262° 28' 01"	-23° 15' 27"	0.9843514	16' 14.89"	23° 26' 18"	5 m 04 s
21	263° 07' 45"	-0.27"	262° 30' 47"	-23° 15' 35"	0.9843474	16' 14.89"	23° 26' 18"	5 m 03 s
22	263° 10' 18"	-0.28"	262° 33' 33"	-23° 15' 43"	0.9843435	16' 14.89"	23° 26' 18"	5 m 01 s
23	263° 12' 50"	-0.28"	262° 36' 19"	-23° 15' 51"	0.9843396	16' 14.90"	23° 26' 18"	5 m 00 s
24	263° 15' 23"	-0.28"	262° 39' 05"	-23° 15' 59"	0.9843357	16' 14.90"	23° 26' 17"	4 m 59 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	196° 08' 17"	-2° 45' 12"	193° 47' 49"	-8° 53' 17"	0° 54' 39"	14' 53.51"	111° 31' 53"	0.29883
1	196° 38' 17"	-2° 47' 24"	194° 14' 57"	-9° 06' 53"	0° 54' 38"	14' 53.21"	111° 26' 31"	0.29518
2	197° 08' 17"	-2° 49' 35"	194° 42' 06"	-9° 20' 28"	0° 54' 37"	14' 52.91"	111° 21' 00"	0.29155
3	197° 38' 16"	-2° 51' 46"	195° 09' 16"	-9° 33' 59"	0° 54' 36"	14' 52.62"	111° 15' 21"	0.28794
4	198° 08' 14"	-2° 53' 55"	195° 36' 27"	-9° 47' 29"	0° 54' 35"	14' 52.33"	111° 9' 34"	0.28434
5	198° 38' 11"	-2° 56' 04"	196° 03' 40"	-10° 00' 55"	0° 54' 34"	14' 52.05"	111° 3' 39"	0.28076
6	199° 08' 07"	-2° 58' 12"	196° 30' 54"	-10° 14' 19"	0° 54' 33"	14' 51.77"	110° 57' 35"	0.27720
7	199° 38' 03"	-3° 00' 19"	196° 58' 10"	-10° 27' 40"	0° 54' 32"	14' 51.50"	110° 51' 23"	0.27365
8	200° 07' 57"	-3° 02' 25"	197° 25' 27"	-10° 40' 59"	0° 54' 31"	14' 51.23"	110° 45' 03"	0.27011
9	200° 37' 51"	-3° 04' 30"	197° 52' 46"	-10° 54' 14"	0° 54' 30"	14' 50.96"	110° 38' 34"	0.26660
10	201° 07' 44"	-3° 06' 34"	198° 20' 06"	-11° 07' 27"	0° 54' 29"	14' 50.70"	110° 31' 57"	0.26310
11	201° 37' 36"	-3° 08' 37"	198° 47' 28"	-11° 20' 37"	0° 54' 28"	14' 50.44"	110° 25' 11"	0.25962
12	202° 07' 27"	-3° 10' 40"	199° 14' 51"	-11° 33' 44"	0° 54' 27"	14' 50.19"	110° 18' 17"	0.25615
13	202° 37' 18"	-3° 12' 41"	199° 42' 16"	-11° 46' 48"	0° 54' 26"	14' 49.94"	110° 11' 15"	0.25270
14	203° 07' 07"	-3° 14' 41"	200° 09' 44"	-11° 59' 49"	0° 54' 25"	14' 49.70"	110° 4' 04"	0.24927
15	203° 36' 57"	-3° 16' 41"	200° 37' 13"	-12° 12' 47"	0° 54' 24"	14' 49.46"	109° 56' 44"	0.24586
16	204° 06' 45"	-3° 18' 40"	201° 04' 44"	-12° 25' 41"	0° 54' 23"	14' 49.22"	109° 49' 16"	0.24246
17	204° 36' 33"	-3° 20' 37"	201° 32' 17"	-12° 38' 33"	0° 54' 22"	14' 48.99"	109° 41' 39"	0.23908
18	205° 06' 20"	-3° 22' 34"	201° 59' 52"	-12° 51' 22"	0° 54' 22"	14' 48.77"	109° 33' 53"	0.23572
19	205° 36' 06"	-3° 24' 29"	202° 27' 29"	-13° 04' 07"	0° 54' 21"	14' 48.54"	109° 25' 59"	0.23238
20	206° 05' 52"	-3° 26' 24"	202° 55' 08"	-13° 16' 49"	0° 54' 20"	14' 48.33"	109° 17' 56"	0.22906
21	206° 35' 37"	-3° 28' 18"	203° 22' 50"	-13° 29' 28"	0° 54' 19"	14' 48.11"	109° 9' 44"	0.22575
22	207° 05' 22"	-3° 30' 10"	203° 50' 34"	-13° 42' 03"	0° 54' 18"	14' 47.90"	109° 1' 24"	0.22247
23	207° 35' 06"	-3° 32' 02"	204° 18' 20"	-13° 54' 35"	0° 54' 18"	14' 47.70"	108° 52' 54"	0.21920
24	208° 04' 50"	-3° 33' 53"	204° 46' 08"	-14° 07' 03"	0° 54' 17"	14' 47.50"	108° 44' 16"	0.21595

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	263° 15' 23"	-0.28"	262° 39' 05"	-23° 15' 59"	0.9843357	16'14.90"	23° 26' 17"	4 m 59 s
1	263° 17' 55"	-0.29"	262° 41' 51"	-23° 16' 06"	0.9843318	16'14.90"	23° 26' 17"	4 m 58 s
2	263° 20' 28"	-0.29"	262° 44' 37"	-23° 16' 14"	0.9843279	16'14.91"	23° 26' 17"	4 m 57 s
3	263° 23' 01"	-0.30"	262° 47' 23"	-23° 16' 22"	0.9843240	16'14.91"	23° 26' 17"	4 m 55 s
4	263° 25' 33"	-0.30"	262° 50' 08"	-23° 16' 29"	0.9843202	16'14.92"	23° 26' 17"	4 m 54 s
5	263° 28' 06"	-0.31"	262° 52' 54"	-23° 16' 37"	0.9843163	16'14.92"	23° 26' 17"	4 m 53 s
6	263° 30' 38"	-0.31"	262° 55' 40"	-23° 16' 44"	0.9843124	16'14.92"	23° 26' 17"	4 m 52 s
7	263° 33' 11"	-0.31"	262° 58' 26"	-23° 16' 52"	0.9843086	16'14.93"	23° 26' 17"	4 m 51 s
8	263° 35' 44"	-0.32"	263° 01' 12"	-23° 16' 59"	0.9843047	16'14.93"	23° 26' 17"	4 m 49 s
9	263° 38' 16"	-0.32"	263° 03' 58"	-23° 17' 07"	0.9843009	16'14.94"	23° 26' 17"	4 m 48 s
10	263° 40' 49"	-0.32"	263° 06' 44"	-23° 17' 14"	0.9842971	16'14.94"	23° 26' 17"	4 m 47 s
11	263° 43' 22"	-0.33"	263° 09' 30"	-23° 17' 21"	0.9842932	16'14.94"	23° 26' 17"	4 m 46 s
12	263° 45' 54"	-0.33"	263° 12' 16"	-23° 17' 28"	0.9842894	16'14.95"	23° 26' 17"	4 m 45 s
13	263° 48' 27"	-0.34"	263° 15' 02"	-23° 17' 36"	0.9842856	16'14.95"	23° 26' 17"	4 m 43 s
14	263° 50' 59"	-0.34"	263° 17' 48"	-23° 17' 43"	0.9842818	16'14.95"	23° 26' 17"	4 m 42 s
15	263° 53' 32"	-0.34"	263° 20' 34"	-23° 17' 50"	0.9842780	16'14.96"	23° 26' 17"	4 m 41 s
16	263° 56' 05"	-0.35"	263° 23' 20"	-23° 17' 57"	0.9842742	16'14.96"	23° 26' 17"	4 m 40 s
17	263° 58' 37"	-0.35"	263° 26' 06"	-23° 18' 04"	0.9842704	16'14.97"	23° 26' 17"	4 m 39 s
18	264° 01' 10"	-0.35"	263° 28' 52"	-23° 18' 11"	0.9842667	16'14.97"	23° 26' 17"	4 m 37 s
19	264° 03' 43"	-0.36"	263° 31' 38"	-23° 18' 18"	0.9842629	16'14.97"	23° 26' 17"	4 m 36 s
20	264° 06' 15"	-0.36"	263° 34' 24"	-23° 18' 24"	0.9842591	16'14.98"	23° 26' 17"	4 m 35 s
21	264° 08' 48"	-0.36"	263° 37' 10"	-23° 18' 31"	0.9842554	16'14.98"	23° 26' 17"	4 m 34 s
22	264° 11' 20"	-0.37"	263° 39' 56"	-23° 18' 38"	0.9842516	16'14.98"	23° 26' 17"	4 m 33 s
23	264° 13' 53"	-0.37"	263° 42' 42"	-23° 18' 44"	0.9842479	16'14.99"	23° 26' 17"	4 m 31 s
24	264° 16' 26"	-0.37"	263° 45' 28"	-23° 18' 51"	0.9842441	16'14.99"	23° 26' 17"	4 m 30 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	208° 04' 50"	-3° 33' 53"	204° 46' 08"	-14° 07' 03"	0° 54' 17"	14' 47.50"	108° 44' 16"	0.21595
1	208° 34' 33"	-3° 35' 43"	205° 13' 59"	-14° 19' 28"	0° 54' 16"	14' 47.30"	108° 35' 28"	0.21272
2	209° 04' 15"	-3° 37' 31"	205° 41' 53"	-14° 31' 50"	0° 54' 15"	14' 47.11"	108° 26' 32"	0.20951
3	209° 33' 58"	-3° 39' 19"	206° 09' 49"	-14° 44' 08"	0° 54' 15"	14' 46.92"	108° 17' 26"	0.20632
4	210° 03' 39"	-3° 41' 05"	206° 37' 48"	-14° 56' 22"	0° 54' 14"	14' 46.73"	108° 8' 11"	0.20315
5	210° 33' 20"	-3° 42' 51"	207° 05' 49"	-15° 08' 33"	0° 54' 13"	14' 46.55"	107° 58' 47"	0.19999
6	211° 03' 01"	-3° 44' 36"	207° 33' 53"	-15° 20' 40"	0° 54' 13"	14' 46.38"	107° 49' 14"	0.19686
7	211° 32' 41"	-3° 46' 19"	208° 01' 60"	-15° 32' 43"	0° 54' 12"	14' 46.20"	107° 39' 31"	0.19375
8	212° 02' 21"	-3° 48' 01"	208° 30' 09"	-15° 44' 43"	0° 54' 11"	14' 46.03"	107° 29' 39"	0.19066
9	212° 32' 01"	-3° 49' 43"	208° 58' 22"	-15° 56' 38"	0° 54' 11"	14' 45.87"	107° 19' 38"	0.18758
10	213° 01' 40"	-3° 51' 23"	209° 26' 37"	-16° 08' 30"	0° 54' 10"	14' 45.71"	107° 9' 27"	0.18453
11	213° 31' 18"	-3° 53' 02"	209° 54' 55"	-16° 20' 18"	0° 54' 10"	14' 45.55"	106° 59' 06"	0.18150
12	214° 00' 57"	-3° 54' 40"	210° 23' 17"	-16° 32' 01"	0° 54' 09"	14' 45.40"	106° 48' 36"	0.17849
13	214° 30' 35"	-3° 56' 17"	210° 51' 41"	-16° 43' 41"	0° 54' 09"	14' 45.25"	106° 37' 55"	0.17550
14	215° 00' 13"	-3° 57' 53"	211° 20' 08"	-16° 55' 17"	0° 54' 08"	14' 45.11"	106° 27' 06"	0.17253
15	215° 29' 50"	-3° 59' 28"	211° 48' 39"	-17° 06' 48"	0° 54' 08"	14' 44.97"	106° 16' 06"	0.16958
16	215° 59' 27"	-4° 01' 02"	212° 17' 12"	-17° 18' 16"	0° 54' 07"	14' 44.83"	106° 4' 56"	0.16665
17	216° 29' 04"	-4° 02' 35"	212° 45' 49"	-17° 29' 39"	0° 54' 07"	14' 44.70"	105° 53' 36"	0.16375
18	216° 58' 41"	-4° 04' 06"	213° 14' 29"	-17° 40' 58"	0° 54' 06"	14' 44.57"	105° 42' 06"	0.16086
19	217° 28' 18"	-4° 05' 37"	213° 43' 12"	-17° 52' 13"	0° 54' 06"	14' 44.45"	105° 30' 25"	0.15800
20	217° 57' 54"	-4° 07' 06"	214° 11' 59"	-18° 03' 23"	0° 54' 05"	14' 44.32"	105° 18' 34"	0.15516
21	218° 27' 30"	-4° 08' 34"	214° 40' 49"	-18° 14' 29"	0° 54' 05"	14' 44.21"	105° 6' 33"	0.15234
22	218° 57' 06"	-4° 10' 01"	215° 09' 42"	-18° 25' 30"	0° 54' 04"	14' 44.09"	104° 54' 21"	0.14954
23	219° 26' 41"	-4° 11' 27"	215° 38' 39"	-18° 36' 27"	0° 54' 04"	14' 43.98"	104° 41' 59"	0.14676
24	219° 56' 17"	-4° 12' 52"	216° 07' 39"	-18° 47' 19"	0° 54' 04"	14' 43.88"	104° 29' 25"	0.14401

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	264° 16' 26"	-0.37"	263° 45' 28"	-23° 18' 51"	0.9842441	16' 14.99"	23° 26' 17"	4 m 30 s
1	264° 18' 58"	-0.38"	263° 48' 14"	-23° 18' 58"	0.9842404	16' 15.00"	23° 26' 17"	4 m 29 s
2	264° 21' 31"	-0.38"	263° 51' 00"	-23° 19' 04"	0.9842367	16' 15.00"	23° 26' 17"	4 m 28 s
3	264° 24' 04"	-0.38"	263° 53' 47"	-23° 19' 11"	0.9842330	16' 15.00"	23° 26' 17"	4 m 27 s
4	264° 26' 36"	-0.39"	263° 56' 33"	-23° 19' 17"	0.9842293	16' 15.01"	23° 26' 17"	4 m 25 s
5	264° 29' 09"	-0.39"	263° 59' 19"	-23° 19' 24"	0.9842256	16' 15.01"	23° 26' 17"	4 m 24 s
6	264° 31' 42"	-0.39"	264° 02' 05"	-23° 19' 30"	0.9842219	16' 15.01"	23° 26' 17"	4 m 23 s
7	264° 34' 14"	-0.40"	264° 04' 51"	-23° 19' 36"	0.9842182	16' 15.02"	23° 26' 17"	4 m 22 s
8	264° 36' 47"	-0.40"	264° 07' 37"	-23° 19' 42"	0.9842145	16' 15.02"	23° 26' 17"	4 m 20 s
9	264° 39' 20"	-0.40"	264° 10' 23"	-23° 19' 49"	0.9842108	16' 15.02"	23° 26' 17"	4 m 19 s
10	264° 41' 52"	-0.40"	264° 13' 09"	-23° 19' 55"	0.9842072	16' 15.03"	23° 26' 17"	4 m 18 s
11	264° 44' 25"	-0.41"	264° 15' 55"	-23° 20' 01"	0.9842035	16' 15.03"	23° 26' 17"	4 m 17 s
12	264° 46' 58"	-0.41"	264° 18' 41"	-23° 20' 07"	0.9841998	16' 15.04"	23° 26' 17"	4 m 16 s
13	264° 49' 30"	-0.41"	264° 21' 28"	-23° 20' 13"	0.9841962	16' 15.04"	23° 26' 17"	4 m 14 s
14	264° 52' 03"	-0.41"	264° 24' 14"	-23° 20' 19"	0.9841925	16' 15.04"	23° 26' 17"	4 m 13 s
15	264° 54' 36"	-0.42"	264° 26' 60"	-23° 20' 25"	0.9841889	16' 15.05"	23° 26' 17"	4 m 12 s
16	264° 57' 08"	-0.42"	264° 29' 46"	-23° 20' 31"	0.9841853	16' 15.05"	23° 26' 17"	4 m 11 s
17	264° 59' 41"	-0.42"	264° 32' 32"	-23° 20' 36"	0.9841817	16' 15.05"	23° 26' 17"	4 m 10 s
18	265° 02' 14"	-0.42"	264° 35' 18"	-23° 20' 42"	0.9841780	16' 15.06"	23° 26' 17"	4 m 08 s
19	265° 04' 46"	-0.43"	264° 38' 05"	-23° 20' 48"	0.9841744	16' 15.06"	23° 26' 17"	4 m 07 s
20	265° 07' 19"	-0.43"	264° 40' 51"	-23° 20' 53"	0.9841708	16' 15.06"	23° 26' 17"	4 m 06 s
21	265° 09' 52"	-0.43"	264° 43' 37"	-23° 20' 59"	0.9841672	16' 15.07"	23° 26' 17"	4 m 05 s
22	265° 12' 24"	-0.43"	264° 46' 23"	-23° 21' 05"	0.9841637	16' 15.07"	23° 26' 17"	4 m 03 s
23	265° 14' 57"	-0.44"	264° 49' 09"	-23° 21' 10"	0.9841601	16' 15.08"	23° 26' 17"	4 m 02 s
24	265° 17' 30"	-0.44"	264° 51' 55"	-23° 21' 16"	0.9841565	16' 15.08"	23° 26' 17"	4 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	219° 56' 17"	-4° 12' 52"	216° 07' 39"	-18° 47' 19"	0° 54' 04"	14' 43.88"	104° 29' 25"	0.14401
1	220° 25' 52"	-4° 14' 15"	216° 36' 43"	-18° 58' 07"	0° 54' 03"	14' 43.78"	104° 16' 41"	0.14128
2	220° 55' 28"	-4° 15' 38"	217° 05' 50"	-19° 08' 50"	0° 54' 03"	14' 43.68"	104° 3' 45"	0.13857
3	221° 25' 03"	-4° 16' 59"	217° 35' 01"	-19° 19' 29"	0° 54' 03"	14' 43.58"	103° 50' 39"	0.13589
4	221° 54' 38"	-4° 18' 19"	218° 04' 16"	-19° 30' 02"	0° 54' 02"	14' 43.49"	103° 37' 21"	0.13323
5	222° 24' 13"	-4° 19' 38"	218° 33' 34"	-19° 40' 31"	0° 54' 02"	14' 43.40"	103° 23' 51"	0.13059
6	222° 53' 48"	-4° 20' 56"	219° 02' 55"	-19° 50' 55"	0° 54' 02"	14' 43.32"	103° 10' 10"	0.12797
7	223° 23' 23"	-4° 22' 12"	219° 32' 21"	-20° 01' 15"	0° 54' 01"	14' 43.24"	102° 56' 17"	0.12538
8	223° 52' 57"	-4° 23' 28"	220° 01' 50"	-20° 11' 29"	0° 54' 01"	14' 43.16"	102° 42' 12"	0.12281
9	224° 22' 32"	-4° 24' 42"	220° 31' 23"	-20° 21' 38"	0° 54' 01"	14' 43.09"	102° 27' 56"	0.12026
10	224° 52' 07"	-4° 25' 55"	221° 00' 59"	-20° 31' 42"	0° 54' 00"	14' 43.02"	102° 13' 26"	0.11774
11	225° 21' 42"	-4° 27' 07"	221° 30' 40"	-20° 41' 41"	0° 54' 00"	14' 42.96"	101° 58' 45"	0.11524
12	225° 51' 16"	-4° 28' 17"	222° 00' 24"	-20° 51' 35"	0° 53' 60"	14' 42.90"	101° 43' 50"	0.11276
13	226° 20' 51"	-4° 29' 27"	222° 30' 12"	-21° 01' 24"	0° 53' 60"	14' 42.84"	101° 28' 43"	0.11031
14	226° 50' 26"	-4° 30' 35"	223° 00' 04"	-21° 11' 07"	0° 53' 60"	14' 42.78"	101° 13' 23"	0.10788
15	227° 20' 01"	-4° 31' 42"	223° 29' 60"	-21° 20' 46"	0° 53' 59"	14' 42.73"	100° 57' 50"	0.10548
16	227° 49' 35"	-4° 32' 47"	223° 59' 59"	-21° 30' 19"	0° 53' 59"	14' 42.68"	100° 42' 03"	0.10310
17	228° 19' 10"	-4° 33' 52"	224° 30' 03"	-21° 39' 46"	0° 53' 59"	14' 42.64"	100° 26' 02"	0.10075
18	228° 48' 45"	-4° 34' 55"	225° 00' 10"	-21° 49' 08"	0° 53' 59"	14' 42.60"	100° 9' 47"	0.09842
19	229° 18' 20"	-4° 35' 57"	225° 30' 22"	-21° 58' 25"	0° 53' 59"	14' 42.56"	99° 53' 18"	0.09611
20	229° 47' 56"	-4° 36' 58"	226° 00' 37"	-22° 07' 36"	0° 53' 59"	14' 42.52"	99° 36' 35"	0.09383
21	230° 17' 31"	-4° 37' 57"	226° 30' 56"	-22° 16' 41"	0° 53' 58"	14' 42.49"	99° 19' 36"	0.09158
22	230° 47' 06"	-4° 38' 55"	227° 01' 20"	-22° 25' 41"	0° 53' 58"	14' 42.46"	99° 2' 23"	0.08935
23	231° 16' 42"	-4° 39' 52"	227° 31' 47"	-22° 34' 35"	0° 53' 58"	14' 42.44"	98° 44' 54"	0.08715
24	231° 46' 17"	-4° 40' 48"	228° 02' 18"	-22° 43' 23"	0° 53' 58"	14' 42.42"	98° 27' 09"	0.08497

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	265° 17' 30"	-0.44"	264° 51' 55"	-23° 21' 16"	0.9841565	16'15.08"	23° 26' 17"	4 m 01 s
1	265° 20' 02"	-0.44"	264° 54' 42"	-23° 21' 21"	0.9841529	16'15.08"	23° 26' 17"	3 m 60 s
2	265° 22' 35"	-0.44"	264° 57' 28"	-23° 21' 26"	0.9841494	16'15.09"	23° 26' 17"	3 m 59 s
3	265° 25' 08"	-0.44"	265° 00' 14"	-23° 21' 32"	0.9841458	16'15.09"	23° 26' 17"	3 m 57 s
4	265° 27' 40"	-0.45"	265° 03' 00"	-23° 21' 37"	0.9841423	16'15.09"	23° 26' 17"	3 m 56 s
5	265° 30' 13"	-0.45"	265° 05' 47"	-23° 21' 42"	0.9841387	16'15.10"	23° 26' 17"	3 m 55 s
6	265° 32' 46"	-0.45"	265° 08' 33"	-23° 21' 47"	0.9841352	16'15.10"	23° 26' 17"	3 m 54 s
7	265° 35' 18"	-0.45"	265° 11' 19"	-23° 21' 52"	0.9841317	16'15.10"	23° 26' 17"	3 m 52 s
8	265° 37' 51"	-0.45"	265° 14' 05"	-23° 21' 58"	0.9841281	16'15.11"	23° 26' 17"	3 m 51 s
9	265° 40' 24"	-0.45"	265° 16' 51"	-23° 22' 03"	0.9841246	16'15.11"	23° 26' 17"	3 m 50 s
10	265° 42' 56"	-0.46"	265° 19' 38"	-23° 22' 08"	0.9841211	16'15.11"	23° 26' 17"	3 m 49 s
11	265° 45' 29"	-0.46"	265° 22' 24"	-23° 22' 12"	0.9841176	16'15.12"	23° 26' 17"	3 m 48 s
12	265° 48' 02"	-0.46"	265° 25' 10"	-23° 22' 17"	0.9841141	16'15.12"	23° 26' 17"	3 m 46 s
13	265° 50' 35"	-0.46"	265° 27' 57"	-23° 22' 22"	0.9841106	16'15.12"	23° 26' 17"	3 m 45 s
14	265° 53' 07"	-0.46"	265° 30' 43"	-23° 22' 27"	0.9841072	16'15.13"	23° 26' 17"	3 m 44 s
15	265° 55' 40"	-0.46"	265° 33' 29"	-23° 22' 32"	0.9841037	16'15.13"	23° 26' 17"	3 m 43 s
16	265° 58' 13"	-0.46"	265° 36' 15"	-23° 22' 36"	0.9841002	16'15.13"	23° 26' 17"	3 m 41 s
17	266° 00' 45"	-0.47"	265° 39' 02"	-23° 22' 41"	0.9840967	16'15.14"	23° 26' 17"	3 m 40 s
18	266° 03' 18"	-0.47"	265° 41' 48"	-23° 22' 46"	0.9840933	16'15.14"	23° 26' 17"	3 m 39 s
19	266° 05' 51"	-0.47"	265° 44' 34"	-23° 22' 50"	0.9840898	16'15.14"	23° 26' 17"	3 m 38 s
20	266° 08' 23"	-0.47"	265° 47' 21"	-23° 22' 55"	0.9840864	16'15.15"	23° 26' 17"	3 m 37 s
21	266° 10' 56"	-0.47"	265° 50' 07"	-23° 22' 59"	0.9840830	16'15.15"	23° 26' 17"	3 m 35 s
22	266° 13' 29"	-0.47"	265° 52' 53"	-23° 23' 03"	0.9840795	16'15.15"	23° 26' 17"	3 m 34 s
23	266° 16' 02"	-0.47"	265° 55' 39"	-23° 23' 08"	0.9840761	16'15.16"	23° 26' 17"	3 m 33 s
24	266° 18' 34"	-0.47"	265° 58' 26"	-23° 23' 12"	0.9840727	16'15.16"	23° 26' 17"	3 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	231° 46' 17"	-4° 40' 48"	228° 02' 18"	-22° 43' 23"	0° 53' 58"	14' 42.42"	98° 27' 09"	0.08497
1	232° 15' 53"	-4° 41' 43"	228° 32' 53"	-22° 52' 05"	0° 53' 58"	14' 42.40"	98° 9' 08"	0.08281
2	232° 45' 29"	-4° 42' 36"	229° 03' 33"	-23° 00' 42"	0° 53' 58"	14' 42.38"	97° 50' 50"	0.08069
3	233° 15' 05"	-4° 43' 28"	229° 34' 16"	-23° 09' 13"	0° 53' 58"	14' 42.37"	97° 32' 16"	0.07858
4	233° 44' 42"	-4° 44' 18"	230° 05' 03"	-23° 17' 37"	0° 53' 58"	14' 42.36"	97° 13' 24"	0.07651
5	234° 14' 18"	-4° 45' 08"	230° 35' 54"	-23° 25' 56"	0° 53' 58"	14' 42.36"	96° 54' 14"	0.07446
6	234° 43' 55"	-4° 45' 56"	231° 06' 50"	-23° 34' 09"	0° 53' 58"	14' 42.36"	96° 34' 46"	0.07243
7	235° 13' 32"	-4° 46' 43"	231° 37' 49"	-23° 42' 15"	0° 53' 58"	14' 42.36"	96° 14' 59"	0.07044
8	235° 43' 09"	-4° 47' 28"	232° 08' 52"	-23° 50' 16"	0° 53' 58"	14' 42.36"	95° 54' 53"	0.06846
9	236° 12' 47"	-4° 48' 12"	232° 39' 59"	-23° 58' 10"	0° 53' 58"	14' 42.37"	95° 34' 26"	0.06652
10	236° 42' 24"	-4° 48' 55"	233° 11' 11"	-24° 05' 58"	0° 53' 58"	14' 42.38"	95° 13' 39"	0.06460
11	237° 12' 02"	-4° 49' 37"	233° 42' 26"	-24° 13' 39"	0° 53' 58"	14' 42.39"	94° 52' 32"	0.06271
12	237° 41' 40"	-4° 50' 17"	234° 13' 45"	-24° 21' 15"	0° 53' 58"	14' 42.41"	94° 31' 02"	0.06084
13	238° 11' 19"	-4° 50' 56"	234° 45' 08"	-24° 28' 43"	0° 53' 58"	14' 42.43"	94° 9' 09"	0.05901
14	238° 40' 57"	-4° 51' 34"	235° 16' 35"	-24° 36' 06"	0° 53' 58"	14' 42.45"	93° 46' 54"	0.05719
15	239° 10' 36"	-4° 52' 10"	235° 48' 06"	-24° 43' 21"	0° 53' 58"	14' 42.48"	93° 24' 14"	0.05541
16	239° 40' 16"	-4° 52' 45"	236° 19' 41"	-24° 50' 31"	0° 53' 59"	14' 42.50"	93° 1' 09"	0.05365
17	240° 09' 55"	-4° 53' 19"	236° 51' 20"	-24° 57' 33"	0° 53' 59"	14' 42.54"	92° 37' 37"	0.05193
18	240° 39' 35"	-4° 53' 51"	237° 23' 03"	-25° 04' 29"	0° 53' 59"	14' 42.57"	92° 13' 39"	0.05022
19	241° 09' 16"	-4° 54' 22"	237° 54' 50"	-25° 11' 19"	0° 53' 59"	14' 42.61"	91° 49' 13"	0.04855
20	241° 38' 56"	-4° 54' 52"	238° 26' 40"	-25° 18' 01"	0° 53' 59"	14' 42.65"	91° 24' 18"	0.04690
21	242° 08' 37"	-4° 55' 21"	238° 58' 34"	-25° 24' 37"	0° 53' 59"	14' 42.69"	90° 58' 52"	0.04528
22	242° 38' 18"	-4° 55' 48"	239° 30' 32"	-25° 31' 06"	0° 53' 59"	14' 42.74"	90° 32' 54"	0.04369
23	243° 07' 60"	-4° 56' 13"	240° 02' 34"	-25° 37' 28"	0° 53' 60"	14' 42.78"	90° 6' 23"	0.04213
24	243° 37' 42"	-4° 56' 38"	240° 34' 40"	-25° 43' 43"	0° 53' 60"	14' 42.84"	89° 39' 17"	0.04060

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	266° 18' 34"	-0.47"	265° 58' 26"	-23° 23' 12"	0.9840727	16' 15.16"	23° 26' 17"	3 m 32 s
1	266° 21' 07"	-0.47"	266° 01' 12"	-23° 23' 16"	0.9840693	16' 15.17"	23° 26' 17"	3 m 30 s
2	266° 23' 40"	-0.48"	266° 03' 58"	-23° 23' 20"	0.9840659	16' 15.17"	23° 26' 17"	3 m 29 s
3	266° 26' 12"	-0.48"	266° 06' 45"	-23° 23' 25"	0.9840625	16' 15.17"	23° 26' 17"	3 m 28 s
4	266° 28' 45"	-0.48"	266° 09' 31"	-23° 23' 29"	0.9840591	16' 15.18"	23° 26' 17"	3 m 27 s
5	266° 31' 18"	-0.48"	266° 12' 17"	-23° 23' 33"	0.9840557	16' 15.18"	23° 26' 17"	3 m 26 s
6	266° 33' 51"	-0.48"	266° 15' 04"	-23° 23' 37"	0.9840523	16' 15.18"	23° 26' 17"	3 m 24 s
7	266° 36' 23"	-0.48"	266° 17' 50"	-23° 23' 41"	0.9840490	16' 15.19"	23° 26' 17"	3 m 23 s
8	266° 38' 56"	-0.48"	266° 20' 36"	-23° 23' 45"	0.9840456	16' 15.19"	23° 26' 17"	3 m 22 s
9	266° 41' 29"	-0.48"	266° 23' 23"	-23° 23' 48"	0.9840422	16' 15.19"	23° 26' 17"	3 m 21 s
10	266° 44' 01"	-0.48"	266° 26' 09"	-23° 23' 52"	0.9840389	16' 15.20"	23° 26' 17"	3 m 19 s
11	266° 46' 34"	-0.48"	266° 28' 55"	-23° 23' 56"	0.9840355	16' 15.20"	23° 26' 17"	3 m 18 s
12	266° 49' 07"	-0.48"	266° 31' 42"	-23° 23' 60"	0.9840322	16' 15.20"	23° 26' 17"	3 m 17 s
13	266° 51' 40"	-0.48"	266° 34' 28"	-23° 24' 03"	0.9840289	16' 15.21"	23° 26' 17"	3 m 16 s
14	266° 54' 12"	-0.48"	266° 37' 15"	-23° 24' 07"	0.9840255	16' 15.21"	23° 26' 17"	3 m 15 s
15	266° 56' 45"	-0.48"	266° 40' 01"	-23° 24' 10"	0.9840222	16' 15.21"	23° 26' 17"	3 m 13 s
16	266° 59' 18"	-0.48"	266° 42' 47"	-23° 24' 14"	0.9840189	16' 15.21"	23° 26' 17"	3 m 12 s
17	267° 01' 50"	-0.48"	266° 45' 34"	-23° 24' 17"	0.9840156	16' 15.22"	23° 26' 17"	3 m 11 s
18	267° 04' 23"	-0.48"	266° 48' 20"	-23° 24' 21"	0.9840123	16' 15.22"	23° 26' 17"	3 m 10 s
19	267° 06' 56"	-0.48"	266° 51' 07"	-23° 24' 24"	0.9840090	16' 15.22"	23° 26' 17"	3 m 08 s
20	267° 09' 29"	-0.48"	266° 53' 53"	-23° 24' 28"	0.9840057	16' 15.23"	23° 26' 17"	3 m 07 s
21	267° 12' 01"	-0.48"	266° 56' 39"	-23° 24' 31"	0.9840024	16' 15.23"	23° 26' 17"	3 m 06 s
22	267° 14' 34"	-0.48"	266° 59' 26"	-23° 24' 34"	0.9839992	16' 15.23"	23° 26' 17"	3 m 05 s
23	267° 17' 07"	-0.48"	267° 02' 12"	-23° 24' 37"	0.9839959	16' 15.24"	23° 26' 17"	3 m 03 s
24	267° 19' 40"	-0.48"	267° 04' 59"	-23° 24' 40"	0.9839926	16' 15.24"	23° 26' 17"	3 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	243° 37' 42"	-4° 56' 38"	240° 34' 40"	-25° 43' 43"	0° 53' 60"	14' 42.84"	89° 39' 17"	0.04060
1	244° 07' 24"	-4° 57' 01"	241° 06' 49"	-25° 49' 51"	0° 53' 60"	14' 42.89"	89° 11' 35"	0.03909
2	244° 37' 07"	-4° 57' 22"	241° 39' 02"	-25° 55' 51"	0° 54' 00"	14' 42.95"	88° 43' 14"	0.03761
3	245° 06' 50"	-4° 57' 43"	242° 11' 19"	-26° 01' 45"	0° 54' 00"	14' 43.01"	88° 14' 13"	0.03616
4	245° 36' 33"	-4° 58' 02"	242° 43' 39"	-26° 07' 32"	0° 54' 01"	14' 43.07"	87° 44' 30"	0.03474
5	246° 06' 17"	-4° 58' 19"	243° 16' 03"	-26° 13' 11"	0° 54' 01"	14' 43.13"	87° 14' 02"	0.03335
6	246° 36' 01"	-4° 58' 36"	243° 48' 30"	-26° 18' 44"	0° 54' 01"	14' 43.20"	86° 42' 47"	0.03199
7	247° 05' 46"	-4° 58' 51"	244° 21' 01"	-26° 24' 09"	0° 54' 01"	14' 43.27"	86° 10' 43"	0.03065
8	247° 35' 31"	-4° 59' 04"	244° 53' 35"	-26° 29' 26"	0° 54' 02"	14' 43.34"	85° 37' 45"	0.02935
9	248° 05' 17"	-4° 59' 17"	245° 26' 13"	-26° 34' 37"	0° 54' 02"	14' 43.42"	85° 3' 52"	0.02807
10	248° 35' 02"	-4° 59' 27"	245° 58' 54"	-26° 39' 40"	0° 54' 02"	14' 43.50"	84° 28' 59"	0.02682
11	249° 04' 49"	-4° 59' 37"	246° 31' 39"	-26° 44' 35"	0° 54' 02"	14' 43.58"	83° 53' 04"	0.02560
12	249° 34' 36"	-4° 59' 45"	247° 04' 26"	-26° 49' 23"	0° 54' 03"	14' 43.66"	83° 16' 01"	0.02441
13	250° 04' 23"	-4° 59' 52"	247° 37' 17"	-26° 54' 04"	0° 54' 03"	14' 43.75"	82° 37' 46"	0.02325
14	250° 34' 11"	-4° 59' 57"	248° 10' 11"	-26° 58' 37"	0° 54' 03"	14' 43.84"	81° 58' 14"	0.02212
15	251° 03' 59"	-5° 00' 01"	248° 43' 08"	-27° 03' 02"	0° 54' 04"	14' 43.93"	81° 17' 20"	0.02102
16	251° 33' 47"	-5° 00' 04"	249° 16' 09"	-27° 07' 19"	0° 54' 04"	14' 44.02"	80° 34' 58"	0.01995
17	252° 03' 37"	-5° 00' 05"	249° 49' 12"	-27° 11' 29"	0° 54' 04"	14' 44.12"	79° 51' 00"	0.01891
18	252° 33' 26"	-5° 00' 05"	250° 22' 18"	-27° 15' 32"	0° 54' 05"	14' 44.22"	79° 5' 20"	0.01790
19	253° 03' 16"	-5° 00' 03"	250° 55' 28"	-27° 19' 26"	0° 54' 05"	14' 44.32"	78° 17' 50"	0.01692
20	253° 33' 07"	-5° 00' 01"	251° 28' 40"	-27° 23' 13"	0° 54' 06"	14' 44.42"	77° 28' 19"	0.01597
21	254° 02' 58"	-4° 59' 56"	252° 01' 54"	-27° 26' 52"	0° 54' 06"	14' 44.53"	76° 36' 38"	0.01505
22	254° 32' 49"	-4° 59' 51"	252° 35' 12"	-27° 30' 23"	0° 54' 06"	14' 44.63"	75° 42' 36"	0.01416
23	255° 02' 41"	-4° 59' 44"	253° 08' 32"	-27° 33' 46"	0° 54' 07"	14' 44.75"	74° 45' 59"	0.01330
24	255° 32' 34"	-4° 59' 35"	253° 41' 55"	-27° 37' 01"	0° 54' 07"	14' 44.86"	73° 46' 34"	0.01247

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	267° 19' 40"	-0.48"	267° 04' 59"	-23° 24' 40"	0.9839926	16'15.24"	23° 26' 17"	3 m 02 s
1	267° 22' 12"	-0.48"	267° 07' 45"	-23° 24' 43"	0.9839894	16'15.24"	23° 26' 17"	3 m 01 s
2	267° 24' 45"	-0.48"	267° 10' 31"	-23° 24' 46"	0.9839861	16'15.25"	23° 26' 17"	2 m 60 s
3	267° 27' 18"	-0.48"	267° 13' 18"	-23° 24' 49"	0.9839829	16'15.25"	23° 26' 17"	2 m 59 s
4	267° 29' 51"	-0.48"	267° 16' 04"	-23° 24' 52"	0.9839797	16'15.25"	23° 26' 17"	2 m 57 s
5	267° 32' 23"	-0.48"	267° 18' 51"	-23° 24' 55"	0.9839764	16'15.26"	23° 26' 17"	2 m 56 s
6	267° 34' 56"	-0.48"	267° 21' 37"	-23° 24' 58"	0.9839732	16'15.26"	23° 26' 17"	2 m 55 s
7	267° 37' 29"	-0.48"	267° 24' 24"	-23° 25' 01"	0.9839700	16'15.26"	23° 26' 17"	2 m 54 s
8	267° 40' 02"	-0.47"	267° 27' 10"	-23° 25' 03"	0.9839668	16'15.27"	23° 26' 17"	2 m 52 s
9	267° 42' 34"	-0.47"	267° 29' 56"	-23° 25' 06"	0.9839636	16'15.27"	23° 26' 17"	2 m 51 s
10	267° 45' 07"	-0.47"	267° 32' 43"	-23° 25' 09"	0.9839604	16'15.27"	23° 26' 17"	2 m 50 s
11	267° 47' 40"	-0.47"	267° 35' 29"	-23° 25' 11"	0.9839572	16'15.28"	23° 26' 17"	2 m 49 s
12	267° 50' 13"	-0.47"	267° 38' 16"	-23° 25' 14"	0.9839540	16'15.28"	23° 26' 17"	2 m 47 s
13	267° 52' 45"	-0.47"	267° 41' 02"	-23° 25' 16"	0.9839508	16'15.28"	23° 26' 17"	2 m 46 s
14	267° 55' 18"	-0.47"	267° 43' 49"	-23° 25' 19"	0.9839477	16'15.29"	23° 26' 17"	2 m 45 s
15	267° 57' 51"	-0.47"	267° 46' 35"	-23° 25' 21"	0.9839445	16'15.29"	23° 26' 17"	2 m 44 s
16	268° 00' 24"	-0.47"	267° 49' 22"	-23° 25' 23"	0.9839413	16'15.29"	23° 26' 17"	2 m 43 s
17	268° 02' 56"	-0.46"	267° 52' 08"	-23° 25' 26"	0.9839382	16'15.30"	23° 26' 17"	2 m 41 s
18	268° 05' 29"	-0.46"	267° 54' 54"	-23° 25' 28"	0.9839350	16'15.30"	23° 26' 17"	2 m 40 s
19	268° 08' 02"	-0.46"	267° 57' 41"	-23° 25' 30"	0.9839319	16'15.30"	23° 26' 17"	2 m 39 s
20	268° 10' 35"	-0.46"	268° 00' 27"	-23° 25' 32"	0.9839288	16'15.30"	23° 26' 17"	2 m 38 s
21	268° 13' 07"	-0.46"	268° 03' 14"	-23° 25' 34"	0.9839256	16'15.31"	23° 26' 17"	2 m 36 s
22	268° 15' 40"	-0.46"	268° 06' 00"	-23° 25' 36"	0.9839225	16'15.31"	23° 26' 17"	2 m 35 s
23	268° 18' 13"	-0.46"	268° 08' 47"	-23° 25' 38"	0.9839194	16'15.31"	23° 26' 17"	2 m 34 s
24	268° 20' 46"	-0.45"	268° 11' 33"	-23° 25' 40"	0.9839163	16'15.32"	23° 26' 17"	2 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	255° 32' 34"	-4° 59' 35"	253° 41' 55"	-27° 37' 01"	0° 54' 07"	14' 44.86"	73° 46' 34"	0.01247
1	256° 02' 27"	-4° 59' 26"	254° 15' 20"	-27° 40' 08"	0° 54' 08"	14' 44.97"	72° 44' 05"	0.01167
2	256° 32' 21"	-4° 59' 14"	254° 48' 48"	-27° 43' 07"	0° 54' 08"	14' 45.09"	71° 38' 13"	0.01090
3	257° 02' 15"	-4° 59' 02"	255° 22' 19"	-27° 45' 58"	0° 54' 08"	14' 45.21"	70° 28' 39"	0.01016
4	257° 32' 09"	-4° 58' 48"	255° 55' 51"	-27° 48' 41"	0° 54' 09"	14' 45.33"	69° 14' 59"	0.00945
5	258° 02' 05"	-4° 58' 33"	256° 29' 26"	-27° 51' 16"	0° 54' 09"	14' 45.46"	67° 56' 48"	0.00877
6	258° 32' 00"	-4° 58' 16"	257° 03' 03"	-27° 53' 43"	0° 54' 10"	14' 45.59"	66° 33' 37"	0.00813
7	259° 01' 57"	-4° 57' 58"	257° 36' 42"	-27° 56' 02"	0° 54' 10"	14' 45.72"	65° 4' 51"	0.00751
8	259° 31' 54"	-4° 57' 38"	258° 10' 24"	-27° 58' 12"	0° 54' 11"	14' 45.85"	63° 29' 55"	0.00692
9	260° 01' 51"	-4° 57' 18"	258° 44' 07"	-28° 00' 15"	0° 54' 11"	14' 45.98"	61° 48' 04"	0.00637
10	260° 31' 49"	-4° 56' 55"	259° 17' 52"	-28° 02' 09"	0° 54' 12"	14' 46.12"	59° 58' 32"	0.00585
11	261° 01' 47"	-4° 56' 32"	259° 51' 39"	-28° 03' 55"	0° 54' 12"	14' 46.25"	58° 0' 23"	0.00536
12	261° 31' 46"	-4° 56' 07"	260° 25' 27"	-28° 05' 32"	0° 54' 13"	14' 46.40"	55° 52' 36"	0.00490
13	262° 01' 46"	-4° 55' 40"	260° 59' 18"	-28° 07' 01"	0° 54' 13"	14' 46.54"	53° 34' 03"	0.00447
14	262° 31' 46"	-4° 55' 13"	261° 33' 10"	-28° 08' 22"	0° 54' 14"	14' 46.68"	51° 3' 30"	0.00407
15	263° 01' 47"	-4° 54' 44"	262° 07' 03"	-28° 09' 35"	0° 54' 14"	14' 46.83"	48° 19' 34"	0.00370
16	263° 31' 49"	-4° 54' 13"	262° 40' 58"	-28° 10' 39"	0° 54' 15"	14' 46.98"	45° 20' 49"	0.00337
17	264° 01' 51"	-4° 53' 41"	263° 14' 54"	-28° 11' 35"	0° 54' 16"	14' 47.13"	42° 5' 46"	0.00307
18	264° 31' 53"	-4° 53' 08"	263° 48' 52"	-28° 12' 23"	0° 54' 16"	14' 47.28"	38° 33' 00"	0.00279
19	265° 01' 56"	-4° 52' 33"	264° 22' 51"	-28° 13' 02"	0° 54' 17"	14' 47.44"	34° 41' 16"	0.00255
20	265° 32' 00"	-4° 51' 57"	264° 56' 51"	-28° 13' 33"	0° 54' 17"	14' 47.60"	30° 29' 38"	0.00234
21	266° 02' 04"	-4° 51' 20"	265° 30' 51"	-28° 13' 55"	0° 54' 18"	14' 47.76"	25° 57' 47"	0.00217
22	266° 32' 09"	-4° 50' 41"	266° 04' 53"	-28° 14' 09"	0° 54' 18"	14' 47.92"	21° 6' 12"	0.00202
23	267° 02' 16"	-4° 50' 01"	266° 38' 57"	-28° 14' 14"	0° 54' 19"	14' 48.08"	15° 56' 23"	0.00191
24	267° 32' 22"	-4° 49' 19"	267° 13' 00"	-28° 14' 11"	0° 54' 20"	14' 48.25"	10° 31' 20"	0.00183

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	268° 20' 46"	-0.45"	268° 11' 33"	-23° 25' 40"	0.9839163	16' 15.32"	23° 26' 17"	2 m 33 s
1	268° 23' 18"	-0.45"	268° 14' 20"	-23° 25' 42"	0.9839132	16' 15.32"	23° 26' 17"	2 m 31 s
2	268° 25' 51"	-0.45"	268° 17' 06"	-23° 25' 44"	0.9839101	16' 15.32"	23° 26' 17"	2 m 30 s
3	268° 28' 24"	-0.45"	268° 19' 53"	-23° 25' 46"	0.9839070	16' 15.33"	23° 26' 17"	2 m 29 s
4	268° 30' 57"	-0.45"	268° 22' 39"	-23° 25' 48"	0.9839039	16' 15.33"	23° 26' 17"	2 m 28 s
5	268° 33' 29"	-0.45"	268° 25' 26"	-23° 25' 49"	0.9839009	16' 15.33"	23° 26' 17"	2 m 26 s
6	268° 36' 02"	-0.44"	268° 28' 12"	-23° 25' 51"	0.9838978	16' 15.34"	23° 26' 17"	2 m 25 s
7	268° 38' 35"	-0.44"	268° 30' 59"	-23° 25' 53"	0.9838947	16' 15.34"	23° 26' 17"	2 m 24 s
8	268° 41' 08"	-0.44"	268° 33' 45"	-23° 25' 54"	0.9838917	16' 15.34"	23° 26' 17"	2 m 23 s
9	268° 43' 41"	-0.44"	268° 36' 32"	-23° 25' 56"	0.9838886	16' 15.34"	23° 26' 17"	2 m 22 s
10	268° 46' 13"	-0.44"	268° 39' 18"	-23° 25' 57"	0.9838856	16' 15.35"	23° 26' 17"	2 m 20 s
11	268° 48' 46"	-0.43"	268° 42' 05"	-23° 25' 58"	0.9838825	16' 15.35"	23° 26' 17"	2 m 19 s
12	268° 51' 19"	-0.43"	268° 44' 51"	-23° 25' 60"	0.9838795	16' 15.35"	23° 26' 17"	2 m 18 s
13	268° 53' 52"	-0.43"	268° 47' 38"	-23° 26' 01"	0.9838765	16' 15.36"	23° 26' 17"	2 m 17 s
14	268° 56' 24"	-0.43"	268° 50' 24"	-23° 26' 02"	0.9838735	16' 15.36"	23° 26' 17"	2 m 15 s
15	268° 58' 57"	-0.42"	268° 53' 11"	-23° 26' 04"	0.9838705	16' 15.36"	23° 26' 17"	2 m 14 s
16	269° 01' 30"	-0.42"	268° 55' 57"	-23° 26' 05"	0.9838674	16' 15.37"	23° 26' 17"	2 m 13 s
17	269° 04' 03"	-0.42"	268° 58' 44"	-23° 26' 06"	0.9838644	16' 15.37"	23° 26' 17"	2 m 12 s
18	269° 06' 36"	-0.42"	269° 01' 30"	-23° 26' 07"	0.9838615	16' 15.37"	23° 26' 17"	2 m 10 s
19	269° 09' 08"	-0.41"	269° 04' 17"	-23° 26' 08"	0.9838585	16' 15.37"	23° 26' 17"	2 m 09 s
20	269° 11' 41"	-0.41"	269° 07' 03"	-23° 26' 09"	0.9838555	16' 15.38"	23° 26' 17"	2 m 08 s
21	269° 14' 14"	-0.41"	269° 09' 50"	-23° 26' 10"	0.9838525	16' 15.38"	23° 26' 17"	2 m 07 s
22	269° 16' 47"	-0.41"	269° 12' 36"	-23° 26' 11"	0.9838496	16' 15.38"	23° 26' 17"	2 m 05 s
23	269° 19' 19"	-0.40"	269° 15' 23"	-23° 26' 11"	0.9838466	16' 15.39"	23° 26' 17"	2 m 04 s
24	269° 21' 52"	-0.40"	269° 18' 10"	-23° 26' 12"	0.9838436	16' 15.39"	23° 26' 17"	2 m 03 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	267° 32' 22"	-4° 49' 19"	267° 13' 00"	-28° 14' 11"	0° 54' 20"	14' 48.25"	10° 31' 20"	0.00183
1	268° 02' 29"	-4° 48' 37"	267° 47' 04"	-28° 13' 60"	0° 54' 20"	14' 48.42"	4° 55' 05"	0.00178
2	268° 32' 36"	-4° 47' 52"	268° 21' 09"	-28° 13' 40"	0° 54' 21"	14' 48.59"	359° 12' 47"	0.00176
3	269° 02' 44"	-4° 47' 07"	268° 55' 14"	-28° 13' 11"	0° 54' 22"	14' 48.76"	353° 30' 13"	0.00178
4	269° 32' 53"	-4° 46' 20"	269° 29' 20"	-28° 12' 34"	0° 54' 22"	14' 48.94"	347° 53' 12"	0.00182
5	270° 03' 02"	-4° 45' 31"	270° 03' 26"	-28° 11' 49"	0° 54' 23"	14' 49.11"	342° 26' 59"	0.00190
6	270° 33' 12"	-4° 44' 42"	270° 37' 33"	-28° 10' 55"	0° 54' 23"	14' 49.29"	337° 15' 44"	0.00201
7	271° 03' 23"	-4° 43' 51"	271° 11' 39"	-28° 09' 52"	0° 54' 24"	14' 49.47"	332° 22' 27"	0.00216
8	271° 33' 34"	-4° 42' 58"	271° 45' 46"	-28° 08' 41"	0° 54' 25"	14' 49.65"	327° 48' 48"	0.00233
9	272° 03' 46"	-4° 42' 04"	272° 19' 53"	-28° 07' 22"	0° 54' 25"	14' 49.84"	323° 35' 21"	0.00254
10	272° 33' 59"	-4° 41' 09"	272° 53' 59"	-28° 05' 54"	0° 54' 26"	14' 50.02"	319° 41' 51"	0.00278
11	273° 04' 12"	-4° 40' 13"	273° 28' 06"	-28° 04' 17"	0° 54' 27"	14' 50.21"	316° 7' 26"	0.00305
12	273° 34' 26"	-4° 39' 15"	274° 02' 12"	-28° 02' 32"	0° 54' 28"	14' 50.40"	312° 50' 51"	0.00335
13	274° 04' 41"	-4° 38' 16"	274° 36' 18"	-28° 00' 39"	0° 54' 28"	14' 50.59"	309° 50' 42"	0.00369
14	274° 34' 56"	-4° 37' 15"	275° 10' 24"	-27° 58' 37"	0° 54' 29"	14' 50.79"	307° 5' 30"	0.00406
15	275° 05' 12"	-4° 36' 14"	275° 44' 29"	-27° 56' 26"	0° 54' 30"	14' 50.98"	304° 33' 47"	0.00446
16	275° 35' 29"	-4° 35' 10"	276° 18' 34"	-27° 54' 07"	0° 54' 30"	14' 51.18"	302° 14' 13"	0.00489
17	276° 05' 46"	-4° 34' 06"	276° 52' 38"	-27° 51' 40"	0° 54' 31"	14' 51.38"	300° 5' 30"	0.00536
18	276° 36' 04"	-4° 33' 00"	277° 26' 41"	-27° 49' 04"	0° 54' 32"	14' 51.58"	298° 6' 32"	0.00586
19	277° 06' 23"	-4° 31' 53"	278° 00' 43"	-27° 46' 20"	0° 54' 33"	14' 51.79"	296° 16' 14"	0.00639
20	277° 36' 42"	-4° 30' 44"	278° 34' 45"	-27° 43' 27"	0° 54' 33"	14' 51.99"	294° 33' 44"	0.00695
21	278° 07' 02"	-4° 29' 35"	279° 08' 45"	-27° 40' 26"	0° 54' 34"	14' 52.20"	292° 58' 11"	0.00755
22	278° 37' 23"	-4° 28' 24"	279° 42' 45"	-27° 37' 16"	0° 54' 35"	14' 52.41"	291° 28' 54"	0.00817
23	279° 07' 45"	-4° 27' 11"	280° 16' 44"	-27° 33' 58"	0° 54' 36"	14' 52.62"	290° 5' 13"	0.00883
24	279° 38' 07"	-4° 25' 57"	280° 50' 41"	-27° 30' 32"	0° 54' 36"	14' 52.84"	288° 46' 36"	0.00953

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	269° 21' 52"	-0.40"	269° 18' 10"	-23° 26' 12"	0.9838436	16'15.39"	23° 26' 17"	2 m 03 s
1	269° 24' 25"	-0.40"	269° 20' 56"	-23° 26' 13"	0.9838407	16'15.39"	23° 26' 17"	2 m 02 s
2	269° 26' 58"	-0.40"	269° 23' 43"	-23° 26' 14"	0.9838377	16'15.39"	23° 26' 17"	2 m 00 s
3	269° 29' 31"	-0.39"	269° 26' 29"	-23° 26' 14"	0.9838348	16'15.40"	23° 26' 17"	1 m 59 s
4	269° 32' 03"	-0.39"	269° 29' 16"	-23° 26' 15"	0.9838319	16'15.40"	23° 26' 17"	1 m 58 s
5	269° 34' 36"	-0.39"	269° 32' 02"	-23° 26' 15"	0.9838290	16'15.40"	23° 26' 17"	1 m 57 s
6	269° 37' 09"	-0.38"	269° 34' 49"	-23° 26' 16"	0.9838260	16'15.41"	23° 26' 17"	1 m 56 s
7	269° 39' 42"	-0.38"	269° 37' 35"	-23° 26' 16"	0.9838231	16'15.41"	23° 26' 17"	1 m 54 s
8	269° 42' 15"	-0.38"	269° 40' 22"	-23° 26' 16"	0.9838202	16'15.41"	23° 26' 17"	1 m 53 s
9	269° 44' 47"	-0.37"	269° 43' 08"	-23° 26' 17"	0.9838173	16'15.41"	23° 26' 17"	1 m 52 s
10	269° 47' 20"	-0.37"	269° 45' 55"	-23° 26' 17"	0.9838145	16'15.42"	23° 26' 17"	1 m 51 s
11	269° 49' 53"	-0.37"	269° 48' 41"	-23° 26' 17"	0.9838116	16'15.42"	23° 26' 17"	1 m 49 s
12	269° 52' 26"	-0.36"	269° 51' 28"	-23° 26' 17"	0.9838087	16'15.42"	23° 26' 17"	1 m 48 s
13	269° 54' 59"	-0.36"	269° 54' 14"	-23° 26' 18"	0.9838058	16'15.43"	23° 26' 17"	1 m 47 s
14	269° 57' 31"	-0.36"	269° 57' 01"	-23° 26' 18"	0.9838030	16'15.43"	23° 26' 17"	1 m 46 s
15	270° 00' 04"	-0.35"	269° 59' 48"	-23° 26' 18"	0.9838001	16'15.43"	23° 26' 17"	1 m 44 s
16	270° 02' 37"	-0.35"	270° 02' 34"	-23° 26' 18"	0.9837973	16'15.43"	23° 26' 17"	1 m 43 s
17	270° 05' 10"	-0.35"	270° 05' 21"	-23° 26' 18"	0.9837944	16'15.44"	23° 26' 17"	1 m 42 s
18	270° 07' 43"	-0.34"	270° 08' 07"	-23° 26' 17"	0.9837916	16'15.44"	23° 26' 17"	1 m 41 s
19	270° 10' 15"	-0.34"	270° 10' 54"	-23° 26' 17"	0.9837887	16'15.44"	23° 26' 17"	1 m 39 s
20	270° 12' 48"	-0.34"	270° 13' 40"	-23° 26' 17"	0.9837859	16'15.45"	23° 26' 17"	1 m 38 s
21	270° 15' 21"	-0.33"	270° 16' 27"	-23° 26' 17"	0.9837831	16'15.45"	23° 26' 17"	1 m 37 s
22	270° 17' 54"	-0.33"	270° 19' 13"	-23° 26' 16"	0.9837803	16'15.45"	23° 26' 17"	1 m 36 s
23	270° 20' 27"	-0.32"	270° 21' 60"	-23° 26' 16"	0.9837775	16'15.45"	23° 26' 17"	1 m 34 s
24	270° 22' 59"	-0.32"	270° 24' 46"	-23° 26' 16"	0.9837747	16'15.46"	23° 26' 17"	1 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	279° 38' 07"	-4° 25' 57"	280° 50' 41"	-27° 30' 32"	0° 54' 36"	14' 52.84"	288° 46' 36"	0.00953
1	280° 08' 30"	-4° 24' 42"	281° 24' 37"	-27° 26' 57"	0° 54' 37"	14' 53.05"	287° 32' 32"	0.01025
2	280° 38' 54"	-4° 23' 26"	281° 58' 32"	-27° 23' 14"	0° 54' 38"	14' 53.27"	286° 22' 36"	0.01101
3	281° 09' 18"	-4° 22' 08"	282° 32' 25"	-27° 19' 22"	0° 54' 39"	14' 53.49"	285° 16' 25"	0.01180
4	281° 39' 43"	-4° 20' 50"	283° 06' 17"	-27° 15' 23"	0° 54' 40"	14' 53.71"	284° 13' 38"	0.01262
5	282° 10' 09"	-4° 19' 29"	283° 40' 07"	-27° 11' 15"	0° 54' 40"	14' 53.93"	283° 13' 56"	0.01348
6	282° 40' 36"	-4° 18' 08"	284° 13' 56"	-27° 06' 58"	0° 54' 41"	14' 54.16"	282° 17' 05"	0.01437
7	283° 11' 03"	-4° 16' 45"	284° 47' 43"	-27° 02' 34"	0° 54' 42"	14' 54.38"	281° 22' 49"	0.01529
8	283° 41' 31"	-4° 15' 21"	285° 21' 28"	-26° 58' 01"	0° 54' 43"	14' 54.61"	280° 30' 55"	0.01624
9	284° 11' 60"	-4° 13' 56"	285° 55' 12"	-26° 53' 20"	0° 54' 44"	14' 54.84"	279° 41' 13"	0.01722
10	284° 42' 29"	-4° 12' 29"	286° 28' 53"	-26° 48' 31"	0° 54' 45"	14' 55.07"	278° 53' 32"	0.01824
11	285° 12' 60"	-4° 11' 02"	287° 02' 33"	-26° 43' 34"	0° 54' 46"	14' 55.31"	278° 7' 42"	0.01929
12	285° 43' 31"	-4° 09' 33"	287° 36' 10"	-26° 38' 29"	0° 54' 46"	14' 55.54"	277° 23' 35"	0.02037
13	286° 14' 03"	-4° 08' 02"	288° 09' 46"	-26° 33' 16"	0° 54' 47"	14' 55.78"	276° 41' 05"	0.02149
14	286° 44' 35"	-4° 06' 31"	288° 43' 19"	-26° 27' 54"	0° 54' 48"	14' 56.02"	276° 0' 03"	0.02263
15	287° 15' 09"	-4° 04' 58"	289° 16' 51"	-26° 22' 25"	0° 54' 49"	14' 56.26"	275° 20' 25"	0.02381
16	287° 45' 43"	-4° 03' 24"	289° 50' 20"	-26° 16' 47"	0° 54' 50"	14' 56.50"	274° 42' 04"	0.02502
17	288° 16' 18"	-4° 01' 49"	290° 23' 46"	-26° 11' 02"	0° 54' 51"	14' 56.75"	274° 4' 55"	0.02627
18	288° 46' 53"	-4° 00' 12"	290° 57' 11"	-26° 05' 09"	0° 54' 52"	14' 57.00"	273° 28' 54"	0.02754
19	289° 17' 30"	-3° 58' 35"	291° 30' 32"	-25° 59' 08"	0° 54' 53"	14' 57.24"	272° 53' 57"	0.02885
20	289° 48' 07"	-3° 56' 56"	292° 03' 52"	-25° 52' 58"	0° 54' 54"	14' 57.50"	272° 19' 60"	0.03019
21	290° 18' 45"	-3° 55' 16"	292° 37' 09"	-25° 46' 42"	0° 54' 54"	14' 57.75"	271° 46' 59"	0.03157
22	290° 49' 24"	-3° 53' 34"	293° 10' 23"	-25° 40' 17"	0° 54' 55"	14' 58.00"	271° 14' 51"	0.03297
23	291° 20' 04"	-3° 51' 52"	293° 43' 35"	-25° 33' 45"	0° 54' 56"	14' 58.26"	270° 43' 33"	0.03441
24	291° 50' 45"	-3° 50' 08"	294° 16' 44"	-25° 27' 05"	0° 54' 57"	14' 58.52"	270° 13' 03"	0.03588

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	270° 22' 59"	-0.32"	270° 24' 46"	-23° 26' 16"	0.9837747	16' 15.46"	23° 26' 17"	1 m 33 s
1	270° 25' 32"	-0.32"	270° 27' 33"	-23° 26' 15"	0.9837719	16' 15.46"	23° 26' 17"	1 m 32 s
2	270° 28' 05"	-0.31"	270° 30' 20"	-23° 26' 15"	0.9837691	16' 15.46"	23° 26' 17"	1 m 31 s
3	270° 30' 38"	-0.31"	270° 33' 06"	-23° 26' 14"	0.9837663	16' 15.47"	23° 26' 17"	1 m 29 s
4	270° 33' 11"	-0.30"	270° 35' 53"	-23° 26' 14"	0.9837635	16' 15.47"	23° 26' 17"	1 m 28 s
5	270° 35' 43"	-0.30"	270° 38' 39"	-23° 26' 13"	0.9837608	16' 15.47"	23° 26' 17"	1 m 27 s
6	270° 38' 16"	-0.30"	270° 41' 26"	-23° 26' 12"	0.9837580	16' 15.47"	23° 26' 17"	1 m 26 s
7	270° 40' 49"	-0.29"	270° 44' 12"	-23° 26' 11"	0.9837553	16' 15.48"	23° 26' 17"	1 m 25 s
8	270° 43' 22"	-0.29"	270° 46' 59"	-23° 26' 11"	0.9837525	16' 15.48"	23° 26' 17"	1 m 23 s
9	270° 45' 55"	-0.28"	270° 49' 45"	-23° 26' 10"	0.9837498	16' 15.48"	23° 26' 17"	1 m 22 s
10	270° 48' 27"	-0.28"	270° 52' 32"	-23° 26' 09"	0.9837470	16' 15.48"	23° 26' 17"	1 m 21 s
11	270° 51' 00"	-0.28"	270° 55' 19"	-23° 26' 08"	0.9837443	16' 15.49"	23° 26' 17"	1 m 20 s
12	270° 53' 33"	-0.27"	270° 58' 05"	-23° 26' 07"	0.9837416	16' 15.49"	23° 26' 17"	1 m 18 s
13	270° 56' 06"	-0.27"	271° 00' 52"	-23° 26' 06"	0.9837389	16' 15.49"	23° 26' 17"	1 m 17 s
14	270° 58' 39"	-0.26"	271° 03' 38"	-23° 26' 05"	0.9837362	16' 15.50"	23° 26' 17"	1 m 16 s
15	271° 01' 11"	-0.26"	271° 06' 25"	-23° 26' 04"	0.9837335	16' 15.50"	23° 26' 17"	1 m 15 s
16	271° 03' 44"	-0.25"	271° 09' 11"	-23° 26' 02"	0.9837308	16' 15.50"	23° 26' 17"	1 m 13 s
17	271° 06' 17"	-0.25"	271° 11' 58"	-23° 26' 01"	0.9837281	16' 15.50"	23° 26' 17"	1 m 12 s
18	271° 08' 50"	-0.25"	271° 14' 44"	-23° 25' 60"	0.9837254	16' 15.51"	23° 26' 17"	1 m 11 s
19	271° 11' 23"	-0.24"	271° 17' 31"	-23° 25' 58"	0.9837227	16' 15.51"	23° 26' 17"	1 m 10 s
20	271° 13' 56"	-0.24"	271° 20' 17"	-23° 25' 57"	0.9837201	16' 15.51"	23° 26' 17"	1 m 08 s
21	271° 16' 28"	-0.23"	271° 23' 04"	-23° 25' 56"	0.9837174	16' 15.51"	23° 26' 17"	1 m 07 s
22	271° 19' 01"	-0.23"	271° 25' 51"	-23° 25' 54"	0.9837148	16' 15.52"	23° 26' 17"	1 m 06 s
23	271° 21' 34"	-0.22"	271° 28' 37"	-23° 25' 53"	0.9837121	16' 15.52"	23° 26' 17"	1 m 05 s
24	271° 24' 07"	-0.22"	271° 31' 24"	-23° 25' 51"	0.9837095	16' 15.52"	23° 26' 17"	1 m 03 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	291° 50' 45"	-3° 50' 08"	294° 16' 44"	-25° 27' 05"	0° 54' 57"	14' 58.52"	270° 13' 03"	0.03588
1	292° 21' 26"	-3° 48' 23"	294° 49' 51"	-25° 20' 17"	0° 54' 58"	14' 58.78"	269° 43' 18"	0.03738
2	292° 52' 08"	-3° 46' 38"	295° 22' 55"	-25° 13' 22"	0° 54' 59"	14' 59.04"	269° 14' 16"	0.03891
3	293° 22' 51"	-3° 44' 50"	295° 55' 56"	-25° 06' 19"	0° 55' 00"	14' 59.30"	268° 45' 54"	0.04047
4	293° 53' 35"	-3° 43' 02"	296° 28' 54"	-24° 59' 08"	0° 55' 01"	14' 59.57"	268° 18' 11"	0.04207
5	294° 24' 20"	-3° 41' 13"	297° 01' 49"	-24° 51' 50"	0° 55' 02"	14' 59.83"	267° 51' 05"	0.04370
6	294° 55' 05"	-3° 39' 22"	297° 34' 42"	-24° 44' 25"	0° 55' 03"	15' 00.10"	267° 24' 34"	0.04536
7	295° 25' 52"	-3° 37' 30"	298° 07' 31"	-24° 36' 52"	0° 55' 04"	15' 00.37"	266° 58' 37"	0.04705
8	295° 56' 39"	-3° 35' 37"	298° 40' 18"	-24° 29' 11"	0° 55' 05"	15' 00.65"	266° 33' 12"	0.04877
9	296° 27' 27"	-3° 33' 43"	299° 13' 01"	-24° 21' 24"	0° 55' 06"	15' 00.92"	266° 8' 18"	0.05053
10	296° 58' 16"	-3° 31' 48"	299° 45' 42"	-24° 13' 29"	0° 55' 07"	15' 01.20"	265° 43' 53"	0.05232
11	297° 29' 06"	-3° 29' 52"	300° 18' 20"	-24° 05' 27"	0° 55' 08"	15' 01.48"	265° 19' 58"	0.05413
12	297° 59' 57"	-3° 27' 55"	300° 50' 54"	-23° 57' 17"	0° 55' 09"	15' 01.76"	264° 56' 29"	0.05598
13	298° 30' 49"	-3° 25' 57"	301° 23' 26"	-23° 49' 01"	0° 55' 10"	15' 02.04"	264° 33' 27"	0.05786
14	299° 01' 41"	-3° 23' 57"	301° 55' 54"	-23° 40' 37"	0° 55' 11"	15' 02.32"	264° 10' 51"	0.05978
15	299° 32' 35"	-3° 21' 56"	302° 28' 19"	-23° 32' 07"	0° 55' 12"	15' 02.61"	263° 48' 39"	0.06172
16	300° 03' 29"	-3° 19' 55"	303° 00' 41"	-23° 23' 29"	0° 55' 13"	15' 02.90"	263° 26' 51"	0.06369
17	300° 34' 25"	-3° 17' 52"	303° 33' 00"	-23° 14' 44"	0° 55' 14"	15' 03.19"	263° 5' 26"	0.06570
18	301° 05' 21"	-3° 15' 48"	304° 05' 16"	-23° 05' 53"	0° 55' 16"	15' 03.48"	262° 44' 24"	0.06774
19	301° 36' 18"	-3° 13' 44"	304° 37' 29"	-22° 56' 54"	0° 55' 17"	15' 03.77"	262° 23' 43"	0.06980
20	302° 07' 16"	-3° 11' 38"	305° 09' 38"	-22° 47' 49"	0° 55' 18"	15' 04.07"	262° 3' 23"	0.07190
21	302° 38' 15"	-3° 09' 31"	305° 41' 44"	-22° 38' 37"	0° 55' 19"	15' 04.37"	261° 43' 23"	0.07403
22	303° 09' 15"	-3° 07' 23"	306° 13' 47"	-22° 29' 18"	0° 55' 20"	15' 04.66"	261° 23' 43"	0.07619
23	303° 40' 16"	-3° 05' 14"	306° 45' 47"	-22° 19' 53"	0° 55' 21"	15' 04.97"	261° 4' 23"	0.07838
24	304° 11' 18"	-3° 03' 04"	307° 17' 44"	-22° 10' 21"	0° 55' 22"	15' 05.27"	260° 45' 21"	0.08060

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	271° 24' 07"	-0.22"	271° 31' 24"	-23° 25' 51"	0.9837095	16'15.52"	23° 26' 17"	1 m 03 s
1	271° 26' 40"	-0.21"	271° 34' 10"	-23° 25' 49"	0.9837068	16'15.52"	23° 26' 17"	1 m 02 s
2	271° 29' 12"	-0.21"	271° 36' 57"	-23° 25' 48"	0.9837042	16'15.53"	23° 26' 17"	1 m 01 s
3	271° 31' 45"	-0.20"	271° 39' 43"	-23° 25' 46"	0.9837016	16'15.53"	23° 26' 17"	0 m 60 s
4	271° 34' 18"	-0.20"	271° 42' 30"	-23° 25' 44"	0.9836990	16'15.53"	23° 26' 17"	0 m 58 s
5	271° 36' 51"	-0.19"	271° 45' 16"	-23° 25' 42"	0.9836964	16'15.53"	23° 26' 17"	0 m 57 s
6	271° 39' 24"	-0.19"	271° 48' 03"	-23° 25' 40"	0.9836938	16'15.54"	23° 26' 17"	0 m 56 s
7	271° 41' 57"	-0.18"	271° 50' 49"	-23° 25' 38"	0.9836912	16'15.54"	23° 26' 17"	0 m 55 s
8	271° 44' 29"	-0.18"	271° 53' 36"	-23° 25' 36"	0.9836886	16'15.54"	23° 26' 17"	0 m 54 s
9	271° 47' 02"	-0.17"	271° 56' 23"	-23° 25' 34"	0.9836860	16'15.55"	23° 26' 17"	0 m 52 s
10	271° 49' 35"	-0.17"	271° 59' 09"	-23° 25' 32"	0.9836834	16'15.55"	23° 26' 17"	0 m 51 s
11	271° 52' 08"	-0.17"	272° 01' 56"	-23° 25' 30"	0.9836809	16'15.55"	23° 26' 17"	0 m 50 s
12	271° 54' 41"	-0.16"	272° 04' 42"	-23° 25' 28"	0.9836783	16'15.55"	23° 26' 17"	0 m 49 s
13	271° 57' 13"	-0.16"	272° 07' 29"	-23° 25' 26"	0.9836758	16'15.56"	23° 26' 17"	0 m 47 s
14	271° 59' 46"	-0.15"	272° 10' 15"	-23° 25' 24"	0.9836732	16'15.56"	23° 26' 17"	0 m 46 s
15	272° 02' 19"	-0.15"	272° 13' 02"	-23° 25' 21"	0.9836707	16'15.56"	23° 26' 17"	0 m 45 s
16	272° 04' 52"	-0.14"	272° 15' 48"	-23° 25' 19"	0.9836681	16'15.56"	23° 26' 17"	0 m 44 s
17	272° 07' 25"	-0.13"	272° 18' 35"	-23° 25' 16"	0.9836656	16'15.57"	23° 26' 17"	0 m 42 s
18	272° 09' 58"	-0.13"	272° 21' 21"	-23° 25' 14"	0.9836631	16'15.57"	23° 26' 17"	0 m 41 s
19	272° 12' 30"	-0.12"	272° 24' 08"	-23° 25' 11"	0.9836606	16'15.57"	23° 26' 17"	0 m 40 s
20	272° 15' 03"	-0.12"	272° 26' 54"	-23° 25' 09"	0.9836581	16'15.57"	23° 26' 17"	0 m 39 s
21	272° 17' 36"	-0.11"	272° 29' 41"	-23° 25' 06"	0.9836556	16'15.58"	23° 26' 17"	0 m 37 s
22	272° 20' 09"	-0.11"	272° 32' 27"	-23° 25' 04"	0.9836531	16'15.58"	23° 26' 17"	0 m 36 s
23	272° 22' 42"	-0.10"	272° 35' 14"	-23° 25' 01"	0.9836506	16'15.58"	23° 26' 17"	0 m 35 s
24	272° 25' 15"	-0.10"	272° 38' 01"	-23° 24' 58"	0.9836481	16'15.58"	23° 26' 17"	0 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	304° 11' 18"	-3° 03' 04"	307° 17' 44"	-22° 10' 21"	0° 55' 22"	15' 05.27"	260° 45' 21"	0.08060
1	304° 42' 21"	-3° 00' 54"	307° 49' 37"	-22° 00' 42"	0° 55' 23"	15' 05.57"	260° 26' 38"	0.08285
2	305° 13' 25"	-2° 58' 42"	308° 21' 27"	-21° 50' 57"	0° 55' 24"	15' 05.88"	260° 8' 13"	0.08513
3	305° 44' 30"	-2° 56' 29"	308° 53' 14"	-21° 41' 05"	0° 55' 25"	15' 06.19"	259° 50' 05"	0.08744
4	306° 15' 35"	-2° 54' 15"	309° 24' 57"	-21° 31' 07"	0° 55' 27"	15' 06.50"	259° 32' 14"	0.08978
5	306° 46' 42"	-2° 52' 00"	309° 56' 38"	-21° 21' 03"	0° 55' 28"	15' 06.81"	259° 14' 40"	0.09216
6	307° 17' 50"	-2° 49' 45"	310° 28' 15"	-21° 10' 52"	0° 55' 29"	15' 07.13"	258° 57' 23"	0.09456
7	307° 48' 59"	-2° 47' 28"	310° 59' 49"	-21° 00' 35"	0° 55' 30"	15' 07.44"	258° 40' 21"	0.09699
8	308° 20' 09"	-2° 45' 10"	311° 31' 20"	-20° 50' 12"	0° 55' 31"	15' 07.76"	258° 23' 36"	0.09945
9	308° 51' 20"	-2° 42' 52"	312° 02' 47"	-20° 39' 42"	0° 55' 32"	15' 08.08"	258° 7' 05"	0.10194
10	309° 22' 32"	-2° 40' 33"	312° 34' 11"	-20° 29' 07"	0° 55' 34"	15' 08.40"	257° 50' 50"	0.10446
11	309° 53' 45"	-2° 38' 12"	313° 05' 33"	-20° 18' 25"	0° 55' 35"	15' 08.73"	257° 34' 50"	0.10701
12	310° 24' 59"	-2° 35' 51"	313° 36' 50"	-20° 07' 38"	0° 55' 36"	15' 09.05"	257° 19' 04"	0.10959
13	310° 56' 14"	-2° 33' 29"	314° 08' 05"	-19° 56' 44"	0° 55' 37"	15' 09.38"	257° 3' 32"	0.11220
14	311° 27' 31"	-2° 31' 06"	314° 39' 17"	-19° 45' 45"	0° 55' 38"	15' 09.71"	256° 48' 15"	0.11483
15	311° 58' 48"	-2° 28' 42"	315° 10' 25"	-19° 34' 39"	0° 55' 40"	15' 10.04"	256° 33' 12"	0.11750
16	312° 30' 06"	-2° 26' 18"	315° 41' 31"	-19° 23' 28"	0° 55' 41"	15' 10.38"	256° 18' 22"	0.12019
17	313° 01' 26"	-2° 23' 52"	316° 12' 33"	-19° 12' 12"	0° 55' 42"	15' 10.71"	256° 3' 46"	0.12292
18	313° 32' 46"	-2° 21' 26"	316° 43' 33"	-19° 00' 49"	0° 55' 43"	15' 11.05"	255° 49' 23"	0.12567
19	314° 04' 08"	-2° 18' 58"	317° 14' 29"	-18° 49' 21"	0° 55' 45"	15' 11.39"	255° 35' 14"	0.12845
20	314° 35' 31"	-2° 16' 31"	317° 45' 22"	-18° 37' 48"	0° 55' 46"	15' 11.73"	255° 21' 17"	0.13126
21	315° 06' 55"	-2° 14' 02"	318° 16' 12"	-18° 26' 08"	0° 55' 47"	15' 12.08"	255° 7' 33"	0.13410
22	315° 38' 20"	-2° 11' 32"	318° 46' 59"	-18° 14' 24"	0° 55' 48"	15' 12.42"	254° 54' 02"	0.13696
23	316° 09' 47"	-2° 09' 02"	319° 17' 44"	-18° 02' 34"	0° 55' 50"	15' 12.77"	254° 40' 44"	0.13985
24	316° 41' 14"	-2° 06' 31"	319° 48' 25"	-17° 50' 38"	0° 55' 51"	15' 13.12"	254° 27' 37"	0.14277

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	272° 25' 15"	-0.10"	272° 38' 01"	-23° 24' 58"	0.9836481	16' 15.58"	23° 26' 17"	0 m 34 s
1	272° 27' 47"	-0.09"	272° 40' 47"	-23° 24' 55"	0.9836457	16' 15.59"	23° 26' 17"	0 m 32 s
2	272° 30' 20"	-0.09"	272° 43' 34"	-23° 24' 52"	0.9836432	16' 15.59"	23° 26' 17"	0 m 31 s
3	272° 32' 53"	-0.08"	272° 46' 20"	-23° 24' 49"	0.9836407	16' 15.59"	23° 26' 17"	0 m 30 s
4	272° 35' 26"	-0.08"	272° 49' 07"	-23° 24' 46"	0.9836383	16' 15.59"	23° 26' 17"	0 m 29 s
5	272° 37' 59"	-0.07"	272° 51' 53"	-23° 24' 43"	0.9836358	16' 15.59"	23° 26' 17"	0 m 28 s
6	272° 40' 32"	-0.07"	272° 54' 40"	-23° 24' 40"	0.9836334	16' 15.60"	23° 26' 17"	0 m 26 s
7	272° 43' 04"	-0.06"	272° 57' 26"	-23° 24' 37"	0.9836310	16' 15.60"	23° 26' 17"	0 m 25 s
8	272° 45' 37"	-0.06"	273° 00' 13"	-23° 24' 34"	0.9836286	16' 15.60"	23° 26' 17"	0 m 24 s
9	272° 48' 10"	-0.05"	273° 02' 59"	-23° 24' 31"	0.9836261	16' 15.60"	23° 26' 17"	0 m 23 s
10	272° 50' 43"	-0.05"	273° 05' 46"	-23° 24' 28"	0.9836237	16' 15.61"	23° 26' 17"	0 m 21 s
11	272° 53' 16"	-0.04"	273° 08' 32"	-23° 24' 24"	0.9836213	16' 15.61"	23° 26' 17"	0 m 20 s
12	272° 55' 49"	-0.03"	273° 11' 19"	-23° 24' 21"	0.9836189	16' 15.61"	23° 26' 17"	0 m 19 s
13	272° 58' 21"	-0.03"	273° 14' 05"	-23° 24' 18"	0.9836166	16' 15.61"	23° 26' 17"	0 m 18 s
14	273° 00' 54"	-0.02"	273° 16' 52"	-23° 24' 14"	0.9836142	16' 15.62"	23° 26' 17"	0 m 16 s
15	273° 03' 27"	-0.02"	273° 19' 38"	-23° 24' 11"	0.9836118	16' 15.62"	23° 26' 17"	0 m 15 s
16	273° 05' 60"	-0.01"	273° 22' 25"	-23° 24' 07"	0.9836094	16' 15.62"	23° 26' 17"	0 m 14 s
17	273° 08' 33"	-0.01"	273° 25' 11"	-23° 24' 03"	0.9836071	16' 15.62"	23° 26' 17"	0 m 13 s
18	273° 11' 06"	-0.00"	273° 27' 58"	-23° 23' 60"	0.9836047	16' 15.63"	23° 26' 17"	0 m 11 s
19	273° 13' 38"	0.00"	273° 30' 44"	-23° 23' 56"	0.9836024	16' 15.63"	23° 26' 17"	0 m 10 s
20	273° 16' 11"	0.01"	273° 33' 31"	-23° 23' 52"	0.9836001	16' 15.63"	23° 26' 17"	0 m 09 s
21	273° 18' 44"	0.01"	273° 36' 17"	-23° 23' 48"	0.9835977	16' 15.63"	23° 26' 17"	0 m 08 s
22	273° 21' 17"	0.02"	273° 39' 03"	-23° 23' 45"	0.9835954	16' 15.63"	23° 26' 17"	0 m 06 s
23	273° 23' 50"	0.03"	273° 41' 50"	-23° 23' 41"	0.9835931	16' 15.64"	23° 26' 17"	0 m 05 s
24	273° 26' 23"	0.03"	273° 44' 36"	-23° 23' 37"	0.9835908	16' 15.64"	23° 26' 17"	0 m 04 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	316° 41' 14"	-2° 06' 31"	319° 48' 25"	-17° 50' 38"	0° 55' 51"	15' 13.12"	254° 27' 37"	0.14277
1	317° 12' 43"	-2° 03' 59"	320° 19' 04"	-17° 38' 38"	0° 55' 52"	15' 13.47"	254° 14' 43"	0.14572
2	317° 44' 13"	-2° 01' 26"	320° 49' 39"	-17° 26' 32"	0° 55' 54"	15' 13.83"	254° 2' 01"	0.14870
3	318° 15' 44"	-1° 58' 53"	321° 20' 12"	-17° 14' 21"	0° 55' 55"	15' 14.18"	253° 49' 31"	0.15170
4	318° 47' 16"	-1° 56' 19"	321° 50' 42"	-17° 02' 05"	0° 55' 56"	15' 14.54"	253° 37' 13"	0.15473
5	319° 18' 50"	-1° 53' 44"	322° 21' 10"	-16° 49' 43"	0° 55' 57"	15' 14.90"	253° 25' 06"	0.15779
6	319° 50' 25"	-1° 51' 09"	322° 51' 34"	-16° 37' 17"	0° 55' 59"	15' 15.26"	253° 13' 11"	0.16087
7	320° 22' 01"	-1° 48' 32"	323° 21' 56"	-16° 24' 46"	0° 56' 00"	15' 15.63"	253° 1' 28"	0.16398
8	320° 53' 38"	-1° 45' 55"	323° 52' 16"	-16° 12' 10"	0° 56' 01"	15' 15.99"	252° 49' 56"	0.16712
9	321° 25' 17"	-1° 43' 18"	324° 22' 32"	-15° 59' 29"	0° 56' 03"	15' 16.36"	252° 38' 35"	0.17028
10	321° 56' 56"	-1° 40' 40"	324° 52' 47"	-15° 46' 43"	0° 56' 04"	15' 16.73"	252° 27' 26"	0.17348
11	322° 28' 37"	-1° 38' 01"	325° 22' 58"	-15° 33' 52"	0° 56' 06"	15' 17.10"	252° 16' 27"	0.17669
12	323° 00' 20"	-1° 35' 21"	325° 53' 08"	-15° 20' 57"	0° 56' 07"	15' 17.48"	252° 5' 40"	0.17993
13	323° 32' 04"	-1° 32' 41"	326° 23' 14"	-15° 07' 57"	0° 56' 08"	15' 17.85"	251° 55' 04"	0.18320
14	324° 03' 49"	-1° 30' 01"	326° 53' 19"	-14° 54' 53"	0° 56' 10"	15' 18.23"	251° 44' 38"	0.18650
15	324° 35' 35"	-1° 27' 19"	327° 23' 21"	-14° 41' 44"	0° 56' 11"	15' 18.61"	251° 34' 23"	0.18982
16	325° 07' 23"	-1° 24' 37"	327° 53' 20"	-14° 28' 30"	0° 56' 12"	15' 18.99"	251° 24' 20"	0.19316
17	325° 39' 12"	-1° 21' 55"	328° 23' 18"	-14° 15' 13"	0° 56' 14"	15' 19.38"	251° 14' 26"	0.19653
18	326° 11' 02"	-1° 19' 12"	328° 53' 13"	-14° 01' 50"	0° 56' 15"	15' 19.76"	251° 4' 44"	0.19993
19	326° 42' 54"	-1° 16' 28"	329° 23' 07"	-13° 48' 24"	0° 56' 17"	15' 20.15"	250° 55' 12"	0.20335
20	327° 14' 47"	-1° 13' 44"	329° 52' 58"	-13° 34' 53"	0° 56' 18"	15' 20.54"	250° 45' 50"	0.20679
21	327° 46' 42"	-1° 10' 60"	330° 22' 47"	-13° 21' 18"	0° 56' 20"	15' 20.93"	250° 36' 39"	0.21026
22	328° 18' 38"	-1° 08' 15"	330° 52' 34"	-13° 07' 39"	0° 56' 21"	15' 21.33"	250° 27' 38"	0.21375
23	328° 50' 35"	-1° 05' 29"	331° 22' 19"	-12° 53' 56"	0° 56' 22"	15' 21.72"	250° 18' 47"	0.21727
24	329° 22' 34"	-1° 02' 43"	331° 52' 02"	-12° 40' 09"	0° 56' 24"	15' 22.12"	250° 10' 07"	0.22081

25 Desember 2025

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	273° 26' 23"	0.03"	273° 44' 36"	-23° 23' 37"	0.9835908	16'15.64"	23° 26' 17"	0 m 04 s
1	273° 28' 55"	0.04"	273° 47' 23"	-23° 23' 33"	0.9835885	16'15.64"	23° 26' 17"	0 m 03 s
2	273° 31' 28"	0.04"	273° 50' 09"	-23° 23' 29"	0.9835862	16'15.64"	23° 26' 17"	0 m 02 s
3	273° 34' 01"	0.05"	273° 52' 56"	-23° 23' 25"	0.9835839	16'15.65"	23° 26' 17"	0 m 00 s
4	273° 36' 34"	0.05"	273° 55' 42"	-23° 23' 20"	0.9835817	16'15.65"	23° 26' 17"	0 m -1 s
5	273° 39' 07"	0.06"	273° 58' 29"	-23° 23' 16"	0.9835794	16'15.65"	23° 26' 17"	0 m -2 s
6	273° 41' 40"	0.06"	274° 01' 15"	-23° 23' 12"	0.9835771	16'15.65"	23° 26' 17"	0 m -3 s
7	273° 44' 12"	0.07"	274° 04' 02"	-23° 23' 08"	0.9835749	16'15.66"	23° 26' 17"	0 m -5 s
8	273° 46' 45"	0.08"	274° 06' 48"	-23° 23' 03"	0.9835726	16'15.66"	23° 26' 17"	0 m -6 s
9	273° 49' 18"	0.08"	274° 09' 34"	-23° 22' 59"	0.9835704	16'15.66"	23° 26' 17"	0 m -7 s
10	273° 51' 51"	0.09"	274° 12' 21"	-23° 22' 55"	0.9835681	16'15.66"	23° 26' 17"	0 m -8 s
11	273° 54' 24"	0.09"	274° 15' 07"	-23° 22' 50"	0.9835659	16'15.66"	23° 26' 17"	0 m-10 s
12	273° 56' 57"	0.10"	274° 17' 54"	-23° 22' 46"	0.9835637	16'15.67"	23° 26' 17"	0 m-11 s
13	273° 59' 29"	0.10"	274° 20' 40"	-23° 22' 41"	0.9835615	16'15.67"	23° 26' 17"	0 m-12 s
14	274° 02' 02"	0.11"	274° 23' 27"	-23° 22' 36"	0.9835593	16'15.67"	23° 26' 17"	0 m-13 s
15	274° 04' 35"	0.11"	274° 26' 13"	-23° 22' 32"	0.9835571	16'15.67"	23° 26' 17"	0 m-15 s
16	274° 07' 08"	0.12"	274° 28' 60"	-23° 22' 27"	0.9835549	16'15.68"	23° 26' 17"	0 m-16 s
17	274° 09' 41"	0.13"	274° 31' 46"	-23° 22' 22"	0.9835527	16'15.68"	23° 26' 17"	0 m-17 s
18	274° 12' 14"	0.13"	274° 34' 32"	-23° 22' 17"	0.9835506	16'15.68"	23° 26' 17"	0 m-18 s
19	274° 14' 46"	0.14"	274° 37' 19"	-23° 22' 12"	0.9835484	16'15.68"	23° 26' 17"	0 m-19 s
20	274° 17' 19"	0.14"	274° 40' 05"	-23° 22' 08"	0.9835463	16'15.68"	23° 26' 17"	0 m-21 s
21	274° 19' 52"	0.15"	274° 42' 52"	-23° 22' 03"	0.9835441	16'15.69"	23° 26' 17"	0 m-22 s
22	274° 22' 25"	0.15"	274° 45' 38"	-23° 21' 58"	0.9835420	16'15.69"	23° 26' 17"	0 m-23 s
23	274° 24' 58"	0.16"	274° 48' 24"	-23° 21' 52"	0.9835398	16'15.69"	23° 26' 17"	0 m-24 s
24	274° 27' 31"	0.16"	274° 51' 11"	-23° 21' 47"	0.9835377	16'15.69"	23° 26' 17"	0 m-26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	329° 22' 34"	-1° 02' 43"	331° 52' 02"	-12° 40' 09"	0° 56' 24"	15' 22.12"	250° 10' 07"	0.22081
1	329° 54' 34"	0°-59' 56"	332° 21' 44"	-12° 26' 18"	0° 56' 25"	15' 22.52"	250° 1' 37"	0.22437
2	330° 26' 36"	0°-57' 09"	332° 51' 23"	-12° 12' 23"	0° 56' 27"	15' 22.92"	249° 53' 17"	0.22796
3	330° 58' 39"	0°-54' 22"	333° 21' 01"	-11° 58' 24"	0° 56' 28"	15' 23.32"	249° 45' 07"	0.23157
4	331° 30' 44"	0°-51' 34"	333° 50' 37"	-11° 44' 22"	0° 56' 30"	15' 23.73"	249° 37' 07"	0.23521
5	332° 02' 50"	0°-48' 45"	334° 20' 12"	-11° 30' 15"	0° 56' 31"	15' 24.14"	249° 29' 17"	0.23886
6	332° 34' 58"	0°-45' 57"	334° 49' 45"	-11° 16' 05"	0° 56' 33"	15' 24.55"	249° 21' 37"	0.24254
7	333° 07' 07"	0°-43' 08"	335° 19' 17"	-11° 01' 51"	0° 56' 34"	15' 24.96"	249° 14' 08"	0.24625
8	333° 39' 18"	0°-40' 18"	335° 48' 47"	-10° 47' 34"	0° 56' 36"	15' 25.37"	249° 6' 48"	0.24997
9	334° 11' 31"	0°-37' 28"	336° 18' 16"	-10° 33' 14"	0° 56' 37"	15' 25.79"	248° 59' 38"	0.25372
10	334° 43' 44"	0°-34' 38"	336° 47' 43"	-10° 18' 49"	0° 56' 39"	15' 26.21"	248° 52' 37"	0.25749
11	335° 15' 60"	0°-31' 47"	337° 17' 10"	-10° 04' 22"	0° 56' 40"	15' 26.63"	248° 45' 47"	0.26128
12	335° 48' 17"	0°-28' 56"	337° 46' 35"	-9° 49' 51"	0° 56' 42"	15' 27.05"	248° 39' 06"	0.26509
13	336° 20' 36"	0°-26' 08"	338° 15' 60"	-9° 35' 19"	0° 56' 44"	15' 27.47"	248° 32' 37"	0.26892
14	336° 52' 56"	0°-23' 16"	338° 45' 23"	-9° 20' 41"	0° 56' 45"	15' 27.90"	248° 26' 15"	0.27277
15	337° 25' 18"	0°-20' 24"	339° 14' 45"	-9° 06' 01"	0° 56' 47"	15' 28.32"	248° 20' 04"	0.27665
16	337° 57' 42"	0°-17' 32"	339° 44' 06"	-8° 51' 17"	0° 56' 48"	15' 28.75"	248° 14' 02"	0.28054
17	338° 30' 07"	0°-14' 40"	340° 13' 26"	-8° 36' 30"	0° 56' 50"	15' 29.18"	248° 8' 10"	0.28446
18	339° 02' 34"	0°-11' 48"	340° 42' 46"	-8° 21' 41"	0° 56' 51"	15' 29.62"	248° 2' 27"	0.28839
19	339° 35' 02"	0° -8' 55"	341° 12' 04"	-8° 06' 48"	0° 56' 53"	15' 30.05"	247° 56' 55"	0.29235
20	340° 07' 32"	0° -6' 02"	341° 41' 23"	-7° 51' 52"	0° 56' 55"	15' 30.49"	247° 51' 31"	0.29633
21	340° 40' 04"	0° -3' 09"	342° 10' 40"	-7° 36' 54"	0° 56' 56"	15' 30.93"	247° 46' 18"	0.30032
22	341° 12' 38"	0° 00'-15"	342° 39' 57"	-7° 21' 53"	0° 56' 58"	15' 31.37"	247° 41' 13"	0.30433
23	341° 45' 13"	0° 02' 38"	343° 09' 14"	-7° 06' 49"	0° 56' 59"	15' 31.81"	247° 36' 19"	0.30837
24	342° 17' 51"	0° 05' 32"	343° 38' 30"	-6° 51' 42"	0° 57' 01"	15' 32.25"	247° 31' 34"	0.31242

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	274° 27' 31"	0.16"	274° 51' 11"	-23° 21' 47"	0.9835377	16' 15.69"	23° 26' 17"	0 m-26 s
1	274° 30' 03"	0.17"	274° 53' 57"	-23° 21' 42"	0.9835356	16' 15.69"	23° 26' 17"	0 m-27 s
2	274° 32' 36"	0.17"	274° 56' 44"	-23° 21' 37"	0.9835335	16' 15.70"	23° 26' 17"	0 m-28 s
3	274° 35' 09"	0.18"	274° 59' 30"	-23° 21' 32"	0.9835314	16' 15.70"	23° 26' 17"	0 m-29 s
4	274° 37' 42"	0.19"	275° 02' 16"	-23° 21' 26"	0.9835293	16' 15.70"	23° 26' 18"	0 m-31 s
5	274° 40' 15"	0.19"	275° 05' 03"	-23° 21' 21"	0.9835272	16' 15.70"	23° 26' 18"	0 m-32 s
6	274° 42' 48"	0.20"	275° 07' 49"	-23° 21' 16"	0.9835251	16' 15.70"	23° 26' 18"	0 m-33 s
7	274° 45' 21"	0.20"	275° 10' 35"	-23° 21' 10"	0.9835231	16' 15.71"	23° 26' 18"	0 m-34 s
8	274° 47' 53"	0.21"	275° 13' 22"	-23° 21' 05"	0.9835210	16' 15.71"	23° 26' 18"	0 m-35 s
9	274° 50' 26"	0.21"	275° 16' 08"	-23° 20' 59"	0.9835189	16' 15.71"	23° 26' 18"	0 m-37 s
10	274° 52' 59"	0.22"	275° 18' 55"	-23° 20' 53"	0.9835169	16' 15.71"	23° 26' 18"	0 m-38 s
11	274° 55' 32"	0.22"	275° 21' 41"	-23° 20' 48"	0.9835149	16' 15.71"	23° 26' 18"	0 m-39 s
12	274° 58' 05"	0.23"	275° 24' 27"	-23° 20' 42"	0.9835128	16' 15.72"	23° 26' 18"	0 m-40 s
13	275° 00' 38"	0.24"	275° 27' 14"	-23° 20' 36"	0.9835108	16' 15.72"	23° 26' 18"	0 m-42 s
14	275° 03' 10"	0.24"	275° 29' 60"	-23° 20' 30"	0.9835088	16' 15.72"	23° 26' 18"	0 m-43 s
15	275° 05' 43"	0.25"	275° 32' 46"	-23° 20' 25"	0.9835068	16' 15.72"	23° 26' 18"	0 m-44 s
16	275° 08' 16"	0.25"	275° 35' 33"	-23° 20' 19"	0.9835048	16' 15.72"	23° 26' 18"	0 m-45 s
17	275° 10' 49"	0.26"	275° 38' 19"	-23° 20' 13"	0.9835028	16' 15.73"	23° 26' 18"	0 m-47 s
18	275° 13' 22"	0.26"	275° 41' 05"	-23° 20' 07"	0.9835008	16' 15.73"	23° 26' 18"	0 m-48 s
19	275° 15' 55"	0.27"	275° 43' 52"	-23° 20' 01"	0.9834989	16' 15.73"	23° 26' 18"	0 m-49 s
20	275° 18' 27"	0.27"	275° 46' 38"	-23° 19' 55"	0.9834969	16' 15.73"	23° 26' 18"	0 m-50 s
21	275° 21' 00"	0.28"	275° 49' 24"	-23° 19' 48"	0.9834949	16' 15.73"	23° 26' 18"	0 m-51 s
22	275° 23' 33"	0.28"	275° 52' 10"	-23° 19' 42"	0.9834930	16' 15.74"	23° 26' 18"	0 m-53 s
23	275° 26' 06"	0.29"	275° 54' 57"	-23° 19' 36"	0.9834911	16' 15.74"	23° 26' 18"	0 m-54 s
24	275° 28' 39"	0.29"	275° 57' 43"	-23° 19' 30"	0.9834891	16' 15.74"	23° 26' 18"	0 m-55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	342° 17' 51"	0° 05' 32"	343° 38' 30"	-6° 51' 42"	0° 57' 01"	15' 32.25"	247° 31' 34"	0.31242
1	342° 50' 29"	0° 08' 26"	344° 07' 46"	-6° 36' 33"	0° 57' 03"	15' 32.70"	247° 26' 58"	0.31649
2	343° 23' 10"	0° 11' 20"	344° 37' 02"	-6° 21' 21"	0° 57' 04"	15' 33.14"	247° 22' 32"	0.32057
3	343° 55' 52"	0° 14' 14"	345° 06' 17"	-6° 06' 07"	0° 57' 06"	15' 33.59"	247° 18' 16"	0.32468
4	344° 28' 37"	0° 17' 08"	345° 35' 33"	-5° 50' 50"	0° 57' 08"	15' 34.04"	247° 14' 09"	0.32880
5	345° 01' 23"	0° 20' 02"	346° 04' 48"	-5° 35' 32"	0° 57' 09"	15' 34.49"	247° 10' 11"	0.33294
6	345° 34' 11"	0° 22' 56"	346° 34' 04"	-5° 20' 10"	0° 57' 11"	15' 34.95"	247° 6' 23"	0.33710
7	346° 07' 00"	0° 25' 50"	347° 03' 19"	-5° 04' 47"	0° 57' 13"	15' 35.40"	247° 2' 45"	0.34127
8	346° 39' 52"	0° 28' 45"	347° 32' 35"	-4° 49' 21"	0° 57' 14"	15' 35.86"	246° 59' 15"	0.34546
9	347° 12' 45"	0° 31' 39"	348° 01' 51"	-4° 33' 53"	0° 57' 16"	15' 36.32"	246° 55' 56"	0.34967
10	347° 45' 41"	0° 34' 34"	348° 31' 08"	-4° 18' 23"	0° 57' 18"	15' 36.78"	246° 52' 46"	0.35389
11	348° 18' 38"	0° 37' 28"	349° 00' 25"	-4° 02' 52"	0° 57' 19"	15' 37.24"	246° 49' 45"	0.35813
12	348° 51' 37"	0° 40' 22"	349° 29' 42"	-3° 47' 18"	0° 57' 21"	15' 37.71"	246° 46' 54"	0.36239
13	349° 24' 38"	0° 43' 16"	349° 59' 01"	-3° 31' 42"	0° 57' 23"	15' 38.17"	246° 44' 12"	0.36666
14	349° 57' 41"	0° 46' 11"	350° 28' 19"	-3° 16' 05"	0° 57' 25"	15' 38.64"	246° 41' 40"	0.37094
15	350° 30' 45"	0° 49' 05"	350° 57' 39"	-3° 00' 25"	0° 57' 26"	15' 39.11"	246° 39' 17"	0.37524
16	351° 03' 52"	0° 51' 59"	351° 26' 59"	-2° 44' 44"	0° 57' 28"	15' 39.58"	246° 37' 04"	0.37956
17	351° 37' 01"	0° 54' 52"	351° 56' 21"	-2° 29' 02"	0° 57' 30"	15' 40.05"	246° 35' 00"	0.38388
18	352° 10' 12"	0° 57' 46"	352° 25' 43"	-2° 13' 18"	0° 57' 31"	15' 40.52"	246° 33' 06"	0.38822
19	352° 43' 24"	1° 00' 40"	352° 55' 07"	-1° 57' 32"	0° 57' 33"	15' 40.99"	246° 31' 21"	0.39258
20	353° 16' 39"	1° 03' 33"	353° 24' 31"	-1° 41' 45"	0° 57' 35"	15' 41.47"	246° 29' 46"	0.39695
21	353° 49' 56"	1° 06' 26"	353° 53' 57"	-1° 25' 57"	0° 57' 37"	15' 41.94"	246° 28' 20"	0.40133
22	354° 23' 14"	1° 09' 19"	354° 23' 24"	-1° 10' 07"	0° 57' 38"	15' 42.42"	246° 27' 04"	0.40572
23	354° 56' 35"	1° 12' 12"	354° 52' 53"	0°-54' 16"	0° 57' 40"	15' 42.90"	246° 25' 58"	0.41013
24	355° 29' 58"	1° 15' 05"	355° 22' 23"	0°-38' 24"	0° 57' 42"	15' 43.38"	246° 25' 01"	0.41454

27 Desember 2025

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	275° 28' 39"	0.29"	275° 57' 43"	-23° 19' 30"	0.9834891	16'15.74"	23° 26' 18"	0 m-55 s
1	275° 31' 12"	0.30"	276° 00' 29"	-23° 19' 23"	0.9834872	16'15.74"	23° 26' 18"	0 m-56 s
2	275° 33' 44"	0.30"	276° 03' 16"	-23° 19' 17"	0.9834853	16'15.74"	23° 26' 18"	0 m-58 s
3	275° 36' 17"	0.31"	276° 06' 02"	-23° 19' 11"	0.9834834	16'15.75"	23° 26' 18"	0 m-59 s
4	275° 38' 50"	0.31"	276° 08' 48"	-23° 19' 04"	0.9834815	16'15.75"	23° 26' 18"	-1 m 00 s
5	275° 41' 23"	0.32"	276° 11' 35"	-23° 18' 58"	0.9834796	16'15.75"	23° 26' 18"	-1 m 01 s
6	275° 43' 56"	0.32"	276° 14' 21"	-23° 18' 51"	0.9834777	16'15.75"	23° 26' 18"	-1 m 02 s
7	275° 46' 29"	0.33"	276° 17' 07"	-23° 18' 44"	0.9834759	16'15.75"	23° 26' 18"	-1 m 04 s
8	275° 49' 01"	0.33"	276° 19' 53"	-23° 18' 38"	0.9834740	16'15.76"	23° 26' 18"	-1 m 05 s
9	275° 51' 34"	0.34"	276° 22' 40"	-23° 18' 31"	0.9834721	16'15.76"	23° 26' 18"	-1 m 06 s
10	275° 54' 07"	0.35"	276° 25' 26"	-23° 18' 24"	0.9834703	16'15.76"	23° 26' 18"	-1 m 07 s
11	275° 56' 40"	0.35"	276° 28' 12"	-23° 18' 17"	0.9834685	16'15.76"	23° 26' 18"	-1 m 09 s
12	275° 59' 13"	0.36"	276° 30' 58"	-23° 18' 10"	0.9834666	16'15.76"	23° 26' 18"	-1 m 10 s
13	276° 01' 46"	0.36"	276° 33' 45"	-23° 18' 03"	0.9834648	16'15.76"	23° 26' 18"	-1 m 11 s
14	276° 04' 19"	0.37"	276° 36' 31"	-23° 17' 56"	0.9834630	16'15.77"	23° 26' 18"	-1 m 12 s
15	276° 06' 51"	0.37"	276° 39' 17"	-23° 17' 49"	0.9834612	16'15.77"	23° 26' 18"	-1 m 13 s
16	276° 09' 24"	0.37"	276° 42' 03"	-23° 17' 42"	0.9834594	16'15.77"	23° 26' 18"	-1 m 15 s
17	276° 11' 57"	0.38"	276° 44' 49"	-23° 17' 35"	0.9834576	16'15.77"	23° 26' 18"	-1 m 16 s
18	276° 14' 30"	0.38"	276° 47' 36"	-23° 17' 28"	0.9834559	16'15.77"	23° 26' 18"	-1 m 17 s
19	276° 17' 03"	0.39"	276° 50' 22"	-23° 17' 21"	0.9834541	16'15.78"	23° 26' 18"	-1 m 18 s
20	276° 19' 36"	0.39"	276° 53' 08"	-23° 17' 14"	0.9834523	16'15.78"	23° 26' 18"	-1 m 20 s
21	276° 22' 08"	0.40"	276° 55' 54"	-23° 17' 06"	0.9834506	16'15.78"	23° 26' 17"	-1 m 21 s
22	276° 24' 41"	0.40"	276° 58' 40"	-23° 16' 59"	0.9834488	16'15.78"	23° 26' 17"	-1 m 22 s
23	276° 27' 14"	0.41"	277° 01' 27"	-23° 16' 51"	0.9834471	16'15.78"	23° 26' 17"	-1 m 23 s
24	276° 29' 47"	0.41"	277° 04' 13"	-23° 16' 44"	0.9834454	16'15.78"	23° 26' 17"	-1 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	355° 29' 58"	1° 15' 05"	355° 22' 23"	0°-38' 24"	0° 57' 42"	15' 43.38"	246° 25' 01"	0.41454
1	356° 03' 23"	1° 17' 57"	355° 51' 54"	0°-22' 30"	0° 57' 44"	15' 43.86"	246° 24' 14"	0.41897
2	356° 36' 50"	1° 20' 49"	356° 21' 28"	0° -6' 36"	0° 57' 45"	15' 44.34"	246° 23' 36"	0.42341
3	357° 10' 19"	1° 23' 41"	356° 51' 03"	0° 09' 20"	0° 57' 47"	15' 44.83"	246° 23' 08"	0.42787
4	357° 43' 50"	1° 26' 33"	357° 20' 39"	0° 25' 16"	0° 57' 49"	15' 45.31"	246° 22' 49"	0.43233
5	358° 17' 23"	1° 29' 24"	357° 50' 18"	0° 41' 13"	0° 57' 51"	15' 45.80"	246° 22' 40"	0.43680
6	358° 50' 58"	1° 32' 15"	358° 19' 59"	0° 57' 11"	0° 57' 53"	15' 46.28"	246° 22' 41"	0.44128
7	359° 24' 36"	1° 35' 05"	358° 49' 42"	1° 13' 09"	0° 57' 54"	15' 46.77"	246° 22' 52"	0.44577
8	359° 58' 15"	1° 37' 55"	359° 19' 27"	1° 29' 09"	0° 57' 56"	15' 47.26"	246° 23' 12"	0.45028
9	0° 31' 57"	1° 40' 45"	359° 49' 14"	1° 45' 09"	0° 57' 58"	15' 47.75"	246° 23' 42"	0.45479
10	1° 05' 41"	1° 43' 34"	0° 19' 03"	2° 01' 09"	0° 57' 60"	15' 48.24"	246° 24' 22"	0.45931
11	1° 39' 27"	1° 46' 23"	0° 48' 55"	2° 17' 10"	0° 58' 02"	15' 48.73"	246° 25' 11"	0.46383
12	2° 13' 15"	1° 49' 12"	1° 18' 50"	2° 33' 11"	0° 58' 03"	15' 49.22"	246° 26' 11"	0.46837
13	2° 47' 06"	1° 51' 60"	1° 48' 47"	2° 49' 12"	0° 58' 05"	15' 49.72"	246° 27' 20"	0.47291
14	3° 20' 58"	1° 54' 47"	2° 18' 46"	3° 05' 14"	0° 58' 07"	15' 50.21"	246° 28' 39"	0.47746
15	3° 54' 53"	1° 57' 34"	2° 48' 49"	3° 21' 16"	0° 58' 09"	15' 50.70"	246° 30' 08"	0.48202
16	4° 28' 50"	2° 00' 21"	3° 18' 54"	3° 37' 18"	0° 58' 11"	15' 51.20"	246° 31' 47"	0.48658
17	5° 02' 49"	2° 03' 07"	3° 49' 02"	3° 53' 20"	0° 58' 12"	15' 51.69"	246° 33' 36"	0.49115
18	5° 36' 51"	2° 05' 52"	4° 19' 14"	4° 09' 21"	0° 58' 14"	15' 52.19"	246° 35' 35"	0.49573
19	6° 10' 55"	2° 08' 37"	4° 49' 28"	4° 25' 23"	0° 58' 16"	15' 52.68"	246° 37' 44"	0.50031
20	6° 45' 01"	2° 11' 21"	5° 19' 46"	4° 41' 24"	0° 58' 18"	15' 53.18"	246° 40' 03"	0.50489
21	7° 19' 09"	2° 14' 05"	5° 50' 06"	4° 57' 26"	0° 58' 20"	15' 53.68"	246° 42' 33"	0.50948
22	7° 53' 19"	2° 16' 48"	6° 20' 31"	5° 13' 26"	0° 58' 22"	15' 54.17"	246° 45' 12"	0.51408
23	8° 27' 32"	2° 19' 30"	6° 50' 58"	5° 29' 27"	0° 58' 23"	15' 54.67"	246° 48' 02"	0.51868
24	9° 01' 47"	2° 22' 12"	7° 21' 30"	5° 45' 26"	0° 58' 25"	15' 55.17"	246° 51' 01"	0.52328

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	276° 29' 47"	0.41"	277° 04' 13"	-23° 16' 44"	0.9834454	16' 15.78"	23° 26' 17"	-1 m 24 s
1	276° 32' 20"	0.42"	277° 06' 59"	-23° 16' 36"	0.9834437	16' 15.79"	23° 26' 17"	-1 m 26 s
2	276° 34' 53"	0.42"	277° 09' 45"	-23° 16' 29"	0.9834420	16' 15.79"	23° 26' 17"	-1 m 27 s
3	276° 37' 25"	0.43"	277° 12' 31"	-23° 16' 21"	0.9834403	16' 15.79"	23° 26' 17"	-1 m 28 s
4	276° 39' 58"	0.43"	277° 15' 18"	-23° 16' 14"	0.9834386	16' 15.79"	23° 26' 17"	-1 m 29 s
5	276° 42' 31"	0.44"	277° 18' 04"	-23° 16' 06"	0.9834369	16' 15.79"	23° 26' 17"	-1 m 31 s
6	276° 45' 04"	0.44"	277° 20' 50"	-23° 15' 58"	0.9834352	16' 15.79"	23° 26' 17"	-1 m 32 s
7	276° 47' 37"	0.45"	277° 23' 36"	-23° 15' 50"	0.9834336	16' 15.80"	23° 26' 17"	-1 m 33 s
8	276° 50' 10"	0.45"	277° 26' 22"	-23° 15' 43"	0.9834319	16' 15.80"	23° 26' 17"	-1 m 34 s
9	276° 52' 42"	0.45"	277° 29' 08"	-23° 15' 35"	0.9834303	16' 15.80"	23° 26' 17"	-1 m 35 s
10	276° 55' 15"	0.46"	277° 31' 54"	-23° 15' 27"	0.9834287	16' 15.80"	23° 26' 17"	-1 m 37 s
11	276° 57' 48"	0.46"	277° 34' 41"	-23° 15' 19"	0.9834270	16' 15.80"	23° 26' 17"	-1 m 38 s
12	277° 00' 21"	0.47"	277° 37' 27"	-23° 15' 11"	0.9834254	16' 15.80"	23° 26' 17"	-1 m 39 s
13	277° 02' 54"	0.47"	277° 40' 13"	-23° 15' 03"	0.9834238	16' 15.81"	23° 26' 17"	-1 m 40 s
14	277° 05' 27"	0.48"	277° 42' 59"	-23° 14' 54"	0.9834222	16' 15.81"	23° 26' 17"	-1 m 42 s
15	277° 07' 59"	0.48"	277° 45' 45"	-23° 14' 46"	0.9834207	16' 15.81"	23° 26' 17"	-1 m 43 s
16	277° 10' 32"	0.48"	277° 48' 31"	-23° 14' 38"	0.9834191	16' 15.81"	23° 26' 17"	-1 m 44 s
17	277° 13' 05"	0.49"	277° 51' 17"	-23° 14' 30"	0.9834175	16' 15.81"	23° 26' 17"	-1 m 45 s
18	277° 15' 38"	0.49"	277° 54' 03"	-23° 14' 21"	0.9834160	16' 15.81"	23° 26' 17"	-1 m 46 s
19	277° 18' 11"	0.50"	277° 56' 49"	-23° 14' 13"	0.9834144	16' 15.81"	23° 26' 17"	-1 m 48 s
20	277° 20' 44"	0.50"	277° 59' 35"	-23° 14' 05"	0.9834129	16' 15.82"	23° 26' 17"	-1 m 49 s
21	277° 23' 16"	0.50"	278° 02' 21"	-23° 13' 56"	0.9834113	16' 15.82"	23° 26' 17"	-1 m 50 s
22	277° 25' 49"	0.51"	278° 05' 08"	-23° 13' 48"	0.9834098	16' 15.82"	23° 26' 17"	-1 m 51 s
23	277° 28' 22"	0.51"	278° 07' 54"	-23° 13' 39"	0.9834083	16' 15.82"	23° 26' 17"	-1 m 52 s
24	277° 30' 55"	0.52"	278° 10' 40"	-23° 13' 30"	0.9834068	16' 15.82"	23° 26' 17"	-1 m 54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	9° 01' 47"	2° 22' 12"	7° 21' 30"	5° 45' 26"	0° 58' 25"	15' 55.17"	246° 51' 01"	0.52328
1	9° 36' 05"	2° 24' 53"	7° 52' 05"	6° 01' 25"	0° 58' 27"	15' 55.67"	246° 54' 11"	0.52789
2	10° 10' 24"	2° 27' 34"	8° 22' 43"	6° 17' 24"	0° 58' 29"	15' 56.16"	246° 57' 32"	0.53249
3	10° 44' 46"	2° 30' 13"	8° 53' 26"	6° 33' 22"	0° 58' 31"	15' 56.66"	247° 1' 02"	0.53710
4	11° 19' 11"	2° 32' 52"	9° 24' 12"	6° 49' 18"	0° 58' 33"	15' 57.16"	247° 4' 43"	0.54172
5	11° 53' 37"	2° 35' 30"	9° 55' 02"	7° 05' 14"	0° 58' 34"	15' 57.66"	247° 8' 35"	0.54633
6	12° 28' 06"	2° 38' 08"	10° 25' 57"	7° 21' 09"	0° 58' 36"	15' 58.15"	247° 12' 37"	0.55095
7	13° 02' 37"	2° 40' 44"	10° 56' 55"	7° 37' 03"	0° 58' 38"	15' 58.65"	247° 16' 49"	0.55556
8	13° 37' 11"	2° 43' 20"	11° 27' 58"	7° 52' 55"	0° 58' 40"	15' 59.15"	247° 21' 12"	0.56018
9	14° 11' 47"	2° 45' 55"	11° 59' 06"	8° 08' 46"	0° 58' 42"	15' 59.64"	247° 25' 46"	0.56480
10	14° 46' 25"	2° 48' 29"	12° 30' 17"	8° 24' 36"	0° 58' 43"	16' 00.14"	247° 30' 30"	0.56941
11	15° 21' 06"	2° 51' 02"	13° 01' 33"	8° 40' 24"	0° 58' 45"	16' 00.64"	247° 35' 25"	0.57403
12	15° 55' 49"	2° 53' 35"	13° 32' 54"	8° 56' 11"	0° 58' 47"	16' 01.13"	247° 40' 31"	0.57864
13	16° 30' 34"	2° 56' 06"	14° 04' 20"	9° 11' 56"	0° 58' 49"	16' 01.63"	247° 45' 47"	0.58325
14	17° 05' 22"	2° 58' 37"	14° 35' 50"	9° 27' 40"	0° 58' 51"	16' 02.12"	247° 51' 14"	0.58786
15	17° 40' 12"	3° 01' 06"	15° 07' 25"	9° 43' 21"	0° 58' 53"	16' 02.61"	247° 56' 53"	0.59247
16	18° 15' 04"	3° 03' 35"	15° 39' 06"	9° 59' 01"	0° 58' 54"	16' 03.11"	248° 2' 42"	0.59707
17	18° 49' 59"	3° 06' 03"	16° 10' 51"	10° 14' 39"	0° 58' 56"	16' 03.60"	248° 8' 42"	0.60167
18	19° 24' 56"	3° 08' 29"	16° 42' 41"	10° 30' 14"	0° 58' 58"	16' 04.09"	248° 14' 53"	0.60627
19	19° 59' 55"	3° 10' 55"	17° 14' 37"	10° 45' 47"	0° 58' 60"	16' 04.58"	248° 21' 15"	0.61086
20	20° 34' 57"	3° 13' 19"	17° 46' 38"	11° 01' 18"	0° 59' 02"	16' 05.07"	248° 27' 49"	0.61545
21	21° 10' 01"	3° 15' 43"	18° 18' 44"	11° 16' 47"	0° 59' 03"	16' 05.56"	248° 34' 34"	0.62003
22	21° 45' 08"	3° 18' 05"	18° 50' 56"	11° 32' 13"	0° 59' 05"	16' 06.04"	248° 41' 30"	0.62461
23	22° 20' 17"	3° 20' 27"	19° 23' 13"	11° 47' 37"	0° 59' 07"	16' 06.53"	248° 48' 37"	0.62918
24	22° 55' 28"	3° 22' 47"	19° 55' 36"	12° 02' 58"	0° 59' 09"	16' 07.01"	248° 55' 56"	0.63375

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	277° 30' 55"	0.52"	278° 10' 40"	-23° 13' 30"	0.9834068	16'15.82"	23° 26' 17"	-1 m 54 s
1	277° 33' 28"	0.52"	278° 13' 26"	-23° 13' 22"	0.9834053	16'15.82"	23° 26' 17"	-1 m 55 s
2	277° 36' 01"	0.52"	278° 16' 12"	-23° 13' 13"	0.9834039	16'15.82"	23° 26' 17"	-1 m 56 s
3	277° 38' 33"	0.53"	278° 18' 58"	-23° 13' 04"	0.9834024	16'15.83"	23° 26' 17"	-1 m 57 s
4	277° 41' 06"	0.53"	278° 21' 44"	-23° 12' 55"	0.9834009	16'15.83"	23° 26' 17"	-1 m 58 s
5	277° 43' 39"	0.53"	278° 24' 30"	-23° 12' 46"	0.9833995	16'15.83"	23° 26' 17"	-1 m 60 s
6	277° 46' 12"	0.54"	278° 27' 16"	-23° 12' 38"	0.9833980	16'15.83"	23° 26' 17"	-2 m 01 s
7	277° 48' 45"	0.54"	278° 30' 02"	-23° 12' 29"	0.9833966	16'15.83"	23° 26' 17"	-2 m 02 s
8	277° 51' 18"	0.55"	278° 32' 48"	-23° 12' 20"	0.9833952	16'15.83"	23° 26' 17"	-2 m 03 s
9	277° 53' 50"	0.55"	278° 35' 34"	-23° 12' 10"	0.9833938	16'15.83"	23° 26' 17"	-2 m 05 s
10	277° 56' 23"	0.55"	278° 38' 20"	-23° 12' 01"	0.9833924	16'15.84"	23° 26' 17"	-2 m 06 s
11	277° 58' 56"	0.56"	278° 41' 06"	-23° 11' 52"	0.9833910	16'15.84"	23° 26' 17"	-2 m 07 s
12	278° 01' 29"	0.56"	278° 43' 52"	-23° 11' 43"	0.9833896	16'15.84"	23° 26' 17"	-2 m 08 s
13	278° 04' 02"	0.56"	278° 46' 38"	-23° 11' 34"	0.9833882	16'15.84"	23° 26' 17"	-2 m 09 s
14	278° 06' 35"	0.57"	278° 49' 24"	-23° 11' 24"	0.9833869	16'15.84"	23° 26' 17"	-2 m 11 s
15	278° 09' 07"	0.57"	278° 52' 10"	-23° 11' 15"	0.9833855	16'15.84"	23° 26' 17"	-2 m 12 s
16	278° 11' 40"	0.57"	278° 54' 56"	-23° 11' 06"	0.9833842	16'15.84"	23° 26' 17"	-2 m 13 s
17	278° 14' 13"	0.58"	278° 57' 41"	-23° 10' 56"	0.9833828	16'15.85"	23° 26' 17"	-2 m 14 s
18	278° 16' 46"	0.58"	279° 00' 27"	-23° 10' 47"	0.9833815	16'15.85"	23° 26' 17"	-2 m 15 s
19	278° 19' 19"	0.58"	279° 03' 13"	-23° 10' 37"	0.9833802	16'15.85"	23° 26' 17"	-2 m 17 s
20	278° 21' 52"	0.58"	279° 05' 59"	-23° 10' 28"	0.9833789	16'15.85"	23° 26' 17"	-2 m 18 s
21	278° 24' 24"	0.59"	279° 08' 45"	-23° 10' 18"	0.9833776	16'15.85"	23° 26' 17"	-2 m 19 s
22	278° 26' 57"	0.59"	279° 11' 31"	-23° 10' 08"	0.9833763	16'15.85"	23° 26' 17"	-2 m 20 s
23	278° 29' 30"	0.59"	279° 14' 17"	-23° 09' 59"	0.9833751	16'15.85"	23° 26' 17"	-2 m 21 s
24	278° 32' 03"	0.60"	279° 17' 03"	-23° 09' 49"	0.9833738	16'15.85"	23° 26' 17"	-2 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	22° 55' 28"	3° 22' 47"	19° 55' 36"	12° 02' 58"	0° 59' 09"	16' 07.01"	248° 55' 56"	0.63375
1	23° 30' 42"	3° 25' 06"	20° 28' 05"	12° 18' 16"	0° 59' 10"	16' 07.49"	249° 3' 26"	0.63830
2	24° 05' 58"	3° 27' 24"	21° 00' 39"	12° 33' 31"	0° 59' 12"	16' 07.98"	249° 11' 07"	0.64285
3	24° 41' 17"	3° 29' 41"	21° 33' 20"	12° 48' 43"	0° 59' 14"	16' 08.45"	249° 19' 00"	0.64740
4	25° 16' 37"	3° 31' 56"	22° 06' 06"	13° 03' 52"	0° 59' 16"	16' 08.93"	249° 27' 05"	0.65193
5	25° 52' 00"	3° 34' 11"	22° 38' 59"	13° 18' 58"	0° 59' 17"	16' 09.41"	249° 35' 22"	0.65645
6	26° 27' 26"	3° 36' 24"	23° 11' 57"	13° 34' 00"	0° 59' 19"	16' 09.88"	249° 43' 50"	0.66097
7	27° 02' 54"	3° 38' 36"	23° 45' 02"	13° 48' 59"	0° 59' 21"	16' 10.36"	249° 52' 30"	0.66547
8	27° 38' 24"	3° 40' 46"	24° 18' 13"	14° 03' 55"	0° 59' 23"	16' 10.83"	250° 1' 22"	0.66997
9	28° 13' 57"	3° 42' 56"	24° 51' 31"	14° 18' 47"	0° 59' 24"	16' 11.30"	250° 10' 26"	0.67445
10	28° 49' 31"	3° 45' 04"	25° 24' 54"	14° 33' 35"	0° 59' 26"	16' 11.76"	250° 19' 42"	0.67893
11	29° 25' 09"	3° 47' 10"	25° 58' 25"	14° 48' 19"	0° 59' 28"	16' 12.23"	250° 29' 10"	0.68339
12	30° 00' 48"	3° 49' 16"	26° 32' 02"	15° 02' 60"	0° 59' 30"	16' 12.69"	250° 38' 50"	0.68784
13	30° 36' 30"	3° 51' 20"	27° 05' 45"	15° 17' 36"	0° 59' 31"	16' 13.15"	250° 48' 42"	0.69227
14	31° 12' 14"	3° 53' 22"	27° 39' 36"	15° 32' 08"	0° 59' 33"	16' 13.61"	250° 58' 46"	0.69670
15	31° 48' 01"	3° 55' 24"	28° 13' 33"	15° 46' 35"	0° 59' 35"	16' 14.06"	251° 9' 03"	0.70111
16	32° 23' 49"	3° 57' 23"	28° 47' 37"	16° 00' 59"	0° 59' 36"	16' 14.51"	251° 19' 32"	0.70550
17	32° 59' 41"	3° 59' 22"	29° 21' 48"	16° 15' 17"	0° 59' 38"	16' 14.96"	251° 30' 14"	0.70988
18	33° 35' 34"	4° 01' 19"	29° 56' 06"	16° 29' 31"	0° 59' 40"	16' 15.41"	251° 41' 08"	0.71425
19	34° 11' 29"	4° 03' 14"	30° 30' 31"	16° 43' 41"	0° 59' 41"	16' 15.85"	251° 52' 15"	0.71860
20	34° 47' 27"	4° 05' 08"	31° 05' 03"	16° 57' 45"	0° 59' 43"	16' 16.29"	252° 3' 35"	0.72293
21	35° 23' 27"	4° 07' 00"	31° 39' 42"	17° 11' 44"	0° 59' 44"	16' 16.73"	252° 15' 07"	0.72725
22	35° 59' 30"	4° 08' 51"	32° 14' 29"	17° 25' 38"	0° 59' 46"	16' 17.17"	252° 26' 52"	0.73155
23	36° 35' 34"	4° 10' 41"	32° 49' 22"	17° 39' 27"	0° 59' 48"	16' 17.60"	252° 38' 50"	0.73584
24	37° 11' 41"	4° 12' 28"	33° 24' 24"	17° 53' 11"	0° 59' 49"	16' 18.03"	252° 51' 01"	0.74010

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	278° 32' 03"	0.60"	279° 17' 03"	-23° 09' 49"	0.9833738	16' 15.85"	23° 26' 17"	-2 m 23 s
1	278° 34' 36"	0.60"	279° 19' 49"	-23° 09' 39"	0.9833725	16' 15.86"	23° 26' 17"	-2 m 24 s
2	278° 37' 09"	0.60"	279° 22' 35"	-23° 09' 29"	0.9833713	16' 15.86"	23° 26' 17"	-2 m 25 s
3	278° 39' 41"	0.61"	279° 25' 21"	-23° 09' 19"	0.9833701	16' 15.86"	23° 26' 17"	-2 m 26 s
4	278° 42' 14"	0.61"	279° 28' 06"	-23° 09' 09"	0.9833689	16' 15.86"	23° 26' 17"	-2 m 27 s
5	278° 44' 47"	0.61"	279° 30' 52"	-23° 08' 59"	0.9833676	16' 15.86"	23° 26' 17"	-2 m 29 s
6	278° 47' 20"	0.61"	279° 33' 38"	-23° 08' 49"	0.9833664	16' 15.86"	23° 26' 17"	-2 m 30 s
7	278° 49' 53"	0.62"	279° 36' 24"	-23° 08' 39"	0.9833653	16' 15.86"	23° 26' 17"	-2 m 31 s
8	278° 52' 26"	0.62"	279° 39' 10"	-23° 08' 29"	0.9833641	16' 15.86"	23° 26' 17"	-2 m 32 s
9	278° 54' 58"	0.62"	279° 41' 56"	-23° 08' 18"	0.9833629	16' 15.87"	23° 26' 17"	-2 m 33 s
10	278° 57' 31"	0.62"	279° 44' 41"	-23° 08' 08"	0.9833618	16' 15.87"	23° 26' 17"	-2 m 35 s
11	279° 00' 04"	0.63"	279° 47' 27"	-23° 07' 58"	0.9833606	16' 15.87"	23° 26' 17"	-2 m 36 s
12	279° 02' 37"	0.63"	279° 50' 13"	-23° 07' 47"	0.9833595	16' 15.87"	23° 26' 17"	-2 m 37 s
13	279° 05' 10"	0.63"	279° 52' 59"	-23° 07' 37"	0.9833583	16' 15.87"	23° 26' 17"	-2 m 38 s
14	279° 07' 43"	0.63"	279° 55' 45"	-23° 07' 27"	0.9833572	16' 15.87"	23° 26' 17"	-2 m 39 s
15	279° 10' 15"	0.63"	279° 58' 30"	-23° 07' 16"	0.9833561	16' 15.87"	23° 26' 17"	-2 m 41 s
16	279° 12' 48"	0.64"	280° 01' 16"	-23° 07' 06"	0.9833550	16' 15.87"	23° 26' 17"	-2 m 42 s
17	279° 15' 21"	0.64"	280° 04' 02"	-23° 06' 55"	0.9833539	16' 15.87"	23° 26' 17"	-2 m 43 s
18	279° 17' 54"	0.64"	280° 06' 48"	-23° 06' 44"	0.9833529	16' 15.88"	23° 26' 17"	-2 m 44 s
19	279° 20' 27"	0.64"	280° 09' 34"	-23° 06' 34"	0.9833518	16' 15.88"	23° 26' 17"	-2 m 45 s
20	279° 22' 60"	0.64"	280° 12' 19"	-23° 06' 23"	0.9833508	16' 15.88"	23° 26' 17"	-2 m 47 s
21	279° 25' 32"	0.65"	280° 15' 05"	-23° 06' 12"	0.9833497	16' 15.88"	23° 26' 17"	-2 m 48 s
22	279° 28' 05"	0.65"	280° 17' 51"	-23° 06' 01"	0.9833487	16' 15.88"	23° 26' 17"	-2 m 49 s
23	279° 30' 38"	0.65"	280° 20' 37"	-23° 05' 50"	0.9833477	16' 15.88"	23° 26' 17"	-2 m 50 s
24	279° 33' 11"	0.65"	280° 23' 22"	-23° 05' 39"	0.9833467	16' 15.88"	23° 26' 17"	-2 m 51 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	37° 11' 41"	4° 12' 28"	33° 24' 24"	17° 53' 11"	0° 59' 49"	16' 18.03"	252° 51' 01"	0.74010
1	37° 47' 50"	4° 14' 15"	33° 59' 32"	18° 06' 49"	0° 59' 51"	16' 18.45"	253° 3' 25"	0.74435
2	38° 24' 01"	4° 15' 59"	34° 34' 48"	18° 20' 21"	0° 59' 52"	16' 18.87"	253° 16' 02"	0.74857
3	39° 00' 15"	4° 17' 42"	35° 10' 11"	18° 33' 48"	0° 59' 54"	16' 19.29"	253° 28' 52"	0.75278
4	39° 36' 30"	4° 19' 24"	35° 45' 42"	18° 47' 08"	0° 59' 55"	16' 19.71"	253° 41' 55"	0.75697
5	40° 12' 48"	4° 21' 03"	36° 21' 21"	19° 00' 23"	0° 59' 57"	16' 20.12"	253° 55' 12"	0.76114
6	40° 49' 07"	4° 22' 41"	36° 57' 07"	19° 13' 31"	0° 59' 58"	16' 20.53"	254° 8' 42"	0.76528
7	41° 25' 29"	4° 24' 18"	37° 33' 01"	19° 26' 33"	0° 59' 60"	16' 20.93"	254° 22' 26"	0.76941
8	42° 01' 53"	4° 25' 53"	38° 09' 02"	19° 39' 29"	1° 00' 01"	16' 21.33"	254° 36' 23"	0.77351
9	42° 38' 19"	4° 27' 25"	38° 45' 11"	19° 52' 18"	1° 00' 03"	16' 21.72"	254° 50' 34"	0.77759
10	43° 14' 47"	4° 28' 57"	39° 21' 28"	20° 05' 01"	1° 00' 04"	16' 22.11"	255° 4' 59"	0.78165
11	43° 51' 18"	4° 30' 26"	39° 57' 53"	20° 17' 37"	1° 00' 06"	16' 22.50"	255° 19' 37"	0.78568
12	44° 27' 50"	4° 31' 54"	40° 34' 25"	20° 30' 06"	1° 00' 07"	16' 22.88"	255° 34' 30"	0.78969
13	45° 04' 24"	4° 33' 20"	41° 11' 05"	20° 42' 28"	1° 00' 08"	16' 23.26"	255° 49' 36"	0.79367
14	45° 41' 00"	4° 34' 44"	41° 47' 53"	20° 54' 42"	1° 00' 10"	16' 23.64"	256° 4' 57"	0.79763
15	46° 17' 38"	4° 36' 06"	42° 24' 49"	21° 06' 50"	1° 00' 11"	16' 24.00"	256° 20' 31"	0.80157
16	46° 54' 18"	4° 37' 27"	43° 01' 53"	21° 18' 49"	1° 00' 12"	16' 24.37"	256° 36' 20"	0.80548
17	47° 31' 00"	4° 38' 46"	43° 39' 04"	21° 30' 42"	1° 00' 14"	16' 24.73"	256° 52' 23"	0.80936
18	48° 07' 44"	4° 40' 02"	44° 16' 23"	21° 42' 26"	1° 00' 15"	16' 25.08"	257° 8' 41"	0.81321
19	48° 44' 30"	4° 41' 17"	44° 53' 51"	21° 54' 03"	1° 00' 16"	16' 25.43"	257° 25' 13"	0.81704
20	49° 21' 17"	4° 42' 30"	45° 31' 26"	22° 05' 32"	1° 00' 18"	16' 25.78"	257° 42' 00"	0.82084
21	49° 58' 07"	4° 43' 42"	46° 09' 08"	22° 16' 52"	1° 00' 19"	16' 26.12"	257° 59' 02"	0.82461
22	50° 34' 58"	4° 44' 51"	46° 46' 59"	22° 28' 05"	1° 00' 20"	16' 26.45"	258° 16' 19"	0.82835
23	51° 11' 51"	4° 45' 58"	47° 24' 58"	22° 39' 09"	1° 00' 21"	16' 26.78"	258° 33' 50"	0.83206
24	51° 48' 46"	4° 47' 04"	48° 03' 04"	22° 50' 04"	1° 00' 22"	16' 27.11"	258° 51' 37"	0.83575

31 Desember 2025

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	279° 33' 11"	0.65"	280° 23' 22"	-23° 05' 39"	0.9833467	16'15.88"	23° 26' 17"	-2 m 51 s
1	279° 35' 44"	0.65"	280° 26' 08"	-23° 05' 28"	0.9833457	16'15.88"	23° 26' 17"	-2 m 53 s
2	279° 38' 16"	0.65"	280° 28' 54"	-23° 05' 17"	0.9833447	16'15.88"	23° 26' 17"	-2 m 54 s
3	279° 40' 49"	0.66"	280° 31' 39"	-23° 05' 06"	0.9833437	16'15.88"	23° 26' 17"	-2 m 55 s
4	279° 43' 22"	0.66"	280° 34' 25"	-23° 04' 55"	0.9833427	16'15.89"	23° 26' 17"	-2 m 56 s
5	279° 45' 55"	0.66"	280° 37' 11"	-23° 04' 44"	0.9833418	16'15.89"	23° 26' 17"	-2 m 57 s
6	279° 48' 28"	0.66"	280° 39' 56"	-23° 04' 33"	0.9833408	16'15.89"	23° 26' 17"	-2 m 59 s
7	279° 51' 01"	0.66"	280° 42' 42"	-23° 04' 21"	0.9833399	16'15.89"	23° 26' 17"	-2 m 60 s
8	279° 53' 33"	0.66"	280° 45' 28"	-23° 04' 10"	0.9833390	16'15.89"	23° 26' 17"	-3 m 01 s
9	279° 56' 06"	0.66"	280° 48' 13"	-23° 03' 59"	0.9833380	16'15.89"	23° 26' 17"	-3 m 02 s
10	279° 58' 39"	0.67"	280° 50' 59"	-23° 03' 47"	0.9833371	16'15.89"	23° 26' 17"	-3 m 03 s
11	280° 01' 12"	0.67"	280° 53' 45"	-23° 03' 36"	0.9833363	16'15.89"	23° 26' 17"	-3 m 04 s
12	280° 03' 45"	0.67"	280° 56' 30"	-23° 03' 24"	0.9833354	16'15.89"	23° 26' 17"	-3 m 06 s
13	280° 06' 18"	0.67"	280° 59' 16"	-23° 03' 13"	0.9833345	16'15.89"	23° 26' 17"	-3 m 07 s
14	280° 08' 50"	0.67"	281° 02' 02"	-23° 03' 01"	0.9833337	16'15.89"	23° 26' 17"	-3 m 08 s
15	280° 11' 23"	0.67"	281° 04' 47"	-23° 02' 49"	0.9833328	16'15.90"	23° 26' 17"	-3 m 09 s
16	280° 13' 56"	0.67"	281° 07' 33"	-23° 02' 38"	0.9833320	16'15.90"	23° 26' 17"	-3 m 10 s
17	280° 16' 29"	0.67"	281° 10' 18"	-23° 02' 26"	0.9833311	16'15.90"	23° 26' 17"	-3 m 12 s
18	280° 19' 02"	0.67"	281° 13' 04"	-23° 02' 14"	0.9833303	16'15.90"	23° 26' 17"	-3 m 13 s
19	280° 21' 35"	0.67"	281° 15' 49"	-23° 02' 02"	0.9833295	16'15.90"	23° 26' 17"	-3 m 14 s
20	280° 24' 07"	0.67"	281° 18' 35"	-23° 01' 50"	0.9833287	16'15.90"	23° 26' 17"	-3 m 15 s
21	280° 26' 40"	0.67"	281° 21' 21"	-23° 01' 38"	0.9833280	16'15.90"	23° 26' 17"	-3 m 16 s
22	280° 29' 13"	0.68"	281° 24' 06"	-23° 01' 27"	0.9833272	16'15.90"	23° 26' 17"	-3 m 17 s
23	280° 31' 46"	0.68"	281° 26' 52"	-23° 01' 14"	0.9833264	16'15.90"	23° 26' 17"	-3 m 19 s
24	280° 34' 19"	0.68"	281° 29' 37"	-23° 01' 02"	0.9833257	16'15.90"	23° 26' 17"	-3 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	51° 48' 46"	4° 47' 04"	48° 03' 04"	22° 50' 04"	1° 00' 22"	16' 27.11"	258° 51' 37"	0.83575
1	52° 25' 42"	4° 48' 07"	48° 41' 18"	23° 00' 51"	1° 00' 24"	16' 27.42"	259° 9' 39"	0.83940
2	53° 02' 40"	4° 49' 09"	49° 19' 40"	23° 11' 29"	1° 00' 25"	16' 27.74"	259° 27' 56"	0.84302
3	53° 39' 40"	4° 50' 08"	49° 58' 09"	23° 21' 58"	1° 00' 26"	16' 28.04"	259° 46' 29"	0.84661
4	54° 16' 42"	4° 51' 06"	50° 36' 46"	23° 32' 19"	1° 00' 27"	16' 28.35"	260° 5' 18"	0.85017
5	54° 53' 45"	4° 52' 01"	51° 15' 31"	23° 42' 30"	1° 00' 28"	16' 28.64"	260° 24' 22"	0.85369
6	55° 30' 49"	4° 52' 55"	51° 54' 23"	23° 52' 31"	1° 00' 29"	16' 28.93"	260° 43' 43"	0.85718
7	56° 07' 56"	4° 53' 46"	52° 33' 23"	24° 02' 24"	1° 00' 30"	16' 29.22"	261° 3' 19"	0.86064
8	56° 45' 03"	4° 54' 36"	53° 12' 30"	24° 12' 06"	1° 00' 31"	16' 29.50"	261° 23' 12"	0.86407
9	57° 22' 13"	4° 55' 23"	53° 51' 45"	24° 21' 39"	1° 00' 32"	16' 29.77"	261° 43' 21"	0.86746
10	57° 59' 23"	4° 56' 09"	54° 31' 07"	24° 31' 03"	1° 00' 33"	16' 30.03"	262° 3' 47"	0.87082
11	58° 36' 35"	4° 56' 52"	55° 10' 36"	24° 40' 16"	1° 00' 34"	16' 30.29"	262° 24' 30"	0.87414
12	59° 13' 46"	4° 57' 33"	55° 50' 09"	24° 49' 19"	1° 00' 35"	16' 30.55"	262° 45' 29"	0.87742
13	59° 51' 01"	4° 58' 12"	56° 29' 53"	24° 58' 12"	1° 00' 36"	16' 30.79"	263° 6' 46"	0.88067
14	60° 28' 17"	4° 58' 49"	57° 09' 43"	25° 06' 55"	1° 00' 37"	16' 31.03"	263° 28' 21"	0.88388
15	61° 05' 35"	4° 59' 24"	57° 49' 41"	25° 15' 27"	1° 00' 38"	16' 31.27"	263° 50' 14"	0.88706
16	61° 42' 53"	4° 59' 57"	58° 29' 45"	25° 23' 49"	1° 00' 39"	16' 31.50"	264° 12' 26"	0.89020
17	62° 20' 13"	5° 00' 28"	59° 09' 57"	25° 32' 00"	1° 00' 39"	16' 31.72"	264° 34' 55"	0.89330
18	62° 57' 35"	5° 00' 57"	59° 50' 15"	25° 40' 01"	1° 00' 40"	16' 31.93"	264° 57' 44"	0.89637
19	63° 34' 57"	5° 01' 23"	60° 30' 39"	25° 47' 50"	1° 00' 41"	16' 32.14"	265° 20' 52"	0.89939
20	64° 12' 21"	5° 01' 48"	61° 11' 10"	25° 55' 29"	1° 00' 42"	16' 32.34"	265° 44' 19"	0.90238
21	64° 49' 45"	5° 02' 10"	61° 51' 47"	26° 02' 56"	1° 00' 42"	16' 32.53"	266° 8' 06"	0.90532
22	65° 27' 11"	5° 02' 30"	62° 32' 31"	26° 10' 13"	1° 00' 43"	16' 32.72"	266° 32' 14"	0.90823
23	66° 04' 38"	5° 02' 48"	63° 13' 20"	26° 17' 18"	1° 00' 44"	16' 32.90"	266° 56' 42"	0.91110
24	66° 42' 05"	5° 03' 04"	63° 54' 16"	26° 24' 11"	1° 00' 44"	16' 33.07"	267° 21' 32"	0.91392

LAMPIRAN - LAMPIRAN

PRESIDEN
REPUBLIK INDONESIA

KEPUTUSAN PRESIDEN REPUBLIK INDONESIA
NOMOR 41 TAHUN 1987

TENTANG

PEMBAGIAN WILAYAH REPUBLIK INDONESIA
MENJADI 3 (TIGA) WILAYAH WAKTU
PRESIDEN REPUBLIK INDONESIA

Menimbang :

a. bahwa pembagian waktu mempunyai peranan penting dalam menunjang kelancaran penyelenggaraan pemerintahan dalam arti yang seluas-luasnya dan dalam usaha peningkatan efesiensi kerja di segala bidang;
b. bahwa pembagian waktu sekarang ini dinilai tidak sesuai lagi dengan kenyataan waktu dan geografis, khususnya di beberapa daerah Propinsi Daerah Tingkat I Kalimantan Barat, Kalimantan Tengah, dan Propinsi Daerah Tingkat I Bali;
c. bahwa sehubungan dengan hal di atas, dipandang perlu untuk menata kembali pembagian wilayah waktu di Indonesia sebagaimana yang telah ditetapkan dalam Keputusan Presiden nomor 243 tahun 1963.

Mengingat : Pasal 4 ayat (1) Undang-undang Dasar 1945

MEMUTUSKAN :

Menetapkan : KEPUTUSAN PRESIDEN REPUBLIK INDONESIA TENTANG PEMBAGIAN WILAYAH REPUBLIK INDONESIA MENJADI 3 (TIGA) WILAYAH WAKTU

Pasal 1

(1) Wilayah Republik Indonesia dibagi menjadi (tiga) wilayah waktu dengan 3 (tiga) waktu tolok.
(2) 3 (tiga) wilayah waktu sebagaimana dimaksud dalam ayat (1) adalah :
    1. Waktu Indonesia Barat, meliputi :
        a. Seluruh Propinsi Daerah Tingkat I Sumatera
        b. Seluruh Propinsi Daerah Tingkat I Jawa dan Madura

PRESIDEN
REPUBLIK INDONESIA

- 2 -

c. Propinsi Daerah Tingkat I Kalimantan Barat
d. Propinsi Daerah Tingkat I Kalimantan Tengah

2. Waktu Indonesia Tengah, meliputi

a. Propinsi Daerah Tingkat I Kalimantan Timur;
b. Propinsi Daerah Tingkat I Kalimantan Selatan;
c. Propinsi Daerah Tingkat 1 Bali;
d. Propinsi Daerah Tingkat I Nusa Tenggara Barat;
e. Propinsi Daerah Tingkat I Nusa Tenggara Timur;
f. Propinsi Daerah Tingkat I Timor Timur;
g. Propinsi Daerah Tingkat I Sulawesi

3. Waktu Indonesia Timur meliputi
a. Propinsi Daerah Tingkat I Maluku
b. Propinsi Daerah Tingkat I Irian Jaya

(3) 3 (tiga) wilayah waktu sebagaimana dimaksud dalam ayat (2) tersebut, masing-masing ditetapkan dengan waktu tolok sebagai berikut :
a. Waktu Indonesia Barat dengan waktu tolok (GMT + 7 jam) dan derajah tolok 105° Bujur Timur;
b. Waktu IndonesiaTengah dengan waktu tolok (GMT + 8 jam) dan derajah tolok 120° Bujur Timur
c. Waktu Indonesia Timur dengan waktu tolok (GMT + 9 jam) dan derajah tolok 135° Bujur Timur.

Pasal 2

Pada saat mulai berlakunya Keputusan Presiden Ini, Keputusan Presiden Normor 243 Tahun 1963 tentang tentang Pembagian Wilayah Republik Indonesia menjadi 3 (tiga) Wilayah Waktu Dengan 3 (tiga) Waktu Tolok dinyatakan tidak berlaku.

PRESIDEN
REPUBLIK INDONESIA

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Pasal 3

Keputusan Presiden ini mulai berlaku pada tanggal 1 Januari 1988

Ditetapkan di Jakarta
Pada tanggal 26 Nopember 1987
PRESIDEN REPUBLIK INDONESIA

ttd

S O E H A R T O

Salinan sesuai dengan aslinya
SEKRETARIAT KABINET RI
Kepala Biro Hukum
dan Perundang-undangan

Bambang Koesowo, SH, LLM

KEBIJAKAN PEMERINTAH RI
DALAM MENETAPKAN AWAL BULAN QAMARIYAH
DI INDONESIA

MUKADIMAH

1. Undang-undang Nomor 3 Tahun 2006 tentang Perubahan Undang-undang Nomor 7 Tahun 1989 tentang Peradilan Agama pasal 52A Pengadilan Agama memberikan Itsbat Kesaksian Rukyat Hilal dalam penentuan awal bulan pada tahun Hijriyah. Sedangkan penetapan awal bulan qomariyah masih menjadi kewenangan Menteri Agama. Berdasarkan Peraturan Menteri Agama nomor 42tahun 2016 tentang Organisasi dan Tata Kerja Kementerian Agama, Direktorat Urusan Agama Islam dan Pembinaan Syariah mempunyai tugas melaksanakan perumusan dan pelaksanaan kebijakan, standardisasi, bimbingan teknis, dan evaluasi, serta pengawasan di bidang urusan agama islam dan pembinaan syariah sesuai dengan ketentuan peraturan perundang-undangan yang termasuk di dalamnya masalah hisab rukyat, sedangkan pelaksanaan di daerah di tangani oleh Bidang Urusan Agama Islam dan Pembinaan Syariah / Bimas Islam.

2. Menyatukan penentuan awal Ramadan, Syawal dan Zulhijah merupakan salahsatu upaya mewujudkan persatuan umat dalam beribadah sehingga terciptapersatuan umat, baik lahir maupun batin serta adanya kehidupan yang penuhrasa toleransi, selaras, seimbang dan berkesinambungan.

3. Namun dalam kenyataannya penentuan tersebut terdapat perbedaan (Khilaf) di kalangan para ulama dan pemuka agama Islam. Di satu pihak bersikukuh dengan rukyat sedangkan di lain pihak boleh saja dengan hisab.

4. Masalah puasa dan hari raya, disamping merupakan masalah fiqh termasuk juga masalah sosial, masalah yang dikerjakan secara umum bersama-sama,maka perbedaan tersebut dapat berdampak yang kurang baik di kalangan kaum muslimin sendiri maupun masyarakat pada umumnya. Islam adalah Agamarahmatal lil ‘aalamiin dengan membawa konsep ukhuwah telah banyak tercatat dalam sejarah, namun dalam soal puasa dan hari raya, yang seharusnya sama ternyata belum mampu bersatu.

DASAR HUKUM

1. Undang-Undang Nomor 25 Tahun 2004 tentang Sistem Perencanaan Pembangunan Nasional;

2. Undang-Undang Nomor 3 Tahun 2006 tentang Perubahan Atas Undang-Undang Nomor 7 Tahun 1989 tentang Peradilan Agama;
3. Undang-undang Nomor 17 Tahun 2007 tentang Rencana Pembangunan Jangka Panjang Nasional Tahun 2005-2025;
4. Peraturan Presiden Nomor 7 tahun 2015 tentang Organisaasi Kementerian Negara;
5. Peraturan Presiden Nomor 83 tahun 2015 tentang Kementerian Agama;
6. Peraturan Menteri Agama Nomor 42 Tahun 2016 tentang Organisasi dan Tata Kerja Kementerian Agama;
7. Peraturan Menteri Agama Nomor 13 Tahun 2012 tentang Organisasi dan Tata Kerja Instansi Vertikal Kementerian Agama.

SASARAN

1. Meningkatnya kualitas pelayanan kehidupan beragama bagi seluruh lapisan masyarakat;
2. Menyamakan persepsi penentuan awal bulan qomariyah;
3. Meningkatnya kerukunan intern dan antar umat beragama dalam rangka terwujudnya kehidupan yang harmonis, toleransi dan saling menghormati.

KEBIJAKAN

1. Umum :
    a. Menghimpun seluruh pendapat ulama, para ahli dan instansi terkaitdalam masalah hisab rukyat
    b. Mengembangkan ilmu hisab dan rukyat
    c. Melaksanakan musyawarah / pertemuan
    d. Melakukan rukyat bersama
    e. Menyelenggarakan pelatihan bersama
    f. Menyusun dan menyebarkan buku, almanak dan sebagainya
    g. Melakukan kerjasama dalam maupun luar negeri.
2. Kebijakan Penetapan Awal Bulan Qomariyah
    a. Selain Ramadan, Syawal, dan Zulhijah dapat berdasar hisab (tinggi hilal + 2°,elongasi 3° atau umur bulan 8 jam antara saat ijtima' dengan ghurub)

b. Untuk Ramadan, Syawal, dan Zulhijah berdasar hisab dan rukyat, yaitu:

1) Data hisab dan hasil rukyat sebagai masukan

2) Ditetapkan dalam sidang itsbat

3) Rukyat dilaksanakan oleh Pegawai Kementerian Agama, Kanwil Kementerian Agama, Kantor Kementerian Agama Kabupaten/Kota,instansi terkait, Ormas Islam dan masyarakat luas (Koordinator : Kanwil Kementerian Agama/Kantor Kementerian Agama Kab/Kota)

4) Itsbat rukyat hilal oleh hakim Pengadilan Tinggi Agama / Pengadilan Agama

3. Tim Hisab Rukyat Pusat dikoordinasikan oleh Direktorat Urusan Agama Islam dan Pembinaan Syariah, BHR Daerah dikoordinasikan olehKanwil Kementerian Agama Provinsi, sedangkan BHR Kabupaten/Kota dikoordinasikan oleh Kantor Kementerian Agama Kabupaten/Kota.Badan Hisab Rukyat Kementerian Agama dapat terdiri dari unsur :

a. Kementerian Agama

b. Pengadilan Agama

c. Ulama / Majelis Ulama Indonesia

d. Ormas Islam

e. Perguruan Tinggi

f. Badan Meteorologi dan Geofisika/Planetarium

g. Pemerintah Daerah/Instansi terkait

h. Tokoh/Ahli hisab rukyat.

PROSEDUR PENETAPAN

1. Rukyatul Hilal

a. Dirjen Bimbingan Masyarakat Islam Kementerian Agama memeritahkan rukyatul hilal menjelang awal Ramadan, Syawal,dan Zulhijah kepada Kanwil Kementerian Agama dan Kantor Kementerian Agama seluruh Indonesia.

b. Kanwil Kementerian Agama dan Kantor Kementerian Agama sebagai koordinator penyelenggaraan pelaksanaan rukyat di daerah masing-masing.

c. Rukyat dilakukan bersama-sama dengan instansi terkait, perwakilan ormas Islam, tokoh agama, ahli hisab rukyat, dan masyarakat luas.

Untuk mendukung kelancaran kegiatan di atas, Ditjen Badan Peradilan Agama Mahkamah Agung menugaskan Hakim Agama pada Pengadilan Tinggi

Agama/Mahkamah Syariah Provinsi dan Pengadilan Agama/Mahkamah Syariah seluruh Indonesia sebagai tenaga ahli dan petugas menyumpah saksi rukyatul hilal.

Oleh karena itu, Kanwil Kementerian Agama dan Kantor Kementerian Agama sebagai penanggung jawab dan koordinator pelaksanaan rukyat didaerah masing-masing diharapkan melakukan rukyatul hilal di tempat-tempat strategis dan di tempat-tempat lain yang dimungkinkan hilal dapat terlihat dan selalu mengikut sertakan Hakim Pengadilan Agama/Mahkamah Syariah. Sedangkan masyarakat luas yang ingin melakukan rukyat agar bergabung atau berkoordinasi dengan Panitia Rukyat Kanwil Kementerian Agama dan Kantor Kementerian Agama di daerah masing-masing. Masyarakat diharapkan tidak membuat tempat rukyat sendiri-sendiri tanpa sepengetahuan Kanwil Kementerian Agama dan Kantor Kementerian Agama.

Laporan rukyat dari Panitia Rukyat Daerah dan masyarakat luas sesegera mungkin dilaporkan kepada Panitia Rukyat dan Itsbat Awal Ramadan, Syawal dan Zulhijah di Kementerian Agama RI.

2. Penetapan Pemerintah

Dalam madzhab Syafi'i mensyaratkan bahwa penetapan (itsbat) awal bulan qamariyah khususnya awal Ramadan, Syawal, dan Zulhijah harus dilakukan oleh pemerintah/qadli. Apabila pemerintah telah menetapkannya maka seluruh umat Islam wajib mengikuti dan melaksanakannya. Sedang madzhab Hanafi,Maliki, dan Hanbali tidak mensyaratkan harus ditetapkan oleh pemerintah/qadli. Tetapi jika pemerintah telah menetapkannya maka umat Islam wajib mengikuti dan mentaatinya.

Itsbat (penetapan) Pemerintah diperlukan karena ada beberapa keuntungan,antara lain :

1. Itsbat diperlukan untuk mendapatkan keabsahan
2. Itsbat diperlukan untuk mencegah kerancuan dan keraguan sistem pelaporan.
3. Itsbat diperlukan untuk penyatuan umat dan menghilangkan perbedaan pendapat.

Semuanya wajib mengikuti dan mentaati, serta tidak boleh lagi terjadi adanya silang pendapat demi tegaknya ukhuwah Islamiyah. Sesuai dengan kaidah fiqih :

a. *Hukm al hakim ilzam wa yarfa'u al khilaf*.
b. *Tasharruf al imam 'ala raiyatih manuthun bi al mashlahah*.
c. *Inna ijtihada ulil amr huwa al ashlu al tsalits minas-syari'ah al islamiyah wa innahum idza ajma'u ra'yahum wajaba 'ala al amah wa 'ala hukkamiha al 'amalu bih.*
d, Fatwa MUI Nomor 2 Tahun 2004 tentang Penentuan AwalRamadan, Syawal, dan Zulhijah. Menyatakan bahwa "seluruh umat Islam di Indonesia wajib

mentaati ketetapan Pemerintah RI tentang PenetapanAwal Ramadan, Syawal dan Zulhijah".

Pelaksanaan sidang itsbat selalu menjunjung tinggi musyawarah, menghormati sikap perbedaan pendapat, kebersamaan, dan demokratis, serta menerima saran dan pendapat dari peserta sidang. Setelah saran dan pendapat dibahas dan diterima, dengan suasana bersama-sama berupaya mencari keputusan yang terbaik, lalu mengambil musyawarah mufakat, bulat dan maslahah, maka sidang memutuskan "Penetapan tanggal 1 Ramadan, Syawal dan Zulhijah".

KEPUTUSAN FATWA
MAJELIS ULAMA INDONESIA
Nomor 2 tahun 2004
Tentang
PENETAPAN AWAL RAMADHAN, SYAWAL, DAN DZULHIJJAH

بِسْمِ اللهِ الرَّحْمَنِ الرَّحِيْمِ

Majelis Ulama Indonesia,

MENIMBANG : a. bahwa umat Islam Indonesia dalam melaksanakan puasa Ramadhan, salat Idul Fitri dan Idul Adha, serta ibadah–ibadah lain yang terkait dengan ketiga bulan tersebut terkadang tidak dapat melakukannya pada hari dan tanggal yang sama disebabkan perbedaan dalam penetapan awal bulan-bulan tersebut;

b. bahwa keadaan sebagaimana tersebut pada huruf a dapat menimbulkan citra dan dampak negative terhadap syi'ar dan dakwah Islam;

c. bahwa Ijtima' Ulama Komisi Fatwa se-Indonesia pada tanggal 22 Syawwal 1424 H / 16 Desember 2003 telah menfatwakan tentang penetapan awal bulan Ramadhan, Syawwal, dan Dzulhijjah sebagai upaya mengatasi hal diatas;

d. bahwa oleh karena itu, Majelis Ulama Indonesia memandang perlu menetapkan fatwa tentang penetapan awal bulan Ramadhan, Syawwal dan Dzulhijjah dimaksud untuk dijadikan pedoman.

MENGINGAT : 1. Firman Allah SWT, antara lain

هُوَ الَّذِيْ جَعَلَ الشَّمْسَ ضِيَآءً وَالْقَمَرَ نُوْرًا وَقَدَّرَهُ مَنَازِلَ لِتَعْلَمُوْا عَدَدَ السِّنِيْنَ وَالْحِسَابَ (يونس[١٠]: ٥)

Dia-lah yang menjadikan matahari bersinar dan bulan bercahaya dan ditetapkan-Nya manzilah-manzilah (tempat-tempat) bagi perjalanan bulan itu, supaya kamu mengetahui bilangan tahun dan perhitungan (waktu). (QS Yunus [10]: 5)

يَآءَيُّهَا الَّذِيْنَ اٰمَنُوْآ اَطِيْعُوا اللهَ وَأَطِيْعُوا الرَّسُوْلَ وَأُولِى الْأَمْرِ مِنْكُمْ (النساء[٤]:٥٩)

Hai orang-orang yang beriman, taatlah kepada Allah, taatlah kepada Rasul dan ulil-amri diantara kamu (QS. an-Nisa'[4]:59)

2. Hadits – hadits Nabi s.a.w, antara lain

١) لاَ تَصُوْمُوا حَتَّى تَرَوْا الْهِلاَلَ وَلاَ تُفْطِرُوْا حَتَّى تَرَوْهُ فَإِنْ غُمَّ عَلَيْكُمْ فَاقْدُرُوْا لَهُ (رواه البخاري ومسلم عن ابن عمر)

"janganlah kamu berpuasa (Ramadhan) sehingga melihat tanggal (satu Ramadhan) dan janganlah berbuka (mengakhiri puasa Ramadhan) sehingga tanggal (satu Syawwal). Jika dihalangi oleh awan/mendung maka kira-kiralah". (H.R. Bukhari Muslim dari Ibnu Umar).

٢) صُوْمُوْا لِرُؤْيَتِهِ وَأَفْطِرُوْا لِرُؤْيَتِهِ فَإِنْ غُبِيَ عَلَيْكُمْ فَأَكْمِلُوْا عِدَّةَ شَعْبَانَ ثَلاَثِيْنَ

"Berpuasalah (Ramadhan) karena melihat tanggal (satu Ramadhan). Dan berbukalah (mengakhiri puasa Ramadhan) karena melihat tanggal (satu Syawwal). Apabila kamu terhalangi, sehingga tidak dapat melihatnya maka sempurnakanlah bilangan Sya'ban tiga puluh hari". (Bukhari Muslim dari Abu Hurairah).

٣) عَلَيْكُمْ بِالسَّمْعِ وَالطَّاعَةِ وَإِنْ وُلِّيَ عَلَيْكُمْ عَبْدٌ حَبَشِّيٌ

"Wajib bagi kalian untuk taat (kepada pemimpin), meskipun yang memimpin kalian itu seorang hamba sahaya Habsyi". (H.R. Bukhari dari Irbadh bin Sariyah).

3. Qa'idah fiqh:

٤) حُكْمُ الْحَاكِمِ إِلْزَامٌ وَيَرْفَعُ الْخِلاَفَ

"Keputusan pemerintah itu mengikat (wajib dipatuhi) dan menghilangkan silang pendapat".

MEMPERHATIKAN : 1. Pendapat para ulama ahli fiqh; antara lain pendapat Imam al Syarwani dalam Hasyiyah al-Syarwani:

وَمَحَلُّ الْخِلاَفِ إِذَا لَمْ يَحْكُمْ بِهِ حَاكِمٌ، فَإِنْ حَكَمَ بِهِ حَاكِمٌ يَرَاهُ وَجَبَ الصَّوْمُ عَلَى الْكَافَةِ وَلَمْ يُنْقَضِ الْحُكْمُ إِجْمَاعًا. قَالَهُ النَّوَوِيُّ فِيْ مَجْمُوْعِهِ، وَهُوَ صَرِيْحٌ فِي أَنَّ لِلْقَاضِيْ أَنْ يَحْكُمَ بِكَوْنِ اللَّيْلَةِ مِنْ رَمَضَانَ .(حَاشِيَة الشرواني ، جزء ٣ ص ٣٧٦)

2. Keputusan Ijtima Ulama Komisi Fatwa se-Indonesia tentang Fatwa Bunga (interest/fa'idah), tanggal 22 Syawwal 1424/16 Desember 2003.
3. Keputusan Rapat Komisi Fatwa MUI, tanggal 05 Dzulhijjah 1424/24 Januari 2004.

Dengan memohon ridha Allah SWT

MEMUTUSKAN

MENETAPKAN : FATWA TENTANG PENETAPAN AWAL RAMADHAN, SYAWAL DAN DZULHIJJAH

Pertama : **Fatwa**

1. Penetapan awal Ramadhan, Syawal dan Dzulhijjah dilakukan berdasarkan metode ru'yah dan hisab oleh Pemerintah RI cq Menteri Agama dan berlaku secara nasional.

2. Seluruh umat Islam di Indonesia wajib menaati ketetapan pemerintah RI tentang penetapan awal Ramadhan, Syawal dan Dzulhijjah.

3. Dalam menetapkan awal Ramadhan, Syawal dan Dzulhijjah, Menteri Agama wajib berkonsultasi dengan Majelis Ulama Indonesia, ormas-ormas Islam dan Instansi terkait.

4. Hasil rukyat dari daerah yang memungkinkan hilal dirukyat walaupun di luar wilayah Indonesia yang

mathla'nya sama dengan Indonesia dapat dijadikan pedoman oleh Menteri Agama RI.

Kedua : **Rekomendasi**

Agar Majelis Ulama Indonesia mengusahakan adanya kriteria penentuan awal Ramadhan, Syawal dan Dzulhijjah untuk dijadikan pedoman oleh Menteri Agama dengan membahasnya bersama ormas-ormas Islam dan para ahli terkait.

Jakarta, 05 Dzulhijjah 1424 H
24 Januari 2004 M

MAJELIS ULAMA INDONESIA
KOMISI FATWA,

Ketua,	Sekretaris,
ttd	ttd
KH. MA'RUF AMIN	HASANUDIN

FATWA
MAJELIS ULAMA INDONESIA
Nomor : 05 Tahun 2010
Tentang
ARAH KIBLAT

بِسْمِ اللهِ الرَّحْمَنِ الرَّحِيْمِ

Komisi Fatwa Majelis Ulama Indonesia

Menimbang : a. bahwa dalam rangka memberikan pedoman kepada masyarakat tentang arah Kiblat,Majelis Ulama Indonesia menetapkan Fatwa Nomor 3 Tahun 2010 tentang Kiblat,yang pada bagian ketentuan Hukum Nomor 3 disebutkan:"Letak geografis Indonesia yang berada di bagian timur Ka'bah/Mekkah Maka kiblat umat islam Indonesia adalah menghadap ke arah barat".

b. bahwa terhadap diktum fatwa tersebut muncul pertanyaan di masyarakat, yang bisa menimbulkan kesimpangsiuran penafsiran serta pertanyaan mengenai keabsahan shalat yang arah kiblatnya menghadap ke barat laut;

c. bahwa oleh karena itu, Komisi Fatwa Majelils Ulama Indonesia memandang perlu menetapkan fatwa tentang arah kiblat untuk dijadikan pedoman bagi masyarakat.

Mengingat : 1. Firman Allah SWT:

قَدْ نَرَىٰ تَقَلُّبَ وَجْهِكَ فِي ٱلسَّمَآءِ ۖ فَلَنُوَلِّيَنَّكَ قِبْلَةً تَرْضَىٰهَا ۚ فَوَلِّ
وَجْهَكَ شَطْرَ ٱلْمَسْجِدِ ٱلْحَرَامِ ۚ وَحَيْثُ مَا كُنتُمْ فَوَلُّوا۟ وُجُوهَكُمْ
شَطْرَهُۥ ۗ وَإِنَّ ٱلَّذِينَ أُوتُوا۟ ٱلْكِتَٰبَ لَيَعْلَمُونَ أَنَّهُ ٱلْحَقُّ مِن رَّبِّهِمْ ۗ وَمَا
ٱللَّهُ بِغَٰفِلٍ عَمَّا يَعْمَلُونَ ﴿١٤٤﴾

Sungguh Kami (sering) melihat mukamu menengadah ke langit, maka sungguh Kami akan memalingkan kamu ke kiblat yang kamu sukai. Palingkanlah mukamu ke arah Masjidil Haram, dan di mana saja kamu berada, palingkanlah mukamu ke arahnya, dan sesungguhnya orang-orang (Yahudi dan Nasrani)

yang diberi Al-Kitab (Taurat dan Injil) memang mengetahui bahwa berpaling ke Masjidil Haram itu adalah benar dari Tuhannya; dan Allah sekali-kali tidak lengah dari apa yang mereka kerjakan. (QS. Al-Baqarah [2]:144)

2. Firman Allah SWT:

وَمِنْ حَيْثُ خَرَجْتَ فَوَلِّ وَجْهَكَ شَطْرَ ٱلْمَسْجِدِ ٱلْحَرَامِ ۖ وَإِنَّهُۥ لَلْحَقُّ مِن رَّبِّكَ ۗ وَمَا ٱللَّهُ بِغَٰفِلٍ عَمَّا تَعْمَلُونَ ﴿١٤٩﴾

Dan dari mana saja kamu keluar (datang), maka palingkanlah wajahmu ke arah Masjidil Haram; Sesungguhnya ketentuan itu benar-benar sesuatu yang haq dari Tuhanmu. Dan Allah sekali-kali tidak lengah dari apa yang kamu kerjakan. (QS. Al-Baqarah [2]:149)

3. Firman Allah SWT:

وَمِنْ حَيْثُ خَرَجْتَ فَوَلِّ وَجْهَكَ شَطْرَ ٱلْمَسْجِدِ ٱلْحَرَامِ ۚ وَحَيْثُ مَا كُنتُمْ فَوَلُّوا۟ وُجُوهَكُمْ شَطْرَهُۥ لِئَلَّا يَكُونَ لِلنَّاسِ عَلَيْكُمْ حُجَّةٌ إِلَّا ٱلَّذِينَ ظَلَمُوا۟ مِنْهُمْ فَلَا تَخْشَوْهُمْ وَٱخْشَوْنِى وَلِأُتِمَّ نِعْمَتِى عَلَيْكُمْ وَلَعَلَّكُمْ تَهْتَدُونَ ﴿١٥٠﴾

Dan dari mana saja kamu (keluar), maka palingkanlah wajahmu ke arah Masjidil Haram. Dan di mana saja kamu (sekalian) berada, maka palingkanlah wajahmu ke arahnya, agar tidak ada hujjah bagi manusia atas kamu, kecuali orang-orang yang zalim di antara mereka. Maka janganlah kamu takut kepada mereka dan takutlah kepada-Ku (saja). Dan agar Ku sempurnakan nikmat-Ku atasmu, dan supaya kamu mendapat petunjuk. (QS. Al-Baqarah [2] : 150)

4. Firman Allah SWT:

وَلِلَّهِ ٱلْمَشْرِقُ وَٱلْمَغْرِبُ ۚ فَأَيْنَمَا تُوَلُّوا۟ فَثَمَّ وَجْهُ ٱللَّهِ ۚ إِنَّ ٱللَّهَ وَٰسِعٌ عَلِيمٌ ﴿١١٥﴾

Dan kepunyaan Allah-lah Timur dan Barat, maka ke manapun kamu menghadap di situlah wajah Allah. Sesungguhnya Allah

Maha Luas (rahmat-Nya) lagi Maha Mengetahui. (QS. Al-Baqarah [2] : 115)

5. Firman Allah SWT:

وَجَٰهِدُواْ فِي ٱللَّهِ حَقَّ جِهَادِهِۦۚ هُوَ ٱجۡتَبَىٰكُمۡ وَمَا جَعَلَ عَلَيۡكُمۡ فِي ٱلدِّينِ مِنۡ حَرَجٖۚ مِّلَّةَ أَبِيكُمۡ إِبۡرَٰهِيمَۚ هُوَ سَمَّىٰكُمُ ٱلۡمُسۡلِمِينَ مِن قَبۡلُ وَفِي هَٰذَا لِيَكُونَ ٱلرَّسُولُ شَهِيدًا عَلَيۡكُمۡ وَتَكُونُواْ شُهَدَآءَ عَلَى ٱلنَّاسِۚ فَأَقِيمُواْ ٱلصَّلَوٰةَ وَءَاتُواْ ٱلزَّكَوٰةَ وَٱعۡتَصِمُواْ بِٱللَّهِ هُوَ مَوۡلَىٰكُمۡۖ فَنِعۡمَ ٱلۡمَوۡلَىٰ وَنِعۡمَ ٱلنَّصِيرُ ٧٨

Dan berjihadlah kamu di jalan Allah dengan jihad yang sebenar-benarnya. Dia telah memilih kamu dan Dia sekali-kali tidak menjadikan untuk kamu dalam agama suatu kesempitan. (Ikutilah) agama orang tuamu Ibrahim. Dia (Allah) telah menamai kamu sekalian orang-orang muslim dari dahulu, dan (begitu pula) dalam (al-Qur'an) ini, supaya Rasul itu menjadi saksi atas dirimu dan supaya kamu semua menjadi saksi atas segenap manusia, maka dirikanlah shalat, tunaikanlah zakat dan berpeganglah kamu pada tali Allah. Dia adalah Pelindungmu, maka Dialah sebaik-baik Pelindung dan sebaik-baik Penolong. (QS. Al-Hajj [22]:78)

6. Hadits Nabi SAW:

عَنْ عَطَاءٍ قَالَ : سَمِعْتُ ابْنَ عَبَّاسٍ قَالَ لَمَّا دَخَلَ النَّبِيُّ صلى الله عليه و سلم الْبَيْتَ دَعَا فِي نَوَاحِيهِ كُلِّهَا وَلَمْ يُصَلِّ حَتَّى خَرَجَ مِنْهُ فَلَمَّا خَرَجَ رَكَعَ رَكْعَتَيْنِ فِي قِبَلِ الْكَعْبَةِ وَقَالَ (هَذِهِ الْقِبْلَةُ)

Dari `Atho, ia berkata: aku mendengar Ibnu `Abbas berkata: setelah Rasulullah SAW masuk ke Ka`bah beliau berdo`a pada setiap sudutnya dan beliau tidak shalat (di dalamnya) sampai beliau keluar Ka`bah. Setelah beliau keluar Ka`bah, beliau lalu shalat dua raka`at di hadapan Ka`bah. Rasulullah SAW lalu bersabda : "Inilah kiblat". (HR. Imam Bukhari dan Imam Muslim)

7. Hadits Nabi SAW:

قَالَ أَبُو هُرَيْرَةَ قَالَ النَّبِيُّ –صلى الله عليه السلام– اِسْتَقْبِلِ الْقِبْلَةَ وَكَبِّرْ

(رواه البخارى)

Abu Hurairah berkata, Rasulullah SAW bersabda: "Menghadaplah kiblat, kemudian bertakbirlah (takbiratul ihram)" (HR. Imam Bukhari)

8. Hadits Nabi SAW:

عَنْ مَالِك عَنْ عَبْدِ اللَّهِ بْنِ دِينَارٍ عَنِ ابْنِ عُمَرَ قَالَ بَيْنَمَا النَّاسُ فِى صَلاَةِ الصُّبْحِ بِقُبَاءٍ إِذْ جَاءَهُمْ آتٍ فَقَالَ إِنَّ رَسُولَ اللَّهِ – صلى الله عليه وسلم – قَدْ أُنْزِلَ عَلَيْهِ اللَّيْلَةَ ، وَقَدْ أُمِرَ أَنْ يَسْتَقْبِلَ الْكَعْبَةَ ، فَاسْتَقْبِلُوهَا . وَكَانَتْ وُجُوهُهُمْ إِلَى الشَّأْمِ فَاسْتَدَارُوا إِلَى الْقِبْلَةِ . أطرافه

(رواه البخارى)

Dari Malik dari Abdullah bin Dinar dari Ibnu Umar berkata: ketika orang-orang sedang shalat Shubuh di Masjid Quba`, tiba-tiba datang seseorang berkata bahwa Rasulullah SAW tadi malam menerima wahyu dan diperintahkan untuk menghadap Ka`bah. Mereka lalu mengubah arah (shalat), yang ketika itu menghadap ke arah Syam (Baitul Maqdis), ke arah kiblat (Masjidil Haram). (HR. Imam Bukhari)

9. Hadits Nabi SAW:

عَنْ سَعِيدِ بْنِ أَبِى سَعِيدٍ الْمَقْبُرِىِّ عَنْ أَبِى هُرَيْرَةَ – رضى الله عنه أَنَّ رَجُلاً دَخَلَ الْمَسْجِدَ وَرَسُولُ اللَّهِ – صلى الله عليه وسلم – جَالِسٌ فِى نَاحِيَةِ الْمَسْجِدِ فَصَلَّى ، ثُمَّ جَاءَ فَسَلَّمَ عَلَيْهِ فَقَالَ لَهُ رَسُولُ اللَّهِ – صلى الله عليه وسلم – « وَعَلَيْكَ السَّلاَمُ ارْجِعْ فَصَلِّ فَإِنَّكَ لَمْ تُصَلِّ » . فَرَجَعَ فَصَلَّى ، ثُمَّ جَاءَ فَسَلَّمَ . فَقَالَ « وَعَلَيْكَ السَّلاَمُ فَارْجِعْ فَصَلِّ ، فَإِنَّكَ لَمْ تُصَلِّ » . فَقَالَ فِى الثَّانِيَةِ أَوْ فِى الَّتِى بَعْدَهَا عَلِّمْنِى يَا رَسُولَ اللَّهِ . فَقَالَ « إِذَا قُمْتَ إِلَى الصَّلاَةِ فَأَسْبِغِ الْوُضُوءَ ، ثُمَّ اسْتَقْبِلِ الْقِبْلَةَ فَكَبِّرْ ، ثُمَّ اقْرَأْ بِمَا تَيَسَّرَ مَعَكَ مِنَ الْقُرْآنِ ، ثُمَّ ارْكَعْ حَتَّى تَطْمَئِنَّ رَاكِعًا ، ثُمَّ ارْفَعْ حَتَّى تَسْتَوِىَ قَائِمًا ، ثُمَّ اسْجُدْ حَتَّى تَطْمَئِنَّ سَاجِدًا ،

ثُمَّ ارْفَعْ حَتَّى تَطْمَئِنَّ جَالِسًا ، ثُمَّ اسْجُدْ حَتَّى تَطْمَئِنَّ سَاجِدًا ، ثُمَّ ارْفَعْ حَتَّى تَطْمَئِنَّ جَالِسًا ، ثُمَّ افْعَلْ ذَلِكَ فِى صَلاَتِكَ كُلِّهَا »

Dari Sa`id ibn Sa`id al-Maqburi dari Abu Hurairah r.a. bahwa ada seorang laki-laki masuk ke masjid kemudian ia shalat dan saat itu ada Rasulullah sedang duduk di salah satu sudut masjid. Setelah shalat orang itu mendatangi Rasul dan memberi salam kepada beliau. Rasul lalu menjawab: "Wa`alaikum al-salam, kembalilah/ulangilah shalatmu karena sesungguhnya kamu belum shalat". Laki-laki itu kemudian mengulangi shalatnya dan kembali mendatangi Rasul serta memberi salam kepada beliau. Rasul menjawab salam dan berkata: "ulangi kembali shalatmu karena kamu belum shalat". Kemudian laki-laki itu berkata di pengulangan shalat yang kedua atau sesudahnya; "Ajarilah aku wahai Rasulullah" Rasulullah menjawab : "Apabila engkau akan menunaikan shalat maka sempurnakanlah wudlu, menghadaplah kiblat lalu bertakbirlah (takbiratul ihram), kemudian bacalah apa yang mudah bagimu dari ayat-ayat al-Qur`an, lalu ruku`lah dengan thuma`ninah, lalu berdiri dengan sempurna, lalu sujud dengan thuma`ninah, lalu duduk dengan thuma`ninah, lalu sujud dengan thuma`ninah, kemudian bangun dan duduk dengan thuma`ninah. Maka lakukanlah seperti itu pada setiap shalat kamu" (HR. Imam Bukhari)

10. Hadits Nabi SAW:

أَبِي هُرَيْرَةَ رضي الله عنه أَنَّ النَّبِيَّ –صلى الله عليه السلام– قَالَ :" مَا بَيْنَ الْمَشْرِقِ وَالْمَغْرِبِ قِبْلَةٌ " (رواه الترمذي)

Dari Abu Hurairah r.a. bahwa Nabi SAW bersabda: "Arah antara Timur dan Barat adalah Kiblat". (HR. Imam al-Turmudzi)

11. Hadits Nabi SAW:

عَنِ ابْنِ عَبَّاسٍ أَنَّ رَسُولَ اللَّه صلى الله عليه وسلم قَالَ : الْبَيْتُ قِبْلَةٌ لأَهْلِ الْمَسْجِدِ ، وَالْمَسْجِدُ قِبْلَةٌ لأَهْلِ الْحَرَمِ ، وَالْحَرَمُ قِبْلَةٌ لأَهْلِ الأَرْضِ فِى مَشَارِقِهَا وَمَغَارِبِهَا مِنْ أُمَّتِى.

Dari Ibnu `Abbas bahwa Nabi SAW bersabda: Ka`bah adalah kiblat bagi orang yang shalat di masjidil haram, dan masjidil haram adalah kiblat bagi penduduk yang tinggal di tanah haram (Mekkah), dan tanah haram (Mekkah) adalah kiblat bagi penduduk bumi di timurnya dan di baratnya dari umatku".

Memperhatikan : 1. Pendapat Imam 'Ala al-Din al-Kasani al-Hanafi dalam kitab *Badai' Shanai' fi Tartib al-Syarai'*:

أَنَّ الْمُصَلِّيَ لَا يَخْلُو إمَّا إنْ كَانَ قَادِرًا عَلَى الاسْتِقْبَالِ أَوْ كَانَ عَاجِزًا عَنْهُ فَإِنْ كَانَ قَادِرًا يَجِبُ عَلَيْهِ التَّوَجُّهُ إلَى الْقِبْلَةِ إنْ كَانَ فِي حَالِ مُشَاهَدَةِ الْكَعْبَةِ فَإِلَى عَيْنِهَا ، أَيْ : أَيِّ جِهَةٍ كَانَتْ مِنْ جِهَاتِ الْكَعْبَةِ ، حَتَّى لَوْ كَانَ مُنْحَرِفًا عَنْهَا غَيْرَ مُتَوَجِّهٍ إلَى شَيْءٍ مِنْهَا لَمْ يَجُزْ ، لِقَوْلِهِ تَعَالَى :

{وَحَيْثُ مَا كُنْتُمْ فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ } ، وَفِي وُسْعِهِ تَوْلِيَةُ الْوَجْهِ إلَى عَيْنِهَا فَيَجِبُ ذَلِكَ ، وَإِنْ كَانَ غَائِبًا عَنْ الْكَعْبَةِ يَجِبُ عَلَيْهِ التَّوَجُّهُ إلَى جِهَتِهَا ، وَهِيَ الْمَحَارِيبُ الْمَنْصُوبَةُ بِالْإِمَارَاتِ الدَّالَّةِ عَلَيْهَا لَا إلَى عَيْنِهَا ، وَتُعْتَبَرُ الْجِهَةُ دُونَ الْعَيْنِ . كَذَا ذَكَرَ الْكَرْخِيُّ وَالرَّازِي ، وَهُوَ قَوْلُ عَامَّةِ مَشَايِخِنَا بِمَا وَرَاءَ النَّهْرِ

"Sesungguhnya bagi orang yang shalat tidak boleh kosong/lepas, apakah ia mampu atau tidak, untuk

menghadap kiblat. Apabila ia mampu maka wajib baginya menghadap kiblat, jika ia dapat menyaksikannya (Ka'bah) maka ia harus menghadap kepada 'ainul Ka'bah atau kepada arah dari arah kiblat. Jika ia tidak menghadap salah satunya maka itu tidak diperbolehkan, sebagaimana firman Allah *"…dan dimana saja kamu berada, palingkanlah mukamu ke arahnya..."*. Dan dalam keadaan yang memungkinkan menghadap tepat

ke 'ainul ka'bah maka wajib dilakukan. Namun jika ghaib (tidak dapat melihat ka'bah) maka wajib menghadap ke arah Ka'bah (*jihatul Ka'bah*)…"

2. Pendapat Imam al-Qurtubi dalam Kitab *Jami` al-Ahkam Al-Qur'an* :

واختلفوا هل فرض الغائب استقبال العين أو الجهة؟ فمهنم من قال بالأول قال ابن العربي (ت ٥٤٣ هـ) وهو ضعيف لأنه تكليف لما لا يصل إليه . ومنهم من قال بالجهة ، وهو الصحيح لثلاثة أمور:

الأول : أنه الممكن الذي يرتبط به التكليف

الثاني : أنه المأمور به في القرآن لقوله تعالى : {فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ وَحَيْثُ مَا كُنْتُمْ} يعني من الأرض من شرق أو غرب {فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ }

الثالث : أن العلماء احتجوا بالصف الطويل الذي يعلم قطعا أنه أضعاف عرض البيت

"Mereka berbeda pendapat apakah wajib bagi si ghaib (orang yang shalat dan tidak dapat melihat Ka'bah) untuk menghadap tepat ke bangunan Ka'bah (*`ainul Ka'bah*) atau ke arah Ka'bah (*jihatul Ka'bah*)? sebagian berpendapat pertama (yaitu, menghadap *'ainul Ka'bah*) berkata Ibnu `Arabi (W.534 H) : pendapat ini adalah lemah karena membebani orang yang tidak dapat shalat dengan menghadap tepat *`ainul Ka'bah*. Sebagian lain berpendapat cukup menghadap arah Ka'bah (*Jihatul Ka'bah*). Pendapat terakhir inilah yang benar, dengan tiga alasan: (1) Bahwa hal inilah yang memungkinkan bagi ketentuan sebuah taklif (pembebanan hukum). (2) Bahwa hal inilah yang

diperintahkan oleh al-Qur'an dalam ayat فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ (maka palingkanlah wajahmu ke arah Masjidil Haram) yakni belahan bumi di timur dan barat فَوَلُّوا وُجُوْهَكُمْ شَطْرَهُ (palingkanlah mukamu ke arahnya). (3) Bahwa para ulama berhujjah dengan (kebolehan) shalat dengan shaf yang panjang, yang sangat lemah (kecil kemungkinan) dapat menghadap tepat ke bangunan Ka'bah (*'ainul Ka'bah*)."

3. Pendapat Imam Al-Syirazi dalam kitab al-Muhadzdzab:

وإن لم يكن شيء من ذلك نظرت فإن كان ممن يعرف الدلائل فإن كان غائبا عن مكة اجتهد في طلب القبلة لأن له طريقا إلى معرفتها بالشمس والقمر والجبال والرياح ولهذا قال الله تعالى : { وَعَلَامَاتٍ وَبِالنَّجْمِ هُمْ يَهْتَدُوْنْ } [النحل : ١٦] فكان له أن يجتهد كالعالم في الحادثة وفي فرضه قولان : قال في الأم : فرضها إصابة العين لأن من لزمه فرض القبلة لزمه إصابة العين المكي وظاهر ما نقله المزني أن الفرض هو الجهة لأنه لو كان الفرض هو العين لما صحت صلاة الصف الطويل لأن فيهم من يخرج عن العين

"Jika sama sekali ia tidak memiliki petunjuk apapun, maka dilihat maslahatnya. Jika ia termasuk orang yang mengetahui tanda-tanda atau petunjuk kiblat, maka meskipun ia tidak dapat melihat Ka'bah, ia harus tetap berijtihad mengetahi kiblat. Karena ia memiliki cara untuk mengetahuinya melalui keberadaan matahari, bulan, gunung, dan angin karena Allah SWT berfirman:

وَعَلَامَاتٍ وَبِالنَّجْمِ هُمْ يَهْتَدُوْنْ

"Dan (Dia ciptakan) tanda-tanda (penunjuk jalan). Dan dengan bintang-bintang itulah mereka mendapat petunjuk". (Qs An-Nahl:16).

Dengan begitu ia berhak berijtihad (dalam menentukan letak Ka'bah) seperti orang yang paham tentang fenomena alam mengenai kewajibannya ada dua pendapat. Dalam kitab al-Umm, Imam al-Syafi'i berkata : "Yang wajib dalam berkiblat adalah menghadap secara tepat ke bangunan Ka'bah. Karena orang yang diwajibkan

untuk menghadap kiblat, ia wajib menghadap ke bangunan Ka'bah, seperti halnya orang Mekkah. "Sedangkan teks yang jelas yang dikutip oleh imam al-Muzanni (murid Imam al-Syafi'i) dari Imam al-Syafi'i mengatakan bahwa yang wajib adalah menghadap ke arah Ka'bah (Jihatul Ka'bah) karena seandainya yang wajib itu adalah menghadap ke bangunan Ka'bah secara fisik, maka shalat jama'ah yang shafnya memanjang adalah tidak sah, sebab diantara mereka terdapat orang yang menghadap ke arah di luar dari bangunan Ka'bah."

4. Pendapat Ibnu Qudamah al-Hanbali:

ولنا، قول النبي صلى الله عليه السلام :" ما بين المشرق والمغرب قبلة " رواه الترمذي وقال: حديث حسن صحيح وظاهره أن جميع ما بينهما قبلة . ولانه لو كان الفرض إصابة العين ، لما صحت صلاة اهل الصف الطويل على خط مستو، ولا صلاة اثنين متباعدين يستقبلان قبلة واحدة . فإنه لا يجوز أن يتوجه إلى الكعبة مع طول الصف إلا بقدرها . فإن قيل : مع البعيد يتسع المحاذي . قلنا : انما يتسع مع تقوس الصف ،أما مع استوائه فلا . وشطر البيت : نحوه و قبله.

"Dan bagi kita adalah sabda Nabi SAW:" Arah antara timur dan barat adalah kiblat"(HR.Imam At-Tirmidzi), menurut sebuah pendapat hadist ini adalah hasan shahih.yang jelas bahwa arah antara keduanya adalah kiblat karena jika yang diwajibkan adalah menghadap tepat ke bangunan Ka'bah ('ainul Ka'bah) maka tidaklah sah shalat orang dengan shaf yang panjang…"

5. Makalah Drs.KH.A.Ghazaly Masroeri tentang" arah kiblat dari Indonesia" Dan "Posisi Arah Barat Indonesia" dalam rapat komisi Fatwa MUI tanggal 1 Juli 2010;
6. Pandangan dan pendapat rapat Komisi Fatwa MUI pada hari senin tanggal 1 Februari 2010 dan 1 Juli 2010.

MEMUTUSKAN

Menetapkan : FATWA TENTANG ARAH KIBLAT

Pertama : Ketentuan Hukum

1. Kiblat bagi orang yang shalat dan dapat melihat Ka`bah adalah menghadap ke bangunan Ka`bah (*ainul Ka`bah*)
2. Kiblat bagi orang yang shalat dan tidak dapat melihat Ka`bah adalah arah Ka`bah (*Jihat al-Ka`bah*)
3. Kiblat umat Islam Indonesia adalah menghadap ke barat laut dengan posisi bervariasi sesuai dengan letak kawasan masing-masing.

Kedua : **Rekomendasi**
Bangunan masjid/musholla yang tidak tepat arah kiblatnya, perlu ditata ulang shafnya tanpa membongkar bangunannya

Ditetapkan di : Jakarta

Tanggal : 18 Rajab 1431 H
01 Juli 2010 M

KOMISI FATWA
MAJELIS ULAMA INDONESIA

Ketua,	Sekretaris,
ttd	ttd
DR. H. M. ANWAR IBRAHIM	DR. H. HASANUDIN, M.Ag.

CONTOH PERHITUNGAN DAN PENGUKURAN ARAH KIBLAT DENGAN THEODOLIT

Pada dasarnya semua theodolit itu sama hanya berbeda dalam hal ketelitiannya saja. Dalam uraian ini akan digunakan theodolit merek "Topcon" *type* "DT-104".

A. Arah Kiblat menurut Al-Qur'an dan Hadis

Dalam kitab suci Al-Qur'an terdapat beberapa ayat yang menerangkan mengenai arah kiblat ini antara lain dalam surat al-Baqarah ayat 144 sebagai berikut:

قَدْ نَرَى تَقَلُّبَ وَجْهِكَ فِي السَّمَاءِ فَلَنُوَلِّيَنَّكَ قِبْلَةً تَرْضَاهَا فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ وَحَيْثُ مَا كُنْتُمْ فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ وَإِنَّ الَّذِينَ أُوتُوا الْكِتَابَ لَيَعْلَمُونَ أَنَّهُ الْحَقُّ مِنْ رَبِّهِمْ وَمَا اللَّهُ بِغَافِلٍ عَمَّا يَعْمَلُونَ...(البقرة : 144)

Artinya : Sesungguhnya Kami memperhatikan wajahmu berbolak-balik ke langit, maka sungguh Kami akan menghadapkan wajahmu ke kiblat yang kamu sukai. Oleh karena itu hadapkanlah wajahmu ke arah masjid al-Haram, dan di mana saja kamu berada, hadapkanlah wajahmu ke arahnya. Sesungguhnya orang-orang yang diberi kitab itu mengetahui bahwa kebenaran itu berasal dari Tuhanmu. Dan Allah tidak pernah lalai terhadap apa-apa yang kamu lakukan. (al-Baqarah:144)

Selain ayat-ayat Al-Qur'an arah kiblat juga dijelaskan dalam banyak hadis Rasulullah SAW, antara lain sebagai berikut:
Dalam *Sahih al-Bukhari*:

حَدَّثَنَا إِسْحَاقُ بْنُ نَصْرٍ قَالَ حَدَّثَنَا عَبْدُ الرَّزَّاقِ أَخْبَرَنَا ابْنُ جُرَيْجٍ عَنْ عَطَاءٍ قَالَ سَمِعْتُ ابْنَ عَبَّاسٍ قَالَ لَمَّا دَخَلَ النَّبِيُّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ الْبَيْتَ دَعَا فِي نَوَاحِيهِ كُلِّهَا وَلَمْ يُصَلِّ حَتَّى خَرَجَ مِنْهُ فَلَمَّا خَرَجَ رَكَعَ رَكْعَتَيْنِ فِي قُبُلِ الْكَعْبَةِ وَقَالَ هَذِهِ الْقِبْلَةُ رواه البخارى [1]

Artinya : …. Atha berkata: "Aku mendengar ibn Abbas berkata bahwa ketika Rasulullah SAW. memasuki Baitullah (Ka'bah), beliau berdoa di seantero Ka'bah itu, tetapi beliau tidak melakukan salat di dalamnya, sampai beliau keluar. Ketika sudah berada di luar Ka'bah beliau salat dua rakaat menghadap Ka'bah, lalu berkata inilah kiblat." (HR al-Bukhari).

[1] Program Hadis- Kutub al-Tis'ah, Sahih al-Bukhari, Kitab Salat, hadis nomor 383

Dalam kitab Sunan al-Kubra li al-Baihaqi, ia menulis:

حَدَّثَنَا عُمَرُ بْنُ حَفْصٍ الْمَكِّيُّ مِنْ وَلَدِ عَبْدِ الدَّارِحَدَّثَنَا ابْنُ جُرَيْجٍ عَنْ عَطَاءٍ عَنِ ابْنِ عَبَّاسٍ أَنَّ رَسُولَ اللَّهِ - صلى الله عليه وسلم - قَالَ : الْبَيْتُ قِبْلَةٌ لأَهْلِ الْمَسْجِدِ . وَالْمَسْجِدُ قِبْلَةٌ لأَهْلِ الْحَرَمِ . وَالْحَرَمُ قِبْلَةٌ لأَهْلِ الأَرْضِ فِى مَشَارِقِهَا وَمَغَارِبِهَا مِنْ أُمَّتِى. تَفَرَدَبِهِ عُمَرُ بْنُ حَفْصٍ الْمَكِّيُّ وَهُوَ ضَعِيفٌ لاَ يُحْتَجُّ بِهِ وَرُوِىَ بِإِسْنَادٍ آخَرَ ضَعِيفٍ عَنْ عَبْدِ اللَّهِ بْنِ حُبْشِيٍّ كَذَلِكَ مَرْفُوعًا. وَلاَ يُحْتَجُّ بِمِثْلِهِ وَاللَّهُ أَعْلَم. رواه البيهقى [2]

Artinya: … Dari ibn Abbas, Rasulullah bersabda: "Baitullah adalah kiblat bagi orang yang berada di dalam masjid al-Haram, dan masjid al-Haram adalah kiblat bagi mereka yang berada di tanah Haram, dan tanah Haram kiblat bagi seluruh umatku di muka bumi baik di timur maupun di barat". (Al-Baihaqi berkata "Umar ibnu Hafsh meriwayatkan hadis ini seorang diri, dan dia tergolong daif, tidak dapat dijadikan hujjah". Hadis ini diriwayatkan juga dengan sanad lain yang daif juga, dari Abdillah ibnu Hubaisy, yang sanadnya marfu', tetapi juga tidak dapat dijadikan hujjah, Wallahu a'lam). (HR Al-Baihaqi).

Dari ayat dan hadis-hadis dapat kita simpulkan bahwa **kiblat umat Islam adalah Baitullah (Ka'bah)**, sebagaimana dijelaskan oleh hadis al-Bukhari tersebut. Sedangkan ayat Al-Qur'an memerintahkan menghadap ke "arah" Masjid al-Haram karena Ka'bah itu berada dalam Masjid al-Haram, dan ayat itu diturunkan di Madinah.

Sedangkan hadis al-Baihaqi yang menyatakan "Baitullah kiblat ahli Masjid (al-Haram), dan Masjid (al-Haram) kiblat bagi penduduk Tanah Haram, lalu Tanah Haram adalah kiblat bagi semua penghuni bumi timur dan barat, diakui sendiri oleh al-Baihaqi bahwa hadis itu lemah dan tidak dapat dijadikan hujjah. Oleh karena itu, semaksimal mungkin kita harus berusaha untuk menghadap Ka'bah, sesuai dengan petunjuk hadis di atas. Tentu saja kita tidak diberati dengan hal-hal yang di luar kemampuan kita, tetapi hal ini tidak mengurangi kewajiban kita untuk berusaha meningkatkan kemampuan kita untuk menghadap kiblat yang benar. Sama halnya dengan salat, bagi yang belum mampu membaca al-Fatihah, tidak apa-apa, tetapi tentu tidak mengurangi kewajibannya untuk berusaha mampu membaca al-Fatihah dan memenuhi semua syarat dan rukun salat yang lain termasuk menghadap kiblat.

B. Mencari Titik Utara

Arah (Utara, Timur, Selatan dan Barat) dapat ditentukan dengan langkah sebagai berikut:

a. Cocokkan jam yang akan dipakai dalam pengukuran ini dengan jam RRI/TVRI, hanya jam RRI/TVRI yang selalu dikontrol oleh Badan Meteorologi, Klimatologi dan Geofisika (BMKG).

[2] Program MAKTABAH SYAMILAH, *Kutub al-Mutûn*, *Sunan al-Kubrâ li al-Baihaqi*, "Jama' Istiqbâl al-Qiblah", Juz 1 halaman 1506

b. Pasanglah theodolit pada tripod (tiang)nya, dengan benar/mantap dengan memperhatikan keseimbangan *waterpass*-nya, agar tegak lurus dengan titik pusat bumi di atas suatu pelataran yang tidak terlindung dari sinar matahari.

c. Bidiklah titik pusat matahari, dan catat jam berapa pada saat itu, lalu kunci theodolit agar tidak berubah arahnya. Biarkan menghadap matahari pada saat pembidikan. Misalkan pembidikan dilakukan di Jakarta pada hari Senin tanggal 17 Agustus 2025 jam 10:31:28 WIB = jam 03:31:28 UT.

d. Lihat *Equation of time* (e) dalam buku *Ephemeris Hisab Rukyat* tahun 2025 atau Program *Winhisab Version 2.0.* tanggal 17 Agustus 2025 jam 05:00 UT (jam 12:00 WIB = 05:00 UT). e = $-0^j\ 04^m\ 06^d$. Jadi Merpass = 12 - e = 12 - ($-0^j\ 04^m\ 06^d$) = jam 12:04:06.

e. Cari data *deklinasi matahari*, dalam buku *Ephemeris Hisab Rukyat Tahun 2025* atau Program *Winhisab Version 2.0* tanggal 17 Agustus 2025 jam 03:31:28 UT.

Deklinasi matahari :

Jam 03 UT	= 13° 21′ 42″ (utara)		=>	13° 21′ 42″
Jam 04 UT	= 13° 20′ 54″ (utara)			
	= 00° 00′ 48″ x	0^j 31' 28"	=>	00° 00′ 25,17″-
Deklinasi matahari (δ) pada jam 10:31:28 WIB				13° 21′ 16,83″

f. Hitung Sudut Waktu matahari dengan rumus :

$$t = 15 \times (W - M) + \lambda - \omega$$

Waktu pengukuran (W)	= 10 : 31 : 28
Merpass (M)	= 12 : 04 : 06 -
W - M	= - 1 : 32 : 38
	15 ×
15 (W - M)	= -23° 09′ 30″
Bujur Tempat (λ)	= 106° 49′ 00″+
	83° 39′ 30″
Bujur Waktu Standar WIB	= 105° 00′ 00″ -
Sudut Waktu Matahari (t)	= -21° 20′ 30″

g. Hitung azimut matahari pada jam pengukuran dengan rumus:

$$Tg\ A_m = \frac{sin\ t}{\cos\varphi\ .tan\ \delta\ - sin\varphi\ .cos\ t}$$

Keterangan A_m = Azimut Matahari

a. δ = Deklinasi Matahari = 13° 21′ 16,83″

φ = Lintang Jakarta = -6° 10′

t = Sudut Waktu Matahari = -21° 28′ 45″

Perhitungan:

$$Tg\ A_m = \frac{sin\ t}{\cos \varphi\ .tan\ \delta\ - \sin \varphi\ .cos\ t}$$

tg A_m = sin t : ((cos φ × tan δ) – (sin φ) × cos t))

tg A_m = sin -21° 28′ 45″ : ((cos -6° 10′ × tan 13° 21′ 16,83″) – (sin -6° 10′ × cos -21° 28′ 45″))

= - 0,3661628931292 : ((0,99421362705 × 0,2373977936036) – (-0,1074209638756 × 0,9305507700794)

= - 0,3661628931292 : ((0,2360241214323) – (-0,0999606606571))

= - 0,3661628931292 : 0,3359847820894

= - 1,089819874734

A_m = Shift-tan $^{-1}$- 1,089819874734 = -47° 27′ 39,75″ => 47° 27′ 39,75″

Jadi, azimut matahari di Jakarta pada tanggal 17 Agustus 2025 jam 10:31:28 WIB adalah = **47° 27′ 39,75″**

h. Hasil perhitungan itu diambil angka mutlaknya, menunjukkan:

- Bila pengukuran dilakukan pagi hari, theodolit menghadap ke timur/matahari.
- Bila pengukuran dilakukan sore hari, theodolit menghadap ke barat/matahari.
- Bila deklinasi matahari di utara (+), angka itu adalah jarak matahari dari titik utara.
- Bila deklinasi matahari di selatan (-), angka itu adalah jarak matahari dari titik selatan.

Karena pengukuran (pembidikan matahari) dilakukan pada waktu pagi (jam 10:31:28), berarti theodolit menghadap ke Timur, dan deklinasi matahari positif (utara), jadi titik Utara berada di sebelah kiri theodolit.

i. Tekan tombol "R/L" agar display theodolit menunjukkan -HL 0° 0′ 0″.

j. Putar theodolit ke kiri (berlawanan dengan arah jarum jam) sebesar 47° 27′ 39,75″. Inilah True North (titik Utara sejati).

C. Menghitung Arah Kiblat di Lokasi Pengukuran

1. Untuk menghitung Azimut kiblat digunakan rumus :

tan Q = sin SB : (cos φ x tan 21° 25' - sin φ x cos SB)

Keterangan Q = Arah Kiblat

φ = Lintang Jakarta = -06° 10' (S)

λ = Bujur Jakarta = 106° 49' (T)

φ_K = Lintang Ka'bah = 21° 25' (U)

λ_K = Bujur Ka'bah = 39° 50' (T)

SB = Selisih Bujur = Bujur Jakarta – Bujur Ka'bah

106° 49' – 39° 50'

= 66° 59'

Perhitungan :

tan Q = sin 66° 59': ((cos -06° 10' x tan 21° 25') - (sin -06° 10' x cos 66° 59'))

= 0.920391155 : ((0.994213627 x 0.392231316) – (-0.107420964 x 0.390998875))

= 0.920391155 : ((0.389961719) – (- 0.042001476))

= 0.920391155 : 0.431963195

= 2.130716611

Q = shift $\tan^{-1}$ 2.130716611 = 64° 51' 29.27"

Jadi arah kiblat di tempat yang diukur adalah 64° 51' 29,27" dari titik Utara ke arah barat , atau 25° 08' 30,73" dari titik Barat ke arah utara.

2. Tekan tombol "0-Set" agar display theodolit menunjukkan -HL 0° 0' 0".

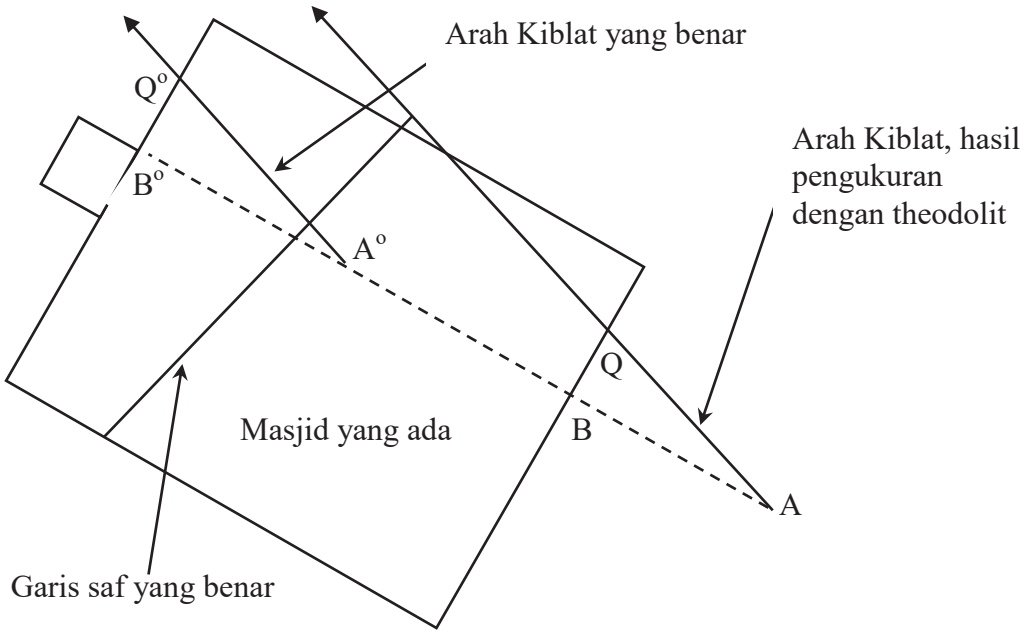
D. Menentukan Arah Kiblat.

Untuk mengukur arah kiblat (64° 51' 29,27" dari titik Utara ke arah barat), maka theodolit ini harus diputar lagi ke kiri (berlawanan dengan arah jarum jam), sebanyak 64° 51' 29,27".

E. Memindahkan Garis Arah Kiblat ke dalam Masjid.

Kalau masjid yang bersangkutan sudah jadi, hanya memperbaiki arah kiblatnya saja, sedangkan pengukuran dengan theodolit yang menggunakan sinar matahari, tentu dilakukan di luar masjid, maka perlu memindahkan Garis Arah Kiblat itu ke dalam masjid.

Caranya sebagai berikut : Perhatikan gambar berikut :



Buat garis AB ⊥ BQ . Ukur panjang garis AB, AQ dan BQ.

Misal : AB = 50,0 cm, AQ = 55,2 cm dan BQ = 23,5 cm.

Pindahkan segitiga ABQ ke dalam Masjid (ukur persis ukuran Δ aslinya).

1. Buat garis AB tegak lurus dari garis arah kiblat hasil pengukuran (AQ) ke badan masjid,

   (AB ⊥ BQ) → Sudut B = 90^o.

2. Ukur panjang AB dan BQ.

3. Buat segitiga siku-siku A^o B^o Q^o di dalam masjid, dekat mihrab seperti terlihat pada gambar, dan pastikan bahwa :
   a. Sudut $B^o = 90^o$
   b. Panjang garis $A^o Q^o$ = AQ, dan garis $B^o Q^o$ = BQ.

4. Garis A^oQ^o adalah arah kiblat yang benar.

CONTOH PERHITUNGAN DAN PENGUKURAN ARAH KIBLAT DENGAN SINAR MATAHARI

Idealnya setiap Kantor Kementerian Agama Kabupaten/Kota di Indonesia sudah memiliki theodolit. Yang sudah memiliki pun belum tentu banyak yang paham cara mengoperasikannya. Oleh karena itu di bawah ini akan diuraikan cara pengukuran arah kiblat dengan tidak menggunakan theodolit.

A. PERALATAN YANG DIPERLUKAN

1. Sebatang kayu atau besi sepanjang ± 1 meter, dengan diameter ± 2 cm.
2. Sebuah segitiga siku-siku yang besar.
3. Sebuah meteran gulung minimal 12,5 meter.
4. Segulung benang besar atau tali plastik kecil.

B. MEMPERSIAPKAN BAHAN-BAHAN DAN PERHITUNGAN

1. Menghitung Sudut Arah Kiblat

Dalam contoh ini pengukuran akan dilaksanakan di Jakarta tanggal 17 Agustus 2025, jam 10.00 WIB.

Lintang Tempat 06° 10′ LS dan Bujur Tempat 106° 49’ BT.

1. Untuk menghitung Azimut Kiblat digunakan rumus :

tan Q = sin SB : (cos φ x tan 21° 25' - sin φ x cos SB)

Keterangan Q = Arah Kiblat

φ = Lintang Jakarta = -06° 10’ (S)

λ = Bujur Jakarta = 106° 49’ (T)

φ_K = Lintang Ka’bah = 21° 25’ (U)

λ_K = Bujur Ka’bah = 39° 50’ (T)

SB = Selisih Bujur = Bujur Jakarta – Bujur Ka’bah

106° 49’ – 39° 50’

= 66° 59’

Perhitungan :

tan Q = sin 66° 59’: ((cos -06° 10’ x tan 21° 25’) - (sin -06° 10’ x cos 66°59’))

= 0.920391155 : ((0.994213627 x 0.392231316) – (-0.107420964 x 0.390998875))

= 0.920391155 : ((0.389961719) – (- 0.042001476))

= 0.920391155 : 0.431963195

= 2.130716611

Q = shift $\tan^{-1}$ 2.130716611 = 64º 51' 29.27"

Inilah arah kiblat di Jakarta (64^o 51’ 29.27” dari titik Utara ke barat), atau 25^o 08’ 30.73” dari titik Barat ke utara.

2. Menghitung Azimut Matahari

a. Lihat *Equation of Time* (e) dalam buku Ephemeris Hisab Rukyat tahun 2025 atau Program Winhisab Version 2.0 tanggal 17 Agustus 2025 jam 12:00 WIB (jam 05:00 UT). e = -0^j 04^m 06^d. Jadi Merpass = 12 - e = 12 - (-0:04:06) = jam 12:04:06.

b. Cari data deklinasi matahari, dalam buku Ephemeris Hisab Rukyat Tahun 2025 atau Program Winhisab Version 2.0 tanggal 17 Agustus 2025 jam 10:00 WIB (jam 03:00 UT) = 13^o 21' 42".

c. Hitung sudut waktu matahari dengan rumus :

$$t = 15 \times (W - M) + \lambda - \omega$$

Waktu pengukuran (W)	= 10 : 00 : 00
Merpass (M)	= 12 : 04 : 06 -
W - M	= - 2 : 04 : 06
	15 x
15 (W - M)	= -31^o 01' 30"
Bujur Tempat (λ)	= 106^o 49' +
	75^o 47' 30"
Bujur Waktu Standar WIB	= 105^o -
Sudut Waktu Matahari (t)	= -29^o 12' 30"

d. Hitung azimut matahari pada jam pengukuran dengan rumus :

$$Tg\ A_m = \frac{sin\ t}{\cos \varphi\ .tan\ \delta\ - \sin \varphi\ .cos\ t}$$

Keterangan A_m = Azimut Matahari

δ = Deklinasi Matahari = 13^o 21' 42".

φ = Lintang Jakarta = -6^o 10’

t = Sudut Waktu Matahari = -29^o 12’ 30"

Perhitungan:

$$Tg\ A_m = \frac{sin\ t}{\cos \varphi\ .tan\ \delta\ - \sin \varphi\ .cos\ t}$$

tg A_m = sin t : ((cos φ) x tan δ) – (sin φ) x cos t))

tg A_m = sin -29° 12' 30" : ((cos -6° 10' x tan 13° 21' 42") – (sin -6° 10' x cos -29° 12' 30"))

= - 0.4879866153479 : ((0.994213627205 x 0.2375267021387) – (-0.1074209638756 x 0.872851111726))

= - 0.4879866153479: ((0.2361522840914) – (-0.0937625077415))

= - 0.4879866153479: 0.3299147918329

= - 1.4791292401193

A_m = Shift-tan $^{-1}$- 1.4791292401193 = -55° 56' 18.31" => 55° 56' 18.31"

Jadi, azimut matahari di Jakarta pada tanggal 17 Agustus 2025 jam 10.00 WIB adalah = **55° 56' 18.31"**

C. MENGUKUR ARAH KIBLAT

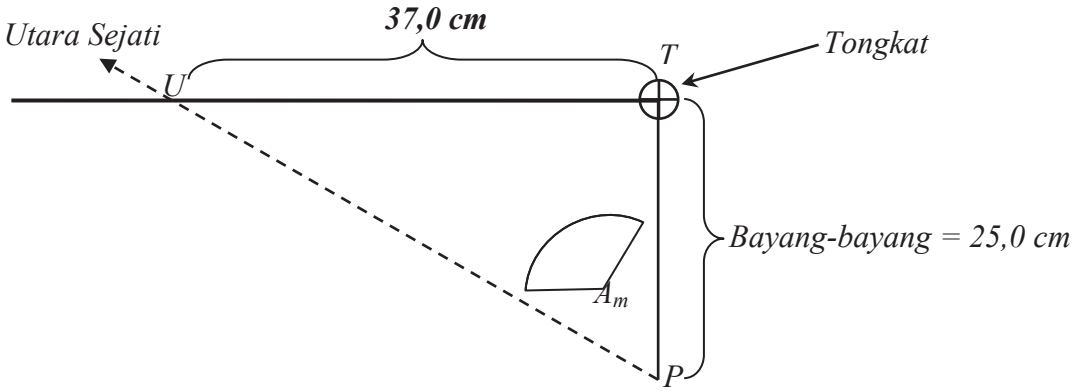
1. Mencari Titik Utara

Untuk penentuan arah (Utara, Timur, Selatan, dan Barat) dilakukan langkah-langkah sebagai berikut :

a. Tegakkan sebuah tiang/tongkat sepanjang ± 1 meter di suatu lapangan yang tidak terhalang dari sinar matahari. Pastikan tiang tersebut betul-betul tegak lurus; (gantungkan benang yang diberi pemberat).

b. Tunggu tepat jam 10:00 WIB, dan ukur panjang bayang-bayang tongkat, misalnya 25 cm, lalu buat garis sepanjang bayang-bayang tersebut.

c. Buat garis (T-U) tegak lurus dengan garis bayang-bayang tersebut di tempat kedudukan tongkat ke arah utara. (Karena pengukuran jam 10 pagi berarti matahari berada di sebelah timur). Perhatikan gambar berikut ini:



d. Ukur azimut matahari dari derajat menjadi cm dengan rumus :

TU = tan A_m x Panjang bayang-bayang

a. = tan 55º 56' 18.31" x 25,0 cm

b. = 37,0 cm

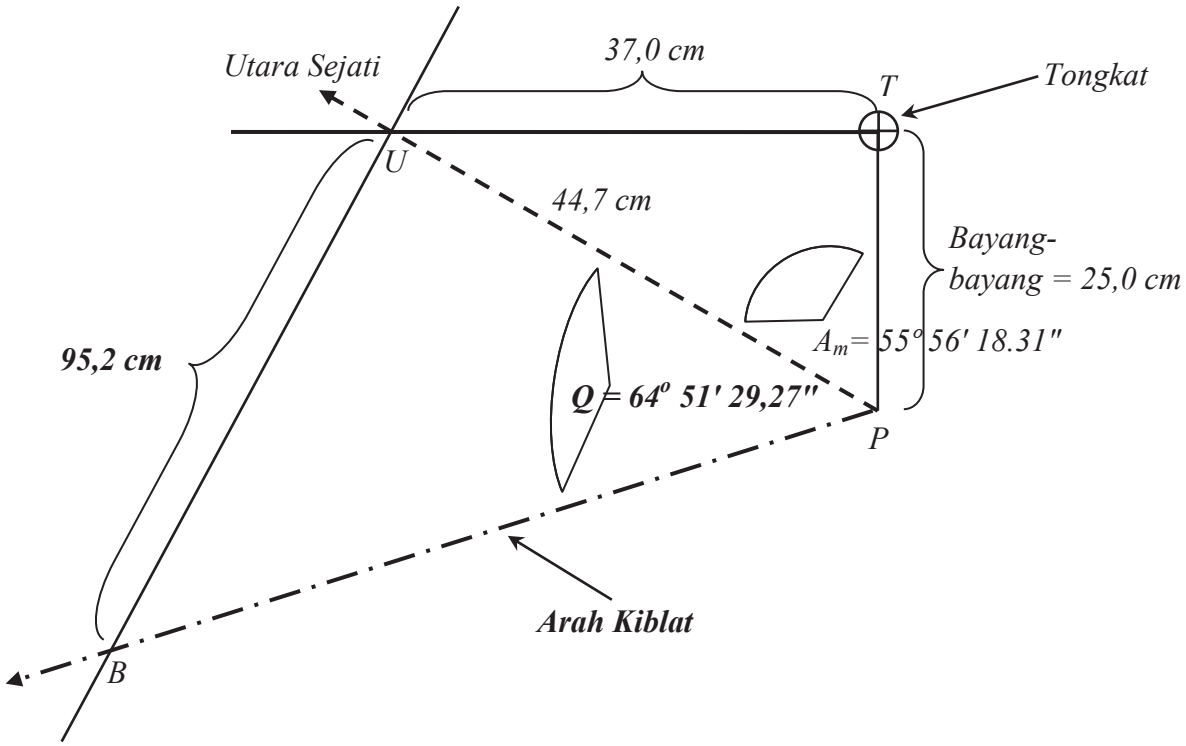
e. Ukur garis TU sepanjang 37,0 cm.

f. Hubungkan titik P dan titik U; dan inilah arah Utara-Selatan.

g. Ukur panjang garis P-U atau hitung dengan rumus Phytagoras didapat 44,7 cm.

2. Mencari Arah Kiblat

a. Buat garis (U - B) tegak lurus dengan garis P-U di tempat kedudukan titik U ke arah barat. (Karena pengukuran jam 10 pagi berarti matahari di sebelah timur). Perhatikan gambar berikut ini :



b. Ubah sudut arah kiblat dari derajat menjadi centimeter dengan rumus :

UB = Tan Q x Panjang garis P-U

= Tan 64º 51' 29.27" x 44,7 cm = 95,2 cm.

c. Ukur garis U-B sepanjang 95,2 cm.

d. Hubungkan titik P dan titik B; dan inilah arah kiblat yang dicari.

Memindahkan Garis Arah Kiblat ke dalam Masjid.

Untuk memindahkan arah kiblat ke dalam masjid dapat dilakukan langkah-langkah seperti dalam Contoh Cara Pengukuran Arah Kiblat dengan theodolit dalam buku Ephemeris ini.

CONTOH PERHITUNGAN AWAL WAKTU SHALAT UNTUK JAKARTA

Pada tanggal 17 Agustus 2025

Data :

1. Lintang Tempat (ϕ) = -06° 10’ (LS)
2. Bujur Tempat (λ) = 106° 49’ (BT)
3. Deklinasi Matahari (δ⊙) jam 5 GMT = 13° 20′ 06″
4. Equation of Time (e) jam 5 GMT = $-00^{j}\ 04^{m}\ 06^{d}$

   δ⊙ dan e menggunakan data jam 5 UT untuk WIB, 4 untuk WITA dan 3 untuk WIT.
5. cotan h_{asar} = tan [ϕ - δ⊙] + 1
   = tan [-06° 10’ – 13° 20′ 06″] + 1
   = tan 19° 30′ 06″ + 1
   = 0.354151309 + 1

   tan h_{asar} = $1.\ 354151309^{-1}$
   = 0.7384699135

   h_{asar} = $\tan^{-1}$ 0.7384699135 = 36° 26′ 41.11″

   a. h_{asar} = 36° 26′ 41.11″
   b. h_{magrib} = -01°
   c. $h_{isya'}$ = -18°
   d. h_{subuh} = -20°
   e. h_{imsak} = 10 menit sebelum subuh
   f. h_{terbit} = -01°
   g. h_{dhuha} = 04° 30’
6. Mer. Pass = $12^{j}\ 00^{m}\ 00^{d}$ – (e)
   = $12^{j}\ 00^{m}\ 00^{d}$ – ($-00^{j}\ 04^{m}\ 06^{d}$)
   $12^{j}\ 04^{m}\ 06^{d}$
7. Koreksi Waktu Daerah (KWD) = (106° 49′ – 105°) : 15
   = $00^{j}\ 07^{m}\ 16.00^{d}$

   KWD bernilai (λ – 105°) : 15 untuk WIB; (λ – 120°) : 15 untuk WITA; dan (λ – 135°) : 15 untuk WIT.

1. Awal Waktu Zuhur :

Mer. Pass = $12^{j}\ 04^{m}\ 06.00^{d}$ (LMT)
KMD = $\underline{00^{j}\ 07^{m}\ 16.00^{d}}$ –
$11^{j}\ 56^{m}\ 50.00^{d}$
$11^{j}\ 57^{m}$ (dibulatkan ke atas)
Ikhtiyat = $\underline{00^{j}\ 03^{m}}$ +
$12^{j}\ 00^{m}$ (WIB)

2. Awal Waktu Ashar :

$$\textbf{Cos t} = \textbf{-tan } \phi \textbf{ tan } \delta\odot \textbf{ + sin } h_{as} \textbf{ : cos } \phi \textbf{ : cos } \delta\odot$$

Cos t = -tan -06° 10′ × tan 13° 20′ 06″ + sin 36° 26′ 41.11″:
cos -06° 10′ : cos 13° 20′ 06″
= 0.1080461592 × 0.2370350768 + 0.5940473946 :
0.9942136272 : 0.9730381618
= 0.6396717228
t = 50° 13′ 57.56″
Mer. Pass = $12^{j}\ 04^{m}\ 06.00^{d}$
t : 15 = $\underline{03^{j}\ 20^{m}\ 55.84^{d}}$ +
$15^{j}\ 25^{m}\ 01.84^{d}$ (LMT)
Interpolasi = $\underline{00^{j}\ 07^{m}16.00^{d}}$ –
$15^{j}\ 17^{m}\ 45.84^{d}$
$15^{j}\ 18^{m}$ (dibulatkan ke atas)
Ikhtiyat = $\underline{00^{j}\ 02^{m}}$ +
Ashar = $15^{j}\ 20^{m}$ (WIB)

3. Awal Waktu Maghrib :

$$\textbf{Cos t} = \textbf{-tan } \phi \textbf{ tan } \delta\odot \textbf{ + sin } h_{mg} \textbf{ : cos } \phi \textbf{ : cos } \delta\odot$$

Cos t = -tan -06° 10′ × tan 13° 20′ 06″ + sin -01° :
cos -06° 10′ : cos 13° 20′ 06″
= 0.1080461592 × 0.2370350768 + -0.0174524064 :
0.9942136272 : 0.9730381618
= 0.0075703474
t = 89° 33’ 58.49”
Mer. Pass = $12^{j}\ 04^{m}\ 06.00^{d}$
t : 15 = $\underline{05^{j}\ 58^{m}\ 15.90^{d}}$ +
$18^{j}\ 02^{m}\ 21.90^{d}$ (LMT)
KWD = $\underline{00^{j}\ 07^{m}16.00^{d}}$ –
$17^{j}\ 55^{m}\ 05.90^{d}$
$17^{j}\ 56^{m}$ (dibulatkan ke atas)
Ikhtiyat = $\underline{00^{j}\ 02^{m}}$ +
Maghrib = $17^{j}\ 58^{m}$ (WIB)

4. Awal Waktu Isya’ :

$$\textbf{Cos t} = \textbf{-tan } \phi \textbf{ tan } \delta\odot \textbf{ + sin } h_{is} \textbf{ : cos } \phi \textbf{ : cos } \delta\odot$$

Cos t = -tan -06° 10′ × tan 13° 20′ 06″ + sin -18° :
cos -06° 10′ : cos 13° 20′ 06″

= 0.1080461592 × 0.2370350768 + -0.3090169944 :
0.9942136272 : 0.9730381618
= -0.293817121
t = 107° 05’ 11.83”
Mer. Pass = $12^j\ 04^m\ 06.00^d$
t : 15 = $\underline{07^j\ 08^m\ 20.79^d}$ +
$19^j\ 12^m\ 26.79^d$ (LMT)
KWD = $\underline{00^j\ 07^m 16.00^d}$ –
$19^j\ 05^m\ 10.79^d$
$19^j\ 06^m$ (dibulatkan ke atas)
Ikhtiyat = $\underline{00^j\ 02^m}$ +
Isya’ = $19^j\ 08^m$ (WIB)

5. Awal Waktu Subuh :

Cos t = -tan ϕ tan δ⊙ + sin h_{sb} : cos ϕ : cos δ⊙

Cos t = -tan -06° 10′ × tan 13° 20′ 06″ + sin -20° :
cos -06° 10′ : cos 13° 20′ 06″
= 0.1080461592 × 0.2370350768 + -0.3420201433 :
0.9942136272 : 0.9730381618
= -0.3279321539
t = 109 08′ 35.93″
Mer. Pass = $12^j\ 04^m\ 06.00^d$
t : 15 = $\underline{07^j\ 16^m\ 34.40^d}$ –
$04^j\ 47^m\ 31.60^d$ (LMT)
KWD = $\underline{00^j\ 07^m 16.00^d}$ –
$04^j\ 40^m\ 15.60^d$
$04^j\ 41^m$ (dibulatkan ke atas)
Ikhtiyat = $\underline{00^j\ 02^m}$ +
Subuh = $04^j\ 43^m$ (WIB)

6. Waktu Imsak :

Imsak = Waktu Subuh– 10^m

Subuh = $04^j\ 43^m$ (WIB)
= $\underline{00^j\ 10^m}$ –
Imsak = $04^j\ 33^m$ (WIB)

7. Waktu Terbit :

Cos t = -tan ϕ tan δ⊙ + sin h_{tb} : cos ϕ : cos δ⊙

Cos t = -tan -06° 10′ × tan 13° 20′ 06″ + sin -01° :
cos -06° 10′ : cos 13° 20′ 06″
= 0.1080461592 × 0.2370350768 + -0.0174524064 :
0.9942136272 : 0.9730381618
= 0.007570347
t = 89° 33’ 58.49”
Mer. Pass = $12^j\ 04^m\ 06.00^d$
t : 15 = $05^j\ 58^m\ 15.90^d$ –
$06^j\ 05^m\ 50.10^d$ (LMT)
KWD = $00^j\ 07^m\ 16.00^d$ –
$05^j\ 58^m\ 34.10^d$
$05^j\ 58^m$ (dibulatkan ke bawah)
Ikhtiyat = $00^j\ 02^m$ –
Terbit = $05^j\ 56^m$ (WIB)

8. Awal Waktu Duha :

Cos t = -tan ϕ tan δ⊙ + sin h_{dl} : cos ϕ : cos δ⊙

Cos t = -tan -06° 10′ × tan 13° 20′ 06″ + sin 04° 30′ :
cos -06° 10′ : cos 13° 20′ 06″
= 0.1080461592 × 0.2370350768 + 0.078459095 :
0.9942136272 : 0.9730381618
= 0.106713131
t = 83° 52’ 26.85”
Mer. Pass = $12^j\ 04^m\ 06.00^d$
t : 15 = $05^j\ 35^m\ 29.79^d$ –
$06^j\ 28^m\ 36.21^d$ (LMT)
KWD = $00^j\ 07^m\ 16.00^d$ –
$06^j\ 21^m\ 20.21^d$
$06^j\ 22^m$
Ikhtiyat = $00^j\ 02^m$ +
Dluha = $06^j\ 24^m$ (WIB)

Hasil Perhitungan
Awal waktu-waktu salat untuk Jakarta pada tanggal 17 Agustus 2025

Imsak	Subuh	Terbit	Duha	Zuhur	Asar	Maghrib	Isya
04:33	04:43	05:56	06:24	12:00	15:20	17:58	19:08

Keterangan: Koreksi penggunaan Dip pada awal waktu salat Maghrib dan terbit Matahari bersifat opsional, tergantung ketinggian dan topografis tempat.

CONTOH PERHITUNGAN AWAL BULAN RAMADAN 1446 H

1. Menentukan bulan dan tahun

   Sebagai contoh, dihitung waktu ijtimak dan posisi hilal menjelang bulan Ramadan 1446 H.

2. Menentukan Lokasi

   Perhitungan untuk lokasi POB Cibeas, Sukabumi, Jawa Barat dengan posisi

   Lintang Tempat (ϕ) = -07° 04' 26"

   Bujur Tempat (λ) = 106° 31' 52"

   Tinggi tempat = 137 meter di atas air laut

3. Konversi Tanggal

   29 Sya`ban 1446 H atau tanggal 29-08-1446 H

   Waktu yang telah dilalui sebanyak 1445 th, lebih 07 bl, lebih 29 hr.

   1445 tahun : 30 tahun = 48 daur lebih 2 tahun

48 daur	= 48 x 10631 hari	= 510288 hari
5 tahun	= 5 x 354 + 2	= 1772 hari
07 bulan	= (30 x 4) + (29 x 3)	= 207 hari
29 hari		= 29 hari +
	Jumlah	= 512296 hari
Selisih kalender Masehi – Hijriyah		= 227016 hari
Anggaran baru Gregorius		= 13 hari +
	JUMLAH	= 739325 hari

   512296 : 7 = 73185 lebih 1 = Jum'at (dihitung mulai Jum'at)

   512296 : 5 = 102459 lebih 1 = Legi (dihitung mulai Legi)

   739323 : 1461 = 506 siklus lebih 1164 hari

   506 siklus = 506 × 4 = 2024 tahun

   59 hari = 1 Bulan lebih 28 hari

   Waktu yang dilewati = 2024 tahun + 1 bulan + 28 hari

   atau 2025 tahun lebih 1 bulan lebih 28 hari

   Jadi 29 Sya'ban 1446 H bertepatan 28 Februari 2025 M (Jumat Legi).

4. Menyiapkan data astronomi pada tanggal masehi tersebut atau sehari sebelumnya, yakni di mana terdapat nilai FIB (Fraksi Iluminasi Bulan) terkecil

5. FIB (Fraksi Iluminasi Bulan) terkecil pada tanggal 28 Februari 2025 M yaitu 0.00020, pada jam 01 (UT)

6. ELM jam 01 = 339° 41’ 23.00”
   ELM jam 02 = 339° 43’ 54.00” –
   Selisih (**B_1**) = **00° 02’ 31.00”**

7. ALB jam 01 = 339° 48’ 52.00”
   ALB jam 02 = 339° 25’ 25.00” –
   Selisih (**B_2**) = **00° 36’ 33.00”**

8. ELM jam 01 = 339° 41’ 23.00”
   ALB jam 01 = 339° 48’ 52.00” –
   MB = **-00° 07’ 29.00”**

9. B_2 = 00° 36’ 33.00”
   B_1 = 00° 02’ 31.00” –
   SB = **00° 34’ 02.00”**

10. Titik Ijtimak = MB : SB
    = -00° 07’ 29.00” : 00° 34’ 02.00”
    = **-00° 13’ 11.58”**

11. Waktu FIB terkecil = 01^j 00^m 00^d
    Titik Ijtimak = -00° 13’ 11.58” +
    Ijtimak (DT) = **00^j 46^m 48.42^d**
    Koreksi **Δ**T = 00^j 01^m 11.66^d **-**
    Ijtima’ dalam UT = 00^j 45^m 36.76^d
    Koreksi WIB = 07^j 00^m 00.00^d +
    Ijtima’ = **07^j 45^m 36.76^d**

    *Rumus **Δ**T = $(67.62 + 0.3645 \times t + 0.0039755 \times t^2)$ (F. ESPENAK)

    T tahun 2025 (antara 2015 dan 3000) = 2025-2015 = 10

    Maka **Δ**T = 71.66255^d = 0^j 1^m 11.66^d

12. Perkiraan matahari terbenam untuk POB Cibeas, Sukabumi, Jawa Barat pada tanggal 28 Februari 2025 (29 Sya’ban 1446 H)

    ϕ = -07° 04’ 26”
    λ = 106° 31’ 52”
    Tt = 137m

δ (jam 11 UT)	= 08° 51’ 03.00”	
e (jam 11 UT)	= -00^{j} 12^{m} 28.00^{d}	
Dip	= √ 137 x 0.0293 = 00° 20’ 34.61”	
h	= -(00° 16’ + 00° 34’ 30” + Dip) = -01° 11’ 04.61”	
cos t	= -tan ϕ tan δ + sin h : cos ϕ : cos δ	
	= -tan -07° 04’ 26” x tan -07° 46’ 49.00” + sin -01° 11’ 04.61”	
	: cos -07° 04’ 26” : cos -07° 46’ 49.00”	
	= -0.037981301	
t	= 92° 10’ 36.09”	
12 – e	= 12^{j} 12^{m} 28.00^{d}	
t : 15	= 06^{j} 08^{m} 42.41^{d} +	
12 – e + t : 15	= 18^{j} 12^{m} 10.41^{d}	
λ : 15	= 07^{j} 06^{m} 07.41^{d} –	
Matahari terbenam	= **11^{j} 15^{m} 02.94^{d}**	

13. Data dari Ephemeris pada jam 11:15:02.94 (GMT)

a) Deklinasi matahari (δ⊙)

δ⊙ jam 11	= -07° 46’ 49.00”	-07° 46’ 49.00”
δ⊙ jam 12	= -07° 45’ 52.00” –	
	-00° 00’ 57.00”	
	00° 15’ 02.94” x	
	-00° 00’ 14.30”	-00° 00’ 14.30” –
δ⊙ jam 11:15:02.94	**=**	**-07° 46’ 34.70”**

b) Semi diameter matahari (SD⊙)

SD⊙ jam 11	= 00° 16’ 08.63”	00° 16’ 08.63”
SD⊙ jam 12	= 00° 16’ 08.62” –	
	00° 00’ 00.01”	
	00° 15’ 02.94” x	
	00° 00’ 00.00”	00° 00’ 00.00” –
SD⊙ jam 11:15:02.94	**=**	**00° 16’ 08.63”**

c) Equation of Time (e)

e jam 11	= -00^{j} 12^{m} 28.00^{d}	-00^{j} 12^{m} 28.00^{d}
e jam 12	= -00^{j} 12^{m} 28.00^{d} –	

		00° 00’ 00.00”		
		00° 15’ 02.94”	x	
		00° 00’ 00.00”	00° 00’ 00.00”	–
e jam 11:15:02.94	**=**		**-00^{j} 12^{m} 28.00^{d}**	

14. Menghitung Tinggi Matahari dengan rumus:

h⊙	= -(SD⊙ + 00° 34’ 30” + Dip)
	= -(00° 16’ 08.63” + 00° 34’ 30” + 00° 20’ 34.61”)
h⊙	= **-01° 11’ 13.24”**

15. Menghitung Sudut Jam *(Hour Angle)* Matahari dengan rumus:

cos t⊙	= -tan ϕ tan δ⊙ + sin h⊙ : cos ϕ : cos δ⊙
	= -tan -07° 04’ 26” x tan -07° 46’ 34.70” + sin -01° 11’ 13.24”
	: cos -07° 04’ 26” : cos -07° 46’ 34.70”
	= -0.0380148721
t⊙	= **92° 10’ 43.02”**

16. Menghitung waktu Matahari terbenam *(Ghurub)* dengan rumus:

Ghurub	= 12 – e + (t⊙ : 15) – (λ : 15)
12 – e	= 12^{j} 12^{m} 28.00^{d}
t⊙ : 15	= 06^{j} 08^{m} 42.87^{d} +
12 – e + t⊙ : 15	= 18^{j} 21^{m} 10.87^{d}
λ : 15	= 07^{j} 06^{m} 07.47^{d} –
Ghurub (UT)	= 11^{j} 15^{m} 03.40^{d}
Koreksi WIB	= 07^{j} 00^{m} 00.00^{d} +
Ghurub (WIB)	= **18^{j} 15^{m} 03.40^{d}**

17. Menghitung Asensio Rekta Matahari dengan cara interpolasi

AR⊙ jam 11	= 341° 37’ 49.00”	341° 37’ 49.00”	
AR⊙ jam 12	= 341° 40’ 10.00”	–	
	-00° 02’ 21.00”		
	00° 15’ 02.94”	x	
	-00° 00’ 35.57”	-00° 00’ 35.37”	–
AR⊙ jam 11:15:02.94	**=**	**341° 38’ 24.38”**	

18. Menghitung Asensio Rekta Bulan dengan cara interpolasi

$AR_{(}$ jam 11	=	347° 27’ 15.00”	347° 27’ 15.00”
$AR_{(}$ jam 12	=	348° 00’ 01.00” –	
		-00° 32’ 46.00”	
		00° 15’ 02.94” x	
		-00° 08’ 13.11”	-00° 08’ 13.11” –
$AR_{(}$ jam 11:15:02.94	**=**		**347° 35’ 28.36”**

19. Menghitung Deklinasi Bulan dengan cara interpolasi

$\delta_{(}$ jam 11	=	-06° 31’ 15.00”	-06° 31’ 15.00”
$\delta_{(}$ jam 12	=	06° 13’ 54.00” –	
		-00° 17’ 21.00”	
		00° 15’ 02.94” x	
		-00° 04’ 21.10”	-00° 04’ 21.10” –
$\delta_{(}$ jam 11:15:02.94	**=**		**-06° 26’ 53.77”**

20. Menghitung Semi Diameter Bulan dengan cara interpolasi

$SD_{(}$ jam 11	=	00° 16’ 26.08”	00° 16’ 26.08”
$SD_{(}$ jam 12	=	00° 16’ 26.33” –	
		-00° 00’ 00.25”	
		00° 15’ 02.94” x	
		-00° 00’ 00.06”	-00° 00’ 00.06” –
$SD_{(}$ jam 11:15:02.94	**=**		**00° 16’ 26.14”**

21. Menghitung *Horizontal Parallax* Bulan dengan cara interpolasi

$HP_{(}$ jam 11	=	01° 00’ 19.00”	01° 00’ 19.00”
$HP_{(}$ jam 12	=	01° 00’ 20.00” –	
		-00° 00’ 01.00”	
		00° 15’ 02.94” x	
		-00° 00’ 00.25”	-00° 00’ 00.25” –
$HP_{(}$ jam 11:15:02.94	**=**		**01° 00’ 19.25”**

22. Menghitung Sudut Jam *(Hour Angle)* Bulan dengan rumus:

$t_{(} = AR\odot - AR_{(} + t_o$

$= 341° 38’ 24.38” - 347° 35′ 28.36” + 92° 10′ 43.02”$

$= \mathbf{86° 13′ 39.05″}$

23. Menghitung tinggi hilal hakiki dengan rumus:

sin $h_($ = sin ϕ sin $\delta_($ + cos ϕ cos $\delta_($ cos $t_($
= sin -07° 04’ 26” x sin -06° 26’ 53.77” + cos -07° 04’ 26”
x cos -06° 26’ 53.77” x cos 86° 13’ 39.05”
= 0.070627366
$h_($ = **04° 30’ 52.18”**

24. Menghitung Paralaks Bulan dengan rumus:

$P_($ = cos $h_($ x $HP_($
= cos 04° 30’ 52.18” × 01° 00’ 19.25”
$P_($ = **01° 00’ 08.02”**

25. Menghitung tinggi hilal dengan rumus:

$h_(^o$ = $h_($ – $P_($ + $SD_($
$h_($ = 04° 30’ 52.18”
$P_($ = 01° 00’ 08.02” –
03° 30’ 44.16”
$SD_($ = 00° 16’ 26.14” + (Titik Pusat Bulan)
$h_(^o$ = **03° 47’ 10.30”**

26. Menghitung Refraksi dengan rumus:

Refr = 0.01695 : tan ($h_(°$ + 10.3 : ($h_(°$ + 5.1255)) untuk $h_(°$ berharga + (positif).
Untuk $h_(°$ berharga – (negatif), Refr = 00° 34’ 30”)

Refr = 0.01695 : tan ($h_(°$ + 10.3 : ($h_(°$ + 5.1255))
= 0.01695 : tan (03° 47’ 10.30” + 10.3 : (03° 47’ 10.30” + 5.1255))
Refr = **00° 11’ 45.69”**

27. Menghitung tinggi hilal mar’i Pusat Bulan *(Center)* dengan rumus:

$h_('$ = $h_(°$ + Refr + Dip
$h_(°$ = 03° 47’ 10.30”
Refr = 00° 11’ 45.69”
Dip = 00° 20’ 34.61” +
$h_('$ = **04° 19’ 30.60”**

28. Menghitung *Nisful Fudlah* Bulan dengan rumus:

sin NF = (sin ϕ sin $\phi_($) : (cos ϕ cos $\phi_($)

= (sin -07° 04’ 26” × sin -06° 26’ 53.77”) : (cos -07° 04’ 26” × cos -06° 26’ 53.77”)

= 0.014025219

NF = 00° 48’ 13”

29. Menghitung Paralaks *Nisful Fudlah* Bulan dengan rumus:

PNF = cos NF × $HP_{(}$

= cos 00° 48’ 13” × 01° 00’ 19.25”

PNF = 01° 00’ 18.89”

30. Menghitung Setengah Busur Siang Bulan Hakiki (SBSH) dengan rumus:

SBSH = 90° + NF

= 90° + 00° 48’ 13”

SBSH = 90° 48’ 13”

31. Menghitung Setengah Busur Siang Bulan (SBS):
Jika SBSH ≥ 90° maka menggunakan rumus:

SBS = 90° + NF – PNF + ($SD_{(}$ + 0.575 + Dip)

Jika SBSH < 90° maka menggunakan rumus:

SBS = 90° + NF + PNF – ($SD_{(}$ + 0.575 + Dip)

Karena nilai SBSH > 90°, maka:

SBS = 90° + NF – PNF + ($SD_{(}$ + 0.575 + Dip)

= 90° + 00° 48’ 13” – 01° 00’ 18.89” +

(00° 16’ 26.14” + 0.575 + 00° 20’ 34.61”)

SBS = 90° 59’ 24.86”

32. Menghitung Lama Hilal di atas ufuk (*Lag* / $Lm_{(}$) dengan rumus:

$Lm_{(}$ = (SBS – $t_{(}$) : 15

= (90° 59’ 24.86” – 86° 13’ 39.05”) : 15

$Lm_{(}$ = 00^{j} 19^{m} 3.05^{d}

33. Menghitung Waktu Terbenam Bulan dengan rumus:

$Terb_{(}$ = Ghurub + $Lm_{(}$

$= 18^{j}\ \ 15^{m}\ \ 03.40^{d}\ + 00^{j}\ \ 19^{m}\ \ 03.05^{d}$

$Terb_{(}$ $= 18^{j}\ \ 34^{m}\ \ 6.45^{d}$

34. Menghitung Azimut Matahari dengan rumus:

$\tan A\odot = -\sin \phi : \tan t\odot + \cos \phi \tan \delta\odot : \sin t\odot$

$= -\sin -07° 04' 26'' : \tan 92° 10' 43.02'' + \cos -07° 04' 26''$

$\times \tan -07° 46' 34.70'' : \sin 92° 10' 43.02''$

$= -0.1403051119$

$A\odot = -07°\ \ 59'\ \ 12.32''$ (dihitung dari barat)

Karena azimut diukur dari utara ke arah timur, maka

$Az\odot = 270° + A\odot$

$= 270° + -07°\ \ 59'\ \ 12.32''$

$Az\odot = 262°\ \ 00'\ \ 47.68''$

35. $\tan A_{(} = -\sin \phi : \tan t_{(} + \cos \phi \tan \delta_{(} : \sin t_{(}$

$= -\sin -07° 04' 26'' : \tan 86°\ \ 13'\ \ 39.05'' +$

$\cos -07° 04' 26'' \times \tan -06° 26'\ \ 53.77'' : \sin 86°\ \ 13'\ \ 39.05''$

$= -0.1042842083$

$A_{(}$ $= -05°\ \ 57'\ \ 12.69''$ (dihitung dari barat)

Karena azimut dihitung dari utara kearah timur, maka

$Az_{(} = 270° + A_{(}$

$= 270° – 05° 57' 12.69''$

$Az_{(}$ $= 264°\ \ 02'\ \ 47.31''$

36. Menghitung Posisi Hilal (selisih azimut Bulan dan Matahari) dengan rumus:

$PH = A_{(} – A_{(}$

$= -05°\ \ 57'\ \ 12.69'' – -07°\ \ 59'\ \ 12.32''$

PH $= 02°\ \ 01'\ \ 59.63''$

37. Menghitung Azimut Terbenam Bulan

$\tan AT_{(} = -\sin \phi : \tan SBS + \cos \phi \tan \delta\odot : \sin SBS$

$= -\sin -07° 04' 26'' : \tan 90° 59' 24.86'' + \cos -07° 04'$

$26'' \times \tan -06°\ \ 26' 53.77'' : \sin 90° 59' 24.86''$

= -0.1143061596

$AT_{(}$ = -06° 31' 15.45" (dihitung dari barat)

Karena azimut dihitung dari utara ke arah timur, maka

$AzT_{(}$ = 270° + $AT_{(}$

= 270° + -06° 31′ 15.45″

$AzT_{(}$ = 263° 28′ 44.55″

38. Menghitung Fraksi Iluminasi Bulan dengan cara interpolasi

FI jam 11	=	0.00267	0.00267
FI jam 12	=	0.00319 –	
		-0.00052	
		00° 15' 02.94" ×	
		-0.000130425	-0.000130425 –
			0.002800491

FI jam 11:15:02.94 = 0.002800491 × 100% = 0.28%

39. Menghitung Lebar Nurul Hilal dengan satuan ukur *ushbu'* (jari) dengan rumus:

NH = (√ [$PH^2 + h_{(}'^2$]) : 15

= (√ [(-02° 01' 59.63")^2 + (04° 19' 30.60")^2]) : 15

= (√ [04° 08' 02.5" + 18° 42' 25.44"]) : 15

= (√ 22° 50' 27.94") : 15

= 04° 46' 45.25" : 15

NH = 0.3186157175 Jari

40. Menghitung Sudut Kemiringan Hilal dengan rumus:

tan MRG = [PH : $h_{(}'$]

= [02° 01' 59.63" : 04° 19' 30.60]

= 0.4700929958

MRG = 25° 10' 40.4"

Jika MRG ≤ 15° maka hilal telentang

Jika MRG > 15° dan PH positif maka hilal miring ke utara

Jika MRG > 15° dan PH negatif maka hilal miring ke selatan

41. Menghitung Elongasi Geosentris Bulan-Matahari (Jarak Busur) dengan rumus:

$\cos JB_g$ $= \sin \delta\odot \times \sin \delta_(+ \cos \delta\odot \times \cos \delta_(\times \cos (AR\odot - AR_()$

$= \sin$ -07° 46’ 34.70” $\times \sin$ -06° 26’ 53.77” + $\cos$ -07° 46’ 34.70” $\times \cos$ -06° 26’ 53.77” $\times \cos$ (341° 38’ 24.38” – 347° 35’ 28.36”)

$= 0.99442546$

JB_g = 06° 03’ 09.46”

42. Menghitung Umur Hilal

Umur Hilal = Saat Matahari Terbenam – Ijtimak

$= 18^j\ 15^m\ 03.40^d - 07^j\ 45^m\ 36.76^d$

= 10 jam 29 menit 26.64 detik

Dari perhitungan di atas dapat diketahui bahwa ijtimak menjelang bulan Ramadan 1446 H terjadi pada hari Jumat Legi tanggal 28 Februari 2025 M pukul 07:45:36.76 WIB.

Untuk lokasi POB Cibeas, Sukabumi, Jawa Barat:

Matahari Terbenam	= $18^j\ 15^m\ 03.40^d$ WIB
Azimut Matahari	= 262° 00’ 47.68”
Tinggi Hilal Pusat Bulan *(Center)*	= 04° 19’ 30.60” (di atas ufuk Mar’i)
Azimut Bulan	= 264° 02’ 47.31”
Posisi Bulan	= 02° 01’ 59.63” (Utara Matahari)
Elongasi Geosentrik	= 06° 03’ 09.46”
Keadaan Hilal	= Miring ke Utara
Lama Hilal *(Lag)*	= $00^j\ 19^m\ 3.05^d$
Terbenam Bulan	= 18 : 34 : 6.45 WIB
Azimut Terbenam Bulan	= 263° 28’ 44.55”
Illuminasi Bulan	= 0. 28%
Nurul Hilal	= 0.32 Jari
Umur Hilal	= 10 jam 29 menit 26.64 detik

CONTOH PERHITUNGAN GERHANA MATAHARI PADA BULAN RAMADAN 1446 H

Penentuan hisab gerhana matahari dapat dihitung dengan metode ephemeris hisab rukyat dengan menyesuaikan contoh perhitungan sebagai berikut:

1. Menakar tanggal hijriah kemungkinan terjadinya gerhana matahari ke kalender Masehi.
   Tanggal 29 Ramadan 1446 H atau 29 – 09 – 1446 H
   Waktu yang telah dilalui sebanyak 1445 tahun + 8 bulan + 29 hari

   1445 tahun : 30 tahun = 48 daur lebih 5 tahun

48 Daur	= 48 x 10.631 hari	= 510.288 hari
5 tahun	= (5 x 354) + 2 hari	= 1.772 hari
8 bulan	= (8 x 29) + 4 hari	= 236 hari
	29 hari	= 29 hari +
	Jumlah	= 512.325 hari
Selisih kalender Masehi – Hijriah		= 227.016 hari
Anggaran baru Gregorius		= 13 hari +
	JUMLAH	= 739.354 hari

   512.325 : 7 = 73.189 lebih 2 = Sabtu (*dihitung mulai Jum'at*)

   512.325 : 5 = 102.465 lebih 0 = Kliwon (*dihitung mulai Legi*)

   739.354 :1461 = 506 Siklus lebih 88 hari

   506 Siklus = 506 x 4 tahun = 2024 tahun

   88 hari = 02 bulan lebih 29 hari

   Waktu yang dilewati 2024 tahun lebih 02 bulan lebih 29 hari
   Waktu yang berjalan adalah hari ke 29 bulan ke 03 tahun ke 2025
   Jadi 29 Ramadan 1445 H bertepatan dengan tgl. **29 Maret 2025 M (Senin Kliwon)**

2. Menyiapkan data astronomi pada tanggal masehi tersebut di atas atau sehari sebelumnya, yakni di mana terdapat nilai FIB (Fraksi Iluminasi Bulan) terkecil.

3. FIB terkecil pada tanggal 29 Maret 2025 M yaitu 0.00009, pada jam 11 (UT)

4. ELM jam 11 = 09° 00′ 27.00″
   ELM jam 12 = 09° 02′ 55.00″ –
   Selisih (**B_1**) = **00° 02′ 28.00″**

5. ALB jam 11 = 09° 00′ 32.00″
   ALB jam 12 = 09° 38′ 16.00″ –
   Selisih (**B_2**) = **00° 37′ 44.00″**

6. Menghitung jarak Matahari dan Bulan (**MB**)
   ELM jam 11 = 09° 00′ 27.00″
   ALB jam 11 = 09° 00′ 32.00″ –
   MB = **-00° 00′ 05.00″**

7. Menghitung Sabak Bulan Mu'addal (**SB**) dengan rumus SB = $B_2 – B_1$
   B_2 = 00° 37′ 44.00″
   B_1 = 00° 02′ 28.00″ –
   SB = **00° 35′ 16.00″**

8. Menghitung Titik Ijtimak dengan rumus :
   Titik Ijtimak = MB : SB
   = -00° 00′ 05.00″ : 00° 35′ 16.00″
   = **-00° 00′ 08.51″**

9. Menghitung waktu Ijtimak dengan rumus :
   Waktu FIB terkecil = 11^j 00^m 00^d
   Titik Ijtimak = -00° 00′ 08.51″ +
   Ijtimak (DT) = **10^j 59^m 51.49^d**

10. Menentukan terjadi atau tidaknya gerhana matahari
    a) Menentukan harga *Apparent Latitude* atau lintang Bulan ($L_☾$) pada saat ijtimak jam 10 : 59 : 51.49
    $L_☾$ jam 10 = 01° 00′ 23.00″ 01° 00′ 23.00″
    $L_☾$ jam 11 = 01° 03′ 49.00″ –
    -00° 03′ 26.00″
    00° 59’ 51.49” ×
    -00° 03′ 25.51″ -00° 03′ 25.51″ –
    $L_☾$ jam 10 : 59 : 51.49= **01° 03′ 48.51″**

    b) Menentukan batas terjadinya gerhana matahari dengan melihat besarnya L_C
    (1) $L_☾$ > 1° 34′ 46″ = tidak mungkin terjadi gerhana matahari

(2) 1° 24′ 46″ < $L_{☾}$ < 1° 34′ 46″ = mungkin terjadi gerhana matahari

(3) $L_{☾}$ < 1° 24′ 46″ = pasti terjadi gerhana matahari

Karena harga mutlak *Apparent Latitude Bulan* ($L_{☾}$) **lebih kecil dari 1° 24′ 46″, maka pasti terjadi gerhana matahari.**

11). a) Menentukan besarnya Semi Diameter Bulan (**$SD_{☾}$**) pada saat ijtimak

$SD_{☾}$ jam 10	= 00° 16′ 39.36″	00° 16′ 39.36″
$SD_{☾}$ jam 11	= 00° 16′ 39.54″ –	
	-00° 00′ 00.18″	
	00° 59’ 51.49” ×	
	-00° 00′ 00.18″	-00° 00′ 00.18″ –
$SD_{☾}$ jam 10 : 59 : 51.49=		**00° 16′ 39.54″**

b) Menentukan besarnya *Horizontal Parallax* Bulan (**$HP_{☾}$**) pada saat ijtimak

$HP_{☾}$ jam 10	= 01° 01′ 07.00″	01° 01′ 07.00″
$HP_{☾}$ jam 11	= 01° 01′ 08.00″ –	
	-00° 00′ 01.00″	
	00° 59’ 51.49” ×	
	-00° 00′ 01.00″	-00° 00′ 01.00″ –
$HP_{☾}$ jam 10 : 59 : 51.49=		**01° 01′ 08.00″**

c) Menentukan besarnya Semi Diameter Matahari (**$SD_{⊙}$**) pada saat ijtimak

$SD_{⊙}$ jam 10	= 00° 16′ 01.08″	00° 16′ 01.08″
$SD_{⊙}$ jam 11	= 00° 15′ 01.07″ –	
	00° 01′ 00.01″	
	00° 59’ 51.49” ×	
	00° 00′ 59.87″	00° 00′ 59.87″ –
$SD_{⊙}$ jam 10 : 59 : 51.49=		**00° 15′ 01.21″**

d) Menentukan Jarak Bumi (**JB**) pada kolom *True Geocentric Distance* pada saat ijtimak

JB jam 18	= 0.9984895	0.9984895
JB jam 19	= 0.9985014–	
	- 0.0000119	
	00° 59’ 51.49” ×	

- 0,0000118718697 - 0,0000118718697 –

JB jam 10 : 59 : 51.49= 0.9985013718697

12. Menghitung *Horizontal Parallax* Matahari (**$HP_\odot$**) dengan rumus :

sin $HP_\odot$ = sin 08.794" : JB

= sin 00° 00' 08.794" : 0.9985013718697

= 0,0000426985043

$HP_\odot$ = **00° 00' 08.81"**

13. Menghitung jarak bulan dari titik simpul (**H**) dengan rumus :

sin H = sin L_C : sin 5°

= sin 01° 03′ 48.51″ : sin 5°

= 0,212953153

H **= 12° 17' 43.70"**

14. Menghitung Lintang Bulan maksimum terkoreksi (**U**) dengan rumus :

tan U = [tan L_C : sin H]

= [tan 01° 03′ 48.51″ : sin 12º 17' 43.70"]

= 0,087170758

U = **04º 58' 54.92"**

15. Menghitung Lintang Bulan minimum terkoreksi (**Z**) dengan rumus :

sin Z = [sin U x sin H]

= [sin 04º 58' 54.92" x sin 12º 17' 43.70"]

= 0,018493158

Z = **01º 03' 34.71"**

16. Menghitung koreksi kecepatan bulan relatif terhadap matahari (**K)** dengan rumus :

K = cos L_C x SB : cos U

= cos 01° 03′ 48.51″ x 00° 35′ 16.00″ : cos 04º 58' 54.92"

= 0,589905106

= **00º 35' 23.66"**

17. Menghitung besarnya semi diameter anti bayangan inti bumi (**D**) dengan rumus :

D = $HP_☾$ + $SD_\odot$ - $HP_\odot$

= 01° 01′ 08.00″ + 00° 15′ 01.21″ - 00° 00' 08.81"

= **01º 32' 39.94"**

18. Menghitung jarak titik pusat anti bayangan inti bumi sampai titik pusat bulan ketika piringan bulan mulai bersentuhan dengan piringan matahari (**X**) dengan rumus :

X = D + $SD_{☾}$

= 01º 32' 39.94" + 00° 16′ 39.54″

= **01º 32' 39.94"**

19. Menghitung jarak titik pusat anti bayangan inti bumi sampai titik pusat bulan ketika seluruh piringan bulan mulai menutupi piringan matahari (**Y**) dengan rumus :

Y = D - $SD_{☾}$

= 01º 32' 39.94" - 00° 16′ 39.54″

= **00º 59’ 20.86"**

20. Menghitung jarak titik pusat bulan ketika piringan bulan mulai menutupi matahari sampai titik pusat bulan ketika ia segaris dengan anti bayangan inti bumi (**C**) dengan rumus :

cos C = cos X : cos Z

= cos 01º 32' 39.94" : cos 01º 03' 34.71"

= 0,999807707

C = **01º 07' 25.10"**

21. Menghitung waktu yang diperlukan oleh bulan untuk berjalan mulai ketika piringan bulan menutupi piringan matahari sampai titik pusat bulan ketika segaris dengan anti bayangan inti bumi (**T_1**) dengan rumus :

T_1 = C : K

= 01º 07' 25.10" : 00º 35' 23.66"

= **$01^j\ 54^m\ 17.21^d$**

Karena Y (00º 59’ 20.86") lebih besar daripada Z (01º 03' 34.71") dan $SD_{☉}$ (00° 15′ 01.21″) lebih besar daripada $SD_{☾}$ (00° 16′ 39.54″), **maka terjadi gerhana matahari sebagian.**

22. Menghitung jarak titik pusat bulan saat segaris dengan anti bayangan inti bumi sampai titik pusat bulan ketika seluruh piringan bulan menutupi piringan matahari (E) dengan rumus :

cos E = cos Y : cos Z

= cos 00º 59’ 20.86" : cos 01º 03' 34.71"

= 1,000022005

E = **tidak terhitung**

23. Menghitung waktu yang diperlukan untuk berjalan mulai ketika titik pusat bulan saat segaris dengan anti bayangan inti bumi sampai titik pusat bulan ketika seluruh piringan bulan menutupi piringan matahari (**T_2**) dengan rumus :

T_2 = E : K

= tidak terhitung : 00º 35' 23.66"

= tidak terhitung

= **tidak terhitung**

24. Koreksi pertama terhadap kecepatan bulan (**T_a**) dengan rumus :

T_a = cos H : sin K

= cos **12º 17' 43.70"** : sin 00º 35' 23.66"

= 94,90092712

= **94º 54' 03.34"**

25. Koreksi kedua terhadap kecepatan bulan (**T_b**) dengan rumus :

T_b = sin L_C : sin K

= sin 01° 03′ 48.51″ : sin 00º 35' 23.66"

= 1,802719812

= **01º 48' 09.79"**

26. Menghitung waktu gerhana (**T_0**) dengan rumus :

T_0 = [sin 0.05º x T_a x T_b]

= [sin 0.05º x 94º 54' 03.34" x 01º 48' 09.79"]

= 0,149295255

= **$00^j\ 08^m\ 57.46^d$**

27. Menghitung waktu titik tengah gerhana (**Tgh**). Karena harga mutlak Lintang Bulan $L_☾$ semakin membesar, maka menggunakan rumus:

Tgh = Ijtimak - To – Δ T; Δ T adalah koreksi waktu TT menjadi UT

= 10 : 59 : 51.49 - $00^j\ 08^m\ 57.46^d$ - $00^j\ 02^m\ 15.21^d$

= **$10^j\ 48^m\ 38.82^d$**

Δ T = (102.3 + 123.5 x t + 32.5 x t^2) : 3600 (J. Meeus)

t = (2025 -2000) : 100 = 0.25

Δ T = 0,037557292 = **$00^j\ 02^m\ 15.21^d$**

28. Menghitung waktu mulai gerhana dengan rumus :

Mulai Gerhana (P1) = Tgh – T_1

= $10^j\ 48^m\ 38.82^d$ - $01^j\ 54^m\ 17.21^d$

= **$08^j\ 54^m\ 21.62^d$**

29. Menghitung waktu mulai gerhana total dengan rumus :

Mulai Total (U1) = Tgh – T_2

= $10^j\ 48^m\ 38.82^d$ – tidak terhitung

= **tidak terhitung**

30. Menghitung waktu selesai gerhana total dengan rumus :

Selesai Total (U4) = Tgh + T_2

= $10^j\ 48^m\ 38.82^d$ + tidak terhitung

= **tidak terhitung**

31. Menghitung waktu selesai gerhana dengan rumus :

Selesai Gerhana (P4) = Tgh + T_1

= $10^j\ 48^m\ 38.82^d$ + $01^j\ 54^m\ 17.21^d$

= **$12^j\ 42^m\ 56.03^d$**

Kesimpulan :

Gerhana Matahari Sebagian terjadi pada tanggal 29 Maret 2025.

Mulai gerhana (P1)	pukul	$08^j\ 54^m\ 21.62^d$ UT	atau $15^j\ 54^m\ 21.62^d$ WIB
Maksimal gerhana	pukul	$10^j\ 48^m\ 38.82^d$ UT	atau $17^j\ 48^m\ 38.82^d$ WIB
Selesai gerhana (P4)	pukul	$12^j\ 42^m\ 56.03^d$ UT	atau $19^j\ 42^m\ 56.03^d$ WIB

Catatan :

Gerhana Matahari 29 Maret 2025 merupakan jenis gerhana matahari sebagian. Di wilayah Indonesia gerhana ini tidak dapat diamati karena berada di luar jalur gerhana.

CONTOH PERHITUNGAN GERHANA BULAN PADA BULAN RAMADAN 1446 H

Penentuan hisab gerhana bulan dapat dihitung dengan metode ephemeris hisab rukyat dengan menyesuaikan contoh perhitungan sebagai berikut:

1. Konversi tanggal kemungkinan terjadinya gerhana ke kalender Masehi
   Tanggal 15 Ramadan 1446 H atau 15 – 08 – 1446 H

   Waktu yang telah dilalui sebanyak 1445 tahun + 08 bulan + 15 hari

   1445 tahun : 30 tahun = 48 Daur lebih 5 tahun

   48 Daur = 48 x 10.631 hari = 510.288 hari

   5 tahun = (5 x 354) + 2 hari = 1.771 hari

   8 bulan = (8 x 29) + 4 hari = 236 hari

   15 hari = 15 hari +

   JUMLAH = 512.310 hari

   Selisih kalender Masehi – Hijriah = 227.016 hari

   Anggaran baru Gregorius = 13 hari

   JUMLAH = 739.339 hari

   512.133 : 7 = 73.187 lebih 1 = Jum'at (*dihitung mulai Jum'at*)

   512.133 : 5 = 102.462 lebih 0 = Kliwon (*dihitung mulai legi*)

   739.162 : 1461 = 506 siklus lebih 73 hari

   505 siklus = 506 x 4 tahun = 2024 tahun

   73 hari = 2 bulan lebih 14 hari

   Waktu yang dilewati 2024 th + 2 bulan + 14 hari
   Waktu yang sedang berjalan adalah hari ke 14 bulan ke 03 tahun ke 2025.
   Jadi 15 Rabi'ul Awal 1446 H bertepatan dengan **14 Maret 2025 M (Jum'at Kliwon).**

2. Menentukan saat terjadinya oposisi (istiqbal)
   FIB terbesar terjadi pada tanggal 14 Maret 2025 M adalah 0.99999 pada jam 07 UT. Harga mutlak lintang bulan pada kolom *Apparent Latitude* bulan pada saat itu sebesar 0° 18' 57". Harga ini lebih kecil dari 01° 00' 24", sehingga benar akan terjadi gerhana bulan.

   ELM jam 03 = 353° 57′ 01.00″

   ELM jam 04 = 353° 59′ 31.00″ –

   Selisih ($\mathbf{B_1}$) = **00° 02′ 30.00″**

   ALB jam 03 = 173° 58′ 29.00″

ALB jam 04 = 174° 28′ 41.00″ –

Selisih (**B_2**) = **00° 30′ 12.00″**

Istiqbal = (ELM – (ALB + 180°) / (**B_2 - B_1**) + pukul (FIB terkecil)

= 353° 57′ 01.00″ - (173° 58′ 29.00″+ 180°) / 00° 27' 42" + 07:00

= 353° 57′ 01.00″ - 353° 58' 29" / 00º 27' 42" + 07:00

= 06:56:49.39 UT

= 13:56:49.39 WIB

Jadi istiqbal terjadi pada tanggal 14 Maret 2025 M jam 06:56:49.39 UT atau 13:56:49.39 WIB

3. Menentukan waktu gerhana

a) Menentukan harga *Apparent Latitude* Bulan (β_b) pada saat istiqbal jam 06:56:49.39 UT

A Lat B jam 06	= 00° 21′ 45.00″	00° 21′ 45.00″
A Lat B jam 07	= 00° 18′ 57.00″ -	
	00° 02′ 48.00″	
	00° 56’ 49.39” x	
	00° 02′ 39.10″	00° 02′ 39.10″ -
A Lat B jam 06:56:49.39=		**00° 19′ 05.90″**

Harga mutlak A Lat B (β_b) jam 06:56:49.39 = 00° 19′ 05.90″

b). Menentukan batas terjadinya gerhana bulan dengan melihat besarnya A Lat B (β_b)

(1) βb > 1° 36' 38" = tidak mungkin terjadi gerhana

(2) 1° 26' 19" < βb < 1° 36' 38" = mungkin terjadi gerhana penumbral

(3) 1° 03' 46" < βb < 1° 26' 19" = pasti terjadi gerhana penumbral

(4) 0° 53' 26" < βb < 1° 03' 46" = mungkin terjadi gerhana umbral

(5) βb < 0° 53' 26" = pasti terjadi gerhana umbral

Karena harga multak *Apparent Latitude* Bulan (β_b) => βb < 0° 53' 26", pasti terjadi gerhana bulan umbral.

4. $SD_{☾}$ jam 06:56:49.39

$SD_{☾}$ jam 06	= 00° 14′ 53.15″	00° 14′ 53.15″
$SD_{☾}$ jam 07	= 00° 14′ 52.94″ –	
	00° 00′ 00.21″	

00° 56’ 49.39” ×

00° 00′ 00.20″ 00° 00′ 00.20″ –

SD☾ jam 06:56:49.39 = 00° 14′ 52.95″

5. HP☾ jam 06:56:49.39

HP☾ jam 06 = 00° 54′ 38.00″ 00° 54′ 38.00″

HP☾ jam 07 = 01° 54′ 37.00″ –

00° 00′ 01.00″

00° 56’ 49.39” ×

00° 00′ 00.95″ 00° 00′ 00.95″ –

HP☾ jam 06:56:49.39= 00° 54′ 37.05″

6. L☾ **jam 06:56:49.39**

L☾ jam 06 = 00° 21′ 45.00″ 00° 21′ 45.00″

L☾ jam 07 = 00° 18′ 57.00″ -

00° 02′ 48.00″

00° 56’ 49.39” x

00° 02′ 39.10″ 00° 02′ 39.10″ -

L☾ jam 06:56:49.39 = 00° 19′ 05.90″

7. SD☉ jam 06:56:49.39

SD☉ jam 06 = 00° 16′ 05.24″ 00° 16′ 05.24″

SD☉ jam 07 = 00° 16′ 05.23″ –

00° 00′ 00.01″

00° 56’ 49.39” ×

00° 00′ 00.01″ 00° 00′ 00.01″ –

SD☉ jam 06:56:49.39 = 00° 16′ 05.23″

8. Menghitung Jarak Bumi (**JB**) pada kolom *True Geocentric Distance* Matahari pada saat istiqbal jam $02^{j}\ 36^{m}\ 30.06^{d}$

JB jam 06 = 0,9941835 0,9941835

JB jam 07 = 0,9941948 –

-0.0000113

00° 56’ 49.39” ×

- 0.0000106828631 - 0.0000106828631 –

JB jam 06:56:49.39 = 0,9941941828631

9. Menghitung Horizontal Parallaks Matahari ($HP_\odot$)

Sin $HP_\odot$ = sin 08.794" : JB

= 0.0000426345151 : 0,9941941828631

= 0.0000428834888

$HP_\odot$ = 0.0024570429197° = **0° 00' 08,85"**

10. Menghitung jarak bulan dari titik Simpul (H) dengan rumus :

sin H = sin $L_☾$: sin 5°

sin H = sin 00° 19′ 05.90″ : sin 5°

= 0.0055554513951 : 0.0871557427477

H = 3° 39' 16,58"

11. Menghitung lintang bulan maksimum terkoreksi (U) dengan rumus :

tan U = [tan $L_☾$: sin H]

= [tan 00° 19′ 05.90″ : sin 3° 39' 16,58"]

= [0,0055555371261 : 0,0637416569834]

U = 4° 58' 52,12"

12. Menghitung lintang bulan minimum terkoreksi (Z) dengan rumus :

sin Z = [sin U x sin H]

= [sin 4° 58' 52,12" x sin 3° 39' 16,58"]

= [0,0868278987999 x 0,0637416569834]

Z = 0° 19' 01,59"

13. Menghitung koreksi kecepatan bulan relatif terhadap matahari (K) dengan rumus :

K = cos $L_☾$ x SB : cos U

= cos 00° 19′ 05.90″ x 00° 27' 42" : cos 4° 58' 52,12"

= 0,999984568608 x 00° 27' 42" : 0,996223326 3631

K = 0° 27' 35,7°

14. Menghitung besarnya semidiameter bayangan inti bumi (D) dengan rumus :

D = ($HP_☾$ + $HP_\odot$ - $SD_\odot$) x 1,02

D = (00° 54′ 37.05″ + 00° 00' 08,85" - 00° 16′ 05.23″) x 1,02

D = (0° 38' 40,67") x 1,02 = **0° 39' 27,08"**

15. Menghitung jarak titik pusat bayangan inti bumi sampai titik pusat bulan ketika piringan bulan mulai bersentuhan dengan bayangan inti bumi (X) dengan rumus :

X = D + $SD_{☾}$

X = 0° 39' 27,08" + 0° 14′ 52.95″

X = 0° 54' 20,03"

16. Menghitung jarak titik pusat bayangan inti bumi sampai titik pusat bulan ketika seluruh piringan bulan mulai masuk pada bayangan inti bumi (Y) dengan rumus :

Y = D - $SD_{☾}$

Y = 0° 39' 27,08" - 0° 14′ 52.95″

Y = 0° 24' 34,13"

Y (0° 24' 34,13") > Z (0° 19' 01,59"), sehingga terjadi gerhana bulan total.

17. Menghitung jarak titik pusat bulan ketika piringan bulan mulai bersentuhan dengan bayangan inti bumi sampai titik pusat bulan saat segaris dengan bayangan inti bumi (C) dengan rumus:

cos C = cos X : cos Z

= cos 0° 54' 20,03" : cos 0° 19' 01,59"

= 0,9998751024582 : 0,9999846842263

C = 0° 50' 53,63"

18. Menghitung waktu yang diperlukan oleh bulan untuk berjalan mulai ketika piringan bulan bersentuhan dengan bayangan inti bumi sampai ketika titik pusat bulan segaris dengan bayangan inti bumi (T_1) dengan rumus :

T_1 = C : K

T_1 = 0° 50' 53,63" : 0° 27' 35,7°

= $1^j\ 50^m\ 39{,}53^d$

19. Menghitung jarak titik pusat bulan saat segaris dengan bayangan inti bumi sampai titi pusat bulan ketika seluruh piringan bulan masuk pada bayangan inti bumi (E) dengan rumus :

cos E = cos Y : cos Z

= cos 0° 24' 34,13" : cos 0° 19' 01,59"

= 0,9999744618485 : 0,9999846842263

E = 0° 15' 32,65"

20. Menghitung waktu yang diperlukan oleh bulan untuk berjalan mulai titik pusat bulan saat segaris dengan bayangan inti bumi sampai titik pusat bulan ketika seluruh piringan bulan masuk pada bayangan inti bumi (T_2) dengan rumus :

T_2 = E : K

= 0° 15' 32,65" : 0° 27' 35,7°

= **0^j 33^m 47,87^d**

21. Koreksi pertama terhadap kecepatan bulan (Ta) dengan rumus :

Ta = cos H : sin K

= cos 3° 39' 16,58" : sin 0° 27' 35,7°

= 0,9979664328849 : 0,0080269739162

= **124° 19' 35,79"**

22. Koreksi kedua terhadap kecepatan bulan (Tb) dengan rumus :

Tb = sin $L_{☾}$: sin K

= sin 00° 19′ 05,90″ : sin 0° 27' 35,7°

= 0,0055554513951 : 0,0080269739162

= **0° 41' 31,55"**

23. Menghitung waktu gerhana (T0) dengan rumus :

T0 = [sin 0,05° x Ta x Tb]

= [0,0008726645152 x 124° 19' 35,79" x 0° 41' 31,55"]

= **0^j 04^m 30,32^d**

24. Menghitung waktu titik tengah gerhana (Tgh) denga cara : Perhatian lintang bulan ($L_{☾}$) dalam kolom *Apparent Latitude Bulan* pada jam FIB terbesar dan pada satu jam berikutnya. Jika harga mutlak lintang bulan semakin mengecil, maka

Tgh = istiqbal +T0 – Δ T

Jika harga mutlak lintang bulan semakin membesar, maka

Tgh = istiqbal - T0 – Δ T

Karena harga mutlak lintang bulan semakin mengecil dari (0° 18' 57" ke 0° 16' 10"), maka

Tgh = istiqbal +T0 – Δ T

= 06^j 56^m 49.39d + 0^j 04^m 30,32^d - 00^j 02^m 15.21^d

= **06^j 59^m 04,50^d**

25. Menghitung waktu mulai gerhana dengan rumus :

Mulai Gerhana = Tgh - T_1

= 06^j 59^m 04,5^d - 1^j 50^m 39,53^d

= **05^j 08^m 24,97^d**

26. Menghitung waktu mulai gerhana total dengan rumus :

Mulai Total = Tgh – T_2

= $06^j\ 59^m\ 04{,}5^d$ - $00^j\ 33^m\ 47{,}87^d$

= $\mathbf{06^j\ 25^m\ 16{,}63^d}$

27. Menghitung waktu selesai gerhana total dengan rumus :

Selesai Total = Tgh + T_2

= $06^j\ 59^m\ 04{,}5^d$ + $00^j\ 33^m\ 47{,}87^d$

= $\mathbf{07^j\ 32^m\ 52{,}37^d}$

28. Menghitung waktu selesai gerhana dengan rumus :

Selesai Gerhana = Tgh + T_1

= $06^j\ 59^m\ 04{,}5^d$ + $01^j\ 50^m\ 39{,}53^d$

= $\mathbf{08^j\ 49^m\ 44{,}03^d}$

Kesimpulan :

Gerhana Bulan Total tanggal 14 Maret 2025 tidak teramati di Indonesia, karena Bulan letaknya di bawah ufuk.

Mulai Gerhana	pukul	$05^j\ 08^m\ 24{,}97^d$ UT	$12^j\ 08^m\ 24{,}97^d$ WIB
Mulai Total	pukul	$06^j\ 25^m\ 06{,}63^d$ UT	$13^j\ 25^m\ 16{,}63^d$ WIB
Tengah Gerhana (MID)	pukul	$06^j\ 59^m\ 04{,}50^d$ UT	$13^j\ 59^m\ 04{,}50^d$ WIB
Selesai Total	pukul	$07^j\ 32^m\ 52{,}37^d$ UT	$14^j\ 32^m\ 52{,}37^d$ WIB
Selesai Gerhana	pukul	$08^j\ 49^m\ 44{,}03^d$ UT	$15^j\ 49^m\ 44{,}03^d$ WIB

DAFTAR REFRAKSI

h	Refr	h′	h	Refr	h′	h	Refr	h′	h	Refr	h′
-0° 35′	34,5′	0° 00′	2° 14′	16,1′	2° 30′	5° 51′	08,5′	6° 00′	15° 00′	03,5′	15° 04′
-0° 31′	33,8′	0° 03′	2° 19′	15,8′	2° 35′	6° 02′	08,3′	6° 10′	15° 27′	03,4′	15° 30′
-0° 27′	33,2′	0° 06′	2° 24′	15,5′	2° 40′	6° 12′	08,1′	6° 20′	15° 54′	03,3′	15° 57′
-0° 24′	32,6′	0° 09′	2° 30′	15,2′	2° 45′	6° 22′	07,9′	6° 30′	16° 23′	03,2′	16° 26′
-0° 20′	32,0′	0° 12′	2° 35′	14,9′	2° 50′	6° 32′	07,7′	6° 40′	16° 53′	03,1′	16° 56′
-0° 16′	31,4′	0° 15′	2° 40′	14,7′	2° 55′	6° 42′	07,6′	6° 50′	17° 25′	03,0′	17° 28′
-0° 13′	30,8′	0° 18′	2° 46′	14,4′	3° 00′	6° 53′	07,4′	7° 00′	17° 59′	02,9′	18° 02′
-0° 09′	30,3′	0° 21′	2° 51′	14,1′	3° 05′	7° 03′	07,2′	7° 10′	18° 35′	02,8′	18° 38′
-0° 06′	29,8′	0° 24′	2° 56′	13,9′	3° 10′	7° 13′	07,1′	7° 20′	19° 14′	02,7′	19° 17′
-0° 02′	29,2′	0° 27′	3° 01′	13,7′	3° 15′	7° 23′	07,0′	7° 30′	19° 55′	02,6′	19° 58′
+0° 01′	28,7′	0° 30′	3° 07′	13,4′	3° 20′	7° 33′	06,8′	7° 40′	20° 39′	02,5′	20° 42′
+0° 05′	28,2′	0° 33′	3° 12′	13,2′	3° 25′	7° 43′	06,7′	7° 50′	21° 26′	02,4′	21° 28′
0° 08′	27,8′	0° 36′	3° 17′	13,0	3° 30′	7° 53′	06,6′	8° 00′	22° 17′	02,3′	22° 19′
0° 12′	27,3′	0° 39′	3° 22′	12,7	3° 35′	8° 04′	06,4′	8° 10′	23° 11′	02,2′	23° 13′
0° 15′	26,8′	0° 42′	3° 27′	12,5	3° 40′	8° 14′	06,3′	8° 20′	24° 09′	02,1′	24° 11′
0° 19′	26,4′	0° 45′	3° 33′	12,3	3° 45′	8° 24′	06,2′	8° 30′	25° 12′	02,0′	25° 14′
0° 22′	25,9′	0° 48′	3° 38′	12,1	3° 50′	8° 34′	06,1′	8° 40′	26° 20′	01,9′	26° 22′
0° 26′	25,5′	0° 51′	3° 43′	11,9	3° 55′	8° 44′	06,0′	8° 50′	27° 34′	01,8′	27° 36′
0° 29′	25,1′	0° 54′	3° 48′	11,8′	4° 00′	8° 54′	05,9′	9° 00′	28° 54′	01,7′	28° 56′
0° 32′	24,7′	0° 57′	3° 53′	11,6′	4° 05′	9° 04′	05,8′	9° 10′	30° 22′	01,6′	30° 24′
0° 36′	24,3′	1° 00′	3° 59′	11,4′	4° 10′	9° 14′	05,7′	9° 20′	31° 58′	01,5′	32° 00′
0° 39′	24,0′	1° 03′	4° 04′	11,2′	4° 15′	9° 24′	05,6′	9° 30′	33° 44′	01,4′	33° 45′
0° 42′	23,6′	1° 06′	4° 09′	11,1′	4° 20′	9° 34′	05,5′	9° 40′	35° 39′	01,3′	35° 40′
0° 46′	23,2′	1° 09′	4° 14′	10,9′	4° 25′	9° 45′	05,4′	9° 50′	37° 47′	01,2′	37° 48′
0° 49′	22,9′	1° 12′	4° 19′	10,7′	4° 30′	9° 51′	05,3′	9° 56′	40° 07′	01,1′	40° 08′
0° 52′	22,5′	1° 15′	4° 24′	10,6′	4° 35′	10° 03′	05,2′	10° 08′	42° 43′	01,0′	42° 44′
0° 56′	22,2′	1° 18′	4° 30′	10,4′	4° 40′	10° 15′	05,1′	10° 20′	45° 35′	00,9′	45° 36′
0° 59′	21,9′	1° 21′	4° 35′	10,3′	4° 45′	10° 28′	05,0′	10° 33′	48° 46′	00,8′	48° 47′
1° 02′	21,6′	1° 24′	4° 40′	10,1′	4° 50′	10° 41′	04,9′	10° 46′	52° 17′	00,7′	52° 18′
1° 06′	21,2′	1° 27′	4° 45′	10,0′	4° 55′	10° 55′	04,8′	11° 00′	56° 10′	00,6′	56° 11′
1° 09′	20,9′	1° 30′	4° 50′	09,9	5° 00′	11° 09′	04,7′	11° 14′	60° 27′	00,5′	60° 28′
1° 14′	20,5′	1° 35′	4° 55′	09,7	5° 05′	11° 24′	04,6′	11° 29′	65° 08′	00,4′	65° 08′
1° 20′	20,0′	1° 40′	5° 00′	09,6	5° 10′	11° 40′	04,5′	11° 45′	70° 11′	00,3′	70° 11′
1° 25′	19,5′	1° 45′	5° 05′	09,5	5° 15′	11° 57′	04,4′	12° 01′	75° 34′	00,2′	75° 34′
1° 31′	19,1′	1° 50′	5° 11′	09,4	5° 20′	12° 14′	04,3′	12° 18′	81° 13′	00,1′	81° 13′
1° 36′	18,7′	1° 55′	5° 16′	09,2	5° 25′	12° 31′	04,2′	12° 35′	87° 03′	00,0′	87° 03′
1° 42′	18,3′	2° 00′	5° 21′	09,1	5° 30′	12° 50′	04,1′	12° 54′			
1° 47′	17,9′	2° 05′	5° 26′	09,0	5° 35′	13° 09′	04,0′	13° 13′			
1° 52′	17,5′	2° 10′	5° 31′	08,9	5° 40′	13° 29′	03,9′	13° 33′			
1° 58′	17,2′	2° 15′	5° 36′	08,8	5° 45′	13° 50′	03,8′	13° 54′			
2° 03′	16,8′	2° 20′	5° 41′	08,7	5° 50′	14° 12′	03,7′	14° 16′			
2° 08′	16,5′	2° 25′	5° 46′	08,6	5° 55′	14° 36′	03,6′	14° 40′			

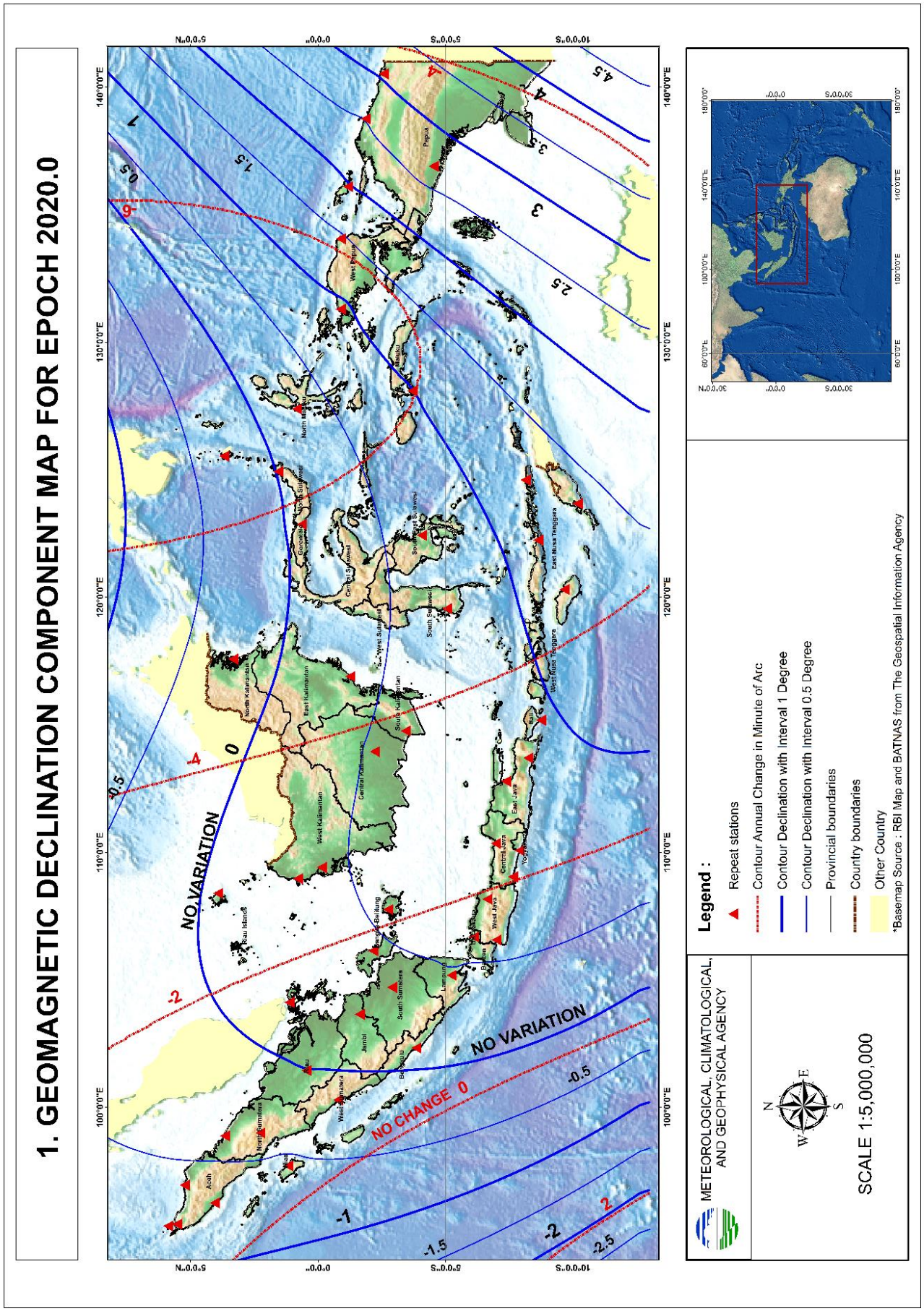
Keterangan:

h = Tinggi Nyata
Refr = Refraksi
h′ = Tinggi Lihat
= h + Refr

DAFTAR KERENDAHAN UFUK

(Berdasarkan rumus D` = 1,76`√ m)

Tinggi (meter)	Rendah Ufuk (′)	Tinggi (meter)	Rendah Ufuk (′)	Tinggi (meter)	Rendah Ufuk (′)	Tinggi (meter)	Rendah Ufuk (′)
1	1,8	34	10,3	160	22,3	475	38,4
2	2,5	36	10,6	170	23,0	500	39,4
3	3,0	38	10,8	180	23,6	525	40,3
4	3,5	40	11,1	190	24,3	550	41,3
5	3,9	45	11,8	200	24,9	575	42,2
6	4,3	50	12,4	210	25,5	600	43,1
7	4,7	55	13,1	220	26,1	625	44,0
8	5,0	60	13,6	230	26,7	650	44,9
9	5,3	65	14,2	240	27,3	675	45,7
10	5,6	70	14,7	250	27,8	700	46,6
12	6,1	75	15,2	260	28,4	725	47,4
14	6,6	80	15,7	270	28,9	750	48,2
16	7,0	85	16,2	280	29,4	775	49,0
18	7,5	90	16,7	290	30,0	800	49,8
20	7,9	95	17,2	300	30,5	825	50,5
22	8,3	100	17,6	325	31,7	850	51,3
24	8,6	110	18,5	350	32,9	875	52,1
26	9,0	120	19,3	375	34,1	900	52,8
28	9,3	130	20,1	400	35,2	925	53,5
30	9,6	140	20,8	425	36,3	950	54,2
32	10,0	150	21,6	450	37,3	975	55,0


1. GEOMAGNETIC DECLINATION COMPONENT MAP FOR EPOCH 2020.0
NO VARIATION
NO CHANGE 0
NO VARIATION
Legend :
Repeat stations
Contour Annual Change in Minute of Arc
Contour Declination with Interval 1 Degree
Contour Declination with Interval 0.5 Degree
Provincial boundaries
Country boundaries
Other Country
*Basemap Source : RBI Map and BATNAS from The Geospatial Information Agency
METEOROLOGICAL, CLIMATOLOGICAL, AND GEOPHYSICAL AGENCY
SCALE 1:5,000,000

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Keputusan Hasil Sinkronisasi Hisab Taqwim Standar Indonesia Tahun 2023 tanggal 14 s.d 16 Maret 2023 bertepatan tanggal 21 s.d 23 Syakban 1444 H di Bali.

Keputusan Musyawarah Jawatan Kuasa Penyelarasan Rukyat dan Taqwim Islam MABIMS Tanggal 1 s.d 5 Juli 1994 di Jakarta.

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