BELLCOMM, INC.
955 L'ENFANT PLAZA NORTH, S.W. WASHINGTON, D.C. 20024

B69 08075

SUBJECT: A Star Finder and Identifier for Use on the Surface of the Moon - Case 310

DATE: September 2, 1969

FROM: D. A. Corey

(NASA-CR-109062) A STAR FINDER AND IDENTIFIER FOR USE ON THE SURFACE OF THE MOON (Bellcomm, Inc.) 70 p

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ABSTRACT

Two versions of a Star Finder and Identifier applicable for a lunar surface observer have been developed. One version is derived from an existing device familiar to earth based navigators. The other version is a new device which features easier readability for an observer located near the equator.

Both versions depict the apparent azimuth and elevation of stars and planets, given an estimate of the observer's position and the time of the observation.

The device is to be used in conjunction with a special almanac, a limited version of which is included.

The devices may be used for planning purposes, that is, to determine at a time prior to the observation what stars will be available for the observation. In addition, they can aid an observer in identifying a visible star when poor visibility precludes the normal method of identifying a star by its relationship to neighboring stars.

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MEMORANDUM FOR FILE

INTRODUCTION

This memorandum describes a device which can help a navigator operating on the lunar surface identify navigation stars and plan his star sights. Typically, such devices are used by earth based navigators for two purposes. First, they enable a navigator to plan a star sight schedule well in advance of the actual time of observation by displaying what stars will be visible and their relative locations. Second, visibility may be restricted by cloud cover at the time of the actual observations and identification of visible stars by location in a constellation may be difficult. In this situation a visible star can often be identified by noting its approximate elevation and azimuth and checking the star finder for that elevation and azimuth.

The Apollo astronauts on the lunar surface face similar problems. Although there are no plans for using lunar surface star sights for determining position, star sights will be used for alignment of the inertial platform. Mission planning activities include determination of what stars will be available for the platform alignment task. It is thought that a visibility problem may exist because of sunlight reflected from LM surfaces into the optics, making it difficult or impossible to see any but the brightest stars. In addition, if the sun appears in a detent of the Alignment Optical Telescope (AOT), it "washes out" any stars visible in that detent. Similarly, the earth "washes out" stars located very near it. The sun will normally be located below the rear detent for Apollo landing missions, but the earth will appear in one or more of the detents for many of the planned Apollo landing sites.

DESCRIPTION OF THE DEVICE - CIRCULAR VERSION

Two versions of the Star Finder and Identifier have been developed. The circular version is based on a device originally invented by Captain G. T. Rude, USC&GS, and later modified by E. B. Collins of the U. S. Navy Hydrographic Office. The current model - known as HO No. 2102-D - is available from several suppliers (among them are Weems and Plath of Annapolis, Md.). The lunar model is identical in form but star positions have been changed to adapt it to a moon-based coordinate system.

The circular Star Finder and Identifier consists of a thin white opaque plastic disc about 8 1/2 inches in diameter, and several clear plastic templates. An angular scale from 0 through 360 degrees is printed around the outside of the disc on both sides. Points and labels representing the star locations are printed on both sides of the disc. (Figures 1A and 1B show the two sides of the disc.) The star locations are plotted on the disc according to their respective lunar right ascensions and lunar declinations. For the purpose of this memorandum, lunar right ascension and lunar declination are defined analogously to the usual right ascension and declination except that the lunar equator is the reference plane and the intersection of the ecliptic with the lunar equator - the lunar equinox - forms the reference direction. The angular scale on the edge of the disc represents the lunar right ascension (measured in degrees). Linear distance from the center represents lunar declination, with one lunar celestial pole represented at the center and the other at the edge of the disc. One side of the disc has the lunar north celestial pole at the center and the other side has the lunar south celestial pole at the center. (Note, however, that the entire celestial sphere is represented on each side of the disc.) A circle printed halfway between the center and the outside of the disc represents the lunar celestial equator.

Any set of stars can be plotted on the disc. The set selected for Figures 1A and 1B (and Figure 3) are the 37 navigation stars in the Apollo star catalog plus the remainder of the stars listed in the 1969 American Ephemeris and Nautical Almanac which have magnitudes numerically less than 2.0. Table 1 presents a list of these stars, their magnitude, and their selenocentric equatorial coordinates.

Relative magnitudes of the stars are represented on the base disc by the symbols used to indicate the star positions.

The symbols are defined as follows:

STAR MAGNITUDE	SYMBOL
$-\infty < \text{magnitude} < 2.0$	●
$2.0 \leq \text{magnitude} < 3.0$	⊙
$3.0 \leq \text{magnitude} < \infty$	.

The coordinate system in which lunar right ascension and declination are defined is a selenocentric equatorial coordinate system with the x-axis pointed towards the mean lunar equinox of July 20, 1969, 0000 hours Greenwich Mean Time, and the z-axis pointed north along the axis of lunar rotation at the same instant of time. For greatest accuracy, it is best to define the coordinate system near the time the device is to be used, though the error incurred by not doing so is small. More will be said of this later in the discussion of the almanac.

The clear plastic templates are called "altitude-azimuth" templates and fit over the base by putting the peg on the disc through the hole at the center of the template. The template is then free to rotate about the center. A different template is provided for each of several different selenographic latitudes. The user selects the template for the latitude nearest his own. The lines printed on the templates represent lines of equal elevation and lines of equal azimuth (see Figures 2A, 2B, 2C and 2D). The outermost elevation line represents the observer's visible horizon and a small cross near the center of the figure represents the observer's zenith. The straight line from the center of the template, through the zenith cross, to the edge of the template represents the observer's north-south line. In use, the arrowhead on the end of this line is aligned with the angle scale printed on the base disc so that the angle indicated corresponds to the observer's local hour angle of the lunar equinox (derived from the local hour angle of the equinox at the prime meridian obtained from an almanac and the observer's estimated longitude). When properly oriented, any of the stars printed on the base which fall within the figure on the template (within the horizon line) are visible to the observer and the apparent azimuth and elevation of the star are indicated by the lines on the template.

The templates can, of course, have additional aids printed on them. The templates in Figures 2A, 2B, 2C and 2D each have six additional curves which represent the limits of visibility through each of the six detents of the Lunar Module AOT. These curves were plotted assuming that the Lunar Module lands level (body x-axis along the local vertical) and with a landing azimuth of 270 degrees (body z-axis 270 degrees from local north). Except for certain special cases, it is difficult

to visualize how the detent visibility curves should be adjusted for a LM in an attitude significantly different from the particular attitude assumed when the plots are made. The altitude - azimuth data is more dependable since it does not depend on LM attitude.

Each of the templates can be used for an observer at either the north or south latitude of the appropriate value. An observer at 2 degrees north latitude, for example, should use the side of the base disc with north at the center and place the template such that the label "2° NORTH" appears correctly. The label "2° SOUTH" will appear to be printed backwards. Similarly, two sets of numbers are printed on the template as labels for the lines. One set will appear to be printed backwards and is not used by the observer.

DESCRIPTION OF THE DEVICE - RECTANGULAR VERSION

The other version of the device performs the same function but it is not based on any device known by the author. In this version, the base consists of a white opaque plastic rectangle. The star positions are plotted on the base, again with respect to their lunar right ascension and declination. In this case, both lunar right ascension and lunar declination are plotted as rectangular coordinates with right ascension plotted lengthwise on the rectangle and declination plotted vertically (see Figure 3). The top of the rectangle represents the lunar north pole, the bottom the lunar south pole, and a line halfway between represents the lunar equator. A scale printed along the bottom represents right ascension from 0° through 360°. For convenience in use, the scale and star plots are repeated to the right of the first plot. Again, several templates are provided for observers at different latitudes. Lines of equal azimuth and elevation and labels are printed on the clear plastic templates. (See Figures 4A, 4B, 4C, and 4D). The outermost curve on the figure represents the visible horizon and the vertical lines in the center of the figures represent the observer's north-south line. The template is formed as a sleeve which slips onto the base rectangle and is free to slide left and right along the base. In use, the arrow on the bottom of the north-south line is set on the right ascension scale to the value of the local hour angle of the lunar equinox. As before, the lines on the template indicate the apparent azimuth and elevation of the stars located beneath them on the base rectangle. The limits of visiblity through the Lunar Module AOT detents are indicated on Figures 4A - 4D.

Again, the same template can be used for an observer located at either south or north latitude of the same numerical value. An observer located at 2 degrees north, for example, should place the template on the base so that the label "2° NORTH" appears right side up and the label "2° SOUTH" appears upside down. The numbers printed right side up are then correct.

The advantage of this version is that the template is a little easier to read for an observer near the equator.

Note that this version of the device can also be adapted to work for an earth-based navigator.

THE ALMANAC

In order to use the Star Finder, knowledge of the observer's local hour angle of the lunar equinox is required just as the local hour angle of the equinox is required to use the earth-based device. The local hour angle of the lunar equinox is derived from the local hour angle of the lunar equinox at the lunar prime meridian (0 degrees selenographic longitude) for the time of the observation and an estimate of the observer's selenographic longitude. The first figure, which will be called the "Prime Hour Angle of the Equinox" (PHAE), is obtained from an accompanying almanac. A sample almanac is presented in Table II for the July 1969 through January 1970 period. The PHAE is referenced to the mean lunar equinox of the same date as the selenocentric coordinate system used to define the star locations. The PHAE entries in the almanac were determined in the following manner. The PHAE for the reference date, in this case July 20, 1969, 0000 hours GMT, is determined from lunar ephemeris data. It is then propagated to other dates and times by applying a constant angular rotation rate which represents the inertial rate of rotation of the moon. The effects of physical libration, which are completely negligible for the purposes of the Star Finder, are ignored.

The almanac also provides data for including the locations of the Sun, Earth, Mars, Venus, Saturn and Jupiter on the Star Finder. Because of the comparatively rapid movement of these bodies, their locations at the time of the intended observation must be plotted on the star finder base by the user. Right ascension and declination data for these bodies is provided with each PHAE entry in the almanac. This data was derived from the JPL ephemeris tapes (DE19) and rotated into the same coordinate system used to plot the star locations on the Star Finder base. A separate template is provided to facilitate plotting the locations of these bodies. See Figures 5A and 5B. These templates fit the star finder base in the same manner as the altitude - azimuth templates. The zero degree meridian lines on the templates have an arrow which is to be used with the right ascension scale on the base. Along the zero meridian line is a declination scale and a portion of the template is cut out adjacent to the line to facilitate plotting directly on the star finder base.

The periodic precession of the lunar rotational axis about the north pole of the ecliptic will cause some error when the devices are used for an observation date substantially different from the date used to define the selenocentric equatorial coordinate system. A maximum error of about three degrees will be present for an observation date nine years after the reference coordinate system date. The maximum error becomes very nearly zero about eighteen years after the reference coordinate system date. The sun and planetary data presented in the almanac does not suffer from this error but correcting the star data would require re-plotting the star positions on the base.

INSTRUCTIONS AND EXAMPLES

To Find or Identify Celestial Bodies

Determine from the almanac the PHAE (local hour angle of the lunar equinox at the prime meridian) for the date and time closest to the time of observation. Convert PHAE to LHAE (local hour angle of the lunar equinox) by subtracting west longitude or adding east longitude. Select the azimuth-elevation template for the latitude nearest the observer's position. In the case of the circular star finder, center the template over the star base so that the template and star base conform to the hemisphere of the observer. In the case of the rectangular star finder, fit the template on the star base so that the latitude label corresponding to the observer's latitude is read right side up. Rotate or slide the template until the arrow is over LHAE. The approximate altitude and azimuth of celestial bodies above the horizon are then indicated by the curves. Example - July 20, 1969, 1800 hours GMT, latitude - .6°N, estimated longitude - 23.65°E. Find altitude and azimuth of navigational stars in or near the forward AOT detents.

GMT	18:00 July 20
PHAE	198.44
Long.	23.65 E (add)
LHAE	222.09

Select the template for 0° latitude, place it on the star base and set arrow on 0°-180° azimuth line on 222.09°. The following stars appear in the front detents

STAR NAME	AZIMUTH (degrees)	ELEVATION (degrees)
DIPHDA	236	50
ENIF	293	22
FOMALHAUT	246	24
ALPHERATZ	320	55
ACAMAR	189	35
NAVI	4	41
ACHERNAR	204	18

To Plot Sun, Earth, Planets, or Additional Stars

Determine from the almanac the body's lunar declination and lunar right ascension. Place the plotting template on the star finder base. (In the case of the circular star finder, be certain that the side of the star base conforms to the observers hemisphere (N or S)). Adjust the template so that the arrow on the 0° meridian line is on the correct right ascension. Plot the body on the 0° meridian using the declination scale. Be certain that bodies are plotted on the proper side of the celestial equator (north declination towards north pole and vice versa).

If the Earth is plotted on the star finders for the time and date given in the example, it can be determined that for the observer's position in that example, the earth is visible at an elevation of 59° and an azimuth of 272°.

D. A. Corey

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Attachments
Tables I and II
Figures 1A - 5B

TABLE I

STARS PLOTTED ON THE STAR FINDERS

COMMON NAME	BAYER NAME	RIGHT ASCENSION (DEGREES)	DECLINATION (DEGREES)	MAGNITUDE	APOLLO STAR
ALKAID	η Ursae Majoris	3.36	54.33	1.9	X
GIENAH	γ Corvi	14.62	-14.89	2.8	X
SPICA	α Virginis	28.07	- 2.78	1.2	X
ARCTURUS	α Bootis	30.01	29.31	0.2	X
MIAPLACIDUS	β Carinae	32.17	-49.73	1.8	
GACRUX	γ Crucis	39.70	-48.83	1.6	
MIMOSA	β Crucis	44.67	-49.73	1.5	
ACRUX	α Crucis	44.70	-53.97	1.0	X
MENKENT	θ Centari	46.15	-23.19	2.3	X
ALPHECCA	α Coronae Bor.	47.58	43.20	2.3	X
HADAR	β Centauri	57.26	-45.44	0.9	
RIGEL KENT.	α Centauri	63.15	-43.97	0.1	
ANTARES	α Scorpii	74.00	- 6.05	1.2	X
ATRIA	α Triang. Aust.	85.04	-47.68	1.9	X

COMMON NAME	BAYER NAME	RIGHT ASCENSION (DEGREES)	DECLINATION (DEGREES)	MAGNITUDE	APOLLO STAR
RASALHAGUE	α Ophiuchi	86.79	34.30	2.1	X
SHAULA	λ Scorpii	88.86	-15.33	1.7	
NUNKI	σ Sagittarii	106.70	- 4.92	2.1	X
VEGA	α Lyrae	108.68	60.28	0.1	X
PEACOCK	α Pavonis	118.65	-37.62	2.1	X
ALTAIR	α Aquilae	125.56	28.05	0.9	X
DABIH	β Capricorni	128.26	3.38	3.2	X
ENIF	ε Pegasi	155.60	21.47	2.5	X
DENEB	α Cygni	157.17	59.34	1.3	X
FOMALHAUT	α Piscis Aust.	158.70	-21.70	1.3	X
ACHERNAR	α Eridani	172.17	-59.62	0.6	X
DIPHDA	β Ceti	187.44	-20.59	2.2	X
ALPHERATZ	α Andromedae	197.88	26.16	2.1	X
ACAMAR	θ Eridani	209.38	-53.00	3.4	X
NAVI	γ Cassiopeiae	227.00	49.95	2.2*	X

*Irregular variable

COMMON NAME	BAYER NAME	RIGHT ASCENSION (DEGREES)	DECLINATION (DEGREES)	MAGNITUDE	APOLLO STAR
MENKAR	α Ceti	228.82	-11.43	2.8	X
MIRFAR	α Persei	245.99	31.53	1.9	X
ALDEBARAN	α Tauri	254.11	- 3.99	1.1	X
RIGEL	β Orionis	261.25	-29.60	0.3	X
BELLATRIX	γ Orionis	265.27	-15.28	1.7	
CAPELLA	α Aurigae	266.09	24.40	0.2	X
ELNATH	β Tauri	266.85	6.92	1.8	
ALNILAM	ε Orionis	267.77	-22.97	1.8	
BETELGEUSE	α Orionis	273.01	-14.49	**	
POLARIS	α Ursae Minoris	273.03	67.64	2.1	
ALHENA	γ Geminorum	283.35	- 5.24	1.9	
CANOPUS	α Carinae	287.43	-74.36	-0.9	X
SIRIUS	α Canis Majoris	287.98	-38.13	-1.6	X
ADHARA	ε Canis Majoris	294.26	-49.96	1.6	
CASTOR	α Geminorum	294.65	11.50	1.6	

**Variable 0.1 - 1.2

COMMON NAME	BAYER NAME	RIGHT ASCENSION (DEGREES)	DECLINATION (DEGREES)	MAGNITUDE	APOLLO STAR
POLLUX	β Geminorum	297.59	8.05	1.2	
PROCYON	α Canis Minoris	299.86	-14.68	0.5	X
DNOCES	i Ursae Majoris	307.63	30.80	3.1	X
REGOR	γ Velorum	328.88	-63.70	1.9	X
ALPHARD	α Hydrae	331.02	-21.64	2.2	X
REGULUS	α Leonis	334.13	1.14	1.3	X
ALIOTH	ε Ursae Majoris	345.29	54.74	1.7	
AVIOR	ε Carinae	352.51	-72.54	1.7	
DENEBOLA	β Leonis	356.24	12.38	2.2	X

TABLE II

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * JULY 1969 * * * *

GMT DATE	GMT HOUR	EQUINOX PHAE	SUN DEC	SUN RA	EARTH DEC	EARTH RA	VENUS DEC	VENUS RA	MARS DEC	MARS RA	JUPITER DEC	JUPITER RA	SATURN DEC	SATURN RA
19	0	175.38	1.33	300.59	-.97	169.08	-1.03	257.46	-4.83	67.22	1.10	4.70	-1.39	222.37
19	1	175.93	1.33	300.63	-.91	169.59	-1.02	257.50	-4.83	67.22	1.10	4.70	-1.39	222.38
19	2	176.48	1.33	300.67	-.85	170.09	-1.02	257.55	-4.83	67.23	1.10	4.71	-1.39	222.38
19	3	177.03	1.33	300.71	-.80	170.60	-1.02	257.60	-4.83	67.23	1.10	4.72	-1.39	222.38
19	4	177.58	1.33	300.74	-.74	171.11	-1.02	257.64	-4.83	67.24	1.10	4.72	-1.39	222.38
19	5	178.13	1.33	300.78	-.68	171.62	-1.02	257.69	-4.83	67.24	1.10	4.73	-1.39	222.39
19	6	178.68	1.32	300.82	-.62	172.13	-1.01	257.73	-4.83	67.25	1.10	4.73	-1.39	222.39
19	7	179.23	1.32	300.86	-.56	172.64	-1.01	257.78	-4.83	67.25	1.10	4.74	-1.39	222.39
19	8	179.78	1.32	300.90	-.50	173.15	-1.01	257.83	-4.83	67.26	1.10	4.74	-1.39	222.39
19	9	180.32	1.32	300.94	-.44	173.66	-1.01	257.87	-4.83	67.26	1.10	4.75	-1.39	222.40
19	10	180.87	1.32	300.98	-.38	174.18	-1.01	257.92	-4.83	67.27	1.10	4.76	-1.39	222.40
19	11	181.42	1.32	301.02	-.32	174.69	-1.00	257.96	-4.83	67.27	1.10	4.76	-1.39	222.40
19	12	181.97	1.32	301.05	-.26	175.20	-1.00	258.01	-4.83	67.28	1.10	4.77	-1.39	222.40
19	13	182.52	1.32	301.09	-.20	175.71	-1.00	258.06	-4.83	67.29	1.10	4.77	-1.39	222.40
19	14	183.07	1.32	301.13	-.14	176.23	-1.00	258.10	-4.83	67.29	1.10	4.78	-1.39	222.41
19	15	183.62	1.32	301.17	-.08	176.74	-1.00	258.15	-4.83	67.30	1.10	4.78	-1.39	222.41
19	16	184.17	1.32	301.21	-.02	177.26	-.99	258.20	-4.83	67.30	1.10	4.79	-1.39	222.41
19	17	184.72	1.32	301.25	.04	177.77	-.99	258.24	-4.83	67.31	1.10	4.80	-1.39	222.41
19	18	185.27	1.32	301.29	.10	178.29	-.99	258.29	-4.83	67.31	1.10	4.80	-1.39	222.42
19	19	185.81	1.32	301.33	.16	178.80	-.99	258.33	-4.83	67.32	1.10	4.81	-1.39	222.42
19	20	186.36	1.32	301.37	.22	179.32	-.99	258.38	-4.83	67.32	1.10	4.81	-1.39	222.42
19	21	186.91	1.32	301.40	.28	179.83	-.98	258.43	-4.83	67.33	1.09	4.82	-1.39	222.42
19	22	187.46	1.32	301.44	.34	180.35	-.98	258.47	-4.83	67.33	1.09	4.83	-1.39	222.43
19	23	188.01	1.32	301.48	.40	180.87	-.98	258.52	-4.83	67.34	1.09	4.83	-1.39	222.43
20	0	188.56	1.32	301.52	.46	181.39	-.98	258.57	-4.83	67.35	1.09	4.84	-1.39	222.43
20	1	189.11	1.32	301.56	.52	181.91	-.98	258.61	-4.83	67.35	1.09	4.84	-1.39	222.43
20	2	189.66	1.32	301.60	.58	182.42	-.97	258.66	-4.83	67.36	1.09	4.85	-1.39	222.44
20	3	190.21	1.32	301.64	.64	182.94	-.97	258.70	-4.83	67.36	1.09	4.85	-1.39	222.44
20	4	190.76	1.32	301.68	.70	183.47	-.97	258.75	-4.83	67.37	1.09	4.86	-1.39	222.44
20	5	191.30	1.31	301.72	.76	183.99	-.97	258.80	-4.83	67.37	1.09	4.87	-1.39	222.44
20	6	191.85	1.31	301.76	.82	184.51	-.97	258.84	-4.83	67.38	1.09	4.87	-1.39	222.45
20	7	192.40	1.31	301.79	.88	185.03	-.96	258.89	-4.83	67.38	1.09	4.88	-1.40	222.45
20	8	192.95	1.31	301.83	.95	185.55	-.96	258.94	-4.83	67.39	1.09	4.88	-1.40	222.45
20	9	193.50	1.31	301.87	1.01	186.07	-.96	258.98	-4.83	67.39	1.09	4.89	-1.40	222.45
20	10	194.05	1.31	301.91	1.07	186.60	-.96	259.03	-4.83	67.40	1.09	4.89	-1.40	222.45
20	11	194.60	1.31	301.95	1.13	187.12	-.95	259.08	-4.83	67.41	1.09	4.90	-1.40	222.46
20	12	195.15	1.31	301.99	1.19	187.65	-.95	259.12	-4.83	67.41	1.09	4.91	-1.40	222.46
20	13	195.70	1.31	302.03	1.25	188.17	-.95	259.17	-4.83	67.42	1.09	4.91	-1.40	222.46
20	14	196.25	1.31	302.07	1.31	188.70	-.95	259.22	-4.83	67.42	1.09	4.92	-1.40	222.46
20	15	196.79	1.31	302.11	1.37	189.22	-.95	259.26	-4.83	67.43	1.09	4.92	-1.40	222.47
20	16	197.34	1.31	302.15	1.43	189.75	-.94	259.31	-4.83	67.43	1.09	4.93	-1.40	222.47
20	17	197.89	1.31	302.19	1.49	190.28	-.94	259.36	-4.83	67.44	1.09	4.94	-1.40	222.47
20	18	198.44	1.31	302.23	1.55	190.81	-.94	259.40	-4.83	67.44	1.09	4.94	-1.40	222.47
20	19	198.99	1.31	302.26	1.61	191.34	-.94	259.45	-4.83	67.45	1.09	4.95	-1.40	222.48
20	20	199.54	1.31	302.30	1.67	191.87	-.94	259.50	-4.83	67.46	1.09	4.95	-1.40	222.48
20	21	200.09	1.31	302.34	1.73	192.40	-.93	259.54	-4.83	67.46	1.09	4.96	-1.40	222.48
20	22	200.64	1.31	302.38	1.79	192.93	-.93	259.59	-4.83	67.47	1.09	4.96	-1.40	222.48
20	23	201.19	1.31	302.42	1.85	193.46	-.93	259.64	-4.83	67.47	1.09	4.97	-1.40	222.49

TABLE II

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * JULY 1969 * * * *

GMT DATE	GMT HOUR	EQUINOX PHAE	SUN DEC	SUN RA	EARTH DEC	EARTH RA	VENUS DEC	VENUS RA	MARS DEC	MARS RA	JUPITER DEC	JUPITER RA	SATURN DEC	SATURN RA
21	0	201.74	1.31	302.46	1.91	193.99	-.93	259.68	-4.83	67.48	1.09	4.98	-1.40	222.49
21	1	202.28	1.31	302.50	1.97	194.52	-.93	259.73	-4.83	67.48	1.09	4.98	-1.40	222.49
21	2	202.83	1.31	302.54	2.03	195.06	-.92	259.78	-4.83	67.49	1.09	4.99	-1.40	222.49
21	3	203.38	1.31	302.58	2.09	195.59	-.92	259.82	-4.83	67.49	1.09	4.99	-1.40	222.49
21	4	203.93	1.30	302.62	2.14	196.13	-.92	259.87	-4.83	67.50	1.09	5.00	-1.40	222.50
21	5	204.48	1.30	302.66	2.20	196.66	-.92	259.92	-4.83	67.50	1.09	5.01	-1.40	222.50
21	6	205.03	1.30	302.70	2.26	197.20	-.92	259.96	-4.83	67.51	1.09	5.01	-1.40	222.50
21	7	205.58	1.30	302.73	2.32	197.73	-.91	260.01	-4.83	67.52	1.09	5.02	-1.40	222.50
21	8	206.13	1.30	302.77	2.38	198.27	-.91	260.06	-4.83	67.52	1.09	5.02	-1.40	222.51
21	9	206.68	1.30	302.81	2.44	198.81	-.91	260.10	-4.83	67.53	1.09	5.03	-1.40	222.51
21	10	207.23	1.30	302.85	2.50	199.35	-.91	260.15	-4.83	67.53	1.09	5.04	-1.40	222.51
21	11	207.77	1.30	302.89	2.56	199.89	-.91	260.20	-4.83	67.54	1.08	5.04	-1.40	222.51
21	12	208.32	1.30	302.93	2.61	200.43	-.90	260.24	-4.83	67.54	1.08	5.05	-1.40	222.52
21	13	208.87	1.30	302.97	2.67	200.97	-.90	260.29	-4.83	67.55	1.08	5.05	-1.40	222.52
21	14	209.42	1.30	303.01	2.73	201.51	-.90	260.34	-4.83	67.56	1.08	5.06	-1.40	222.52
21	15	209.97	1.30	303.05	2.79	202.05	-.90	260.38	-4.83	67.56	1.08	5.06	-1.40	222.52
21	16	210.52	1.30	303.09	2.84	202.59	-.90	260.43	-4.83	67.57	1.08	5.07	-1.40	222.52
21	17	211.07	1.30	303.13	2.90	203.14	-.89	260.48	-4.83	67.57	1.08	5.08	-1.40	222.53
21	18	211.62	1.30	303.17	2.96	203.68	-.89	260.52	-4.83	67.58	1.08	5.08	-1.40	222.53
21	19	212.17	1.30	303.21	3.02	204.23	-.89	260.57	-4.83	67.58	1.08	5.09	-1.40	222.53
21	20	212.72	1.30	303.25	3.07	204.77	-.89	260.62	-4.83	67.59	1.08	5.09	-1.40	222.53
21	21	213.27	1.30	303.29	3.13	205.32	-.88	260.67	-4.83	67.59	1.08	5.10	-1.40	222.54
21	22	213.81	1.30	303.33	3.19	205.87	-.88	260.71	-4.83	67.60	1.08	5.11	-1.40	222.54
21	23	214.36	1.30	303.36	3.24	206.41	-.88	260.76	-4.83	67.61	1.08	5.11	-1.40	222.54
22	0	214.91	1.30	303.40	3.30	206.96	-.88	260.81	-4.83	67.61	1.08	5.12	-1.40	222.54
22	1	215.46	1.29	303.44	3.35	207.51	-.88	260.85	-4.83	67.62	1.08	5.12	-1.40	222.55
22	2	216.01	1.29	303.48	3.41	208.06	-.87	260.90	-4.83	67.62	1.08	5.13	-1.40	222.55
22	3	216.56	1.29	303.52	3.46	208.61	-.87	260.95	-4.83	67.63	1.08	5.14	-1.40	222.55
22	4	217.11	1.29	303.56	3.52	209.16	-.87	260.99	-4.83	67.63	1.08	5.14	-1.40	222.55
22	5	217.66	1.29	303.60	3.57	209.72	-.87	261.04	-4.83	67.64	1.08	5.15	-1.40	222.55
22	6	218.21	1.29	303.64	3.63	210.27	-.87	261.09	-4.83	67.65	1.08	5.15	-1.40	222.56
22	7	218.76	1.29	303.68	3.68	210.82	-.86	261.14	-4.83	67.65	1.08	5.16	-1.40	222.56
22	8	219.30	1.29	303.72	3.74	211.38	-.86	261.18	-4.83	67.66	1.08	5.17	-1.40	222.56
22	9	219.85	1.29	303.76	3.79	211.94	-.86	261.23	-4.83	67.66	1.08	5.17	-1.40	222.56
22	10	220.40	1.29	303.80	3.84	212.49	-.86	261.28	-4.83	67.67	1.08	5.18	-1.40	222.57
22	11	220.95	1.29	303.84	3.89	213.05	-.86	261.32	-4.83	67.67	1.08	5.18	-1.40	222.57
22	12	221.50	1.29	303.88	3.95	213.61	-.85	261.37	-4.83	67.68	1.08	5.19	-1.40	222.57
22	13	222.05	1.29	303.92	4.00	214.17	-.85	261.42	-4.83	67.69	1.08	5.20	-1.40	222.57
22	14	222.60	1.29	303.96	4.05	214.72	-.85	261.47	-4.83	67.69	1.08	5.20	-1.40	222.58
22	15	223.15	1.29	304.00	4.10	215.28	-.85	261.51	-4.83	67.70	1.08	5.21	-1.40	222.58
22	16	223.70	1.29	304.04	4.15	215.85	-.85	261.56	-4.83	67.70	1.08	5.21	-1.40	222.58
22	17	224.25	1.29	304.08	4.21	216.41	-.84	261.61	-4.83	67.71	1.08	5.22	-1.40	222.58
22	18	224.79	1.29	304.12	4.26	216.97	-.84	261.66	-4.83	67.72	1.08	5.23	-1.40	222.58
22	19	225.34	1.29	304.16	4.31	217.53	-.84	261.70	-4.83	67.72	1.08	5.23	-1.40	222.59
22	20	225.89	1.29	304.20	4.36	218.10	-.84	261.75	-4.83	67.73	1.08	5.24	-1.40	222.59
22	21	226.44	1.29	304.24	4.41	218.66	-.84	261.80	-4.83	67.73	1.08	5.24	-1.40	222.59
22	22	226.99	1.29	304.28	4.46	219.23	-.83	261.84	-4.83	67.74	1.08	5.25	-1.40	222.59
22	23	227.54	1.29	304.32	4.56	219.80	-.83	261.89	-4.83	67.74	1.08	5.26	-1.40	222.60

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * JULY 1969 * * * *

GMT DATE	GMT HOUR	EQUINOX PHAE	SUN DEC	SUN RA	EARTH DEC	EARTH RA	VENUS DEC	VENUS RA	MARS DEC	MARS RA	JUPITER DEC	JUPITER RA	SATURN DEC	SATURN RA
23	0	228.09	1.28	304.36	4.55	220.36	-.83	261.94	-4.83	67.75	1.08	5.26	-1.40	222.60
23	1	228.64	1.28	304.40	4.60	220.93	-.83	261.99	-4.83	67.76	1.07	5.27	-1.40	222.60
23	2	229.19	1.28	304.43	4.65	221.50	-.83	262.03	-4.83	67.76	1.07	5.27	-1.40	222.60
23	3	229.74	1.28	304.47	4.70	222.07	-.82	262.08	-4.83	67.77	1.07	5.28	-1.40	222.60
23	4	230.28	1.28	304.51	4.74	222.64	-.82	262.13	-4.83	67.77	1.07	5.29	-1.40	222.61
23	5	230.83	1.28	304.55	4.79	223.21	-.82	262.18	-4.83	67.78	1.07	5.29	-1.40	222.61
23	6	231.38	1.28	304.59	4.84	223.79	-.82	262.22	-4.83	67.79	1.07	5.30	-1.40	222.61
23	7	231.93	1.28	304.63	4.88	224.36	-.81	262.27	-4.83	67.79	1.07	5.31	-1.40	222.61
23	8	232.48	1.28	304.67	4.93	224.93	-.81	262.32	-4.83	67.80	1.07	5.31	-1.40	222.62
23	9	233.03	1.28	304.71	4.97	225.51	-.81	262.37	-4.83	67.80	1.07	5.32	-1.40	222.62
23	10	233.58	1.28	304.75	5.02	226.08	-.81	262.41	-4.83	67.81	1.07	5.32	-1.40	222.62
23	11	234.13	1.28	304.79	5.06	226.66	-.81	262.46	-4.83	67.82	1.07	5.33	-1.40	222.62
23	12	234.68	1.28	304.83	5.10	227.24	-.80	262.51	-4.83	67.82	1.07	5.34	-1.40	222.62
23	13	235.23	1.28	304.87	5.15	227.81	-.80	262.55	-4.83	67.83	1.07	5.34	-1.40	222.63
23	14	235.77	1.28	304.91	5.19	228.39	-.80	262.60	-4.83	67.83	1.07	5.35	-1.40	222.63
23	15	236.32	1.28	304.95	5.23	228.97	-.80	262.65	-4.83	67.84	1.07	5.35	-1.40	222.63
23	16	236.87	1.27	304.99	5.27	229.55	-.80	262.70	-4.83	67.85	1.07	5.36	-1.40	222.63
23	17	237.42	1.27	305.03	5.31	230.14	-.79	262.74	-4.83	67.85	1.07	5.37	-1.40	222.64
23	18	237.97	1.27	305.07	5.36	230.72	-.79	262.79	-4.83	67.86	1.07	5.37	-1.40	222.64
23	19	238.52	1.27	305.11	5.40	231.30	-.79	262.84	-4.83	67.87	1.07	5.38	-1.40	222.64
23	20	239.07	1.27	305.15	5.43	231.88	-.79	262.89	-4.83	67.87	1.07	5.38	-1.40	222.64
23	21	239.62	1.27	305.19	5.47	232.47	-.79	262.93	-4.83	67.88	1.07	5.39	-1.40	222.64
23	22	240.17	1.27	305.23	5.51	233.05	-.78	262.98	-4.83	67.88	1.07	5.40	-1.40	222.65
23	23	240.72	1.27	305.27	5.55	233.64	-.78	263.03	-4.83	67.89	1.07	5.40	-1.40	222.65
24	0	241.26	1.27	305.31	5.59	234.23	-.78	263.08	-4.83	67.90	1.07	5.41	-1.40	222.65
24	1	241.81	1.27	305.35	5.63	234.82	-.78	263.13	-4.83	67.90	1.07	5.42	-1.40	222.65
24	2	242.36	1.27	305.39	5.66	235.40	-.78	263.17	-4.83	67.91	1.07	5.42	-1.41	222.65
24	3	242.91	1.27	305.43	5.70	235.99	-.77	263.22	-4.83	67.92	1.07	5.43	-1.41	222.66
24	4	243.46	1.27	305.47	5.73	236.58	-.77	263.27	-4.83	67.92	1.07	5.43	-1.41	222.66
24	5	244.01	1.27	305.51	5.77	237.17	-.77	263.32	-4.83	67.93	1.07	5.44	-1.41	222.66
24	6	244.56	1.27	305.55	5.80	237.77	-.77	263.36	-4.83	67.93	1.07	5.45	-1.41	222.66
24	7	245.11	1.27	305.59	5.84	238.36	-.77	263.41	-4.83	67.94	1.07	5.45	-1.41	222.67
24	8	245.66	1.27	305.63	5.87	238.95	-.76	263.46	-4.83	67.95	1.07	5.46	-1.41	222.67
24	9	246.21	1.27	305.67	5.90	239.55	-.76	263.51	-4.83	67.95	1.07	5.46	-1.41	222.67
24	10	246.76	1.26	305.71	5.93	240.14	-.76	263.55	-4.83	67.96	1.07	5.47	-1.41	222.67
24	11	247.30	1.26	305.75	5.96	240.74	-.76	263.60	-4.83	67.97	1.07	5.48	-1.41	222.67
24	12	247.85	1.26	305.79	5.99	241.33	-.76	263.65	-4.83	67.97	1.07	5.48	-1.41	222.68
24	13	248.40	1.26	305.83	6.02	241.93	-.75	263.70	-4.83	67.98	1.07	5.49	-1.41	222.68
24	14	248.95	1.26	305.87	6.05	242.53	-.75	263.74	-4.83	67.99	1.06	5.50	-1.41	222.68
24	15	249.50	1.26	305.91	6.08	243.13	-.75	263.79	-4.83	67.99	1.06	5.50	-1.41	222.68
24	16	250.05	1.26	305.95	6.11	243.73	-.75	263.84	-4.83	68.00	1.06	5.51	-1.41	222.68
24	17	250.60	1.26	306.00	6.14	244.33	-.75	263.89	-4.83	68.01	1.06	5.51	-1.41	222.69
24	18	251.15	1.26	306.04	6.17	244.93	-.74	263.94	-4.83	68.01	1.06	5.52	-1.41	222.69
24	19	251.70	1.26	306.08	6.19	245.53	-.74	263.98	-4.83	68.02	1.06	5.53	-1.41	222.69
24	20	252.25	1.26	306.12	6.22	246.13	-.74	264.03	-4.83	68.03	1.06	5.53	-1.41	222.69
24	21	252.79	1.26	306.16	6.24	246.74	-.74	264.08	-4.83	68.03	1.06	5.54	-1.41	222.69
24	22	253.34	1.26	306.20	6.27	247.34	-.74	264.13	-4.83	68.04	1.06	5.55	-1.41	222.70
24	23	253.89	1.26	306.24	6.29	247.94	-.73	264.17	-4.83	68.05	1.06	5.55	-1.41	222.70

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * JULY 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
25	0	254.44	1.26	306.28	6.31	248.55	-.73	264.22	-4.83	68.05	1.06	5.56	-1.41	222.70
25	1	254.99	1.26	306.32	6.34	249.16	-.73	264.27	-4.83	68.06	1.06	5.57	-1.41	222.70
25	2	255.54	1.26	306.36	6.36	249.76	-.73	264.32	-4.83	68.07	1.06	5.57	-1.41	222.71
25	3	256.09	1.25	306.40	6.38	250.37	-.73	264.36	-4.83	68.07	1.06	5.58	-1.41	222.71
25	4	256.64	1.25	306.44	6.40	250.98	-.72	264.41	-4.83	68.08	1.06	5.58	-1.41	222.71
25	5	257.19	1.25	306.48	6.42	251.59	-.72	264.46	-4.83	68.09	1.06	5.59	-1.41	222.71
25	6	257.74	1.25	306.52	6.44	252.20	-.72	264.51	-4.83	68.09	1.06	5.60	-1.41	222.71
25	7	258.28	1.25	306.56	6.45	252.81	-.72	264.56	-4.83	68.10	1.06	5.60	-1.41	222.72
25	8	258.83	1.25	306.60	6.47	253.42	-.72	264.60	-4.83	68.11	1.06	5.61	-1.41	222.72
25	9	259.38	1.25	306.64	6.49	254.03	-.71	264.65	-4.83	68.11	1.06	5.62	-1.41	222.72
25	10	259.93	1.25	306.68	6.50	254.64	-.71	264.70	-4.83	68.12	1.06	5.62	-1.41	222.72
25	11	260.48	1.25	306.72	6.52	255.25	-.71	264.75	-4.83	68.13	1.06	5.63	-1.41	222.72
25	12	261.03	1.25	306.76	6.53	255.87	-.71	264.80	-4.83	68.13	1.06	5.63	-1.41	222.73
25	13	261.58	1.25	306.80	6.55	256.48	-.71	264.84	-4.83	68.14	1.06	5.64	-1.41	222.73
25	14	262.13	1.25	306.84	6.56	257.10	-.70	264.89	-4.83	68.15	1.06	5.65	-1.41	222.73
25	15	262.68	1.25	306.88	6.57	257.71	-.70	264.94	-4.83	68.15	1.06	5.65	-1.41	222.73
25	16	263.23	1.25	306.92	6.58	258.33	-.70	264.99	-4.83	68.16	1.06	5.66	-1.41	222.73
25	17	263.77	1.25	306.96	6.60	258.94	-.70	265.03	-4.83	68.17	1.06	5.67	-1.41	222.74
25	18	264.32	1.25	307.00	6.61	259.56	-.70	265.08	-4.83	68.18	1.06	5.67	-1.41	222.74
25	19	264.87	1.24	307.04	6.61	260.18	-.69	265.13	-4.83	68.18	1.06	5.68	-1.41	222.74
25	20	265.42	1.24	307.09	6.62	260.80	-.69	265.18	-4.83	68.19	1.06	5.69	-1.41	222.74
25	21	265.97	1.24	307.13	6.63	261.42	-.69	265.23	-4.83	68.20	1.06	5.69	-1.41	222.74
25	22	266.52	1.24	307.17	6.64	262.04	-.69	265.27	-4.83	68.20	1.06	5.70	-1.41	222.75
25	23	267.07	1.24	307.21	6.64	262.66	-.69	265.32	-4.83	68.21	1.06	5.70	-1.41	222.75
26	0	267.62	1.24	307.25	6.65	263.28	-.68	265.37	-4.83	68.22	1.06	5.71	-1.41	222.75
26	1	268.17	1.24	307.29	6.65	263.90	-.68	265.42	-4.83	68.23	1.05	5.72	-1.41	222.75
26	2	268.72	1.24	307.33	6.66	264.52	-.68	265.47	-4.83	68.23	1.05	5.72	-1.41	222.75
26	3	269.26	1.24	307.37	6.66	265.14	-.68	265.51	-4.83	68.24	1.05	5.73	-1.41	222.76
26	4	269.81	1.24	307.41	6.66	265.76	-.68	265.56	-4.83	68.25	1.05	5.74	-1.41	222.76
26	5	270.36	1.24	307.45	6.66	266.39	-.67	265.61	-4.83	68.26	1.05	5.74	-1.41	222.76
26	6	270.91	1.24	307.49	6.67	267.01	-.67	265.66	-4.83	68.26	1.05	5.75	-1.41	222.76
26	7	271.46	1.24	307.53	6.67	267.63	-.67	265.70	-4.83	68.27	1.05	5.76	-1.41	222.76
26	8	272.01	1.24	307.57	6.66	268.26	-.67	265.75	-4.83	68.28	1.05	5.76	-1.41	222.77
26	9	272.56	1.24	307.61	6.66	268.88	-.67	265.80	-4.83	68.29	1.05	5.77	-1.41	222.77
26	10	273.11	1.23	307.65	6.66	269.51	-.66	265.85	-4.83	68.29	1.05	5.78	-1.41	222.77
26	11	273.66	1.23	307.69	6.66	270.13	-.66	265.90	-4.83	68.30	1.05	5.78	-1.41	222.77
26	12	274.21	1.23	307.73	6.65	270.76	-.66	265.94	-4.83	68.31	1.05	5.79	-1.41	222.77
26	13	274.75	1.23	307.77	6.65	271.38	-.66	265.99	-4.83	68.32	1.05	5.79	-1.41	222.78
26	14	275.30	1.23	307.82	6.64	272.01	-.66	266.04	-4.83	68.32	1.05	5.80	-1.41	222.78
26	15	275.85	1.23	307.86	6.64	272.64	-.65	266.09	-4.83	68.33	1.05	5.81	-1.41	222.78
26	16	276.40	1.23	307.90	6.63	273.27	-.65	266.14	-4.83	68.34	1.05	5.81	-1.41	222.78
26	17	276.95	1.23	307.94	6.62	273.89	-.65	266.18	-4.83	68.35	1.05	5.82	-1.41	222.78
26	18	277.50	1.23	307.98	6.61	274.52	-.65	266.23	-4.83	68.36	1.05	5.83	-1.41	222.79
26	19	278.05	1.23	308.02	6.60	275.15	-.65	266.28	-4.83	68.36	1.05	5.83	-1.41	222.79
26	20	278.60	1.23	308.06	6.59	275.78	-.64	266.33	-4.83	68.37	1.05	5.84	-1.41	222.79
26	21	279.15	1.23	308.10	6.58	276.41	-.64	266.38	-4.83	68.38	1.05	5.85	-1.41	222.79
26	22	279.70	1.23	308.14	6.57	277.04	-.64	266.42	-4.83	68.39	1.05	5.85	-1.41	222.79
26	23	280.25	1.23	308.18	6.56	277.67	-.64	266.47	-4.83	68.39	1.05	5.86	-1.41	222.80

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * JULY 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
27	0	280.79	1.22	308.22	6.54	278.30	-.64	266.52	-4.83	68.40	1.05	5.87	-1.41	222.80
27	1	281.34	1.22	308.26	6.53	278.93	-.63	266.57	-4.83	68.41	1.05	5.87	-1.41	222.80
27	2	281.89	1.22	308.30	6.51	279.56	-.63	266.62	-4.83	68.42	1.05	5.88	-1.41	222.80
27	3	282.44	1.22	308.34	6.50	280.19	-.63	266.66	-4.83	68.43	1.05	5.89	-1.41	222.80
27	4	282.99	1.22	308.39	6.48	280.82	-.63	266.71	-4.83	68.44	1.05	5.89	-1.41	222.80
27	5	283.54	1.22	308.43	6.46	281.45	-.63	266.76	-4.83	68.44	1.05	5.90	-1.41	222.81
27	6	284.09	1.22	308.47	6.45	282.08	-.62	266.81	-4.83	68.45	1.05	5.91	-1.42	222.81
27	7	284.64	1.22	308.51	6.43	282.71	-.62	266.86	-4.83	68.46	1.05	5.91	-1.42	222.81
27	8	285.19	1.22	308.55	6.41	283.35	-.62	266.90	-4.83	68.47	1.05	5.92	-1.42	222.81
27	9	285.74	1.22	308.59	6.39	283.98	-.62	266.95	-4.83	68.48	1.05	5.93	-1.42	222.81
27	10	286.28	1.22	308.63	6.36	284.61	-.62	267.00	-4.83	68.48	1.05	5.93	-1.42	222.82
27	11	286.83	1.22	308.67	6.34	285.24	-.61	267.05	-4.83	68.49	1.04	5.94	-1.42	222.82
27	12	287.38	1.22	308.71	6.32	285.87	-.61	267.09	-4.83	68.50	1.04	5.95	-1.42	222.82
27	13	287.93	1.22	308.75	6.30	286.51	-.61	267.14	-4.83	68.51	1.04	5.95	-1.42	222.82
27	14	288.48	1.21	308.79	6.27	287.14	-.61	267.19	-4.83	68.52	1.04	5.96	-1.42	222.82
27	15	289.03	1.21	308.83	6.25	287.77	-.61	267.24	-4.83	68.53	1.04	5.97	-1.42	222.83
27	16	289.58	1.21	308.87	6.22	288.40	-.60	267.29	-4.83	68.54	1.04	5.97	-1.42	222.83
27	17	290.13	1.21	308.92	6.19	289.04	-.60	267.33	-4.83	68.54	1.04	5.98	-1.42	222.83
27	18	290.68	1.21	308.96	6.16	289.67	-.60	267.38	-4.83	68.55	1.04	5.99	-1.42	222.83
27	19	291.23	1.21	309.00	6.14	290.30	-.60	267.43	-4.83	68.56	1.04	5.99	-1.42	222.83
27	20	291.77	1.21	309.04	6.11	290.93	-.60	267.48	-4.83	68.57	1.04	6.00	-1.42	222.83
27	21	292.32	1.21	309.08	6.08	291.57	-.59	267.53	-4.83	68.58	1.04	6.01	-1.42	222.84
27	22	292.87	1.21	309.12	6.05	292.20	-.59	267.57	-4.83	68.59	1.04	6.01	-1.42	222.84
27	23	293.42	1.21	309.16	6.02	292.83	-.59	267.62	-4.83	68.60	1.04	6.02	-1.42	222.84
28	0	293.97	1.21	309.20	5.98	293.47	-.59	267.67	-4.83	68.60	1.04	6.03	-1.42	222.84
28	1	294.52	1.21	309.24	5.95	294.10	-.59	267.72	-4.83	68.61	1.04	6.03	-1.42	222.84
28	2	295.07	1.21	309.28	5.92	294.73	-.58	267.77	-4.83	68.62	1.04	6.04	-1.42	222.85
28	3	295.62	1.20	309.32	5.88	295.36	-.58	267.81	-4.83	68.63	1.04	6.05	-1.42	222.85
28	4	296.17	1.20	309.37	5.85	296.00	-.58	267.86	-4.83	68.64	1.04	6.05	-1.42	222.85
28	5	296.72	1.20	309.41	5.81	296.63	-.58	267.91	-4.83	68.65	1.04	6.06	-1.42	222.85
28	6	297.26	1.20	309.45	5.78	297.26	-.58	267.96	-4.83	68.66	1.04	6.07	-1.42	222.85
28	7	297.81	1.20	309.49	5.74	297.89	-.58	268.01	-4.83	68.67	1.04	6.07	-1.42	222.85
28	8	298.36	1.20	309.53	5.70	298.53	-.57	268.05	-4.83	68.68	1.04	6.08	-1.42	222.86
28	9	298.91	1.20	309.57	5.66	299.16	-.57	268.10	-4.83	68.69	1.04	6.09	-1.42	222.86
28	10	299.46	1.20	309.61	5.62	299.79	-.57	268.15	-4.83	68.70	1.04	6.09	-1.42	222.86
28	11	300.01	1.20	309.65	5.58	300.42	-.57	268.20	-4.83	68.70	1.04	6.10	-1.42	222.86
28	12	300.56	1.20	309.69	5.54	301.05	-.57	268.24	-4.83	68.71	1.04	6.11	-1.42	222.86
28	13	301.11	1.20	309.73	5.50	301.69	-.56	268.29	-4.83	68.72	1.04	6.11	-1.42	222.86
28	14	301.66	1.20	309.77	5.46	302.32	-.56	268.34	-4.83	68.73	1.04	6.12	-1.42	222.87
28	15	302.21	1.20	309.81	5.42	302.95	-.56	268.39	-4.83	68.74	1.04	6.13	-1.42	222.87
28	16	302.75	1.19	309.86	5.37	303.58	-.56	268.44	-4.83	68.75	1.04	6.13	-1.42	222.87
28	17	303.30	1.19	309.90	5.33	304.21	-.56	268.48	-4.83	68.76	1.04	6.14	-1.42	222.87
28	18	303.85	1.19	309.94	5.29	304.84	-.55	268.53	-4.83	68.77	1.04	6.15	-1.42	222.87
28	19	304.40	1.19	309.98	5.24	305.47	-.55	268.58	-4.83	68.78	1.04	6.15	-1.42	222.87
28	20	304.95	1.19	310.02	5.19	306.10	-.55	268.63	-4.83	68.79	1.03	6.16	-1.42	222.88
28	21	305.50	1.19	310.06	5.15	306.73	-.55	268.68	-4.83	68.80	1.03	6.17	-1.42	222.88
28	22	306.05	1.19	310.10	5.10	307.36	-.55	268.72	-4.83	68.81	1.03	6.17	-1.42	222.88
28	23	306.60	1.19	310.14	5.05	307.99	-.54	268.77	-4.83	68.82	1.03	6.18	-1.42	222.88

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * AUG 1969 * * * *

GMT DATE	GMT HOUR	EQUINOX PHAE	SUN DEC	SUN RA	EARTH DEC	EARTH RA	VENUS DEC	VENUS RA	MARS DEC	MARS RA	JUPITER DEC	JUPITER RA	SATURN DEC	SATURN RA
18	0	210.67	.81	329.10	3.13	203.88	.43	291.44	-4.75	76.32	.90	9.68	-1.50	223.33
18	1	211.22	.81	329.14	3.19	204.42	.43	291.49	-4.75	76.34	.90	9.69	-1.50	223.33
18	2	211.77	.80	329.17	3.25	204.96	.43	291.54	-4.75	76.36	.90	9.70	-1.50	223.33
18	3	212.32	.80	329.21	3.30	205.51	.44	291.58	-4.75	76.37	.89	9.71	-1.50	223.33
18	4	212.87	.80	329.25	3.36	206.05	.44	291.63	-4.75	76.39	.89	9.71	-1.50	223.33
18	5	213.42	.80	329.29	3.41	206.59	.44	291.68	-4.75	76.41	.89	9.72	-1.50	223.33
18	6	213.97	.80	329.33	3.47	207.13	.44	291.73	-4.75	76.42	.89	9.73	-1.50	223.33
18	7	214.52	.79	329.37	3.53	207.68	.44	291.78	-4.75	76.44	.89	9.74	-1.50	223.33
18	8	215.07	.79	329.41	3.58	208.22	.45	291.83	-4.75	76.46	.89	9.75	-1.50	223.33
18	9	215.62	.79	329.45	3.64	208.77	.45	291.87	-4.75	76.48	.89	9.75	-1.50	223.33
18	10	216.16	.79	329.49	3.69	209.31	.45	291.92	-4.75	76.49	.89	9.76	-1.50	223.33
18	11	216.71	.79	329.53	3.74	209.86	.45	291.97	-4.75	76.51	.89	9.77	-1.50	223.33
18	12	217.26	.79	329.57	3.80	210.41	.45	292.02	-4.75	76.53	.89	9.78	-1.50	223.33
18	13	217.81	.79	329.61	3.85	210.96	.46	292.07	-4.75	76.54	.89	9.78	-1.50	223.33
18	14	218.36	.79	329.64	3.90	211.50	.46	292.12	-4.75	76.56	.89	9.79	-1.50	223.33
18	15	218.91	.79	329.68	3.96	212.05	.46	292.17	-4.75	76.58	.89	9.80	-1.50	223.33
18	16	219.46	.79	329.72	4.01	212.60	.46	292.21	-4.74	76.59	.89	9.81	-1.50	223.33
18	17	220.01	.79	329.76	4.06	213.15	.46	292.26	-4.74	76.61	.89	9.81	-1.50	223.33
18	18	220.56	.79	329.80	4.12	213.70	.47	292.31	-4.74	76.63	.89	9.82	-1.50	223.33
18	19	221.11	.78	329.84	4.17	214.25	.47	292.36	-4.74	76.65	.89	9.83	-1.50	223.33
18	20	221.65	.79	329.88	4.22	214.80	.47	292.41	-4.74	76.66	.89	9.84	-1.50	223.33
18	21	222.20	.78	329.92	4.27	215.36	.47	292.46	-4.74	76.68	.89	9.84	-1.50	223.33
18	22	222.75	.78	329.96	4.32	215.91	.47	292.51	-4.74	76.70	.89	9.85	-1.50	223.34
18	23	223.30	.78	330.00	4.37	216.46	.48	292.55	-4.74	76.71	.89	9.86	-1.50	223.34
19	0	223.85	.78	330.04	4.42	217.02	.48	292.60	-4.74	76.73	.89	9.87	-1.50	223.34
19	1	224.40	.78	330.08	4.47	217.57	.48	292.65	-4.74	76.75	.89	9.87	-1.50	223.34
19	2	224.95	.78	330.12	4.52	218.13	.48	292.70	-4.74	76.77	.89	9.88	-1.50	223.34
19	3	225.50	.78	330.16	4.57	218.68	.48	292.75	-4.74	76.78	.89	9.89	-1.50	223.34
19	4	226.05	.78	330.20	4.62	219.24	.49	292.80	-4.74	76.80	.89	9.90	-1.50	223.34
19	5	226.60	.78	330.23	4.67	219.79	.49	292.85	-4.74	76.82	.89	9.91	-1.50	223.34
19	6	227.14	.78	330.27	4.71	220.35	.49	292.90	-4.74	76.83	.89	9.91	-1.50	223.34
19	7	227.69	.77	330.31	4.76	220.91	.49	292.94	-4.74	76.85	.89	9.92	-1.50	223.34
19	8	228.24	.77	330.35	4.81	221.47	.49	292.99	-4.74	76.87	.89	9.93	-1.50	223.34
19	9	228.79	.77	330.39	4.85	222.03	.50	293.04	-4.74	76.89	.89	9.94	-1.50	223.34
19	10	229.34	.77	330.43	4.90	222.59	.50	293.09	-4.74	76.90	.89	9.94	-1.50	223.34
19	11	229.89	.77	330.47	4.95	223.15	.50	293.14	-4.74	76.92	.89	9.95	-1.50	223.34
19	12	230.44	.77	330.51	4.99	223.71	.50	293.19	-4.74	76.94	.89	9.96	-1.50	223.34
19	13	230.99	.77	330.55	5.04	224.27	.50	293.24	-4.74	76.95	.89	9.97	-1.50	223.34
19	14	231.54	.77	330.59	5.08	224.83	.51	293.29	-4.74	76.97	.89	9.97	-1.50	223.34
19	15	232.09	.77	330.63	5.12	225.40	.51	293.33	-4.74	76.99	.89	9.98	-1.50	223.34
19	16	232.63	.77	330.67	5.17	225.96	.51	293.38	-4.73	77.01	.88	9.99	-1.50	223.34
19	17	233.18	.77	330.71	5.21	226.52	.51	293.43	-4.73	77.02	.88	10.00	-1.50	223.34
19	18	233.73	.77	330.75	5.25	227.09	.51	293.48	-4.73	77.04	.88	10.01	-1.50	223.34
19	19	234.28	.76	330.79	5.30	227.65	.52	293.53	-4.73	77.06	.88	10.01	-1.50	223.34
19	20	234.83	.76	330.83	5.34	228.22	.52	293.58	-4.73	77.07	.88	10.02	-1.50	223.34
19	21	235.38	.76	330.87	5.38	228.79	.52	293.63	-4.73	77.09	.88	10.03	-1.50	223.34
19	22	235.93	.76	330.91	5.42	229.35	.52	293.68	-4.73	77.11	.88	10.04	-1.50	223.34
19	23	236.48	.76	330.95	5.46	229.92	.52	293.73	-4.73	77.13	.88	10.04	-1.50	223.34

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * AUG 1969 * * * *

GMT DATE	GMT HOUR	EQUINOX PHAE	SUN DEC	SUN RA	EARTH DEC	EARTH RA	VENUS DEC	VENUS RA	MARS DEC	MARS RA	JUPITER DEC	JUPITER RA	SATURN DEC	SATURN RA
20	0	237.03	.76	330.99	5.50	230.49	.53	293.77	-4.73	77.14	.88	10.05	-1.50	223.34
20	1	237.58	.76	331.03	5.54	231.06	.53	293.82	-4.73	77.16	.88	10.06	-1.50	223.34
20	2	238.13	.76	331.07	5.58	231.63	.53	293.87	-4.73	77.18	.88	10.07	-1.50	223.34
20	3	238.67	.76	331.11	5.62	232.20	.53	293.92	-4.73	77.20	.88	10.07	-1.50	223.34
20	4	239.22	.76	331.14	5.65	232.77	.53	293.97	-4.73	77.21	.88	10.08	-1.50	223.34
20	5	239.77	.76	331.18	5.69	233.34	.54	294.02	-4.73	77.23	.88	10.09	-1.50	223.34
20	6	240.32	.75	331.22	5.73	233.91	.54	294.07	-4.73	77.25	.88	10.10	-1.51	223.34
20	7	240.87	.75	331.26	5.76	234.49	.54	294.12	-4.73	77.26	.88	10.11	-1.51	223.34
20	8	241.42	.75	331.30	5.80	235.06	.54	294.17	-4.73	77.28	.88	10.11	-1.51	223.34
20	9	241.97	.75	331.34	5.83	235.63	.54	294.22	-4.73	77.30	.88	10.12	-1.51	223.34
20	10	242.52	.75	331.38	5.87	236.21	.55	294.26	-4.73	77.32	.88	10.13	-1.51	223.34
20	11	243.07	.75	331.42	5.90	236.78	.55	294.31	-4.73	77.33	.88	10.14	-1.51	223.35
20	12	243.62	.75	331.46	5.93	237.36	.55	294.36	-4.73	77.35	.88	10.14	-1.51	223.35
20	13	244.16	.75	331.50	5.97	237.93	.55	294.41	-4.73	77.37	.88	10.15	-1.51	223.35
20	14	244.71	.75	331.54	6.00	238.51	.55	294.46	-4.73	77.39	.88	10.16	-1.51	223.35
20	15	245.26	.75	331.58	6.03	239.09	.55	294.51	-4.73	77.40	.88	10.17	-1.51	223.35
20	16	245.81	.75	331.62	6.06	239.67	.56	294.56	-4.73	77.42	.88	10.18	-1.51	223.35
20	17	246.36	.75	331.66	6.09	240.24	.56	294.61	-4.72	77.44	.88	10.18	-1.51	223.35
20	18	246.91	.74	331.70	6.12	240.82	.56	294.66	-4.72	77.45	.88	10.19	-1.51	223.35
20	19	247.46	.74	331.74	6.15	241.40	.56	294.71	-4.72	77.47	.88	10.20	-1.51	223.35
20	20	248.01	.74	331.78	6.18	241.98	.56	294.76	-4.72	77.49	.88	10.21	-1.51	223.35
20	21	248.56	.74	331.82	6.21	242.57	.57	294.80	-4.72	77.51	.88	10.21	-1.51	223.35
20	22	249.11	.74	331.86	6.24	243.15	.57	294.85	-4.72	77.52	.88	10.22	-1.51	223.35
20	23	249.65	.74	331.90	6.26	243.73	.57	294.90	-4.72	77.54	.88	10.23	-1.51	223.35
21	0	250.20	.74	331.94	6.29	244.31	.57	294.95	-4.72	77.56	.88	10.24	-1.51	223.35
21	1	250.75	.74	331.98	6.32	244.90	.57	295.00	-4.72	77.58	.88	10.25	-1.51	223.35
21	2	251.30	.74	332.02	6.34	245.48	.58	295.05	-4.72	77.59	.88	10.25	-1.51	223.35
21	3	251.85	.74	332.06	6.36	246.06	.58	295.10	-4.72	77.61	.88	10.26	-1.51	223.35
21	4	252.40	.74	332.10	6.39	246.65	.58	295.15	-4.72	77.63	.87	10.27	-1.51	223.35
21	5	252.95	.73	332.14	6.41	247.23	.58	295.20	-4.72	77.65	.87	10.28	-1.51	223.35
21	6	253.50	.73	332.18	6.43	247.82	.58	295.25	-4.72	77.66	.87	10.29	-1.51	223.35
21	7	254.05	.73	332.22	6.46	248.41	.58	295.30	-4.72	77.68	.87	10.29	-1.51	223.35
21	8	254.60	.73	332.26	6.48	248.99	.59	295.35	-4.72	77.70	.87	10.30	-1.51	223.35
21	9	255.14	.73	332.30	6.50	249.58	.59	295.40	-4.72	77.72	.87	10.31	-1.51	223.35
21	10	255.69	.73	332.34	6.52	250.17	.59	295.44	-4.72	77.73	.87	10.32	-1.51	223.35
21	11	256.24	.73	332.38	6.54	250.76	.59	295.49	-4.72	77.75	.87	10.32	-1.51	223.35
21	12	256.79	.73	332.42	6.55	251.35	.59	295.54	-4.72	77.77	.87	10.33	-1.51	223.35
21	13	257.34	.73	332.46	6.57	251.94	.60	295.59	-4.72	77.79	.87	10.34	-1.51	223.35
21	14	257.89	.73	332.50	6.59	252.53	.60	295.64	-4.72	77.80	.87	10.35	-1.51	223.35
21	15	258.44	.73	332.54	6.61	253.12	.60	295.69	-4.72	77.82	.87	10.36	-1.51	223.35
21	16	258.99	.72	332.58	6.62	253.71	.60	295.74	-4.72	77.84	.87	10.36	-1.51	223.35
21	17	259.54	.72	332.62	6.64	254.31	.60	295.79	-4.71	77.86	.87	10.37	-1.51	223.35
21	18	260.09	.72	332.66	6.65	254.90	.61	295.84	-4.71	77.87	.87	10.38	-1.51	223.35
21	19	260.63	.72	332.70	6.66	255.49	.61	295.89	-4.71	77.89	.87	10.39	-1.51	223.35
21	20	261.18	.72	332.74	6.68	256.09	.61	295.94	-4.71	77.91	.87	10.40	-1.51	223.35
21	21	261.73	.72	332.78	6.69	256.68	.61	295.99	-4.71	77.93	.87	10.40	-1.51	223.35
21	22	262.28	.72	332.82	6.70	257.27	.61	296.04	-4.71	77.94	.87	10.41	-1.51	223.35
21	23	262.83	.72	332.86	6.71	257.87	.61	296.09	-4.71	77.96	.87	10.42	-1.51	223.35

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * AUG 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
22	0	263.38	.72	332.90	6.72	258.47	.62	296.14	-4.71	77.98	.87	10.43	-1.51	223.35
22	1	263.93	.72	332.94	6.73	259.06	.62	296.19	-4.71	78.00	.87	10.43	-1.51	223.35
22	2	264.48	.71	332.98	6.74	259.66	.62	296.23	-4.71	78.01	.87	10.44	-1.51	223.35
22	3	265.03	.71	333.02	6.75	260.26	.62	296.28	-4.71	78.03	.87	10.45	-1.51	223.35
22	4	265.58	.71	333.07	6.76	260.85	.62	296.33	-4.71	78.05	.87	10.46	-1.51	223.35
22	5	266.12	.71	333.11	6.76	261.45	.63	296.38	-4.71	78.07	.87	10.47	-1.51	223.35
22	6	266.67	.71	333.15	6.77	262.05	.63	296.43	-4.71	78.08	.87	10.47	-1.51	223.35
22	7	267.22	.71	333.19	6.77	262.65	.63	296.48	-4.71	78.10	.87	10.48	-1.51	223.35
22	8	267.77	.71	333.23	6.78	263.25	.63	296.53	-4.71	78.12	.87	10.49	-1.51	223.35
22	9	268.32	.71	333.27	6.78	263.85	.63	296.58	-4.71	78.14	.87	10.50	-1.51	223.35
22	10	268.87	.71	333.31	6.78	264.45	.63	296.63	-4.71	78.16	.87	10.51	-1.51	223.35
22	11	269.42	.71	333.35	6.79	265.05	.64	296.68	-4.71	78.17	.87	10.51	-1.51	223.35
22	12	269.97	.70	333.39	6.79	265.66	.64	296.73	-4.71	78.19	.87	10.52	-1.51	223.35
22	13	270.52	.70	333.43	6.79	266.26	.64	296.78	-4.71	78.21	.87	10.53	-1.51	223.35
22	14	271.07	.70	333.47	6.79	266.86	.64	296.83	-4.71	78.23	.87	10.54	-1.51	223.35
22	15	271.62	.70	333.51	6.79	267.46	.64	296.88	-4.71	78.24	.86	10.55	-1.51	223.35
22	16	272.16	.70	333.55	6.79	268.07	.65	296.93	-4.71	78.26	.86	10.55	-1.52	223.35
22	17	272.71	.70	333.59	6.78	268.67	.65	296.98	-4.71	78.28	.86	10.56	-1.52	223.35
22	18	273.26	.70	333.63	6.78	269.27	.65	297.03	-4.70	78.30	.86	10.57	-1.52	223.35
22	19	273.81	.70	333.67	6.78	269.88	.65	297.08	-4.70	78.32	.86	10.58	-1.52	223.35
22	20	274.36	.70	333.71	6.77	270.48	.65	297.13	-4.70	78.33	.86	10.59	-1.52	223.35
22	21	274.91	.70	333.75	6.77	271.09	.65	297.18	-4.70	78.35	.86	10.59	-1.52	223.35
22	22	275.46	.70	333.79	6.76	271.70	.66	297.22	-4.70	78.37	.86	10.60	-1.52	223.35
22	23	276.01	.69	333.83	6.75	272.30	.66	297.27	-4.70	78.39	.86	10.61	-1.52	223.35
23	0	276.56	.69	333.87	6.75	272.91	.66	297.32	-4.70	78.41	.86	10.62	-1.52	223.35
23	1	277.11	.69	333.91	6.74	273.52	.66	297.37	-4.70	78.42	.86	10.63	-1.52	223.35
23	2	277.65	.69	333.96	6.73	274.12	.66	297.42	-4.70	78.44	.86	10.63	-1.52	223.35
23	3	278.20	.69	334.00	6.72	274.73	.66	297.47	-4.70	78.46	.86	10.64	-1.52	223.35
23	4	278.75	.69	334.04	6.71	275.34	.67	297.52	-4.70	78.48	.86	10.65	-1.52	223.35
23	5	279.30	.69	334.08	6.70	275.95	.67	297.57	-4.70	78.50	.86	10.66	-1.52	223.35
23	6	279.85	.69	334.12	6.69	276.56	.67	297.62	-4.70	78.51	.86	10.67	-1.52	223.35
23	7	280.40	.69	334.16	6.67	277.17	.67	297.67	-4.70	78.53	.86	10.67	-1.52	223.35
23	8	280.95	.69	334.20	6.66	277.78	.67	297.72	-4.70	78.55	.86	10.68	-1.52	223.35
23	9	281.50	.68	334.24	6.64	278.39	.68	297.77	-4.70	78.57	.86	10.69	-1.52	223.35
23	10	282.05	.68	334.28	6.63	279.00	.68	297.82	-4.70	78.59	.86	10.70	-1.52	223.35
23	11	282.60	.68	334.32	6.61	279.61	.68	297.87	-4.70	78.60	.86	10.71	-1.52	223.35
23	12	283.14	.68	334.36	6.60	280.22	.68	297.92	-4.70	78.62	.86	10.71	-1.52	223.35
23	13	283.69	.68	334.40	6.58	280.83	.68	297.97	-4.70	78.64	.86	10.72	-1.52	223.35
23	14	284.24	.68	334.44	6.56	281.44	.68	298.02	-4.70	78.66	.86	10.73	-1.52	223.35
23	15	284.79	.68	334.48	6.54	282.05	.69	298.07	-4.70	78.68	.86	10.74	-1.52	223.35
23	16	285.34	.68	334.52	6.52	282.66	.69	298.12	-4.70	78.70	.86	10.75	-1.52	223.35
23	17	285.89	.68	334.57	6.50	283.28	.69	298.17	-4.70	78.71	.86	10.75	-1.52	223.35
23	18	286.44	.67	334.61	6.48	283.89	.69	298.22	-4.70	78.73	.86	10.76	-1.52	223.35
23	19	286.99	.67	334.65	6.46	284.50	.69	298.27	-4.70	78.75	.86	10.77	-1.52	223.35
23	20	287.54	.67	334.69	6.44	285.11	.69	298.32	-4.69	78.77	.86	10.78	-1.52	223.35
23	21	288.09	.67	334.73	6.41	285.73	.70	298.37	-4.69	78.79	.86	10.79	-1.52	223.35
23	22	288.63	.67	334.77	6.39	286.34	.70	298.42	-4.69	78.81	.86	10.79	-1.52	223.35
23	23	289.18	.67	334.81	6.36	286.95	.70	298.47	-4.69	78.82	.86	10.80	-1.52	223.35

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * AUG 1969 * * * *

GMT DATE	GMT HOUR	EQUINOX PHAE	SUN DEC	SUN RA	EARTH DEC	EARTH RA	VENUS DEC	VENUS RA	MARS DEC	MARS RA	JUPITER DEC	JUPITER RA	SATURN DEC	SATURN RA
24	0	289.73	.67	334.85	6.34	287.57	.70	298.52	-4.69	78.84	.86	10.81	-1.52	223.35
24	1	290.28	.67	334.89	6.31	288.18	.70	298.57	-4.69	78.86	.85	10.82	-1.52	223.35
24	2	290.83	.67	334.93	6.28	288.80	.70	298.62	-4.69	78.88	.85	10.83	-1.52	223.35
24	3	291.38	.67	334.97	6.26	289.41	.71	298.66	-4.69	78.90	.85	10.83	-1.52	223.35
24	4	291.93	.66	335.01	6.23	290.03	.71	298.71	-4.69	78.92	.85	10.84	-1.52	223.35
24	5	292.48	.66	335.05	6.20	290.64	.71	298.76	-4.69	78.93	.85	10.85	-1.52	223.35
24	6	293.03	.66	335.10	6.17	291.26	.71	298.81	-4.69	78.95	.85	10.86	-1.52	223.35
24	7	293.58	.66	335.14	6.14	291.87	.71	298.86	-4.69	78.97	.85	10.87	-1.52	223.35
24	8	294.12	.66	335.18	6.11	292.49	.71	298.91	-4.69	78.99	.85	10.88	-1.52	223.35
24	9	294.67	.66	335.22	6.07	293.10	.72	298.96	-4.69	79.01	.85	10.88	-1.52	223.35
24	10	295.22	.66	335.26	6.04	293.72	.72	299.01	-4.69	79.03	.85	10.89	-1.52	223.35
24	11	295.77	.66	335.30	6.01	294.34	.72	299.06	-4.69	79.05	.85	10.90	-1.52	223.35
24	12	296.32	.66	335.34	5.97	294.95	.72	299.11	-4.69	79.07	.85	10.91	-1.52	223.35
24	13	296.87	.65	335.38	5.94	295.57	.72	299.16	-4.69	79.08	.85	10.92	-1.52	223.35
24	14	297.42	.65	335.42	5.90	296.18	.72	299.21	-4.69	79.10	.85	10.92	-1.52	223.35
24	15	297.97	.65	335.46	5.87	296.80	.73	299.26	-4.69	79.12	.85	10.93	-1.52	223.35
24	16	298.52	.65	335.51	5.83	297.42	.73	299.31	-4.69	79.14	.85	10.94	-1.52	223.35
24	17	299.07	.65	335.55	5.79	298.03	.73	299.36	-4.69	79.16	.85	10.95	-1.52	223.35
24	18	299.61	.65	335.59	5.75	298.65	.73	299.41	-4.69	79.18	.85	10.96	-1.52	223.35
24	19	300.16	.65	335.63	5.71	299.27	.73	299.46	-4.69	79.20	.85	10.97	-1.52	223.35
24	20	300.71	.65	335.67	5.67	299.88	.73	299.51	-4.69	79.22	.85	10.97	-1.52	223.35
24	21	301.26	.65	335.71	5.63	300.50	.74	299.56	-4.69	79.23	.85	10.98	-1.53	223.35
24	22	301.81	.65	335.75	5.59	301.12	.74	299.61	-4.68	79.25	.85	10.99	-1.53	223.35
24	23	302.36	.64	335.79	5.55	301.74	.74	299.66	-4.68	79.27	.85	11.00	-1.53	223.34
25	0	302.91	.64	335.83	5.51	302.35	.74	299.71	-4.68	79.29	.85	11.01	-1.53	223.34
25	1	303.46	.64	335.87	5.47	302.97	.74	299.76	-4.68	79.31	.85	11.01	-1.53	223.34
25	2	304.01	.64	335.92	5.42	303.59	.74	299.81	-4.68	79.33	.85	11.02	-1.53	223.34
25	3	304.56	.64	335.96	5.38	304.20	.75	299.86	-4.68	79.35	.85	11.03	-1.53	223.34
25	4	305.11	.64	336.00	5.33	304.82	.75	299.91	-4.68	79.37	.85	11.04	-1.53	223.34
25	5	305.65	.64	336.04	5.29	305.44	.75	299.96	-4.68	79.39	.85	11.05	-1.53	223.34
25	6	306.20	.64	336.08	5.24	306.06	.75	300.01	-4.68	79.41	.85	11.06	-1.53	223.34
25	7	306.75	.64	336.12	5.19	306.67	.75	300.06	-4.68	79.42	.85	11.06	-1.53	223.34
25	8	307.30	.63	336.16	5.15	307.29	.75	300.11	-4.68	79.44	.85	11.07	-1.53	223.34
25	9	307.85	.63	336.20	5.10	307.91	.76	300.16	-4.68	79.46	.85	11.08	-1.53	223.34
25	10	308.40	.63	336.24	5.05	308.52	.76	300.21	-4.68	79.48	.84	11.09	-1.53	223.34
25	11	308.95	.63	336.29	5.00	309.14	.76	300.26	-4.68	79.50	.84	11.10	-1.53	223.34
25	12	309.50	.63	336.33	4.95	309.76	.76	300.31	-4.68	79.52	.84	11.10	-1.53	223.34
25	13	310.05	.63	336.37	4.90	310.38	.76	300.36	-4.68	79.54	.84	11.11	-1.53	223.34
25	14	310.60	.63	336.41	4.85	310.99	.76	300.41	-4.68	79.56	.84	11.12	-1.53	223.34
25	15	311.14	.63	336.45	4.80	311.61	.77	300.46	-4.68	79.58	.84	11.13	-1.53	223.34
25	16	311.69	.63	336.49	4.75	312.23	.77	300.51	-4.68	79.60	.84	11.14	-1.53	223.34
25	17	312.24	.62	336.53	4.69	312.84	.77	300.56	-4.68	79.62	.84	11.15	-1.53	223.34
25	18	312.79	.62	336.57	4.64	313.46	.77	300.61	-4.68	79.64	.84	11.15	-1.53	223.34
25	19	313.34	.62	336.61	4.59	314.07	.77	300.66	-4.68	79.66	.84	11.16	-1.53	223.34
25	20	313.89	.62	336.66	4.53	314.69	.77	300.71	-4.68	79.68	.84	11.17	-1.53	223.34
25	21	314.44	.62	336.70	4.48	315.31	.78	300.76	-4.68	79.70	.84	11.18	-1.53	223.34
25	22	314.99	.62	336.74	4.42	315.92	.78	300.81	-4.68	79.71	.84	11.19	-1.53	223.34
25	23	315.54	.62	336.78	4.37	316.54	.78	300.85	-4.68	79.73	.84	11.20	-1.53	223.34

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * AUG 1969 * * * *

GMT DATE	GMT HOUR	EQUINOX PHAE	SUN DEC	SUN RA	EARTH DEC	EARTH RA	VENUS DEC	VENUS RA	MARS DEC	MARS RA	JUPITER DEC	JUPITER RA	SATURN DEC	SATURN RA
26	0	316.09	.62	336.82	4.31	317.15	.78	300.90	-4.68	79.75	.84	11.20	-1.53	223.34
26	1	316.63	.62	336.86	4.25	317.77	.78	300.95	-4.67	79.77	.84	11.21	-1.53	223.34
26	2	317.18	.61	336.90	4.20	318.39	.78	301.00	-4.67	79.79	.84	11.22	-1.53	223.34
26	3	317.73	.61	336.94	4.14	319.00	.79	301.05	-4.67	79.81	.84	11.23	-1.53	223.34
26	4	318.28	.61	336.99	4.08	319.62	.79	301.10	-4.67	79.83	.84	11.24	-1.53	223.34
26	5	318.83	.61	337.03	4.02	320.23	.79	301.15	-4.67	79.85	.84	11.24	-1.53	223.34
26	6	319.38	.61	337.07	3.96	320.85	.79	301.20	-4.67	79.87	.84	11.25	-1.53	223.34
26	7	319.93	.61	337.11	3.90	321.46	.79	301.25	-4.67	79.89	.84	11.26	-1.53	223.33
26	8	320.48	.61	337.15	3.84	322.07	.79	301.30	-4.67	79.91	.84	11.27	-1.53	223.33
26	9	321.03	.61	337.19	3.78	322.69	.79	301.35	-4.67	79.93	.84	11.28	-1.53	223.33
26	10	321.58	.61	337.23	3.72	323.30	.80	301.40	-4.67	79.95	.84	11.29	-1.53	223.33
26	11	322.12	.60	337.27	3.66	323.92	.80	301.45	-4.67	79.97	.84	11.29	-1.53	223.33
26	12	322.67	.60	337.32	3.60	324.53	.80	301.50	-4.67	79.99	.84	11.30	-1.53	223.33
26	13	323.22	.60	337.36	3.54	325.14	.80	301.55	-4.67	80.01	.84	11.31	-1.53	223.33
26	14	323.77	.60	337.40	3.48	325.76	.80	301.60	-4.67	80.03	.84	11.32	-1.53	223.33
26	15	324.32	.60	337.44	3.41	326.37	.80	301.65	-4.67	80.05	.84	11.33	-1.53	223.33
26	16	324.87	.60	337.48	3.35	326.98	.81	301.70	-4.67	80.07	.84	11.34	-1.53	223.33
26	17	325.42	.60	337.52	3.29	327.59	.81	301.75	-4.67	80.09	.84	11.34	-1.53	223.33
26	18	325.97	.60	337.56	3.22	328.20	.81	301.80	-4.67	80.11	.84	11.35	-1.53	223.33
26	19	326.52	.59	337.60	3.16	328.82	.81	301.85	-4.67	80.13	.83	11.36	-1.53	223.33
26	20	327.07	.59	337.65	3.09	329.43	.81	301.90	-4.67	80.15	.83	11.37	-1.53	223.33
26	21	327.61	.59	337.69	3.03	330.04	.81	301.95	-4.67	80.17	.83	11.38	-1.53	223.33
26	22	328.16	.59	337.73	2.96	330.65	.81	302.00	-4.67	80.19	.83	11.39	-1.53	223.33
26	23	328.71	.59	337.77	2.90	331.26	.82	302.05	-4.67	80.21	.83	11.39	-1.53	223.33
27	0	329.26	.59	337.81	2.83	331.87	.82	302.10	-4.67	80.23	.83	11.40	-1.54	223.33
27	1	329.81	.59	337.85	2.77	332.48	.82	302.15	-4.67	80.25	.83	11.41	-1.54	223.33
27	2	330.36	.59	337.89	2.70	333.09	.82	302.20	-4.67	80.27	.83	11.42	-1.54	223.33
27	3	330.91	.59	337.93	2.63	333.70	.82	302.25	-4.66	80.29	.83	11.43	-1.54	223.33
27	4	331.46	.58	337.98	2.57	334.31	.82	302.30	-4.66	80.31	.83	11.44	-1.54	223.33
27	5	332.01	.58	338.02	2.50	334.91	.83	302.35	-4.66	80.33	.83	11.45	-1.54	223.32
27	6	332.56	.58	338.06	2.43	335.52	.83	302.40	-4.66	80.35	.83	11.45	-1.54	223.32
27	7	333.10	.58	338.10	2.36	336.13	.83	302.45	-4.66	80.37	.83	11.46	-1.54	223.32
27	8	333.65	.58	338.14	2.30	336.74	.83	302.50	-4.66	80.39	.83	11.47	-1.54	223.32
27	9	334.20	.58	338.18	2.23	337.34	.83	302.55	-4.66	80.41	.83	11.48	-1.54	223.32
27	10	334.75	.58	338.22	2.16	337.95	.83	302.60	-4.66	80.44	.83	11.49	-1.54	223.32
27	11	335.30	.58	338.27	2.09	338.56	.84	302.65	-4.66	80.46	.83	11.50	-1.54	223.32
27	12	335.85	.58	338.31	2.02	339.16	.84	302.70	-4.66	80.48	.83	11.50	-1.54	223.32
27	13	336.40	.57	338.35	1.95	339.77	.84	302.75	-4.66	80.50	.83	11.51	-1.54	223.32
27	14	336.95	.57	338.39	1.88	340.37	.84	302.80	-4.66	80.52	.83	11.52	-1.54	223.32
27	15	337.50	.57	338.43	1.81	340.98	.84	302.84	-4.66	80.54	.83	11.53	-1.54	223.32
27	16	338.05	.57	338.47	1.74	341.58	.84	302.89	-4.66	80.56	.83	11.54	-1.54	223.32
27	17	338.60	.57	338.51	1.67	342.18	.84	302.94	-4.66	80.58	.83	11.55	-1.54	223.32
27	18	339.14	.57	338.55	1.60	342.79	.85	302.99	-4.66	80.60	.83	11.55	-1.54	223.32
27	19	339.69	.57	338.60	1.53	343.39	.85	303.04	-4.66	80.62	.83	11.56	-1.54	223.32
27	20	340.24	.57	338.64	1.46	343.99	.85	303.09	-4.66	80.64	.83	11.57	-1.54	223.32
27	21	340.79	.56	338.68	1.39	344.59	.85	303.14	-4.66	80.66	.83	11.58	-1.54	223.32
27	22	341.34	.56	338.72	1.32	345.20	.85	303.19	-4.66	80.68	.83	11.59	-1.54	223.32
27	23	341.89	.56	338.76	1.25	345.80	.85	303.24	-4.66	80.70	.83	11.60	-1.54	223.32

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * SEPT 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
17	0	245.97	.07	357.99	6.18	241.14	1.46	326.83	-4.38	92.10	.70	15.70	-1.62	222.72
17	1	246.51	.07	358.03	6.21	241.71	1.46	326.88	-4.38	92.13	.70	15.71	-1.62	222.72
17	2	247.06	.07	358.07	6.24	242.29	1.46	326.93	-4.38	92.15	.70	15.72	-1.62	222.72
17	3	247.61	.06	358.11	6.27	242.87	1.46	326.98	-4.37	92.17	.70	15.73	-1.62	222.72
17	4	248.16	.06	358.15	6.29	243.44	1.46	327.03	-4.37	92.20	.70	15.74	-1.62	222.72
17	5	248.71	.06	358.19	6.32	244.02	1.46	327.08	-4.37	92.22	.70	15.74	-1.62	222.72
17	6	249.26	.06	358.23	6.34	244.60	1.46	327.13	-4.37	92.24	.70	15.75	-1.62	222.71
17	7	249.81	.06	358.27	6.37	245.18	1.46	327.18	-4.37	92.27	.69	15.76	-1.63	222.71
17	8	250.36	.06	358.31	6.39	245.76	1.46	327.23	-4.37	92.29	.69	15.77	-1.63	222.71
17	9	250.91	.06	358.35	6.42	246.34	1.46	327.28	-4.37	92.32	.69	15.78	-1.63	222.71
17	10	251.46	.06	358.39	6.44	246.92	1.46	327.33	-4.37	92.34	.69	15.79	-1.63	222.71
17	11	252.00	.06	358.43	6.46	247.50	1.46	327.38	-4.37	92.36	.69	15.80	-1.63	222.71
17	12	252.55	.05	358.47	6.49	248.08	1.46	327.43	-4.37	92.39	.69	15.80	-1.63	222.70
17	13	253.10	.05	358.51	6.51	248.66	1.47	327.48	-4.37	92.41	.69	15.81	-1.63	222.70
17	14	253.65	.05	358.55	6.53	249.24	1.47	327.53	-4.37	92.43	.69	15.82	-1.63	222.70
17	15	254.20	.05	358.59	6.55	249.82	1.47	327.58	-4.37	92.46	.69	15.83	-1.63	222.70
17	16	254.75	.05	358.63	6.57	250.40	1.47	327.63	-4.37	92.48	.69	15.84	-1.63	222.70
17	17	255.30	.05	358.67	6.58	250.98	1.47	327.68	-4.36	92.50	.69	15.85	-1.63	222.70
17	18	255.85	.05	358.71	6.60	251.56	1.47	327.73	-4.36	92.53	.69	15.86	-1.63	222.69
17	19	256.40	.05	358.75	6.62	252.15	1.47	327.78	-4.36	92.55	.69	15.87	-1.63	222.69
17	20	256.95	.05	358.79	6.64	252.73	1.47	327.83	-4.36	92.58	.69	15.87	-1.63	222.69
17	21	257.50	.05	358.83	6.65	253.31	1.47	327.88	-4.36	92.60	.69	15.88	-1.63	222.69
17	22	258.04	.04	358.87	6.67	253.89	1.47	327.93	-4.36	92.62	.69	15.89	-1.63	222.69
17	23	258.59	.04	358.91	6.68	254.48	1.47	327.98	-4.36	92.65	.69	15.90	-1.63	222.68
18	0	259.14	.04	358.95	6.70	255.06	1.47	328.03	-4.36	92.67	.69	15.91	-1.63	222.68
18	1	259.69	.04	358.99	6.71	255.65	1.47	328.08	-4.36	92.69	.69	15.92	-1.63	222.68
18	2	260.24	.04	359.03	6.72	256.23	1.48	328.13	-4.36	92.72	.69	15.93	-1.63	222.68
18	3	260.79	.04	359.07	6.73	256.82	1.48	328.19	-4.36	92.74	.69	15.94	-1.63	222.68
18	4	261.34	.04	359.11	6.74	257.40	1.48	328.24	-4.36	92.77	.69	15.94	-1.63	222.68
18	5	261.89	.04	359.15	6.75	257.99	1.48	328.29	-4.36	92.79	.69	15.95	-1.63	222.67
18	6	262.44	.04	359.19	6.76	258.57	1.48	328.34	-4.35	92.81	.69	15.96	-1.63	222.67
18	7	262.99	.03	359.23	6.77	259.16	1.48	328.39	-4.35	92.84	.69	15.97	-1.63	222.67
18	8	263.53	.03	359.27	6.78	259.74	1.48	328.44	-4.35	92.86	.69	15.98	-1.63	222.67
18	9	264.08	.03	359.31	6.79	260.33	1.48	328.49	-4.35	92.88	.69	15.99	-1.63	222.67
18	10	264.63	.03	359.35	6.80	260.92	1.48	328.54	-4.35	92.91	.69	16.00	-1.63	222.66
18	11	265.18	.03	359.39	6.80	261.50	1.48	328.59	-4.35	92.93	.69	16.01	-1.63	222.66
18	12	265.73	.03	359.44	6.81	262.09	1.48	328.64	-4.35	92.96	.69	16.01	-1.63	222.66
18	13	266.28	.03	359.48	6.81	262.68	1.48	328.69	-4.35	92.98	.69	16.02	-1.63	222.66
18	14	266.83	.03	359.52	6.82	263.27	1.48	328.74	-4.35	93.00	.69	16.03	-1.63	222.66
18	15	267.38	.03	359.56	6.82	263.85	1.48	328.79	-4.35	93.03	.69	16.04	-1.63	222.65
18	16	267.93	.03	359.60	6.82	264.44	1.48	328.84	-4.35	93.05	.69	16.05	-1.63	222.65
18	17	268.48	.02	359.64	6.83	265.03	1.49	328.89	-4.35	93.07	.69	16.06	-1.63	222.65
18	18	269.02	.02	359.68	6.83	265.62	1.49	328.94	-4.35	93.10	.69	16.07	-1.63	222.65
18	19	269.57	.02	359.72	6.83	266.21	1.49	328.99	-4.35	93.12	.69	16.08	-1.63	222.65
18	20	270.12	.02	359.76	6.83	266.80	1.49	329.04	-4.35	93.15	.69	16.08	-1.63	222.65
18	21	270.67	.02	359.80	6.83	267.39	1.49	329.09	-4.34	93.17	.68	16.09	-1.63	222.64
18	22	271.22	.02	359.84	6.82	267.98	1.49	329.14	-4.34	93.19	.68	16.10	-1.63	222.64
18	23	271.77	.02	359.88	6.82	268.57	1.49	329.19	-4.34	93.22	.68	16.11	-1.63	222.64

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * SEPT 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
19	0	272.32	.02	359.92	6.82	269.16	1.49	329.25	-4.34	93.24	.68	16.12	-1.63	222.64
19	1	272.87	.02	359.96	6.82	269.75	1.49	329.30	-4.34	93.26	.68	16.13	-1.63	222.64
19	2	273.42	.01	.00	6.81	270.34	1.49	329.35	-4.34	93.29	.68	16.14	-1.63	222.63
19	3	273.97	.01	.04	6.81	270.93	1.49	329.40	-4.34	93.31	.68	16.15	-1.63	222.63
19	4	274.51	.01	.08	6.80	271.52	1.49	329.45	-4.34	93.34	.68	16.15	-1.63	222.63
19	5	275.06	.01	.13	6.79	272.11	1.49	329.50	-4.34	93.36	.68	16.16	-1.63	222.63
19	6	275.61	.01	.17	6.79	272.70	1.49	329.55	-4.34	93.38	.68	16.17	-1.63	222.63
19	7	276.16	.01	.21	6.78	273.30	1.49	329.60	-4.34	93.41	.68	16.18	-1.63	222.62
19	8	276.71	.01	.25	6.77	273.89	1.49	329.65	-4.34	93.43	.68	16.19	-1.63	222.62
19	9	277.26	.01	.29	6.76	274.48	1.50	329.70	-4.34	93.45	.68	16.20	-1.63	222.62
19	10	277.81	.01	.33	6.75	275.07	1.50	329.75	-4.34	93.48	.68	16.21	-1.63	222.62
19	11	278.36	.00	.37	6.74	275.66	1.50	329.80	-4.33	93.50	.68	16.22	-1.63	222.62
19	12	278.91	.00	.41	6.73	276.26	1.50	329.85	-4.33	93.53	.68	16.23	-1.63	222.61
19	13	279.46	.00	.45	6.71	276.85	1.50	329.90	-4.33	93.55	.68	16.23	-1.63	222.61
19	14	280.00	.00	.49	6.70	277.44	1.50	329.95	-4.33	93.57	.68	16.24	-1.63	222.61
19	15	280.55	-.00	.53	6.69	278.04	1.50	330.01	-4.33	93.60	.68	16.25	-1.63	222.61
19	16	281.10	-.00	.57	6.67	278.63	1.50	330.06	-4.33	93.62	.68	16.26	-1.63	222.61
19	17	281.65	-.00	.61	6.66	279.22	1.50	330.11	-4.33	93.65	.68	16.27	-1.64	222.61
19	18	282.20	-.00	.66	6.64	279.82	1.50	330.16	-4.33	93.67	.68	16.28	-1.64	222.60
19	19	282.75	-.01	.70	6.62	280.41	1.50	330.21	-4.33	93.69	.68	16.29	-1.64	222.60
19	20	283.30	-.01	.74	6.61	281.00	1.50	330.26	-4.33	93.72	.68	16.30	-1.64	222.60
19	21	283.85	-.01	.78	6.59	281.60	1.50	330.31	-4.33	93.74	.68	16.30	-1.64	222.60
19	22	284.40	-.01	.82	6.57	282.19	1.50	330.36	-4.33	93.77	.68	16.31	-1.64	222.60
19	23	284.95	-.01	.86	6.55	282.79	1.50	330.41	-4.33	93.79	.68	16.32	-1.64	222.59
20	0	285.49	-.01	.90	6.53	283.38	1.50	330.46	-4.33	93.81	.68	16.33	-1.64	222.59
20	1	286.04	-.01	.94	6.51	283.98	1.50	330.51	-4.32	93.84	.68	16.34	-1.64	222.59
20	2	286.59	-.01	.98	6.49	284.57	1.51	330.56	-4.32	93.86	.68	16.35	-1.64	222.59
20	3	287.14	-.01	1.02	6.47	285.17	1.51	330.61	-4.32	93.89	.68	16.36	-1.64	222.59
20	4	287.69	-.02	1.07	6.44	285.76	1.51	330.67	-4.32	93.91	.68	16.37	-1.64	222.58
20	5	288.24	-.02	1.11	6.42	286.36	1.51	330.72	-4.32	93.93	.68	16.38	-1.64	222.58
20	6	288.79	-.02	1.15	6.39	286.95	1.51	330.77	-4.32	93.96	.68	16.38	-1.64	222.58
20	7	289.34	-.02	1.19	6.37	287.55	1.51	330.82	-4.32	93.98	.68	16.39	-1.64	222.58
20	8	289.69	-.02	1.23	6.34	288.14	1.51	330.87	-4.32	94.01	.68	16.40	-1.64	222.58
20	9	290.44	-.02	1.27	6.32	288.74	1.51	330.92	-4.32	94.03	.68	16.41	-1.64	222.57
20	10	290.98	-.02	1.31	6.29	289.34	1.51	330.97	-4.32	94.05	.67	16.42	-1.64	222.57
20	11	291.53	-.02	1.35	6.26	289.93	1.51	331.02	-4.32	94.08	.67	16.43	-1.64	222.57
20	12	292.08	-.02	1.39	6.23	290.53	1.51	331.07	-4.32	94.10	.67	16.44	-1.64	222.57
20	13	292.63	-.03	1.43	6.20	291.12	1.51	331.12	-4.32	94.13	.67	16.45	-1.64	222.57
20	14	293.18	-.03	1.48	6.17	291.72	1.51	331.17	-4.32	94.15	.67	16.46	-1.64	222.56
20	15	293.73	-.03	1.52	6.14	292.32	1.51	331.23	-4.31	94.17	.67	16.46	-1.64	222.56
20	16	294.28	-.03	1.56	6.11	292.91	1.51	331.28	-4.31	94.20	.67	16.47	-1.64	222.56
20	17	294.83	-.03	1.60	6.08	293.51	1.51	331.33	-4.31	94.22	.67	16.48	-1.64	222.56
20	18	295.38	-.03	1.64	6.05	294.11	1.51	331.38	-4.31	94.25	.67	16.49	-1.64	222.55
20	19	295.93	-.03	1.68	6.01	294.70	1.51	331.43	-4.31	94.27	.67	16.50	-1.64	222.55
20	20	296.48	-.03	1.72	5.98	295.30	1.51	331.48	-4.31	94.30	.67	16.51	-1.64	222.55
20	21	297.02	-.04	1.76	5.95	295.90	1.51	331.53	-4.31	94.32	.67	16.52	-1.64	222.55
20	22	297.57	-.04	1.81	5.91	296.49	1.52	331.58	-4.31	94.34	.67	16.53	-1.64	222.55
20	23	298.12	-.04	1.85	5.88	297.09	1.52	331.63	-4.31	94.37	.67	16.54	-1.64	222.54

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * SEPT 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
21	0	298.67	-.04	1.89	5.84	297.69	1.52	331.68	-4.31	94.39	.67	16.55	-1.64	222.54
21	1	299.22	-.04	1.93	5.80	298.29	1.52	331.73	-4.31	94.42	.67	16.55	-1.64	222.54
21	2	299.77	-.04	1.97	5.76	298.88	1.52	331.79	-4.31	94.44	.67	16.56	-1.64	222.54
21	3	300.32	-.04	2.01	5.73	299.48	1.52	331.84	-4.31	94.46	.67	16.57	-1.64	222.54
21	4	300.87	-.04	2.05	5.69	300.08	1.52	331.89	-4.31	94.49	.67	16.58	-1.64	222.53
21	5	301.42	-.04	2.09	5.65	300.68	1.52	331.94	-4.30	94.51	.67	16.59	-1.64	222.53
21	6	301.97	-.05	2.14	5.61	301.27	1.52	331.99	-4.30	94.54	.67	16.60	-1.64	222.53
21	7	302.51	-.05	2.18	5.57	301.87	1.52	332.04	-4.30	94.56	.67	16.61	-1.64	222.53
21	8	303.06	-.05	2.22	5.52	302.47	1.52	332.09	-4.30	94.59	.67	16.62	-1.64	222.53
21	9	303.61	-.05	2.26	5.48	303.07	1.52	332.14	-4.30	94.61	.67	16.63	-1.64	222.52
21	10	304.16	-.05	2.30	5.44	303.66	1.52	332.19	-4.30	94.64	.67	16.63	-1.64	222.52
21	11	304.71	-.05	2.34	5.40	304.26	1.52	332.25	-4.30	94.66	.67	16.64	-1.64	222.52
21	12	305.26	-.05	2.38	5.35	304.86	1.52	332.30	-4.30	94.68	.67	16.65	-1.64	222.52
21	13	305.81	-.05	2.43	5.31	305.46	1.52	332.35	-4.30	94.71	.67	16.66	-1.64	222.51
21	14	306.36	-.06	2.47	5.26	306.06	1.52	332.40	-4.30	94.73	.67	16.67	-1.64	222.51
21	15	306.91	-.06	2.51	5.22	306.65	1.52	332.45	-4.30	94.76	.67	16.68	-1.64	222.51
21	16	307.46	-.06	2.55	5.17	307.25	1.52	332.50	-4.30	94.78	.67	16.69	-1.64	222.51
21	17	308.00	-.06	2.59	5.12	307.85	1.52	332.55	-4.30	94.81	.67	16.70	-1.64	222.51
21	18	308.55	-.06	2.63	5.08	308.45	1.52	332.60	-4.30	94.83	.67	16.71	-1.64	222.50
21	19	309.10	-.06	2.67	5.03	309.04	1.52	332.65	-4.29	94.86	.67	16.72	-1.64	222.50
21	20	309.65	-.06	2.72	4.98	309.64	1.53	332.70	-4.29	94.88	.67	16.72	-1.64	222.50
21	21	310.20	-.06	2.76	4.93	310.24	1.53	332.76	-4.29	94.90	.67	16.73	-1.64	222.50
21	22	310.75	-.07	2.80	4.88	310.84	1.53	332.81	-4.29	94.93	.66	16.74	-1.64	222.50
21	23	311.30	-.07	2.84	4.83	311.44	1.53	332.86	-4.29	94.95	.66	16.75	-1.64	222.49
22	0	311.85	-.07	2.88	4.78	312.03	1.53	332.91	-4.29	94.98	.66	16.76	-1.65	222.49
22	1	312.40	-.07	2.92	4.73	312.63	1.53	332.96	-4.29	95.00	.66	16.77	-1.65	222.49
22	2	312.95	-.07	2.97	4.68	313.23	1.53	333.01	-4.29	95.03	.66	16.78	-1.65	222.49
22	3	313.49	-.07	3.01	4.63	313.83	1.53	333.06	-4.29	95.05	.66	16.79	-1.65	222.48
22	4	314.04	-.07	3.05	4.57	314.43	1.53	333.11	-4.29	95.08	.66	16.80	-1.65	222.48
22	5	314.59	-.07	3.09	4.52	315.02	1.53	333.17	-4.29	95.10	.66	16.81	-1.65	222.48
22	6	315.14	-.07	3.13	4.47	315.62	1.53	333.22	-4.29	95.13	.66	16.81	-1.65	222.48
22	7	315.69	-.08	3.17	4.41	316.22	1.53	333.27	-4.29	95.15	.66	16.82	-1.65	222.48
22	8	316.24	-.08	3.22	4.36	316.82	1.53	333.32	-4.29	95.17	.66	16.83	-1.65	222.47
22	9	316.79	-.08	3.26	4.30	317.41	1.53	333.37	-4.29	95.20	.66	16.84	-1.65	222.47
22	10	317.34	-.08	3.30	4.25	318.01	1.53	333.42	-4.28	95.22	.66	16.85	-1.65	222.47
22	11	317.89	-.08	3.34	4.19	318.61	1.53	333.47	-4.28	95.25	.66	16.86	-1.65	222.47
22	12	318.44	-.08	3.38	4.14	319.21	1.53	333.52	-4.28	95.27	.66	16.87	-1.65	222.46
22	13	318.98	-.08	3.42	4.08	319.80	1.53	333.57	-4.28	95.30	.66	16.88	-1.65	222.46
22	14	319.53	-.08	3.47	4.02	320.40	1.53	333.63	-4.28	95.32	.66	16.89	-1.65	222.46
22	15	320.08	-.09	3.51	3.96	321.00	1.53	333.68	-4.28	95.35	.66	16.90	-1.65	222.46
22	16	320.63	-.09	3.55	3.91	321.60	1.53	333.73	-4.28	95.37	.66	16.90	-1.65	222.46
22	17	321.18	-.09	3.59	3.85	322.19	1.53	333.78	-4.28	95.40	.66	16.91	-1.65	222.45
22	18	321.73	-.09	3.63	3.79	322.79	1.53	333.83	-4.28	95.42	.66	16.92	-1.65	222.45
22	19	322.28	-.09	3.67	3.73	323.39	1.53	333.88	-4.28	95.45	.66	16.93	-1.65	222.45
22	20	322.83	-.09	3.72	3.67	323.98	1.53	333.93	-4.28	95.47	.66	16.94	-1.65	222.45
22	21	323.38	-.09	3.76	3.61	324.58	1.53	333.98	-4.28	95.50	.66	16.95	-1.65	222.44
22	22	323.93	-.09	3.80	3.55	325.18	1.54	334.04	-4.28	95.52	.66	16.96	-1.65	222.44
22	23	324.47	-.10	3.84	3.49	325.77	1.54	334.09	-4.28	95.55	.66	16.97	-1.65	222.44

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * SEPT 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
23	0	325.02	-.10	3.86	3.42	326.37	1.54	334.14	-4.27	95.57	.66	16.98	-1.65	222.44
23	1	325.57	-.10	3.93	3.36	326.97	1.54	334.19	-4.27	95.60	.66	16.99	-1.65	222.43
23	2	326.12	-.10	3.97	3.30	327.56	1.54	334.24	-4.27	95.62	.66	17.00	-1.65	222.43
23	3	326.67	-.10	4.01	3.24	328.16	1.54	334.29	-4.27	95.65	.66	17.00	-1.65	222.43
23	4	327.22	-.10	4.05	3.18	328.76	1.54	334.34	-4.27	95.67	.66	17.01	-1.65	222.43
23	5	327.77	-.10	4.09	3.11	329.35	1.54	334.39	-4.27	95.70	.66	17.02	-1.65	222.43
23	6	328.32	-.10	4.13	3.05	329.95	1.54	334.45	-4.27	95.72	.66	17.03	-1.65	222.42
23	7	328.87	-.11	4.18	2.98	330.55	1.54	334.50	-4.27	95.75	.66	17.04	-1.65	222.42
23	8	329.42	-.11	4.22	2.92	331.14	1.54	334.55	-4.27	95.77	.66	17.05	-1.65	222.42
23	9	329.97	-.11	4.26	2.86	331.74	1.54	334.60	-4.27	95.80	.65	17.06	-1.65	222.42
23	10	330.51	-.11	4.30	2.79	332.33	1.54	334.65	-4.27	95.82	.65	17.07	-1.65	222.41
23	11	331.06	-.11	4.34	2.73	332.93	1.54	334.70	-4.27	95.85	.65	17.08	-1.65	222.41
23	12	331.61	-.11	4.39	2.66	333.52	1.54	334.75	-4.27	95.87	.65	17.09	-1.65	222.41
23	13	332.16	-.11	4.43	2.60	334.12	1.54	334.80	-4.27	95.90	.65	17.10	-1.65	222.41
23	14	332.71	-.11	4.47	2.53	334.71	1.54	334.86	-4.26	95.92	.65	17.10	-1.65	222.40
23	15	333.26	-.12	4.51	2.46	335.31	1.54	334.91	-4.26	95.95	.65	17.11	-1.65	222.40
23	16	333.81	-.12	4.55	2.40	335.90	1.54	334.96	-4.26	95.97	.65	17.12	-1.65	222.40
23	17	334.36	-.12	4.60	2.33	336.50	1.54	335.01	-4.26	96.00	.65	17.13	-1.65	222.40
23	18	334.91	-.12	4.64	2.26	337.09	1.54	335.06	-4.26	96.02	.65	17.14	-1.65	222.40
23	19	335.46	-.12	4.68	2.20	337.69	1.54	335.11	-4.26	96.05	.65	17.15	-1.65	222.39
23	20	336.00	-.12	4.72	2.13	338.28	1.54	335.16	-4.26	96.08	.65	17.16	-1.65	222.39
23	21	336.55	-.12	4.76	2.06	338.87	1.54	335.21	-4.26	96.10	.65	17.17	-1.65	222.39
23	22	337.10	-.12	4.81	1.99	339.47	1.54	335.27	-4.26	96.13	.65	17.18	-1.65	222.39
23	23	337.65	-.13	4.85	1.93	340.06	1.54	335.32	-4.26	96.15	.65	17.19	-1.65	222.38
24	0	338.20	-.13	4.89	1.86	340.65	1.54	335.37	-4.26	96.18	.65	17.20	-1.65	222.38
24	1	338.75	-.13	4.93	1.79	341.25	1.54	335.42	-4.26	96.20	.65	17.20	-1.65	222.38
24	2	339.30	-.13	4.97	1.72	341.84	1.54	335.47	-4.26	96.23	.65	17.21	-1.65	222.38
24	3	339.85	-.13	5.02	1.65	342.43	1.54	335.52	-4.26	96.25	.65	17.22	-1.65	222.37
24	4	340.40	-.13	5.06	1.58	343.03	1.54	335.57	-4.25	96.28	.65	17.23	-1.65	222.37
24	5	340.95	-.13	5.10	1.51	343.62	1.54	335.63	-4.25	96.30	.65	17.24	-1.66	222.37
24	6	341.49	-.13	5.14	1.44	344.21	1.54	335.68	-4.25	96.33	.65	17.25	-1.66	222.37
24	7	342.04	-.14	5.18	1.38	344.80	1.55	335.73	-4.25	96.36	.65	17.26	-1.66	222.36
24	8	342.59	-.14	5.23	1.31	345.39	1.55	335.78	-4.25	96.38	.65	17.27	-1.66	222.36
24	9	343.14	-.14	5.27	1.24	345.99	1.55	335.83	-4.25	96.41	.65	17.28	-1.66	222.36
24	10	343.69	-.14	5.31	1.17	346.58	1.55	335.88	-4.25	96.43	.65	17.29	-1.66	222.36
24	11	344.24	-.14	5.35	1.10	347.17	1.55	335.93	-4.25	96.46	.65	17.30	-1.66	222.35
24	12	344.79	-.14	5.39	1.03	347.76	1.55	335.98	-4.25	96.48	.65	17.30	-1.66	222.35
24	13	345.34	-.14	5.44	.96	348.35	1.55	336.04	-4.25	96.51	.65	17.31	-1.66	222.35
24	14	345.89	-.14	5.48	.89	348.94	1.55	336.09	-4.25	96.53	.65	17.32	-1.66	222.35
24	15	346.44	-.15	5.52	.82	349.53	1.55	336.14	-4.25	96.56	.65	17.33	-1.66	222.34
24	16	346.98	-.15	5.56	.75	350.12	1.55	336.19	-4.25	96.59	.65	17.34	-1.66	222.34
24	17	347.53	-.15	5.60	.68	350.71	1.55	336.24	-4.25	96.61	.65	17.35	-1.66	222.34
24	18	348.08	-.15	5.65	.61	351.30	1.55	336.29	-4.24	96.64	.65	17.36	-1.66	222.34
24	19	348.63	-.15	5.69	.54	351.89	1.55	336.34	-4.24	96.66	.65	17.37	-1.66	222.34
24	20	349.18	-.15	5.73	.47	352.48	1.55	336.39	-4.24	96.69	.65	17.38	-1.66	222.33
24	21	349.73	-.15	5.77	.40	353.07	1.55	336.45	-4.24	96.71	.64	17.39	-1.66	222.33
24	22	350.28	-.15	5.82	.33	353.65	1.55	336.50	-4.24	96.74	.64	17.40	-1.66	222.33
24	23	350.83	-.15	5.86	.26	354.24	1.55	336.55	-4.24	96.77	.64	17.41	-1.66	222.33

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * OCT 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
13	0	228.55	-.61	23.65	4.99	223.73	1.50	358.48	-3.83	108.82	.54	21.32	-1.72	221.11
13	1	229.10	-.61	23.69	5.03	224.30	1.50	358.53	-3.83	108.84	.54	21.33	-1.72	221.10
13	2	229.65	-.61	23.73	5.08	224.89	1.50	358.58	-3.83	108.87	.54	21.34	-1.72	221.10
13	3	230.20	-.61	23.77	5.12	225.46	1.50	358.63	-3.83	108.90	.54	21.34	-1.72	221.10
13	4	230.75	-.61	23.81	5.17	226.03	1.50	358.68	-3.83	108.93	.54	21.35	-1.72	221.09
13	5	231.30	-.61	23.85	5.21	226.61	1.50	358.73	-3.83	108.95	.54	21.36	-1.72	221.09
13	6	231.85	-.61	23.89	5.25	227.19	1.49	358.78	-3.83	108.98	.54	21.37	-1.72	221.09
13	7	232.39	-.61	23.93	5.30	227.77	1.49	358.83	-3.82	109.01	.54	21.38	-1.72	221.08
13	8	232.94	-.62	23.97	5.34	228.35	1.49	358.89	-3.82	109.04	.54	21.39	-1.72	221.08
13	9	233.49	-.62	24.01	5.38	228.92	1.49	358.94	-3.82	109.06	.54	21.40	-1.72	221.08
13	10	234.04	-.62	24.05	5.42	229.50	1.49	358.99	-3.82	109.09	.54	21.41	-1.72	221.08
13	11	234.59	-.62	24.09	5.46	230.08	1.49	359.04	-3.82	109.12	.54	21.42	-1.72	221.07
13	12	235.14	-.62	24.13	5.50	230.66	1.49	359.09	-3.82	109.15	.54	21.42	-1.72	221.07
13	13	235.69	-.62	24.17	5.54	231.24	1.49	359.14	-3.82	109.17	.54	21.43	-1.72	221.07
13	14	236.24	-.62	24.21	5.58	231.83	1.49	359.19	-3.82	109.20	.54	21.44	-1.72	221.06
13	15	236.79	-.62	24.25	5.62	232.41	1.49	359.24	-3.82	109.23	.54	21.45	-1.72	221.06
13	16	237.34	-.62	24.29	5.65	232.99	1.49	359.29	-3.81	109.26	.54	21.46	-1.72	221.06
13	17	237.88	-.62	24.33	5.69	233.57	1.49	359.34	-3.81	109.28	.54	21.47	-1.72	221.05
13	18	238.43	-.62	24.38	5.73	234.15	1.49	359.39	-3.81	109.31	.54	21.48	-1.72	221.05
13	19	238.98	-.63	24.42	5.76	234.74	1.49	359.45	-3.81	109.34	.54	21.49	-1.72	221.05
13	20	239.53	-.63	24.46	5.80	235.32	1.49	359.50	-3.81	109.37	.54	21.50	-1.72	221.05
13	21	240.08	-.63	24.50	5.83	235.90	1.49	359.55	-3.81	109.39	.54	21.50	-1.72	221.04
13	22	240.63	-.63	24.54	5.87	236.49	1.48	359.60	-3.81	109.42	.54	21.51	-1.72	221.04
13	23	241.18	-.63	24.58	5.90	237.07	1.48	359.65	-3.81	109.45	.54	21.52	-1.72	221.04
14	0	241.73	-.63	24.62	5.94	237.66	1.48	359.70	-3.81	109.48	.54	21.53	-1.72	221.03
14	1	242.28	-.63	24.66	5.97	238.24	1.48	359.75	-3.81	109.50	.54	21.54	-1.72	221.03
14	2	242.83	-.63	24.70	6.00	238.83	1.48	359.80	-3.80	109.53	.54	21.55	-1.72	221.03
14	3	243.37	-.63	24.74	6.03	239.41	1.48	359.85	-3.80	109.56	.54	21.56	-1.72	221.02
14	4	243.92	-.63	24.78	6.06	240.00	1.48	359.90	-3.80	109.59	.54	21.57	-1.72	221.02
14	5	244.47	-.63	24.82	6.09	240.58	1.48	359.95	-3.80	109.61	.54	21.58	-1.72	221.02
14	6	245.02	-.64	24.86	6.12	241.17	1.48	.01	-3.80	109.64	.54	21.58	-1.72	221.02
14	7	245.57	-.64	24.90	6.15	241.76	1.48	.06	-3.80	109.67	.54	21.59	-1.72	221.01
14	8	246.12	-.64	24.94	6.18	242.34	1.48	.11	-3.80	109.69	.54	21.60	-1.72	221.01
14	9	246.67	-.64	24.98	6.20	242.93	1.48	.16	-3.80	109.72	.53	21.61	-1.72	221.01
14	10	247.22	-.64	25.02	6.23	243.52	1.48	.21	-3.80	109.75	.53	21.62	-1.72	221.00
14	11	247.77	-.64	25.06	6.26	244.10	1.48	.26	-3.79	109.78	.53	21.63	-1.72	221.00
14	12	248.32	-.64	25.10	6.28	244.69	1.48	.31	-3.79	109.80	.53	21.64	-1.72	221.00
14	13	248.87	-.64	25.14	6.31	245.28	1.47	.36	-3.79	109.83	.53	21.65	-1.72	220.99
14	14	249.41	-.64	25.18	6.33	245.87	1.47	.41	-3.79	109.86	.53	21.66	-1.72	220.99
14	15	249.96	-.64	25.22	6.35	246.46	1.47	.47	-3.79	109.89	.53	21.66	-1.72	220.99
14	16	250.51	-.65	25.26	6.38	247.05	1.47	.52	-3.79	109.91	.53	21.67	-1.72	220.99
14	17	251.06	-.65	25.30	6.40	247.64	1.47	.57	-3.79	109.94	.53	21.68	-1.72	220.98
14	18	251.61	-.65	25.35	6.42	248.22	1.47	.62	-3.79	109.97	.53	21.69	-1.72	220.98
14	19	252.16	-.65	25.39	6.44	248.81	1.47	.67	-3.79	110.00	.53	21.70	-1.72	220.98
14	20	252.71	-.65	25.43	6.46	249.40	1.47	.72	-3.79	110.02	.53	21.71	-1.72	220.97
14	21	253.26	-.65	25.47	6.48	249.99	1.47	.77	-3.78	110.05	.53	21.72	-1.72	220.97
14	22	253.81	-.65	25.51	6.50	250.58	1.47	.82	-3.78	110.08	.53	21.73	-1.72	220.97
14	23	254.36	-.65	25.55	6.52	251.17	1.47	.87	-3.78	110.10	.53	21.74	-1.72	220.96

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * OCT 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
15	0	254.90	-.65	25.59	6.54	251.76	1.47	.93	-3.78	110.13	.53	21.74	-1.72	220.96
15	1	255.45	-.65	25.63	6.55	252.35	1.47	.98	-3.78	110.16	.53	21.75	-1.72	220.96
15	2	256.00	-.65	25.67	6.57	252.95	1.47	1.03	-3.78	110.19	.53	21.76	-1.72	220.96
15	3	256.55	-.66	25.71	6.58	253.54	1.46	1.08	-3.78	110.21	.53	21.77	-1.72	220.95
15	4	257.10	-.66	25.75	6.60	254.13	1.46	1.13	-3.78	110.24	.53	21.78	-1.72	220.95
15	5	257.65	-.66	25.79	6.61	254.72	1.46	1.18	-3.78	110.27	.53	21.79	-1.72	220.95
15	6	258.20	-.66	25.83	6.63	255.31	1.46	1.23	-3.78	110.29	.53	21.80	-1.72	220.94
15	7	258.75	-.66	25.87	6.64	255.90	1.46	1.28	-3.77	110.32	.53	21.81	-1.72	220.94
15	8	259.30	-.66	25.91	6.65	256.49	1.46	1.33	-3.77	110.35	.53	21.82	-1.72	220.94
15	9	259.85	-.66	25.95	6.66	257.08	1.46	1.39	-3.77	110.38	.53	21.83	-1.72	220.93
15	10	260.39	-.66	26.00	6.67	257.68	1.46	1.44	-3.77	110.40	.53	21.83	-1.72	220.93
15	11	260.94	-.66	26.04	6.68	258.27	1.46	1.49	-3.77	110.43	.53	21.84	-1.72	220.93
15	12	261.49	-.66	26.08	6.69	258.86	1.46	1.54	-3.77	110.46	.53	21.85	-1.72	220.92
15	13	262.04	-.67	26.12	6.70	259.45	1.46	1.59	-3.77	110.49	.53	21.86	-1.72	220.92
15	14	262.59	-.67	26.16	6.71	260.04	1.46	1.64	-3.77	110.51	.53	21.87	-1.72	220.92
15	15	263.14	-.67	26.20	6.71	260.64	1.46	1.69	-3.77	110.54	.53	21.88	-1.72	220.92
15	16	263.69	-.67	26.24	6.72	261.23	1.45	1.75	-3.76	110.57	.53	21.89	-1.72	220.91
15	17	264.24	-.67	26.28	6.73	261.82	1.45	1.80	-3.76	110.59	.53	21.90	-1.72	220.91
15	18	264.79	-.67	26.32	6.73	262.41	1.45	1.85	-3.76	110.62	.53	21.91	-1.72	220.91
15	19	265.34	-.67	26.36	6.73	263.01	1.45	1.90	-3.76	110.65	.53	21.91	-1.72	220.90
15	20	265.88	-.67	26.40	6.74	263.60	1.45	1.95	-3.76	110.68	.53	21.92	-1.72	220.90
15	21	266.43	-.67	26.44	6.74	264.19	1.45	2.00	-3.76	110.70	.53	21.93	-1.72	220.90
15	22	266.98	-.67	26.48	6.74	264.78	1.45	2.05	-3.76	110.73	.53	21.94	-1.72	220.89
15	23	267.53	-.68	26.53	6.74	265.38	1.45	2.10	-3.76	110.76	.53	21.95	-1.72	220.89
16	0	268.08	-.68	26.57	6.74	265.97	1.45	2.16	-3.76	110.79	.53	21.96	-1.72	220.89
16	1	268.63	-.68	26.61	6.74	266.56	1.45	2.21	-3.76	110.81	.53	21.97	-1.72	220.88
16	2	269.18	-.68	26.65	6.74	267.15	1.45	2.26	-3.75	110.84	.53	21.98	-1.72	220.88
16	3	269.73	-.68	26.69	6.74	267.75	1.45	2.31	-3.75	110.87	.53	21.99	-1.72	220.88
16	4	270.28	-.68	26.73	6.74	268.34	1.45	2.36	-3.75	110.89	.53	22.00	-1.72	220.88
16	5	270.83	-.68	26.77	6.74	268.93	1.44	2.41	-3.75	110.92	.53	22.00	-1.72	220.87
16	6	271.37	-.68	26.81	6.73	269.52	1.44	2.46	-3.75	110.95	.52	22.01	-1.72	220.87
16	7	271.92	-.68	26.85	6.73	270.12	1.44	2.52	-3.75	110.98	.52	22.02	-1.72	220.87
16	8	272.47	-.68	26.89	6.72	270.71	1.44	2.57	-3.75	111.00	.52	22.03	-1.72	220.86
16	9	273.02	-.69	26.93	6.72	271.30	1.44	2.62	-3.75	111.03	.52	22.04	-1.73	220.86
16	10	273.57	-.69	26.98	6.71	271.90	1.44	2.67	-3.75	111.06	.52	22.05	-1.73	220.86
16	11	274.12	-.69	27.02	6.70	272.49	1.44	2.72	-3.75	111.08	.52	22.06	-1.73	220.85
16	12	274.67	-.69	27.06	6.69	273.08	1.44	2.77	-3.74	111.11	.52	22.07	-1.73	220.85
16	13	275.22	-.69	27.10	6.68	273.67	1.44	2.83	-3.74	111.14	.52	22.08	-1.73	220.85
16	14	275.77	-.69	27.14	6.67	274.27	1.44	2.88	-3.74	111.17	.52	22.09	-1.73	220.84
16	15	276.32	-.69	27.18	6.66	274.86	1.44	2.93	-3.74	111.19	.52	22.09	-1.73	220.84
16	16	276.86	-.69	27.22	6.65	275.45	1.43	2.98	-3.74	111.22	.52	22.10	-1.73	220.84
16	17	277.41	-.69	27.26	6.64	276.04	1.43	3.03	-3.74	111.25	.52	22.11	-1.73	220.83
16	18	277.96	-.69	27.30	6.63	276.64	1.43	3.08	-3.74	111.27	.52	22.12	-1.73	220.83
16	19	278.51	-.70	27.34	6.62	277.23	1.43	3.13	-3.74	111.30	.52	22.13	-1.73	220.83
16	20	279.06	-.70	27.39	6.60	277.82	1.43	3.19	-3.74	111.33	.52	22.14	-1.73	220.83
16	21	279.61	-.70	27.43	6.59	278.41	1.43	3.24	-3.73	111.36	.52	22.15	-1.73	220.82
16	22	280.16	-.70	27.47	6.57	279.00	1.43	3.29	-3.73	111.38	.52	22.16	-1.73	220.82
16	23	280.71	-.70	27.51	6.56	279.60	1.43	3.34	-3.73	111.41	.52	22.17	-1.73	220.82

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * OCT 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
17	0	281.26	-.70	27.55	6.54	280.19	1.43	3.39	-3.73	111.44	.52	22.18	-1.73	220.81
17	1	281.81	-.70	27.59	6.52	280.78	1.43	3.44	-3.73	111.47	.52	22.18	-1.73	220.81
17	2	282.36	-.70	27.63	6.51	281.37	1.43	3.50	-3.73	111.49	.52	22.19	-1.73	220.81
17	3	282.90	-.70	27.67	6.49	281.96	1.43	3.55	-3.73	111.52	.52	22.20	-1.73	220.80
17	4	283.45	-.70	27.72	6.47	282.56	1.42	3.60	-3.73	111.55	.52	22.21	-1.73	220.80
17	5	284.00	-.71	27.76	6.45	283.15	1.42	3.65	-3.73	111.57	.52	22.22	-1.73	220.80
17	6	284.55	-.71	27.80	6.43	283.74	1.42	3.70	-3.73	111.60	.52	22.23	-1.73	220.79
17	7	285.10	-.71	27.84	6.41	284.33	1.42	3.75	-3.72	111.63	.52	22.24	-1.73	220.79
17	8	285.65	-.71	27.88	6.38	284.92	1.42	3.81	-3.72	111.66	.52	22.25	-1.73	220.79
17	9	286.20	-.71	27.92	6.36	285.51	1.42	3.86	-3.72	111.68	.52	22.26	-1.73	220.78
17	10	286.75	-.71	27.96	6.34	286.10	1.42	3.91	-3.72	111.71	.52	22.27	-1.73	220.78
17	11	287.30	-.71	28.00	6.31	286.70	1.42	3.96	-3.72	111.74	.52	22.27	-1.73	220.78
17	12	287.85	-.71	28.05	6.29	287.29	1.42	4.01	-3.72	111.77	.52	22.28	-1.73	220.77
17	13	288.39	-.71	28.09	6.26	287.88	1.42	4.06	-3.72	111.79	.52	22.29	-1.73	220.77
17	14	288.94	-.71	28.13	6.24	288.47	1.42	4.12	-3.72	111.82	.52	22.30	-1.73	220.77
17	15	289.49	-.72	28.17	6.21	289.06	1.41	4.17	-3.72	111.85	.52	22.31	-1.73	220.77
17	16	290.04	-.72	28.21	6.18	289.65	1.41	4.22	-3.72	111.87	.52	22.32	-1.73	220.76
17	17	290.59	-.72	28.25	6.16	290.24	1.41	4.27	-3.71	111.90	.52	22.33	-1.73	220.76
17	18	291.14	-.72	28.29	6.13	290.83	1.41	4.32	-3.71	111.93	.52	22.34	-1.73	220.76
17	19	291.69	-.72	28.33	6.10	291.42	1.41	4.38	-3.71	111.96	.52	22.35	-1.73	220.75
17	20	292.24	-.72	28.38	6.07	292.01	1.41	4.43	-3.71	111.98	.52	22.36	-1.73	220.75
17	21	292.79	-.72	28.42	6.04	292.60	1.41	4.48	-3.71	112.01	.52	22.36	-1.73	220.75
17	22	293.34	-.72	28.46	6.01	293.19	1.41	4.53	-3.71	112.04	.52	22.37	-1.73	220.74
17	23	293.88	-.72	28.50	5.97	293.78	1.41	4.58	-3.71	112.07	.52	22.38	-1.73	220.74
18	0	294.43	-.73	28.54	5.94	294.37	1.41	4.63	-3.71	112.09	.52	22.39	-1.73	220.74
18	1	294.98	-.73	28.58	5.91	294.96	1.40	4.69	-3.71	112.12	.52	22.40	-1.73	220.73
18	2	295.53	-.73	28.63	5.87	295.55	1.40	4.74	-3.70	112.15	.51	22.41	-1.73	220.73
18	3	296.08	-.73	28.67	5.84	296.13	1.40	4.79	-3.70	112.17	.51	22.42	-1.73	220.73
18	4	296.63	-.73	28.71	5.81	296.72	1.40	4.84	-3.70	112.20	.51	22.43	-1.73	220.72
18	5	297.18	-.73	28.75	5.77	297.31	1.40	4.89	-3.70	112.23	.51	22.44	-1.73	220.72
18	6	297.73	-.73	28.79	5.73	297.90	1.40	4.95	-3.70	112.26	.51	22.45	-1.73	220.72
18	7	298.28	-.73	28.83	5.70	298.49	1.40	5.00	-3.70	112.28	.51	22.46	-1.73	220.71
18	8	298.83	-.73	28.87	5.66	299.08	1.40	5.05	-3.70	112.31	.51	22.46	-1.73	220.71
18	9	299.37	-.73	28.92	5.62	299.66	1.40	5.10	-3.70	112.34	.51	22.47	-1.73	220.71
18	10	299.92	-.74	28.96	5.58	300.25	1.40	5.15	-3.70	112.37	.51	22.48	-1.73	220.70
18	11	300.47	-.74	29.00	5.54	300.84	1.39	5.21	-3.70	112.39	.51	22.49	-1.73	220.70
18	12	301.02	-.74	29.04	5.50	301.43	1.39	5.26	-3.69	112.42	.51	22.50	-1.73	220.70
18	13	301.57	-.74	29.08	5.46	302.02	1.39	5.31	-3.69	112.45	.51	22.51	-1.73	220.69
18	14	302.12	-.74	29.12	5.42	302.60	1.39	5.36	-3.69	112.48	.51	22.52	-1.73	220.69
18	15	302.67	-.74	29.17	5.38	303.19	1.39	5.41	-3.69	112.50	.51	22.53	-1.73	220.69
18	16	303.22	-.74	29.21	5.34	303.78	1.39	5.47	-3.69	112.53	.51	22.54	-1.73	220.68
18	17	303.77	-.74	29.25	5.30	304.36	1.39	5.52	-3.69	112.56	.51	22.55	-1.73	220.68
18	18	304.32	-.74	29.29	5.26	304.95	1.39	5.57	-3.69	112.58	.51	22.56	-1.73	220.68
18	19	304.86	-.75	29.33	5.21	305.54	1.39	5.62	-3.69	112.61	.51	22.56	-1.73	220.67
18	20	305.41	-.75	29.37	5.17	306.12	1.39	5.67	-3.69	112.64	.51	22.57	-1.73	220.67
18	21	305.96	-.75	29.42	5.12	306.71	1.38	5.73	-3.69	112.67	.51	22.58	-1.73	220.67
18	22	306.51	-.75	29.46	5.08	307.30	1.38	5.78	-3.68	112.69	.51	22.59	-1.73	220.67
18	23	307.06	-.75	29.50	5.03	307.88	1.38	5.83	-3.68	112.72	.51	22.60	-1.73	220.66

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * OCT 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
19	0	307.61	-.75	29.54	4.99	308.47	1.38	5.88	-3.68	112.75	.51	22.61	-1.73	220.66
19	1	308.16	-.75	29.58	4.94	309.05	1.38	5.93	-3.68	112.78	.51	22.62	-1.73	220.66
19	2	308.71	-.75	29.63	4.89	309.64	1.38	5.99	-3.68	112.80	.51	22.63	-1.73	220.65
19	3	309.26	-.75	29.67	4.84	310.22	1.38	6.04	-3.68	112.83	.51	22.64	-1.73	220.65
19	4	309.81	-.75	29.71	4.80	310.81	1.38	6.09	-3.68	112.86	.51	22.65	-1.73	220.65
19	5	310.35	-.76	29.75	4.75	311.39	1.38	6.14	-3.68	112.89	.51	22.66	-1.73	220.64
19	6	310.90	-.76	29.79	4.70	311.98	1.38	6.19	-3.68	112.91	.51	22.66	-1.73	220.64
19	7	311.45	-.76	29.84	4.65	312.56	1.37	6.25	-3.68	112.94	.51	22.67	-1.73	220.64
19	8	312.00	-.76	29.88	4.60	313.15	1.37	6.30	-3.67	112.97	.51	22.68	-1.73	220.63
19	9	312.55	-.76	29.92	4.55	313.73	1.37	6.35	-3.67	113.00	.51	22.69	-1.73	220.63
19	10	313.10	-.76	29.96	4.50	314.32	1.37	6.40	-3.67	113.02	.51	22.70	-1.73	220.63
19	11	313.65	-.76	30.00	4.45	314.90	1.37	6.46	-3.67	113.05	.51	22.71	-1.73	220.62
19	12	314.20	-.76	30.04	4.39	315.49	1.37	6.51	-3.67	113.08	.51	22.72	-1.73	220.62
19	13	314.75	-.76	30.09	4.34	316.07	1.37	6.56	-3.67	113.11	.51	22.73	-1.73	220.62
19	14	315.30	-.77	30.13	4.29	316.65	1.37	6.61	-3.67	113.13	.51	22.74	-1.73	220.61
19	15	315.85	-.77	30.17	4.24	317.24	1.37	6.66	-3.67	113.16	.51	22.75	-1.73	220.61
19	16	316.39	-.77	30.21	4.18	317.82	1.36	6.72	-3.67	113.19	.51	22.76	-1.73	220.61
19	17	316.94	-.77	30.25	4.13	318.40	1.36	6.77	-3.66	113.22	.51	22.76	-1.73	220.60
19	18	317.49	-.77	30.30	4.07	318.99	1.36	6.82	-3.66	113.24	.51	22.77	-1.73	220.60
19	19	318.04	-.77	30.34	4.02	319.57	1.36	6.87	-3.66	113.27	.51	22.78	-1.73	220.60
19	20	318.59	-.77	30.38	3.96	320.15	1.36	6.93	-3.66	113.30	.51	22.79	-1.73	220.59
19	21	319.14	-.77	30.42	3.91	320.73	1.36	6.98	-3.66	113.33	.50	22.80	-1.73	220.59
19	22	319.69	-.77	30.47	3.85	321.32	1.36	7.03	-3.66	113.35	.50	22.81	-1.73	220.59
19	23	320.24	-.78	30.51	3.79	321.90	1.36	7.08	-3.66	113.38	.50	22.82	-1.73	220.58
20	0	320.79	-.78	30.55	3.74	322.48	1.36	7.13	-3.66	113.41	.50	22.83	-1.73	220.58
20	1	321.34	-.78	30.59	3.68	323.06	1.36	7.19	-3.66	113.44	.50	22.84	-1.73	220.58
20	2	321.88	-.78	30.63	3.62	323.64	1.35	7.24	-3.66	113.47	.50	22.85	-1.73	220.57
20	3	322.43	-.78	30.68	3.56	324.23	1.35	7.29	-3.65	113.49	.50	22.86	-1.73	220.57
20	4	322.98	-.78	30.72	3.51	324.81	1.35	7.34	-3.65	113.52	.50	22.87	-1.74	220.57
20	5	323.53	-.78	30.76	3.45	325.39	1.35	7.40	-3.65	113.55	.50	22.87	-1.74	220.56
20	6	324.08	-.78	30.80	3.39	325.97	1.35	7.45	-3.65	113.58	.50	22.88	-1.74	220.56
20	7	324.63	-.78	30.84	3.33	326.55	1.35	7.50	-3.65	113.60	.50	22.89	-1.74	220.56
20	8	325.18	-.79	30.89	3.27	327.13	1.35	7.55	-3.65	113.63	.50	22.90	-1.74	220.55
20	9	325.73	-.79	30.93	3.21	327.71	1.35	7.61	-3.65	113.66	.50	22.91	-1.74	220.55
20	10	326.28	-.79	30.97	3.15	328.29	1.35	7.66	-3.65	113.69	.50	22.92	-1.74	220.55
20	11	326.83	-.79	31.01	3.09	328.87	1.34	7.71	-3.65	113.71	.50	22.93	-1.74	220.54
20	12	327.37	-.79	31.06	3.03	329.45	1.34	7.76	-3.65	113.74	.50	22.94	-1.74	220.54
20	13	327.92	-.79	31.10	2.97	330.03	1.34	7.81	-3.64	113.77	.50	22.95	-1.74	220.54
20	14	328.47	-.79	31.14	2.90	330.61	1.34	7.87	-3.64	113.80	.50	22.96	-1.74	220.53
20	15	329.02	-.79	31.18	2.84	331.19	1.34	7.92	-3.64	113.83	.50	22.97	-1.74	220.53
20	16	329.57	-.79	31.23	2.78	331.77	1.34	7.97	-3.64	113.85	.50	22.98	-1.74	220.53
20	17	330.12	-.79	31.27	2.72	332.35	1.34	8.02	-3.64	113.88	.50	22.98	-1.74	220.52
20	18	330.67	-.80	31.31	2.66	332.93	1.34	8.08	-3.64	113.91	.50	22.99	-1.74	220.52
20	19	331.22	-.80	31.35	2.59	333.51	1.34	8.13	-3.64	113.94	.50	23.00	-1.74	220.52
20	20	331.77	-.80	31.39	2.53	334.09	1.33	8.18	-3.64	113.96	.50	23.01	-1.74	220.51
20	21	332.32	-.80	31.44	2.47	334.67	1.33	8.23	-3.64	113.99	.50	23.02	-1.74	220.51
20	22	332.86	-.80	31.48	2.40	335.25	1.33	8.29	-3.63	114.02	.50	23.03	-1.74	220.51
20	23	333.41	-.80	31.52	2.34	335.82	1.33	8.34	-3.63	114.05	.50	23.04	-1.74	220.50

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * OCT 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
21	0	333.96	-.80	31.56	2.27	336.40	1.33	8.39	-3.63	114.08	.50	23.05	-1.74	220.50
21	1	334.51	-.80	31.61	2.21	336.98	1.33	8.44	-3.63	114.10	.50	23.06	-1.74	220.50
21	2	335.06	-.80	31.65	2.15	337.56	1.33	8.50	-3.63	114.13	.50	23.07	-1.74	220.49
21	3	335.61	-.81	31.69	2.08	338.14	1.33	8.55	-3.63	114.16	.50	23.08	-1.74	220.49
21	4	336.16	-.81	31.73	2.02	338.72	1.32	8.60	-3.63	114.19	.50	23.09	-1.74	220.48
21	5	336.71	-.81	31.78	1.95	339.29	1.32	8.65	-3.63	114.22	.50	23.09	-1.74	220.48
21	6	337.26	-.81	31.82	1.88	339.87	1.32	8.71	-3.63	114.24	.50	23.10	-1.74	220.48
21	7	337.81	-.81	31.86	1.82	340.45	1.32	8.76	-3.63	114.27	.50	23.11	-1.74	220.47
21	8	338.35	-.81	31.90	1.75	341.03	1.32	8.81	-3.62	114.30	.50	23.12	-1.74	220.47
21	9	338.90	-.81	31.95	1.69	341.60	1.32	8.86	-3.62	114.33	.50	23.13	-1.74	220.47
21	10	339.45	-.81	31.99	1.62	342.18	1.32	8.92	-3.62	114.36	.50	23.14	-1.74	220.46
21	11	340.00	-.81	32.03	1.56	342.76	1.32	8.97	-3.62	114.38	.50	23.15	-1.74	220.46
21	12	340.55	-.82	32.07	1.49	343.33	1.32	9.02	-3.62	114.41	.50	23.16	-1.74	220.46
21	13	341.10	-.82	32.12	1.42	343.91	1.31	9.07	-3.62	114.44	.50	23.17	-1.74	220.45
21	14	341.65	-.82	32.16	1.36	344.49	1.31	9.13	-3.62	114.47	.50	23.18	-1.74	220.45
21	15	342.20	-.82	32.20	1.29	345.06	1.31	9.18	-3.62	114.50	.49	23.19	-1.74	220.45
21	16	342.75	-.82	32.25	1.22	345.64	1.31	9.23	-3.62	114.52	.49	23.20	-1.74	220.44
21	17	343.30	-.82	32.29	1.16	346.21	1.31	9.28	-3.62	114.55	.49	23.20	-1.74	220.44
21	18	343.84	-.82	32.33	1.09	346.79	1.31	9.34	-3.61	114.58	.49	23.21	-1.74	220.44
21	19	344.39	-.82	32.37	1.02	347.37	1.31	9.39	-3.61	114.61	.49	23.22	-1.74	220.43
21	20	344.94	-.82	32.42	.95	347.94	1.31	9.44	-3.61	114.64	.49	23.23	-1.74	220.43
21	21	345.49	-.83	32.46	.89	348.52	1.30	9.49	-3.61	114.66	.49	23.24	-1.74	220.43
21	22	346.04	-.83	32.50	.82	349.09	1.30	9.55	-3.61	114.69	.49	23.25	-1.74	220.42
21	23	346.59	-.83	32.54	.75	349.67	1.30	9.60	-3.61	114.72	.49	23.26	-1.74	220.42
22	0	347.14	-.83	32.59	.69	350.24	1.30	9.65	-3.61	114.75	.49	23.27	-1.74	220.42
22	1	347.69	-.83	32.63	.62	350.82	1.30	9.70	-3.61	114.78	.49	23.28	-1.74	220.41
22	2	348.24	-.83	32.67	.55	351.39	1.30	9.76	-3.61	114.80	.49	23.29	-1.74	220.41
22	3	348.79	-.83	32.71	.48	351.96	1.30	9.81	-3.60	114.83	.49	23.30	-1.74	220.41
22	4	349.33	-.83	32.76	.42	352.54	1.30	9.86	-3.60	114.86	.49	23.31	-1.74	220.40
22	5	349.88	-.83	32.80	.35	353.11	1.30	9.91	-3.60	114.89	.49	23.32	-1.74	220.40
22	6	350.43	-.84	32.84	.28	353.69	1.29	9.97	-3.60	114.92	.49	23.32	-1.74	220.40
22	7	350.98	-.84	32.89	.21	354.26	1.29	10.02	-3.60	114.95	.49	23.33	-1.74	220.39
22	8	351.53	-.84	32.93	.14	354.83	1.29	10.07	-3.60	114.97	.49	23.34	-1.74	220.39
22	9	352.08	-.84	32.97	.08	355.41	1.29	10.12	-3.60	115.00	.49	23.35	-1.74	220.39
22	10	352.63	-.84	33.01	.01	355.98	1.29	10.18	-3.60	115.03	.49	23.36	-1.74	220.38
22	11	353.18	-.84	33.06	-.06	356.55	1.29	10.23	-3.60	115.06	.49	23.37	-1.74	220.38
22	12	353.73	-.84	33.10	-.13	357.13	1.29	10.28	-3.59	115.09	.49	23.38	-1.74	220.37
22	13	354.28	-.84	33.14	-.19	357.70	1.29	10.33	-3.59	115.12	.49	23.39	-1.74	220.37
22	14	354.83	-.84	33.18	-.26	358.27	1.28	10.39	-3.59	115.14	.49	23.40	-1.74	220.37
22	15	355.37	-.85	33.23	-.33	358.84	1.28	10.44	-3.59	115.17	.49	23.41	-1.74	220.36
22	16	355.92	-.85	33.27	-.40	359.42	1.28	10.49	-3.59	115.20	.49	23.42	-1.74	220.36
22	17	356.47	-.85	33.31	-.46	359.99	1.28	10.54	-3.59	115.23	.49	23.43	-1.74	220.36
22	18	357.02	-.85	33.36	-.53	.56	1.28	10.60	-3.59	115.26	.49	23.43	-1.74	220.35
22	19	357.57	-.85	33.40	-.60	1.13	1.28	10.65	-3.59	115.29	.49	23.44	-1.74	220.35
22	20	358.12	-.85	33.44	-.66	1.70	1.28	10.70	-3.59	115.31	.49	23.45	-1.74	220.35
22	21	358.67	-.85	33.48	-.73	2.27	1.28	10.75	-3.59	115.34	.49	23.46	-1.74	220.34
22	22	359.22	-.85	33.53	-.80	2.84	1.27	10.81	-3.58	115.37	.49	23.47	-1.74	220.34
22	23	359.77	-.85	33.57	-.86	3.42	1.27	10.86	-3.58	115.40	.49	23.48	-1.74	220.34

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * NOV 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
12	0	263.84	-1.23	53.79	6.59	261.73	.55	35.90	-2.96	129.80	.40	27.73	-1.76	218.73
12	1	264.39	-1.23	53.83	6.60	262.34	.55	35.95	-2.96	129.83	.40	27.73	-1.76	218.73
12	2	264.94	-1.23	53.87	6.60	262.95	.54	36.00	-2.96	129.86	.40	27.74	-1.76	218.73
12	3	265.49	-1.23	53.91	6.60	263.56	.54	36.05	-2.96	129.89	.40	27.75	-1.76	218.72
12	4	266.04	-1.23	53.95	6.60	264.17	.54	36.11	-2.96	129.92	.40	27.76	-1.76	218.72
12	5	266.59	-1.24	53.99	6.60	264.78	.54	36.16	-2.96	129.95	.40	27.77	-1.76	218.72
12	6	267.14	-1.24	54.04	6.60	265.39	.54	36.21	-2.96	129.98	.40	27.78	-1.76	218.72
12	7	267.69	-1.24	54.08	6.60	266.00	.53	36.26	-2.95	130.01	.40	27.78	-1.76	218.71
12	8	268.23	-1.24	54.12	6.60	266.61	.53	36.31	-2.95	130.03	.40	27.79	-1.76	218.71
12	9	268.78	-1.24	54.16	6.60	267.22	.53	36.37	-2.95	130.06	.40	27.80	-1.76	218.71
12	10	269.33	-1.24	54.20	6.60	267.83	.53	36.42	-2.95	130.09	.40	27.81	-1.76	218.70
12	11	269.88	-1.24	54.24	6.59	268.44	.53	36.47	-2.95	130.12	.40	27.82	-1.76	218.70
12	12	270.43	-1.24	54.28	6.59	269.05	.52	36.52	-2.95	130.15	.40	27.83	-1.76	218.70
12	13	270.98	-1.24	54.32	6.58	269.66	.52	36.57	-2.95	130.18	.40	27.84	-1.76	218.69
12	14	271.53	-1.24	54.36	6.58	270.27	.52	36.63	-2.95	130.21	.40	27.84	-1.76	218.69
12	15	272.08	-1.24	54.41	6.57	270.88	.52	36.68	-2.94	130.24	.40	27.85	-1.76	218.69
12	16	272.63	-1.24	54.45	6.56	271.48	.52	36.73	-2.94	130.27	.40	27.86	-1.76	218.68
12	17	273.18	-1.24	54.49	6.55	272.09	.51	36.78	-2.94	130.30	.40	27.87	-1.76	218.68
12	18	273.73	-1.24	54.53	6.54	272.70	.51	36.83	-2.94	130.33	.40	27.88	-1.76	218.68
12	19	274.27	-1.24	54.57	6.53	273.31	.51	36.89	-2.94	130.36	.40	27.89	-1.76	218.68
12	20	274.82	-1.25	54.61	6.52	273.92	.51	36.94	-2.94	130.38	.40	27.90	-1.76	218.67
12	21	275.37	-1.25	54.65	6.51	274.53	.51	36.99	-2.94	130.41	.40	27.90	-1.76	218.67
12	22	275.92	-1.25	54.69	6.50	275.14	.51	37.04	-2.94	130.44	.40	27.91	-1.76	218.67
12	23	276.47	-1.25	54.73	6.49	275.75	.50	37.09	-2.93	130.47	.40	27.92	-1.76	218.66
13	0	277.02	-1.25	54.78	6.47	276.35	.50	37.15	-2.93	130.50	.40	27.93	-1.76	218.66
13	1	277.57	-1.25	54.82	6.46	276.96	.50	37.20	-2.93	130.53	.40	27.94	-1.76	218.66
13	2	278.12	-1.25	54.86	6.44	277.57	.50	37.25	-2.93	130.56	.40	27.95	-1.76	218.65
13	3	278.67	-1.25	54.90	6.43	278.18	.50	37.30	-2.93	130.59	.40	27.95	-1.76	218.65
13	4	279.22	-1.25	54.94	6.41	278.78	.49	37.35	-2.93	130.62	.40	27.96	-1.76	218.65
13	5	279.76	-1.25	54.98	6.39	279.39	.49	37.41	-2.93	130.65	.40	27.97	-1.76	218.64
13	6	280.31	-1.25	55.02	6.38	280.00	.49	37.46	-2.92	130.68	.40	27.98	-1.76	218.64
13	7	280.86	-1.25	55.06	6.36	280.60	.49	37.51	-2.92	130.71	.40	27.99	-1.76	218.64
13	8	281.41	-1.25	55.11	6.34	281.21	.49	37.56	-2.92	130.73	.40	28.00	-1.76	218.64
13	9	281.96	-1.25	55.15	6.32	281.82	.48	37.61	-2.92	130.76	.40	28.01	-1.76	218.63
13	10	282.51	-1.25	55.19	6.30	282.42	.48	37.67	-2.92	130.79	.40	28.01	-1.76	218.63
13	11	283.06	-1.26	55.23	6.28	283.03	.48	37.72	-2.92	130.82	.40	28.02	-1.76	218.63
13	12	283.61	-1.26	55.27	6.25	283.64	.48	37.77	-2.92	130.85	.40	28.03	-1.76	218.62
13	13	284.16	-1.26	55.31	6.23	284.24	.48	37.82	-2.92	130.88	.40	28.04	-1.76	218.62
13	14	284.71	-1.26	55.35	6.21	284.85	.47	37.88	-2.91	130.91	.40	28.05	-1.76	218.62
13	15	285.25	-1.26	55.40	6.18	285.45	.47	37.93	-2.91	130.94	.40	28.06	-1.76	218.61
13	16	285.80	-1.26	55.44	6.16	286.06	.47	37.98	-2.91	130.97	.39	28.07	-1.76	218.61
13	17	286.35	-1.26	55.48	6.13	286.66	.47	38.03	-2.91	131.00	.39	28.07	-1.76	218.61
13	18	286.90	-1.26	55.52	6.11	287.26	.47	38.08	-2.91	131.03	.39	28.08	-1.76	218.60
13	19	287.45	-1.26	55.56	6.08	287.87	.46	38.14	-2.91	131.05	.39	28.09	-1.76	218.60
13	20	288.00	-1.26	55.60	6.05	288.47	.46	38.19	-2.91	131.08	.39	28.10	-1.76	218.60
13	21	288.55	-1.26	55.64	6.03	289.07	.46	38.24	-2.91	131.11	.39	28.11	-1.76	218.60
13	22	289.10	-1.26	55.69	6.00	289.68	.46	38.29	-2.90	131.14	.39	28.12	-1.76	218.59
13	23	289.65	-1.26	55.73	5.97	290.28	.46	38.35	-2.90	131.17	.39	28.12	-1.75	218.59

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * NOV 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
14	0	290.20	-1.26	55.77	5.94	290.88	.45	38.40	-2.90	131.20	.39	28.13	-1.75	218.59
14	1	290.74	-1.26	55.81	5.91	291.48	.45	38.45	-2.90	131.23	.39	28.14	-1.75	218.58
14	2	291.29	-1.27	55.85	5.87	292.09	.45	38.50	-2.90	131.26	.39	28.15	-1.75	218.58
14	3	291.84	-1.27	55.89	5.84	292.69	.45	38.55	-2.90	131.29	.39	28.16	-1.75	218.58
14	4	292.39	-1.27	55.93	5.81	293.29	.45	38.61	-2.90	131.32	.39	28.17	-1.75	218.57
14	5	292.94	-1.27	55.98	5.78	293.89	.44	38.66	-2.89	131.35	.39	28.18	-1.75	218.57
14	6	293.49	-1.27	56.02	5.74	294.49	.44	38.71	-2.89	131.37	.39	28.18	-1.75	218.57
14	7	294.04	-1.27	56.06	5.71	295.09	.44	38.76	-2.89	131.40	.39	28.19	-1.75	218.56
14	8	294.59	-1.27	56.10	5.67	295.69	.44	38.82	-2.89	131.43	.39	28.20	-1.75	218.56
14	9	295.14	-1.27	56.14	5.64	296.29	.44	38.87	-2.89	131.46	.39	28.21	-1.75	218.56
14	10	295.69	-1.27	56.18	5.60	296.89	.43	38.92	-2.89	131.49	.39	28.22	-1.75	218.56
14	11	296.23	-1.27	56.22	5.56	297.48	.43	38.97	-2.89	131.52	.39	28.23	-1.75	218.55
14	12	296.78	-1.27	56.27	5.53	298.08	.43	39.02	-2.89	131.55	.39	28.24	-1.75	218.55
14	13	297.33	-1.27	56.31	5.49	298.68	.43	39.08	-2.88	131.58	.39	28.24	-1.75	218.55
14	14	297.88	-1.27	56.35	5.45	299.28	.43	39.13	-2.88	131.61	.39	28.25	-1.75	218.54
14	15	298.43	-1.27	56.39	5.41	299.87	.42	39.18	-2.88	131.64	.39	28.26	-1.75	218.54
14	16	298.98	-1.28	56.43	5.37	300.47	.42	39.23	-2.88	131.66	.39	28.27	-1.75	218.54
14	17	299.53	-1.28	56.47	5.33	301.07	.42	39.29	-2.88	131.69	.39	28.28	-1.75	218.53
14	18	300.08	-1.28	56.52	5.29	301.66	.42	39.34	-2.88	131.72	.39	28.29	-1.75	218.53
14	19	300.63	-1.28	56.56	5.25	302.26	.42	39.39	-2.88	131.75	.39	28.30	-1.75	218.53
14	20	301.18	-1.28	56.60	5.21	302.85	.41	39.44	-2.88	131.78	.39	28.30	-1.75	218.52
14	21	301.72	-1.28	56.64	5.16	303.45	.41	39.50	-2.87	131.81	.39	28.31	-1.75	218.52
14	22	302.27	-1.28	56.68	5.12	304.04	.41	39.55	-2.87	131.84	.39	28.32	-1.75	218.52
14	23	302.82	-1.28	56.72	5.08	304.64	.41	39.60	-2.87	131.87	.39	28.33	-1.75	218.52
15	0	303.37	-1.28	56.77	5.03	305.23	.41	39.65	-2.87	131.90	.39	28.34	-1.75	218.51
15	1	303.92	-1.28	56.81	4.99	305.82	.40	39.71	-2.87	131.93	.39	28.35	-1.75	218.51
15	2	304.47	-1.28	56.85	4.94	306.42	.40	39.76	-2.87	131.96	.39	28.36	-1.75	218.51
15	3	305.02	-1.28	56.89	4.90	307.01	.40	39.81	-2.87	131.98	.39	28.36	-1.75	218.50
15	4	305.57	-1.28	56.93	4.85	307.60	.40	39.86	-2.87	132.01	.39	28.37	-1.75	218.50
15	5	306.12	-1.28	56.98	4.80	308.19	.40	39.92	-2.86	132.04	.39	28.38	-1.75	218.50
15	6	306.67	-1.28	57.02	4.76	308.78	.39	39.97	-2.86	132.07	.39	28.39	-1.75	218.49
15	7	307.22	-1.29	57.06	4.71	309.37	.39	40.02	-2.86	132.10	.39	28.40	-1.75	218.49
15	8	307.76	-1.29	57.10	4.66	309.96	.39	40.07	-2.86	132.13	.39	28.41	-1.75	218.49
15	9	308.31	-1.29	57.14	4.61	310.55	.39	40.13	-2.86	132.16	.39	28.42	-1.75	218.48
15	10	308.86	-1.29	57.18	4.56	311.14	.39	40.18	-2.86	132.19	.39	28.42	-1.75	218.48
15	11	309.41	-1.29	57.23	4.52	311.73	.38	40.23	-2.86	132.22	.39	28.43	-1.75	218.48
15	12	309.96	-1.29	57.27	4.47	312.32	.38	40.28	-2.85	132.25	.39	28.44	-1.75	218.47
15	13	310.51	-1.29	57.31	4.41	312.91	.38	40.34	-2.85	132.28	.39	28.45	-1.75	218.47
15	14	311.06	-1.29	57.35	4.36	313.50	.38	40.39	-2.85	132.30	.39	28.46	-1.75	218.47
15	15	311.61	-1.29	57.39	4.31	314.09	.38	40.44	-2.85	132.33	.39	28.47	-1.75	218.47
15	16	312.16	-1.29	57.44	4.26	314.67	.37	40.49	-2.85	132.36	.39	28.47	-1.75	218.46
15	17	312.71	-1.29	57.48	4.21	315.26	.37	40.55	-2.85	132.39	.39	28.48	-1.75	218.46
15	18	313.25	-1.29	57.52	4.16	315.85	.37	40.60	-2.85	132.42	.39	28.49	-1.75	218.46
15	19	313.80	-1.29	57.56	4.10	316.43	.37	40.65	-2.85	132.45	.39	28.50	-1.75	218.45
15	20	314.35	-1.29	57.60	4.05	317.02	.37	40.70	-2.84	132.48	.39	28.51	-1.75	218.45
15	21	314.90	-1.30	57.65	4.00	317.60	.36	40.76	-2.84	132.51	.39	28.52	-1.75	218.45
15	22	315.45	-1.30	57.69	3.94	318.19	.36	40.81	-2.84	132.54	.39	28.53	-1.75	218.44
15	23	316.00	-1.30	57.73	3.89	318.77	.36	40.86	-2.84	132.57	.39	28.53	-1.75	218.44

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * NOV 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
16	0	316.55	-1.30	57.77	3.83	319.36	.36	40.91	-2.84	132.60	.39	28.54	-1.75	218.44
16	1	317.10	-1.30	57.81	3.78	319.94	.36	40.97	-2.84	132.62	.39	28.55	-1.75	218.43
16	2	317.65	-1.30	57.86	3.72	320.52	.35	41.02	-2.84	132.65	.38	28.56	-1.75	218.43
16	3	318.20	-1.30	57.90	3.67	321.11	.35	41.07	-2.84	132.68	.38	28.57	-1.75	218.43
16	4	318.74	-1.30	57.94	3.61	321.69	.35	41.13	-2.83	132.71	.38	28.58	-1.75	218.43
16	5	319.29	-1.30	57.98	3.55	322.27	.35	41.18	-2.83	132.74	.38	28.59	-1.75	218.42
16	6	319.84	-1.30	58.03	3.50	322.85	.35	41.23	-2.83	132.77	.38	28.59	-1.75	218.42
16	7	320.39	-1.30	58.07	3.44	323.43	.34	41.28	-2.83	132.80	.38	28.60	-1.75	218.42
16	8	320.94	-1.30	58.11	3.38	324.02	.34	41.34	-2.83	132.83	.38	28.61	-1.75	218.41
16	9	321.49	-1.30	58.15	3.32	324.60	.34	41.39	-2.83	132.86	.38	28.62	-1.75	218.41
16	10	322.04	-1.30	58.19	3.27	325.18	.34	41.44	-2.83	132.89	.38	28.63	-1.75	218.41
16	11	322.59	-1.31	58.24	3.21	325.76	.34	41.49	-2.83	132.92	.38	28.64	-1.75	218.40
16	12	323.14	-1.31	58.28	3.15	326.34	.33	41.55	-2.82	132.94	.38	28.65	-1.75	218.40
16	13	323.69	-1.31	58.32	3.09	326.91	.33	41.60	-2.82	132.97	.38	28.65	-1.75	218.40
16	14	324.23	-1.31	58.36	3.03	327.49	.33	41.65	-2.82	133.00	.38	28.66	-1.75	218.39
16	15	324.78	-1.31	58.41	2.97	328.07	.33	41.71	-2.82	133.03	.38	28.67	-1.75	218.39
16	16	325.33	-1.31	58.45	2.91	328.65	.32	41.76	-2.82	133.06	.38	28.68	-1.75	218.39
16	17	325.88	-1.31	58.49	2.85	329.23	.32	41.81	-2.82	133.09	.38	28.69	-1.75	218.38
16	18	326.43	-1.31	58.53	2.79	329.80	.32	41.86	-2.82	133.12	.38	28.70	-1.75	218.38
16	19	326.98	-1.31	58.57	2.73	330.38	.32	41.92	-2.81	133.15	.38	28.71	-1.75	218.38
16	20	327.53	-1.31	58.62	2.67	330.96	.32	41.97	-2.81	133.18	.38	28.71	-1.75	218.38
16	21	328.08	-1.31	58.66	2.61	331.53	.31	42.02	-2.81	133.21	.38	28.72	-1.75	218.37
16	22	328.63	-1.31	58.70	2.54	332.11	.31	42.07	-2.81	133.24	.38	28.73	-1.75	218.37
16	23	329.18	-1.31	58.74	2.48	332.68	.31	42.13	-2.81	133.27	.38	28.74	-1.75	218.37
17	0	329.72	-1.31	58.79	2.42	333.26	.31	42.18	-2.81	133.30	.38	28.75	-1.75	218.36
17	1	330.27	-1.32	58.83	2.36	333.83	.31	42.23	-2.81	133.32	.38	28.76	-1.75	218.36
17	2	330.82	-1.32	58.87	2.30	334.41	.30	42.29	-2.81	133.35	.38	28.77	-1.75	218.36
17	3	331.37	-1.32	58.91	2.23	334.98	.30	42.34	-2.80	133.38	.38	28.77	-1.75	218.35
17	4	331.92	-1.32	58.96	2.17	335.56	.30	42.39	-2.80	133.41	.38	28.78	-1.75	218.35
17	5	332.47	-1.32	59.00	2.11	336.13	.30	42.44	-2.80	133.44	.38	28.79	-1.75	218.35
17	6	333.02	-1.32	59.04	2.05	336.70	.30	42.50	-2.80	133.47	.38	28.80	-1.75	218.34
17	7	333.57	-1.32	59.08	1.98	337.27	.29	42.55	-2.80	133.50	.38	28.81	-1.75	218.34
17	8	334.12	-1.32	59.13	1.92	337.85	.29	42.60	-2.80	133.53	.38	28.82	-1.75	218.34
17	9	334.67	-1.32	59.17	1.86	338.42	.29	42.66	-2.80	133.56	.38	28.83	-1.75	218.33
17	10	335.21	-1.32	59.21	1.79	338.99	.29	42.71	-2.80	133.59	.38	28.83	-1.75	218.33
17	11	335.76	-1.32	59.25	1.73	339.56	.29	42.76	-2.79	133.62	.38	28.84	-1.75	218.33
17	12	336.31	-1.32	59.30	1.66	340.13	.28	42.81	-2.79	133.65	.38	28.85	-1.75	218.33
17	13	336.86	-1.32	59.34	1.60	340.70	.28	42.87	-2.79	133.68	.38	28.86	-1.75	218.32
17	14	337.41	-1.32	59.38	1.54	341.27	.28	42.92	-2.79	133.70	.38	28.87	-1.75	218.32
17	15	337.96	-1.33	59.42	1.47	341.84	.28	42.97	-2.79	133.73	.38	28.88	-1.75	218.32
17	16	338.51	-1.33	59.47	1.41	342.41	.27	43.03	-2.79	133.76	.38	28.89	-1.75	218.31
17	17	339.06	-1.33	59.51	1.34	342.98	.27	43.08	-2.79	133.79	.38	28.89	-1.75	218.31
17	18	339.61	-1.33	59.55	1.28	343.55	.27	43.13	-2.78	133.82	.38	28.90	-1.75	218.31
17	19	340.16	-1.33	59.59	1.21	344.12	.27	43.19	-2.78	133.85	.38	28.91	-1.75	218.30
17	20	340.71	-1.33	59.64	1.15	344.69	.27	43.24	-2.78	133.88	.38	28.92	-1.75	218.30
17	21	341.25	-1.33	59.68	1.08	345.26	.26	43.29	-2.78	133.91	.38	28.93	-1.75	218.30
17	22	341.80	-1.33	59.72	1.02	345.82	.26	43.34	-2.78	133.94	.38	28.94	-1.75	218.29
17	23	342.35	-1.33	59.76	.95	346.39	.26	43.40	-2.78	133.97	.38	28.95	-1.75	218.29

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * NOV 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
18	0	342.90	-1.33	59.81	.89	346.96	.26	43.45	-2.78	134.00	.38	28.95	-1.75	218.29
18	1	343.45	-1.33	59.85	.82	347.53	.26	43.50	-2.78	134.03	.38	28.96	-1.75	218.29
18	2	344.00	-1.33	59.89	.76	348.09	.25	43.56	-2.77	134.06	.38	28.97	-1.75	218.28
18	3	344.55	-1.33	59.94	.69	348.66	.25	43.61	-2.77	134.09	.38	28.98	-1.75	218.28
18	4	345.10	-1.33	59.98	.63	349.22	.25	43.66	-2.77	134.12	.38	28.99	-1.75	218.28
18	5	345.65	-1.34	60.02	.56	349.79	.25	43.72	-2.77	134.14	.38	29.00	-1.75	218.27
18	6	346.20	-1.34	60.06	.50	350.36	.25	43.77	-2.77	134.17	.38	29.01	-1.75	218.27
18	7	346.74	-1.34	60.11	.43	350.92	.24	43.82	-2.77	134.20	.38	29.01	-1.75	218.27
18	8	347.29	-1.34	60.15	.37	351.49	.24	43.87	-2.77	134.23	.38	29.02	-1.75	218.26
18	9	347.84	-1.34	60.19	.30	352.05	.24	43.93	-2.77	134.26	.38	29.03	-1.75	218.26
18	10	348.39	-1.34	60.23	.24	352.61	.24	43.98	-2.76	134.29	.38	29.04	-1.75	218.26
18	11	348.94	-1.34	60.28	.17	353.18	.23	44.03	-2.76	134.32	.38	29.05	-1.75	218.25
18	12	349.49	-1.34	60.32	.10	353.74	.23	44.09	-2.76	134.35	.37	29.06	-1.75	218.25
18	13	350.04	-1.34	60.36	.04	354.31	.23	44.14	-2.76	134.38	.37	29.07	-1.75	218.25
18	14	350.59	-1.34	60.41	-.03	354.87	.23	44.19	-2.76	134.41	.37	29.07	-1.75	218.24
18	15	351.14	-1.34	60.45	-.09	355.43	.23	44.25	-2.76	134.44	.37	29.08	-1.75	218.24
18	16	351.69	-1.34	60.49	-.16	356.00	.22	44.30	-2.76	134.47	.37	29.09	-1.75	218.24
18	17	352.23	-1.34	60.53	-.22	356.56	.22	44.35	-2.75	134.50	.37	29.10	-1.75	218.24
18	18	352.78	-1.34	60.58	-.29	357.12	.22	44.41	-2.75	134.53	.37	29.11	-1.75	218.23
18	19	353.33	-1.35	60.62	-.35	357.68	.22	44.46	-2.75	134.56	.37	29.12	-1.75	218.23
18	20	353.88	-1.35	60.66	-.42	358.24	.22	44.51	-2.75	134.59	.37	29.13	-1.75	218.23
18	21	354.43	-1.35	60.71	-.48	358.81	.21	44.56	-2.75	134.62	.37	29.13	-1.75	218.22
18	22	354.98	-1.35	60.75	-.55	359.37	.21	44.62	-2.75	134.65	.37	29.14	-1.75	218.22
18	23	355.53	-1.35	60.79	-.61	359.93	.21	44.67	-2.75	134.68	.37	29.15	-1.75	218.22
19	0	356.08	-1.35	60.84	-.68	.49	.21	44.72	-2.75	134.71	.37	29.16	-1.75	218.21
19	1	356.63	-1.35	60.88	-.74	1.05	.20	44.78	-2.74	134.73	.37	29.17	-1.75	218.21
19	2	357.18	-1.35	60.92	-.80	1.61	.20	44.83	-2.74	134.76	.37	29.18	-1.75	218.21
19	3	357.72	-1.35	60.96	-.87	2.17	.20	44.88	-2.74	134.79	.37	29.19	-1.75	218.20
19	4	358.27	-1.35	61.01	-.93	2.73	.20	44.94	-2.74	134.82	.37	29.19	-1.75	218.20
19	5	358.82	-1.35	61.05	-1.00	3.29	.20	44.99	-2.74	134.85	.37	29.20	-1.75	218.20
19	6	359.37	-1.35	61.09	-1.06	3.85	.19	45.04	-2.74	134.88	.37	29.21	-1.75	218.19
19	7	359.92	-1.35	61.14	-1.12	4.41	.19	45.10	-2.74	134.91	.37	29.22	-1.75	218.19
19	8	.47	-1.35	61.18	-1.19	4.97	.19	45.15	-2.73	134.94	.37	29.23	-1.75	218.19
19	9	1.02	-1.35	61.22	-1.25	5.52	.19	45.20	-2.73	134.97	.37	29.24	-1.75	218.19
19	10	1.57	-1.36	61.27	-1.32	6.08	.19	45.26	-2.73	135.00	.37	29.25	-1.75	218.18
19	11	2.12	-1.36	61.31	-1.38	6.64	.18	45.31	-2.73	135.03	.37	29.25	-1.75	218.18
19	12	2.67	-1.36	61.35	-1.44	7.20	.18	45.36	-2.73	135.06	.37	29.26	-1.75	218.18
19	13	3.21	-1.36	61.39	-1.50	7.76	.18	45.42	-2.73	135.09	.37	29.27	-1.75	218.17
19	14	3.76	-1.36	61.44	-1.57	8.31	.18	45.47	-2.73	135.12	.37	29.28	-1.75	218.17
19	15	4.31	-1.36	61.48	-1.63	8.87	.17	45.52	-2.73	135.15	.37	29.29	-1.75	218.17
19	16	4.86	-1.36	61.52	-1.69	9.43	.17	45.58	-2.72	135.18	.37	29.30	-1.75	218.16
19	17	5.41	-1.36	61.57	-1.75	9.98	.17	45.63	-2.72	135.21	.37	29.31	-1.75	218.16
19	18	5.96	-1.36	61.61	-1.82	10.54	.17	45.68	-2.72	135.24	.37	29.31	-1.75	218.16
19	19	6.51	-1.36	61.65	-1.88	11.10	.17	45.73	-2.72	135.27	.37	29.32	-1.75	218.15
19	20	7.06	-1.36	61.70	-1.94	11.65	.16	45.79	-2.72	135.30	.37	29.33	-1.75	218.15
19	21	7.61	-1.36	61.74	-2.00	12.21	.16	45.84	-2.72	135.33	.37	29.34	-1.75	218.15
19	22	8.16	-1.36	61.78	-2.06	12.77	.16	45.89	-2.72	135.36	.37	29.35	-1.75	218.15
19	23	8.70	-1.36	61.83	-2.12	13.32	.16	45.95	-2.71	135.39	.37	29.36	-1.75	218.14

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * NOV 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
20	0	9.25	-1.36	61.87	-2.18	13.88	.16	46.00	-2.71	135.42	.37	29.37	-1.75	218.14
20	1	9.80	-1.37	61.91	-2.24	14.43	.15	46.05	-2.71	135.45	.37	29.37	-1.75	218.14
20	2	10.35	-1.37	61.96	-2.30	14.99	.15	46.11	-2.71	135.48	.37	29.38	-1.75	218.13
20	3	10.90	-1.37	62.00	-2.36	15.54	.15	46.16	-2.71	135.51	.37	29.39	-1.75	218.13
20	4	11.45	-1.37	62.04	-2.42	16.09	.15	46.21	-2.71	135.54	.37	29.40	-1.75	218.13
20	5	12.00	-1.37	62.09	-2.48	16.65	.15	46.27	-2.71	135.57	.37	29.41	-1.75	218.12
20	6	12.55	-1.37	62.13	-2.54	17.20	.14	46.32	-2.71	135.60	.37	29.42	-1.75	218.12
20	7	13.10	-1.37	62.17	-2.60	17.76	.14	46.37	-2.70	135.63	.37	29.43	-1.75	218.12
20	8	13.65	-1.37	62.22	-2.66	18.31	.14	46.43	-2.70	135.66	.37	29.43	-1.75	218.11
20	9	14.19	-1.37	62.26	-2.72	18.86	.14	46.48	-2.70	135.69	.37	29.44	-1.75	218.11
20	10	14.74	-1.37	62.30	-2.78	19.42	.13	46.53	-2.70	135.72	.37	29.45	-1.75	218.11
20	11	15.29	-1.37	62.35	-2.83	19.97	.13	46.59	-2.70	135.75	.37	29.46	-1.75	218.11
20	12	15.84	-1.37	62.39	-2.89	20.52	.13	46.64	-2.70	135.78	.37	29.47	-1.75	218.10
20	13	16.39	-1.37	62.43	-2.95	21.07	.13	46.69	-2.70	135.81	.37	29.48	-1.75	218.10
20	14	16.94	-1.37	62.48	-3.00	21.63	.13	46.75	-2.69	135.83	.37	29.49	-1.75	218.10
20	15	17.49	-1.37	62.52	-3.06	22.18	.12	46.80	-2.69	135.86	.37	29.49	-1.75	218.09
20	16	18.04	-1.38	62.56	-3.12	22.73	.12	46.85	-2.69	135.89	.37	29.50	-1.75	218.09
20	17	18.59	-1.38	62.61	-3.17	23.28	.12	46.91	-2.69	135.92	.37	29.51	-1.75	218.09
20	18	19.14	-1.38	62.65	-3.23	23.83	.12	46.96	-2.69	135.95	.37	29.52	-1.75	218.08
20	19	19.69	-1.38	62.69	-3.28	24.38	.12	47.01	-2.69	135.98	.37	29.53	-1.75	218.08
20	20	20.23	-1.38	62.74	-3.34	24.93	.11	47.07	-2.69	136.01	.37	29.54	-1.75	218.08
20	21	20.78	-1.38	62.78	-3.39	25.49	.11	47.12	-2.68	136.04	.37	29.55	-1.75	218.07
20	22	21.33	-1.38	62.82	-3.45	26.04	.11	47.17	-2.68	136.07	.37	29.55	-1.75	218.07
20	23	21.88	-1.38	62.87	-3.50	26.59	.11	47.23	-2.68	136.10	.37	29.56	-1.75	218.07
21	0	22.43	-1.38	62.91	-3.55	27.14	.10	47.28	-2.68	136.13	.37	29.57	-1.75	218.07
21	1	22.98	-1.38	62.95	-3.61	27.69	.10	47.33	-2.68	136.16	.36	29.58	-1.75	218.06
21	2	23.53	-1.38	63.00	-3.66	28.23	.10	47.39	-2.68	136.19	.36	29.59	-1.75	218.06
21	3	24.08	-1.38	63.04	-3.71	28.78	.10	47.44	-2.68	136.22	.36	29.60	-1.75	218.06
21	4	24.63	-1.38	63.08	-3.76	29.33	.10	47.49	-2.68	136.25	.36	29.61	-1.75	218.05
21	5	25.18	-1.38	63.13	-3.82	29.88	.09	47.55	-2.67	136.28	.36	29.61	-1.75	218.05
21	6	25.72	-1.38	63.17	-3.87	30.43	.09	47.60	-2.67	136.31	.36	29.62	-1.75	218.05
21	7	26.27	-1.38	63.21	-3.92	30.98	.09	47.65	-2.67	136.34	.36	29.63	-1.75	218.04
21	8	26.82	-1.39	63.26	-3.97	31.53	.09	47.71	-2.67	136.37	.36	29.64	-1.75	218.04
21	9	27.37	-1.39	63.30	-4.02	32.07	.09	47.76	-2.67	136.41	.36	29.65	-1.75	218.04
21	10	27.92	-1.39	63.34	-4.07	32.62	.08	47.81	-2.67	136.44	.36	29.66	-1.75	218.03
21	11	28.47	-1.39	63.39	-4.12	33.17	.08	47.87	-2.67	136.47	.36	29.66	-1.75	218.03
21	12	29.02	-1.39	63.43	-4.17	33.72	.08	47.92	-2.66	136.50	.36	29.67	-1.75	218.03
21	13	29.57	-1.39	63.47	-4.21	34.26	.08	47.97	-2.66	136.53	.36	29.68	-1.75	218.03
21	14	30.12	-1.39	63.52	-4.26	34.81	.07	48.03	-2.66	136.56	.36	29.69	-1.75	218.02
21	15	30.67	-1.39	63.56	-4.31	35.36	.07	48.08	-2.66	136.59	.36	29.70	-1.75	218.02
21	16	31.21	-1.39	63.60	-4.36	35.90	.07	48.13	-2.66	136.62	.36	29.71	-1.75	218.02
21	17	31.76	-1.39	63.65	-4.40	36.45	.07	48.19	-2.66	136.65	.36	29.72	-1.75	218.01
21	18	32.31	-1.39	63.69	-4.45	36.99	.07	48.24	-2.66	136.68	.36	29.72	-1.75	218.01
21	19	32.86	-1.39	63.74	-4.50	37.54	.06	48.29	-2.65	136.71	.36	29.73	-1.75	218.01
21	20	33.41	-1.39	63.78	-4.54	38.08	.06	48.35	-2.65	136.74	.36	29.74	-1.75	218.00
21	21	33.96	-1.39	63.82	-4.59	38.63	.06	48.40	-2.65	136.77	.36	29.75	-1.75	218.00
21	22	34.51	-1.39	63.87	-4.63	39.17	.06	48.45	-2.65	136.80	.36	29.76	-1.75	218.00
21	23	35.06	-1.39	63.91	-4.68	39.72	.06	48.51	-2.65	136.83	.36	29.77	-1.75	218.00

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * NOV 1969 * * * *

GMT DATE	HOUR	EQUINOX PHAE	SUN DEC	SUN RA	EARTH DEC	EARTH RA	VENUS DEC	VENUS RA	MARS DEC	MARS RA	JUPITER DEC	JUPITER RA	SATURN DEC	SATURN RA
22	0	35.61	-1.40	63.95	-4.72	40.26	.05	48.56	-2.65	136.86	.36	29.78	-1.75	217.99
22	1	36.16	-1.40	64.00	-4.76	40.81	.05	48.62	-2.65	136.89	.36	29.78	-1.75	217.99
22	2	36.70	-1.40	64.04	-4.80	41.35	.05	48.67	-2.64	136.92	.36	29.79	-1.75	217.99
22	3	37.25	-1.40	64.08	-4.85	41.89	.05	48.72	-2.64	136.95	.36	29.80	-1.75	217.98
22	4	37.80	-1.40	64.13	-4.89	42.44	.04	48.78	-2.64	136.98	.36	29.81	-1.75	217.98
22	5	38.35	-1.40	64.17	-4.93	42.98	.04	48.83	-2.64	137.01	.36	29.82	-1.75	217.98
22	6	38.90	-1.40	64.21	-4.97	43.52	.04	48.88	-2.64	137.04	.36	29.83	-1.75	217.97
22	7	39.45	-1.40	64.26	-5.01	44.06	.04	48.94	-2.64	137.07	.36	29.83	-1.75	217.97
22	8	40.00	-1.40	64.30	-5.05	44.60	.04	48.99	-2.64	137.10	.36	29.84	-1.75	217.97
22	9	40.55	-1.40	64.35	-5.09	45.15	.03	49.04	-2.63	137.13	.36	29.85	-1.75	217.97
22	10	41.10	-1.40	64.39	-5.13	45.69	.03	49.10	-2.63	137.16	.36	29.86	-1.75	217.96
22	11	41.65	-1.40	64.43	-5.17	46.23	.03	49.15	-2.63	137.19	.36	29.87	-1.75	217.96
22	12	42.19	-1.40	64.48	-5.21	46.77	.03	49.20	-2.63	137.22	.36	29.88	-1.75	217.96
22	13	42.74	-1.40	64.52	-5.24	47.31	.03	49.26	-2.63	137.25	.36	29.89	-1.75	217.95
22	14	43.29	-1.40	64.56	-5.28	47.85	.02	49.31	-2.63	137.28	.36	29.89	-1.75	217.95
22	15	43.84	-1.40	64.61	-5.32	48.39	.02	49.36	-2.63	137.31	.36	29.90	-1.75	217.95
22	16	44.39	-1.40	64.65	-5.35	48.93	.02	49.42	-2.63	137.34	.36	29.91	-1.75	217.94
22	17	44.94	-1.41	64.69	-5.39	49.47	.02	49.47	-2.62	137.37	.36	29.92	-1.75	217.94
22	18	45.49	-1.41	64.74	-5.42	50.01	.01	49.52	-2.62	137.40	.36	29.93	-1.75	217.94
22	19	46.04	-1.41	64.78	-5.46	50.55	.01	49.58	-2.62	137.43	.36	29.94	-1.75	217.94
22	20	46.59	-1.41	64.83	-5.49	51.08	.01	49.63	-2.62	137.46	.36	29.94	-1.75	217.93
22	21	47.14	-1.41	64.87	-5.52	51.62	.01	49.68	-2.62	137.50	.36	29.95	-1.75	217.93
22	22	47.68	-1.41	64.91	-5.56	52.16	.01	49.74	-2.62	137.53	.36	29.96	-1.75	217.93
22	23	48.23	-1.41	64.96	-5.59	52.70	.00	49.79	-2.62	137.56	.36	29.97	-1.75	217.92
23	0	48.78	-1.41	65.00	-5.62	53.24	.00	49.84	-2.61	137.59	.36	29.98	-1.75	217.92
23	1	49.33	-1.41	65.04	-5.65	53.77	.00	49.90	-2.61	137.62	.36	29.99	-1.75	217.92
23	2	49.88	-1.41	65.09	-5.68	54.31	-.00	49.95	-2.61	137.65	.36	29.99	-1.75	217.91
23	3	50.43	-1.41	65.13	-5.71	54.84	-.00	50.00	-2.61	137.68	.36	30.00	-1.75	217.91
23	4	50.98	-1.41	65.17	-5.74	55.38	-.01	50.06	-2.61	137.71	.36	30.01	-1.75	217.91
23	5	51.53	-1.41	65.22	-5.77	55.92	-.01	50.11	-2.61	137.74	.36	30.02	-1.75	217.91
23	6	52.08	-1.41	65.26	-5.80	56.45	-.01	50.16	-2.61	137.77	.36	30.03	-1.75	217.90
23	7	52.63	-1.41	65.31	-5.83	56.99	-.01	50.22	-2.60	137.80	.36	30.04	-1.75	217.90
23	8	53.18	-1.41	65.35	-5.86	57.52	-.01	50.27	-2.60	137.83	.36	30.05	-1.75	217.90
23	9	53.72	-1.41	65.39	-5.89	58.05	-.02	50.32	-2.60	137.86	.36	30.05	-1.75	217.89
23	10	54.27	-1.41	65.44	-5.91	58.59	-.02	50.38	-2.60	137.89	.36	30.06	-1.75	217.89
23	11	54.82	-1.42	65.48	-5.94	59.12	-.02	50.43	-2.60	137.92	.36	30.07	-1.75	217.89
23	12	55.37	-1.42	65.52	-5.96	59.66	-.02	50.48	-2.60	137.95	.36	30.08	-1.75	217.89
23	13	55.92	-1.42	65.57	-5.99	60.19	-.03	50.54	-2.60	137.98	.36	30.09	-1.75	217.88
23	14	56.47	-1.42	65.61	-6.01	60.72	-.03	50.59	-2.59	138.01	.36	30.10	-1.75	217.88
23	15	57.02	-1.42	65.66	-6.04	61.25	-.03	50.64	-2.59	138.05	.36	30.10	-1.75	217.88
23	16	57.57	-1.42	65.70	-6.06	61.78	-.03	50.70	-2.59	138.08	.36	30.11	-1.75	217.87
23	17	58.12	-1.42	65.74	-6.08	62.32	-.03	50.75	-2.59	138.11	.36	30.12	-1.75	217.87
23	18	58.67	-1.42	65.79	-6.11	62.85	-.04	50.80	-2.59	138.14	.36	30.13	-1.75	217.87
23	19	59.21	-1.42	65.83	-6.13	63.38	-.04	50.86	-2.59	138.17	.36	30.14	-1.75	217.86
23	20	59.76	-1.42	65.87	-6.15	63.91	-.04	50.91	-2.58	138.20	.35	30.15	-1.75	217.86
23	21	60.31	-1.42	65.92	-6.17	64.44	-.04	50.96	-2.58	138.23	.35	30.15	-1.75	217.86
23	22	60.86	-1.42	65.96	-6.19	64.97	-.04	51.02	-2.58	138.26	.35	30.16	-1.75	217.86
23	23	61.41	-1.42	66.00	-6.21	65.50	-.05	51.07	-2.58	138.29	.35	30.17	-1.75	217.85

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * DEC 1969 * * * *

GMT DATE	GMT HOUR	EQUINOX PHAE	SUN DEC	SUN RA	EARTH DEC	EARTH RA	VENUS DEC	VENUS RA	MARS DEC	MARS RA	JUPITER DEC	JUPITER RA	SATURN DEC	SATURN RA
12	0	299.13	-1.53	84.31	5.16	300.59	-.94	73.80	-1.91	151.71	.32	33.49	-1.70	216.89
12	1	299.68	-1.53	84.36	5.12	301.20	-.94	73.85	-1.91	151.74	.32	33.49	-1.70	216.89
12	2	300.23	-1.53	84.40	5.07	301.82	-.94	73.91	-1.91	151.77	.32	33.50	-1.70	216.89
12	3	300.78	-1.53	84.44	5.03	302.44	-.94	73.96	-1.91	151.80	.32	33.51	-1.70	216.89
12	4	301.33	-1.53	84.48	4.98	303.05	-.94	74.01	-1.91	151.83	.32	33.52	-1.70	216.89
12	5	301.88	-1.53	84.52	4.94	303.67	-.95	74.06	-1.91	151.86	.31	33.52	-1.70	216.89
12	6	302.43	-1.53	84.56	4.89	304.28	-.95	74.12	-1.91	151.89	.31	33.53	-1.70	216.88
12	7	302.98	-1.53	84.60	4.84	304.90	-.95	74.17	-1.90	151.92	.31	33.54	-1.70	216.88
12	8	303.53	-1.53	84.65	4.80	305.51	-.95	74.22	-1.90	151.95	.31	33.54	-1.70	216.88
12	9	304.08	-1.53	84.69	4.75	306.13	-.95	74.27	-1.90	151.98	.31	33.55	-1.70	216.88
12	10	304.62	-1.53	84.73	4.70	306.74	-.96	74.32	-1.90	152.01	.31	33.56	-1.70	216.88
12	11	305.17	-1.53	84.77	4.65	307.35	-.96	74.38	-1.90	152.04	.31	33.57	-1.70	216.88
12	12	305.72	-1.53	84.81	4.60	307.96	-.96	74.43	-1.90	152.07	.31	33.57	-1.70	216.87
12	13	306.27	-1.53	84.85	4.55	308.58	-.96	74.48	-1.90	152.10	.31	33.58	-1.70	216.87
12	14	306.82	-1.53	84.89	4.50	309.19	-.96	74.53	-1.89	152.13	.31	33.59	-1.70	216.87
12	15	307.37	-1.53	84.94	4.45	309.80	-.97	74.58	-1.89	152.16	.31	33.60	-1.70	216.87
12	16	307.92	-1.53	84.98	4.40	310.41	-.97	74.64	-1.89	152.19	.31	33.60	-1.70	216.87
12	17	308.47	-1.53	85.02	4.34	311.02	-.97	74.69	-1.89	152.22	.31	33.61	-1.70	216.87
12	18	309.02	-1.53	85.06	4.29	311.63	-.97	74.74	-1.89	152.25	.31	33.62	-1.70	216.86
12	19	309.57	-1.53	85.10	4.24	312.23	-.97	74.79	-1.89	152.28	.31	33.62	-1.70	216.86
12	20	310.11	-1.53	85.14	4.19	312.84	-.98	74.85	-1.89	152.31	.31	33.63	-1.70	216.86
12	21	310.66	-1.53	85.18	4.13	313.45	-.98	74.90	-1.88	152.34	.31	33.64	-1.70	216.86
12	22	311.21	-1.53	85.23	4.08	314.06	-.98	74.95	-1.88	152.37	.31	33.65	-1.70	216.86
12	23	311.76	-1.53	85.27	4.02	314.66	-.98	75.00	-1.88	152.40	.31	33.65	-1.70	216.86
13	0	312.31	-1.53	85.31	3.97	315.27	-.98	75.05	-1.88	152.43	.31	33.66	-1.70	216.85
13	1	312.86	-1.53	85.35	3.91	315.87	-.99	75.11	-1.88	152.46	.31	33.67	-1.70	216.85
13	2	313.41	-1.53	85.39	3.86	316.48	-.99	75.16	-1.88	152.49	.31	33.67	-1.70	216.85
13	3	313.96	-1.53	85.43	3.80	317.08	-.99	75.21	-1.88	152.52	.31	33.68	-1.70	216.85
13	4	314.51	-1.53	85.48	3.74	317.69	-.99	75.26	-1.87	152.55	.31	33.69	-1.70	216.85
13	5	315.06	-1.53	85.52	3.69	318.29	-1.00	75.32	-1.87	152.58	.31	33.70	-1.70	216.85
13	6	315.60	-1.53	85.56	3.63	318.89	-1.00	75.37	-1.87	152.61	.31	33.70	-1.70	216.84
13	7	316.15	-1.53	85.60	3.57	319.50	-1.00	75.42	-1.87	152.64	.31	33.71	-1.70	216.84
13	8	316.70	-1.53	85.64	3.51	320.10	-1.00	75.47	-1.87	152.67	.31	33.72	-1.70	216.84
13	9	317.25	-1.53	85.68	3.46	320.70	-1.00	75.52	-1.87	152.70	.31	33.73	-1.70	216.84
13	10	317.80	-1.53	85.73	3.40	321.30	-1.01	75.58	-1.87	152.73	.31	33.73	-1.70	216.84
13	11	318.35	-1.53	85.77	3.34	321.90	-1.01	75.63	-1.86	152.76	.31	33.74	-1.70	216.84
13	12	318.90	-1.53	85.81	3.28	322.50	-1.01	75.68	-1.86	152.79	.31	33.75	-1.70	216.83
13	13	319.45	-1.53	85.85	3.22	323.10	-1.01	75.73	-1.86	152.82	.31	33.75	-1.70	216.83
13	14	320.00	-1.53	85.89	3.16	323.69	-1.01	75.79	-1.86	152.85	.31	33.76	-1.70	216.83
13	15	320.55	-1.53	85.93	3.10	324.29	-1.02	75.84	-1.86	152.88	.31	33.77	-1.70	216.83
13	16	321.09	-1.53	85.98	3.04	324.89	-1.02	75.89	-1.86	152.91	.31	33.78	-1.70	216.83
13	17	321.64	-1.53	86.02	2.98	325.48	-1.02	75.94	-1.86	152.94	.31	33.78	-1.70	216.83
13	18	322.19	-1.53	86.06	2.92	326.08	-1.02	76.00	-1.85	152.97	.31	33.79	-1.69	216.82
13	19	322.74	-1.53	86.10	2.85	326.68	-1.02	76.05	-1.85	153.00	.31	33.80	-1.69	216.82
13	20	323.29	-1.53	86.14	2.79	327.27	-1.03	76.10	-1.85	153.03	.31	33.80	-1.69	216.82
13	21	323.84	-1.53	86.18	2.73	327.86	-1.03	76.15	-1.85	153.06	.31	33.81	-1.69	216.82
13	22	324.39	-1.53	86.23	2.67	328.46	-1.03	76.20	-1.85	153.09	.31	33.82	-1.69	216.82
13	23	324.94	-1.54	86.27	2.61	329.05	-1.03	76.26	-1.85	153.12	.31	33.83	-1.69	216.82

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * DEC 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
14	0	325.49	-1.54	86.31	2.54	329.64	-1.03	76.31	-1.85	153.15	.31	33.83	-1.69	216.81
14	1	326.04	-1.54	86.35	2.48	330.23	-1.04	76.36	-1.84	153.18	.31	33.84	-1.69	216.81
14	2	326.58	-1.54	86.39	2.42	330.83	-1.04	76.41	-1.84	153.21	.31	33.85	-1.69	216.81
14	3	327.13	-1.54	86.44	2.35	331.42	-1.04	76.47	-1.84	153.24	.31	33.85	-1.69	216.81
14	4	327.68	-1.54	86.48	2.29	332.01	-1.04	76.52	-1.84	153.27	.31	33.86	-1.69	216.81
14	5	328.23	-1.54	86.52	2.23	332.60	-1.04	76.57	-1.84	153.30	.31	33.87	-1.69	216.81
14	6	328.78	-1.54	86.56	2.16	333.18	-1.05	76.62	-1.84	153.33	.31	33.88	-1.69	216.80
14	7	329.33	-1.54	86.60	2.10	333.77	-1.05	76.68	-1.84	153.36	.31	33.88	-1.69	216.80
14	8	329.88	-1.54	86.64	2.04	334.36	-1.05	76.73	-1.83	153.39	.31	33.89	-1.69	216.80
14	9	330.43	-1.54	86.69	1.97	334.95	-1.05	76.78	-1.83	153.42	.31	33.90	-1.69	216.80
14	10	330.98	-1.54	86.73	1.91	335.53	-1.05	76.83	-1.83	153.44	.31	33.91	-1.69	216.80
14	11	331.53	-1.54	86.77	1.84	336.12	-1.06	76.89	-1.83	153.47	.31	33.91	-1.69	216.80
14	12	332.08	-1.54	86.81	1.78	336.71	-1.06	76.94	-1.83	153.50	.31	33.92	-1.69	216.79
14	13	332.62	-1.54	86.85	1.71	337.29	-1.06	76.99	-1.83	153.53	.31	33.93	-1.69	216.79
14	14	333.17	-1.54	86.90	1.65	337.87	-1.06	77.04	-1.83	153.56	.31	33.93	-1.69	216.79
14	15	333.72	-1.54	86.94	1.58	338.46	-1.06	77.10	-1.82	153.59	.31	33.94	-1.69	216.79
14	16	334.27	-1.54	86.98	1.52	339.04	-1.07	77.15	-1.82	153.62	.31	33.95	-1.69	216.79
14	17	334.82	-1.54	87.02	1.45	339.62	-1.07	77.20	-1.82	153.65	.31	33.96	-1.69	216.79
14	18	335.37	-1.54	87.06	1.39	340.21	-1.07	77.25	-1.82	153.68	.31	33.96	-1.69	216.78
14	19	335.92	-1.54	87.11	1.32	340.79	-1.07	77.31	-1.82	153.71	.31	33.97	-1.69	216.78
14	20	336.47	-1.54	87.15	1.26	341.37	-1.08	77.36	-1.82	153.74	.31	33.98	-1.69	216.78
14	21	337.02	-1.54	87.19	1.19	341.95	-1.08	77.41	-1.82	153.77	.31	33.98	-1.69	216.78
14	22	337.57	-1.54	87.23	1.12	342.53	-1.08	77.46	-1.81	153.80	.31	33.99	-1.69	216.78
14	23	338.11	-1.54	87.27	1.06	343.11	-1.08	77.52	-1.81	153.83	.31	34.00	-1.69	216.78
15	0	338.66	-1.54	87.32	.99	343.69	-1.08	77.57	-1.81	153.86	.31	34.01	-1.69	216.77
15	1	339.21	-1.54	87.36	.93	344.26	-1.09	77.62	-1.81	153.89	.31	34.01	-1.69	216.77
15	2	339.76	-1.54	87.40	.86	344.84	-1.09	77.67	-1.81	153.92	.31	34.02	-1.69	216.77
15	3	340.31	-1.54	87.44	.79	345.42	-1.09	77.73	-1.81	153.95	.31	34.03	-1.69	216.77
15	4	340.86	-1.54	87.49	.73	346.00	-1.09	77.78	-1.80	153.98	.31	34.03	-1.69	216.77
15	5	341.41	-1.54	87.53	.66	346.57	-1.09	77.83	-1.80	154.01	.31	34.04	-1.69	216.77
15	6	341.96	-1.54	87.57	.60	347.15	-1.10	77.88	-1.80	154.04	.31	34.05	-1.69	216.77
15	7	342.51	-1.54	87.61	.53	347.72	-1.10	77.94	-1.80	154.07	.31	34.06	-1.69	216.76
15	8	343.06	-1.54	87.65	.46	348.30	-1.10	77.99	-1.80	154.10	.31	34.06	-1.69	216.76
15	9	343.60	-1.54	87.70	.40	348.87	-1.10	78.04	-1.80	154.13	.31	34.07	-1.69	216.76
15	10	344.15	-1.54	87.74	.33	349.44	-1.10	78.09	-1.80	154.16	.31	34.08	-1.69	216.76
15	11	344.70	-1.54	87.78	.27	350.02	-1.11	78.15	-1.79	154.19	.31	34.08	-1.69	216.76
15	12	345.25	-1.54	87.82	.20	350.59	-1.11	78.20	-1.79	154.22	.31	34.09	-1.69	216.76
15	13	345.80	-1.54	87.87	.14	351.16	-1.11	78.25	-1.79	154.25	.31	34.10	-1.69	216.75
15	14	346.35	-1.54	87.91	.07	351.73	-1.11	78.31	-1.79	154.28	.31	34.11	-1.69	216.75
15	15	346.90	-1.54	87.95	.00	352.30	-1.11	78.36	-1.79	154.31	.31	34.11	-1.69	216.75
15	16	347.45	-1.54	87.99	-.06	352.87	-1.12	78.41	-1.79	154.34	.31	34.12	-1.69	216.75
15	17	348.00	-1.54	88.03	-.13	353.44	-1.12	78.46	-1.79	154.37	.31	34.13	-1.69	216.75
15	18	348.55	-1.54	88.08	-.19	354.01	-1.12	78.52	-1.78	154.40	.31	34.13	-1.69	216.75
15	19	349.09	-1.54	88.12	-.26	354.58	-1.12	78.57	-1.78	154.43	.31	34.14	-1.69	216.74
15	20	349.64	-1.54	88.16	-.32	355.15	-1.12	78.62	-1.78	154.46	.31	34.15	-1.69	216.74
15	21	350.19	-1.54	88.20	-.39	355.72	-1.13	78.67	-1.78	154.49	.31	34.16	-1.69	216.74
15	22	350.74	-1.54	88.25	-.45	356.28	-1.13	78.73	-1.78	154.52	.31	34.16	-1.69	216.74
15	23	351.29	-1.54	88.29	-.52	356.85	-1.13	78.78	-1.78	154.55	.31	34.17	-1.69	216.74

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * DEC 1969 * * * *

GMT DATE	GMT HOUR	EQUINOX PHAE	SUN DEC	SUN RA	EARTH DEC	EARTH RA	VENUS DEC	VENUS RA	MARS DEC	MARS RA	JUPITER DEC	JUPITER RA	SATURN DEC	SATURN RA
16	0	351.84	-1.54	88.33	-.59	357.42	-1.13	78.83	-1.78	154.58	.31	34.18	-1.69	216.74
16	1	352.39	-1.54	88.37	-.65	357.98	-1.13	78.88	-1.77	154.61	.31	34.18	-1.69	216.74
16	2	352.94	-1.54	88.42	-.71	358.55	-1.14	78.94	-1.77	154.64	.31	34.19	-1.69	216.73
16	3	353.49	-1.54	88.46	-.78	359.11	-1.14	78.99	-1.77	154.67	.31	34.20	-1.69	216.73
16	4	354.04	-1.54	88.50	-.84	359.68	-1.14	79.04	-1.77	154.70	.31	34.21	-1.69	216.73
16	5	354.58	-1.54	88.54	-.91	.24	-1.14	79.10	-1.77	154.73	.31	34.21	-1.69	216.73
16	6	355.13	-1.54	88.59	-.97	.80	-1.14	79.15	-1.77	154.76	.31	34.22	-1.69	216.73
16	7	355.68	-1.55	88.63	-1.04	1.37	-1.15	79.20	-1.77	154.79	.31	34.23	-1.69	216.73
16	8	356.23	-1.55	88.67	-1.10	1.93	-1.15	79.25	-1.76	154.82	.31	34.24	-1.69	216.72
16	9	356.78	-1.55	88.71	-1.16	2.49	-1.15	79.31	-1.76	154.85	.31	34.24	-1.69	216.72
16	10	357.33	-1.55	88.76	-1.23	3.05	-1.15	79.36	-1.76	154.88	.31	34.25	-1.69	216.72
16	11	357.88	-1.55	88.80	-1.29	3.62	-1.15	79.41	-1.76	154.91	.31	34.26	-1.69	216.72
16	12	358.43	-1.55	88.84	-1.35	4.18	-1.16	79.47	-1.76	154.94	.31	34.26	-1.69	216.72
16	13	358.98	-1.55	88.88	-1.42	4.74	-1.16	79.52	-1.76	154.97	.31	34.27	-1.69	216.72
16	14	359.53	-1.55	88.93	-1.48	5.30	-1.16	79.57	-1.76	155.00	.31	34.28	-1.69	216.72
16	15	.07	-1.55	88.97	-1.54	5.86	-1.16	79.62	-1.75	155.03	.31	34.29	-1.69	216.71
16	16	.62	-1.55	89.01	-1.61	6.41	-1.16	79.68	-1.75	155.06	.31	34.29	-1.69	216.71
16	17	1.17	-1.55	89.05	-1.67	6.97	-1.17	79.73	-1.75	155.09	.31	34.30	-1.69	216.71
16	18	1.72	-1.55	89.10	-1.73	7.53	-1.17	79.78	-1.75	155.12	.30	34.31	-1.69	216.71
16	19	2.27	-1.55	89.14	-1.79	8.09	-1.17	79.83	-1.75	155.15	.30	34.31	-1.69	216.71
16	20	2.82	-1.55	89.18	-1.85	8.65	-1.17	79.89	-1.75	155.18	.30	34.32	-1.69	216.71
16	21	3.37	-1.55	89.22	-1.92	9.20	-1.17	79.94	-1.75	155.21	.30	34.33	-1.69	216.70
16	22	3.92	-1.55	89.27	-1.98	9.76	-1.18	79.99	-1.74	155.24	.30	34.33	-1.69	216.70
16	23	4.47	-1.55	89.31	-2.04	10.32	-1.18	80.05	-1.74	155.27	.30	34.34	-1.69	216.70
17	0	5.02	-1.55	89.35	-2.10	10.87	-1.18	80.10	-1.74	155.30	.30	34.35	-1.68	216.70
17	1	5.57	-1.55	89.39	-2.16	11.43	-1.18	80.15	-1.74	155.33	.30	34.36	-1.68	216.70
17	2	6.11	-1.55	89.44	-2.22	11.98	-1.18	80.20	-1.74	155.36	.30	34.36	-1.68	216.70
17	3	6.66	-1.55	89.48	-2.28	12.54	-1.19	80.26	-1.74	155.39	.30	34.37	-1.68	216.70
17	4	7.21	-1.55	89.52	-2.34	13.09	-1.19	80.31	-1.73	155.42	.30	34.38	-1.68	216.69
17	5	7.76	-1.55	89.57	-2.40	13.64	-1.19	80.36	-1.73	155.45	.30	34.38	-1.68	216.69
17	6	8.31	-1.55	89.61	-2.46	14.20	-1.19	80.42	-1.73	155.48	.30	34.39	-1.68	216.69
17	7	8.86	-1.55	89.65	-2.52	14.75	-1.19	80.47	-1.73	155.51	.30	34.40	-1.68	216.69
17	8	9.41	-1.55	89.69	-2.57	15.30	-1.20	80.52	-1.73	155.54	.30	34.41	-1.68	216.69
17	9	9.96	-1.55	89.74	-2.63	15.85	-1.20	80.57	-1.73	155.57	.30	34.41	-1.68	216.69
17	10	10.51	-1.55	89.78	-2.69	16.40	-1.20	80.63	-1.73	155.60	.30	34.42	-1.68	216.69
17	11	11.06	-1.55	89.82	-2.75	16.96	-1.20	80.68	-1.72	155.64	.30	34.43	-1.68	216.68
17	12	11.60	-1.55	89.87	-2.81	17.51	-1.20	80.73	-1.72	155.67	.30	34.43	-1.68	216.68
17	13	12.15	-1.55	89.91	-2.86	18.06	-1.21	80.79	-1.72	155.70	.30	34.44	-1.68	216.68
17	14	12.70	-1.55	89.95	-2.92	18.61	-1.21	80.84	-1.72	155.73	.30	34.45	-1.68	216.68
17	15	13.25	-1.55	89.99	-2.98	19.16	-1.21	80.89	-1.72	155.76	.30	34.46	-1.68	216.68
17	16	13.80	-1.55	90.04	-3.03	19.71	-1.21	80.95	-1.72	155.79	.30	34.46	-1.68	216.68
17	17	14.35	-1.55	90.08	-3.09	20.26	-1.21	81.00	-1.72	155.82	.30	34.47	-1.68	216.67
17	18	14.90	-1.55	90.12	-3.14	20.80	-1.22	81.05	-1.71	155.85	.30	34.48	-1.68	216.67
17	19	15.45	-1.55	90.17	-3.20	21.35	-1.22	81.10	-1.71	155.88	.30	34.48	-1.68	216.67
17	20	16.00	-1.55	90.21	-3.25	21.90	-1.22	81.16	-1.71	155.91	.30	34.49	-1.68	216.67
17	21	16.55	-1.55	90.25	-3.31	22.45	-1.22	81.21	-1.71	155.94	.30	34.50	-1.68	216.67
17	22	17.09	-1.55	90.29	-3.36	23.00	-1.22	81.26	-1.71	155.97	.30	34.51	-1.68	216.67
17	23	17.64	-1.55	90.34	-3.42	23.54	-1.23	81.32	-1.71	156.00	.30	34.51	-1.68	216.67

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * DEC 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
18	0	18.19	-1.55	90.38	-3.47	24.09	-1.23	81.37	-1.71	156.03	.30	34.52	-1.68	216.66
18	1	18.74	-1.55	90.42	-3.52	24.64	-1.23	81.42	-1.70	156.06	.30	34.53	-1.68	216.66
18	2	19.29	-1.55	90.47	-3.58	25.18	-1.23	81.47	-1.70	156.09	.30	34.53	-1.68	216.66
18	3	19.84	-1.55	90.51	-3.63	25.73	-1.23	81.53	-1.70	156.12	.30	34.54	-1.68	216.66
18	4	20.39	-1.55	90.55	-3.68	26.27	-1.24	81.58	-1.70	156.15	.30	34.55	-1.68	216.66
18	5	20.94	-1.55	90.59	-3.73	26.82	-1.24	81.63	-1.70	156.18	.30	34.55	-1.68	216.66
18	6	21.49	-1.55	90.64	-3.78	27.36	-1.24	81.69	-1.70	156.21	.30	34.56	-1.68	216.66
18	7	22.04	-1.55	90.68	-3.83	27.91	-1.24	81.74	-1.69	156.24	.30	34.57	-1.68	216.65
18	8	22.58	-1.55	90.72	-3.88	28.45	-1.24	81.79	-1.69	156.27	.30	34.58	-1.68	216.65
18	9	23.13	-1.55	90.77	-3.93	28.99	-1.24	81.85	-1.69	156.30	.30	34.58	-1.68	216.65
18	10	23.68	-1.55	90.81	-3.98	29.54	-1.25	81.90	-1.69	156.33	.30	34.59	-1.68	216.65
18	11	24.23	-1.55	90.85	-4.03	30.08	-1.25	81.95	-1.69	156.36	.30	34.60	-1.68	216.65
18	12	24.78	-1.55	90.90	-4.08	30.62	-1.25	82.01	-1.69	156.39	.30	34.60	-1.68	216.65
18	13	25.33	-1.55	90.94	-4.13	31.16	-1.25	82.06	-1.69	156.42	.30	34.61	-1.68	216.65
18	14	25.88	-1.55	90.98	-4.18	31.70	-1.25	82.11	-1.68	156.45	.30	34.62	-1.68	216.64
18	15	26.43	-1.55	91.03	-4.23	32.25	-1.26	82.16	-1.68	156.48	.30	34.62	-1.68	216.64
18	16	26.98	-1.55	91.07	-4.27	32.79	-1.26	82.22	-1.68	156.51	.30	34.63	-1.68	216.64
18	17	27.53	-1.55	91.11	-4.32	33.33	-1.26	82.27	-1.68	156.54	.30	34.64	-1.68	216.64
18	18	28.07	-1.55	91.15	-4.37	33.87	-1.26	82.32	-1.68	156.57	.30	34.65	-1.68	216.64
18	19	28.62	-1.55	91.20	-4.41	34.41	-1.26	82.38	-1.68	156.60	.30	34.65	-1.68	216.64
18	20	29.17	-1.55	91.24	-4.46	34.95	-1.27	82.43	-1.68	156.63	.30	34.66	-1.68	216.64
18	21	29.72	-1.55	91.28	-4.50	35.49	-1.27	82.48	-1.67	156.66	.30	34.67	-1.68	216.63
18	22	30.27	-1.55	91.33	-4.55	36.03	-1.27	82.54	-1.67	156.70	.30	34.67	-1.68	216.63
18	23	30.82	-1.55	91.37	-4.59	36.57	-1.27	82.59	-1.67	156.73	.30	34.68	-1.68	216.63
19	0	31.37	-1.55	91.41	-4.64	37.11	-1.27	82.64	-1.67	156.76	.30	34.69	-1.68	216.63
19	1	31.92	-1.55	91.46	-4.68	37.64	-1.28	82.69	-1.67	156.79	.30	34.69	-1.68	216.63
19	2	32.47	-1.55	91.50	-4.72	38.18	-1.28	82.75	-1.67	156.82	.30	34.70	-1.68	216.63
19	3	33.02	-1.55	91.54	-4.76	38.72	-1.28	82.80	-1.66	156.85	.30	34.71	-1.68	216.63
19	4	33.56	-1.55	91.59	-4.81	39.26	-1.28	82.85	-1.66	156.88	.30	34.72	-1.68	216.63
19	5	34.11	-1.55	91.63	-4.85	39.79	-1.28	82.91	-1.66	156.91	.30	34.72	-1.68	216.62
19	6	34.66	-1.55	91.67	-4.89	40.33	-1.29	82.96	-1.66	156.94	.30	34.73	-1.68	216.62
19	7	35.21	-1.55	91.72	-4.93	40.87	-1.29	83.01	-1.66	156.97	.30	34.74	-1.68	216.62
19	8	35.76	-1.55	91.76	-4.97	41.40	-1.29	83.07	-1.66	157.00	.30	34.74	-1.68	216.62
19	9	36.31	-1.55	91.80	-5.01	41.94	-1.29	83.12	-1.66	157.03	.30	34.75	-1.68	216.62
19	10	36.86	-1.55	91.85	-5.05	42.48	-1.29	83.17	-1.65	157.06	.30	34.76	-1.68	216.62
19	11	37.41	-1.55	91.89	-5.09	43.01	-1.29	83.23	-1.65	157.09	.30	34.76	-1.68	216.62
19	12	37.96	-1.55	91.93	-5.13	43.55	-1.30	83.28	-1.65	157.12	.30	34.77	-1.68	216.61
19	13	38.51	-1.55	91.98	-5.16	44.08	-1.30	83.33	-1.65	157.15	.30	34.78	-1.68	216.61
19	14	39.05	-1.55	92.02	-5.20	44.62	-1.30	83.39	-1.65	157.18	.30	34.79	-1.68	216.61
19	15	39.60	-1.55	92.06	-5.24	45.15	-1.30	83.44	-1.65	157.21	.30	34.79	-1.68	216.61
19	16	40.15	-1.55	92.11	-5.28	45.68	-1.30	83.49	-1.65	157.24	.30	34.80	-1.68	216.61
19	17	40.70	-1.55	92.15	-5.31	46.22	-1.31	83.54	-1.64	157.27	.30	34.81	-1.68	216.61
19	18	41.25	-1.55	92.19	-5.35	46.75	-1.31	83.60	-1.64	157.30	.30	34.81	-1.68	216.61
19	19	41.80	-1.55	92.24	-5.38	47.28	-1.31	83.65	-1.64	157.34	.30	34.82	-1.68	216.61
19	20	42.35	-1.55	92.28	-5.42	47.82	-1.31	83.70	-1.64	157.37	.30	34.83	-1.67	216.60
19	21	42.90	-1.55	92.32	-5.45	48.35	-1.31	83.76	-1.64	157.40	.30	34.83	-1.67	216.60
19	22	43.45	-1.55	92.37	-5.48	48.88	-1.32	83.81	-1.64	157.43	.30	34.84	-1.67	216.60
19	23	44.00	-1.55	92.41	-5.52	49.41	-1.32	83.86	-1.63	157.46	.30	34.85	-1.67	216.60

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * DEC 1969 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
20	0	44.55	-1.55	92.45	-5.55	49.94	-1.32	83.92	-1.63	157.49	.30	34.85	-1.67	216.60
20	1	45.09	-1.55	92.50	-5.58	50.47	-1.32	83.97	-1.63	157.52	.30	34.86	-1.67	216.60
20	2	45.64	-1.55	92.54	-5.61	51.01	-1.32	84.02	-1.63	157.55	.30	34.87	-1.67	216.60
20	3	46.19	-1.55	92.58	-5.64	51.54	-1.32	84.08	-1.63	157.58	.30	34.88	-1.67	216.59
20	4	46.74	-1.55	92.63	-5.67	52.07	-1.33	84.13	-1.63	157.61	.30	34.88	-1.67	216.59
20	5	47.29	-1.55	92.67	-5.70	52.60	-1.33	84.18	-1.63	157.64	.30	34.89	-1.67	216.59
20	6	47.84	-1.55	92.71	-5.73	53.13	-1.33	84.24	-1.62	157.67	.30	34.90	-1.67	216.59
20	7	48.39	-1.55	92.76	-5.76	53.66	-1.33	84.29	-1.62	157.70	.30	34.90	-1.67	216.59
20	8	48.94	-1.55	92.80	-5.79	54.18	-1.33	84.34	-1.62	157.73	.30	34.91	-1.67	216.59
20	9	49.49	-1.55	92.84	-5.82	54.71	-1.34	84.40	-1.62	157.76	.30	34.92	-1.67	216.59
20	10	50.04	-1.55	92.89	-5.85	55.24	-1.34	84.45	-1.62	157.79	.30	34.92	-1.67	216.59
20	11	50.58	-1.55	92.93	-5.87	55.77	-1.34	84.50	-1.62	157.83	.30	34.93	-1.67	216.58
20	12	51.13	-1.55	92.97	-5.90	56.30	-1.34	84.56	-1.61	157.86	.30	34.94	-1.67	216.58
20	13	51.68	-1.55	93.02	-5.92	56.83	-1.34	84.61	-1.61	157.89	.30	34.94	-1.67	216.58
20	14	52.23	-1.55	93.06	-5.95	57.35	-1.35	84.66	-1.61	157.92	.30	34.95	-1.67	216.58
20	15	52.78	-1.55	93.10	-5.97	57.88	-1.35	84.71	-1.61	157.95	.30	34.96	-1.67	216.58
20	16	53.33	-1.55	93.15	-6.00	58.41	-1.35	84.77	-1.61	157.98	.30	34.97	-1.67	216.58
20	17	53.88	-1.55	93.19	-6.02	58.93	-1.35	84.82	-1.61	158.01	.30	34.97	-1.67	216.58
20	18	54.43	-1.55	93.23	-6.05	59.46	-1.35	84.87	-1.61	158.04	.30	34.98	-1.67	216.58
20	19	54.98	-1.55	93.28	-6.07	59.99	-1.35	84.93	-1.60	158.07	.30	34.99	-1.67	216.57
20	20	55.53	-1.55	93.32	-6.09	60.51	-1.36	84.98	-1.60	158.10	.30	34.99	-1.67	216.57
20	21	56.07	-1.55	93.36	-6.11	61.04	-1.36	85.03	-1.60	158.13	.30	35.00	-1.67	216.57
20	22	56.62	-1.55	93.41	-6.13	61.56	-1.36	85.09	-1.60	158.16	.30	35.01	-1.67	216.57
20	23	57.17	-1.55	93.45	-6.15	62.09	-1.36	85.14	-1.60	158.19	.30	35.01	-1.67	216.57
21	0	57.72	-1.55	93.50	-6.17	62.61	-1.36	85.19	-1.60	158.22	.30	35.02	-1.67	216.57
21	1	58.27	-1.55	93.54	-6.19	63.14	-1.37	85.25	-1.59	158.26	.30	35.03	-1.67	216.57
21	2	58.82	-1.55	93.58	-6.21	63.66	-1.37	85.30	-1.59	158.29	.30	35.03	-1.67	216.57
21	3	59.37	-1.55	93.63	-6.23	64.18	-1.37	85.35	-1.59	158.32	.30	35.04	-1.67	216.56
21	4	59.92	-1.55	93.67	-6.25	64.71	-1.37	85.41	-1.59	158.35	.30	35.05	-1.67	216.56
21	5	60.47	-1.55	93.71	-6.27	65.23	-1.37	85.46	-1.59	158.38	.30	35.05	-1.67	216.56
21	6	61.02	-1.55	93.76	-6.28	65.75	-1.37	85.51	-1.59	158.41	.30	35.06	-1.67	216.56
21	7	61.56	-1.55	93.80	-6.30	66.27	-1.38	85.57	-1.59	158.44	.30	35.07	-1.67	216.56
21	8	62.11	-1.55	93.84	-6.32	66.80	-1.38	85.62	-1.58	158.47	.30	35.07	-1.67	216.56
21	9	62.66	-1.55	93.89	-6.33	67.32	-1.38	85.67	-1.58	158.50	.30	35.08	-1.67	216.56
21	10	63.21	-1.55	93.93	-6.34	67.84	-1.38	85.73	-1.58	158.53	.30	35.09	-1.67	216.56
21	11	63.76	-1.55	93.97	-6.36	68.36	-1.38	85.78	-1.58	158.56	.30	35.09	-1.67	216.56
21	12	64.31	-1.55	94.02	-6.37	68.88	-1.39	85.83	-1.58	158.59	.30	35.10	-1.67	216.55
21	13	64.86	-1.55	94.06	-6.39	69.40	-1.39	85.89	-1.58	158.63	.30	35.11	-1.67	216.55
21	14	65.41	-1.55	94.10	-6.40	69.92	-1.39	85.94	-1.57	158.66	.30	35.12	-1.67	216.55
21	15	65.96	-1.55	94.15	-6.41	70.44	-1.39	85.99	-1.57	158.69	.30	35.12	-1.67	216.55
21	16	66.51	-1.55	94.19	-6.42	70.96	-1.39	86.05	-1.57	158.72	.30	35.13	-1.67	216.55
21	17	67.05	-1.55	94.24	-6.43	71.48	-1.39	86.10	-1.57	158.75	.30	35.14	-1.67	216.55
21	18	67.60	-1.55	94.28	-6.44	72.00	-1.40	86.15	-1.57	158.78	.30	35.14	-1.67	216.55
21	19	68.15	-1.55	94.32	-6.45	72.52	-1.40	86.21	-1.57	158.81	.30	35.15	-1.67	216.55
21	20	68.70	-1.55	94.37	-6.46	73.04	-1.40	86.26	-1.56	158.84	.30	35.16	-1.67	216.54
21	21	69.25	-1.55	94.41	-6.47	73.56	-1.40	86.31	-1.56	158.87	.30	35.16	-1.67	216.54
21	22	69.80	-1.55	94.45	-6.48	74.07	-1.40	86.37	-1.56	158.90	.30	35.17	-1.67	216.54
21	23	70.35	-1.55	94.50	-6.49	74.59	-1.41	86.42	-1.56	158.93	.30	35.18	-1.67	216.54

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

GMT		EQUINOX	SUN		* * * * JAN 1970 * * * * EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
11	0	334.43	-1.40	114.83	1.32	338.81	-2.07	111.58	-.79	173.92	.30	37.89	-1.57	216.46
11	1	334.97	-1.40	114.87	1.25	339.41	-2.07	111.63	-.79	173.95	.30	37.89	-1.57	216.46
11	2	335.52	-1.40	114.91	1.18	340.02	-2.07	111.68	-.79	173.98	.30	37.90	-1.57	216.46
11	3	336.07	-1.40	114.95	1.11	340.62	-2.08	111.73	-.79	174.01	.30	37.90	-1.57	216.46
11	4	336.62	-1.40	114.99	1.05	341.23	-2.08	111.78	-.79	174.04	.30	37.91	-1.57	216.46
11	5	337.17	-1.40	115.03	.98	341.83	-2.08	111.84	-.79	174.07	.30	37.91	-1.57	216.46
11	6	337.72	-1.40	115.08	.91	342.43	-2.08	111.89	-.79	174.10	.30	37.92	-1.57	216.46
11	7	338.27	-1.40	115.12	.84	343.03	-2.08	111.94	-.78	174.13	.30	37.92	-1.57	216.46
11	8	338.82	-1.40	115.16	.77	343.63	-2.08	111.99	-.78	174.16	.30	37.93	-1.57	216.46
11	9	339.37	-1.40	115.20	.70	344.23	-2.08	112.04	-.78	174.19	.30	37.93	-1.57	216.46
11	10	339.92	-1.40	115.24	.63	344.83	-2.08	112.09	-.78	174.22	.30	37.94	-1.57	216.46
11	11	340.46	-1.40	115.28	.56	345.43	-2.08	112.15	-.78	174.25	.30	37.94	-1.57	216.46
11	12	341.01	-1.39	115.32	.49	346.03	-2.08	112.20	-.78	174.28	.30	37.95	-1.57	216.46
11	13	341.56	-1.39	115.36	.42	346.63	-2.09	112.25	-.78	174.31	.30	37.95	-1.57	216.46
11	14	342.11	-1.39	115.41	.35	347.22	-2.09	112.30	-.77	174.34	.30	37.95	-1.57	216.46
11	15	342.66	-1.39	115.45	.28	347.82	-2.09	112.35	-.77	174.37	.30	37.96	-1.57	216.46
11	16	343.21	-1.39	115.49	.21	348.41	-2.09	112.40	-.77	174.40	.30	37.96	-1.57	216.46
11	17	343.76	-1.39	115.53	.14	349.01	-2.09	112.46	-.77	174.43	.30	37.97	-1.57	216.46
11	18	344.31	-1.39	115.57	.07	349.60	-2.09	112.51	-.77	174.46	.30	37.97	-1.57	216.47
11	19	344.86	-1.39	115.61	.00	350.20	-2.09	112.56	-.77	174.49	.30	37.98	-1.56	216.47
11	20	345.41	-1.39	115.65	-.07	350.79	-2.09	112.61	-.77	174.52	.30	37.98	-1.56	216.47
11	21	345.95	-1.39	115.70	-.13	351.38	-2.09	112.66	-.76	174.55	.30	37.99	-1.56	216.47
11	22	346.50	-1.39	115.74	-.20	351.97	-2.09	112.72	-.76	174.58	.30	37.99	-1.56	216.47
11	23	347.05	-1.39	115.78	-.27	352.56	-2.10	112.77	-.76	174.61	.30	38.00	-1.56	216.47
12	0	347.60	-1.39	115.82	-.34	353.16	-2.10	112.82	-.76	174.64	.30	38.00	-1.56	216.47
12	1	348.15	-1.39	115.86	-.41	353.74	-2.10	112.87	-.76	174.67	.30	38.01	-1.56	216.47
12	2	348.70	-1.39	115.90	-.48	354.33	-2.10	112.92	-.76	174.70	.30	38.01	-1.56	216.47
12	3	349.25	-1.39	115.94	-.55	354.92	-2.10	112.97	-.76	174.73	.30	38.02	-1.56	216.47
12	4	349.80	-1.39	115.99	-.62	355.51	-2.10	113.03	-.75	174.76	.30	38.02	-1.56	216.47
12	5	350.35	-1.39	116.03	-.68	356.10	-2.10	113.08	-.75	174.79	.30	38.03	-1.56	216.47
12	6	350.90	-1.39	116.07	-.75	356.68	-2.10	113.13	-.75	174.82	.30	38.03	-1.56	216.47
12	7	351.44	-1.39	116.11	-.82	357.27	-2.10	113.18	-.75	174.85	.30	38.04	-1.56	216.47
12	8	351.99	-1.39	116.15	-.89	357.85	-2.10	113.23	-.75	174.88	.30	38.04	-1.56	216.47
12	9	352.54	-1.39	116.19	-.95	358.44	-2.11	113.29	-.75	174.91	.30	38.05	-1.56	216.47
12	10	353.09	-1.39	116.24	-1.02	359.02	-2.11	113.34	-.75	174.94	.30	38.05	-1.56	216.47
12	11	353.64	-1.39	116.28	-1.09	359.60	-2.11	113.39	-.74	174.97	.30	38.06	-1.56	216.47
12	12	354.19	-1.39	116.32	-1.16	.19	-2.11	113.44	-.74	175.00	.30	38.06	-1.56	216.47
12	13	354.74	-1.39	116.36	-1.22	.77	-2.11	113.49	-.74	175.03	.30	38.07	-1.56	216.48
12	14	355.29	-1.39	116.40	-1.29	1.35	-2.11	113.54	-.74	175.06	.30	38.07	-1.56	216.48
12	15	355.84	-1.39	116.44	-1.36	1.93	-2.11	113.60	-.74	175.09	.30	38.08	-1.56	216.48
12	16	356.39	-1.39	116.48	-1.42	2.51	-2.11	113.65	-.74	175.12	.30	38.08	-1.56	216.48
12	17	356.94	-1.38	116.53	-1.49	3.09	-2.11	113.70	-.74	175.15	.30	38.09	-1.56	216.48
12	18	357.48	-1.38	116.57	-1.55	3.67	-2.11	113.75	-.73	175.18	.30	38.09	-1.56	216.48
12	19	358.03	-1.38	116.61	-1.62	4.24	-2.11	113.80	-.73	175.21	.30	38.10	-1.56	216.48
12	20	358.58	-1.38	116.65	-1.68	4.82	-2.12	113.86	-.73	175.24	.30	38.10	-1.56	216.48
12	21	359.13	-1.38	116.69	-1.75	5.40	-2.12	113.91	-.73	175.27	.30	38.11	-1.56	216.48
12	22	359.68	-1.38	116.73	-1.81	5.97	-2.12	113.96	-.73	175.30	.30	38.11	-1.56	216.48
12	23	.23	-1.38	116.78	-1.88	6.55	-2.12	114.01	-.73	175.33	.30	38.11	-1.56	216.48

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * JAN 1970 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
13	0	.78	-1.38	116.82	-1.94	7.12	-2.12	114.06	-.73	175.36	.30	38.12	-1.56	216.48
13	1	1.33	-1.38	116.86	-2.01	7.70	-2.12	114.12	-.72	175.39	.30	38.12	-1.56	216.48
13	2	1.88	-1.38	116.90	-2.07	8.27	-2.12	114.17	-.72	175.42	.30	38.13	-1.56	216.48
13	3	2.43	-1.38	116.94	-2.13	8.84	-2.12	114.22	-.72	175.45	.30	38.13	-1.56	216.48
13	4	2.97	-1.38	116.98	-2.20	9.42	-2.12	114.27	-.72	175.48	.30	38.14	-1.56	216.48
13	5	3.52	-1.38	117.03	-2.26	9.99	-2.12	114.32	-.72	175.51	.30	38.14	-1.56	216.48
13	6	4.07	-1.38	117.07	-2.32	10.56	-2.12	114.38	-.72	175.54	.30	38.15	-1.56	216.48
13	7	4.62	-1.38	117.11	-2.38	11.13	-2.13	114.43	-.71	175.57	.30	38.15	-1.56	216.49
13	8	5.17	-1.38	117.15	-2.45	11.70	-2.13	114.48	-.71	175.60	.30	38.16	-1.56	216.49
13	9	5.72	-1.38	117.19	-2.51	12.27	-2.13	114.53	-.71	175.63	.30	38.16	-1.56	216.49
13	10	6.27	-1.38	117.24	-2.57	12.83	-2.13	114.58	-.71	175.66	.30	38.17	-1.56	216.49
13	11	6.82	-1.38	117.28	-2.63	13.40	-2.13	114.64	-.71	175.69	.30	38.17	-1.56	216.49
13	12	7.37	-1.38	117.32	-2.69	13.97	-2.13	114.69	-.71	175.72	.30	38.18	-1.56	216.49
13	13	7.92	-1.38	117.36	-2.75	14.54	-2.13	114.74	-.71	175.75	.30	38.18	-1.56	216.49
13	14	8.46	-1.38	117.40	-2.81	15.10	-2.13	114.79	-.70	175.78	.30	38.19	-1.56	216.49
13	15	9.01	-1.38	117.44	-2.87	15.67	-2.13	114.84	-.70	175.81	.30	38.19	-1.56	216.49
13	16	9.56	-1.38	117.49	-2.93	16.23	-2.13	114.90	-.70	175.85	.30	38.20	-1.56	216.49
13	17	10.11	-1.38	117.53	-2.99	16.80	-2.13	114.95	-.70	175.88	.30	38.20	-1.56	216.49
13	18	10.66	-1.37	117.57	-3.05	17.36	-2.14	115.00	-.70	175.91	.30	38.21	-1.56	216.49
13	19	11.21	-1.37	117.61	-3.11	17.92	-2.14	115.05	-.70	175.94	.30	38.21	-1.56	216.49
13	20	11.76	-1.37	117.65	-3.16	18.48	-2.14	115.10	-.70	175.97	.30	38.21	-1.55	216.49
13	21	12.31	-1.37	117.70	-3.22	19.05	-2.14	115.16	-.69	176.00	.30	38.22	-1.55	216.49
13	22	12.86	-1.37	117.74	-3.28	19.61	-2.14	115.21	-.69	176.03	.30	38.22	-1.55	216.49
13	23	13.41	-1.37	117.78	-3.34	20.17	-2.14	115.26	-.69	176.06	.30	38.23	-1.55	216.50
14	0	13.95	-1.37	117.82	-3.39	20.73	-2.14	115.31	-.69	176.09	.30	38.23	-1.55	216.50
14	1	14.50	-1.37	117.86	-3.45	21.29	-2.14	115.36	-.69	176.12	.30	38.24	-1.55	216.50
14	2	15.05	-1.37	117.91	-3.50	21.84	-2.14	115.42	-.69	176.15	.30	38.24	-1.55	216.50
14	3	15.60	-1.37	117.95	-3.56	22.40	-2.14	115.47	-.69	176.18	.30	38.25	-1.55	216.50
14	4	16.15	-1.37	117.99	-3.61	22.96	-2.14	115.52	-.68	176.21	.30	38.25	-1.55	216.50
14	5	16.70	-1.37	118.03	-3.67	23.52	-2.15	115.57	-.68	176.24	.30	38.26	-1.55	216.50
14	6	17.25	-1.37	118.07	-3.72	24.07	-2.15	115.62	-.68	176.27	.30	38.26	-1.55	216.50
14	7	17.80	-1.37	118.12	-3.78	24.63	-2.15	115.68	-.68	176.30	.30	38.27	-1.55	216.50
14	8	18.35	-1.37	118.16	-3.83	25.18	-2.15	115.73	-.68	176.33	.30	38.27	-1.55	216.50
14	9	18.90	-1.37	118.20	-3.88	25.74	-2.15	115.78	-.68	176.36	.30	38.28	-1.55	216.50
14	10	19.44	-1.37	118.24	-3.93	26.29	-2.15	115.83	-.68	176.39	.30	38.28	-1.55	216.50
14	11	19.99	-1.37	118.28	-3.99	26.85	-2.15	115.88	-.67	176.42	.30	38.29	-1.55	216.50
14	12	20.54	-1.37	118.33	-4.04	27.40	-2.15	115.94	-.67	176.45	.30	38.29	-1.55	216.50
14	13	21.09	-1.37	118.37	-4.09	27.95	-2.15	115.99	-.67	176.48	.30	38.29	-1.55	216.50
14	14	21.64	-1.37	118.41	-4.14	28.50	-2.15	116.04	-.67	176.51	.30	38.30	-1.55	216.51
14	15	22.19	-1.37	118.45	-4.19	29.06	-2.15	116.09	-.67	176.54	.30	38.30	-1.55	216.51
14	16	22.74	-1.37	118.50	-4.24	29.61	-2.15	116.15	-.67	176.57	.30	38.31	-1.55	216.51
14	17	23.29	-1.37	118.54	-4.29	30.16	-2.16	116.20	-.67	176.60	.30	38.31	-1.55	216.51
14	18	23.84	-1.36	118.58	-4.34	30.71	-2.16	116.25	-.66	176.63	.30	38.32	-1.55	216.51
14	19	24.39	-1.36	118.62	-4.38	31.25	-2.16	116.30	-.66	176.66	.30	38.32	-1.55	216.51
14	20	24.93	-1.36	118.66	-4.43	31.80	-2.16	116.35	-.66	176.69	.30	38.33	-1.55	216.51
14	21	25.48	-1.36	118.71	-4.48	32.35	-2.16	116.41	-.66	176.72	.30	38.33	-1.55	216.51
14	22	26.03	-1.36	118.75	-4.53	32.90	-2.16	116.46	-.66	176.75	.30	38.34	-1.55	216.51
14	23	26.58	-1.36	118.79	-4.57	33.45	-2.16	116.51	-.66	176.78	.30	38.34	-1.55	216.51

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * JAN 1970 * * * *

GMT DATE	GMT HOUR	EQUINOX PHAE	SUN DEC	SUN RA	EARTH DEC	EARTH RA	VENUS DEC	VENUS RA	MARS DEC	MARS RA	JUPITER DEC	JUPITER RA	SATURN DEC	SATURN RA
15	0	27.13	-1.36	118.83	-4.62	33.99	-2.16	116.56	-.65	176.81	.30	38.35	-1.55	216.51
15	1	27.68	-1.36	118.88	-4.66	34.54	-2.16	116.62	-.65	176.84	.30	38.35	-1.55	216.51
15	2	28.23	-1.36	118.92	-4.71	35.08	-2.16	116.67	-.65	176.87	.30	38.36	-1.55	216.51
15	3	28.78	-1.36	118.96	-4.75	35.63	-2.16	116.72	-.65	176.90	.30	38.36	-1.55	216.51
15	4	29.33	-1.36	119.00	-4.80	36.17	-2.16	116.77	-.65	176.93	.30	38.36	-1.55	216.52
15	5	29.88	-1.36	119.04	-4.84	36.72	-2.17	116.82	-.65	176.96	.30	38.37	-1.55	216.52
15	6	30.43	-1.36	119.09	-4.89	37.26	-2.17	116.88	-.65	176.99	.30	38.37	-1.55	216.52
15	7	30.97	-1.36	119.13	-4.93	37.80	-2.17	116.93	-.64	177.02	.30	38.38	-1.55	216.52
15	8	31.52	-1.36	119.17	-4.97	38.35	-2.17	116.98	-.64	177.05	.30	38.38	-1.55	216.52
15	9	32.07	-1.36	119.21	-5.01	38.89	-2.17	117.03	-.64	177.08	.30	38.39	-1.55	216.52
15	10	32.62	-1.36	119.26	-5.05	39.43	-2.17	117.09	-.64	177.11	.30	38.39	-1.55	216.52
15	11	33.17	-1.36	119.30	-5.09	39.97	-2.17	117.14	-.64	177.14	.30	38.40	-1.55	216.52
15	12	33.72	-1.36	119.34	-5.13	40.51	-2.17	117.19	-.64	177.17	.30	38.40	-1.55	216.52
15	13	34.27	-1.36	119.38	-5.17	41.05	-2.17	117.24	-.64	177.20	.30	38.41	-1.55	216.52
15	14	34.82	-1.36	119.43	-5.21	41.59	-2.17	117.29	-.63	177.23	.30	38.41	-1.55	216.52
15	15	35.37	-1.35	119.47	-5.25	42.13	-2.17	117.35	-.63	177.26	.30	38.41	-1.55	216.52
15	16	35.92	-1.35	119.51	-5.29	42.67	-2.17	117.40	-.63	177.29	.30	38.42	-1.55	216.52
15	17	36.46	-1.35	119.55	-5.33	43.20	-2.17	117.45	-.63	177.33	.30	38.42	-1.55	216.53
15	18	37.01	-1.35	119.59	-5.37	43.74	-2.18	117.50	-.63	177.36	.30	38.43	-1.55	216.53
15	19	37.56	-1.35	119.64	-5.40	44.28	-2.18	117.56	-.63	177.39	.30	38.43	-1.55	216.53
15	20	38.11	-1.35	119.68	-5.44	44.82	-2.18	117.61	-.62	177.42	.30	38.44	-1.54	216.53
15	21	38.66	-1.35	119.72	-5.47	45.35	-2.18	117.66	-.62	177.45	.30	38.44	-1.54	216.53
15	22	39.21	-1.35	119.76	-5.51	45.89	-2.18	117.71	-.62	177.48	.30	38.45	-1.54	216.53
15	23	39.76	-1.35	119.81	-5.54	46.42	-2.18	117.77	-.62	177.51	.30	38.45	-1.54	216.53
16	0	40.31	-1.35	119.85	-5.58	46.96	-2.18	117.82	-.62	177.54	.30	38.46	-1.54	216.53
16	1	40.86	-1.35	119.89	-5.61	47.49	-2.18	117.87	-.62	177.57	.30	38.46	-1.54	216.53
16	2	41.41	-1.35	119.93	-5.65	48.03	-2.18	117.92	-.62	177.60	.30	38.46	-1.54	216.53
16	3	41.95	-1.35	119.98	-5.68	48.56	-2.18	117.97	-.61	177.63	.30	38.47	-1.54	216.53
16	4	42.50	-1.35	120.02	-5.71	49.09	-2.18	118.03	-.61	177.66	.30	38.47	-1.54	216.53
16	5	43.05	-1.35	120.06	-5.74	49.62	-2.18	118.08	-.61	177.69	.30	38.48	-1.54	216.53
16	6	43.60	-1.35	120.10	-5.77	50.16	-2.18	118.13	-.61	177.72	.30	38.48	-1.54	216.54
16	7	44.15	-1.35	120.15	-5.80	50.69	-2.18	118.18	-.61	177.75	.30	38.49	-1.54	216.54
16	8	44.70	-1.35	120.19	-5.83	51.22	-2.19	118.24	-.61	177.78	.30	38.49	-1.54	216.54
16	9	45.25	-1.35	120.23	-5.86	51.75	-2.19	118.29	-.61	177.81	.30	38.50	-1.54	216.54
16	10	45.80	-1.35	120.28	-5.89	52.28	-2.19	118.34	-.60	177.84	.30	38.50	-1.54	216.54
16	11	46.35	-1.34	120.32	-5.92	52.81	-2.19	118.39	-.60	177.87	.30	38.51	-1.54	216.54
16	12	46.90	-1.34	120.36	-5.95	53.34	-2.19	118.45	-.60	177.90	.30	38.51	-1.54	216.54
16	13	47.44	-1.34	120.40	-5.98	53.87	-2.19	118.50	-.60	177.93	.30	38.51	-1.54	216.54
16	14	47.99	-1.34	120.45	-6.00	54.40	-2.19	118.55	-.60	177.96	.30	38.52	-1.54	216.54
16	15	48.54	-1.34	120.49	-6.03	54.92	-2.19	118.60	-.60	177.99	.30	38.52	-1.54	216.54
16	16	49.09	-1.34	120.53	-6.05	55.45	-2.19	118.66	-.60	178.02	.30	38.53	-1.54	216.54
16	17	49.64	-1.34	120.57	-6.08	55.98	-2.19	118.71	-.59	178.05	.30	38.53	-1.54	216.54
16	18	50.19	-1.34	120.62	-6.10	56.51	-2.19	118.76	-.59	178.08	.30	38.54	-1.54	216.55
16	19	50.74	-1.34	120.66	-6.13	57.03	-2.19	118.81	-.59	178.11	.30	38.54	-1.54	216.55
16	20	51.29	-1.34	120.70	-6.15	57.56	-2.19	118.87	-.59	178.15	.30	38.55	-1.54	216.55
16	21	51.84	-1.34	120.74	-6.17	58.08	-2.19	118.92	-.59	178.18	.30	38.55	-1.54	216.55
16	22	52.39	-1.34	120.79	-6.20	58.61	-2.19	118.97	-.59	178.21	.30	38.55	-1.54	216.55
16	23	52.93	-1.34	120.83	-6.22	59.13	-2.20	119.02	-.58	178.24	.30	38.56	-1.54	216.55

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * JAN 1970 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
17	0	53.48	-1.34	120.87	-6.24	59.66	-2.20	119.08	-.58	178.27	.30	38.56	-1.54	216.55
17	1	54.03	-1.34	120.92	-6.26	60.18	-2.20	119.13	-.58	178.30	.30	38.57	-1.54	216.55
17	2	54.58	-1.34	120.96	-6.28	60.71	-2.20	119.18	-.58	178.33	.30	38.57	-1.54	216.55
17	3	55.13	-1.34	121.00	-6.30	61.23	-2.20	119.23	-.58	178.36	.30	38.58	-1.54	216.55
17	4	55.68	-1.34	121.04	-6.32	61.75	-2.20	119.29	-.58	178.39	.30	38.58	-1.54	216.55
17	5	56.23	-1.34	121.09	-6.34	62.27	-2.20	119.34	-.58	178.42	.30	38.58	-1.54	216.56
17	6	56.78	-1.33	121.13	-6.36	62.80	-2.20	119.39	-.57	178.45	.30	38.59	-1.54	216.56
17	7	57.33	-1.33	121.17	-6.38	63.32	-2.20	119.44	-.57	178.48	.30	38.59	-1.54	216.56
17	8	57.88	-1.33	121.21	-6.39	63.84	-2.20	119.50	-.57	178.51	.30	38.60	-1.54	216.56
17	9	58.42	-1.33	121.26	-6.41	64.36	-2.20	119.55	-.57	178.54	.30	38.60	-1.54	216.56
17	10	58.97	-1.33	121.30	-6.43	64.88	-2.20	119.60	-.57	178.57	.30	38.61	-1.54	216.56
17	11	59.52	-1.33	121.34	-6.44	65.40	-2.20	119.65	-.57	178.60	.30	38.61	-1.54	216.56
17	12	60.07	-1.33	121.39	-6.46	65.92	-2.20	119.71	-.56	178.63	.30	38.62	-1.54	216.56
17	13	60.62	-1.33	121.43	-6.47	66.44	-2.20	119.76	-.56	178.66	.30	38.62	-1.54	216.56
17	14	61.17	-1.33	121.47	-6.48	66.96	-2.21	119.81	-.56	178.69	.30	38.62	-1.54	216.56
17	15	61.72	-1.33	121.51	-6.50	67.48	-2.21	119.86	-.56	178.72	.30	38.63	-1.54	216.56
17	16	62.27	-1.33	121.56	-6.51	68.00	-2.21	119.92	-.56	178.76	.30	38.63	-1.54	216.57
17	17	62.82	-1.33	121.60	-6.52	68.51	-2.21	119.97	-.56	178.79	.30	38.64	-1.53	216.57
17	18	63.37	-1.33	121.64	-6.54	69.03	-2.21	120.02	-.56	178.82	.30	38.64	-1.53	216.57
17	19	63.92	-1.33	121.69	-6.55	69.55	-2.21	120.07	-.55	178.85	.30	38.65	-1.53	216.57
17	20	64.46	-1.33	121.73	-6.56	70.07	-2.21	120.13	-.55	178.88	.30	38.65	-1.53	216.57
17	21	65.01	-1.33	121.77	-6.57	70.58	-2.21	120.18	-.55	178.91	.30	38.65	-1.53	216.57
17	22	65.56	-1.33	121.81	-6.58	71.10	-2.21	120.23	-.55	178.94	.30	38.66	-1.53	216.57
17	23	66.11	-1.32	121.86	-6.59	71.61	-2.21	120.28	-.55	178.97	.30	38.66	-1.53	216.57
18	0	66.66	-1.32	121.90	-6.59	72.13	-2.21	120.34	-.55	179.00	.30	38.67	-1.53	216.57
18	1	67.21	-1.32	121.94	-6.60	72.65	-2.21	120.39	-.54	179.03	.30	38.67	-1.53	216.57
18	2	67.76	-1.32	121.99	-6.61	73.16	-2.21	120.44	-.54	179.06	.30	38.68	-1.53	216.57
18	3	68.31	-1.32	122.03	-6.62	73.67	-2.21	120.49	-.54	179.09	.30	38.68	-1.53	216.58
18	4	68.86	-1.32	122.07	-6.62	74.19	-2.21	120.55	-.54	179.12	.30	38.68	-1.53	216.58
18	5	69.41	-1.32	122.11	-6.63	74.70	-2.21	120.60	-.54	179.15	.30	38.69	-1.53	216.58
18	6	69.95	-1.32	122.16	-6.63	75.22	-2.21	120.65	-.54	179.18	.30	38.69	-1.53	216.58
18	7	70.50	-1.32	122.20	-6.64	75.73	-2.22	120.70	-.54	179.21	.30	38.70	-1.53	216.58
18	8	71.05	-1.32	122.24	-6.64	76.24	-2.22	120.76	-.53	179.25	.30	38.70	-1.53	216.58
18	9	71.60	-1.32	122.29	-6.65	76.75	-2.22	120.81	-.53	179.28	.30	38.71	-1.53	216.58
18	10	72.15	-1.32	122.33	-6.65	77.27	-2.22	120.86	-.53	179.31	.30	38.71	-1.53	216.58
18	11	72.70	-1.32	122.37	-6.65	77.78	-2.22	120.91	-.53	179.34	.30	38.71	-1.53	216.58
18	12	73.25	-1.32	122.42	-6.65	78.29	-2.22	120.97	-.53	179.37	.30	38.72	-1.53	216.58
18	13	73.80	-1.32	122.46	-6.66	78.80	-2.22	121.02	-.53	179.40	.30	38.72	-1.53	216.59
18	14	74.35	-1.32	122.50	-6.66	79.31	-2.22	121.07	-.53	179.43	.30	38.73	-1.53	216.59
18	15	74.90	-1.32	122.54	-6.66	79.82	-2.22	121.12	-.52	179.46	.30	38.73	-1.53	216.59
18	16	75.44	-1.31	122.59	-6.66	80.33	-2.22	121.18	-.52	179.49	.30	38.73	-1.53	216.59
18	17	75.99	-1.31	122.63	-6.66	80.84	-2.22	121.23	-.52	179.52	.30	38.74	-1.53	216.59
18	18	76.54	-1.31	122.67	-6.66	81.35	-2.22	121.28	-.52	179.55	.30	38.74	-1.53	216.59
18	19	77.09	-1.31	122.72	-6.65	81.86	-2.22	121.33	-.52	179.58	.30	38.75	-1.53	216.59
18	20	77.64	-1.31	122.76	-6.65	82.37	-2.22	121.39	-.52	179.61	.30	38.75	-1.53	216.59
18	21	78.19	-1.31	122.80	-6.65	82.88	-2.22	121.44	-.51	179.64	.30	38.76	-1.53	216.59
18	22	78.74	-1.31	122.85	-6.65	83.39	-2.22	121.49	-.51	179.68	.30	38.76	-1.53	216.60
18	23	79.29	-1.31	122.89	-6.64	83.89	-2.22	121.55	-.51	179.71	.30	38.76	-1.53	216.60

TABLE II (CONT.)

ALMANAC (REFERENCE DATE - JULY 20, 1969 - 0 HOURS GMT)

* * * * JAN 1970 * * * *

GMT		EQUINOX	SUN		EARTH		VENUS		MARS		JUPITER		SATURN	
DATE	HOUR	PHAE	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA	DEC	RA
19	0	79.84	-1.31	122.93	-6.64	84.40	-2.22	121.60	-.51	179.74	.30	38.77	-1.53	216.60
19	1	80.39	-1.31	122.98	-6.63	84.91	-2.23	121.65	-.51	179.77	.30	38.77	-1.53	216.60
19	2	80.93	-1.31	123.02	-6.63	85.42	-2.23	121.70	-.51	179.80	.30	38.78	-1.53	216.60
19	3	81.48	-1.31	123.06	-6.62	85.92	-2.23	121.76	-.51	179.83	.30	38.78	-1.53	216.60
19	4	82.03	-1.31	123.10	-6.62	86.43	-2.23	121.81	-.50	179.86	.30	38.78	-1.53	216.60
19	5	82.58	-1.31	123.15	-6.61	86.94	-2.23	121.86	-.50	179.89	.30	38.79	-1.53	216.60
19	6	83.13	-1.31	123.19	-6.60	87.44	-2.23	121.91	-.50	179.92	.30	38.79	-1.53	216.60
19	7	83.68	-1.30	123.23	-6.59	87.95	-2.23	121.97	-.50	179.95	.30	38.80	-1.53	216.61
19	8	84.23	-1.30	123.28	-6.59	88.45	-2.23	122.02	-.50	179.98	.30	38.80	-1.53	216.61
19	9	84.78	-1.30	123.32	-6.58	88.96	-2.23	122.07	-.50	180.01	.30	38.80	-1.53	216.61
19	10	85.33	-1.30	123.36	-6.57	89.46	-2.23	122.12	-.49	180.04	.30	38.81	-1.53	216.61
19	11	85.88	-1.30	123.41	-6.56	89.97	-2.23	122.18	-.49	180.08	.30	38.81	-1.53	216.61
19	12	86.42	-1.30	123.45	-6.55	90.47	-2.23	122.23	-.49	180.11	.30	38.82	-1.52	216.61
19	13	86.97	-1.30	123.49	-6.54	90.98	-2.23	122.28	-.49	180.14	.30	38.82	-1.52	216.61
19	14	87.52	-1.30	123.54	-6.53	91.48	-2.23	122.34	-.49	180.17	.30	38.83	-1.52	216.61
19	15	88.07	-1.30	123.58	-6.51	91.98	-2.23	122.39	-.49	180.20	.30	38.83	-1.52	216.61
19	16	88.62	-1.30	123.62	-6.50	92.49	-2.23	122.44	-.48	180.23	.30	38.83	-1.52	216.62
19	17	89.17	-1.30	123.67	-6.49	92.99	-2.23	122.49	-.48	180.26	.30	38.84	-1.52	216.62
19	18	89.72	-1.30	123.71	-6.48	93.49	-2.23	122.55	-.48	180.29	.30	38.84	-1.52	216.62
19	19	90.27	-1.30	123.75	-6.46	94.00	-2.23	122.60	-.48	180.32	.30	38.85	-1.52	216.62
19	20	90.82	-1.30	123.80	-6.45	94.50	-2.23	122.65	-.48	180.35	.30	38.85	-1.52	216.62
19	21	91.37	-1.30	123.84	-6.43	95.00	-2.24	122.70	-.48	180.38	.30	38.85	-1.52	216.62
19	22	91.91	-1.29	123.88	-6.42	95.50	-2.24	122.76	-.48	180.41	.30	38.86	-1.52	216.62
19	23	92.46	-1.29	123.92	-6.40	96.00	-2.24	122.81	-.47	180.45	.30	38.86	-1.52	216.62
20	0	93.01	-1.29	123.97	-6.38	96.50	-2.24	122.86	-.47	180.48	.30	38.87	-1.52	216.62
20	1	93.56	-1.29	124.01	-6.37	97.00	-2.24	122.91	-.47	180.51	.30	38.87	-1.52	216.63
20	2	94.11	-1.29	124.05	-6.35	97.51	-2.24	122.97	-.47	180.54	.30	38.87	-1.52	216.63
20	3	94.66	-1.29	124.10	-6.33	98.01	-2.24	123.02	-.47	180.57	.30	38.88	-1.52	216.63
20	4	95.21	-1.29	124.14	-6.31	98.51	-2.24	123.07	-.47	180.60	.30	38.88	-1.52	216.63
20	5	95.76	-1.29	124.18	-6.30	99.01	-2.24	123.13	-.46	180.63	.30	38.89	-1.52	216.63
20	6	96.31	-1.29	124.23	-6.28	99.51	-2.24	123.18	-.46	180.66	.30	38.89	-1.52	216.63
20	7	96.86	-1.29	124.27	-6.26	100.00	-2.24	123.23	-.46	180.69	.30	38.89	-1.52	216.63
20	8	97.40	-1.29	124.31	-6.24	100.50	-2.24	123.28	-.46	180.72	.30	38.90	-1.52	216.63
20	9	97.95	-1.29	124.36	-6.22	101.00	-2.24	123.34	-.46	180.75	.30	38.90	-1.52	216.64
20	10	98.50	-1.29	124.40	-6.20	101.50	-2.24	123.39	-.46	180.79	.30	38.90	-1.52	216.64
20	11	99.05	-1.29	124.44	-6.17	102.00	-2.24	123.44	-.46	180.82	.30	38.91	-1.52	216.64
20	12	99.60	-1.29	124.49	-6.15	102.50	-2.24	123.49	-.45	180.85	.30	38.91	-1.52	216.64
20	13	100.15	-1.28	124.53	-6.13	103.00	-2.24	123.55	-.45	180.88	.30	38.92	-1.52	216.64
20	14	100.70	-1.28	124.57	-6.11	103.49	-2.24	123.60	-.45	180.91	.30	38.92	-1.52	216.64
20	15	101.25	-1.28	124.62	-6.08	103.99	-2.24	123.65	-.45	180.94	.30	38.92	-1.52	216.64
20	16	101.80	-1.28	124.66	-6.06	104.49	-2.24	123.71	-.45	180.97	.30	38.93	-1.52	216.64
20	17	102.35	-1.28	124.70	-6.04	104.99	-2.24	123.76	-.45	181.00	.30	38.93	-1.52	216.65
20	18	102.90	-1.28	124.75	-6.01	105.48	-2.24	123.81	-.44	181.03	.30	38.94	-1.52	216.65
20	19	103.44	-1.28	124.79	-5.99	105.98	-2.24	123.86	-.44	181.06	.30	38.94	-1.52	216.65
20	20	103.99	-1.28	124.83	-5.96	106.48	-2.24	123.92	-.44	181.10	.30	38.94	-1.52	216.65
20	21	104.54	-1.28	124.88	-5.93	106.97	-2.25	123.97	-.44	181.13	.30	38.95	-1.52	216.65
20	22	105.09	-1.28	124.92	-5.91	107.47	-2.25	124.02	-.44	181.16	.30	38.95	-1.52	216.65
20	23	105.64	-1.28	124.96	-5.88	107.96	-2.25	124.07	-.44	181.19	.30	38.96	-1.52	216.65

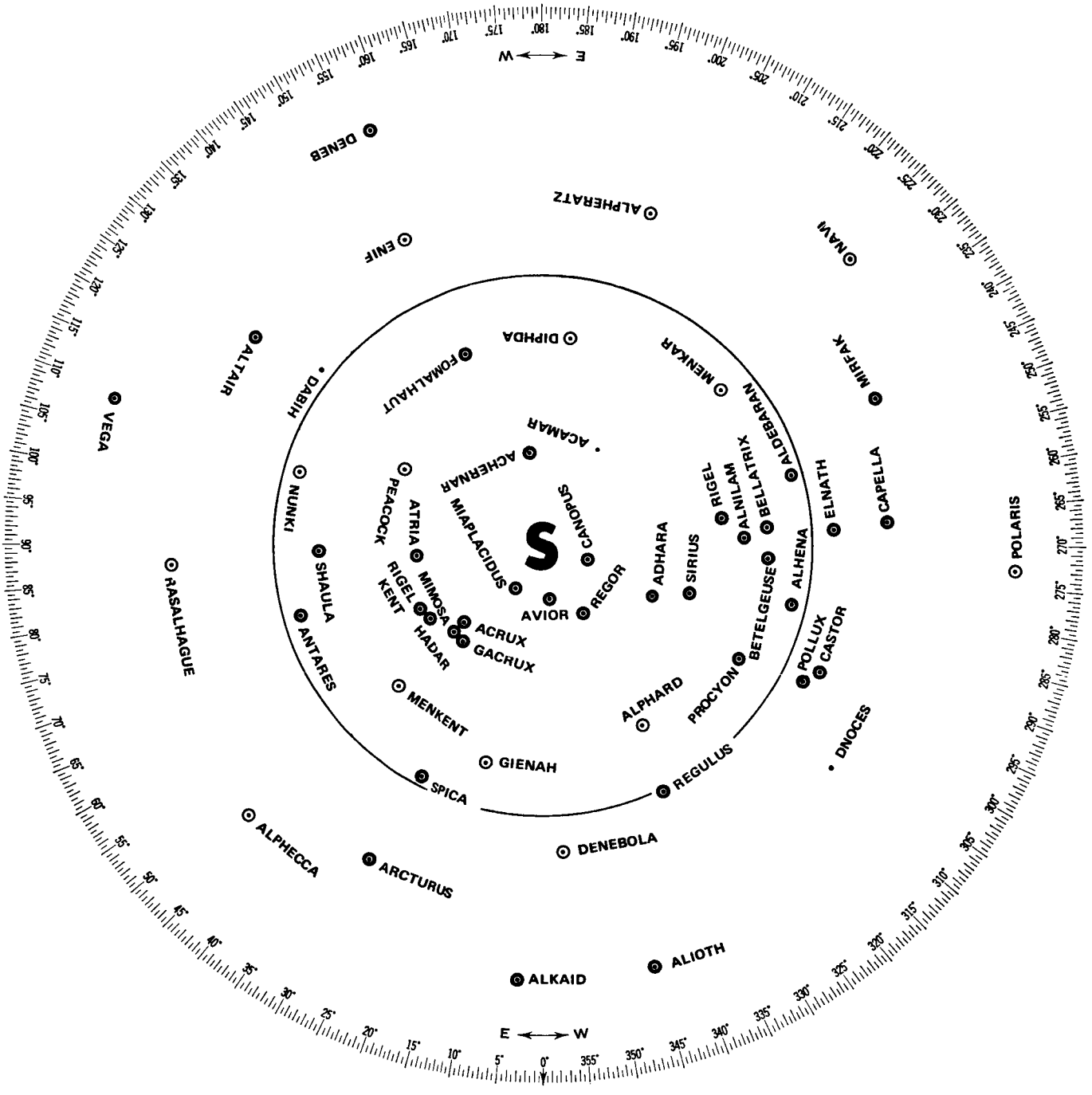


FIGURE 1B
CIRCULAR STAR BASE
SOUTH LATITUDE

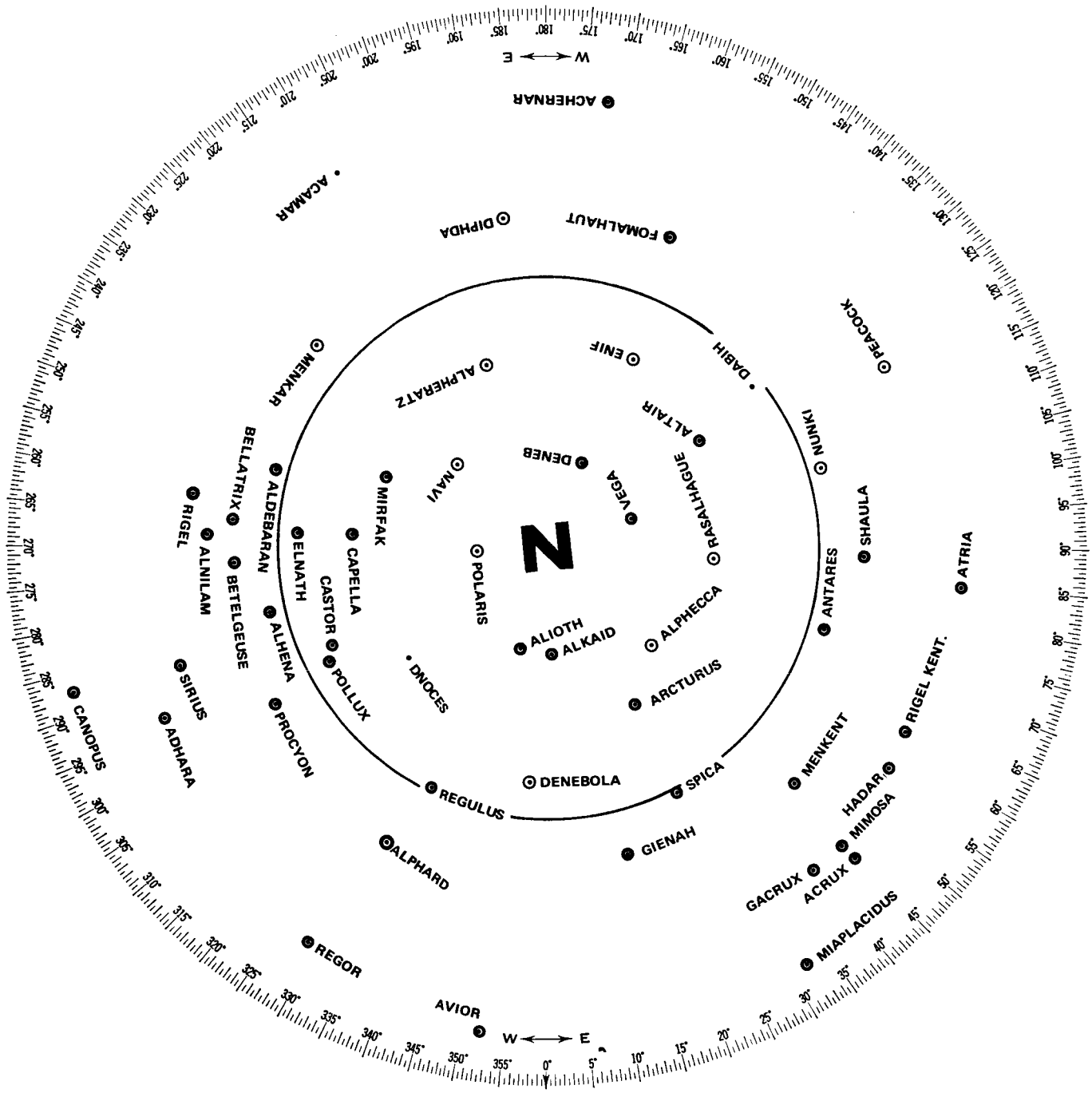


FIGURE 1A
CIRCULAR STAR BASE
NORTH LATITUDE

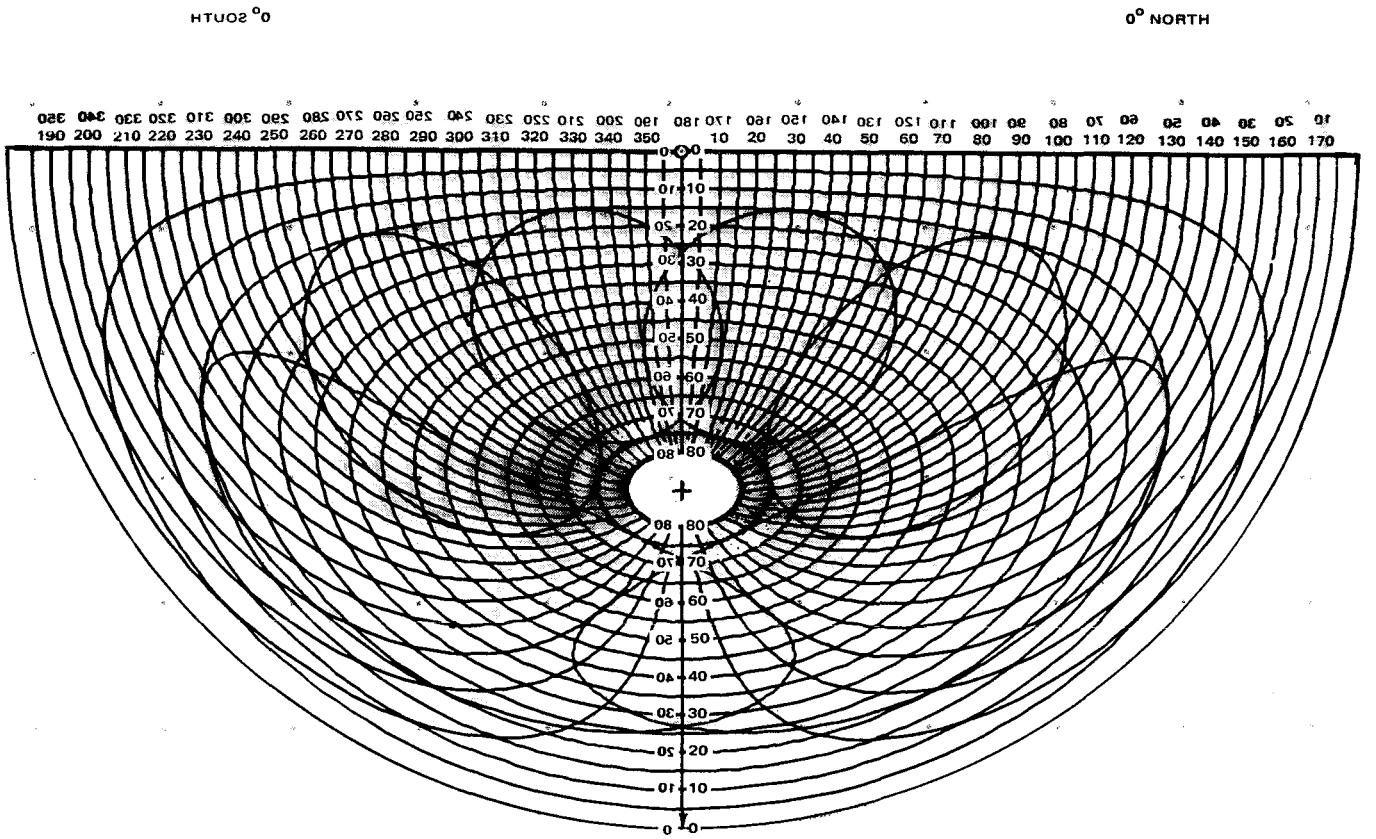


FIGURE 2A
AZIMUTH-ELEVATION TEMPLATE (CIRCULAR)
0 DEGREES LATITUDE

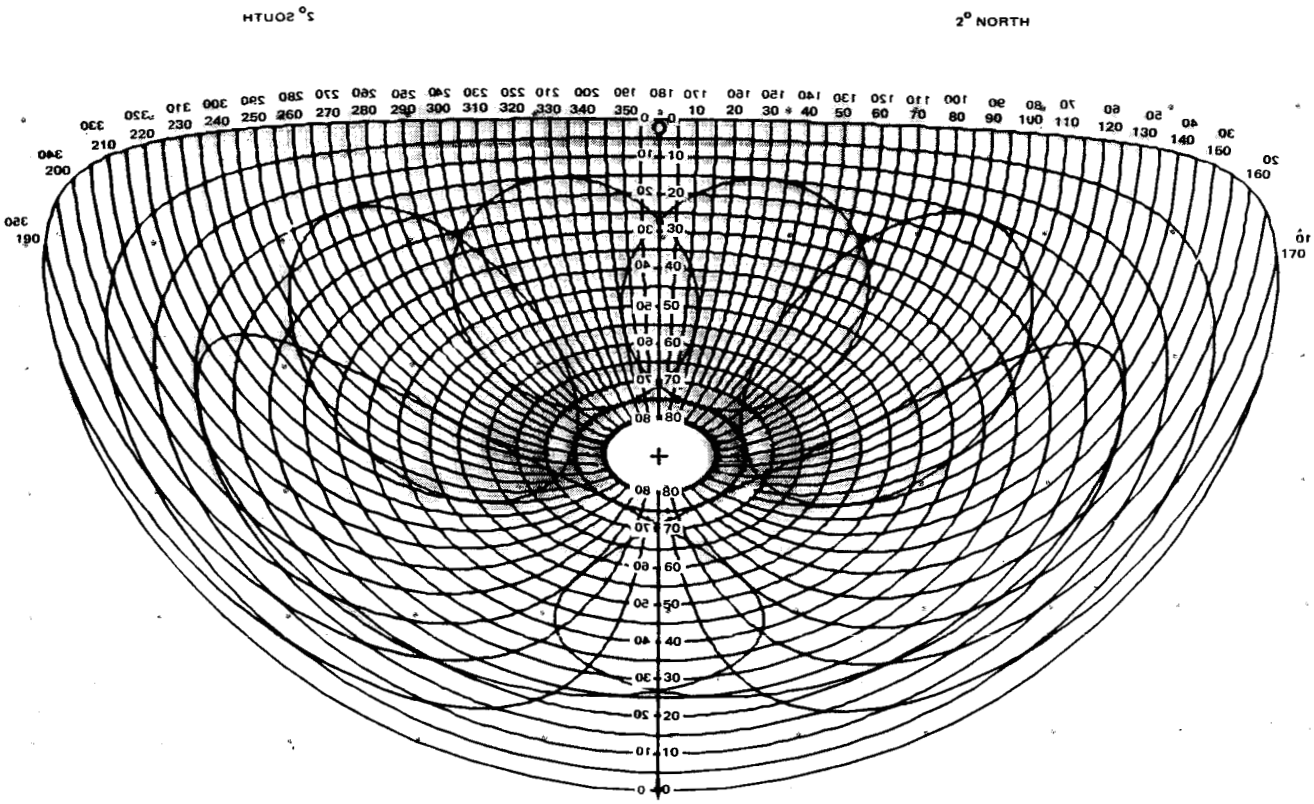


FIGURE 2B
AZIMUTH-ELEVATION TEMPLATE (CIRCULAR)
2 DEGREES LATITUDE

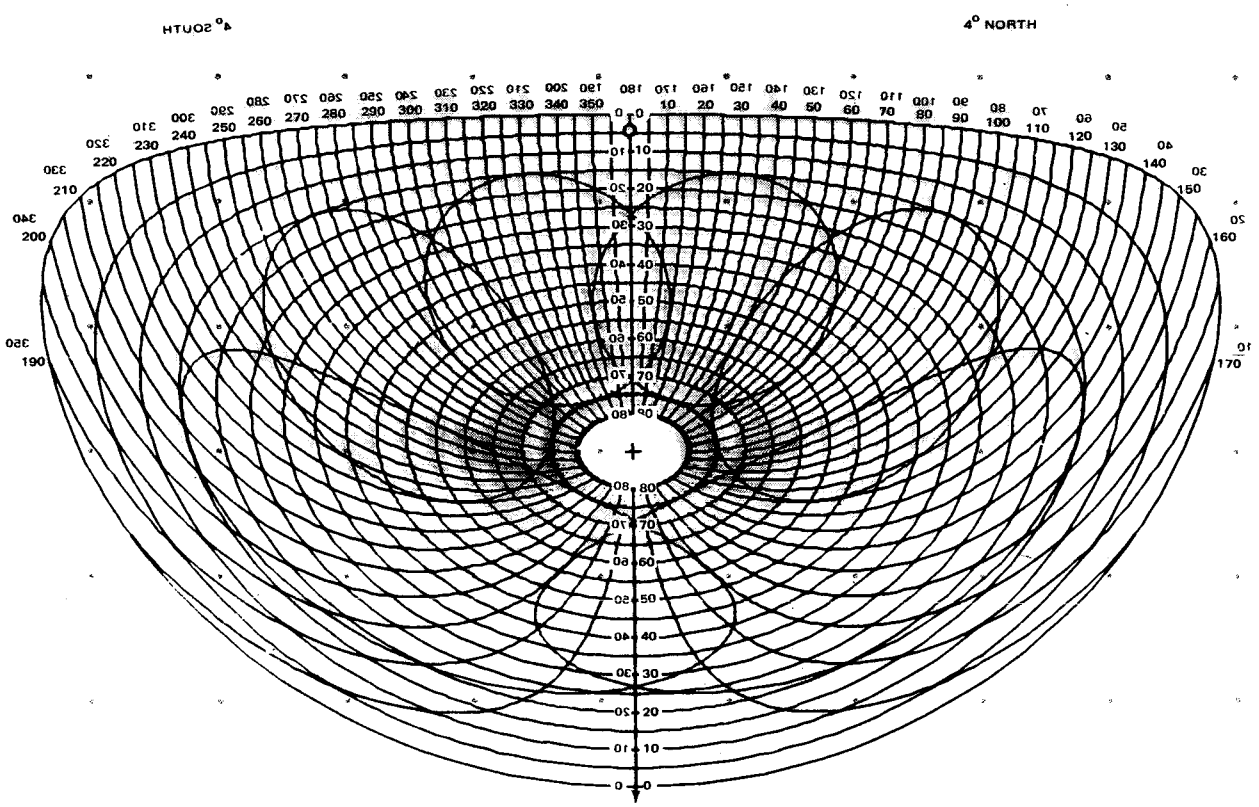


FIGURE 2 C
AZIMUTH-ELEVATION TEMPLATE (CIRCULAR)
4 DEGREES LATITUDE

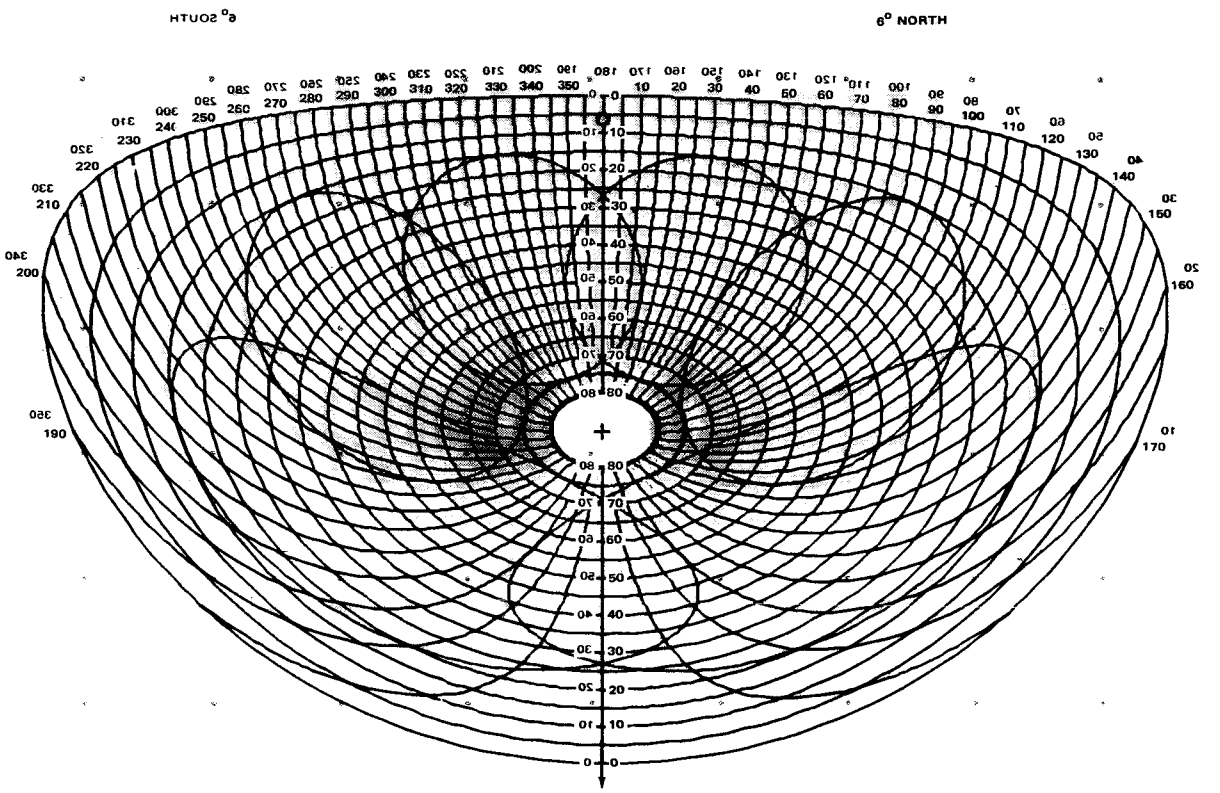
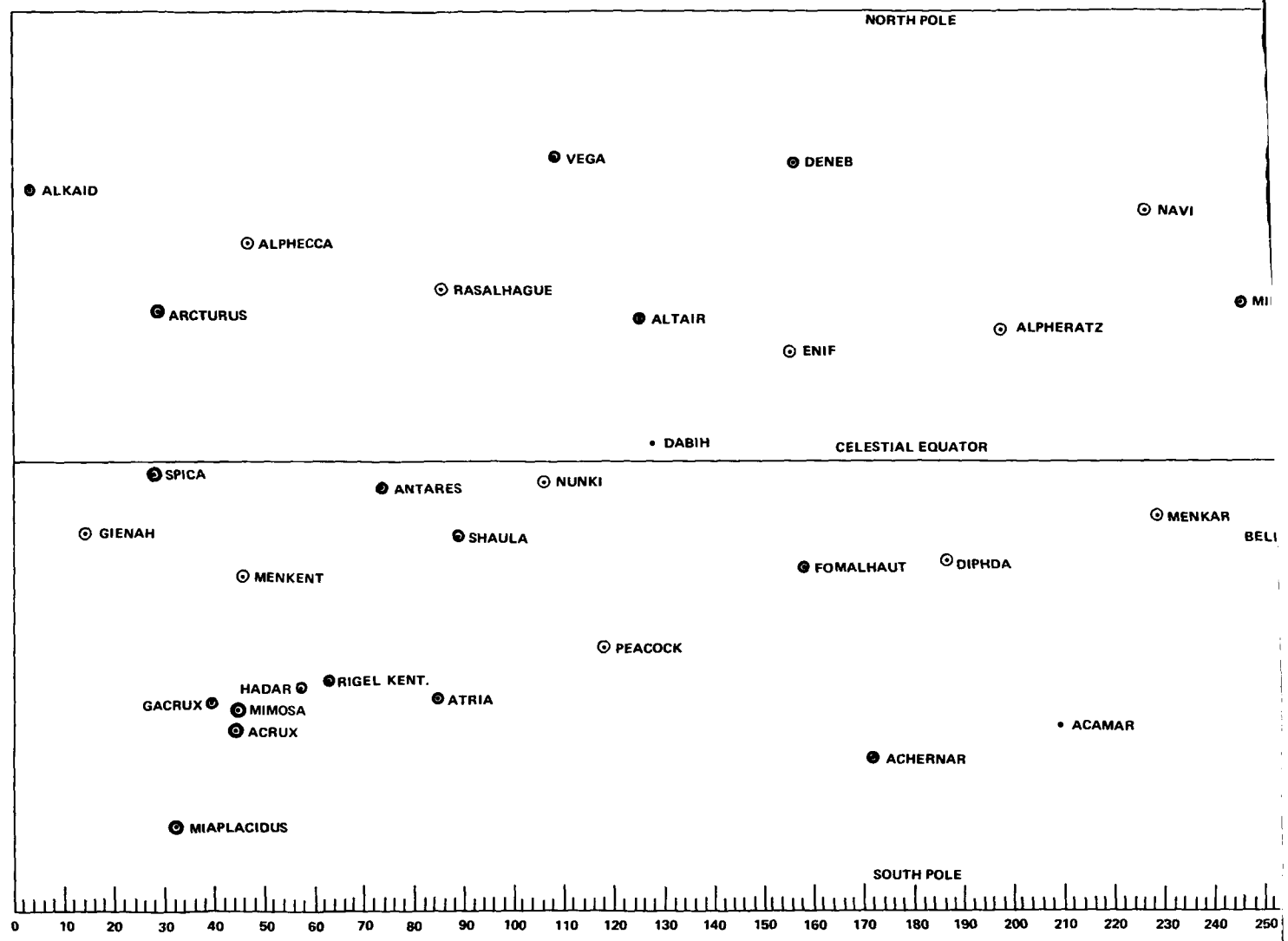


FIGURE 2D

AZIMUTH -ELEVATION TEMPLATE (CIRCULAR)

.6 DEGREES LATITUDE


NORTH POLE
VEGA
DENEB
ALKAID
NAVI
ALPHECCA
RASALHAGUE
ARCTURUS
ALTAIR
ALPHERATZ
ENIF
DABIH
CELESTIAL EQUATOR
SPICA
ANTARES
NUNKI
MENKAR
GIENAH
SHAULA
FOMALHAUT
DIPHDA
MENKENT
PEACOCK
HADAR
RIGEL KENT.
GACRUX
MIMOSA
ATRIA
ACRUX
ACAMAR
ACHERNAR
MIAPLACIDUS
SOUTH POLE
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250

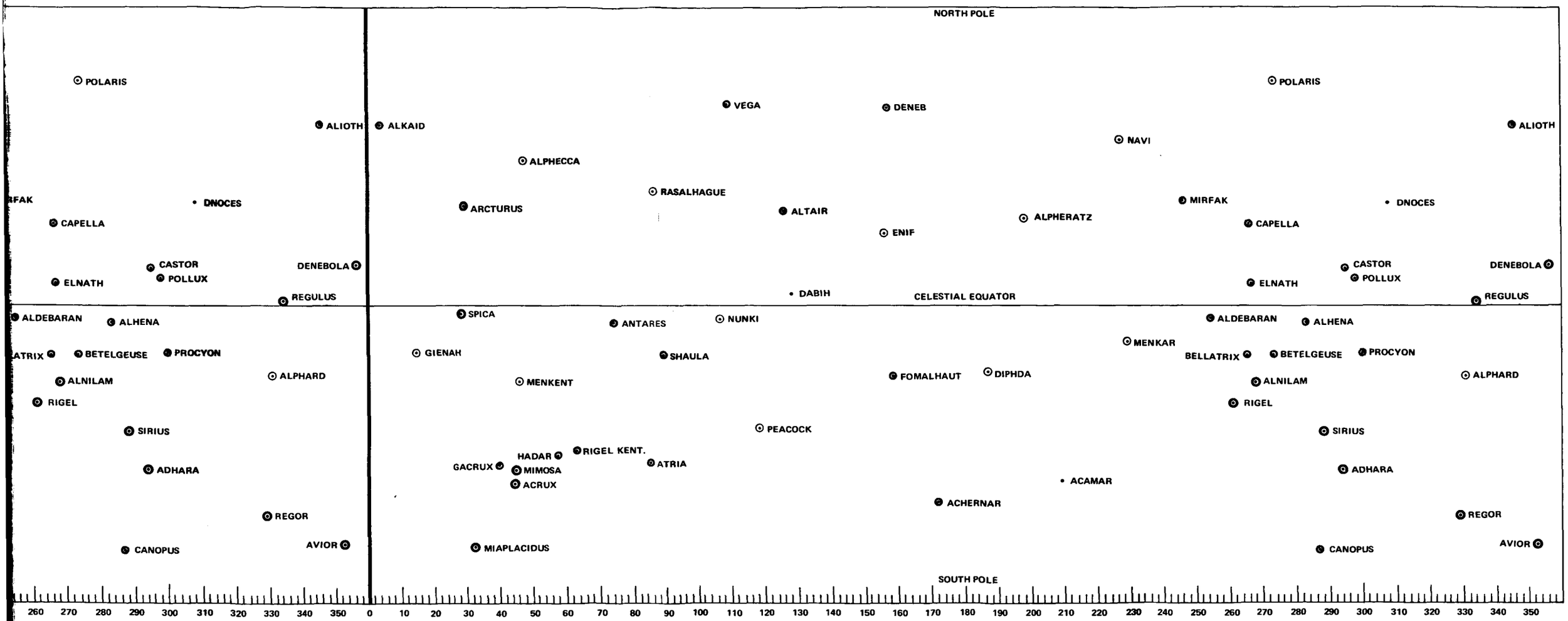


FIGURE 3
RECTANGULAR STAR BASE

2

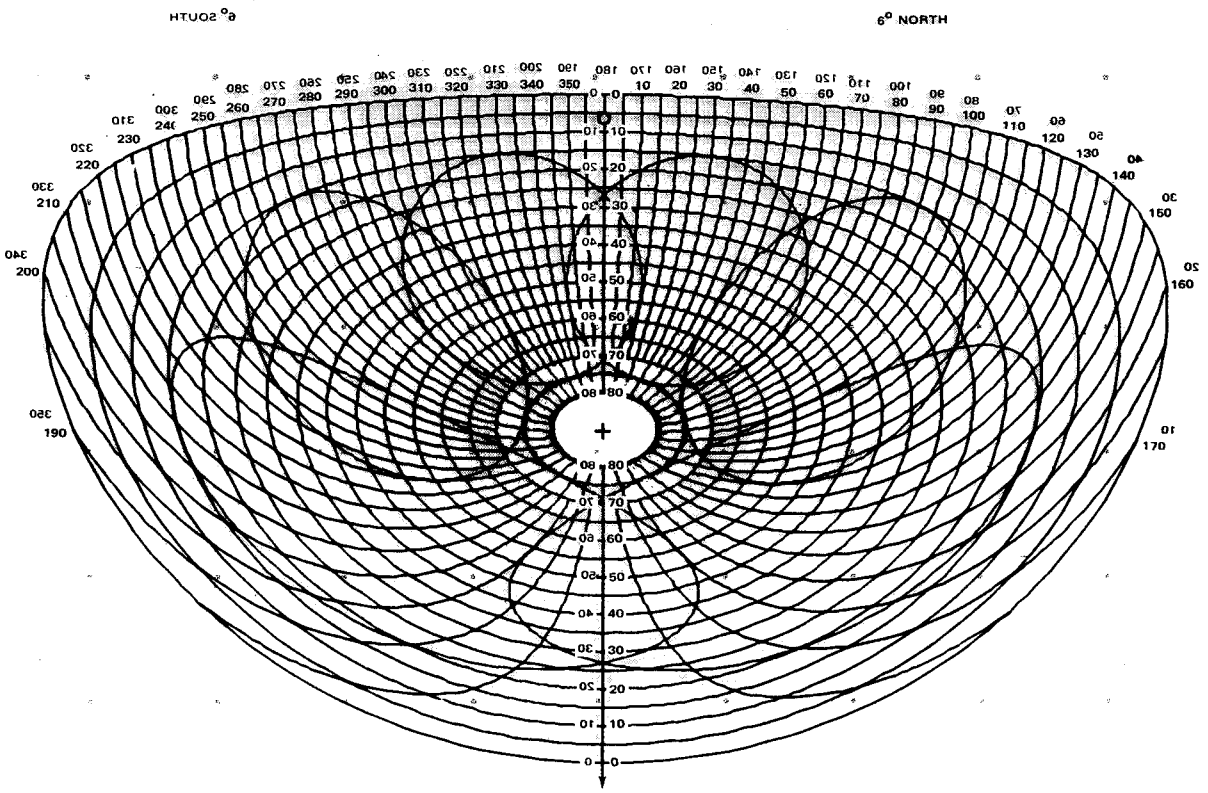
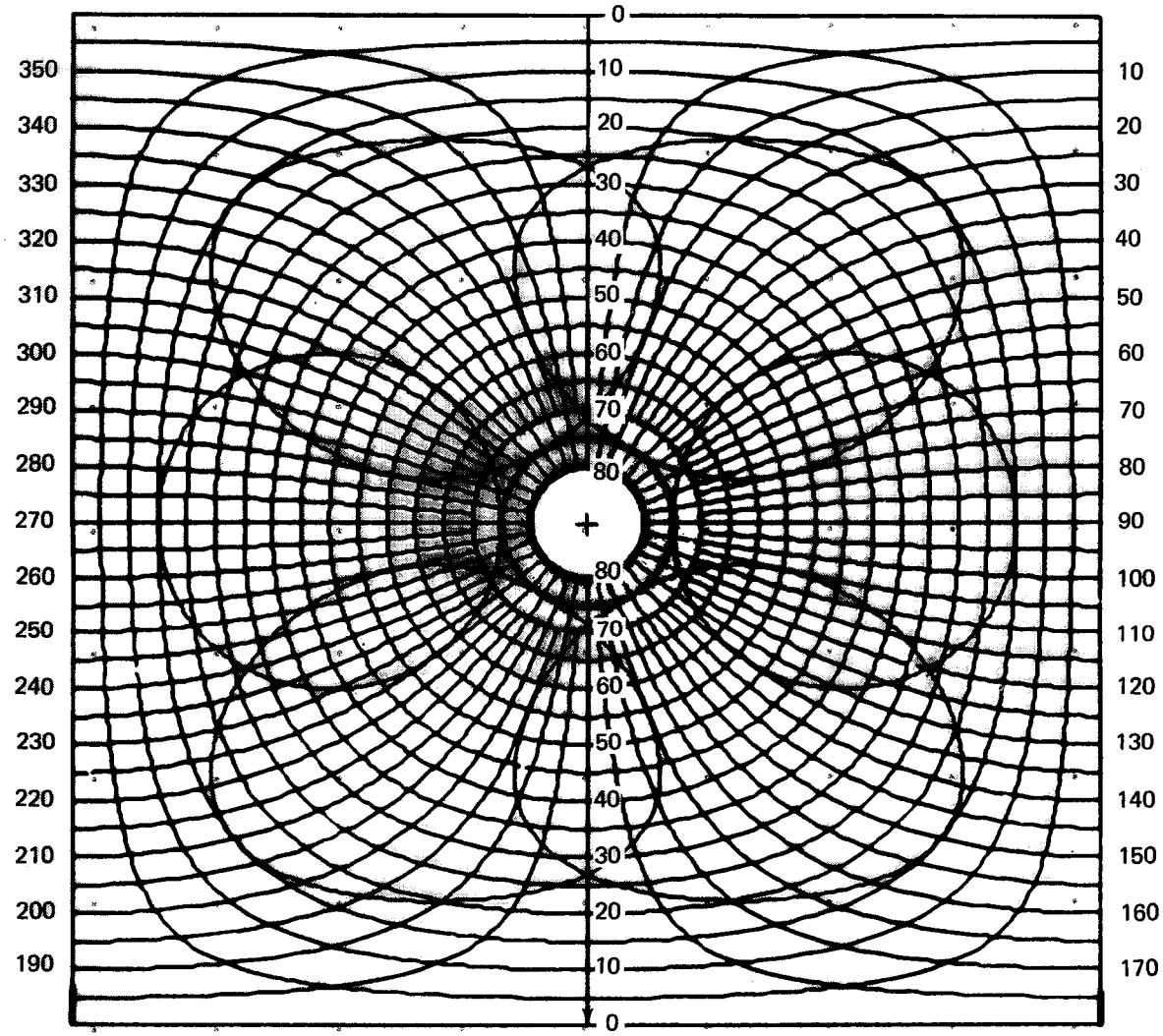


FIGURE 2D
AZIMUTH -ELEVATION TEMPLATE (CIRCULAR)
6 DEGREES LATITUDE



0° LATITUDE

FIGURE 4A
AZIMUTH-ELEVATION TEMPLATE (RECTANGULAR)
0 DEGREES LATITUDE

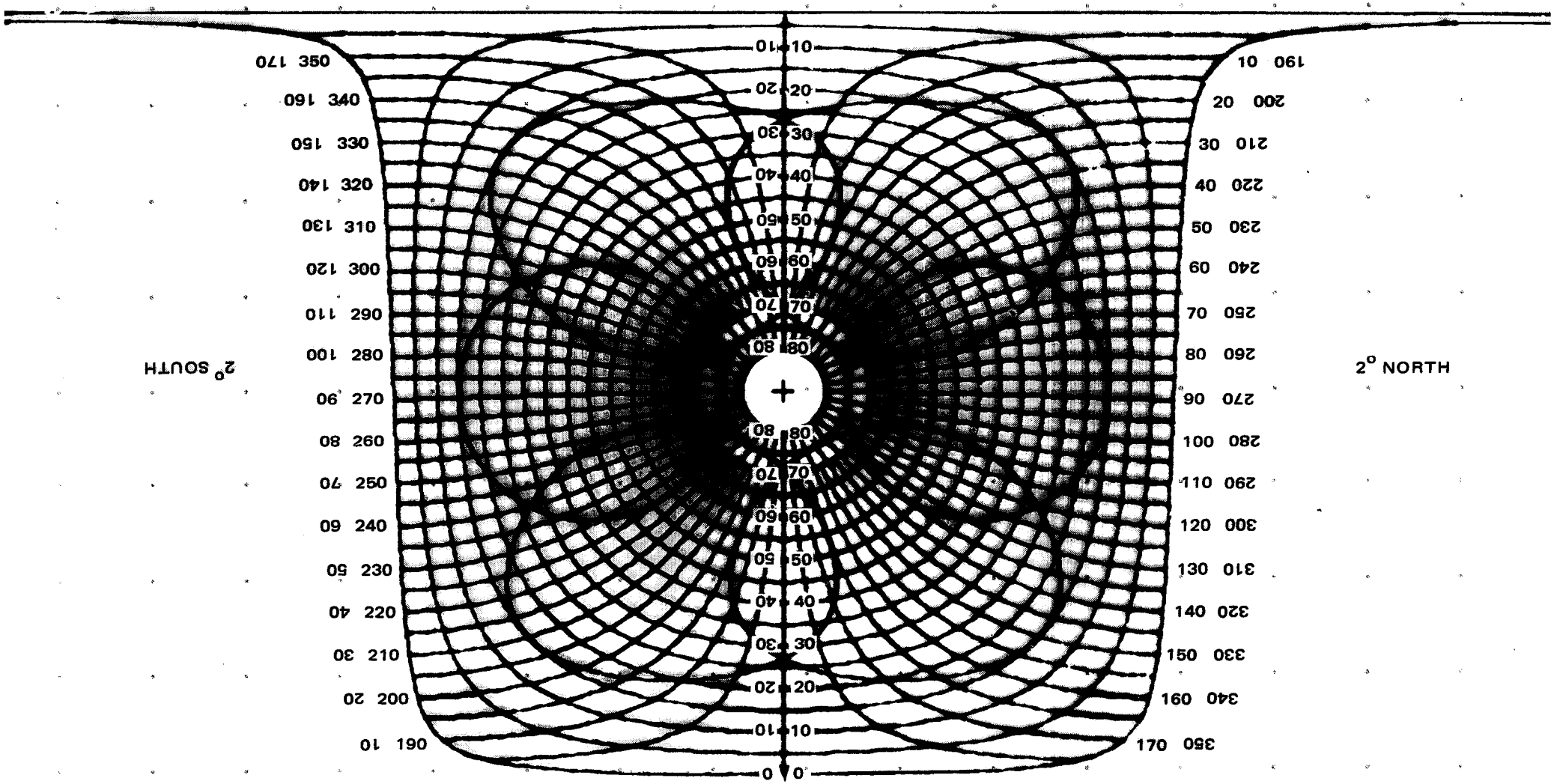


FIGURE 4B
AZIMUTH-ELEVATION TEMPLATE (RECTANGULAR)
2 DEGREES LATITUDE

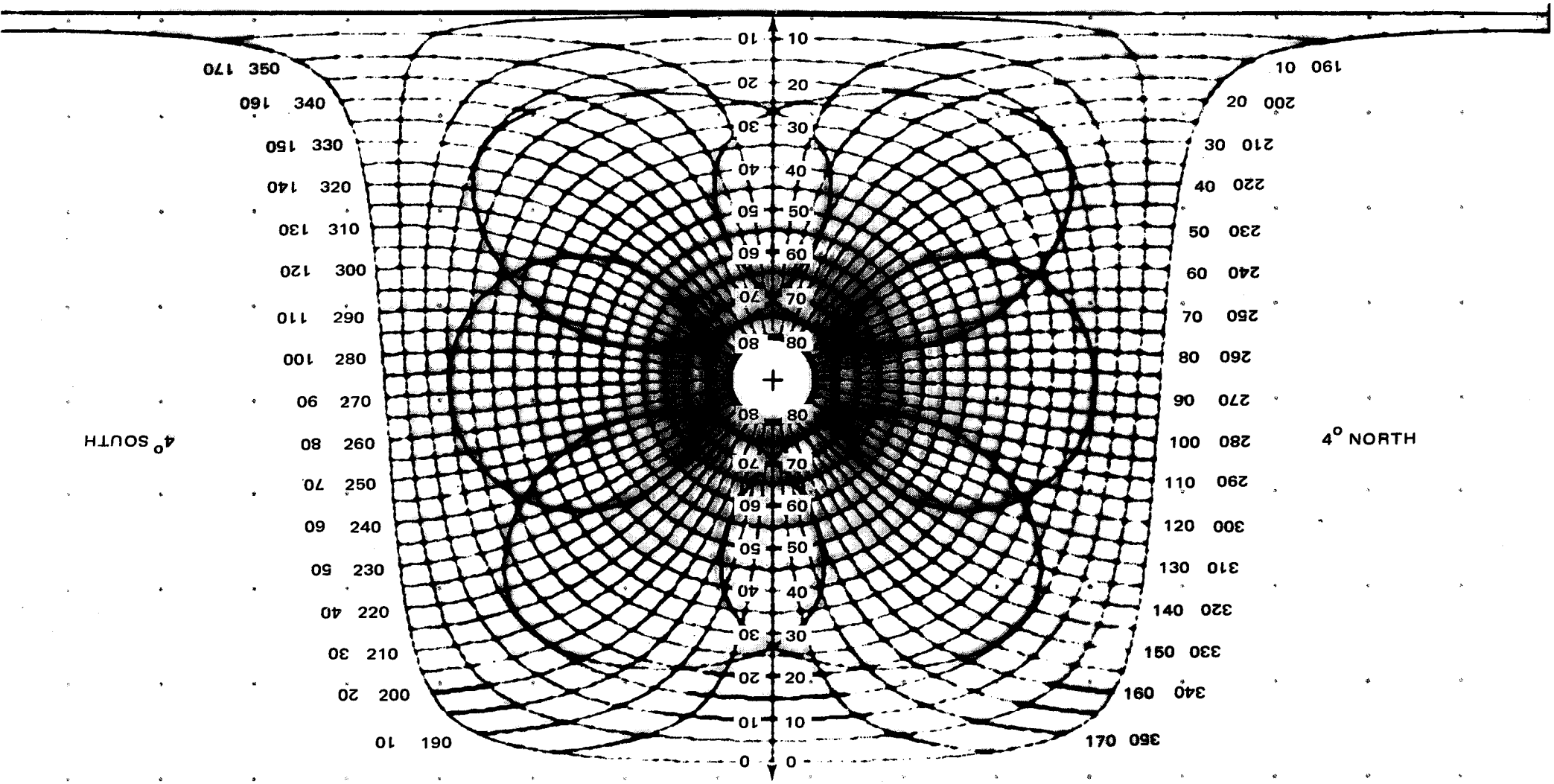


FIGURE 4C

AZIMUTH -ELEVATION TEMPLATE (RECTANGULAR)

4 DEGREES LATITUDE

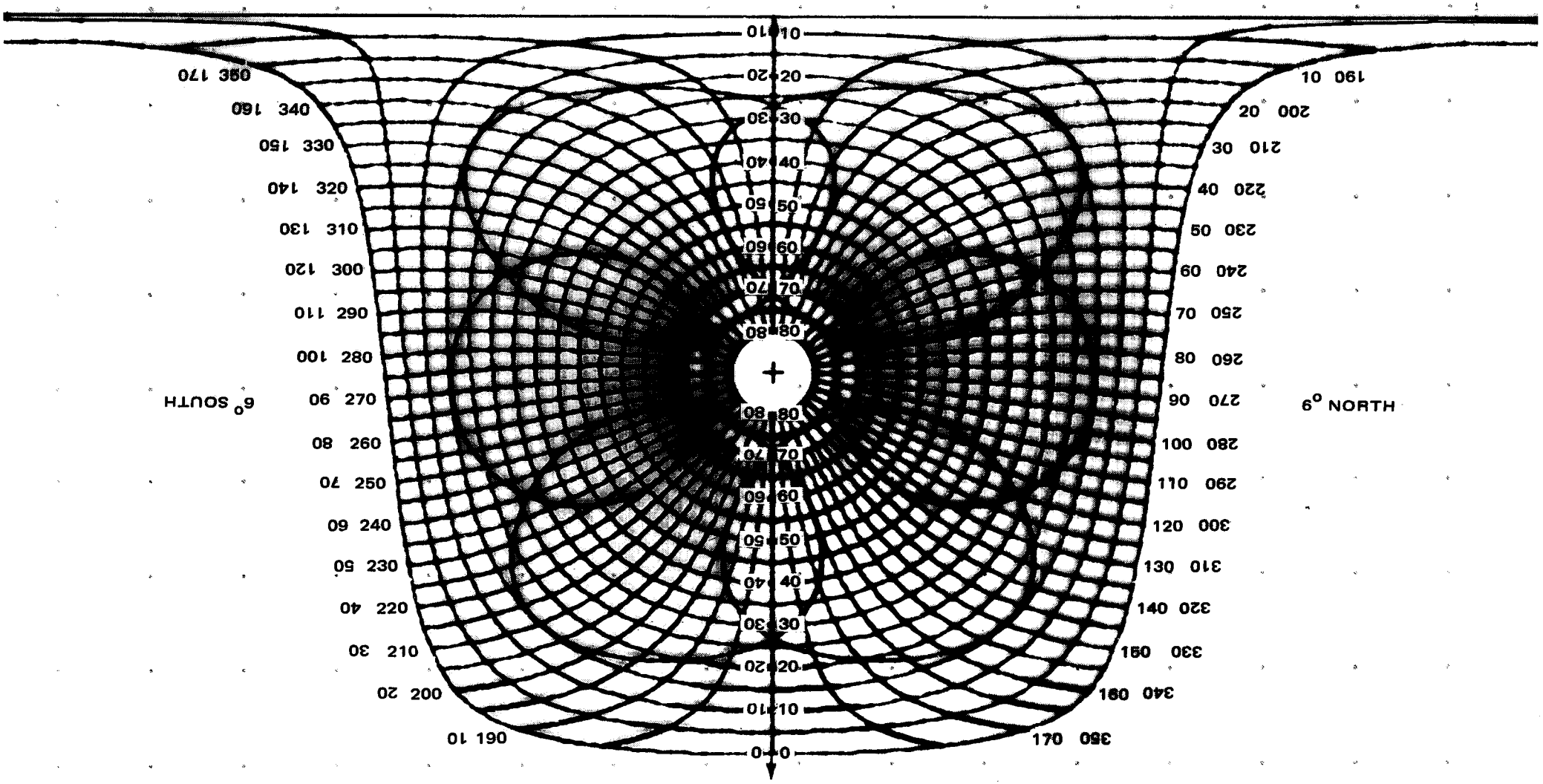


FIGURE 4D
AZIMUTH-ELEVATION TEMPLATE (RECTANGULAR)
6 DEGREES LATITUDE

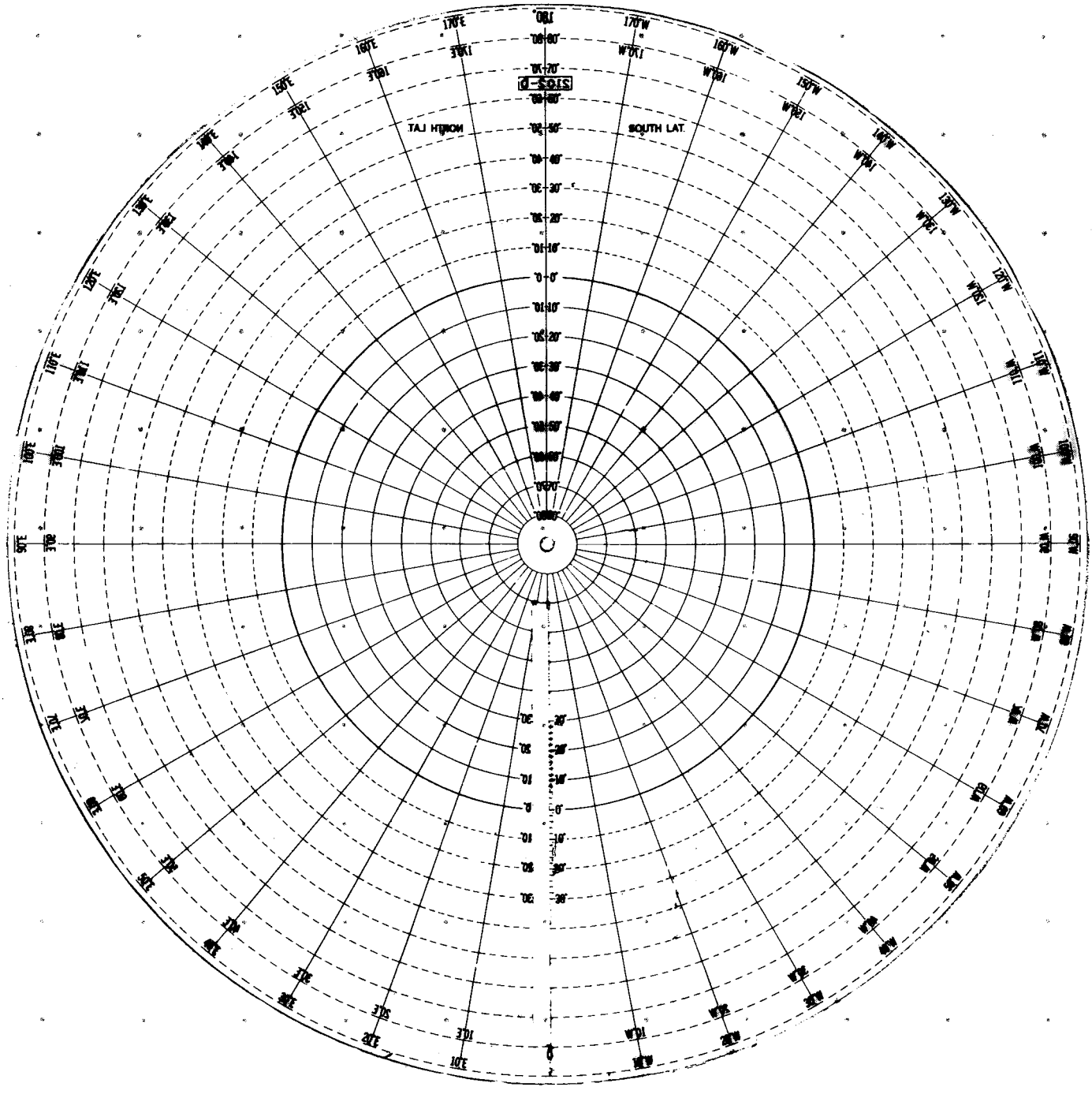


FIGURE 5A - CIRCULAR PLOTTING TEMPLATE

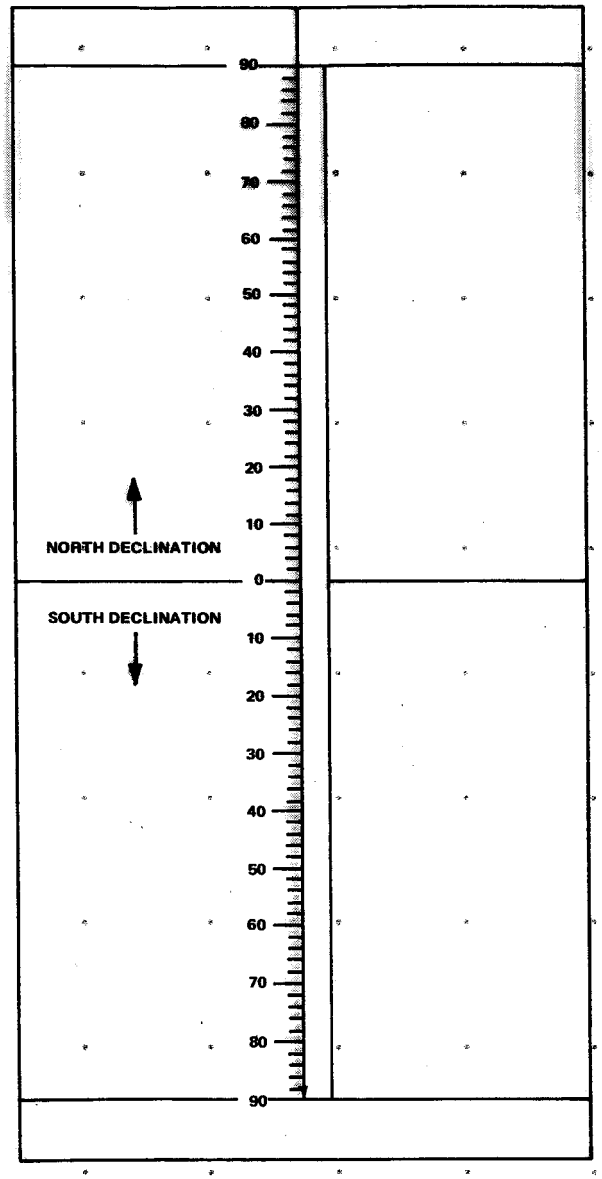


FIGURE 5B - RECTANGULAR PLOTTING TEMPLATE

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