

A COMPUTER PROGRAM

TO DETERMINE THE

POSSIBLE DAILY

RELEASE WINDOW FOR

SKY TARGET

EXPERIMENTS

MICHAUD

**CASE FILE  
COPY**



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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SKY TARGET  
EXPERIMENTS

*Prepared by*

NORMAN H. MICHAUD

*Wallops Station*



*Scientific and Technical Information Office*

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## *Foreword*

The National Aeronautics and Space Administration (NASA) and the Max Planck Institute for Extraterrestrial Physics (MPE), Munich, Germany, conducted a cooperative experiment involving the release and study of a barium cloud at a 31 500-km altitude near the equatorial plane. The release was made near local magnetic midnight on September 21, 1971.

This publication is based upon the computer program that was designed to meet the viewing requirements of the barium cloud experiment. The computer program can be adapted to similar sky target experiments if the launch requirements are suitably defined. Furthermore, experiment definitions requiring modifications to the existing program can be easily made because of the modular structure of the computer program.

The program was successfully designed with the assistance of C. Marshall Curtis, Edgar R. Everton, David W. Hancock III, Thomas J. Harmon, and Dennis F. Melvin, all of the Applied Mathematics Section, NASA Wallops Station.

N. H. M.

*October 1972*

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\* Located inside of back cover on microfiche

## *Introduction*

This computer program is designed to determine the daily release window for sky target experiments. Factors considered in the program are—

- (1) Target illumination by the Sun at release time and during the tracking period
- (2) Look angle elevation above local horizon from each tracking station to the target
- (3) Solar depression angle from the local horizon of each tracking station during the experimental period after target release
- (4) Lunar depression angle from the local horizon of each tracking station during the experimental period after target release
- (5) Total sky background brightness (i.e., light due to airglow, zodiacal light, and integrated starlight) as seen from each tracking station while viewing the target

The computer program defines a favorable time period for release of a sky target within a particular calendar time frame. The given output is not the favorable time period for vehicle launch. Launch time and payload release time must be considered separately.

Program output is produced in both graphic and data form. Output data can be plotted for a single calendar month or year. The numerical values used to generate the plots are furnished to permit a more detailed review of the computed daily release windows. A printout of the daily release window data computed for each constraint and applied to each tracking station is also furnished. Appendixes B and C show the logic and the program statements used in the program. (App. C may be found on microfiche on the inside back cover.) This output enables one to determine which program constraint and which tracking station closes the release window.

## Input/Output Definition

### PROGRAM INPUT

Card input required for the program is divided into two categories: computer system control cards and data cards. The system control cards, which assign the input/output (i/o) files to magnetic tape or disk, are used with the program options for program execution. Table 1 is a list of the necessary control cards. (See ref. 1 for additional information on the system control cards.) Those required for a given computer job are in the section of this document on program options.

Data cards contain the input data required for defining the program parameters. Each input parameter must be recorded in a specific manner on a data card. Nominal values for the input parameters are assigned to reduce the number of data cards required for program execution. Table 2 shows the breakdown of each input variable for a particular sky target experiment, as well as its nominal value and data-card location.

TABLE 1.—Computer System Control Cards

Column	Columns	Columns	Columns	Remarks
1	2 to 7	8 to 11	16-	
\$	blank	TAPE	01,X1D,,,,SAVE1-556BPI	Required when plot tape is to be generated
\$	blank	DISC	07,X2R,5R	Required when data generated on file 07 are not to be saved
\$	blank	TAPE	07,X2D,,,,SAVE7	Required when file 07 data are to be saved for further use
\$	blank	TAPE	07,X2D,,NNNN <sup>a</sup>	Required when previously generated file 07 data are program input
\$	blank	DISC	09,X3R,2R	Required when data generated on file 09 are not to be saved
\$	blank	TAPE	09,X3D,,,,SAVE9	Required when file 09 data are to be saved for further use
\$	blank	TAPE	09,X3D,,NNNN <sup>a</sup>	Required when previously generated file 09 data are program input
\$	blank	TAPE	11,X4D,,,,SAVE11	Required when file 11 data are to be saved for further use
\$	blank	TAPE	11,X4D,,NNNN <sup>a</sup>	Required when previously generated file 11 data are program input
\$	blank	DISC	11,X4R,5L	Required for multiple cases where magnetic tape is not specified.
\$	blank	DISC	12,X5R,5L	Required for computing stacked cases
\$	blank	DISC	13,X6R,5L	Required when performing calculations (ICALC=0)

<sup>a</sup> Insert appropriate 4-digit tape number in place of NNNN



TABLE 2.—Program Input Parameters

Card code	Card columns	Variable name	Nominal value	Input units	Type (format)	Description
BLANK	2 to 80	TITLE CARD	N/A	N/A	Alphanumeric (A1,13A6,A1)	Job title card
A	01	CARD CODE	TBA	N/A	Alphanumeric (A1)	Code value for data input card "A"—start/stop date
	03, 04	KMONTH	TBA	N/A	Integer (I2)	Starting month number
	06, 07	KDAY	TBA	N/A	Integer (I2)	Starting day number
	09 to 12	KYEAR	TBA	N/A	Integer (I4)	Starting year number
	14, 15	LMONTH	TBA	N/A	Integer (I2)	Final month number
	17, 18	LDAY	TBA	N/A	Integer (I2)	Final day number
	20 to 23	LYEAR	TBA	N/A	Integer (I4)	Final year number
B	01	CARD CODE	TBA	N/A	Alphanumeric (A1)	Start/stop date for printed and/or plotted output
	03, 04	KMO	TBA	N/A	Integer (I2)	Starting month number
	06, 07	KDA	TBA	N/A	Integer (I2)	Starting day number
	09 to 12	KYR	TBA	N/A	Integer (I4)	Starting year number
	14, 15	LMO	TBA	N/A	Integer (I2)	Final month number
	17, 18	LDA	TBA	N/A	Integer (I2)	Final day number
	20 to 23	LYR	TBA	N/A	Integer (I4)	Final year number
C	01	CARD CODE	TBA	N/A	Alphanumeric (A1)	Program options card <sup>a</sup>
	04	ICALC	TBA	N/A	Integer (I1)	Option on whether to skip program calculations and manipulate previously generated tapes or to do program calculations
	06	IPRT7	TBA	N/A	Integer (I1)	Option to either print hard copy of file 7 or not
	08	IPRT9	TBA	N/A	Integer (I1)	Option to either print hard copy of file 9 or not
	10	IPRT11	TBA	N/A	Integer (I1)	Option to either create output file 11 data, use an existing file 11 tape, or not use file 11
	12	IPLOT	TBA	N/A	Integer (I1)	Option to create a plot tape for a calendar year or calendar month or no plot tape
	D	01	CARD CODE	TBA	N/A	Alphanumeric (A1)
06 to 15		PHIPDG	TBA	Degrees north	Fixed point (F10 0)	Geodetic latitude of release point
16 to 25		LAMPDG	TBA	Degrees east	Fixed point (F10 0)	Longitude of release point
26 to 35		HEIGHT	TBA	Earth radii	Fixed point (F10 0)	Altitude of release point above Earth surface
E	01	CARD CODE	TBA	N/A	Alphanumeric (A1)	Program brightness and elevation constraints
	06 to 10	RESTR(2)	TBA	Degrees	Fixed point (F5 0)	Minimum look angle elevation from each tracking station to the sky target
	11 to 15	RESTR(3)	TBA	Degrees	Fixed point (F5 0)	Maximum depression angle of the Sun to each tracking station
	16 to 20	RESTR(4)	TBA	Degrees	Fixed point (F5 0)	Maximum depression angle of the Moon to each tracking station
	21 to 25	RESTR(5)	TBA	Rayleighs/angstrom	Fixed point (F5 0)	Maximum total sky background brightness

INPUT/OUTPUT DEFINITION

TABLE 2.—Program Input Parameters—Continued

Card code	Card columns	Variable name	Nominal value	Input units	Type (format)	Description
F	26 to 30	RESTR(6)	TBA	km/sec	Fixed point (F5 0)	Constant longitudinal drift rate of target (Earth relative)
	31 to 35	RESTR(7)	TBA	Hours	Fixed point (F5 0)	Tracking period from time of release (should be given in multiples of 0.5 hr of time)
	01	CARD CODE	TBA	N/A	Alphanumeric (A1)	Stations considered in program
	03, 04	NS	TBA	N/A	Integer (I2)	Number of stations to be used
	06, 07	NOS(1)	TBA	N/A	Integer (I2)	Station number 1 <sup>b</sup>
	09, 10	NOS(2)	TBA	N/A	Integer (I2)	Station number 2 <sup>b</sup>
	12, 13	NOS(3)	TBA	N/A	Integer (I2)	Station number 3 <sup>b</sup>
	15, 16	NOS(4)	TBA	N/A	Integer (I2)	Station number 4 <sup>b</sup>
	18, 19	NOS(5)	TBA	N/A	Integer (I2)	Station number 5 <sup>b</sup>
	21, 22	NOS(6)	TBA	N/A	Integer (I2)	Station number 6 <sup>b</sup>
	24, 25	NOS(7)	TBA	N/A	Integer (I2)	Station number 7 <sup>b</sup>
	27, 28	NOS(8)	TBA	N/A	Integer (I2)	Station number 8 <sup>b</sup>
G	30, 31	NOS(9)	TBA	N/A	Integer (I2)	Station number 9 <sup>b</sup>
	33, 34	NOS(10)	TBA	N/A	Integer (I2)	Station number 10 <sup>b</sup>
	36, 37	NOS(11)	TBA	N/A	Integer (I2)	Station number 11 <sup>b</sup>
	39, 40	NOS(12)	TBA	N/A	Integer (I2)	Station number 12 <sup>b</sup>
	01	CARD CODE	TBA	N/A	Alphanumeric (3A6)	Tracking station positional data card (one set of tracking station parameters per card)
	03, 04	N	TBA	N/A	Integer (I2)	Station number (value of NOS(i) defined on "F" card)
	05, 06	MOVE(N)	TBA	N/A	Integer (I2)	Numeric code to determine if tracking station is Earth fixed (=0 for ground station) or moving with respect to the Earth (=1 for aircraft station)
	08 to 25	NAME (3,N)	TBA	N/A	Alphanumeric	Name of tracking station
	26 to 35	PHI(N)	TBA	Degrees	Fixed point (F10 0)	Geodetic latitude of tracking station
	36 to 45	LAMBDA(N)	TBA	Degrees	Fixed point (F10 0)	Longitude of tracking station.
	46 to 55	ALT(N)	TBA	Feet	Fixed point (F10 0)	Altitude of tracking station above Earth surface
	H	01	CARD CODE	TBA	N/A	Alphanumeric (A1)
03, 04		N	TBA	N/A	Integer	Aircraft station number (identical value with aircraft station number specified in columns 03, 04 of "G" card)
05, 06		JAIR	TBA	N/A	Integer	Index used to identify the aircraft position with the time period after release (JAIR=integral value of 1.0+2.0×current amount of hours after release)
08 to 25		PNAME (3,JAIR)	TBA	N/A	Alphanumeric (3A6)	Name designated for aircraft position for index "JAIR"
26 to 35		PLAT (JAIR)	TBA	Degrees	Fixed point (F10 0)	Geodetic latitude of aircraft position for time after release for index value "JAIR"

TABLE 2. – Program Input Parameters – Concluded

Card code	Card columns	Variable name	Nominal value	Input units	Type (format)	Description
I	36 to 45	PLON (JAIR)	TBA	Degrees	Fixed point (F10 0)	Longitude of aircraft position for time after release for index value "JAIR "
	46 to 55	PALT (JAIR)	TBA	Feet	Fixed point (F10 0)	Altitude of aircraft position above Earth surface for time after release for index value "JAIR "
	01	CARD CODE	TBA	N/A	Alphanumeric	Final input data card
	02 to 05	ICASE	TBA	N/A	Integer (I2)	Case number
	06, 07	IFINAL	TBA	N/A	Integer (I2)	Code used for last input case, set to "1," otherwise leave blank

N/A=not applicable, TBA=to be assigned.

<sup>a</sup>See table 3 for additional description of options described

<sup>b</sup>Station numbers are numeric codes for input tracking stations. The maximum index (i) for NOS must be the numeric value of NS. Each tracking station used is assigned an integer on "G" card. This card is useful in designating any station

whose nominal value is specified and neglecting those preset stations not required. Additional stations may be read through "G" card with their station number specified here.

<sup>c</sup>Expected position of aircraft station at time of target release specified with "G" card with MOVE(N)=01



Each data card, with the exception of the first or title card, contains an alphabetic code in column 1. Not all data cards are required for program execution. They are required only if one or more of the parameters for a particular card are to be changed from their nominal values. The data-card input rules are as follows:

- (1) The title card and the "I" card must be used for any program execution.
- (2) The cards coded "A" through "H" must be inserted (in any order) between the title card and the "I" card.
- (3) If one or more of the parameters required for a given card are to be changed from their nominal values, all parameters required for that input card must be present. A blank numeric field will then be interpreted as zero

Illustrations for three sample input cases are shown in figure 1. In (a), the program will execute using all the preset nominal values for the program. Execution requires only the title card and the "I" card. Case (c) is an example for a change of release point in which given tracking stations and calendar periods are used. An additional tracking station whose position is not preset is added to the input list. A variation of this would be to use only certain nominal-value tracking stations with no additional stations added.

#### **MULTIPLE CASES**

To fully evaluate launch criteria for a given calendar period, variation of certain input parameters must be considered. Several aspects of the vehicle behavior and the target's behavior after its release cannot be accurately predetermined. Therefore, proper analysis of the release window must incorporate the predicted vehicle dispersion area around the nominal release point and all possibilities of speed and direction of the target's motion after release.

The input card deck setup for multiple-case jobs is organized similarly to that for a single-deck setup. Each case must include the title card and the "I" card. For each case, the cards coded "A" through "H" need only be inserted if the parameters for that card are to be different from those of the previous case. (For the first case, the "A" through "H" cards are inserted only if the parameters change from the preset nominal values.)

As stated previously, stacked cases are for use in the analysis of release-point dispersion and drift-rate variations. Therefore, the program is designed so that any variation of the following parameters will either yield erroneous results or cause the program to prematurely terminate:

- (1) All parameters defined on cards coded "A," "B," "C," "F," "G," and "H"
- (2) The values for the minimum look angle elevation from each tracking station to the target and the maximum depression angles of the Sun and of the Moon to each tracking station

These values must remain constant after being defined in the first input case. An example of multiple case input is shown in figure 2.

Two additional computer system control cards are required for stacked cases. These cards are used to define temporary disk storage files for the calculated data for each case and are listed in table 1



## PROGRAM OUTPUT

Output generated by this program is recorded on four computer system files. Through the existing program options, the data can be printed and/or plotted. Each of the four files yields different types of data useful for the user's analysis of the release window problem.

File 01 contains the release window data for either a year or a month in the format required by the CalComp Plotter Model 763. These data must be recorded at 556 bpi for the CalComp Plotter.

File 07 (800 bpi) contains the set of daily window times calculated for each constraint and for each tracking station.

File 09 (800 bpi) contains the set of daily release window times that satisfy all constraints for all tracking stations simultaneously. This set of data is the numerical listing of the data points recorded on tape file 01.

File 11 (800 bpi) contains the set of daily release window times calculated on the Sun and Moon constraints for each tracking station.

A sample of the output data generated from files 01, 07, and 09 are shown in figures 3, 4, and 5, respectively. Printed output of file 11 is not available because the purpose of this file is to omit the recalculation of the Sun and Moon constraint data for later program executions. It is anticipated that this program will be executed many times to analyze the variations of release point locations, target drift velocities, and expected target tracking periods using the same tracking stations. The use of file 11 then saves execution time by omitting the calculation of these data.

## PROGRAM OPTIONS

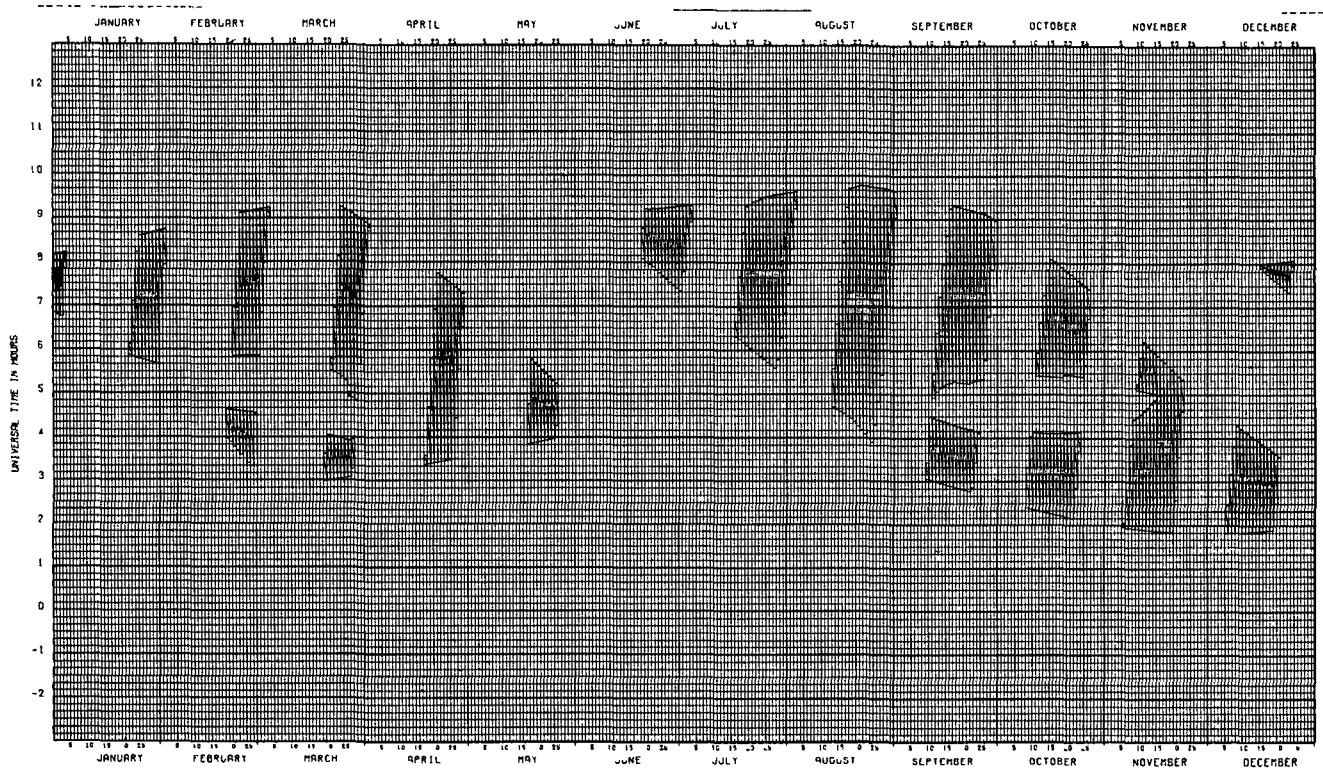
The set of program options provides printed output flexibility and saves execution time by using data previously calculated

Table 3 is a list of program options including the integer value of each option code, the system files used, and the program options exercised. The integer value of each option code is the numerical value used for program input by the "C" card. For each system file required, the appropriate system control card (table 1) must be used. The seven program options in table 3 are

- (1) A: perform program calculations.
- (2) B: furnish printed output of file 07 data.
- (3) C: furnish printed output of file 09 data.
- (4) D: input a magnetic tape of file 11 data calculated from previous job.
- (5) E: create a magnetic tape of file 11 data for future jobs.
- (6) F: create a plot tape on file 01 of release window data for a calendar year.
- (7) G: create a plot tape on file 01 of release window data for a calendar month.

The input cards that must be furnished by the program user follow the "LIMITS" card and are the appropriate system control cards as defined in table 1 and the set of data cards with the title card first and the "I" card last.





MAX-PLANCK ION CLOUD  
 RELEASE TIMES  
 FOR 1971  
 RELEASE POINT  
 LAT = 7 350  
 LONG = -74 990  
 ALT = 5 105  
 SUN ELEVATION = 19 0 DEG  
 MOON ELEVATION = 2 0 DEG  
 CLOUD ELEVATION = 30 0 DEG  
 SKY BRIGHTNESS = 1 5 R/A  
 CLOUD DRIFT = 0 00 KM/SEC  
 TRACKING TIME = 0 00 HRS  
 STATIONS COMBINED  
 LA SERENA CHILE  
 CERRO TOLLOLO CHILE  
 AREQUIPA PERU  
 WHITE SANDS NM  
 MT HOPKINS ARIZ  
 KITT PEAK ARIZONA

PLOTTED  
 07/20/70

INPUT/OUTPUT DEFINITION

FIGURE 3 – Sample plot from file 01

## DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

\*\*\*\*\*RELEASE WINDOW DAILY TIME INTERVALS PER CONSTRAINT PER STATION\*\*\*\*\*

DATE	CONSTRAINT	STATION	START HR/MIN	STOP HR/MIN	START HR/MIN	STOP HR/MIN	START HR/MIN	STOP HR/MIN
1 AUG 1971	EARTH SHADOW	ALL STATIONS	0/0	0	24/0			
	SUN	LA SERENA, CHILE	0/27	10/5	23/33	34/4		
		CERRO TOLOLO, CHILE	0/27	10/6	23/32	34/6		
		AREQUIPA, PERU	0/11	9/56	23/48	33/55		
		WHITE SANDS, N.M.	1/37	10/47	27/36	34/48		
		MT. HOPKINS, ARIZ.	3/52	11/7	27/51	35/8		
		KITTY PEAK, ARIZONA	3/56	11/9	27/55	35/10		
	MOON	LA SERENA, CHILE	6/53	17/1	31/53	41/52		
		CERRO TOLOLO, CHILE	6/56	16/59	31/56	41/49		
		AREQUIPA, PERU	6/26	17/36	31/22	42/29		
		WHITE SANDS, N.M.	17/30	3/10	7/9	21/49		
		MT. HOPKINS, ARIZ.	17/10	2/54	7/29	22/5		
		KITTY PEAK, ARIZONA	17/8	2/50	7/31	22/9		
	SKY BRIGHTNESS	LA SERENA, CHILE	6/0	2/0	5/19	9/53	22/30	24/0
		CERRO TOLOLO, CHILE	6/0	1/57	5/21	9/49	22/32	24/0
		AREQUIPA, PERU	6/0	3/9	5/0	10/43	22/8	24/0
		WHITE SANDS, N.M.	6/0	1/29	5/2	10/7	22/54	24/0
		MT. HOPKINS, ARIZ.	6/0	1/8	5/15	9/41	23/10	24/0
		KITTY PEAK, ARIZONA	6/0	1/3	5/20	9/36	23/16	24/0
2 AUG 1971	EARTH SHADOW	ALL STATIONS	0/0	0	24/0			
	SUN	LA SERENA, CHILE	6/26	10/4	23/33	34/4		
		CERRO TOLOLO, CHILE	6/27	10/6	23/33	34/5		
		AREQUIPA, PERU	6/11	9/55	23/48	33/55		

FIGURE 4 — Sample data from file 07

\*\*\*\*\*TOTAL DAILY RELEASE WINDOW TIME INTERVALS\*\*\*\*\*

DATE	START HR/MIN	STOP HR/MIN	START HR/MIN	STOP HR/MIN	START HR/MIN	STOP HR/MIN	START HR/MIN	STOP HR/MIN	START HR/MIN	STOP HR/MIN	START HR/MIN	STOP HR/MIN
1 AUG 1971	7/31	9/36										
2 AUG 1971	8/18	9/36										
3 AUG 1971	9/13	9/37										
4 AUG 1971	*****NO	RELEASE WINDOW FOR THIS DATE*****										
5 AUG 1971	*****NO	RELEASE WINDOW FOR THIS DATE*****										
6 AUG 1971	*****NO	RELEASE WINDOW FOR THIS DATE*****										
7 AUG 1971	*****NO	RELEASE WINDOW FOR THIS DATE*****										
8 AUG 1971	*****NO	RELEASE WINDOW FOR THIS DATE*****										
9 AUG 1971	*****NO	RELEASE WINDOW FOR THIS DATE*****										
10 AUG 1971	*****NO	RELEASE WINDOW FOR THIS DATE*****										
11 AUG 1971	*****NO	RELEASE WINDOW FOR THIS DATE*****										
12 AUG 1971	*****NO	RELEASE WINDOW FOR THIS DATE*****										
13 AUG 1971	*****NO	RELEASE WINDOW FOR THIS DATE*****										
14 AUG 1971	4/41	5/35										
15 AUG 1971	4/38	6/36										
16 AUG 1971	4/36	7/34										
17 AUG 1971	4/33	8/27										
18 AUG 1971	4/29	9/16										
19 AUG 1971	4/26	9/42										
20 AUG 1971	4/22	9/43										
21 AUG 1971	4/16	9/45										
22 AUG 1971	4/10	9/46										
23 AUG 1971	4/5	9/46										
24 AUG 1971	3/59	9/45										
25 AUG 1971	3/53	9/45										
26 AUG 1971	4/18	9/44										
27 AUG 1971	4/50	9/44										
28 AUG 1971	5/26	9/43										
29 AUG 1971	6/10	9/42										
30 AUG 1971	7/0	9/41										
31 AUG 1971	7/58	9/40										

FIGURE 5 — Sample data from file 09

TABLE 3.—Program Options

Option No	Option code value					System files used <sup>a</sup>				Options exercised						
	ICALC	IPRT7	IPRT9	IPRT11	IPLOT	01	07	09	11 <sup>b</sup>	A	B	C	D	E	F	G
1	0	0	0	0	0	X	X	X	X	X	X	X	X		X	
2	0	0	0	0	0	1	X	X	X	X	X	X	X		X	X
3	0	0	0	0	0	2		X	X	X	X	X	X			
4	0	0	0	0	1	0	X	X	X	X	X	X		X	X	
5	0	0	0	0	1	1	X	X	X	X	X	X		X	X	
6	0	0	0	0	1	2		X	X	X	X	X		X		
7	0	0	0	0	2	0	X	X	X		X	X	X		X	
8	0	0	0	0	2	1	X	X	X		X	X	X			X
9	0	0	0	0	2	2		X	X		X	X	X			
10	0	0	0	1	0	0	X	X	X	X	X	X		X	X	
11	0	0	0	1	0	1	X	X	X	X	X	X	X			X
12	0	0	0	1	0	2		X	X	X	X	X	X			
13	0	0	0	1	1	0	X	X	X	X	X	X		X	X	
14	0	0	0	1	1	1	X	X	X	X	X	X		X	X	
15	0	0	0	1	1	2		X	X	X	X	X		X		
16	0	0	0	1	2	0	X	X	X		X	X			X	
17	0	0	0	1	2	1	X	X	X		X	X				X
18	0	0	0	1	2	2		X	X	X	X	X				X
19	0	0	1	0	0	0	X	X	X	X	X		X		X	
20	0	0	1	0	0	1	X	X	X	X	X	X	X			X
21	0	0	1	0	0	2		X	X	X	X	X	X			X
22	0	0	1	0	1	0	X	X	X	X	X	X		X	X	
23	0	0	1	0	1	1	X	X	X	X	X	X		X	X	
24	0	0	1	0	1	2		X	X	X	X	X		X		X
25	0	0	1	0	2	0	X	X	X	X	X	X			X	
26	0	0	1	0	2	1	X	X	X		X	X				X
27	0	0	1	0	2	2		X	X		X	X				X
28	0	0	1	1	0	0	X	X	X	X	X		X		X	
29	0	0	1	1	0	1	X	X	X	X	X		X			X
30	0	0	1	1	0	2		X	X	X	X	X				X
31	0	0	1	1	1	0	X	X	X	X	X	X		X	X	
32	0	0	1	1	1	1	X	X	X	X	X	X		X	X	
33	0	0	1	1	1	2		X	X	X	X	X		X		X
34	0	0	1	1	2	0	X	X	X		X	X			X	
35	0	0	1	1	2	1	X	X	X		X	X				X

INPUT/OUTPUT DEFINITION

<sup>a</sup> See table 1 for system control cards required for each system file  
<sup>b</sup> Required when calculating multiple cases regardless of "IPRT11" value

TABLE 3.—Program Options—Concluded

Option No	Option code value					System files used <sup>a</sup>				Options exercised						
	ICALC	IPRT7	IPRT9	IPRT11	IPLOT	01	07	09	11 <sup>b</sup>	A	B	C	D	E	F	G
36	0	1	1	2	2		X	X		X						
37	1	0	0	N/A	0	X	X	X			X	X			X	
38	1	0	0	N/A	1	X	X	X			X	X				X
39	1	0	0	N/A	2		X	X			X	X				
40	1	0	1	N/A	0	X	X	X			X	X			X	
41	1	0	1	N/A	1	X	X				X	X				X
42	1	0	1	N/A	2		X				X	X				
43	1	1	0	N/A	0	X		X			X	X			X	
44	1	1	0	N/A	1	X		X			X	X				X
45	1	1	0	N/A	2			X			X	X				
46	1	1	1	N/A	0	X		X							X	
47	1	1	1	N/A	1	X										X
48	1	1	1	N/A	2											

<sup>a</sup> See table 1 for system control cards required for each system file

<sup>b</sup> Required when calculating multiple cases regardless of "IPRT11" value

## *Mathematical Analysis*

Each requirement of a sky target experiment is considered separately in the program computations. Two assumptions made that affect the overall problem and are defined early in the program structure are.

- (1) The input position coordinates of each tracking station and of the target's release point use the Fisher Earth model.
- (2) The value used for the mean radius of the Earth and for the definition of one Earth radius is 6371.024 km.

Other assumptions are:

- (1) The program calculations use a spherical Earth model. This requires a transformation of input position coordinates from the given geodetic Earth model to the spherical Earth model of radius 6371.024 km.
- (2) The drift rate of the target after its release is constant, and the movement is in an east-west direction.
- (3) The position coordinates of any aircraft tracking station are given in half-hour increments from target release time. Aircraft position is treated as a set of discrete fixed locations rather than as a continuous flight pattern.
- (4) Release window calculations are accurate to within 1 min of time

The analysis for each constraint of the release window problem can now be defined.

### **TARGET ILLUMINATION**

The sky target must be illuminated by the Sun throughout the experimental period. The time that the target passes into the Earth's shadow (umbra-penumbra region) must be determined. Initially, consider the target to be Earth fixed at a given geocentric latitude, longitude, and altitude above the Earth's center of mass. As such, the target may or may not pass through the Earth's shadow in a given 24-hr period. This event is a function of the Sun's declination, the target's declination, and the height of the target above the surface of the Earth.

Figure 6 illustrates a situation in which the target does not pass through the Earth's shadow. This occurs whenever the absolute value of the Sun's declination and the target's declination is greater than the angular radius of the Earth's shadow; that is,

$$|\delta_s + \delta_c| > r_s \quad (1)$$

where

$\delta_s$  = the Sun's declination in radians

$\delta_c$  = the target's declination in radians

$r_s$  = the angular radius of the shadow in radians

Equation (1) results because the declination of the shadow's center is the negative of the Sun's declination.

Because  $\delta_c$  is known and  $\delta_s$  can be determined from an ephemeris table,  $r_s$  can be computed.

Figure 7 is used to illustrate the geometric relationships necessary for the solution of  $r_s$ .

The following variables are defined:

$M$  = the mean distance in Earth radii units (ERU) between the Earth's and Sun's center of mass

$P$  = the distance in ERU's from the Earth's center to the tip of the penumbra cone

$H$  = the distance in ERU's of the target from the Earth's center

$R_E$  = the radius in ERU's of the Earth

$R_S$  = the radius in ERU's of the Sun

From similar triangles,

$$\frac{R_S}{M-P} = \frac{R_E}{P} \quad (2)$$

Because

$$\begin{aligned} R_E &= 1 \\ P &= \frac{M}{R_S + 1} \end{aligned}$$

The following angles, which are measured at the Earth's center of mass (fig. 7), are defined:

$A$  = the angle in radians between the Earth-Sun line and the edge of the shadow region

$B$  = the angle in radians between the edge of the shadow region and the tangency point of the Earth-Sun penumbra line

$C$  = the angle in radians between the tangency point of the Earth-Sun penumbra line and the Earth-Sun line

$$A + B + C = \pi \text{ rad} \quad (3)$$

where

$$B = \arccos 1/H$$

$$C = \arccos 1/P = \arccos [(R_S + 1)/M]$$

Using the mean values of  $R_S = 109.12R_E$  and  $M = 23\,454.86R_E$ ,

$$C = 89^\circ 44' = 1.5661 \text{ rad}$$

equation (3) can be rearranged in the form

$$A = \frac{\pi}{2} - B + \frac{\pi}{2} - C$$

or

$$A = \arcsin \frac{1}{H} + 0.0045 \text{ rad} \quad (4)$$

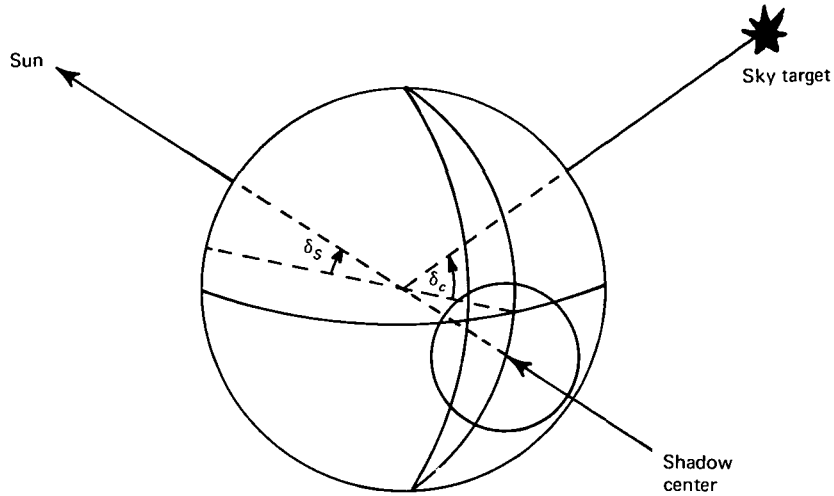


FIGURE 6 – Sky target outside Earth's shadow

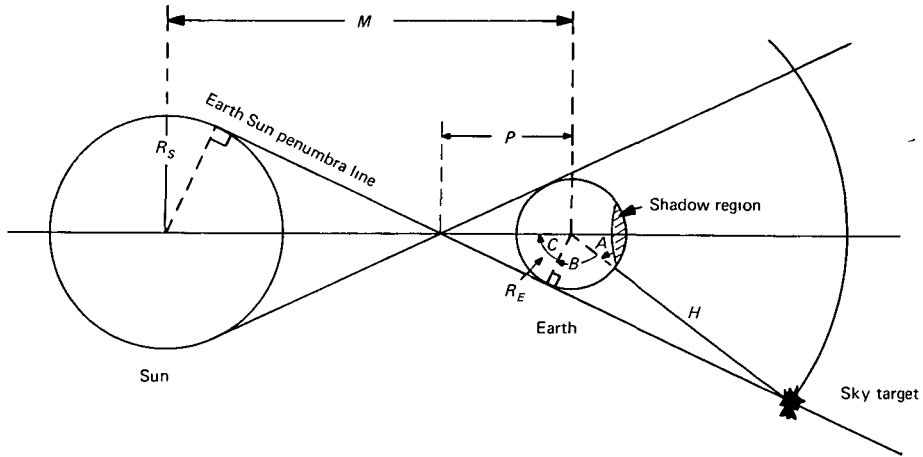


FIGURE 7 – Geometric relationships and shadow radius

The angular radius of the shadow

$$r_s = R_E A = A \text{ rad} \tag{5}$$

Therefore, equation (4) may be used to compute the radius of the shadow in radians, which is approximately 0.169 88 for a target distance  $H = 6R_E$ .

The time that any portion of the sky target is within the Earth's shadow can now be calculated. A cloud-type target is expected to grow in the direction of the geomagnetic poles and drift in the transverse direction after its release. It is assumed that cloud growth is constant and in a geographic north-south direction. Drift rate is assumed to be constant and in an east-west direction. A model of the cloud's behavior after its release can then be constructed.



Consider the target's release at some point  $(\alpha_c, \delta_c)$ , where

$\alpha_c$  = the right ascension of the release point measured positive eastward from the Greenwich meridian

$\delta_c$  = the declination of the release point

After release, the target will drift at some rate  $R_6$  rad/hr and elongate along the magnetic-field lines at some rate of  $2R_8$  rad/hr.

At the end of the experimental period, the extremities of the visible target will be at the points  $(\alpha_1, \delta_1)$  and  $(\alpha_2, \delta_2)$  and are defined as

$$\alpha_1 = \alpha_2 = \alpha_c + (R_6 + \omega)R_7 \quad (6)$$

$$\delta_1 = \delta_c + R_8R_7 \quad (7)$$

$$\delta_2 = \delta_c - R_8R_7 \quad (8)$$

where

$R_7$  = duration in hours of the experimental period

$\omega$  = rotational velocity of the Earth

The region covered by the target from time of release to the end of the experimental period is within a triangle as shown in figure 8. Note that the Earth's shadow region is described as a circle.

For a given day, the right ascension and declination of the Earth's shadow center is assumed fixed. The right ascension of the release point varies with respect to time. Imagine the Earth's shadow region fixed and the entire triangular-shaped region covered by the target moving at a constant rate of change of right ascension. The target's model will then intersect at some points with the Earth's shadow region provided that either

$$|\delta_1 - \delta_s| < r_s$$

or

$$|\delta_2 - \delta_s| < r_s$$

or

$$|\delta_c - \delta_s| < r_s$$

The problem then is to determine at what universal times must the sky target be released to avoid the Earth's shadow. To answer this, the points of intersection of each line segment of the triangle with the shadow region must be determined if a solution exists and is possible. If  $T_0^i$  is the time of release causing the target to enter the shadow region as determined for each line segment of the triangle ( $i = 1, 2, 3$ ) and  $T_f^i$  is the time of release causing the target to exit the shadow region as determined for each line segment of the triangle ( $i = 1, 2, 3$ ), then

$$T_0 = \min (T_0^1, T_0^2, T_0^3) \quad (9)$$

and

$$T_f = \max (T_f^1, T_f^2, T_f^3) \quad (10)$$

for valid solutions of  $T_0^i$  and  $T_f^i$ .

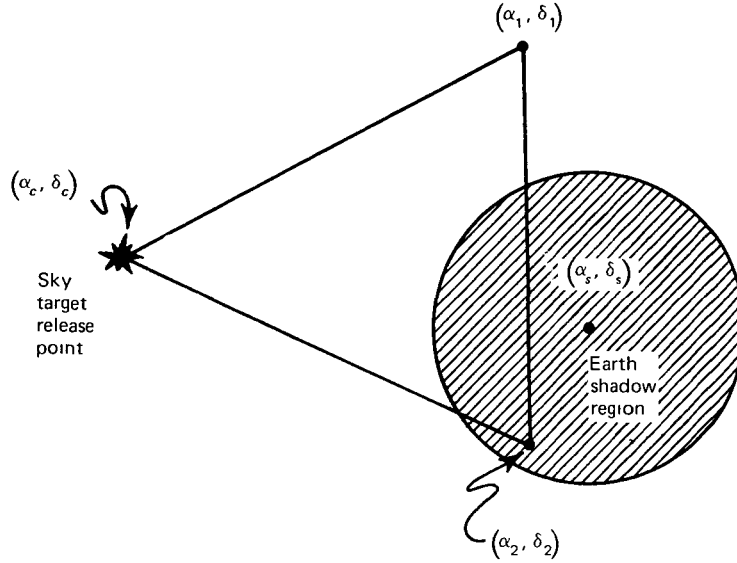


FIGURE 8 – Movement of sky target in Earth's shadow

The first point of contact of each line segment with the Earth's shadow region will be either at the endpoints of the line or at some point within the line segment.

Consider the case when the initial point of contact of the Earth's shadow region is a point within the line segment with endpoints  $(\alpha_e, \delta_e)$  and  $(\alpha_1, \delta_1)$ . The right ascension of the release points  $\delta_e$  for which this line will be tangent to the Earth's shadow region must be determined. The slope of this line will remain constant, and its value is  $R_8/(R_6 + \omega)$ . The declination of the release point is time invariant and will also be constant. The intercept  $b_1$  of the line at the time of tangency with the Earth shadow region can now be determined. The equation of the line is

$$\delta = \frac{R_8}{R_6 + \omega} \alpha + b_1 \quad (11)$$

for some point  $(\alpha, \delta)$  of the line segment.

The distance from the line (when tangent to the Earth's shadow region) to the center of the Earth's shadow is equal to the shadow radius, and

$$r_s = \frac{|R_8 \alpha_s - (R_6 + \omega) \delta_s + (R_6 + \omega) b_1|}{\sqrt{(R_6 + \omega)^2 + R_8^2}} \quad (12)$$

Solving for  $b_1$ ,

$$b_1 = \frac{(R_6 + \omega) \delta_s - R_8 \alpha_s \pm r_s \sqrt{(R_6 + \omega)^2 + R_8^2}}{R_6 + \omega} \quad (13)$$

Therefore, the values of right ascension for the release point when the line is tangent to the Earth's shadow region is

$$\alpha_c = \frac{R_6 + \omega}{R_8} (\delta_c - b_1) \quad (14)$$

and the time of release is

$$t = \frac{\alpha_c - \lambda_c - \text{HA}_0}{1 + \Delta} \quad (15)$$

where

$\lambda_c$  = the longitude of the target release point measured positive eastward from the Greenwich meridian

$\text{HA}_0$  = Greenwich hour angle of Aries at 0 hr universal time (UT) of the given day

$$\Delta = 0.002\,737\,909$$

Two values of  $b_1$  are found from equation (13). Hence, two values for  $t$  are calculated, which represent the two points of tangency for the line to the Earth's shadow region. Because the right ascension of the release point will always move in one direction, the smaller value of  $t$  will always represent the time of entry into the Earth's shadow region.

In the other case, the relative position of the Earth's shadow region to the line segment could be such that the endpoints of the line segment will contact the Earth's shadow region at an earlier time. The point of contact will be at the edge of the Earth's shadow region and the distance from this point to the Earth's shadow center is equal to the shadow radius. Thus

$$(\alpha - \alpha_s)^2 + (\delta - \delta_s)^2 = r^2 \quad (16)$$

If the contact point is at the release point, set

$$\alpha_c = \alpha$$

and

$$\delta_c = \delta$$

Time of release is then found from equation (15). For the contact point to be  $(\alpha_1, \delta_1)$ , set

$$\alpha_1 = \alpha$$

$$\delta_1 = \delta$$

and the time of release is found by using equation (6) and then equation (15).

A similar analysis for both cases is used for the side of the triangle whose line segment is between points  $(\alpha, \delta)$  and  $(\alpha_2, \delta_2)$ . The slope for this line is

$$\frac{-R_8}{R_6 + \omega}$$

For the side of the triangle representing the position of the target at the end of the experiment, the slope of this line is  $90^\circ$ . The equation then would be

$$t = \frac{\alpha_s + (R_6 + \omega) R_7 \pm r_s - \lambda_c - \text{HA}_0}{1 + \Delta} \quad (17)$$

for the case  $\delta_2 \leq \delta_s \leq \delta_1$ .

Otherwise,

$$t = \frac{(R_6 + \omega) R_7 \pm \sqrt{r_s^2 - (\delta - \delta_s)^2} - \lambda_c - HA_0}{1 + \Delta} \quad (18)$$

where  $\delta = \delta_1$  whenever  $\delta_s > \delta_1$  and  $\delta = \delta_2$  whenever  $\delta_s < \delta_2$ .

**TARGET ELEVATION**

Another factor considered in the program is the elevation look angle above local horizon from each tracking station to the sky target. The analysis of target elevation is generalized to permit look angle to be a variable rather than a fixed argument.

Consider an Earth-fixed tracking station located at point  $S_1$  (fig. 9). Construct a vector from  $S_1$  at an elevation angle of  $E$  deg. Rotating this vector about the point  $S_1$  describes a conical shape with apex at  $S_1$ . Any point within this described conical region will then have an elevation look angle greater than  $E$  deg from  $S_1$ . The elevation constraint is satisfied whenever the target remains within the conical region for the duration of the experimental period.

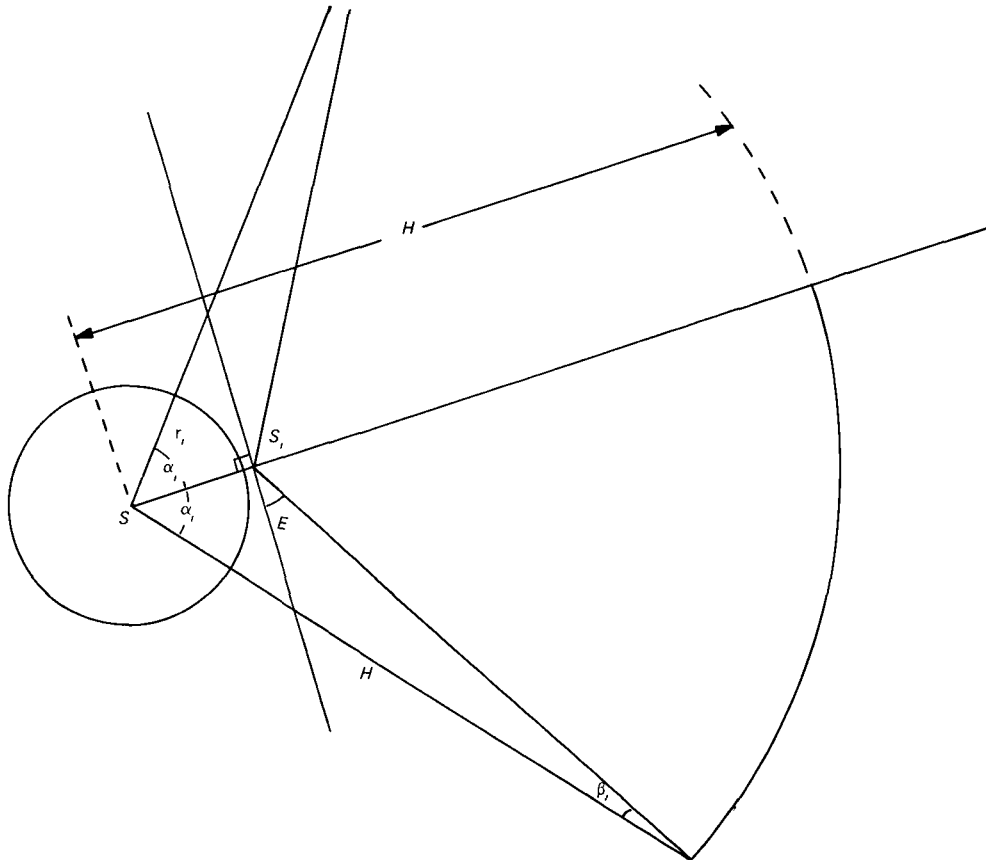


FIGURE 9 – Elevation look angle

From figure 9,

$$\frac{\sin \beta_1}{r_1} = \frac{\sin (\pi/2 + E)}{H} = \frac{\cos E}{H} \quad (19)$$

where

- $r_1$  = distance in ERU's from the Earth's center to  $S_1$
- $H$  = distance in ERU's from the Earth's center to the target
- $\beta_1$  = angle in radians at the intersection of the height of the vector from  $S_1$  to the height of the target for elevation  $E$  and the vector  $H$

Then,

$$\begin{aligned} \alpha_1 &= \pi - (\pi/2 + E + \beta_1) \\ &= \frac{\pi}{2} - E - \arcsin \left( \frac{r_1}{H} \cos E \right) \end{aligned} \quad (20)$$

Project the base of this conical region onto the surface of the spherical Earth model. The shaded region shown in figure 10 is the region that satisfies the elevation constraint. The arc radius of the shaded region is

$$R_E \alpha_1 = \alpha_1$$

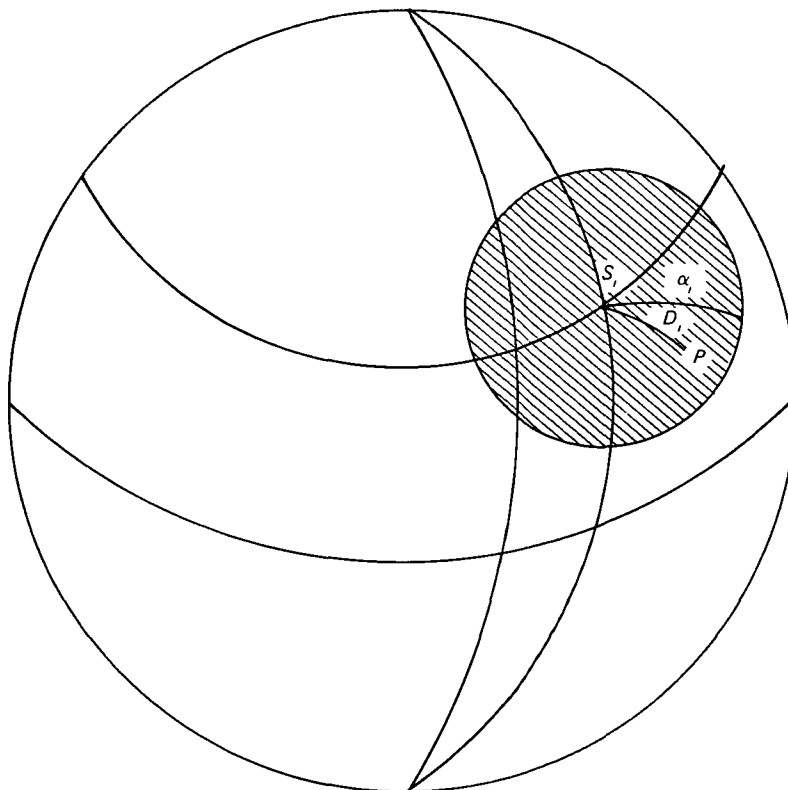


FIGURE 10 – Elevation constraint on Earth model

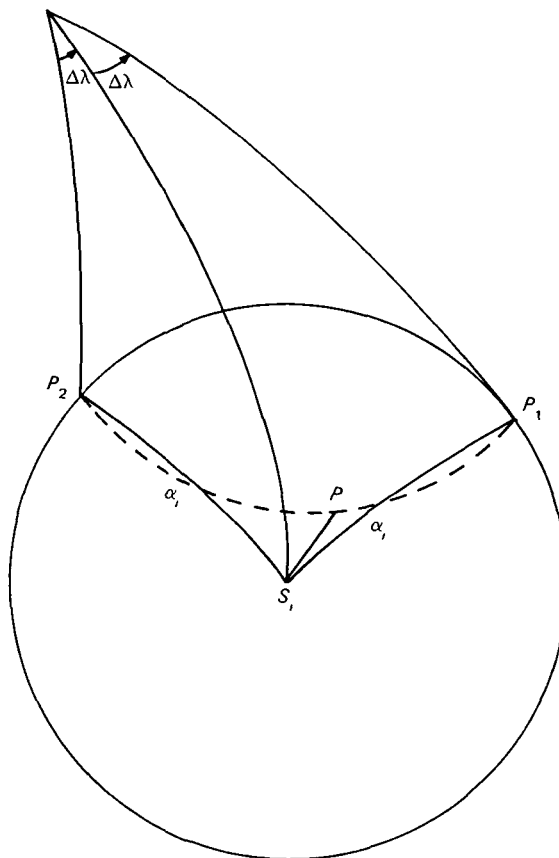


FIGURE 11 – Target drift on Earth model

Let  $P$  be the projection of the target release point onto the Earth's surface. The target has an elevation angle greater than  $E$  deg whenever the arc radius from  $S_i$  to  $P$  is less than  $\alpha_i$ . Denote this arc radius as  $D_i$ . Using spherical trigonometry,

$$\cos D_i = \cos \left( \frac{\pi}{2} - \phi_i \right) \cos \left( \frac{\pi}{2} - \phi_c \right) + \sin \left( \frac{\pi}{2} - \phi_i \right) \sin \left( \frac{\pi}{2} - \phi_c \right) \cos (\lambda_i - \lambda_c) \quad (21)$$

where

- $(\phi_i, \lambda_i)$  = geocentric latitude and longitude of tracking station  $S_i$
- $(\phi_c, \lambda_c)$  = geocentric latitude and longitude of the sky target projection at point  $P$

The question arises of whether the target will drift out of the region during the experimental period. Because the assumed drift is in an east-west direction, the change in target position will be reflected as a longitudinal change only. Consider points  $P_1$  and  $P_2$  at the edge of the region at geocentric latitude  $\phi_c$  (fig. 11). For an easterly drift, the target will move toward  $P_1$ . The arc radius from  $S_i$  to  $P_1$  or  $P_2$  is  $\alpha_i$ . From figure 11, we see that the differences in longitude, denoted by  $\Delta\lambda$ , between  $S_i$  and  $P_1$  and between  $S_i$  and  $P_2$  are equal. Then

$$\Delta\lambda = \arccos \frac{\cos \alpha_i - \sin \phi_i \sin \phi_c}{\cos \phi_i \cos \phi_c} \quad (22)$$

$$\lambda_1 = \lambda_i + \Delta\lambda \quad (23)$$

$$\lambda_2 = \lambda_i - \Delta\lambda \quad (24)$$

where

$\lambda_1$  = longitude in radians at point  $P_1$

$\lambda_2$  = longitude in radians at point  $P_2$

The time it will take a target to drift from  $P$  to  $P_1$  (for an easterly drift) is

$$T = \left| \frac{\lambda_c - \lambda_1}{R_6} \right| \quad \text{hr} \quad (25)$$

and from  $P$  to  $P_2$  (for a westerly drift) is

$$T = \left| \frac{\lambda_c - \lambda_2}{R_6} \right| \quad \text{hr} \quad (26)$$

where  $R_6$  is the given drift rate in units of radians per hour.

If the total required tracking time is  $R_7$  hr and  $T \geq R_7$ , where  $R_7$  is the duration of the experimental period, then the elevation constraint is satisfied. If  $T < R_7$ , the program prints a statement naming the tracking station and giving the value of  $T$ . The program then continues with the remainder of its calculations.

When an aircraft is used as a tracking station, assume that the path and speed of the aircraft will be such that its position at target release and at the end of the experimental period are checked. Use these position coordinates to determine arc radius  $D_i$ . The elevation constraint is satisfied whenever  $D_i < \alpha_i$  for both positions.

### SUN AND MOON

The period for which the Sun and the Moon constraints will hold for a given tracking station  $i$  is initially approximated. Let  $(T_{0_i}, T_{f_i})$  be the time period for the Sun (Moon) constraint to be satisfied at station  $i$  for a given day

Initially in hours,

$$T_{0_i} = (19.0 - K\lambda_i) \bmod 24 \quad (27)$$

and

$$T_{f_i} = (5.0 - K\lambda_i) \bmod 24 \quad (28)$$

where 19.0 and 5.0 are approximate astronomical twilight times at the Greenwich meridian. As before

$K$  = conversion factor from radians to hours

$\lambda_i$  = longitude in radians of tracking station  $i$

Because the Moon is not on a yearly cycle, as is the Sun, an epoch date of January 0, 1970, is used in the initial approximation. For the Moon, again using approximate times of moonset (11.5 hr UT) and moonrise (0.0 hr UT) at the Greenwich meridian,

$$T_{0_i} = [11.5 + 0.82 (J - J_0) - K\lambda_i] \bmod 24 \quad (29)$$

$$T_{f_i} = [0.0 + 0.82 (J - J_0) - K\lambda_i] \bmod 24 \quad (30)$$

where

$J$  = Julian date for the initial day

$J_0$  = Julian date for January 0, 1970

To determine an accurate time period ( $T_{0_i}$ ,  $T_{f_i}$ ) for the Sun's (Moon's) constraint to be met at station  $i$ , find the inertial rectangular coordinates of the Sun (Moon) for the initial time  $T_{0_i}$ . Transforming these coordinates to a topocentric system (see app. A) with origin at  $S_i$ , we find the depression angle for the Sun (Moon) from  $S_i$  to be

$$E = \arcsin \frac{X}{r} \quad (31)$$

where

$X$  = the topocentric  $X$  coordinate in ERU's for the Sun (Moon) at time  $T_{0_i}$ ,

$r$  = the distance in ERU's from  $S_i$  to the Sun (Moon)

Define  $R_3$  as the depression angle constraint in radians of the Sun and  $R_4$  as the depression angle constraint in radians of the Moon. If

$$\left| 1.0 - \frac{E}{R_3} \right| < 10^{-4} \quad (32)$$

then  $T_{0_i}$  is the universal time for the beginning of the time period for the Sun constraint at station  $i$ .

For the Moon, equation (32) becomes

$$\left| 1.0 - \frac{E}{R_4} \right| < 10^{-4} \quad (33)$$

If either equation (32) or (33) is invalid, then a three-point interpolation is done to determine the  $T_{0_i}$  that satisfies these equations. For this interpolation, set

$$\Delta t_1 = E - R_3 \quad (34)$$

$$E_1 = E \quad (35)$$

$$T_{0_i} = T_{0_i} + \Delta t_1 \quad (36)$$

Now compute the Sun's (Moon's) inertial coordinates for the new value of  $T_{0_i}$ . Transforming to the topocentric coordinate system, a new value for  $E$  in equation (31) is found. If equation (32) or (35) is still invalid, then set

$$\Delta t_j = \left| \frac{t_{j-1}}{E - E_{j-1}} \right| (E - R_3) \quad (37)$$



(replace  $R_3$  by  $R_4$  in the case of the Moon):

$$E_j = E \quad (38)$$

and

$$T_{0_i} = T_{0_i} + \Delta t_j \quad (39)$$

This iterative procedure is to be repeated until equation (32) or (33) is satisfied or until  $j=15$ . The program will stop if  $j=15$  because this system should converge rapidly.

To determine  $T_{f_i}$ , the same logic is used by replacing  $T_{0_i}$  by  $T_{f_i}$  in the above equations. However, instead of equations (36) and (39) use

$$T_{f_i} = T_{f_i} - \Delta t_i$$

and

$$T_{f_i} = T_{f_i} - \Delta t_j.$$

respectively.

For these time periods to remain valid during the tracking of a sky target, subtract  $R_7$  from  $T_{f_i}$ .

If the target is released at some time within  $(T_{0_i}, T_{f_i} - R_7)$ , then the Sun's (Moon's) depression angle will be less than the required depression angle.

The positions of the aircraft at time of target release and at the end of the experimental period are used to determine its time interval satisfying the Sun and Moon constraints.

Let  $(t_0, t_f)$  be the interval found for the position of the aircraft at time of release, and let  $(t'_0, t'_f)$  be the interval found for the position of the aircraft at the end of the experimental period. Then, the time interval for the aircraft is the intersection of these two intervals

$$(T_{0_i}, T_{f_i}) = (t_0, t_f) \cap (t'_0 - R_7, t'_f - R_7) \quad (40)$$

This is true for both the Sun and the Moon requirements.

### TOTAL SKY BRIGHTNESS

Sky background brightness in the field of view of the optical instrumentation at each site is not to exceed  $R_5$  rayleighs for a given wavelength. For practical purposes, consider only this brightness along the line of sight between each tracking station and the sky target.

The total sky brightness in rayleighs is expressed as being

$$B_{t_i} = B_{a_i} + (B_{s_i} + B_{z_i}) (0.73^{\sec z_i}) \quad (41)$$

where

- $B_{t_i}$  = total sky brightness at a given point in the sky
- $B_{a_i}$  = the airglow brightness at the given point in the sky
- $B_{s_i}$  = brightness of stars at the given point
- $B_{z_i}$  = brightness due to zodiacal light at the given point

$Z_i$  = zenith angle in radians or the angle measured from station  $i$ 's zenith to the vector from station  $i$  to the release point.

$$B_{a_i} = (0.8 \sec Z_i) \cdot (0.73^{\sec Z_i - 1}) \quad (42)$$

Before calculating  $B_{a_i}$  from equation (41), the geometrical relationships between each station  $i$  and the target are defined with respect to time.

Airglow brightness is a function of angle  $Z_i$ . Let  $P$  be the position of the release point, and let  $S_i$  be the position of station  $i$ . Describe the coordinates for  $P$  and  $S_i$  in terms of these geodetic coordinates. That is

$$P = P(h'_p, \phi'_p, \lambda'_p)$$

$$S_i = S(h'_i, \phi'_i, \lambda'_i)$$

where

$h'_p$  = altitude in ERU's of release point above the Earth's surface

$\phi'_p$  = geodetic latitude in radians of the release point

$\lambda'_p$  = longitude in radians of the release point

$h'_i$  = altitude in ERU's of station  $i$  above the Earth's surface

$\phi'_i$  = geodetic latitude in radians of station  $i$

$\lambda'_i$  = longitude in radians of station  $i$

Now determine

- (1)  $\mathbf{u}_i$  = vector from the Earth's center to station  $i$
- (2)  $\mathbf{v}$  = vector from the Earth's center to release point
- (3)  $\mathbf{w}_i$  = vector from station  $i$  to release point
- (4)  $\mathbf{u}'_i$  = unit vector coincident with the zenith of station  $i$

These vectors are shown in figure 12.

The components of  $\mathbf{u}_i$  and  $\mathbf{v}$  are functions of the polar coordinates of the release point and of station  $i$ .

The rectangular components of  $\mathbf{u}_i$  and  $\mathbf{v}$  are

$$u_{ix} = r_i \cos \phi_i \cos \lambda_i \quad (43)$$

$$u_{iy} = r_i \cos \phi_i \sin \lambda_i \quad (44)$$

$$u_{iz} = r_i \sin \phi_i \quad (45)$$

and

$$v_x = r_p \cos \phi_p \cos \lambda_p \quad (46)$$

$$v_y = r_p \cos \phi_p \sin \lambda_p \quad (47)$$

$$v_z = r_p \sin \phi_p \quad (48)$$

where

$r_i$  = radial distance in ERU's from the Earth's center to station  $i$

$\phi_i$  = geocentric latitude in radians of station  $i$

$r_p$  = radial distance in ERU's from the Earth's center to the release point

$\phi_p$  = geocentric latitude in radians of the release point

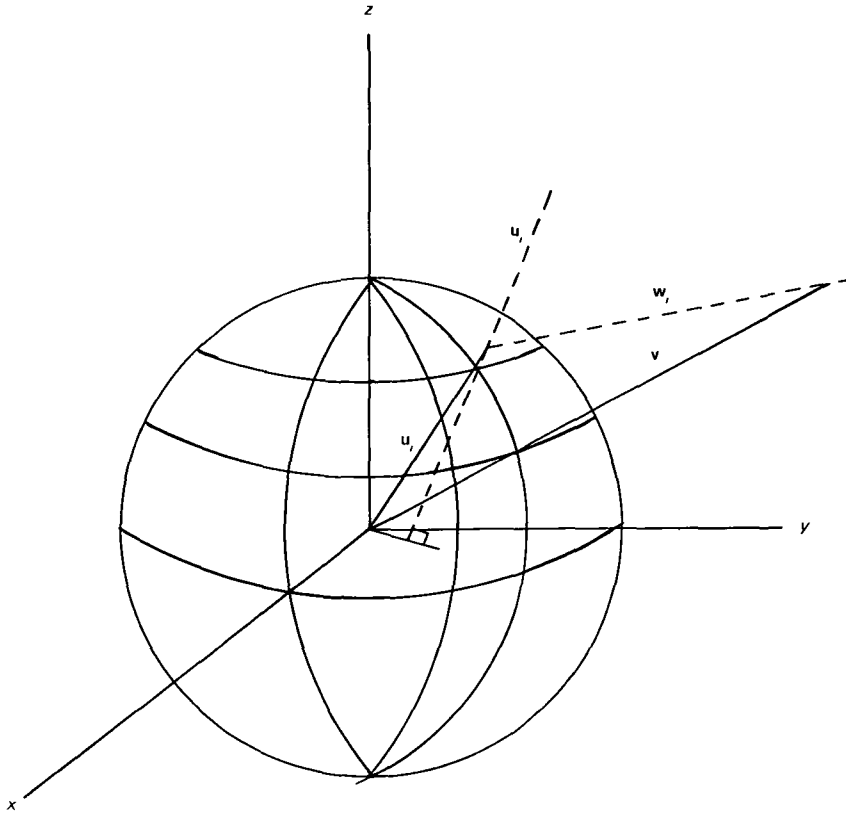


FIGURE 12 – Vectorial notation for sky brightness constraint

By definition

$$\mathbf{w}_i = \mathbf{v} - \mathbf{u}_i \quad (49)$$

The components of the unit vector  $\mathbf{u}'_i$  are

$$u'_{ix} = \cos \phi'_i \cos \lambda_i \quad (50)$$

$$u'_{iy} = \cos \phi'_i \sin \lambda_i \quad (51)$$

and

$$u'_{iz} = \sin \phi'_i \quad (52)$$

By the definition of the dot product of two vectors,

$$\cos Z_i = \frac{\mathbf{u}'_i \cdot \mathbf{w}_i}{|\mathbf{w}_i|}$$

or

$$\cos Z_i = \frac{1}{|\mathbf{w}_i|} [u'_{ix}w_{ix} + u'_{iy}w_{iy} + u'_{iz}w_{iz}] \quad (53)$$

Define

$$C_i = (0.73)^{\sec Z_i} \quad (54)$$

Then equation (42) becomes

$$B_{ai} = \frac{0.8 C_i}{0.73 \cos Z_i} \quad (55)$$

which is the airglow contribution to sky brightness from station  $i$  to the release point.

During the experimental period, the target has a drift rate of  $R_6$  rad/hr relative to the Earth. The zenith angle and, hence, the airglow brightness will vary because of the change in direction of vector  $w_i$ .

The Earth-relative position of the sky target  $t$  hours after release will be

$$P' = P' (r_p, \phi_p, \lambda'_p)$$

where

$$\lambda'_p = \lambda_p + R_6 t \quad (56)$$

Let  $w_i$  be the vector from  $S_i$  to  $P'$ . Its geocentric rectangular coordinates are then

$$w'_{ix} = r_p \cos \phi_p \cos \lambda'_p - u_{ix}$$

$$w'_{iy} = r_p \cos \phi_p \sin \lambda'_p - u_{iy}$$

$$w'_{iz} = r_p \sin \phi_p - u_{iz}$$

Combining the results of equations (46), (47), and (48) with the result of equation (56),

$$w'_{ix} = v_x \cos R_6 t - v_y \sin R_6 t - u_{ix} \quad (57)$$

$$w'_{iy} = v_x \sin R_6 t + v_y \cos R_6 t - u_{iy} \quad (58)$$

$$w'_{iz} = v_z - u_{iz} \quad (59)$$

The geocentric rectangular coordinates of the aircraft's position  $t$  hours after release are appropriately used for component values  $u_{ix}$ ,  $u_{iy}$ , and  $u_{iz}$  in the above three equations. Airglow brightness seen from the aircraft  $t$  hours after target release is found by using the results of these three equations in equations (53), (54), and (55).

### ZODIACAL LIGHT AND STARLIGHT

The analysis for determining brightness due to zodiacal light and starlight must be investigated separately because the two light sources are time dependent. For the analysis, define the components of the vectors  $u_i$ ,  $v$ , and  $w_i$  in an inertial reference frame. The inertial reference frame is defined as a right-handed rectangular coordinate system with the  $x$ -axis directed toward the first

point of Aries, the  $z$ -axis coincident with the Earth's polar axis, and the  $y$ -axis completing the right-handed system. The origin of the system is at the Earth's center.

The  $z$ -axis of the inertial reference frame and of the geocentric reference frame are coincident. The angular difference between the inertial  $x$ -axis and the inertial  $y$ -axis and their respective axes in the geocentric coordinate system is the Greenwich hour angle HA. For some universal time  $T$  of a given day

$$HA = HA_0 + T(1.0 + \Delta) \quad (60)$$

where

$HA_0$  = the Greenwich hour angle in hours at zero hours UT of the given day  
 $\Delta = 0.002\ 737\ 909$

The inertial components of vectors  $\mathbf{u}_i$  and  $\mathbf{v}$  are

$$u'_{ix} = |\mathbf{u}_i| \cos \phi_i \cos (HA + \lambda_i) \quad (61)$$

$$u'_{iy} = |\mathbf{u}_i| \cos \phi_i \sin (HA + \lambda_i) \quad (62)$$

$$u'_{iz} = u_{iz} = |\mathbf{u}_i| \sin \phi_i \quad (63)$$

$$v'_x = |\mathbf{v}| \cos \phi_p \cos (HA + \lambda_p) \quad (64)$$

$$v'_y = |\mathbf{v}| \cos \phi_p \sin (HA + \lambda_p) \quad (65)$$

$$v'_z = v_z = |\mathbf{v}| \sin \phi_p \quad (66)$$

Using the results of equations (43) through (48) and noting that  $|\mathbf{u}_i| = r_i$  and  $|\mathbf{v}| = r_p$ , we have

$$u_{ix} = |\mathbf{u}_i| \cos \phi_i (\cos HA \cos \lambda_i - \sin HA \sin \lambda_i) \quad (67)$$

$$u'_{ix} = u_{ix} \cos HA - u_{iy} \sin HA$$

$$u_{iy} = |\mathbf{u}_i| \cos \phi_i (\sin HA \cos \lambda_i + \cos HA \sin \lambda_i) \quad (68)$$

$$u'_{iy} = u_{ix} \sin HA + u_{iy} \cos HA$$

For  $\mathbf{v}$ ,

$$v'_x = v_x \cos HA - v_y \sin HA \quad (69)$$

$$v'_y = v_x \sin HA + v_y \cos HA \quad (70)$$

The components of  $\mathbf{w}_i$  are defined by equation (49).

The zodiacal light brightness and the starlight brightness in the direction of  $\mathbf{w}_i$  are found in appropriate tables. Values of zodiacal light brightness for given ecliptic latitude versus elongation are found in table 4, and values for starlight brightness versus inertial latitude and longitude are found in table 5. Both tables are in units of 10th visual magnitude stars per square degree. The zodiacal light

TABLE 4.—*Zodiacal Light in 10th Visual Magnitude Stars deg<sup>-2</sup>*

Ecliptic latitude $\beta$	Elongation (celestial longitude minus mean longitude of Sun, $\lambda - \lambda_0$ )																		
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
90	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
80	80	79	78	77	74	73	73	73	72	72	72	72	72	71	71	71	71	71	71
70	105	101	99	96	90	83	80	78	76	76	76	75	75	75	74	74	74	74	73
60	135	131	125	117	107	98	93	90	86	84	83	83	82	82	81	81	80	79	78
50	180	170	160	150	135	123	112	101	97	94	93	90	89	88	87	87	87	86	85
40	270	250	220	190	175	155	143	130	118	108	103	99	98	97	95	94	93	93	93
30	460	400	360	300	260	200	180	160	146	133	120	112	108	106	105	105	106	108	108
20	800	700	610	500	390	300	250	200	175	155	143	129	122	118	117	120	124	127	130
10	1400	1200	1000	960	700	480	350	270	220	185	165	149	135	128	126	130	136	143	146
0	3000	1800	1500	1200	950	700	430	310	250	200	180	160	145	136	133	138	146	160	180

TABLE 5.—Starlight in 10th

Inertial latitude, deg	Inertial																		
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
90	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
80	71	71	71	71	70	70	68	67	64	62	59	55	53	51	49	48	48	47	47
70	87	82	76	70	67	68	73	76	74	69	63	56	51	48	46	44	42	41	41
60	209	186	168	148	120	90	69	68	77	76	68	58	51	45	42	40	38	37	35
50	154	140	129	121	120	127	151	108	81	81	73	62	53	45	40	37	34	33	32
40	113	100	87	78	77	85	102	164	161	105	81	66	57	45	38	33	30	31	30
30	75	69	64	58	51	50	64	88	195	189	109	76	61	48	37	31	29	27	28
20	49	47	48	47	45	44	47	65	90	276	179	98	73	53	39	32	29	28	30
10	37	36	37	39	40	41	45	58	80	138	270	142	96	65	45	35	32	32	32
0	34	32	32	35	37	39	45	60	87	112	289	182	133	86	55	42	37	36	36
-10	35	32	31	33	34	36	45	60	93	133	197	263	154	114	71	53	47	43	43
-20	36	32	32	32	33	36	45	59	87	137	203	368	200	139	94	67	58	55	54
-30	34	36	33	32	33	37	45	58	78	117	202	321	459	209	123	85	73	72	73
-40	33	34	35	34	35	38	45	55	70	92	153	276	458	572	269	156	101	96	101
-50	38	37	37	37	37	39	44	53	63	77	103	186	302	489	742	484	312	244	214
-60	44	42	40	40	40	42	46	51	59	69	78	111	173	241	318	514	694	682	608
-70	50	48	46	45	45	47	49	53	58	65	69	79	98	126	154	176	200	217	233
-80	56	55	54	54	54	55	57	59	61	64	65	68	73	78	84	91	98	104	108
-90	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66

table was adopted from figure 5 of reference 2 and the starlight table was adopted from reference 3. The definition of the ecliptic coordinate system is found in reference 4. Interpolation of these tables gives the sky brightness due to zodiacal light  $B_z$  and starlight  $B_s$  in the direction of vector  $w_i$  at universal time  $t$ . The total sky background brightness for this time is calculated from equation (41).

The computation of  $B_{ti}$  for universal time  $t$  has been described. The problem is to find the time interval  $(T_{0i}, T_{fi})$  for which the total sky background brightness  $B_{ti}$  is less than  $R_5$ . The method used for this computation is to calculate  $B_{ti}$  at half-hour increments during a given day for each station  $i$ .

Whenever two consecutive total sky brightness values are found such that one meets the constraint and the other exceeds it, a two-point iterative procedure is used to find the appropriate bounds of the time interval. Whether the total sky background brightness is less than  $R_5$  during the experimental period must also be determined.

The Earth-relative components of the vector from  $S_i$  to  $P'$  are given in equations (57), (58), and (59). Transforming these components into the appropriate coordinate system, the zodiacal light and starlight brightness are found for  $t$  hours after cloud release. Combining these values with arglow brightness at time  $t$  will give  $B_{ti}$ . Whenever  $B_{ti}$  is less than  $R_5$  for  $0 < t < R_7$ , then  $t$  is within the interval  $(T_{0i}, T_{fi})$ .

*Visual Magnitude Stars deg<sup>-2</sup>*

longitude, deg																	
190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360
57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
47	47	48	49	50	52	53	55	57	59	61	63	65	67	68	69	70	71
41	41	42	44	46	49	53	57	62	66	71	75	79	84	89	92	91	87
35	36	37	39	42	47	54	61	70	82	93	103	123	152	194	230	227	209
32	31	32	35	39	46	55	68	86	110	131	158	233	368	288	199	171	154
29	28	30	33	37	45	57	75	110	149	161	231	410	245	186	154	129	113
31	29	31	34	38	46	61	86	133	172	162	348	237	162	108	87	81	75
29	31	33	35	39	47	65	95	138	134	209	231	155	89	67	60	53	49
31	32	36	38	42	52	70	94	120	120	245	165	102	67	54	47	40	37
36	36	40	42	47	57	71	87	106	183	179	141	85	61	49	42	37	34
43	45	47	49	54	65	74	94	137	254	179	130	80	58	48	41	38	35
55	55	59	61	69	79	95	145	299	238	191	120	75	55	45	39	37	36
75	78	83	93	108	131	180	321	375	255	164	103	71	54	44	38	35	34
111	126	146	175	201	236	382	531	333	218	125	88	67	54	45	39	36	33
213	232	256	281	332	529	540	360	246	140	94	78	66	57	50	45	40	38
557	547	568	580	511	336	287	214	112	94	78	71	65	60	55	51	47	44
243	242	231	216	196	173	146	113	88	75	70	67	63	61	58	55	52	50
110	110	107	102	96	89	82	76	71	68	66	65	62	61	59	58	57	56
66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66

*Summary*

The analysis presented herein is a guide for use of the computer program. The program is intended to compute the daily release window for sky target experiments for the specific requirements of each project. Flexibility in programming techniques was used as much as possible so that the program could be adapted for all projects with similar requirements. A combined window using a maximum of 12 fixed stations or a maximum of 10 fixed stations and one aircraft may be computed. The window output is accurate to within 1 min of time.

*References*

- 1 GE-600 Line Control Cards Reference Manual CPB-1688, Information Systems Equipment Division, General Electric Co., Apr 1970, pp 27-30, 49-52
- 2 DUMONT, RENE Photometry of Zodiacal Light and Atmospheric Continuum by H-M Method and Barbier Correlations, and Tenerife Results About the Shape of the Zodiacal Cloud The Zodiacal Light and the Interplanetary Medium, NASA SP-150, 1967, pp 63-69
- 3 ROACH, F E, AND MEGILL, LAWRENCE R Integrated Starlight Over the Sky *Astrophys J*, vol 133, Jan-May 1961, pp 228-242
- 4 Explanatory Supplement to the Astronomical Ephemeris and the American Ephemeris and Nautical Almanac Her Majesty's Stationery Office (London), 1961, pp 24-27



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*Appendix A*  
*Coordinate Transformations*

**GEODETTIC TO GEOCENTRIC**

Let  $P$  be a point above the Earth's surface with coordinates  $(h, \phi_g, \lambda)$ , where

- $h$  = height of the point above the Earth's surface
- $\phi_g$  = geodetic latitude in radians of the point
- $\lambda$  = longitude in radians of the point

Let  $Q$  be a projection of  $P$  onto the Earth's surface. Consider the points  $P$  and  $Q$  in two dimensions as seen on figure A-1. This figure represents a quarter of an ellipsoid cut along a meridian plane. Let

- $a$  = semimajor axis in kilometers of the ellipse (in the  $x$  direction)
- $b$  = semiminor axis in kilometers of the ellipse (in the  $y$  direction)

The general equation of an ellipse is

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \quad (\text{A-1})$$

For the Earth's ellipsoid, several geoids have been described. In this analysis, the Fischer Earth model is used, where  $a = 6378.166$  km and the Earth's flattening  $F = 1/298.30$ . By definition,

$$F = \frac{a - b}{a}$$

or

$$b = a - aF = a(1 - F)$$

We can now determine the coordinates of point  $Q$  in figure A-1 as measured from the origin  $O$ .

From equation (A-1),

$$\begin{aligned} \frac{x^2}{a^2} + \frac{y^2}{b^2} &= 1 \\ b^2x^2 + a^2y^2 &= a^2b^2 \\ y^2 &= \frac{a^2b^2 - b^2x^2}{a^2} \\ y &= \frac{b}{a} \sqrt{a^2 - x^2} \end{aligned} \quad (\text{A-2})$$

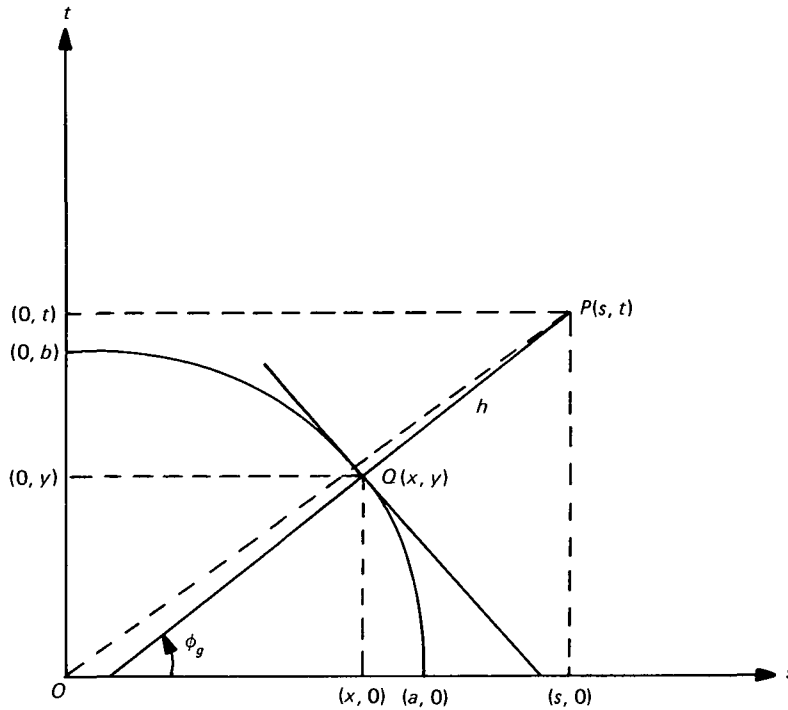


FIGURE A-1 – Geodetic coordinate system

Differentiating equation (A-1),

$$\frac{2x}{a^2} dx + \frac{2y}{b^2} dy = 0$$

$$b^2x dx + a^2y dy = 0 \quad (\text{A-3})$$

$$\frac{dy}{dx} = \frac{-b^2x}{a^2y}$$

gives the slope of the line tangent to the ellipse at  $Q$ . The line perpendicular to this tangent has its slope equal to  $-1/(dy/dx)$ . This, by definition, is the tangent of the geodetic latitude  $\phi_g$ . Hence,

$$-\frac{dx}{dy} = \tan \phi_g \quad (\text{A-4})$$

Combining equations (A-3) and (A-4),

$$\tan \phi_g = \frac{a^2y}{b^2x}$$

or

$$y = \frac{b^2x \tan \phi_g}{a^2} \quad (\text{A-5})$$

Combining equations (A-5) and (A-2),

$$\frac{b}{a} \sqrt{a^2 - x^2} = \frac{b^2}{a^2} x \tan \phi_g$$

Solving for  $x$

$$(a^2 - x^2) = \frac{b^2}{a^2} x^2 \tan^2 \phi_g$$

$$a^4 - a^2 x^2 = b^2 x^2 \tan^2 \phi_g$$

$$x^2 = \frac{a^4}{a^2 + b^2 \tan^2 \phi_g}$$

$$x = \pm \frac{a^2}{\sqrt{a^2 + b^2 \tan^2 \phi_g}}$$

From figure A-1 and the problem definition, we see that the  $x$  value is always positive. Hence,

$$x = \frac{a^2}{\sqrt{a^2 + b^2 \tan^2 \phi_g}} \quad (\text{A-6})$$

We now resolve the values of the coordinates ( $s$ ,  $t$ ) of point  $P$  as measured from the origin.

$$P_s = x + h \cos \phi_g \quad (\text{A-7})$$

$$P_t = y + h \sin \phi_g \quad (\text{A-8})$$

Define the point  $P$  in a three-dimensional coordinate system with the  $x$ -axis in the direction of the Greenwich meridian, the  $z$ -axis as the Earth's polar axis, and the  $y$ -axis completing the right-handed system.

To define  $P$  in this coordinate system (as shown in fig. A-2), recall that our two-dimensional ellipse defined in figure A-1 was cut along the longitude meridian of  $P$ . Hence  $P_s$  is the resultant component of  $P_x$  and  $P_y$  in the  $x$ ,  $y$  plane of figure A-2 and  $P_z = P_t$ . Therefore,

$$P_x = P_s \cos \lambda \quad (\text{A-9})$$

$$P_y = P_s \sin \lambda \quad (\text{A-10})$$

$$P_z = P_t \quad (\text{A-11})$$

The radius vector in kilometers is

$$R = \sqrt{P_x^2 + P_y^2 + P_z^2} \quad (\text{A-12})$$

and the geocentric latitude in radians is

$$\phi_c = \arcsin \frac{P_z}{R} \quad (\text{A-13})$$

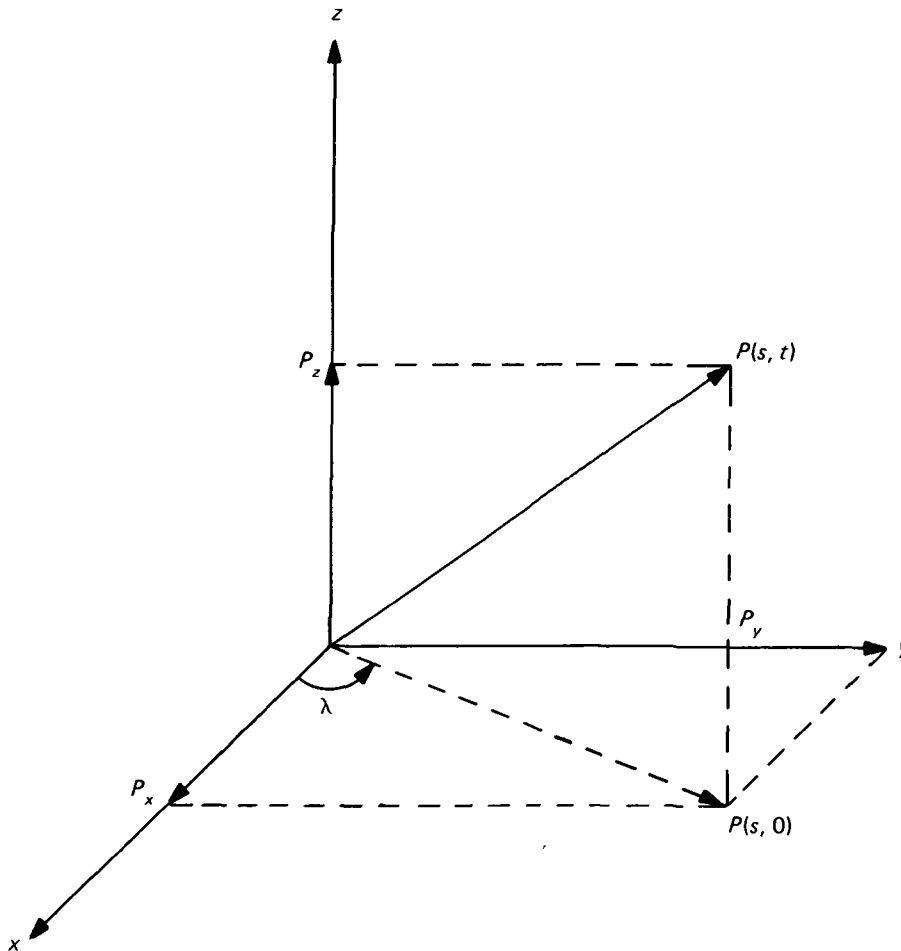


FIGURE A-2 – Geocentric coordinate system

### INERTIAL TO GEOCENTRIC

The inertial coordinate system is defined as a right-handed coordinate system with origin at the Earth's center, the x-axis directed toward the first point of Aries, the z-axis directed toward the polar axis, and the y-axis in the equatorial plane completing the system.

For this transformation, define the sidereal hour angle HA as the angle measured in the equatorial plane from the first point of Aries to the Greenwich meridian at some time  $t$ . Let  $\mathbf{P}$  be a vector in the inertial coordinate system with components

$$P'_x = |\mathbf{P}| \cos \phi_c \cos \lambda \quad (\text{A-14})$$

$$P'_y = |\mathbf{P}| \cos \phi_c \sin \lambda \quad (\text{A-15})$$

$$P'_z = |\mathbf{P}| \sin \phi_c \quad (\text{A-16})$$

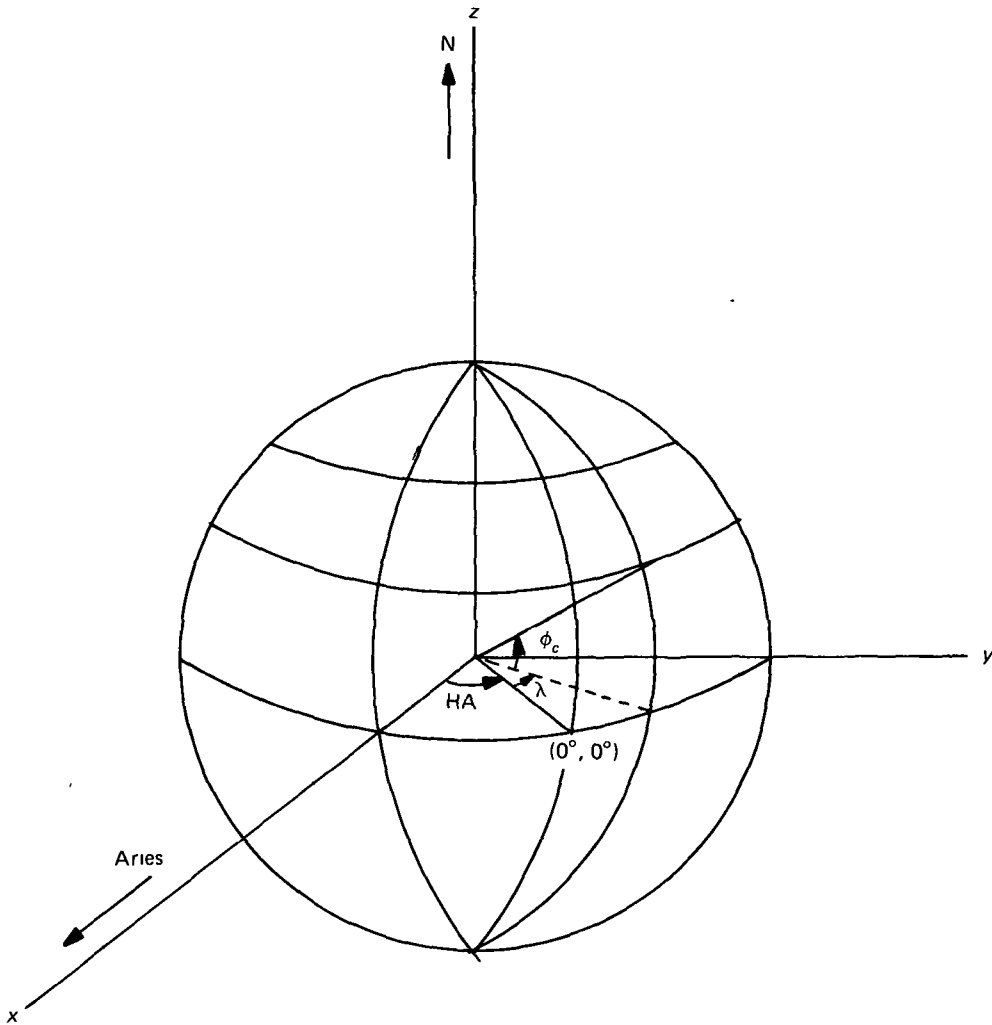


FIGURE A-3 — Inertial to geocentric coordinate transformation

Transformation from inertial to geocentric coordinate systems is a pure rotation counterclockwise about the  $z$ -axis through  $HA$  for some time  $t$ . (See fig. A-3.) Denoting the components of  $P$  in the geocentric system by  $P_x, P_y, P_z$ , we have

$$\begin{bmatrix} P_x \\ P_y \\ P_z \end{bmatrix} = T \begin{bmatrix} P'_x \\ P'_y \\ P'_z \end{bmatrix} \tag{A-17}$$

where

$$T = \begin{bmatrix} \cos HA & \sin HA & 0 \\ -\sin HA & \cos HA & 0 \\ 0 & 0 & 1 \end{bmatrix} \tag{A-18}$$

**GEOCENTRIC TO INERTIAL**

For transformation from the geocentric coordinate system to the inertial system,

$$\begin{bmatrix} P'_x \\ P'_y \\ P'_z \end{bmatrix} = T^{-1} \begin{bmatrix} P_x \\ P_y \\ P_z \end{bmatrix} \quad (\text{A-19})$$

where

$$T^{-1} = \begin{bmatrix} \cos HA & -\sin HA & 0 \\ \sin HA & \cos HA & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad (\text{A-20})$$

**INERTIAL TO TOPOCENTRIC**

The topocentric coordinate system is defined as a right-handed coordinate system with origin at point  $Q(R_i, \phi_c, \lambda)$ . The  $x$ -axis is directed outward toward the zenith of  $Q$ , the  $z$ -axis is directed north, and the  $y, z$  plane is the plane of the local horizon of  $Q$ .

To transform from inertial to topocentric coordinates, first rotate about the  $z$ -axis through the angle  $(HA + \lambda)$  for some time  $t$ . Then rotate these results about the new  $y$ -axis through the geocentric latitude  $\phi_c$ . The origin is then translated from the Earth's center to the point  $Q$ .

Let  $P$  be the vector whose inertial components are  $P'_x, P'_y, P'_z$ , then

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = RT \begin{bmatrix} P'_x \\ P'_y \\ P'_z \end{bmatrix} \quad (\text{A-21})$$

where  $T$  is the  $3 \times 3$  matrix of equation (A-18) and

$$R = \begin{bmatrix} \cos \phi_c & 0 & \sin \phi_c \\ 0 & 1 & 0 \\ -\sin \phi_c & 0 & \cos \phi_c \end{bmatrix} \quad (\text{A-22})$$

Translating from the Earth's center to  $Q$ ,

$$P_{xT} = x - R_i \quad (\text{A-23})$$

$$P_{yT} = y \quad (\text{A-24})$$

$$P_{zT} = z \quad (\text{A-25})$$

where  $R_i$  is the radial distance from the Earth's center to the point  $Q$  in ERU's.

**INERTIAL TO ECLIPTIC**

The ecliptic coordinate system is defined as a right-handed rectangular coordinate system with its center at the Earth's center and  $x$ -axis the angular distance from the inertial  $x$ -axis to the mean longitude of the Sun. The  $x, y$  plane lies in the plane of the ecliptic with the  $y$ -axis  $90^\circ$  counterclockwise from the  $x$ -axis. The  $z$ -axis completes the right-handed system. The transformation from the inertial to ecliptic reference frames is then purely rotational. (See ref. 4.) To perform this transformation, rotate counterclockwise about the inertial  $x$ -axis through the angle of inclination of the ecliptic plane to the equatorial plane  $E$ :

$$\begin{bmatrix} x_e \\ y_e \\ z_e \end{bmatrix} = A \begin{bmatrix} x_i \\ y_i \\ z_i \end{bmatrix} \quad (\text{A-26})$$

where

$$A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos E & \sin E \\ 0 & -\sin E & \cos E \end{bmatrix} \quad (\text{A-27})$$

The ecliptic latitude  $\phi_e$  and ecliptic longitude  $\lambda_e$  are

$$\phi_e = \arcsin \frac{x_e}{\sqrt{x_e^2 + y_e^2 + z_e^2}} \quad (\text{A-28})$$

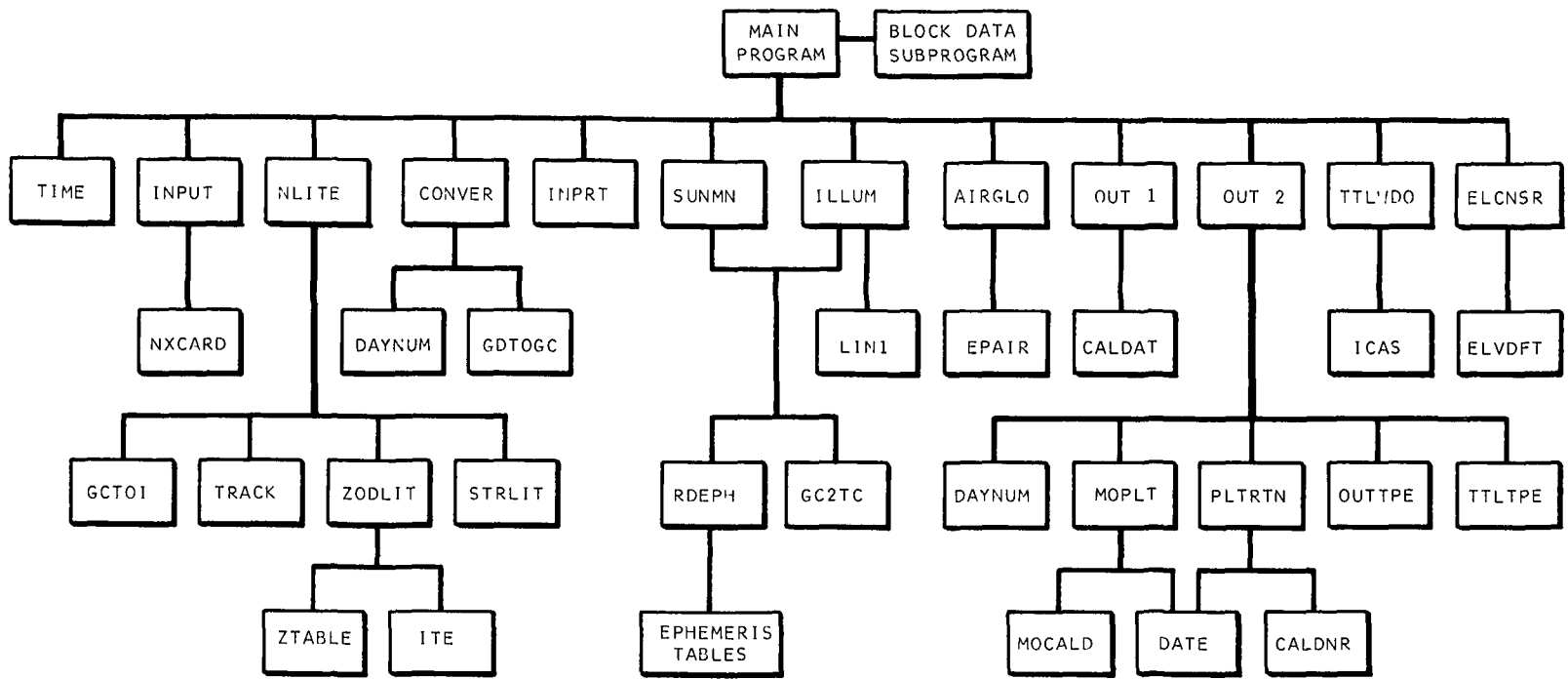
$$\lambda_e = \arctan \frac{y_e}{x_e} \quad (\text{A-29})$$



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*This appendix describes the programming logic used in the computer program and provides a basic understanding of the methods used to develop the defined daily release window requirements. A collection of the flowcharts, a listing of all subroutine documentation cards, and a hierarchy chart of the entire set of subroutines used in the program are included here.*



PROGRAM HIERARCHY CHART

SNUMB = 68427, ACTIVITY # = 02, REPORT CODE = 06, RECORD COUNT = 03290

\*\*\*\*\*TARGET RELEASE WINDOW - PROGRAM NUMBER 1:1,1615

\*\*\*\*\*NASA Wallops version of 02/01/70

\*\*\*\*\*LANGUAGE-FORTRAN IV

\*\*\*\*\*MACHINE-GE 625

\*\*\*\*\*PROGRAM AUTHORS-

CURTIS, C. MARSHALL  
 EVERTON, EDGAR  
 HARMON, THOMAS  
 HANCOCK, DAVID  
 MELVIN, DENNIS  
 MICHAUD, NORMAN

\*\*\*\*\*PURPOSE-

THIS IS THE MAIN PROGRAM WHICH COMPUTES THE RELEASE WINDOWS FOR  
 A SKY TARGET EXPERIMENT.

\*\*\*\*\*METHOD-

THIS PROGRAM PROVIDES AUTOMATIC COMPUTATION OF THE RELEASE  
 WINDOWS SATISFYING THE REQUIREMENTS FOR THE RELEASE CRITERIA.  
 THIS PROGRAM IS DEVELOPED IN MODULAR FORM WITH THE FOLLOWING  
 MAIN FUNCTIONS,..

A. DEFINE PROGRAM INPUTS.

B. DEFINE RE-Occurring PROGRAM CONSTANTS.

C. DEFINE TIME INTERVALS FOR WHICH THE GIVEN TRACKING STATIONS  
 CLOUD RELEASE POINT AND CLOUD POSITION DURING THE TRACKING  
 PERIOD ARE SATISFACTORY FOR THE INPUT VALUES OF THE FOLLOWING  
 CONSTRAINTS,..

1. THE TARGET CLOUD IS NOT WITHIN THE SHADOW OF THE EARTH AT  
 RELEASE TIME OR DURING THE EXPERIMENTAL PERIOD.

2. THE RELATIVE ELEVATION LOOK ANGLE FROM EACH TRACKING  
 STATION TO THE CLOUD WILL BE GREATER THAN THAT SPECIFIED IN  
 INPUT, AT TIME OF RELEASE AND DURING THE EXPERIMENTAL PERIOD

3. THE RELATIVE ELEVATION ANGLE OF THE SUN FROM EACH  
 TRACKING STATION IS BELOW THAT OF THE GIVEN CONSTRAINT.

4. THE RELATIVE ELEVATION ANGLE OF THE MOON FROM EACH  
 TRACKING STATION IS BELOW THAT OF THE GIVEN CONSTRAINT.

5. THE SKY BACKGROUND BRIGHTNESS OF THE CLOUD DUE TO  
 AIRGLOW, ZODIACAL LIGHT, AND STARLIGHT AS SEEN FROM EACH  
 TRACKING STATION WILL BE LESS THAN THE INPUT REQUIREMENT.

D. PROVIDE THESE ABOVE STATED TIME INTERVALS IN OUTPUT FORMAT.

E. PROVIDE THE CAPABILITY FOR MULTIPLE CASE RUNS WITH VARYING  
 RELEASE POINTS AND DRIFT RATES.

F. COMBINE THESE ABOVE STATED TIME INTERVALS ON A DAILY BASIS,  
 AS TO DEFINE A DAILY TIME PERIOD FOR WHICH ALL CONSTRAINTS  
 WILL BE MET FOR ALL TRACKING STATIONS SIMULTANEOUSLY.

G. CREATE A PLOT OF THESE COMBINED DAILY RELEASE WINDOWS.

THE PROGRAM HAS THE FOLLOWING OPTIONS.:

- A, UP TO TWELVE FIXED TRACKING STATIONS MAY BE INPUT,
- B, IF A MOVING OR AIRCRAFT TRACKING STATION IS INPUT; THEN THE MAXIMUM NUMBER OF FIXED STATIONS ALLOWED IS ELEVEN, THE POSITION OF THE MOVING STATION AT RELEASE TIME AND AT HALF HOUR INCREMENTS INTO THE EXPERIMENTAL PERIOD MUST BE INPUT,
- C, A MAXIMUM OF THREE HOURS FOR THE EXPERIMENTAL PERIOD MAY BE USED IN INCREMENTS OF ONE HALF HOUR.
- D, NOMINAL VALUES FOR PROGRAM CALCULATION DATE PERIOD, GENERAL PROGRAM OPTIONS, TRACKING STATIONS AND RELEASE POINT COORDINATES, AND THE VALUES FOR THE CONSTRAINTS CAN BE PRESET.
- E, THE GENERAL OPTIONS FOR THE PROGRAM CONSIST OF THE FOLLOWING.:

1. PERFORM THE PROGRAM CALCULATIONS.
2. CREATE A TAPE ON FILE 11 TO STORE THE SUN AND MOON DAILY TIME INTERVALS FOR THE GIVEN TRACKING STATIONS OR USE AN EXISTING TAPE READ IN ON TAPE FILE 11 IN ORDER TO SKIP THESE CALCULATIONS.
3. CREATE A TAPE ON FILE 07 OF THE DAILY TIME INTERVALS FOUND FOR EACH CONSTRAINT AND FOR EACH STATION AND/OR PRINT AN EXISTING TAPE THROUGH FILE 07.
4. CREATE A TAPE ON FILE 09 OF THE COMBINED DAILY RELEASE WINDOWS AND/OR PRINT AN EXISTING TAPE THROUGH FILE 09.
5. CREATE A TAPE FOR PLOTTING FROM THE DATA ON TAPE FILE 09 OR NOT.

THE FORMAT OF THIS MAIN PROGRAM IS TO ...

- A, READ THE INPUTS.
  - B, PERFORM PROGRAM CALCULATIONS TO YIELD THE PROGRAM CONSTANTS
  - C, CALCULATE THE PARAMETERS FOR THE CONSTRAINTS NOT DEPENDENT UPON TIME.
  - D, FIND THE TIME INTERVALS FOR EACH CONSTRAINT AND STORE ON A DAILY BASIS.
  - E, PROVIDE THE REQUESTED PRINTED OUTPUT AND/OR PLOT TAPE.
  - F, REPEAT A THRU E FOR MULTIPLE CASE RUNS,
- IN SELECTING THE OPTION NOT TO CALCULATE THEN B, C, AND D, ARE OMITTED, FOR DETAILED EXPLANATION OF ENTIRE PROGRAM FUNCTIONS SEE THE COMMENTS AVAILABLE WITH EACH SUBROUTINE.

\*\*\*\*\*SYSTEMS INPUT FILES\*

- FILE 05 = CARD READER
- FILE 07 = IF OPTION 'ICALC' = 1 AND 'IPRT7' = 0
- FILE 09 = IF OPTION 'ICALC' = 1 AND 'IPRT9' = 0
- FILE 11 = IF OPTION 'IPRT11' = 1

## \*\*\*\*\*SYSTEMS OUTPUT FILES-

FILE 01 = IF 'PLOT' = 0,1 (NOTE TAPE FILE 01 MUST BE RECORDED AT 556 BPI)

FILE 06 = PRINTER  
CONTAINS DATA FROM FILE 07 IF IPRT7 = 0  
CONTAINS DATA FROM FILE 09 IF IPRT9 = 0

FILE 07 = IF 'ICALC' = 0

FILE 09 = IF 'ICALC' = 0

FILE 11 = IF 'IPRT11' = 0

## \*\*\*\*\*ADDITIONAL SYSTEMS FILES-

FILE 11 = FOR MORE THAN 1 CASE WITHIN JOB RUN.

FILE 12 = FOR MORE THAN 1 CASE WITHIN JOB RUN.

FILE 13 = ALWAYS REQUIRED.

## \*\*\*\*\*INPUT-

ICALC            -INTEGER CODE TO SIGNAL IF PROGRAM CALCULATIONS  
                  -ARE REQUESTED  
                  -#0;       PERFORM PROGRAM CALCULATIONS  
                  -#1, DO NOT PERFORM PROGRAM CALCULATIONS

IPRT7            -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07  
                  -#0, PRINT FILE 07 DATA  
                  -#1, DO NOT PRINT FILE 07 DATA

IPRT9            -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09  
                  -DATA  
                  -#0, PRINT FILE 09 DATA  
                  -#1, DO NOT PRINT FILE 09 DATA

IPRT11           -INTEGER CODE TO SIGNAL REQUEST CREATING FILE 11  
                  -DATA  
                  -#0, DO NOT CREATE FILE 11 TAPE USE EXISTING INPUT  
                  -TAPE ON FILE 11  
                  -#1, CREATE FILE 11 TAPE  
                  -#2, DO NOT USE FILE 11

ICASE            -CASE NUMBER (INTEGER)

IFINAL           -INTEGER CODE TO DESIGNATE LAST INPUT CASE  
                  -#0, MORE CASES TO FOLLOW

IPRT7            -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07

IJJUL            -JULIAN DATE FOR CURRENT DATA

NDPJ0            -NUMBER OF DAYS PAST EPOCH DATE TO DATE FOR  
                  -STARTING CALCULATIONS (INTEGER)

NDTE            -NUMBER OF DAYS PAST EPOCH DATE TO DATE FOR  
                  -STOPPING CALCULATIONS (INTEGER)

## DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

EPOCH            -JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS ON  
                   -FILE 09  
 RVC              -RADIAL DISTANCE FROM EARTH CENTER TO RELEASE  
                   -POINT (ERJ)  
 DRIFT            -THE SPACE-FIXED DRIFT OF CLOJD (DEG/HR)  
 R(2)             -ELEVATION CONSTRAINT (RADIAN)  
 R(6)             -CLOUD DRIFT RATE (RADIAN/HR)  
 R(7)             -MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS)  
 NS               -THE NUMBER OF STATIONS USED IN THE PROGRAM  
 NOS(12)         -AN ARRAY CONTAINING THE STATION NUMBERS USED  
 RTH              -CONVERSION FACTOR FROM RADIAN TO HOURS  
 HTR              -CONVERSION FACTOR FROM HOURS TO RADIAN  
 SUNL             -MEAN LONGITUDE OF THE SUN AT 0 HRS,UT.  
 GHA              -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS  
                   -UNIVERSAL TIME (HRS)  
 SHADOW          -RADIUS OF EARTH SHADOW REGION (RADIAN)  
 GAMMA           -COSINE OF 'SHADOW'

## \*\*\*\*\*OUTPUT-

WINDOW(6,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES,  
                   -1ST INDEX FOR STORING START/STOP TIMES,  
                   -1,3,5 FOR START TIMES  
                   -2,4,6 FOR STOP TIMES  
                   -2ND INDEX FOR THE CONSTRAINT  
                   - 1=EARTH SHADOW  
                   - 2=ELEVATION  
                   - 3=SUN  
                   - 4=MOON  
                   - 5=TOTAL SKY BACKGROUND BRIGHTNESS  
                   -3RD INDEX FOR THE STATION NUMBER

## \*\*\*\*\*RESTRICTIONS-

THOSE ALREADY NOTED UNDER METHOD, DETAILED RESTRICTIONS ON  
 VARIOUS PHASES OF THE PROGRAM DEFINITION ARE NOTED IN EACH  
 SUBROUTINE.

## \*\*\*\*\*SUBPROGRAMS REQUIRED-

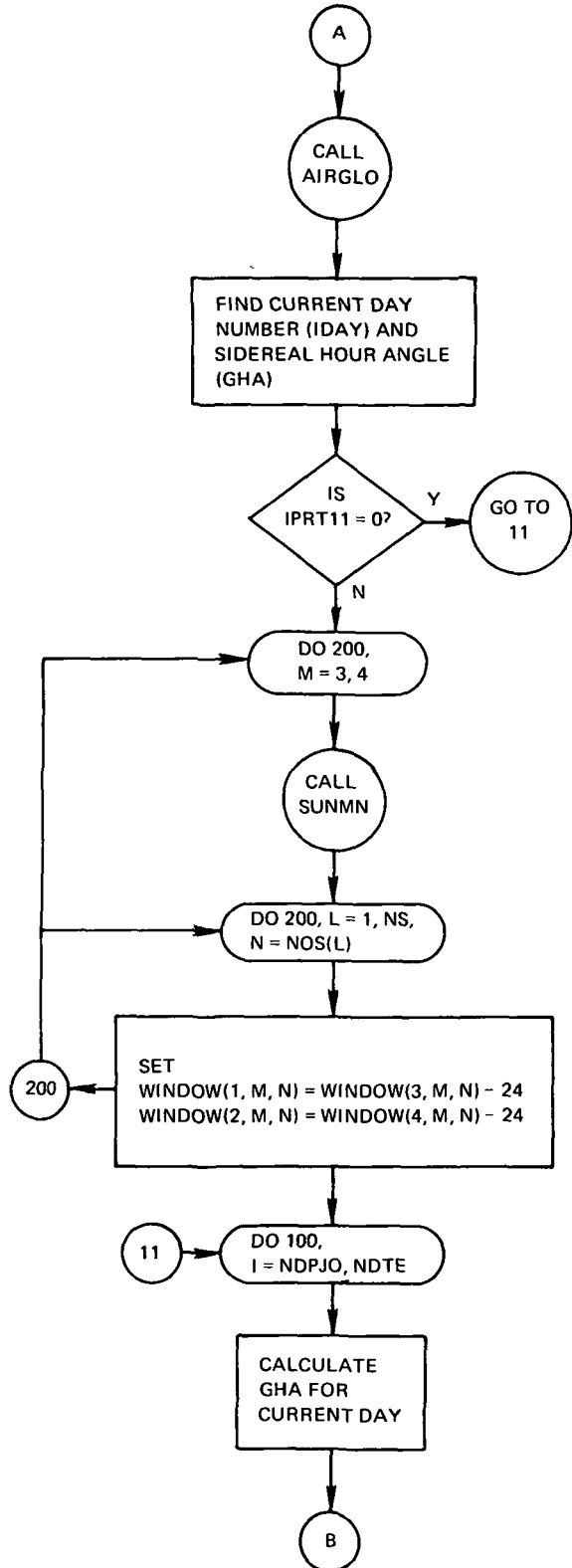
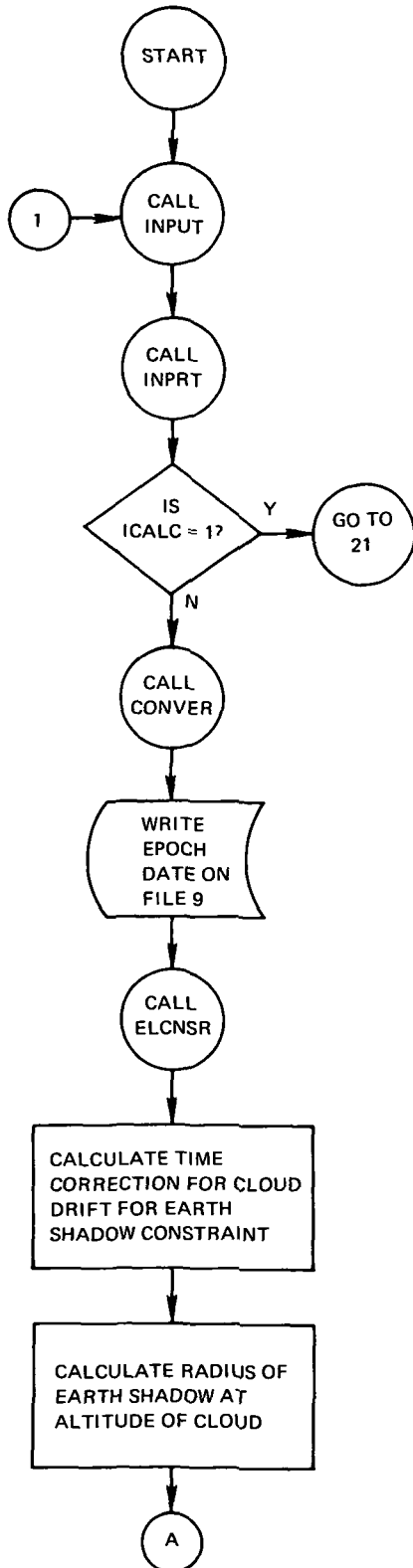
BLOCK DATA  
 INPUT  
           NXCARD  
 INPRT  
 CONVER  
           DAYNUM  
           GDTGDC

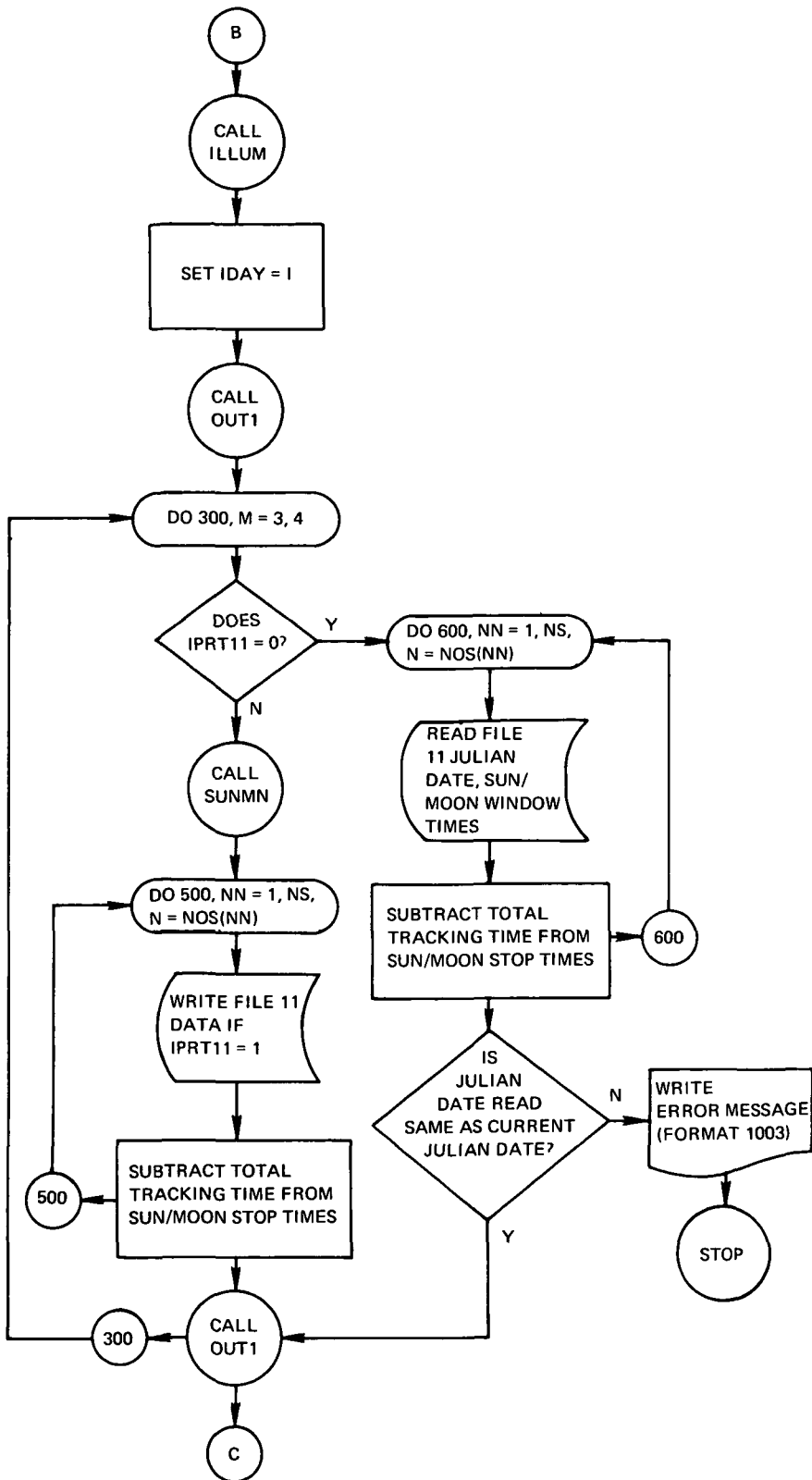
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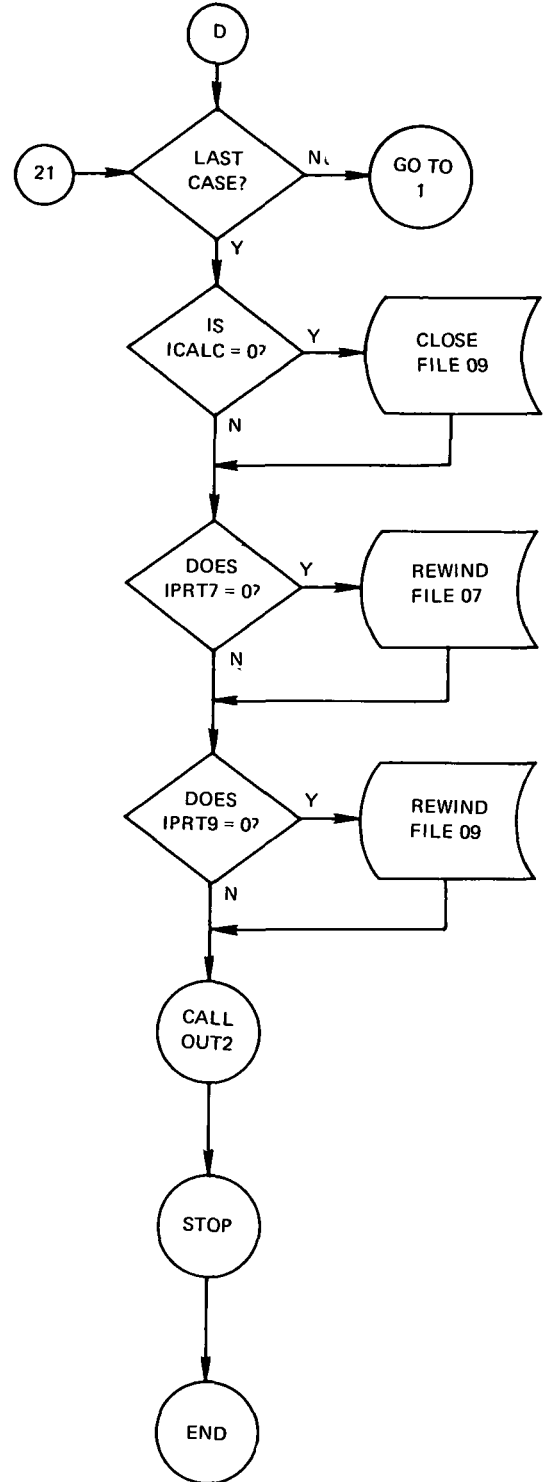
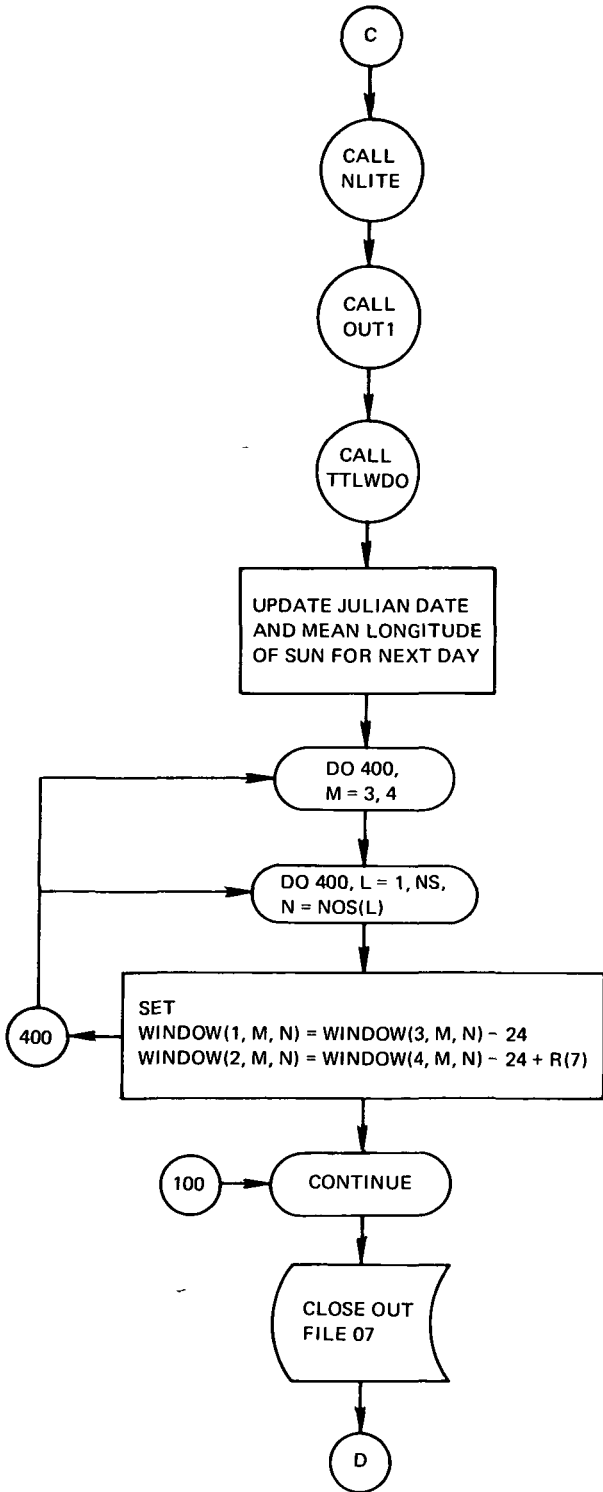
TIME
ELCNSR
AIRGLO
SUNMN
ILLUM
      LIN1
      GC2TC
      RDEPW
      EPHERMERIS TABLES
ALITE
      GCTOI
      TRACK
      STRLIT
      ZODLIT
      ITE
      ZTABLE
OUT1
      CALDAT
TTLWDO
      ICAS
OUT2
      TTLTPE
      OUTTPE
      DAYNUM
      PLTRTN
      MOPLOT
      DATE
      CALDNR
      MOCALD
      PLOT

```









```

*****BLOCK DATA SUBPROGRAM*****
*****NASA WALLOPS VERSION OF 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE-GE 625
*****PURPOSE-
      TO DEFINE NOMINAL INPUT PARAMETERS AND TO DEFINE CONVERSION
      FACTORS FOR USE IN THE BIGWINDOW PROGRAM,
*****METHOD-
      DEFINE CONSTANTS AND NOMINAL PARAMETERS THROUGH DATA STATEMENTS

*****INPUT-
      NONE

*****OUTPUT-
      KMONTH      -MONTH NUMBER FOR STARTING CALCULATIONS
      KDAY        -DAY   NUMBER FOR STARTING CALCULATIONS
      KYEAR       -YEAR  NUMBER FOR STARTING CALCULATIONS
      LMONTH      -MONTH NUMBER FOR STOPPING CALCULATIONS
      LDAY        -DAY   NUMBER FOR STOPPING CALCULATIONS
      LYEAR       -YEAR  NUMBER FOR STOPPING CALCULATIONS
      KMO         -MONTH PLOTTING AND/OR PRINTING TO BEGIN
      KDA         -DAY   PLOTTING AND/OR PRINTING TO BEGIN
      KYR         -YEAR  PLOTTING AND/OR PRINTING TO BEGIN
      LMO         -MONTH PLOTTING AND/OR PRINTING TO END
      LDA         -DAY   PLOTTING AND/OR PRINTING TO END
      LYR         -YEAR  PLOTTING AND/OR PRINTING TO END
      I CALC      -INTEGER CODE TO SIGNAL IF PROGRAM CALCULATIONS
                  -ARE REQUESTED
                  -#0,   PERFORM PROGRAM CALCULATIONS
                  -#1,DO NOT PERFORM PROGRAM CALCULATIONS
      I PRT7      -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07
                  -#0,PRINT FILE 07 DATA
                  -#1,DO NOT PRINT FILE 07 DATA
      I PRT9      -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09
                  -DATA

```

## DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

```

-#0; PRINT FILE 09 DATA
-#1; DO NOT PRINT FILE 09 DATA

IPRT11 -INTEGER CODE TO SIGNAL REQUEST CREATING FILE 11
        -DATA
        -#0; CREATE FILE 11 TAPE
        -#1; DO NOT CREATE FILE 11 TAPE USE EXISTING INPUT
        -TAPE ON FILE 11
        -#2; DO NOT USE FILE 11

IPL0T  -INTEGER CODE TO SIGNAL REQUEST PLOTTING DATA
        -#0; CREATE A TAPE FOR PLOTTING DATA FOR A
        -   CALENDAR YEAR THROUGH FILE 01 AT 556 BPI
        -#1; CREATE A TAPE FOR PLOTTING DATA FOR A
        -   CALENDAR MONTH THROUGH FILE 01 AT 556 BPI
        -#2; DO NOT CREATE A PLOT TAPE

PHIPDG -GEODETTIC LATITUDE OF RELEASE POINT (DEG)

LAMPDG -LONGITUDE OF RELEASE POINT (DEG)

HEIGHT -ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE
        -(EQU)

RESTR(2) -MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION
        -TO THE RELEASE POINT (DEG)

RESTR(3) -MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH
        -TRACKING STATION (DEG)

RESTR(4) -MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH
        -TRACKING STATION (DEG)

RESTR(5) -MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE
        -RELEASE POINT AS SEEN FROM EACH TRACKING STATION
        -(RAYLEIGHS)

RESTR(6) -CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD
        -AFTER RELEASE RELATIVE TO THE EARTH (KM/SEC)

RESTR(7) -MINIMUM TRACKING PERIOD REQUIRED (HRS)

RESTR(8) -ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE
        -RELATIVE TO THE EARTH (KM/SEC)

NS      -THE NUMBER OF STATIONS USED IN THE PROGRAM

NOS(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED

NAME(3,12) -NAME OF TRACKING STATIONS USED

PHI(12)  -GEODETTIC LATITUDE OF TRACKING STATION (DEG)

LAMBDA(12) -LONGITUDE OF TRACKING STATION (DEG)

ALT(12)  -ALTITUDE OF TRACKING STATION ABOVE EARTH SURFACE
        -(FT)

MOVE(12) -CODE NUMBER TO DETERMINE IF STATION COORDINATES
        -ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT
        -#0; FOR FIXED STATION
        -#1; FOR AIRCRAFT

PNAME(3,7) -ALPHANUMERIC DESCRIPTION FOR AIRCRAFT POSITION

```

-DURING TRACKING PERIOD

PLAT(7) -GEODETTIC LATITUDE OF AIRCRAFT DURING  
-EXPERIMENTAL PERIOD (DEG)

PLON(7) -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD  
-(DEG)

PALT(7) -ALTITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD  
-(DEG)

LTR -CONVERSION FACTOR FROM DEGREES TO RADIANS

RTD -CONVERSION FACTOR FROM RADIANS TO DEGREES

HTR -CONVERSION FACTOR FROM HOURS TO RADIANS

RTH -CONVERSION FACTOR FROM RADIANS TO HOURS

AU -CONVERSION FACTOR FROM ASTRONOMICAL UNITS TO  
-EARTH RADII UNITS

DELTA(3) -APPROXIMATE PERIOD OF SUN MOTION (HRS)

DELTA(4) -APPROXIMATE PERIOD OF MOON MOTION (HRS)

ERM -CONVERSION FACTOR FROM EARTH RADII UNITS TO  
-KILOMETERS

HALFPI -VALUE OF 90 DEGREES IN RADIANS

WINDOW(6,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES,  
-1ST INDEX FOR STORING START/STOP TIMES,  
-1,3,5 FOR START TIMES  
-2,4,6 FOR STOP TIMES  
-2ND INDEX FOR THE CONSTRAINT  
- 1=EARTH SHADOW  
- 2=ELEVATION  
- 3=SUN  
- 4=MOON  
- 5=TOTAL SKY BACKGROUND BRIGHTNESS  
-3RD INDEX FOR THE STATION NUMBER

LINE -LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT  
-HEADING

\*\*\*\*\*RESTRICTIONS-  
NONE KNOWN

\*\*\*\*\*SUBPROGRAMS REQUIRED-  
NONE

\*\*\*\*\*SUBROUTINE INPUT\*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 02/01/70

\*\*\*\*\*LANGUAGE=FORTRAY IV

\*\*\*\*\*MACHINE-GE 625

\*\*\*\*\*PURPOSE-

TO READ INPUT PARAMETERS FROM CARD READER USING THE READING  
PROCESS DEFINED THROUGH SUBROUTINE VXCARD.

## \*\*\*\*\*METHOD\*

THIS SUBROUTINE READS INPUT CARDS IN ANY ORDER EXCEPT FOR THE 'I' OR LAST CARD, EACH CARD IS FIRST 'LOOKED AT' USING SUBROUTINE NXCARD. COLUMN 1 OF EACH CARD CONTAINS THE CODE LETTER SIGNIFYING WHAT VARIABLES ARE CONTAINED ON THE CARD, THE CARD CODE IS CHECKED AND THE CARD IS READ INTO THE PROGRAM BY THE CORRECT FORMAT AS DETERMINED FROM THE CARD CODE, IT IS NOT NECESSARY TO DEFINE ALL INPUT PARAMETERS REQUIRED TO GENERATE PROGRAM DATA, EACH INPUT VARIABLE IS DEFINED IN THE BLOCK DATA SUBPROGRAM FOR NOMINAL VALUES, CHANGES TO ANY ONE OR MORE NOMINAL VALUE DEFINED ON ONE CARD REQUIRES THAT ALL VARIABLES SPECIFIED FOR THAT CARD MUST BE INCLUDED, OMISSION OF ANY VARIABLE FROM A CARD WILL BE INTERPRETED TO HAVE A VALUE OF ZERO AND WILL OVERRIDE THE NOMINAL VALUE STORED THROUGH THE BLOCK DATA SUBPROGRAM.

## \*\*\*\*\*INPUT\*

VARIABLES ARE CARD INPUTS WITH THE FOLLOWING SPECIFIC CARD AND COLUMN LOCATIONS, ALL VARIABLES SPECIFIED AS INTEGERS MUST BE RIGHT-JUSTIFIED, THOSE VARIABLES NOT SPECIFIED AS INTEGERS, HOLLERITH, OR ALPHANUMERIC ARE FLOATING POINT AND MUST BE READ IN THE UNITS NOTED,

## A CARD - START/STOP DATE

01	*	A	(HOLLERITH)
03=04	*	STARTING MONTH	(INTEGER)
06=07	*	STARTING DAY	(INTEGER)
09=12	*	STARTING YEAR	(INTEGER)
14=15	*	FINAL MONTH	(INTEGER)
17=18	*	FINAL DAY	(INTEGER)
20=23	*	FINAL YEAR	(INTEGER)

## B CARD - START/STOP DATE FOR OUTPUT

01	*	B	(HOLLERITH)
03=04	*	STARTING MONTH	(INTEGER)
06=07	*	STARTING DAY	(INTEGER)
09=12	*	STARTING YEAR	(INTEGER)
14=15	*	FINAL MONTH	(INTEGER)
17=18	*	FINAL DAY	(INTEGER)
20=23	*	FINAL YEAR	(INTEGER)

## C CARD - PROGRAM OPTIONS

01	*	C	(HOLLERITH)
04		PROGRAM CALCULATION	
		* 0 DO CALCULATIONS FOR DATES SHOWN	
		* 1 SKIP CALCULATIONS-ONLY PRINT FILES 01,07,09	
06		PRINT FILE 07	
		* 0 PRINT FILE 07	
		* 1 DO NOT PRINT FILE 07	
08		PRINT FILE 09	
		* 0 PRINT FILE 09	
		* 1 DO NOT PRINT FILE 09	
10		SUN AND MOON CALCULATIONS	
		* 0 USE FILE 11 FOR WINDOW TIMES FOR SUN AND MOON	
		* 1 CREATE FILE 11 ON SUN AND MOON TIMES	
		* 2 DO NOT USE FILE 11	
12		CALCOMP PLOTTER OPTION	
		* 0 GENERATE CALCOMP PLOT DATA ON FILE 01 FOR A	
		CALENDAR YEAR	
		* 1 GENERATE CALCOMP PLOT DATA ON FILE 01 FOR A	
		CALENDAR MONTH	
		* 2 DO NOT GENERATE CALCOMP OUTPUT	

## D CARD - LOCATION OF RELEASE POINT

01 \* D (HOLLERITH)  
 06=15 \* GEODETIC LATITUDE OF RELEASE POINT (DEG)  
 16=25 \* LONGITUDE OF RELEASE POINT (DEG)  
 26=35 \* ALTITUDE ABOVE THE BARTH'S SURFACE ((ERU)

## E CARD - BRIGHTNESS AND ELEVATION CONSTRAINTS

01 \* E (HOLLERITH)  
 06=10 \* MINIMUM ELEVATION OF RELEASE POINT (DEG)  
 11=15 \* DEPRESSION ANGLE OF THE SUN (DEG)  
 16=20 \* DEPRESSION ANGLE OF THE MOON (DEG)  
 21=25 \* TOTAL SKY BACKGROUND BRIGHTNESS (RAYLEIGHS)  
 26=30 \* DRIFT RATE OF CLOUD (KM/SEC)  
 31=35 \* TOTAL TRACKING TIME (HRS)  
 36=40 \* 1/2 CLOUD'S GROWTH RATE (KM/SEC)

## F CARD - STATIONS TO BE COMBINED

01 \* F (HOLLERITH)  
 03=04 \* THE NUMBER OF STATIONS TO COMBINE  
 06=07 \* THE NUMBER OF THE FIRST STATION

## G CARD - TRACKING SITE POSITIONAL DATA

01 \* G (HOLLERITH)  
 03=04 \* THE CODE NUMBER OF THIS STATION (INTEGER,LT,12)  
 05=06 \* CODE FOR FIXED OR AIRCRAFT TRACKING STATION (INT,)  
       =0, STATION IS FIXED  
       =1, STATION IS AIRCRAFT  
 08=25 \* THE NAME OF THE TRACKING SITE (ALPHANUMERIC)  
 26=35 \* GEODETIC LATITUDE (DEG)  
 36=45 \* LONGITUDE (DEG)  
 46=55 \* ALTITUDE (FEET)

## H CARD - POSITIONS OF AIRCRAFT DURING EXPERIMENTAL PERIOD

01 \* H (HOLLERITH)  
 03=04 \* THE NUMBER OF THE AIRCRAFT STATION (INTEGER)  
 05=06 \* INDEX NUMBER FOR AIRCRAFT POSITION DURING  
       THE EXPERIMENTAL PERIOD. THE AIRCRAFT POSITION  
       MUST BE IN HALF HOUR INCREMENTS WITH THE FIRST  
       INDEX =2 FOR THE POSITION AT .5 HRS. AFTER  
       RELEASE (INTEGER)  
 08=25 \* THE NAME OF THE TRACKING SITE (ALPHANUMERIC)  
 26=35 \* GEODETIC LATITUDE (DEG)  
 36=45 \* LONGITUDE (DEG)  
 46=55 \* ALTITUDE (FT)

## I CARD - FINAL CARD TO SPECIFY END OF CASE

01 \* I (HOLLERITH)  
 02=05 \* CASE NUMBER (INTEGER)  
 06=07 \* CODE FOR FINAL INPUT CASE  
       =0, MORE CASES TO FOLLOW  
       =1, THIS IS THE FINAL CASE

## \*\*\*\*\*OUTPUT-

      NONE

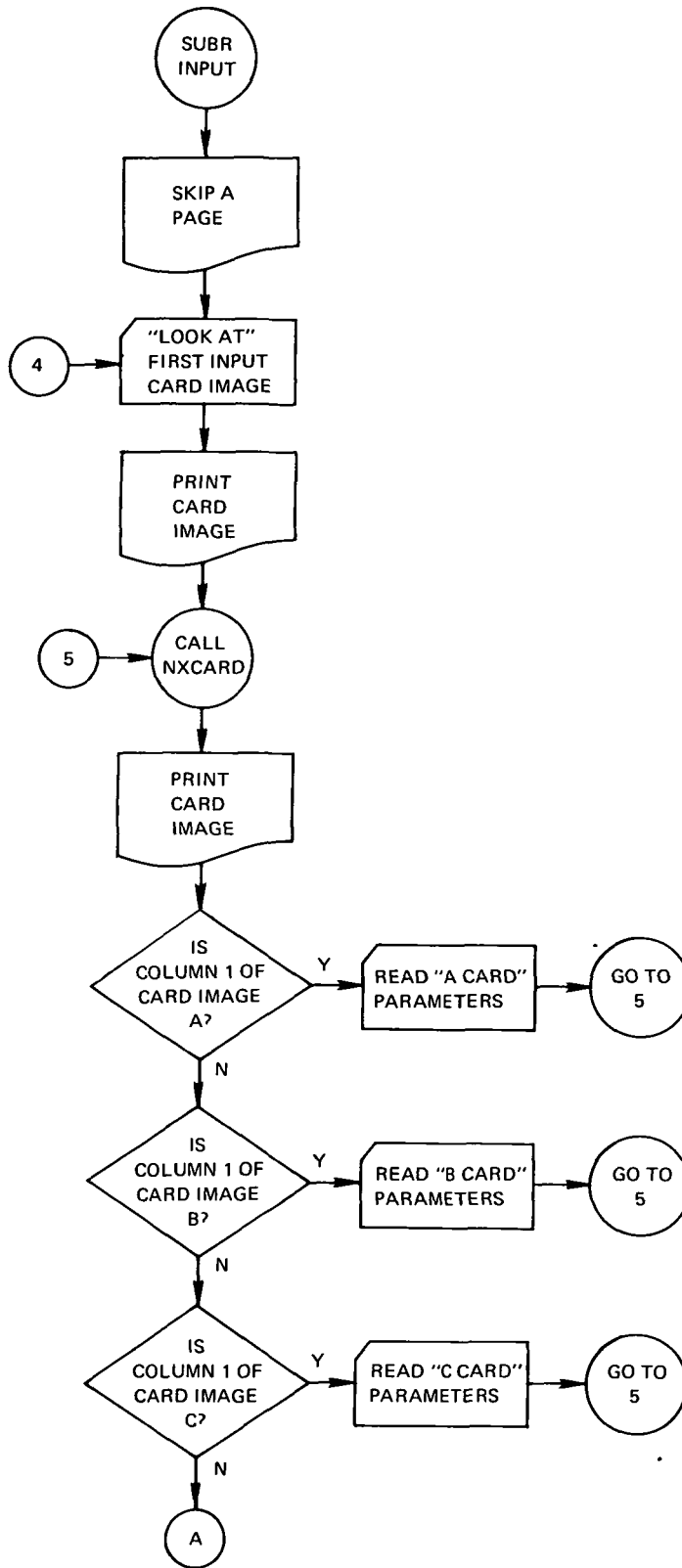
## \*\*\*\*\*RESTRICTIONS=

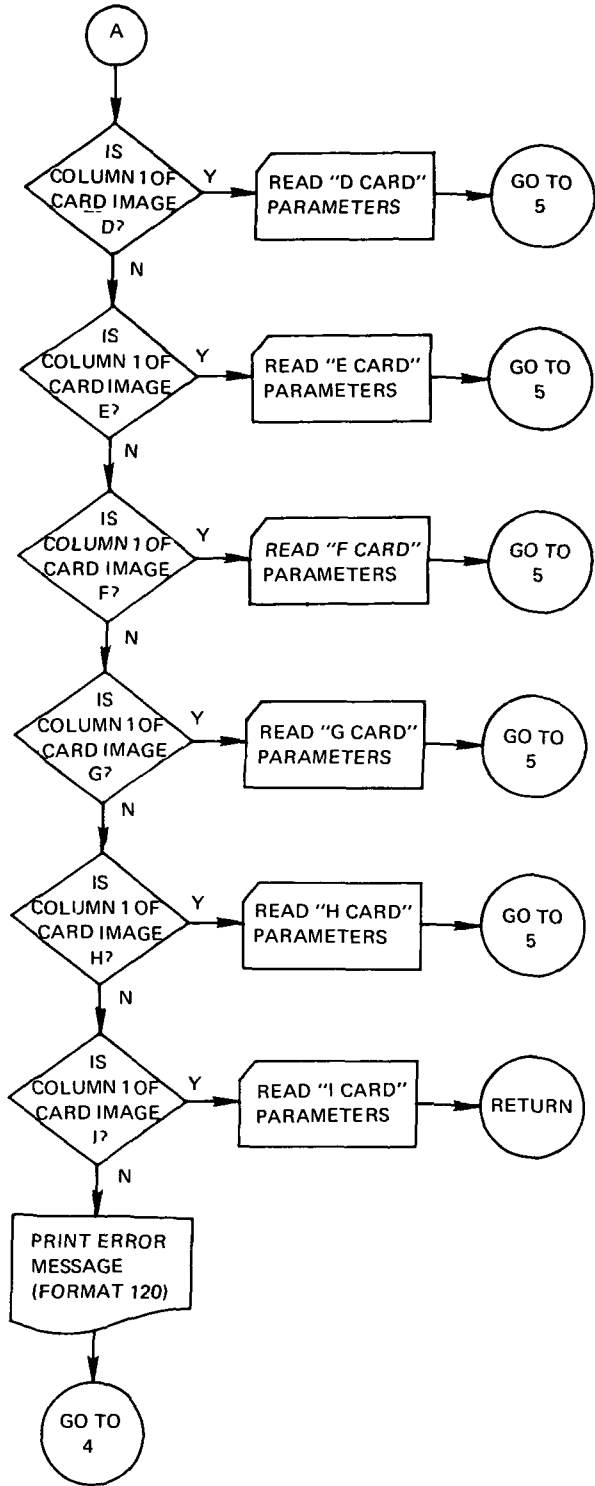
A BLANK CARD OR DUMMY TITLE MUST PRECEDE ANY INPUT DATA FOR EACH CASE. THE 'I' CARD MUST ALWAYS BE THE LAST CARD OF EACH CASE. A PROGRAM EXECUTE USING ALL NOMINAL VALUES MUST HAVE AT LEAST THE BLANK CARD AND THE 'I' CARD FOR INPUT.

## \*\*\*\*\*SUBPROGRAMS REQUIRED-

      NXCARD







```

*****SUBROUTINE INPRT*****
*****NASA Wallops version of 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE-GE 625
*****PURPOSE-
  TO WRITE ALL PROGRAM INPUTS IN A FORMAT WHICH COMPLETELY
  DESCRIBES THE INPUT PARAMETERS TO BE USED IN THE PROGRAM
  EXECUTION.
*****METHOD-
  ALL VARIABLES SPECIFIED IN SUBROUTINE INPUT ARE PRINTED IN A
  MANNER TO DESCRIBE FULLY TO THE PROGRAM USER THE INPUTS USED TO
  GENERATE PROGRAM OUTPUTS, THE FORMAT GENERATOR ROUTINE IS USED
  IN LIEU OF CUMBERSOME NORMAL FORMAT STATEMENTS FOR PRINT
  FORMATS.
*****INPUT-
  KMONTH      -MONTH NUMBER FOR STARTING CALCULATIONS
  KDAY        -DAY   NUMBER FOR STARTING CALCULATIONS
  KYEAR       -YEAR  NUMBER FOR STARTING CALCULATIONS
  LMONTH      -MONTH NUMBER FOR STOPPING CALCULATIONS
  LDAY        -DAY   NUMBER FOR STOPPING CALCULATIONS
  LYEAR       -YEAR  NUMBER FOR STOPPING CALCULATIONS
  KMO         -MONTH PLOTTING AND/OR PRINTING TO BEGIN
  KDA         -DAY   PLOTTING AND/OR PRINTING TO BEGIN
  KYR         -YEAR  PLOTTING AND/OR PRINTING TO BEGIN
  LMO         -MONTH PLOTTING AND/OR PRINTING TO END
  LDA         -DAY   PLOTTING AND/OR PRINTING TO END
  LYR         -YEAR  PLOTTING AND/OR PRINTING TO END
  ICALC       -INTEGER CODE TO SIGNAL IF PROGRAM CALCULATIONS
              -ARE REQUESTED
              =0; PERFORM PROGRAM CALCULATIONS
              =1; DO NOT PERFORM PROGRAM CALCULATIONS
  IPRT7       -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07
              -DATA
              =0; PRINT FILE 07 DATA
              =1; DO NOT PRINT FILE 07 DATA
  IPRT9       -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09
              -DATA
              =0; PRINT FILE 09 DATA
              =1; DO NOT PRINT FILE 09 DATA
  IPLOT       -INTEGER CODE TO SIGNAL REQUEST PLOTTING DATA
              =0; CREATE A TAPE FOR PLOTTING DATA FOR A
              - CALENDAR YEAR THROUGH FILE 01 AT 556 BPI

```

\*#1, CREATE A TAPE FOR PLOTTING DATA FOR A  
 \* CALENDAR MONTH THROUGH FILE 01 AT 556 BPI  
 \*#2, DO NOT CREATE A PLOT TAPE

ICASE            -INTEGER VALUE OF CASE NUMBER

IFINAL           -INTEGER CODE NOTING LAST CASE  
                   -#0, MORE CASES TO FOLLOW  
                   -#1, THIS IS THE FINAL CASE

PHIPDG           -GEODETIC LATITUDE OF RELEASE POINT (DEG)

LAMPDG           -LONGITUDE OF RELEASE POINT (DEG)

HEIGHT           -ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE  
                   -(FT)

RESTR(2)         -MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION  
                   -TO THE RELEASE POINT (DEG)

RESTR(3)         -MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH  
                   -TRACKING STATION (DEG)

RESTR(4)         -MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH  
                   -TRACKING STATION (DEG)

RESTR(5)         -MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE  
                   -RELEASE POINT AS SEEN FROM EACH TRACKING STATION  
                   -(RAYLEIGHS)

RESTR(6)         -CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD  
                   -AFTER RELEASE RELATIVE TO THE EARTH (KM/SEC)

RESTR(7)         -MINIMUM TRACKING PERIOD REQUIRED (HRS)

RESTR(8)         -ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE  
                   -RELATIVE TO THE EARTH (KM/SEC)

NS                -THE NUMBER OF STATIONS USED IN THE PROGRAM

NOS(12)          -AN ARRAY CONTAINING THE STATION NUMBERS USED

NAME(3,12)       -NAME OF TRACKING STATIONS USED

PHI(12)          -GEODETIC LATITUDE OF TRACKING STATION (DEG)

LAMBDA(12)       -LONGITUDE OF TRACKING STATION (DEG)

ALT(12)          -ALTITUDE OF TRACKING STATION ABOVE EARTH SURFACE  
                   -(FT)

MOVE(12)         -CODE NUMBER TO DETERMINE IF STATION COORDINATES  
                   -ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT  
                   -#0, FOR FIXED STATION  
                   -#1, FOR AIRCRAFT

PNAME(3,7)       -ALPHANUMERIC DESCRIPTION FOR AIRCRAFT POSITION  
                   -DURING EXPERIMENTAL PERIOD

PLAT(7)          -GEODETIC LATITUDE OF AIRCRAFT DURING  
                   -EXPERIMENTAL PERIOD (DEG)

PLON(7)          -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD  
                   -(DEG)

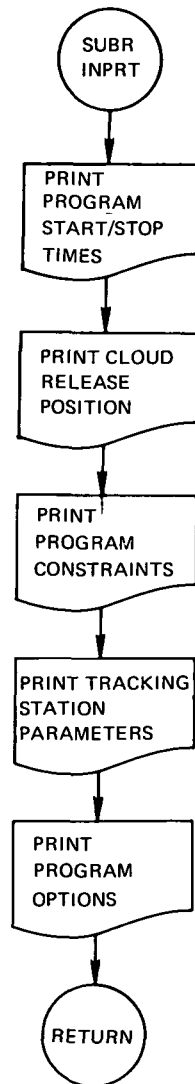
## DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

PALT(7)        =ALTITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD  
              =(DEG)

\*\*\*\*\*OUTPUT=  
ON FILE 06-PRINTER  
ALL VARIABLES LISTED ABOVE ARE USED FOR OUTPUT

\*\*\*\*\*RESTRICTIONS=  
FORMAT GENERATOR IS A GE-625 SYSTEMS ROUTINE, USE OF THIS  
SUBROUTINE ON ANOTHER SYSTEM MAY REQUIRE THAT THESE FORMAT  
GENERATORS BE CHANGED;

\*\*\*\*\*SUBPROGRAMS REQUIRED=  
NONE



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*****SUBROUTINE CONVER*****
*****NASA WOLLOPS VERSION OF 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE-GE 625
*****PURPOSE-
*****SUBROUTINE CONVER*****
      TO CONVERT STATION AND CLOUD PARAMETERS TO NECESSARY RECURRING
      VARIABLES USED IN THE ENTIRE PROGRAM
*****METHOD-
      GIVEN THE GEODETIC COORDINATES OF THE RELEASE POINT AND OF THE
      STATIONS, CONVERT TO GEOCENTRIC, ALSO CALCULATE THE FOLLOWING

      A. THE RADIUS VECTORS FOR THE RELEASE POINT AND STATIONS IN ERU
      B. THE SINES AND COSINES OF THE GEOCENTRIC COORDINATES
      C. THE GEOCENTRIC X, Y, Z COMPONENTS IN ERU
      D. THE RESTRICTIONS IN DEGREES TO RADIAN
      E. THE SPACE FIXED DRIFT OF THE CLOUD IN RADIAN/HOUR
      F. THE NECESSARY DATES REFERENCED TO AN EPOCH DATE OF JANUARY 0
      OF THE YEAR REQUESTED TO BEGIN CALCULATIONS;
      G. THE MEAN LONGITUDE OF THE SUN FOR THE FIRST DAY TO BE
      CALCULATED,
      H. ROUGH ESTIMATE OF THE SUN AND MOON TIME INTERVALS FOR THE
      FIRST DAY FOR EACH STATION,
*****INPUT-
      LMONTH      -MONTH NUMBER FOR STOPPING CALCULATIONS
      LDAY        -DAY   NUMBER FOR STOPPING CALCULATIONS
      LYEAR       -YEAR  NUMBER FOR STOPPING CALCULATIONS
      KMONTH      -MONTH NUMBER FOR STARTING CALCULATIONS
      KDAY        -DAY   NUMBER FOR STARTING CALCULATIONS
      KYEAR       -YEAR  NUMBER FOR STARTING CALCULATIONS
      PHIPDG     -GEODETIC LATITUDE OF RELEASE POINT (DEG)
      LAMPDG     -LONGITUDE OF RELEASE POINT (DEG)
      HEIGHT     -ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE
                -(ERU)
      RESTR(2)   -MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION
                -TO THE RELEASE POINT (DEG)
      RESTR(3)   -MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH
                -TRACKING STATION (DEG)

```

## DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

RESTR(4)      -MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH  
                   -TRACKING STATION (DEG)  
 RESTR(5)      -MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE  
                   -RELEASE POINT AS SEEN FROM EACH TRACKING STATION  
                   -(RAYLEIGHS)  
 RESTR(6)      -CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD  
                   -AFTER RELEASE RELATIVE TO THE EARTH (KM/SEC)  
 RESTR(7)      -MINIMUM TRACKING PERIOD REQUIRED (HRS)  
 RESTR(8)      -ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE  
                   -RELATIVE TO THE EARTH (KM/SEC)  
 NS             -THE NUMBER OF STATION USED IN THE PROGRAM  
 NOS(12)       -AN ARRAY CONTAINING THE STATION NUMBERS USED  
 PHI(12)       -GEODETIC LATITUDE OF TRACKING STATION (DEG)  
 LAMBDA(12)    -LONGITUDE OF TRACKING STATION (DEG)  
 ALT(12)       -ALTITUDE OF TRACKING STATION ABOVE EARTH SURFACE  
                   -(FT)  
 MOVE(12)      -CODE NUMBER TO DETERMINE IF STATION COORDINATES  
                   -ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT  
                   -0, FOR FIXED STATION  
                   -1, FOR AIRCRAFT  
 PNAME(3,7)    -ALPHANUMERIC DESCRIPTION FOR AIRCRAFT POSITION  
                   -DURING EXPERIMENTAL PERIOD  
 PLAT(7)       -GEODETIC LATITUDE OF AIRCRAFT DURING  
                   -EXPERIMENTAL PERIOD (DEG)  
 PLON(7)       -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD  
 PALT(7)       -ALTITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD  
                   -(DEG)  
 DTR            -CONVERSION FACTOR FROM DEGREES TO RADIANS  
 RTH            -CONVERSION FACTOR FROM RADIANS TO HOURS  
 ERM            -CONVERSION FACTOR FROM EARTH RADIUS UNITS TO  
                   -KILOMETERS

## \*\*\*\*\*OUTPUT-

DJUL            -JULIAN DATE FOR CURRENT DATA  
 NDPJU           -NUMBER OF DAYS PAST EPOCH DATE TO DATE FOR  
                   -STARTING CALCULATIONS (INTEGER)  
 NDTE            -NUMBER OF DAYS PAST EPOCH DATE TO DATE FOR  
                   -STOPPING CALCULATIONS (INTEGER)  
 EPOCH           -JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS  
 SINCLT          -SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE

COSCLT	-COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE
SINCLN	-SINE OF RELEASE POINT'S LONGITUDE
COSCLN	-COSINE OF RELEASE POINT'S LONGITUDE
RVC	-RADIAL DISTANCE FROM EARTH CENTER TO RELEASE POINT (ERJ)
CGCX	-GEOCENTRIC X COMPONENT OF RELEASE POINT (ERU)
CGCY	-GEOCENTRIC Y COMPONENT OF RELEASE POINT (ERU)
CGCZ	-GEOCENTRIC Z COMPONENT OF RELEASE POINT (ERU)
PHJP	-GEOCENTRIC LATITUDE OF RELEASE POINT (RADIAN)
RLAMDA	-LONGITUDE OF RELEASE POINT (RADIAN)
R(2)	-ELEVATION CONSTRAINT (RADIAN)
R(3)	-SUN ELEVATION CONSTRAINT (RADIAN)
R(4)	-MOON ELEVATION CONSTRAINT (RADIAN)
R(5)	-INPUT VALUE FOR TOTAL SKY BACKGROUND BRIGHTNESS (RAYLEIGH)
R(6)	-CLOUD DRIFT RATE (RADIAN/HR)
R(7)	-MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS)
R(8)	-ONE-HALF OF CLOUD GROWTH RATE (RADIAN/HR)
SINSLT(12)	-SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE
COSSLT(12)	-COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE
SINSLN(12)	-SINE OF TRACKING STATION'S LONGITUDE
COSSLN(12)	-COSINE OF TRACKING STATION'S LONGITUDE
RVS(12)	-RADIUS VECTOR FROM EARTH CENTER TO TRACKING STATION (ERU)
SGCX(12)	-GEOCENTRIC X COMPONENT OF TRACKING STATION (ERU)
SGCY(12)	-GEOCENTRIC Y COMPONENT OF TRACKING STATION (ERU)
SGCZ(12)	-GEOCENTRIC Z COMPONENT OF TRACKING STATION (ERU)
RPHI(12)	-GEOCENTRIC LATITUDE OF TRACKING STATION (RADIAN)
RLAMD(12)	-LONGITUDE OF THE TRACKING STATION (RADIAN)
SINLAT(7)	-SINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING EXPERIMENTAL PERIOD
COSLAT(7)	-COSINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING EXPERIMENTAL PERIOD
SINLON(7)	-SINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL PERIOD



## DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

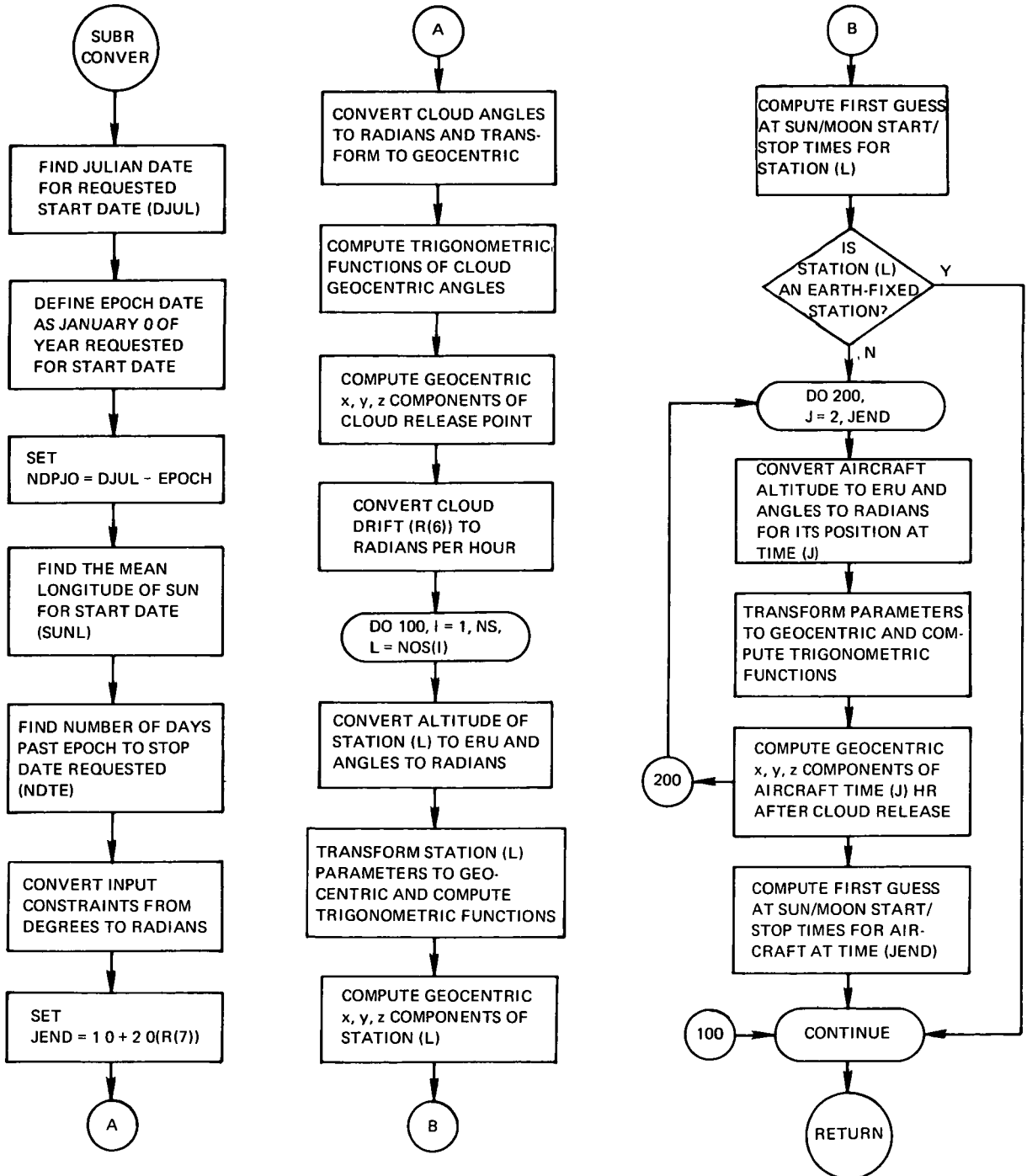
COSLON(7) -COSINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL  
 -PERIOD  
 RVA(7) -DISTANCE FROM EARTH CENTER TO AIRCRAFT DURING  
 -EXPERIMENTAL PERIOD (ERU)  
 AGCX(7) -GEOCENTRIC X COMPONENT OF AIRCRAFT POSITION  
 -DURING EXPERIMENTAL PERIOD (ERU)  
 AGCY(7) -GEOCENTRIC Y COMPONENT OF AIRCRAFT POSITION  
 -DURING EXPERIMENTAL PERIOD (ERU)  
 AGCZ(7) -GEOCENTRIC Z COMPONENT OF AIRCRAFT POSITION  
 -DURING EXPERIMENTAL PERIOD (ERU)  
 RLAT(7) -GEOCENTRIC LATITUDE OF AIRCRAFT DURING  
 -EXPERIMENTAL PERIOD (RADIANs)  
 RLON(7) -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD  
 - (RADIANs)  
 SUNL -MEAN LONGITUDE OF THE SUN AT 0 HRS,UT. FOR 1ST  
 -DAY (DEG)  
 WINDOW(6,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES,  
 -1ST INDEX FOR STORING START/STOP TIMES,  
 -1,3,5 FOR START TIMES  
 -2,4,6 FOR STOP TIMES  
 -2ND INDEX FOR THE CONSTRAINT  
 - 1=EARTH SHADOW  
 - 2=ELEVATION  
 - 3=SU  
 - 4=MOON  
 - 5=TOTAL SKY BACKGROUND BRIGHTNESS  
 -3RD INDEX FOR THE STATION NUMBER  
 JEND -NUMBER OF DISCRETE VALUES STORED FOR  
 -EXPERIMENTAL PERIOD DATA

## \*\*\*\*\*RESTRICTIONS\*

THE ESTIMATED TIME PERIODS CALCULATED FOR THE SUN AND MOON ARE  
 FOR APPROXIMATE TIMES FOR THE OCCURENCE OF ASTRONOMICAL  
 TWILIGHT AND FOR THE MOON TO BE AT THE TRACKING STATION'S LOCAL  
 HORIZON, ANY OTHER RELATIVE ELEVATION ANGLE OF THESE TWO  
 HEAVENLY BODIES TO EACH TRACKING STATION WHICH IS QUITE  
 DIFFERENT WILL REQUIRE A PROGRAM CHANGE, THE COEFFICIENTS 19.0  
 AND 5.0 ARE THE APPROXIMATE TIMES FOR ASTRONOMICAL TWILIGHT AND  
 THE COEFFICIENTS 11.5 AND 0.0 ARE THE APPROXIMATE COEFFICIENTS  
 FOR MOONSET AND MOONRISE, BOTH ARE FOR A POINT OF 0 DEGREES  
 LATITUDE AND 0 DEGREES LONGITUDE,  
 THE GEODETIC EARTH MODEL USED IS THE FISCHER EARTH MODEL WITH  
 AN AVERAGE EARTH RADIUS OF 6371.024 KILOMETERS,

## \*\*\*\*\*SUBPROGRAMS REQUIRED\*

GDTGCG



\*\*\*\*\*SUBROUTINE GDTQGC\*\*\*\*\*  
 \*\*\*\*\*NASA Wallops version of 02/01/70  
 \*\*\*\*\*LANGUAGE=FORTRAN IV  
 \*\*\*\*\*MACHINE-GE 625

## \*\*\*\*\*PURPOSE-

TO CONVERT GEODETIC COORDINATES TO GEOCENTRIC COORDINATES

## \*\*\*\*\*METHOD OF ATTACK-

GIVEN THE GEODETIC LATITUDE AND ALTITUDE OF A POINT ABOVE THE EARTH'S SURFACE, USE THE DIRECT METHOD OF EVERETON TO FIND THE GEOCENTRIC LATITUDE AND RADIUS VECTOR FROM EARTH CENTER USING AN EARTH MODEL WHOSE SEMI-MAJOR AXIS IS 6378,166 KM AND WHOSE FLATTENING IS 1/298.30

## \*\*\*\*\*REQUIRED INPUT-

ALT = ALTITUDE ABOVE EARTH'S SURFACE (ERU)

GLAT = GEODETIC LATITUDE (RADIAN)

## \*\*\*\*\*OUTPUT GENERATED-

R = RADIUS VECTOR FROM EARTH CENTER (ERU)

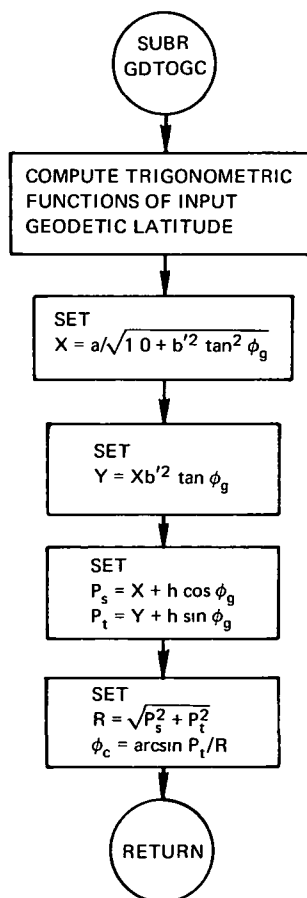
PLAT = GEOCENTRIC LATITUDE (RADIAN)

## \*\*\*\*\*RESTRICTIONS-

NONE KNOWN

## \*\*\*\*\*SUBPROGRAMS REQUIRED-

NONE



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*****SUBROUTINE ELCNSR*****
*****NASA WALLOPS VERSION OF 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE=GE 625

***** PURPOSE
    TO DETERMINE IF THE TARGET CLOUD WILL BE VIEWED AT AN
    ELEVATION ANGLE GREATER THAN THE GIVEN CONSTRAINT (R(3)) DURING
    THE ENTIRE EXPERIMENTAL PERIOD.

*****METHOD
    FROM EACH TRACKING STATION, A REGION CAN BE DEFINED WITHIN WHICH
    ALL POINTS AT ALTITUDE OF THE TARGET CLOUD CAN BE VIEWED AT AN
    ELEVATION ANGLE GREATER THAN THE GIVEN CONSTRAINT; THE ARC
    RADIUS OF THIS REGION WITH CENTER AT THE TRACKING STATION IS
    FOUND, THE PROJECTION POINT OF THE TRACKING STATION AND OF THE
    CLOUD IS USED, THE ARC DISTANCE FROM THESE PROJECTED POINTS IS
    THEN CALCULATED AND IF THIS ARC DISTANCE IS LESS THAN THE ARC
    RADIUS OF THE DEFINED REGION THEN THE CONSTRAINT IS MET FOR
    TIME OF RELEASE; SUBROUTINE ELVDPT IS THEN USED TO DETERMINE IF
    THIS GIVEN CONSTRAINT WILL BE MET FOR THE EXPERIMENTAL PERIOD.

*****INPUT-
    NS           =THE NUMBER OF STATIONS USED IN THE PROGRAM
    NOS(12)      =AN ARRAY CONTAINING THE STATION NUMBERS USED
    RVC          =RADIAL DISTANCE FROM EARTH CENTER TO RELEASE
                 =POINT (ERJ)
    SINCLT       =SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE
    COSCLT       =COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE
    SINCLN       =SINE OF RELEASE POINT'S LONGITUDE
    COSCLN       =COSINE OF RELEASE POINT'S LONGITUDE
    NAME(3,12)   =NAME OF TRACKING STATIONS USED
    RVS(12)      =RADIUS VECTOR FROM EARTH CENTER TO TRACKING
                 =STATION (ERU)
    SINSLT(12)   =SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE
    COSSLT(12)   =COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE
    SINSLN(12)   = SINE OF TRACKING STATION'S LONGITUDE
    COSSLN(12)   =COSINE OF TRACKING STATION'S LONGITUDE
    R(2)         =ELEVATION CONSTRAINT (RADIAN)
    R(6)         =CLOUD DRIFT RATE (RADIAN/HR)
    R(7)         =MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS)
    HALFPI      =VALUE OF 90 DEGREES IN RADIAN

*****OUTPUT-

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## DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

PRINT STATEMENT NOTED UNDER FORMAT 7 IF CONSTRAINT IS NOT MET

## \*\*\*\*\*INTERNAL PARAMETERS\*

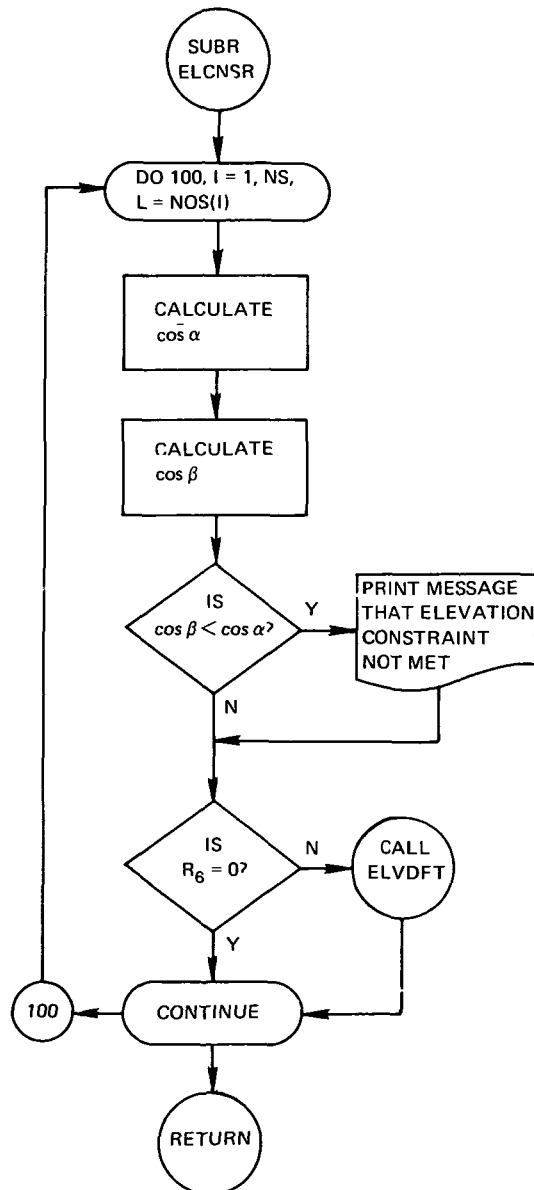
COSALF        -COSINE OF THE ARC RADIUS OF THE DEFINED REGION  
L              -TRACKING STATION NUMBER

## \*\*\*\*\*RESTRICTIONS\*

NONE KNOWN

## \*\*\*\*\*SUBPROGRAMS REQUIRED\*

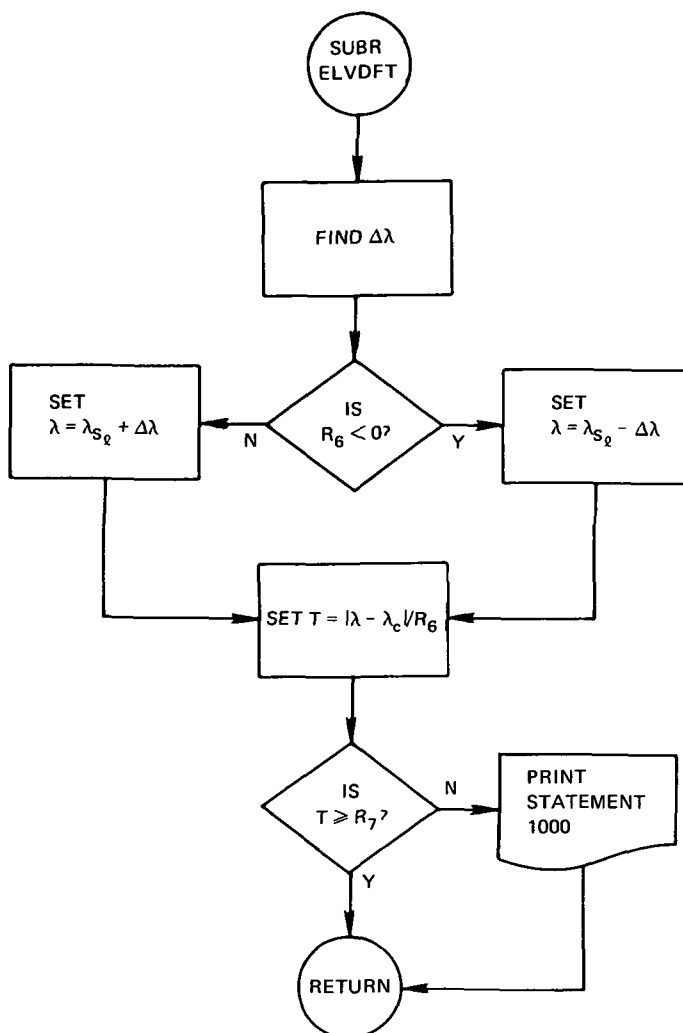
ELVDFT



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*****SUBROUTINE ELMDFT*****
*****NASA HALLOPS VERSION OF 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE=GE 625
*****PURPOSE-
  TO DETERMINE IF THE ELEVATION CONSTRAINT HOLDS DURING THE
  REQUIRED TRACKING PERIOD.
*****METHOD-
  THE LONGITUDINAL DIFFERENCE BETWEEN THE TRACKING STATION TO THE
  EDGE OF THE REGION AT THE LATITUDE OF THE CLOUD ABOUT THIS
  STATION AS DEFINED IN SUBROUTINE BLCMSR IS FOUND, THERE ARE TWO
  POINTS ON THE EDGE OF THIS REGION AT THE LATITUDE OF THE CLOUD
  WHICH ARE AT AN ARC DISTANCE EQUAL TO THE ARC RADIUS OF THIS
  REGION, FOR AN EASTERLY DRIFT OF THE CLOUD AFTER RELEASE THE
  POINT EAST OF THE TRACKING STATION IS REQUIRED, AND FOR THE
  WESTERLY DRIFT THE POINT WEST OF THE TRACKING STATION IS
  REQUIRED, THE PROBLEM NOW IS TO FIND OUT HOW LONG IT WILL TAKE
  FOR THE CLOUD TO DRIFT TO THIS POINT ON THE EDGE OF THE DEFINED
  REGION, IF IT IS SHORTER THAN THE GIVEN TRACKING PERIOD THEN THE
  ERROR MESSAGE (FORMAT 1000) IS PRINTED.
*****INPUT-
  COSALF      =COSINE OF THE ARC RADIUS OF THE DEFINED REGION
  I           =TRACKING STATION NUMBER
  SINCLT      =SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE
  COSCLT      =COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE
  NAME(3,12)  =NAME OF TRACKING STATIONS USED
  RLAMD(12)   =LONGITUDE OF THE TRACKING STATION (RADIAN)
  SINSLT(12)  =SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE
  COSSLT(12)  =COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE
  R(6)        =CLOUD DRIFT RATE (RADIAN/HR)
  R(7)        =MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS)
*****OUTPUT-
  NAME(3,12)  =NAME OF TRACKING STATIONS USED
  T           =TIME CONSTRAINT IS MET FOR GIVEN DRIFT RATE (HRS)
  R(7)        =VALUE OF T IF T.LT. INPUT VALUE OF R(7)=IN HOURS
*****RESTRICTIONS-
  THE DRIFT RATE OF THE CLOUD IS ASSUMED TO BE REFLECTED IN A
  CHANGE ONLY OF LONGITUDE VALUE FOR THE CLOUD'S POSITION AND IS
  ASSUMED TO BE CONSTANT FOR THE EXPERIMENTAL PERIOD,
  THE ELEVATION CONSTRAINT FOR THE POSITION OF THE AIRCRAFT AT
  THE END OF THE EXPERIMENTAL PERIOD IS CALCULATED IN SUBROUTINE
  EPAIR
*****SUBPROGRAMS REQUIRED-
  NONE

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\*\*\*\*\* SUBROUTINE AIRGLO \*\*\*\*\*

\*\*\*\*\* NASA Wallops version of 02/01/70

\*\*\*\*\* LANGUAGE-FORTRAN IV

\*\*\*\*\* MACHINE-GE 625

\*\*\*\*\* PURPOSE-  
TO CALCULATE THE AIRGLOW BRIGHTNESS AS DEFINED,

\*\*\*\*\* METHOD-  
THIS SUBROUTINE CALCULATES A VECTOR BETWEEN THE GEOCENTRIC COORDINATES OF THE STATION AND THE RELEASE POINT, THE ANGLE BETWEEN THIS VECTOR AND THE ZENITH OF THE STATION IS COMPUTED,

FROM THIS ANGLE THE AIRGLOW BRIGHTNESS IS COMPUTED,  
 IT ALSO USES SUBROUTINE EPAIR TO COMPUTE THE AIRGLOW BRIGHTNESS  
 AT DISCRETE POINTS FROM EACH TRACKING STATION TO THE CLOUD'S  
 POSITION AFTER RELEASE.

## \*\*\*\*\*INPUT-

CGCX            -GEOCENTRIC X COMPONENT OF RELEASE POINT (ERU)  
 CGCY            -GEOCENTRIC Y COMPONENT OF RELEASE POINT (ERU)  
 CGCZ            -GEOCENTRIC Z COMPONENT OF RELEASE POINT (ERU)  
 SGCX(12)        -GEOCENTRIC X COMPONENT OF TRACKING STATION (ERU)  
 SGCY(12)        -GEOCENTRIC Y COMPONENT OF TRACKING STATION (ERU)  
 SGCZ(12)        -GEOCENTRIC Z COMPONENT OF TRACKING STATION (ERU)  
 PHI(12)         -GEOCENTRIC LATITUDE OF TRACKING STATION (DEG)  
 SINSLN(12)      - SINE OF TRACKING STATION'S LONGITUDE  
 COSSLN(12)      -COSINE OF TRACKING STATION'S LONGITUDE  
 R(7)            -MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS)  
 NS              -THE NUMBER OF STATIONS USED IN THE PROGRAM  
 NOS(12)         -AN ARRAY CONTAINING THE STATION NUMBERS USED  
 LTR             -CONVERSION FACTOR FROM DEGREES TO RADIANS

## \*\*\*\*\* OUTPUT-

WX              -GEOCENTRIC X COMPONENT OF VECTOR FROM STATION TO  
                  -RELEASE POINT (ERU)  
 WY              -GEOCENTRIC Y COMPONENT OF VECTOR FROM STATION TO  
                  -RELEASE POINT (ERU)  
 WZ              -GEOCENTRIC Z COMPONENT OF VECTOR FROM STATION TO  
                  -RELEASE POINT (ERU)  
 USX             -X-COMPONENT OF UNIT VECTOR IN DIRECTION OF  
                  -TRACKING STATION'S ZENITH  
 USY             -Y-COMPONENT OF UNIT VECTOR IN DIRECTION OF  
                  -TRACKING STATION'S ZENITH  
 USZ             -Z-COMPONENT OF UNIT VECTOR IN DIRECTION OF  
                  -TRACKING STATION'S ZENITH  
 BA(12,7)        -AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE  
                  -GIVEN POSITION OF THE CLOUD (RAYLEIGHS)  
 C(12,7)         -COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION  
                  -OF THE TRACKING STATION TO THE CLOUD AND USED TO  
                  -SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS  
 JEND            -NUMBER OF DISCRETE VALUES STORED FOR  
                  -EXPERIMENTAL PERIOD DATA



## DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

## \*\*\*\*\*RESTRICTIONS-

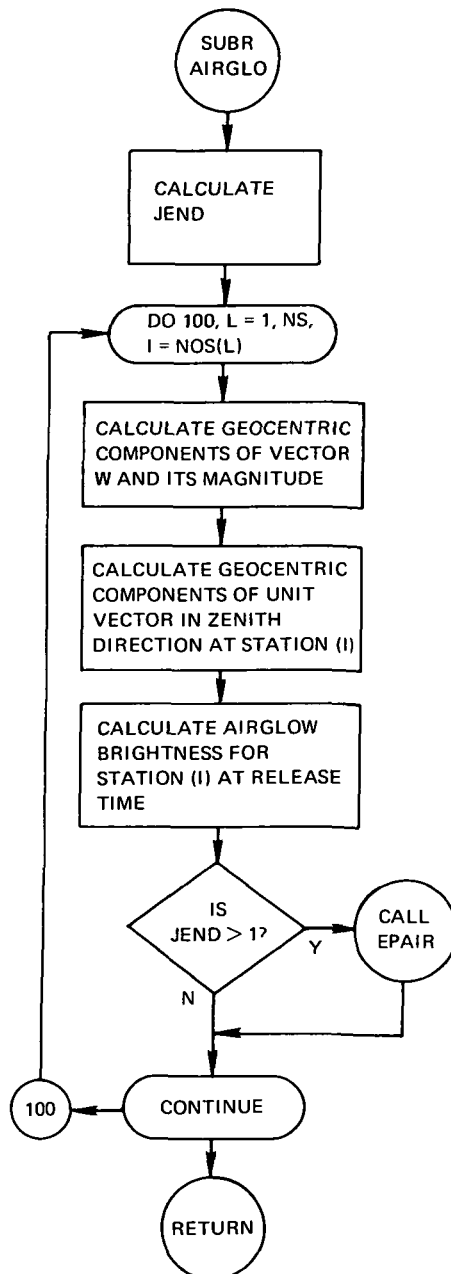
UP TO TWELVE TRACKING STATIONS CAN BE USED AND UP TO SEVEN DISCRETE VALUES FOR AIRGLOW BRIGHTNESS CAN BE COMPUTED FOR EACH TRACKING STATION,

## \*\*\*\*\*SUBPROGRAMS REQUIRED-

EPAIR

## \*\*\*\*\*REMARK-

ONLY ELEVEN TRACKING STATIONS CAN BE USED IF ONE OF THESE STATIONS IS A MOVING OR AIRCRAFT STATION,



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***** SUBROUTINE EPAIR *****
*****NASA Wallops version of 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE=GE 625
***** PURPOSE
    TO CALCULATE THE DIFFERENT AIRGLOW BRIGHTNESS FOR EACH THIRTY
    (30) MINUTE TIME INTERVAL DURING THE DESIRED EXPERIMENT TIME.
*****METHOD
    THE GEOCENTRIC X,Y,Z-COMPONENTS OF THE VECTOR FROM EARTH CENTER
    TO THE CLOUD IS MODIFIED AT 30 MINUTE INCREMENTS TO INCORPORATE
    ITS POSITION AFTER RELEASE DUE TO THE EAST/WEST DRIFT OF THE
    CLOUD. THE CLOUD DRIFT IS ASSUMED TO BE CONSTANT AND IN THE SAME
    DIRECTION AND IS ASSUMED TO BE SOLELY A CHANGE IN LONGITUDE
    ANGLE. THE X,Y,Z-COMPONENTS OF THE VECTOR FROM STATION(1) TO THE
    POSITION OF THE CLOUD AT DISCRETE POINTS DURING THE
    EXPERIMENTAL PERIOD IS CALCULATED. THE AIRGLOW BRIGHTNESS AND
    'IC' COEFFICIENT VALUES ARE FOUND AS IN SUBROUTINE AIRGLO FOR
    THESE POINTS.
    THE ELEVATION CONSTRAINT FOR THE LAST POSITION OF THE MOVING
    TRACKING STATION IS CHECKED USING THE ZENITH ANGLE(SECZ),
*****INPUT-
    I           *INDEX FOR STATION NUMBER
    JEND        -NUMBER OF DISCRETE VALUES STORED FOR
                -EXPERIMENTAL PERIOD DATA
    R(6)        -CLOUD DRIFT RATE (RADIAN/HR)
    CGCX        -GEOCENTRIC X COMPONENT OF RELEASE POINT (ERU)
    CGCY        -GEOCENTRIC Y COMPONENT OF RELEASE POINT (ERU)
    CGCZ        -GEOCENTRIC Z COMPONENT OF RELEASE POINT (ERU)
    SGCX(12)    -GEOCENTRIC X COMPONENT OF TRACKING STATION (ERU)
    SGCY(12)    -GEOCENTRIC Y COMPONENT OF TRACKING STATION (ERU)
    SGCZ(12)    -GEOCENTRIC Z COMPONENT OF TRACKING STATION (ERU)
    USX        -X-COMPONENT OF UNIT VECTOR IN DIRECTION OF
                -TRACKING STATION'S ZENITH
    USY        -Y-COMPONENT OF UNIT VECTOR IN DIRECTION OF
                -TRACKING STATION'S ZENITH
    USZ        -Z-COMPONENT OF UNIT VECTOR IN DIRECTION OF
                -TRACKING STATION'S ZENITH
    PLAT(7)     -GEOCENTRIC LATITUDE OF AIRCRAFT DURING
                -EXPERIMENTAL PERIOD (DEG)
    SINLON(7)   -SINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL
                -PERIOD
    COSLON(7)   -COSINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL
                -PERIOD

```

## DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

AGCX(7)      -GEOCENTRIC X COMPONENT OF AIRCRAFT POSITION  
               -DURING EXPERIMENTAL PERIOD (ERU)

AGCY(7)      -GEOCENTRIC Y COMPONENT OF AIRCRAFT POSITION  
               -DURING EXPERIMENTAL PERIOD (ERU)

AGCZ(7)      -GEOCENTRIC Z COMPONENT OF AIRCRAFT POSITION  
               -DURING EXPERIMENTAL PERIOD (ERU)

MOVE(12)     -CODE NUMBER TO DETERMINE IF STATION COORDINATES  
               -ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT  
               -#0# FOR FIXED STATION  
               -#1# FOR AIRCRAFT

DTR            -CONVERSION FACTOR FROM DEGREES TO RADIANS

## \*\*\*\*\* OUTPUT-

WPX(12,7)    -VALUE OF GEOCENTRIC X COMPONENT OF VECTOR FROM  
               -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE

WPY(12,7)    -VALUE OF GEOCENTRIC Y COMPONENT OF VECTOR FROM  
               -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE

WPZ(12,7)    -VALUE OF GEOCENTRIC Z COMPONENT OF VECTOR FROM  
               -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE

BA(12,7)     -AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE  
               -GIVEN POSITION OF THE CLOUD (RAYLEIGHS)

C(12,7)      -COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION  
               -OF THE TRACKING STATION TO THE CLOUD AND USED TO  
               -SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS

## \*\*\*\*\*RESTRICTIONS-

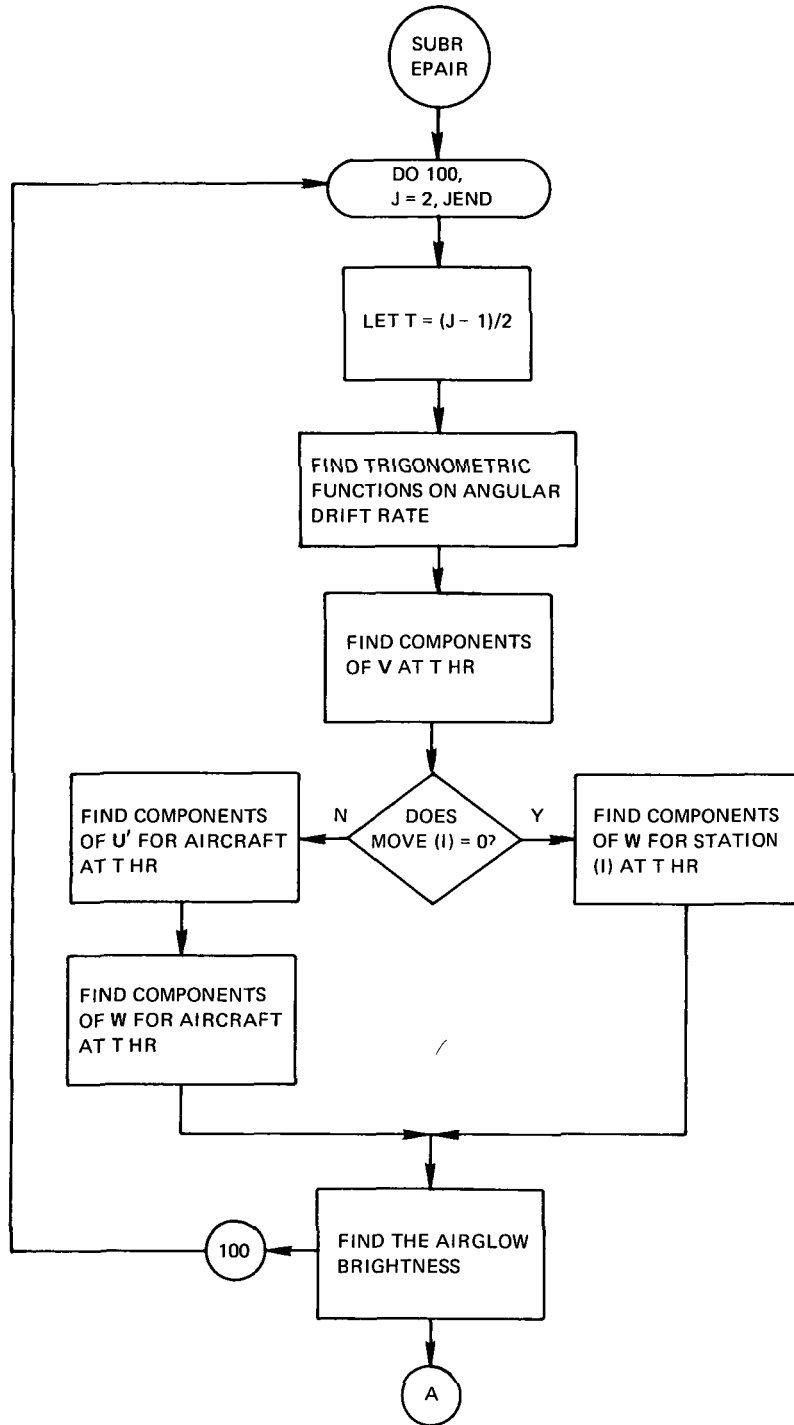
UP TO TWELVE TRACKING STATIONS CAN BE USED AND UP TO SEVEN  
 DISCRETE VALUES FOR AIRGLOW BRIGHTNESS CAN BE COMPUTED FOR EACH  
 TRACKING STATION.

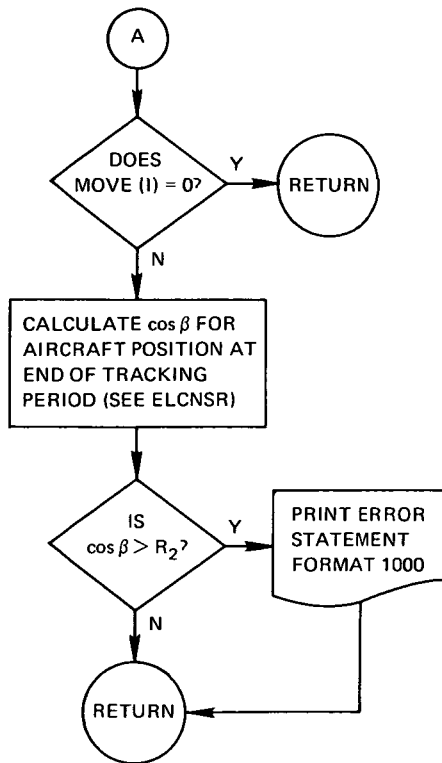
## \*\*\*\*\*SUBPROGRAMS REQUIRED-

NONE

## \*\*\*\*\*REMARK-

ONLY ELEVEN TRACKING STATIONS CAN BE USED AS INPUT IF ONE OF  
 THESE STATIONS IS AN AIRCRAFT.





\*\*\*\*\*SUBROUTINE TIME \*\*\*\*\*

FUNCTION TIME (DAYNUM)

PURPOSE

TO COMPUTE THE GREENWICH MEAN SIDEREAL TIME AT ZERO HOURS UNIVERSAL TIME FOR ANY JULIAN DATE AFTER 2415020.0 OR JANUARY 0,1900

LANGUAGE

FORTRAN IV

CALLING SEQUENCE

GMSIDT = TIME(DAYNUM) (TIME IS A DOUBLE PRECISION FUNCTI

INPUTS

DAYNUM = JULIAN DATE AT ZERO HOURS UNIVERSAL TIME

OUTPUTS

TIME(DAYNUM) = GREENWICH MEAN SIDEREAL TIME AT ZERO HOURS UNIVERSAL, (HOUR ANGLE OF THE FIRST POINT OF ARIES;) ANSWER IS IN HOURS AND DECIMAL FRACTIONS OF HOURS, TO CONVERT TO DEGREES MULTIPLY BY 15.0 (DOUBLE PRECISION)

## REFERENCE

1. AMERICAN EPHEMERIS AND NAUTICAL ALMANAC, 1961
2. EXPLANATORY SUPPLEMENT TO AMERICAN EPHEMERIS AND NAUTICAL ALMANAC; (HER MAJESTY'S STATIONARY OFFICE, LONDON)

## METHOD

VALUES OF GREENWICH MEAN SIDEREAL TIME ARE OBTAINED BY ADDING TWELVE HOURS TO NEWCOMB'S (A.P.A.E; 6,1898, PART I) EXPRESSION FOR THE RIGHT ASCENSION OF THE MEAN SUN.

## RESTRICTIONS

NONE KNOWN

## SUBPROGRAMS REQUIRED

NONE

## ANALYSIS

FRANK E. HOGE  
APPLIED MATH SECTION  
NASA  
WALLOPS STATION, VA.

## PROGRAMMER

BENNIS MELVIN  
APPLIED MATH SECTION  
NASA  
WALLOPS STATION, VA.

\*\*\*\*\*SUBROUTINE DAYNUM \*\*\*\*\*

FUNCTION DAYNUM(MONTH, DAY, YEAR)

## PURPOSE

TO COMPUTE THE JULIAN DATE AT ZERO HOURS UNIVERSAL TIME FOR ANY DAY FROM THE YEAR 1600 TO THE YEAR 2000

## LANGUAGE

FORTRAN IV

## CALLING SEQUENCE

Y = DAYNUM(MONTH, DAY, YEAR)  
YEAR, AND DAY BEING FLOATING POINT VARIABLES,  
MONTH BEING AN INTEGER VARIABLE

## INPUTS

MONTH = CALENDAR MONTH (INTEGER)  
DAY = CALENDAR DAY (FLOATING POINT)  
YEAR = CALENDAR YEAR (FLOATING POINT)

## OUTPUTS

DAYNUM = JULIAN DAY NUMBER AT ZERO HOUR FOR THE ABOVE DATE

## REFERENCE

1. AMERICAN EPHEMERIS AND NAUTICAL ALMANAC

## METHOD

THE NUMBER OF DAYS ELAPSED FROM ZERO HOURS UNIVERSAL TIME, JANUARY 0, 1600 ARE ADDED TO THE JULIAN DAY NUMBER OF THAT PARTICULAR DAY (2305446.5)

## RESTRICTIONS

PROGRAM CHECKED TO THE YEAR 2000 A.D.

## SUBPROGRAMS REQUIRED

NONE

## ANALYSIS

FRANK E. HOGGE  
 APPLIED MATHEMATICS SECTION  
 WALLOPS STATION, VA.

## PROGRAMMER

DENNIS MELVIN  
 APPLIED MATHEMATICS SECTION  
 WALLOPS STATION, VA.

\*\*\*\*\*SUBROUTINE SUNMN\*\*\*\*\*

\*\*\*\*\*NASA WALLOPS VERSION OF 02/01/70

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE=GE 625

## \*\*\*\*\*PURPOSE-

TO DETERMINE THE DAILY TIME INTERVAL FOR WHICH THE SUN AND MOON  
 WILL BE BELOW THE RESPECTIVE ELEVATION ANGLES AT EACH TRACKING  
 STATION'S LOCAL HORIZON.

## \*\*\*\*\*METHOD-

THE SOLUTION FOR DETERMINING THE TIME PERIODS FOR WHICH THE SUN  
 AND MOON CONSTRAINTS ARE MET FOR EACH STATION ARE DEVELOPED  
 USING SIMILAR ANALYSIS, AN APPROXIMATE TIME FOR THE DEFINED  
 CONSTRAINT (SUN OR MOON) TO BE MET IS DETERMINED FROM THE  
 FIRST INTERVAL FOR THE DAY PLUS DELTA(M), THE POSITION OF THE  
 SUN OR MOON FOR THAT TIME IS FOUND AND IS THEN TRANSFORMED TO  
 THE TOPOCENTRIC COORDINATES OF THE TRACKING STATION, THE  
 ELEVATION ANGLE OF THE SUN (OR MOON) AT THIS TRACKING STATION  
 IS FOUND FOR THE CURRENT POSITION OF THE SUN (MOON), A THREE  
 POINT INTERPOLATION METHOD IS USED TO APPROXIMATE THE NEXT  
 GUESS AT THE TIME FOR WHICH THE CONSTRAINT IS MET, THE PROCESS  
 OF DEFINING THE POSITION OF THE SUN (MOON) FOR THE LATEST  
 UNIVERSAL TIME, TRANSFORMING TO TOPOCENTRIC COORDINATES AND  
 CHECKING THE ELEVATION ANGLE IS REPEATED UNTIL EITHER A TIME IS  
 FOUND FOR WHICH THE RATIO OF THE ELEVATION ANGLE TO THE  
 REQUIRED CONSTRAINT IS ACCURATE TO .0001 OR THAT THE ITERATIVE  
 PROCESS IS TOO LONG AND IMPLIES A WEAK CONVERGENCE OR  
 DIVERGENCE, THE TIME PERIOD FOUND IS STORED AS THE SECOND TIME  
 PERIOD FOR THE DAY, THE MAIN PROGRAM TREATS THIS AS THE FIRST  
 TIME PERIOD OF THE NEXT DAY BY SUBTRACTING 24 HOURS FROM THESE  
 VALUES.

IF A MOVING TRACKING STATION IS INPUT, THEN THE TIME OF DAY  
 FOR WHICH ITS POSITION AT THE END OF THE EXPERIMENTAL PERIOD  
 SATISFIES THE SUN AND MOON ELEVATION CONSTRAINTS IS FOUND.  
 THESE TIMES ARE STORED IN THE WINDOW ARRAY AND THE WINDOW TIMES  
 FOR THE MOVING TRACKING STATION ARE DETERMINED SUCH THAT THE  
 SUN AND MOON CONSTRAINTS WILL BE SATISFIED FOR ITS POSITION AT  
 TIME OF RELEASE AND DURING THE EXPERIMENTAL PERIOD,

## \*\*\*\*\*INPUT-

NS                    -THE NUMBER OF STATIONS USED IN THE PROGRAM

NOS(12)              -AN ARRAY CONTAINING THE STATION NUMBERS USED

WINDOW(6,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES.

-1ST INDEX FOR STORING START/STOP TIMES,  
 -1 FOR START TIME  
 -2 FOR STOP TIME  
 -2ND INDEX FOR THE CONSTRAINT  
 - 3=SUN  
 - 4=MOON  
 -3RD INDEX FOR THE STATION NUMBER

KYEAR      -YEAR NUMBER FOR STARTING CALCULATIONS

J            -CURRENT NUMBER OF DAYS PAST JANUARY 0 OF 'KYEAR'

M            -INDEX TO INDICATE CONSTRAINT  
 - 3,SUN  
 - 4,MOON

DELTA(3)    -APPROXIMATE PERIOD OF SUN MOTION (HRS)

DELTA(4)    -APPROXIMATE PERIOD OF MOON MOTION (HRS)

NAME(3,12)  -NAME OF TRACKING STATIONS USED

LAMBDA(12)  -LONGITUDE OF TRACKING STATION (DEG)

RVS(12)     -RADIUS VECTOR FROM EARTH CENTER TO TRACKING  
               -STATION (ERU)

GHA         -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS  
               -UNIVERSAL TIME (HRS)

R(3)        -SUN ELEVATION CONSTRAINT (RADIAN)

R(4)        -MOON ELEVATION CONSTRAINT (RADIAN)

ANS(3)      -DISTANCE FROM EARTH CENTER TO SUN (ASTRONOMICAL  
               -UNITS)

ANS(4)      -INERTIAL X COMPONENT OF VECTOR FROM EARTH CENTER  
               -TO SUN (AU)

ANS(5)      -INERTIAL Y COMPONENT OF VECTOR FROM EARTH CENTER  
               -TO SUN (AU)

ANS(6)      -INERTIAL Z COMPONENT OF VECTOR FROM EARTH CENTER  
               -TO SUN (AU)

ANS(9)      -DISTANCE FROM EARTH CENTER TO MOON (ERU)

ANS(10)     -INERTIAL X COMPONENT OF VECTOR FROM EARTH CENTER  
               -TO MOON (ERU)

ANS(11)     -INERTIAL Y COMPONENT OF VECTOR FROM EARTH CENTER  
               -TO MOON (ERU)

ANS(12)     -INERTIAL Z COMPONENT OF VECTOR FROM EARTH CENTER  
               -TO MOON (ERU)

AGC2TC(3,3) -ELEMENTS OF TRANSFORMATION MATRIX FROM THE  
               -INERTIAL SYSTEM TO THE TOPOCENTRIC SYSTEM

DTR         -CONVERSION FACTOR FROM DEGREES TO RADIAN

RTH         -CONVERSION FACTOR FROM RADIAN TO HOURS

HTR         -CONVERSION FACTOR FROM HOURS TO RADIAN



## DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

AU            -CONVERSION FACTOR FROM ASTRONOMICAL UNITS TO  
              -EARTH RADII UNITS

MOVE(12)      -CODE NUMBER TO DETERMINE IF STATION COORDINATES  
              -ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT  
              -\*0, FOR FIXED STATION  
              -\*1, FOR AIRCRAFT

SINLAT(7)     -SINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING  
              -EXPERIMENTAL PERIOD

COSLAT(7)     -COSINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING  
              -EXPERIMENTAL PERIOD

SINLON(7)     -SINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL  
              -PERIOD

COSLON(7)     -COSINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL  
              -PERIOD

RVA(7)        -DISTANCE FROM EARTH CENTER TO AIRCRAFT DURING  
              -EXPERIMENTAL PERIOD (GRU)

RLAT(7)       -GEOCENTRIC LATITUDE OF AIRCRAFT DURING  
              -EXPERIMENTAL PERIOD (RADIAN)

RLON(7)       -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD  
              -(RADIAN)

JEND          -NUMBER OF DISCRETE VALUES STORED FOR  
              -EXPERIMENTAL PERIOD DATA

## \*\*\*\*\*OUTPUT-

DELTA(3)      -APPROXIMATE PERIOD OF SUN MOTION (HRS)

DELTA(4)      -APPROXIMATE PERIOD OF MOON MOTION (HRS)

WINDOW(6,5,12) -THE DAILY RELEASE WINDOW START/STOP TIMES,  
              -1ST INDEX FOR STORING START/STOP TIMES,  
              -3 FOR START TIME  
              -4 FOR STOP TIME  
              -2ND INDEX FOR THE CONSTRAINT  
              \* 3=SUN  
              \* 4=MOON  
              -3RD INDEX FOR THE STATION NUMBER

## \*\*\*\*\*RESTRICTIONS-

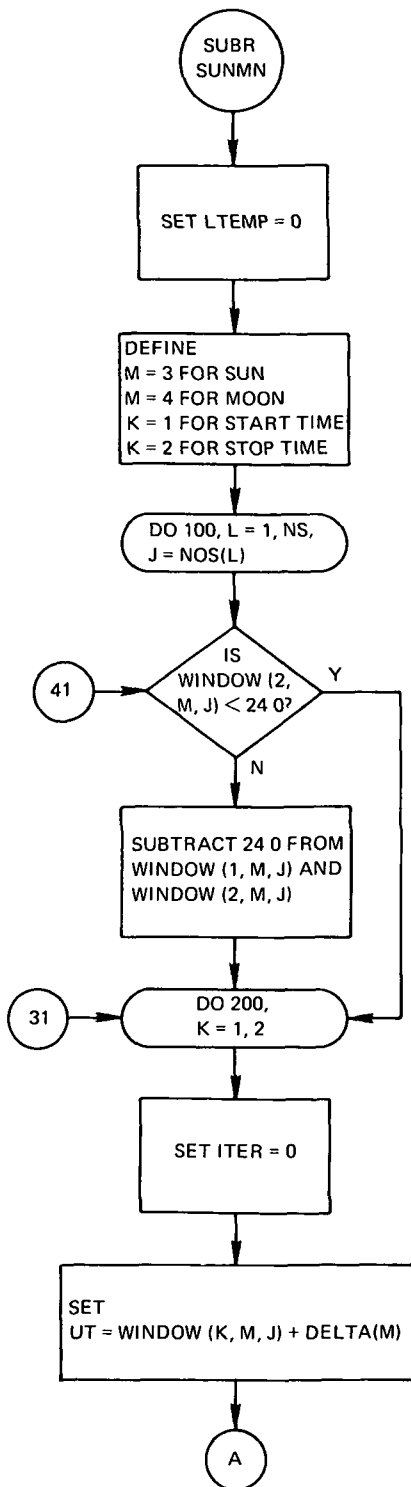
TIME PERIODS FOR UP TO TWELVE TRACKING STATIONS CAN BE FOUND.  
ROUTINE DEPENDS UPON THE AVAILABLE DATA ON THE SUN AND MOON  
POSITION TO BE DEFINED IN THE EPHEMERIS TABLES FOR THE DATES  
REQUIRED, PRESENT VERSION CONTAINS DATA FOR THE YEARS 1972 THRU  
1980. ADDITIONAL DATA CAN BE MADE AVAILABLE WHEN NECESSARY.

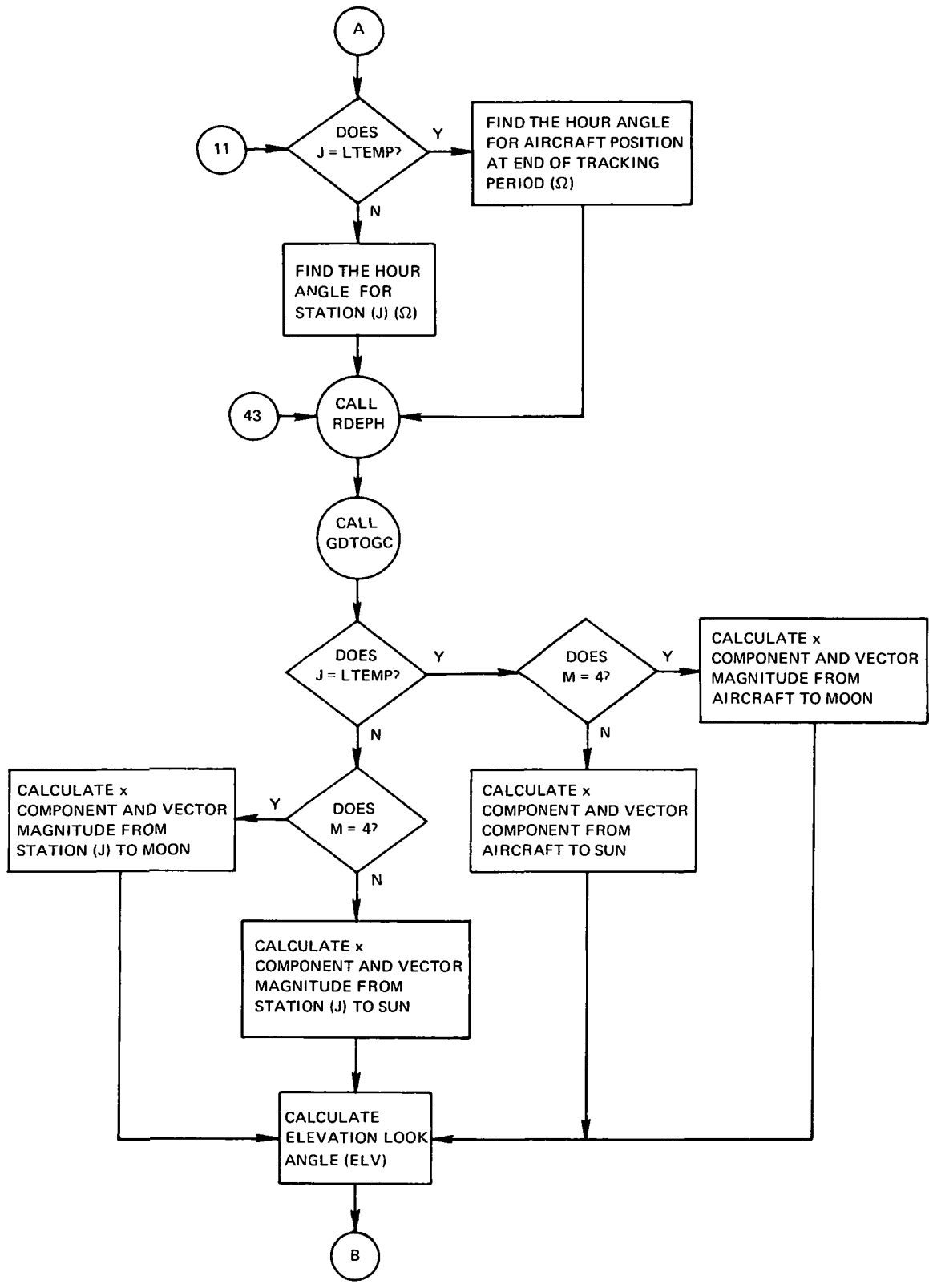
## \*\*\*\*\*SUBPROGRAMS REQUIRED-

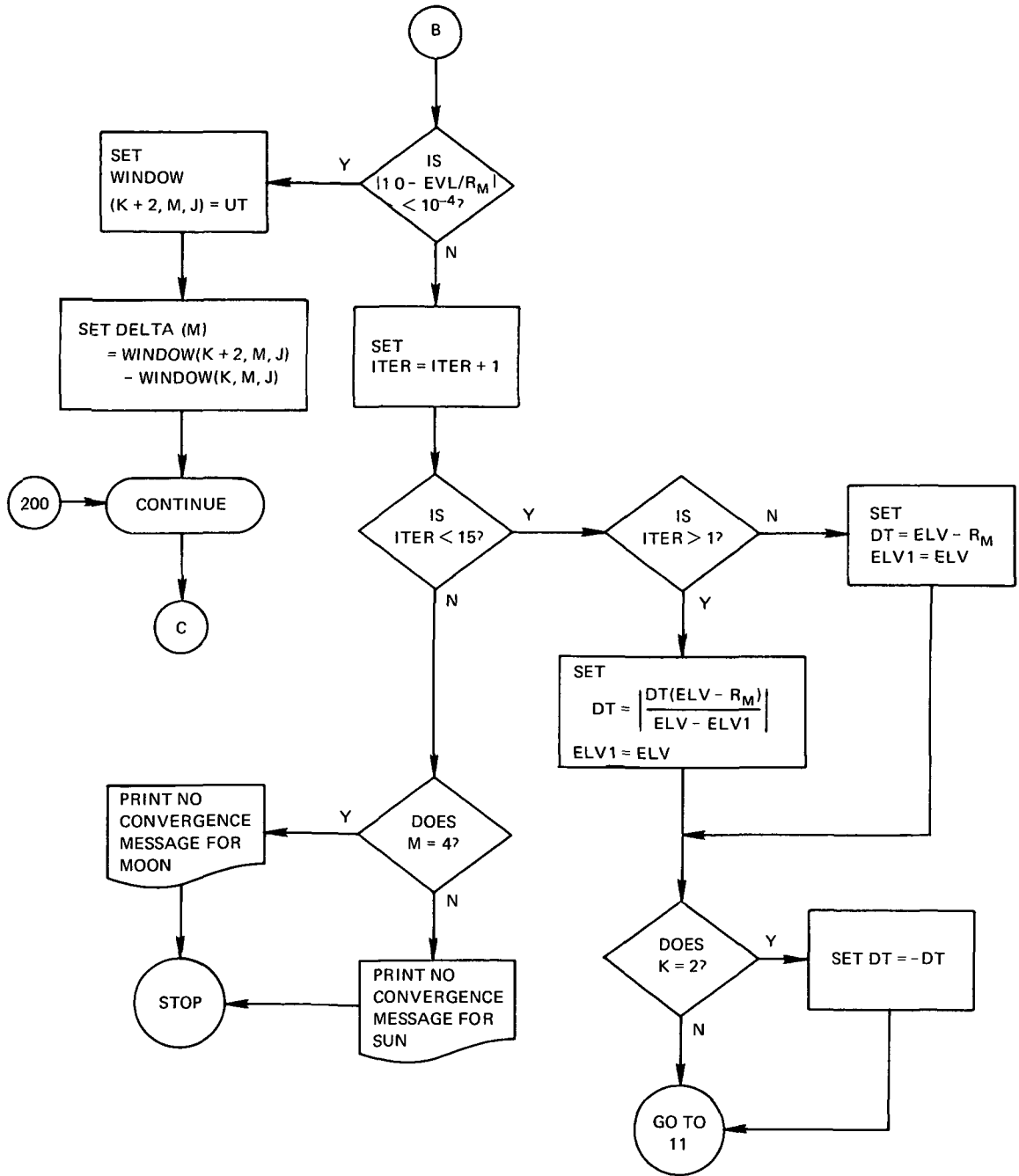
RDEPH  
              EPHEMERIS TABLES  
GC2TC

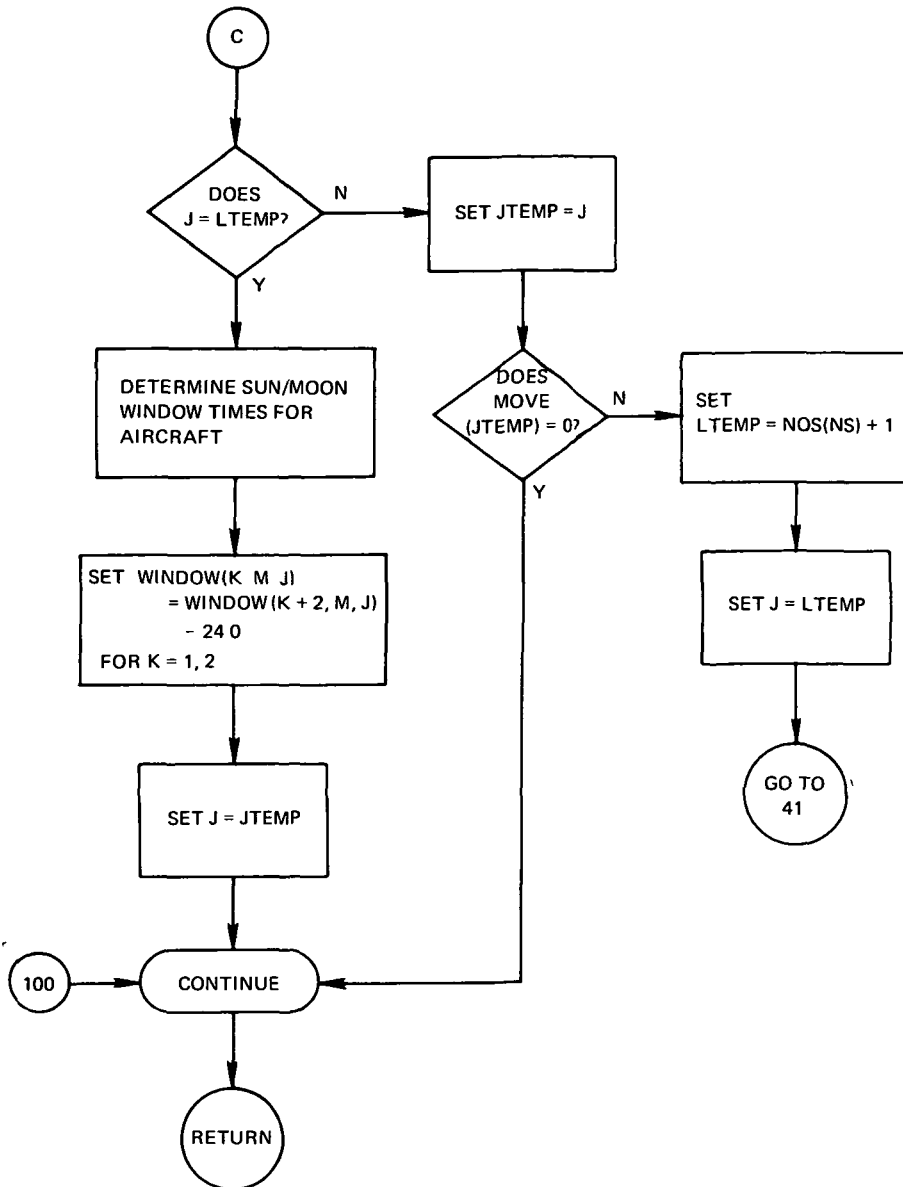
## \*\*\*\*\*REMARK-

ONLY ELEVEN TRACKING STATIONS CAN BE USED AS INPUT IF ONE OF  
THESE STATIONS IS AN AIRCRAFT.









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*****SUBROUTINE GC2TC*****
*****NASA WALLORS VERSION OF 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE=GE 625

*****PURPOSE=
  TO COMPUTE THE ELEMENTS OF THE TRANSFORMATION MATRIX FOR THE
  ROTATION FROM INERTIAL RECTANGULAR COORDINATES TO A TOPOCENTRIC
  SYSTEM WITH ORIGIN AT THE ORIGIN OF THE INERTIAL SYSTEM.

*****METHOD=
  GIVEN A POINT OF GEOCENTRIC LATITUDE AND LONGITUDE AND THE
  CURRENT HOUR ANGLE, CALCULATE THE ELEMENTS OF THE TRANSFORMATION
  MATRIX. COORDINATE TRANSFORMATION BY THIS MATRIX WILL TRANSFORM
  THE COMPONENTS FROM AN INERTIAL RECTANGULAR SYSTEM TO A
  TOPOCENTRIC SYSTEM. THE INERTIAL COORDINATE SYSTEM IS DEFINED AS
  HAVING ITS ORIGIN AT THE EARTH'S CENTER WITH THE X-AXIS IN THE
  DIRECTION OF THE FIRST POINT OF ARIES, THE Y-AXIS IN THE
  EQUATORIAL PLANE 90 DEGREES COUNTERCLOCKWISE FROM X AND THE Z-
  AXIS DIRECTED TOWARDS THE ZENITH IN A RIGHT HANDED SYSTEM. THE
  TOPOCENTRIC SYSTEM HAS ITS X-AXIS DIRECTED TOWARDS THE
  GEOCENTRIC INPUT POINT, THE Z-AXIS DIRECTED TOWARD THE SAME
  LATITUDE BUT AT 180 DEGREES FROM THE INPUT LONGITUDE AND THE Y-
  AXIS POSITIONED AS TO COMPLETE THE RIGHT HANDED SYSTEM,

*****INPUT=

  HA           -THE STATION'S HOUR ANGLE (RADIAN)
  J            -THE INDEX NUMBER OF THE STATION
  NOS(12)     -AN ARRAY CONTAINING THE STATION NUMBERS USED
  NS          -THE NUMBER OF STATIONS USED IN THE PROGRAM
  SINSLT(12)  -SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE
  COSSLT(12)  -COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE
  SINLAT(7)   -SINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING
               -EXPERIMENTAL PERIOD
  COSLAT(7)   -COSINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING
               -EXPERIMENTAL PERIOD

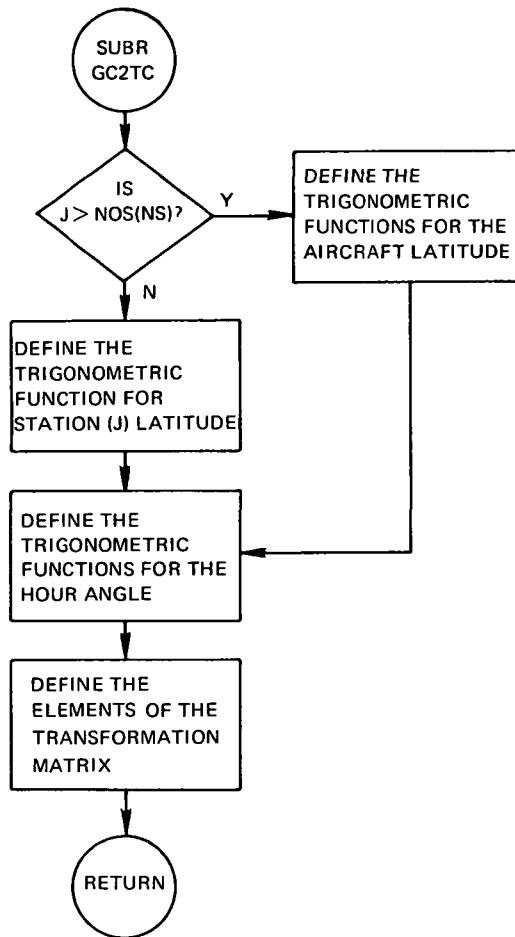
*****OUTPUT=

  AGC2TC(3,3) -ELEMENTS OF TRANSFORMATION MATRIX FROM THE
               -INERTIAL SYSTEM TO THE TOPOCENTRIC SYSTEM

*****RESTRICTIONS=
  NS CANNOT BE GREATER THAN TWELVE.

*****SUBPROGRAMS REQUIRED=
  NONE

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\*\*\*\*\*SUBROUTINE ILLUM\*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 02/01/70

\*\*\*\*\*LANGUAGE-FORTRAN IV

\*\*\*\*\*MACHINE-GE-625

\*\*\*\*\*PURPOSE-

TO DETERMINE THE TIME INTERVAL FOR THE CURRENT DAY FOR WHICH THE POSITION OF THE CLOUD WILL BE WITHIN THE EARTH'S SHADOW.

\*\*\*\*\*METHOD-

THIS SUBROUTINE ASSUMES THAT THE DECLINATION OF THE SUN IS FIXED FOR THE CURRENT DAY; THIS ASSUMPTION WILL HAVE AN ERROR OF LESS THAN 30 SECONDS IN TIME FOR A CLOUD AT LONGITUDE OF 75 DEGREES. THE SUBROUTINE FIRST FINDS THE SUN'S DECLINATION AT ZERO HOURS UNIVERSAL TIME; THEN A CHECK IS MADE TO SEE IF THE CLOUD'S POSITION WILL BE WITHIN THE RE-DEFINED EARTH SHADOW REGION. IF SO, THEN THE TIME ENTERING AND LEAVING THIS REGION DUE TO THE GEOCENTRIC POSITION OF THE CLOUD IS FOUND, THE CLOUD'S GROWTH AND DRIFT AFTER RELEASE IS USED TO DEFINE THE ILLUMINATION OF THE TOTAL CLOUD. THE RESULT OF THIS SUBROUTINE IS TO DEFINE THE TIME PERIOD(S) FOR POSSIBLE RELEASE WHICH EXCLUDES THE EARTH SHADOW REGION.

## \*\*\*\*\*INPUT-

KYEAR            -YEAR NUMBER FOR STARTING CALCULATIONS  
 I                -CURRENT NUMBER OF DAYS PAST JANUARY 0 OF 'KYEAR'  
 PHIP            -GEOCENTRIC LATITUDE OF RELEASE POINT (RADIAN)  
 SINCLT          -SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE  
 COSCLT          -COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE  
 SHADOW          -RADIUS OF EARTH SHADOW REGION (RADIAN)  
 GAMMA           -COSINE OF 'SHADOW'  
 DRIFT           -THE SPACE-FIXED DRIFT OF CLOUD (DEG/HR)  
 GHA             -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS  
                  -UNIVERSAL TIME (HRS)  
 ANS(1)          -RIGHT ASCENSION OF THE SUN (RADIAN)  
 ANS(2)          -DECLINATION OF THE SUN (RADIAN)  
 RTH             -CONVERSION FACTOR FROM RADIAN TO HOURS

## \*\*\*\*\*OUTPUT-

WINDOW(6,1,1) -THE DAILY RELEASE WINDOW START/STOP TIMES,  
                  -1ST INDEX FOR STORING START/STOP TIMES,  
                  -1,3,5 FOR START TIMES  
                  -2,4,6 FOR STOP TIMES  
                  -2ND INDEX FOR THE CONSTRAINT  
                  - 1=EARTH SHADOW  
                  -3RD INDEX DUMMY (NORMALLY STATION NUMBER)

## \*\*\*\*\*INTERNAL PARAMETERS-

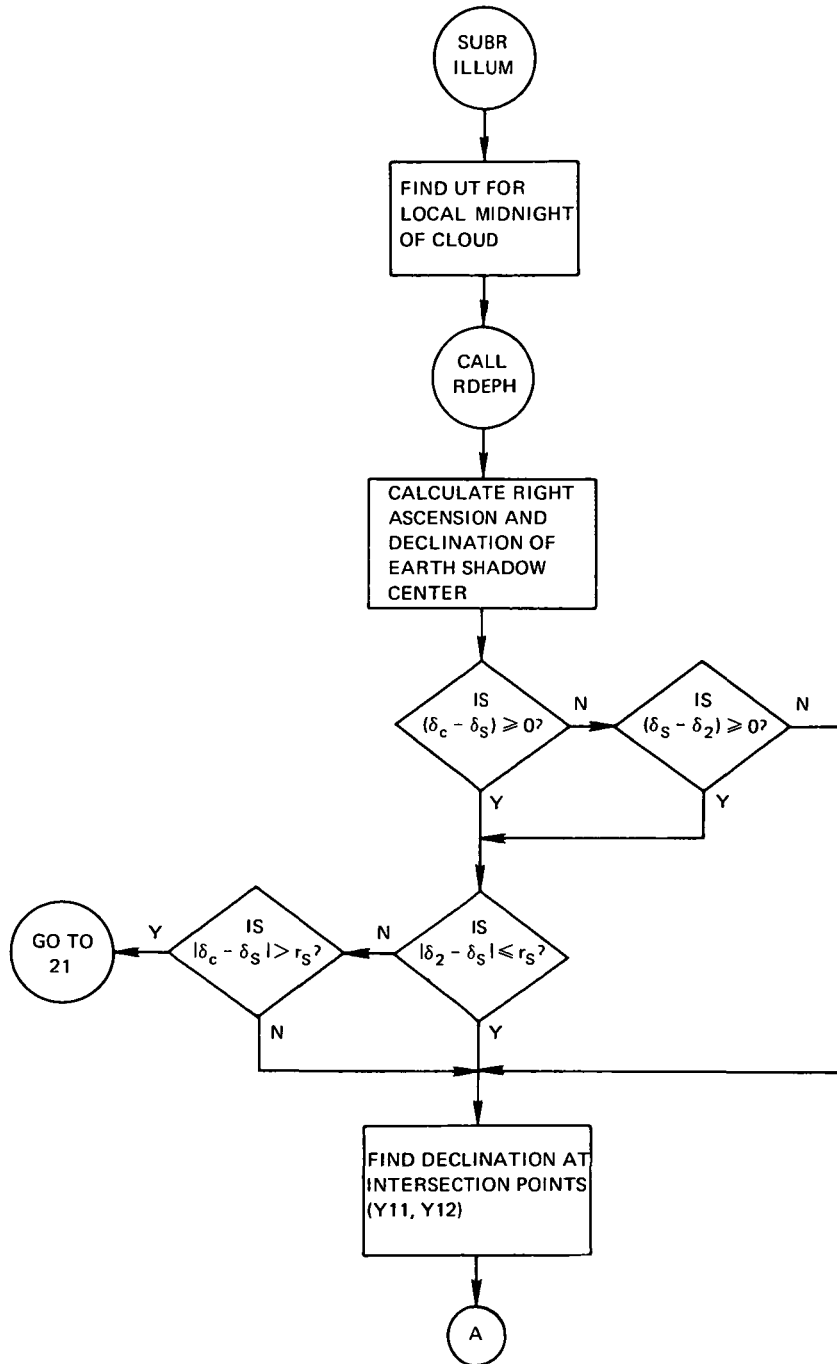
C1              -TOTAL SPACE-FIXED ANGULAR DISPLACEMENT DUE TO  
                  -CLOUD DRIFT FOR THE EXPERIMENTAL PERIOD,  
 C2              -ONE-HALF OF THE SPACE-FIXED ANGULAR DISPLACEMENT  
                  -DUE TO CLOUD GROWTH FOR THE EXPERIMENTAL PERIOD,  
 XO              -RIGHT ASCENSION OF EARTH SHADOW CENTER (RADIAN)  
 YO              -DECLINATION OF EARTH SHADOW CENTER (RADIAN)  
 PHIP2           -LARGEST VALUE OF CLOUD'S DECLINATION DUE TO  
                  -CLOUD GROWTH (RADIAN)  
 PHIP3           -SMALLEST VALUE OF CLOUD'S DECLINATION DUE TO  
                  -CLOUD GROWTH (RADIAN)  
 ST(3)           -START TIME AS CALCULATED FOR EACH SIDE OF  
                  -TRIANGLE MODEL OF CLOUD'S REGION,  
 STR(3)          -STOP TIME AS CALCULATED FOR EACH SIDE OF  
                  -TRIANGLE MODEL OF CLOUD'S REGION,

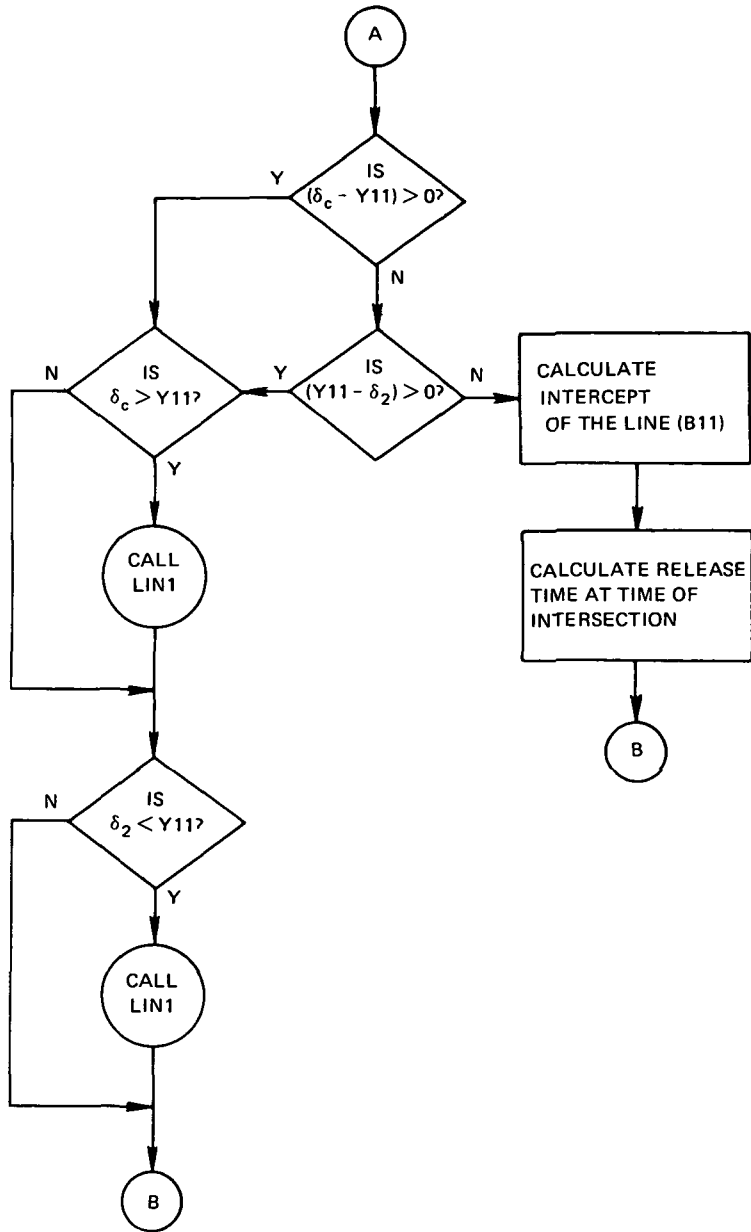
## \*\*\*\*\*RESTRICTIONS-

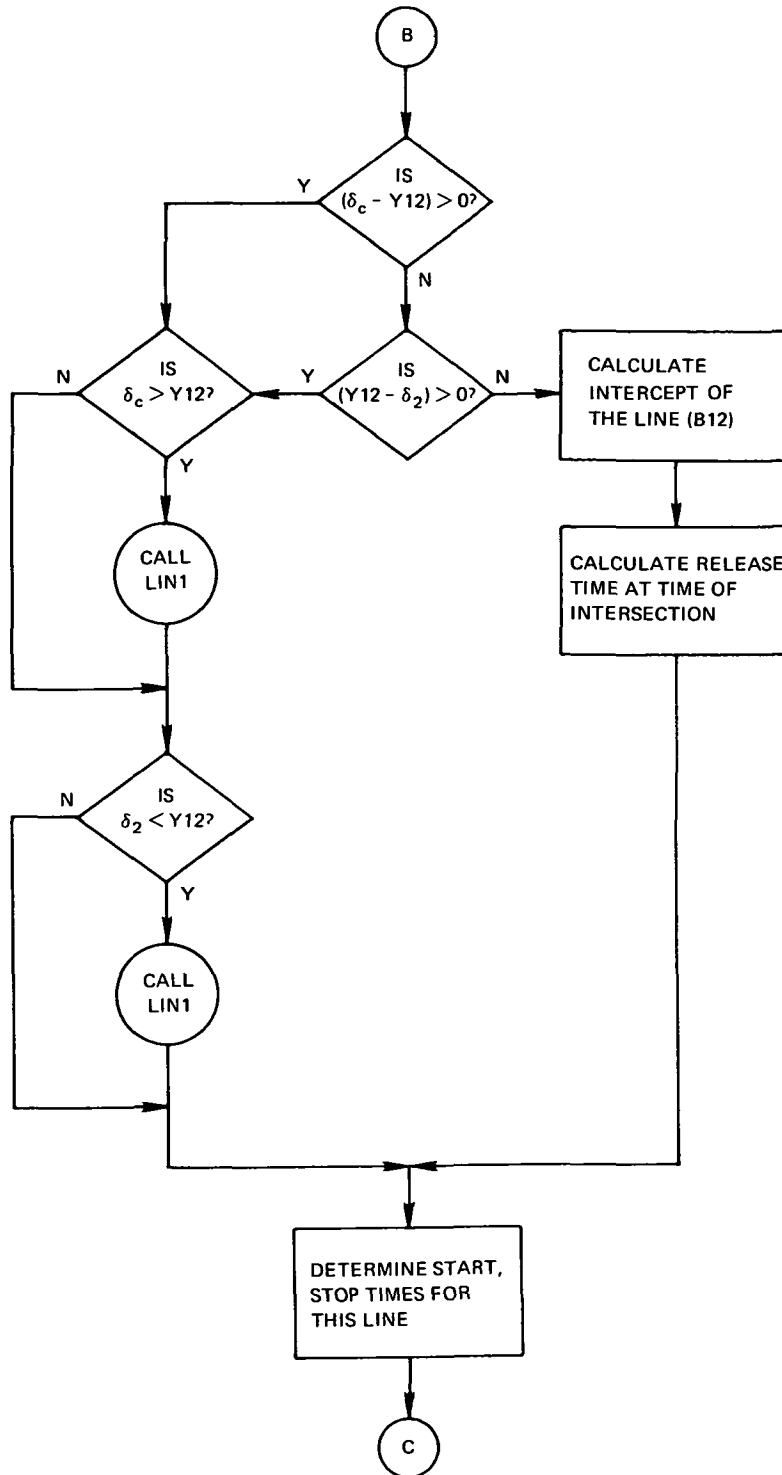
ACCURACY OF OUTPUT AS DEFINED ABOVE UNDER 'METHOD'.

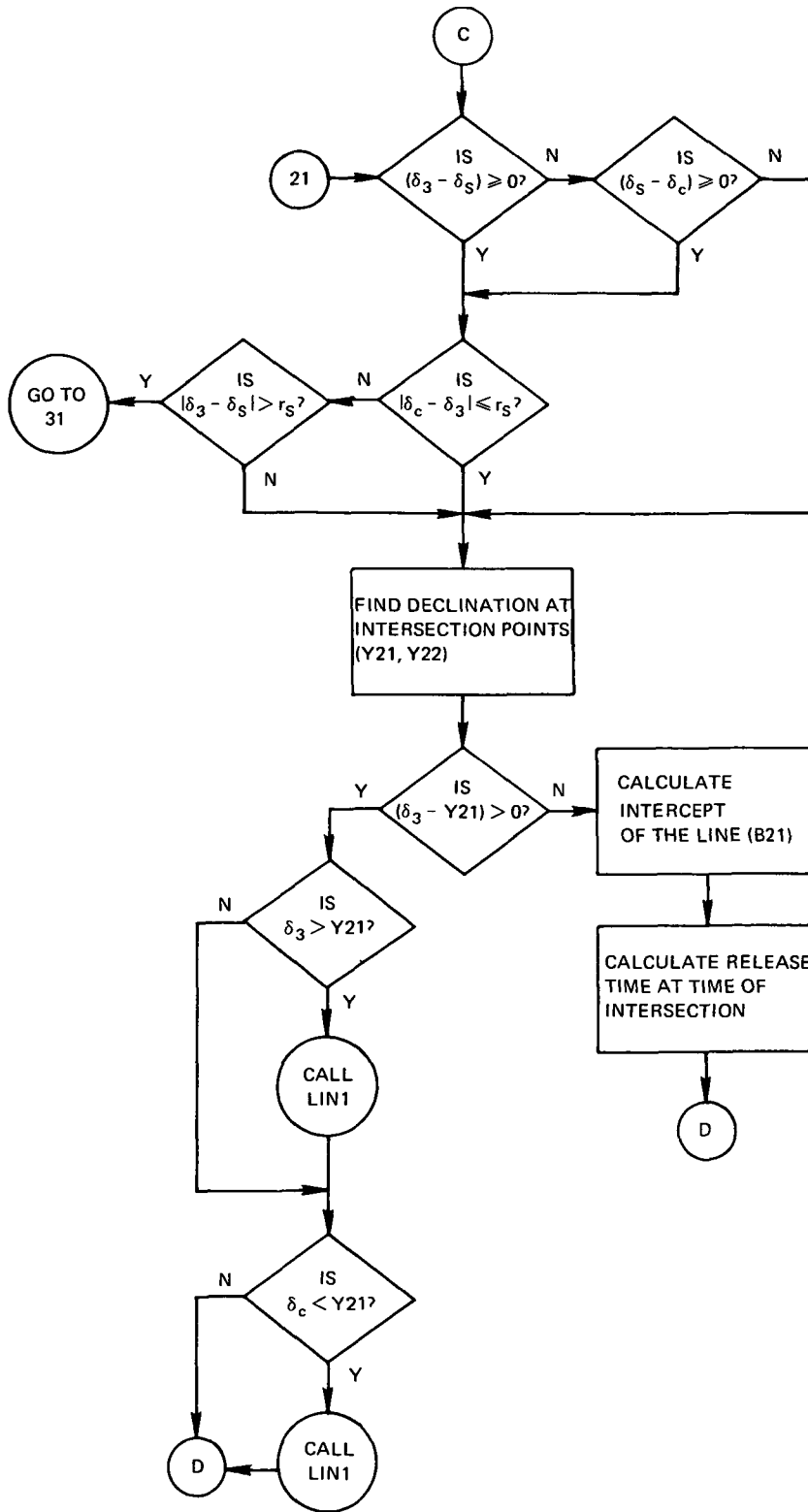


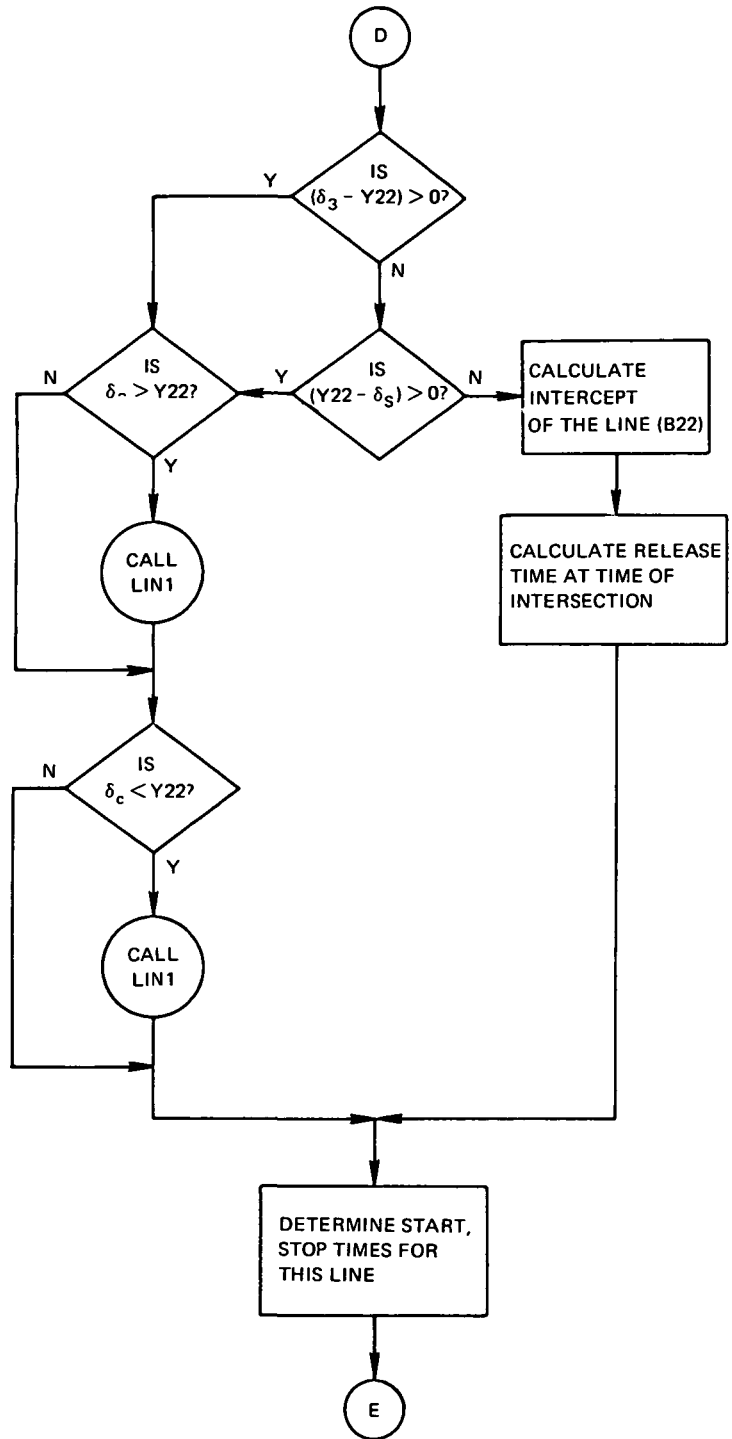
\*\*\*\*\*SUBPROGRAMS REQUIRED-  
 LIN1  
 RDEPH  
 EPHEMERIS TABLES

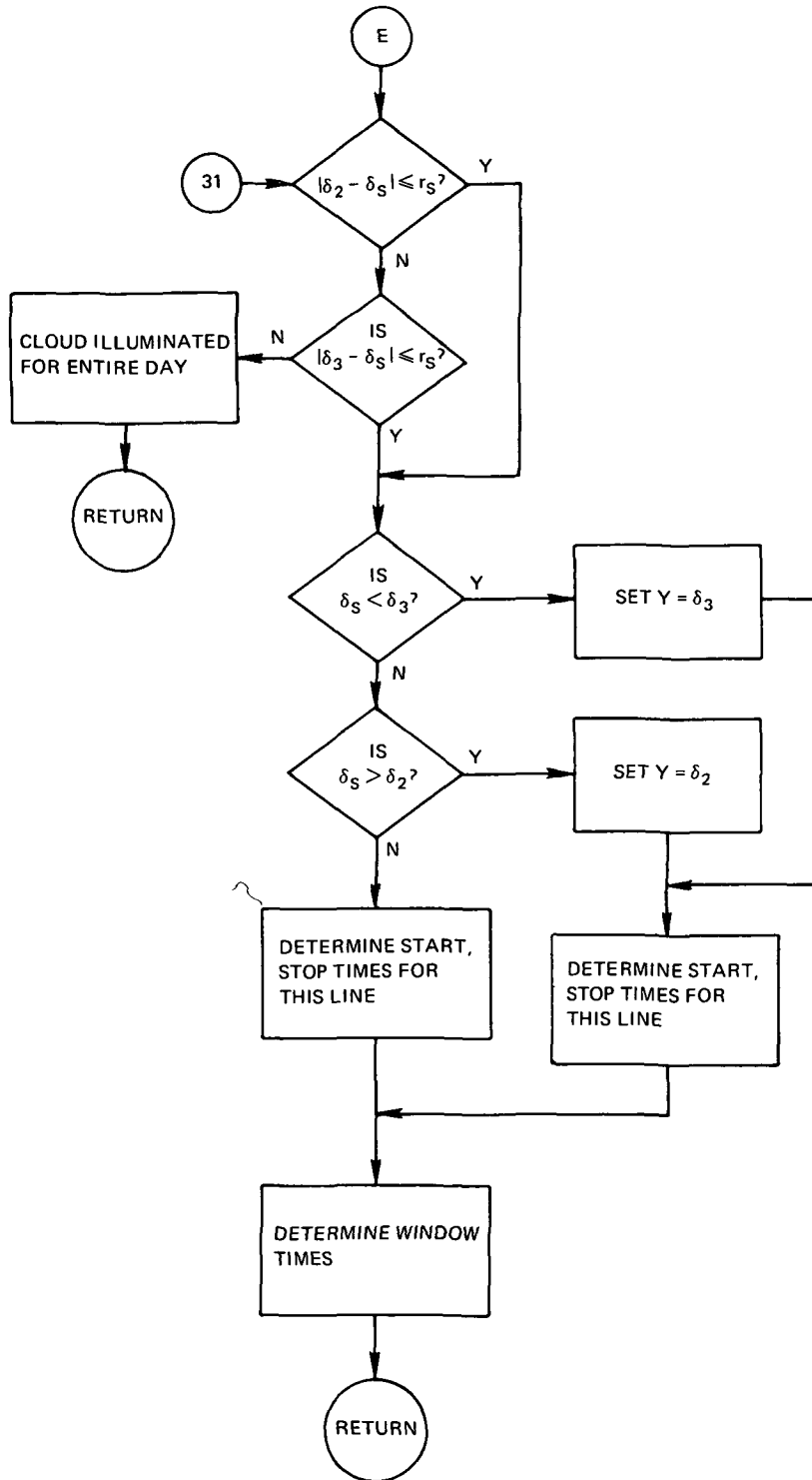












\*\*\*\*\*SUBROUTINE LIN1\*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 08/01/71

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE=HW625

\*\*\*\*\*PURPOSE-

TO CALCULATE THE POSSIBLE RELEASE TIMES FOR THE CLOUD ILLUMINATION CONSTRAINT.

\*\*\*\*\*METHOD-

THIS SUBROUTINE IS USED TO SOLVE THE POSSIBLE RELEASE TIME CALCULATIONS AS DEFINED IN SUBROUTINE ILLUM USING AN EQUATION THAT IS COMMON TO MANY CASES OF THE PROBLEM; THIS ROUTINE IS USED TO SIMPLIFY THE MANIPULATIONS OF SUBROUTINE ILLUM,

\*\*\*\*\*INPUT-

XO            -RIGHT ASCENSION OF EARTH SHADOW CENTER (RADIAN)  
 YO            -DECLINATION OF EARTH SHADOW CENTER (RADIAN)  
 SHADOW        -RADIUS OF EARTH SHADOW REGION (RADIAN)  
 GHA            -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS  
               -UNIVERSAL TIME (HRS)  
 DGHA          -HOURLY CHANGE FOR SIDEREAL TIME  
 RTH            -CONVERSION FACTOR FROM RADIAN TO HOURS  
 RLAMDA        -LONGITUDE OF RELEASE POINT (RADIAN)  
 PHI            -DECLINATION OF INTERSECTING POINT FOR CASE IN  
               -QUESTION (RADIAN)  
 C              -APPLICABLE CONSTANT FOR CLOUD DRIFT (RADIAN/HR)

\*\*\*\*\*OUTPUT-

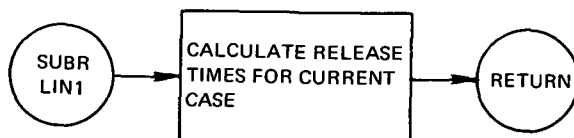
T1            -POSSIBLE TIME OF RELEASE FOR CASE IN QUESTION(HR)  
 T2            -POSSIBLE TIME OF RELEASE FOR CASE IN QUESTION(HR)

\*\*\*\*\*SUBPROGRAMS REQUIRED-

NONE

\*\*\*\*\*RESTRICTIONS-

NONE KNOWN



SUBROUTINE RDEPH(YEAR, DAY, ET, ANS)

NASA/WALLQPS VERSION OF 01/01/69

LANGUAGE = FORTRAN IV

MACHINE = GE 625

PURPOSE

RDEPH COMPUTES THE SUN AND MOON'S POSITION VECTOR

METHOD

THIS ROUTINE USES A THIRD DEGREE POLYNOMIAL TO INTERPOLATE TO A DESIRED ACCURACY OF APPROXIMATELY 5 ARC SECONDS

RESTRICTIONS

EPIHEMERIS DATA IS PRESENTLY AVAILABLE FOR THE YEARS 1972-1980

CALLING SEQUENCE

CALL RDEPH(YEAR, DAY, ET, ANS)

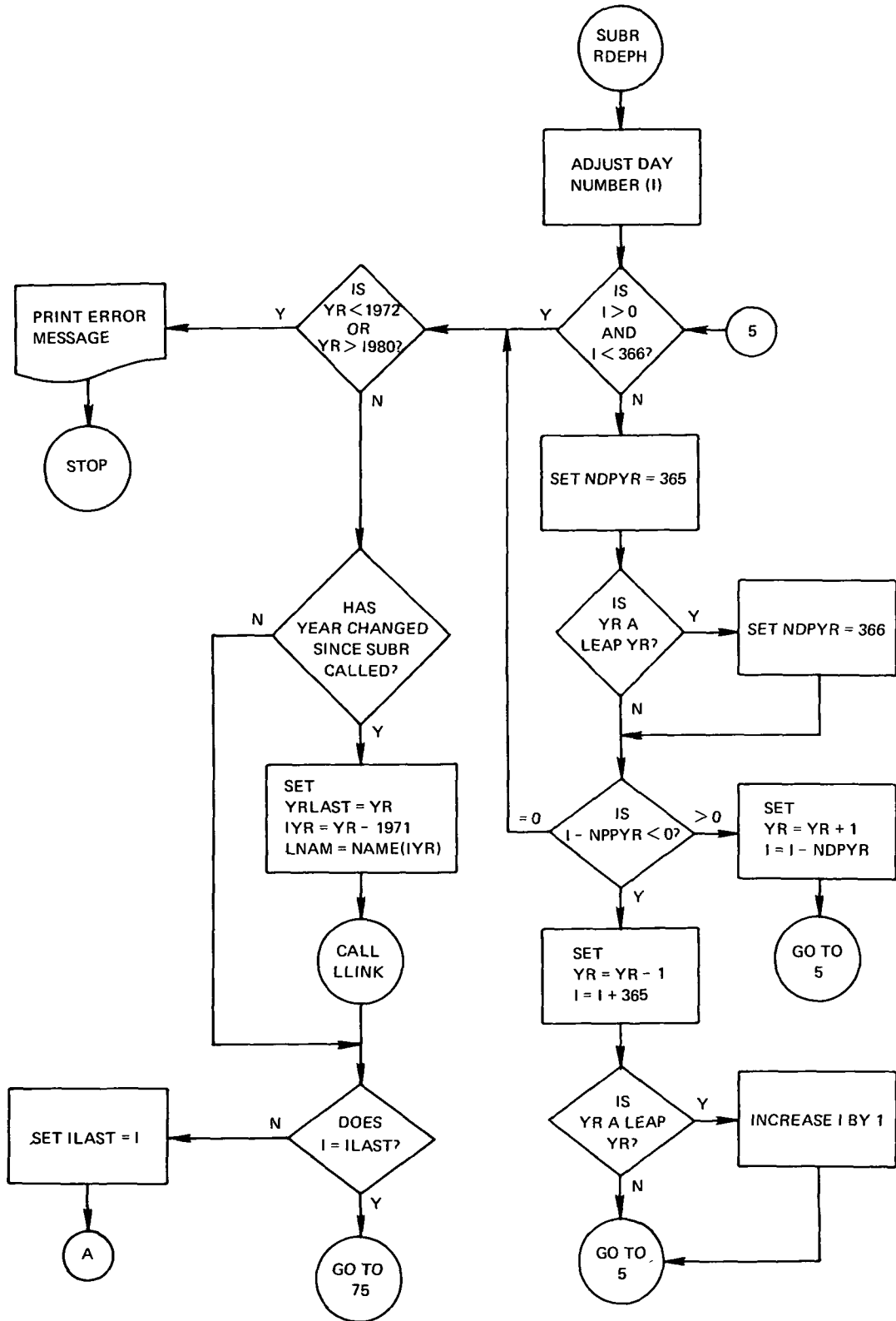
INPUT

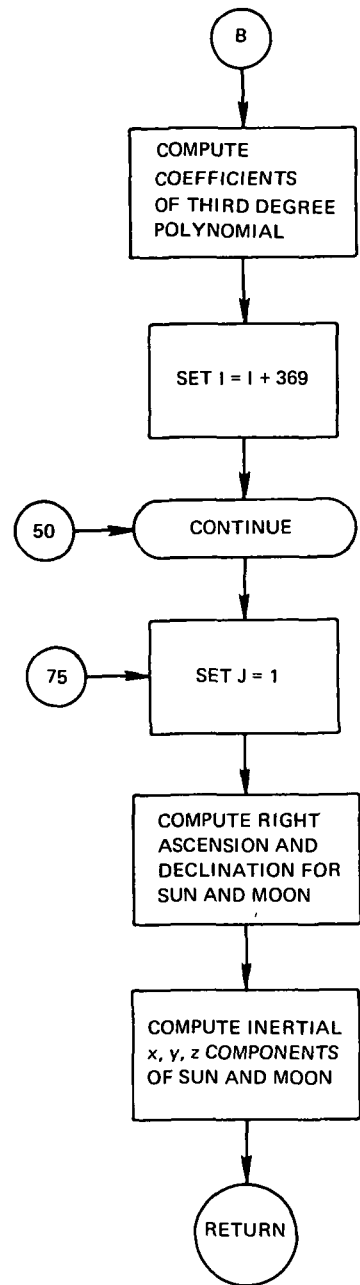
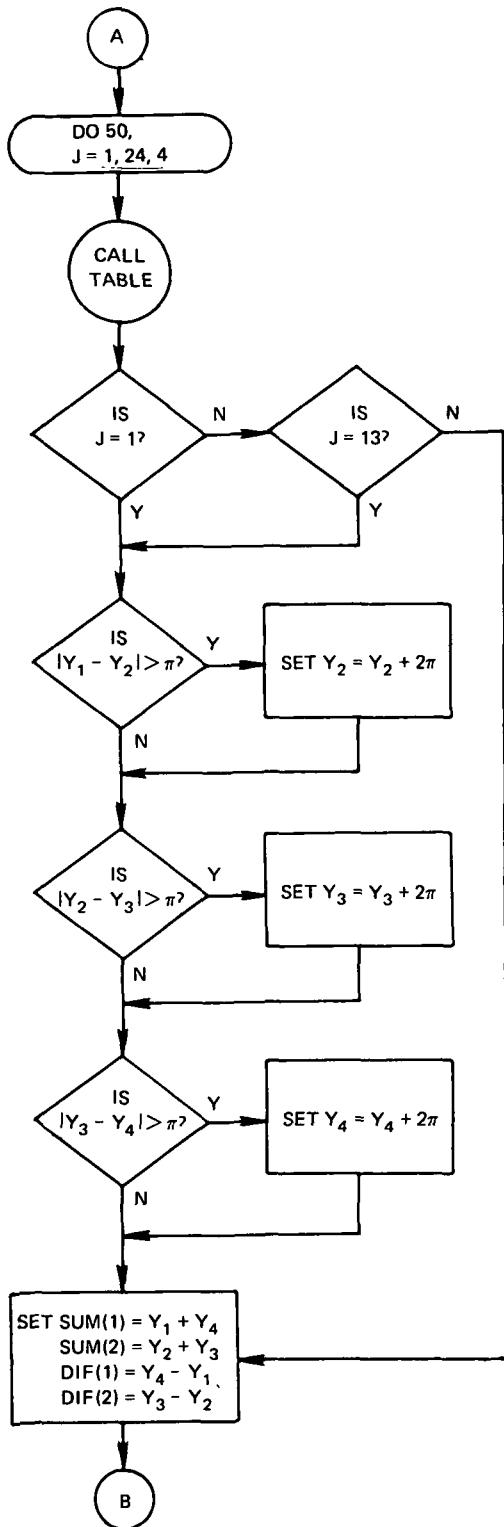
YEAR = THE YEAR NUMBER  
 DAY = THE DAY OF YEAR  
 ET = THE EPHEMERIS TIME PAST THE EPOCH DATE (HOURS)

OUTPUT

ANS(1) = THE SUN'S RIGHT ASCENSION (RADIAN)  
 ANS(2) = THE SUN'S DECLINATION (RADIAN)  
 ANS(3) = THE SUN'S RADIUS VECTOR (A.U.)  
 ANS(4-6) = THE INERTIAL X, Y, Z COORDINATES OF THE SUN (AU)  
 ANS(7) = THE MOON'S RIGHT ASCENSION (RADIAN)  
 ANS(8) = THE MOON'S DECLINATION (RADIAN)  
 ANS(9) = THE MOON'S RADIUS VECTOR (EARTH RADIUS)  
 ANS(10-12) = THE INERTIAL X, Y, Z COORDINATES OF THE MOON (ER)  
 SUBPROGRAMS REQUIRED  
 SUBROUTINE TABLE







\*\*\*\*\*NITE LITE \*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 02/01/70

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE-GE 625

\*\*\*\*\* PURPOSE-

TO DETERMINE FROM DAILY TIME PERIODS, THAT PORTION OF THE STATED PERIOD FOR WHICH THE TOTAL SKY BACKGROUND BRIGHTNESS OF THE TARGET AS SEEN FROM A GIVEN TRACKING STATION WILL BE LOWER THAN THE STATED CONSTRAINT.

\*\*\*\*\*METHOD-

THIS SET OF SUBPROGRAMS DETERMINES THE TOTAL SKY BACKGROUND BRIGHTNESS FOR DISCRETE UNIVERSAL TIMES OF THE CURRENT DAY, CHECKS ARE MADE EACH TIME THE TOTAL SKY BACKGROUND BRIGHTNESS IS CALCULATED TO DETERMINE IF THE GIVEN VALUE OF THIS CONSTRAINT HAS BEEN EXCEEDED OR NOT, INTEGER VARIABLES N, M, L ARE USED TO RECORD THESE EVENTS, FOR THE EVENT THAT THE CONSTRAINT IS EXCEEDED, THE PROPER VARIABLE N, M, L IS GIVEN A VALUE OF ONE, IF THE CONSTRAINT IS NOT EXCEEDED THEN THE PROPER INTEGER VARIABLE IS SET TO ZERO,

USING THE 'N' AND 'M' INTEGER VARIABLES, SUCCESSIVE POINTS ARE CALCULATED IN HALF HOUR TIME INCREMENTS UNTIL A CHANGE OF EVENT OCCURS (N NOT EQUAL TO M), THE 'N' MAINTAINS THE CODE OF WHAT THE CHANGE IN EVENT IS, FROM, THE 'L' VARIABLE RECORDS THE EVENT OF THE CALCULATION PERFORMED AT A TIME BETWEEN THOSE OF EVENTS 'N' AND 'M', THE CALCULATION FOR THE 'L' EVENT THEN REPLACES THOSE OF EITHER THE 'N' OR 'M' EVENT, WHICHEVER IS THE SAME AS THE 'L' EVENT, THIS PROCESS IS REPEATED UNTIL THE ROUTINE CONVERGES TO THE TIME OF EVENT CHANGE WITH AN ACCURACY OF .008 HOURS,

THESE TIMES FOUND ARE THEN THE START/STOP RELEASE TIME INTERVALS FOR SATISFYING THE TOTAL SKY BRIGHTNESS CONSTRAINT FOR A GIVEN STATION ON A GIVEN DAY,

IN ADDITION, IF THE EVENT RECORDED FOR A GIVEN UNIVERSAL TIME IS ZERO (A GOOD RELEASE TIME), THE SUBROUTINE 'TRACK' CHECKS TO MAKE SURE THE CONSTRAINT IS NOT EXCEEDED DURING THE EXPERIMENTAL PERIOD. IF THE BRIGHTNESS CONSTRAINT IS EXCEEDED DURING THE EXPERIMENTAL PERIOD, THEN THE UNIVERSAL TIME RECORDED IS CONSIDERED AS NOT FAVORABLE AND THE EVENT CODE FOR THAT TIME IS CHANGED TO ONE,

\*\*\*\*\*INPUT-

NS	-THE NUMBER OF STATIONS USED IN THE PROGRAM
NOS(12)	-AN ARRAY CONTAINING THE STATION NUMBERS USED
R(5)	-INPUT VALUE FOR TOTAL SKY BACKGROUND BRIGHTNESS -(RAYLEIGHS)
R(7)	-MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS)
BA(12,7)	-AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE

-GIVEN POSITION OF THE CLOUD (RAYLEIGHS)  
 C(12,7) -COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION  
 -OF THE TRACKING STATION TO THE CLOUD AND USED TO  
 -SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS  
 LD -ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY  
 -(RAYLEIGHS)  
 ST -UNRESOLVED STAR BRIGHTNESS OF A POINT IN THE SKY  
 -(RAYLEIGHS)

\*\*\*\*\* OUTPUT-

WINDOW(6,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES;  
 -1ST INDEX FOR STORING START/STOP TIMES,  
 -1,3,5 FOR START TIMES  
 -2,4,6 FOR STOP TIMES  
 -2ND INDEX FOR THE CONSTRAINT  
 - 5=TOTAL SKY BACKGROUND BRIGHTNESS  
 -3RD INDEX FOR THE STATION NUMBER

\*\*\*\*\*RESTRICTIONS-

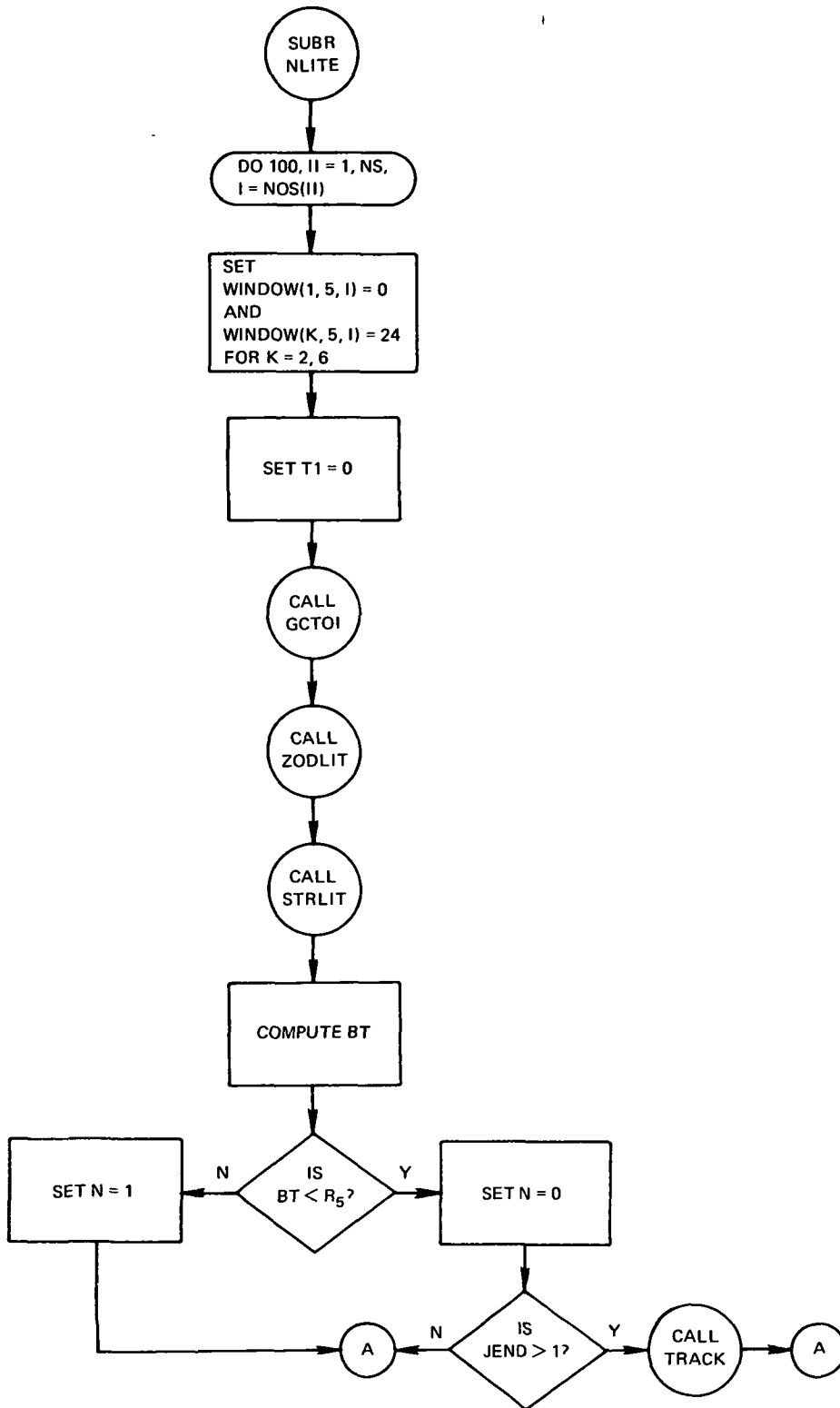
TSTOP MUST BE NUMERICALLY GREATER THAN TSTART, ONLY TWELVE  
 STATIONS MAY BE USED, TSTOP AND TSTART ARE ACCURATE TO ONE  
 MINUTE OF TIME,

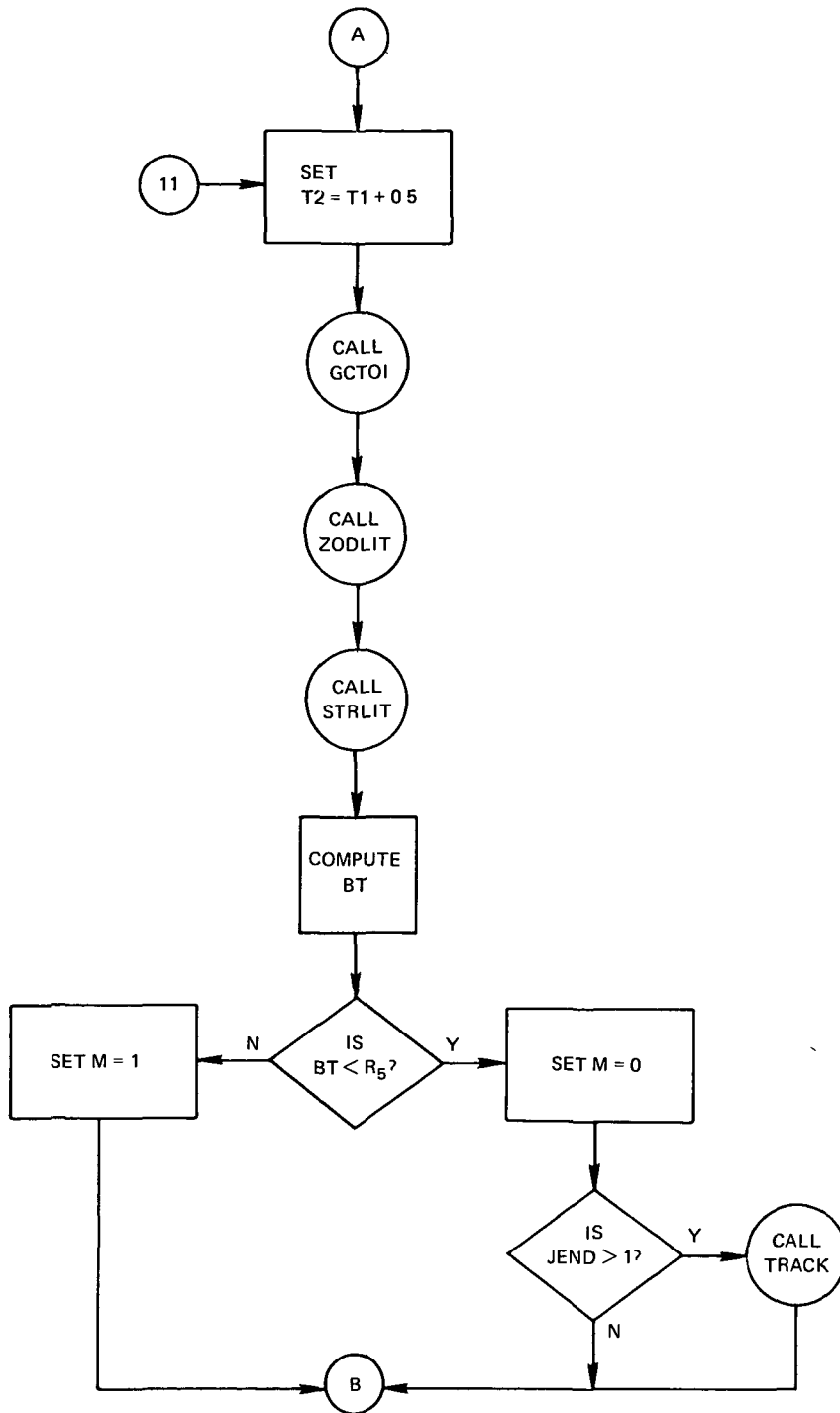
\*\*\*\*\*SUBPROGRAMS REQUIRED-

GCTOI  
 ZODLIT  
       ITE  
       ZTABLE  
 STRLIT  
 TRACK

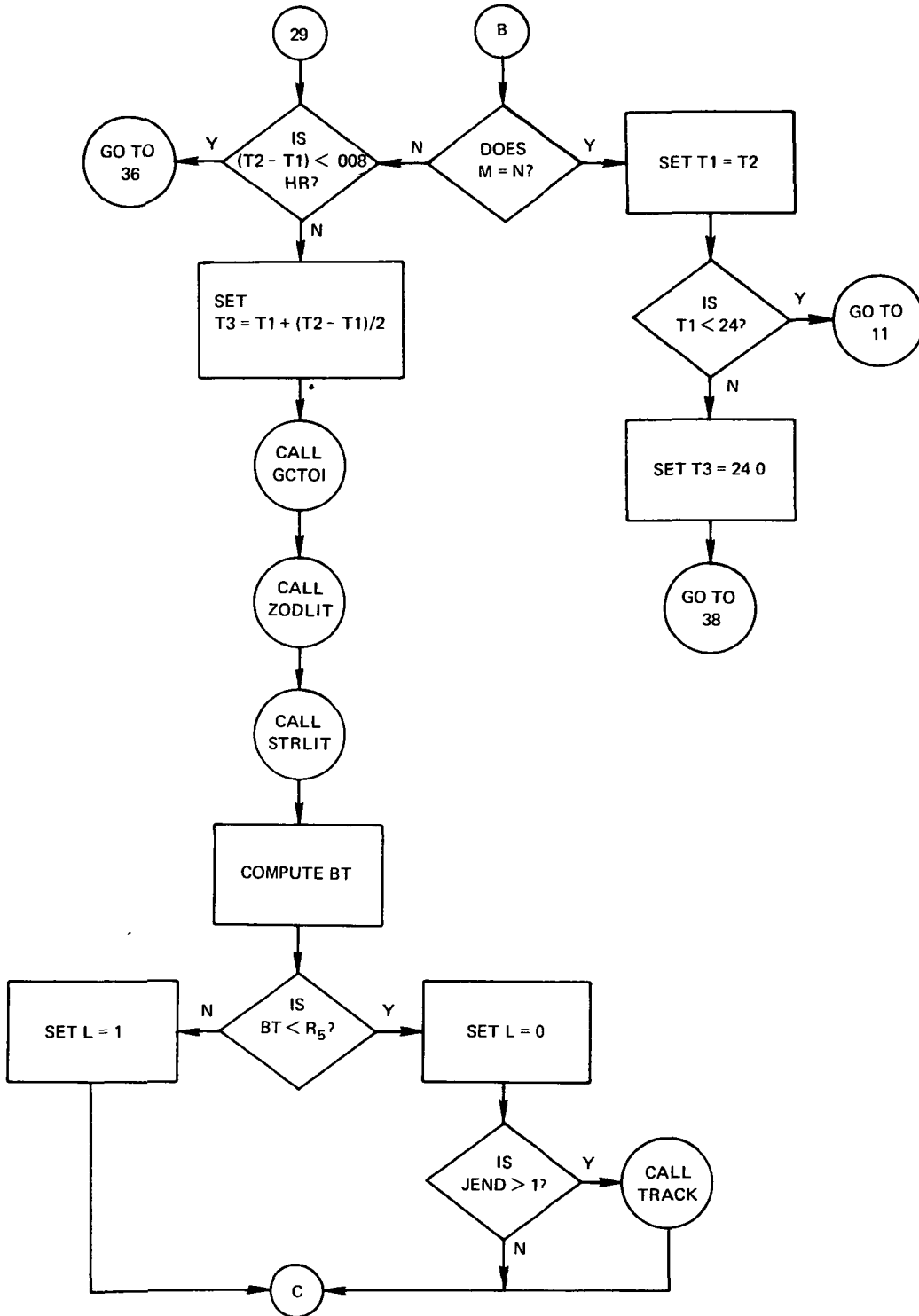
\*\*\*\*\*REMARK-

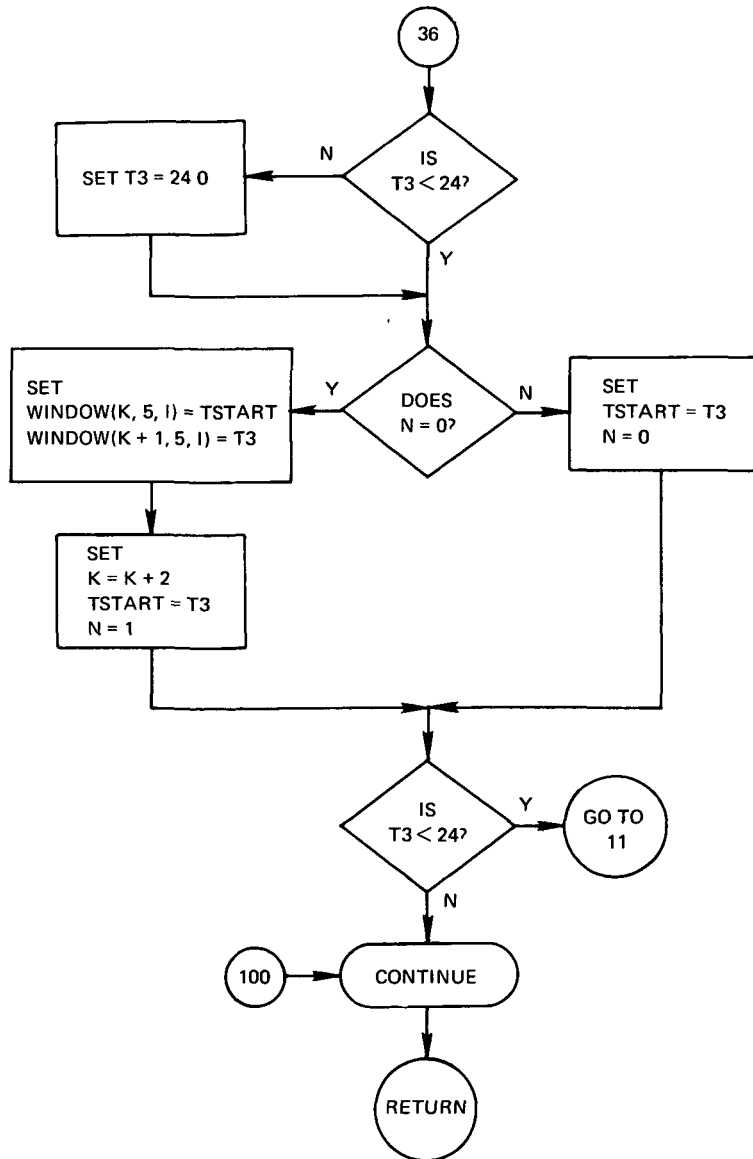
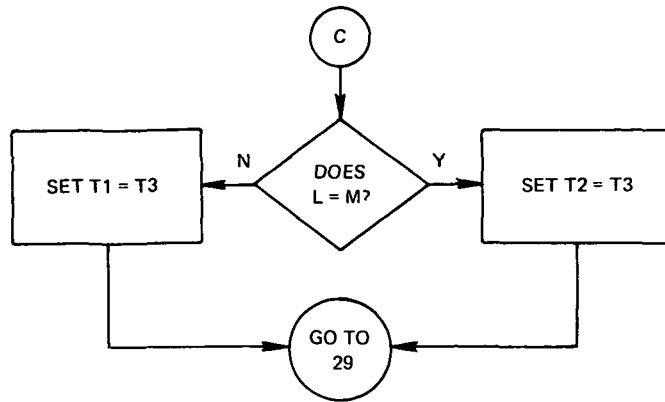
ONLY ELEVEN TRACKING STATIONS CAN BE USED AS INPUT IF ONE OF  
 THESE STATIONS IS AN AIRCRAFT,





DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS







\*\*\*\*\* SUBROUTINE GCTOI \*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 02/01/70

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE=GE 625

\*\*\*\*\* PURPOSE-

TO CONVERT GEOCENTRIC COORDINATES TO INERTIAL COORDINATES.

\*\*\*\*\*METHOD-

FIRST THE SIN AND COS OF THE GREENWICH MEAN SIDEREAL HOUR ANGLE IS CALCULATED FOR THE SPECIFIC TIME IN QUESTION, THESE VALUES ARE THEN USED TO CONVERT THE GEOCENTRIC COORDINATES TO INERTIAL

\*\*\*\*\*INPUT-

GHA	=GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS UNIVERSAL TIME (HRS)
WX	=GEOCENTRIC X COMPONENT OF INPUT VECTOR
WY	=GEOCENTRIC Y COMPONENT OF INPUT VECTOR
WZ	=GEOCENTRIC Z COMPONENT OF INPUT VECTOR
T	=CURRENT UNIVERSAL TIME (HOURS)
I	=TRACKING STATION NUMBER
HTR	=CONVERSION FROM HOURS TO RADIANS
DGHA	=HOURLY CHANGE FOR SIDEREAL TIME

\*\*\*\*\* OUTPUT-

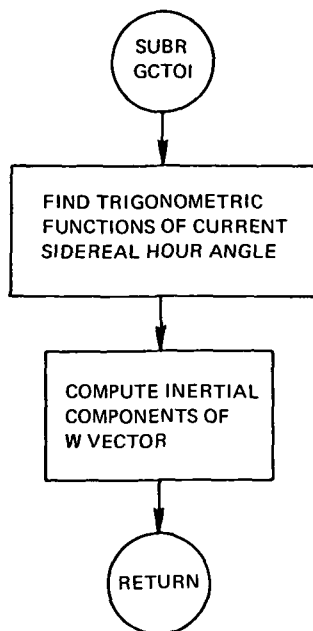
W1	=INERTIAL X COMPONENT OF OUTPUT VECTOR
W2	=INERTIAL Y COMPONENT OF OUTPUT VECTOR
W3	=INERTIAL Z COMPONENT OF OUTPUT VECTOR

\*\*\*\*\*RESTRICTIONS-

NONE KNOWN

\*\*\*\*\*SUBPROGRAMS REQUIRED-

NONE



\*\*\*\*\* SUBROUTINE ZODLIT \*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 02/01/70

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE=GE 625

\*\*\*\*\* PURPOSE -  
 TO CALCULATE THE ZODIACAL LIGHT FOR A GIVEN SET OF LOOK  
 COORDINATES

\*\*\*\*\*METHOD -  
 FIRST SUBROUTINE ITE IS CALLED AND THE INERTIAL COORDINATES  
 OF THE VECTOR FROM THE STATION TO THE TEST CLOUD ARE CONVERTED  
 TO AN ECLIPTIC LATITUDE AND LONGITUDE; THE ECLIPTIC LATITUDE  
 AND LONGITUDE ARE THEN MADE ABSOLUTE VALUES; SUBROUTINE ZTABLE  
 IS THEN CALLED TO TRANSLATE THESE VALUES INTO ZODIACAL LIGHT  
 VALUES IN RAYLEIGHTS

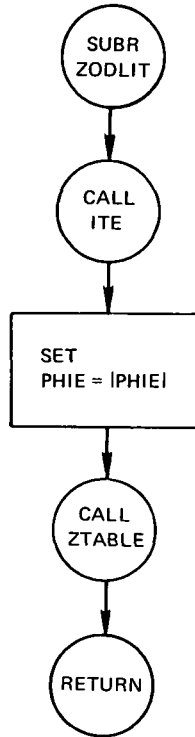
\*\*\*\*\*INPUT -

W1	=INERTIAL X COMPONENT OF VECTOR FROM STATION(I) -TO CLOUD
W2	=INERTIAL Y COMPONENT OF VECTOR FROM STATION(I) -TO CLOUD
W3	=INERTIAL Z COMPONENT OF VECTOR FROM STATION(I) -TO CLOUD

\*\*\*\*\* OUTPUT -

ZD	=ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY =(RAYLEIGHTS)
----	---

\*\*\*\*\*RESTRICTIONS-  
 NONE  
 \*\*\*\*\*SUBPROGRAMS REQUIRED=  
 ITE  
 ZTABLE



\*\*\*\*\* SUBROUTINE ITE \*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 02/01/70

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE-GE 625

\*\*\*\*\* PURPOSE-

TO TRANSFORM FROM AN INERTIAL RECTANGULAR COORDINATE SYSTEM AS DESCRIBED IN USER DOCUMENTATION AND TO FIND THE ECLIPTIC LATITUDE AND ELONGATION OF A POINT OF INTERSECTION OF AN INPUT VECTOR WITH A CELESTIAL SPHERE;

\*\*\*\*\*METHOD-

ROTATION IS PERFORMED ON THE INERTIAL X,Y,Z COMPONENTS TO GIVE ECLIPTIC X,Y,Z, VALUES. THESE VALUES ARE USED TO CALCULATE THE ECLIPTIC LATITUDE AND LONGITUDE.

\*\*\*\*\*INPUT-

W1                    -INERTIAL X COMPONENT OF VECTOR FROM STATION(I)  
                          -TO CLOUD

W2            -INERTIAL Y COMPONENT OF VECTOR FROM STATION(I)  
               -TO CLOUD

W3            -INERTIAL Z COMPONENT OF VECTOR FROM STATION(I)  
               -TO CLOUD

## \*\*\*\*\* OUTPUT=

PHIE            -ECLIPTIC LATITUDE (DEG)  
 OMEGAE        -ECLIPTIC LONGITUDE (DEG)

## \*\*\*\*\*INTERNAL PARAMETERS=

XE            -X COMPONENT OF INPUT VECTOR IN ECLIPTIC  
               -COORDINATES

YE            -Y COMPONENT OF INPUT VECTOR IN ECLIPTIC  
               -COORDINATES

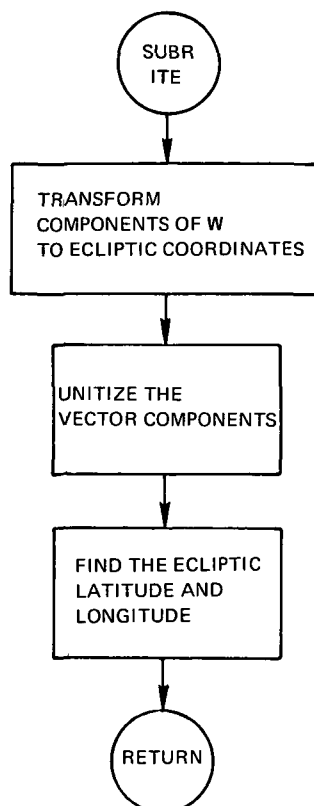
ZE            -Z COMPONENT OF INPUT VECTOR IN ECLIPTIC  
               -COORDINATES

## \*\*\*\*\*RESTRICTIONS=

NONE KNOWN

## \*\*\*\*\*SUBPROGRAMS REQUIRED=

NONE



## DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

\*\*\*\*\* SUBROUTINE ZTABLE \*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 02/01/70

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE=GE 625

\*\*\*\*\* PURPOSE=  
TO FIND THE ZODIACAL LIGHT BRIGHTNESS AT A PARTICULAR POINT.

\*\*\*\*\*METHOD=  
THIS IS A TABLE LOOKUP WITH DOUBLE INTERPOLATION,

\*\*\*\*\*INPUT-

PHIE            -ECLIPTIC LATITUDE (DEG)  
OMEGAE          -ECLIPTIC LONGITUDE (DEG)

\*\*\*\*\* OUTPUT-

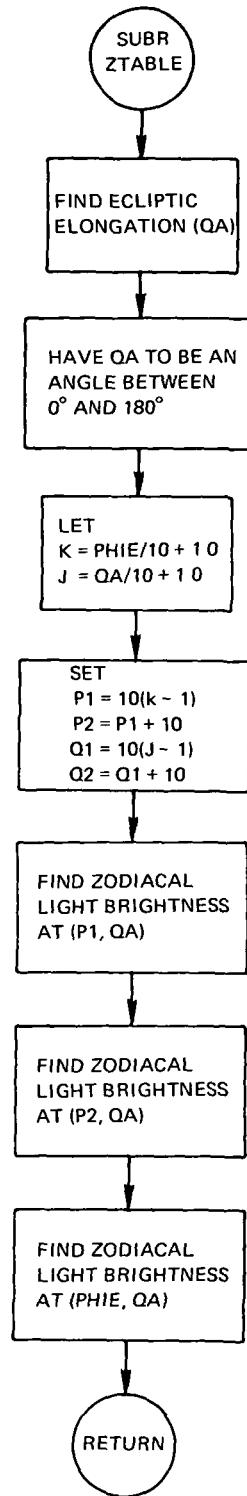
ZD              -ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY  
                  -(RAYLEIGHS)

\*\*\*\*\*INTERNAL PARAMETERS-

P1              -ECLIPTIC LATITUDE FOR BRIGHTNESS AT POINT '1'  
P2              -ECLIPTIC LATITUDE FOR BRIGHTNESS AT POINT '1+1'  
Q1              -ECLIPTIC LONG.    FOR BRIGHTNESS AT POINT '1'  
Q2              -ECLIPTIC LONG.    FOR BRIGHTNESS AT POINT '1+1'  
ZD1             -VALUE OF ZODIACAL LIGHT AT (P1,QA)  
ZD2             -VALUE OF ZODIACAL LIGHT AT (P2,QA)

\*\*\*\*\*RESTRICTIONS=  
NONE KNOWN

\*\*\*\*\*SUBPROGRAMS REQUIRED=  
NONE



\*\*\*\*\*SUBROUTINE STRLIT \*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 02/01/70

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE=GE 625

\*\*\*\*\*PURPOSE-

TO CALCULATE THE STAR LIGHT BRIGHTNESS AT A GIVEN SET OF LOOK COORDINATES.

\*\*\*\*\*METHOD-

A TABLE LOOKUP PROCESS WITH LINEAR INTERPOLATION IS USED TO DETERMINE THE VALUE OF THE STAR BRIGHTNESS OF THE SKY BACKGROUND OF THE CLOUD AS SEEN FROM A GIVEN TRACKING STATION, THE TABLE OF STAR BRIGHTNESS VALUES HAVE BEEN TRANSFORMED INTO INERTIAL COORDINATES WITH UNITS OF TENTH VISUAL STAR MAGNITUDES PER SQUARE DEGREE, BRIGHTNESS TABLES ARE GIVEN IN 5-DEGREE INCREMENTS OF LATITUDE FROM -90 DEG. TO +90 DEG, AND IN 10-DEG, INCREMENTS OF LONGITUDE FROM 0 TO 360 DEGREES, LOOK ANGLES ARE FOUND FROM THE INERTIAL RECTANGULAR COMPONENTS THEN TABLE LINEAR INTERPOLATION DETERMINES THE STAR BRIGHTNESS

\*\*\*\*\*INPUT-

W1	=INERTIAL X COMPONENT OF VECTOR FROM STATION(I) TO CLOUD
W2	=INERTIAL Y COMPONENT OF VECTOR FROM STATION(I) TO CLOUD
W3	=INERTIAL Z COMPONENT OF VECTOR FROM STATION(I) TO CLOUD

\*\*\*\*\*OUTPUT-

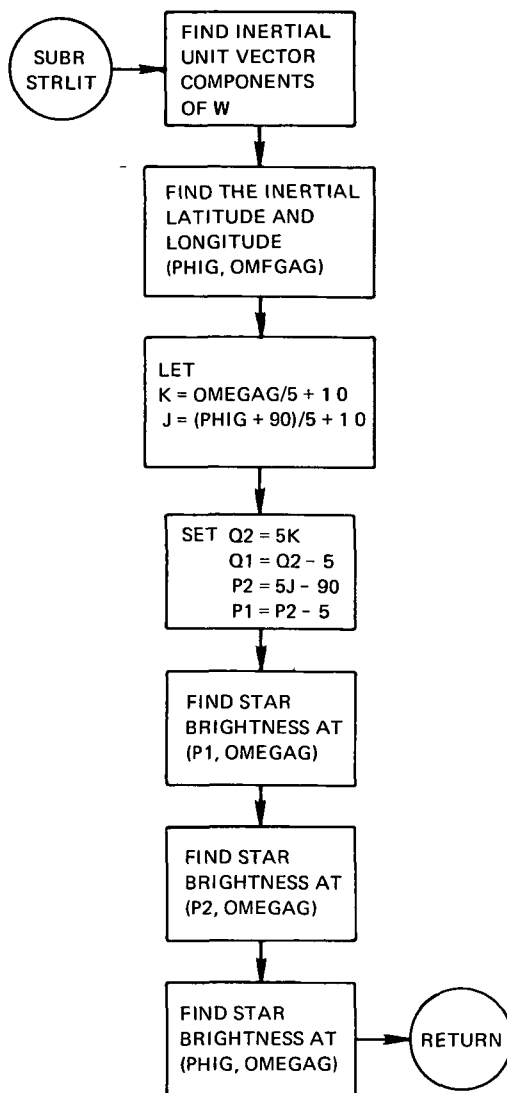
ST	=UNRESOLVED STARLIGHT BRIGHTNESS OF A POINT IN THE SKY (RAYLEIGH)
----	--

\*\*\*\*\*RESTRICTIONS-

FORTAN MEMORY LIMITS MUST BE INCREASED TO 30K FOR COMPILING THIS SUBROUTINE

\*\*\*\*\*SUBPROGRAMS REQUIRED-

NONE



\*\*\*\*\*SUBROUTINE TRACK\*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 02/01/70

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE=GE 625

PURPOSE-

TO DETERMINE IF THE TOTAL SKY BACKGROUND BRIGHTNESS WILL EXCEED THE CONSTRAINT LIMITATION DURING THE REQUIRED EXPERIMENTAL PERIOD.

\*\*\*\*\*METHOD-

GIVEN A FAVORABLE TIME OF RELEASE FOR STATION(I) FROM SUBROUTINE NLITE, DETERMINE IF THE TOTAL SKY BACKGROUND BRIGHTNESS IS EXCEEDED DURING THE EXPERIMENTAL PERIOD BY CHECKING THIS AT 30 MINUTE INTERVALS, THE INERTIAL RECTANGULAR



COMPONENTS OF THE VECTOR FROM STATION(I) TO THE CLOUD,S POSITION DURING THE EXPERIMENTAL PERIOD ARE FIRST CALCULATED. THE VALUES OF ZODIACAL LIGHT AND STARLIGHT ARE DETERMINED THROUGH SUBROUTINES ZODLIT AND STRLIT RESPECTIVELY, THEN THE TOTAL SKY BACKGROUND BRIGHTNESS IS CALCULATED USING THE RESPECTIVE VALUES OF AIRGLOW BRIGHTNESS AS FOUND IN SUBROUTINE EPAIR, THEN THE TOTAL SKY BACKGROUND BRIGHTNESS IS CHECKED AGAINST THE GIVEN CONSTRAINT, IF THE GIVEN CONSTRAINT IS EXCEEDED AT ANY POINT CHECKED, THEN THE EVENT CODE 'N' IS SET TO ONE AND THE SUBROUTINE TERMINATES,

## \*\*\*\*\*INPUT-

R(5)            =INPUT VALUE FOR TOTAL SKY BACKGROUND BRIGHTNESS  
                  =(RAYLEIGHS)

GHA             =GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS  
                  =UNIVERSAL TIME (HRS)

BA(12,7)        =AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE  
                  =GIVEN POSITION OF THE CLOUD (RAYLEIGHS)

C(12,7)         =COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION  
                  =OF THE TRACKING STATION TO THE CLOUD AND USED TO  
                  =OLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS

JEND            =NUMBER OF DISCRETE VALUES STORED FOR  
                  =EXPERIMENTAL PERIOD DATA

ZD              =ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY  
                  =(RAYLEIGHS)

ST              =UNRESOLVED STAR BRIGHTNESS OF A POINT IN THE SKY  
                  =(RAYLEIGHS)

WPX(12,7)      =VALUE OF GEOCENTRIC X COMPONENT OF VECTOR FROM  
                  =STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE

WPY(12,7)      =VALUE OF GEOCENTRIC Y COMPONENT OF VECTOR FROM  
                  =STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE

WPZ(12,7)      =VALUE OF GEOCENTRIC Z COMPONENT OF VECTOR FROM  
                  =STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE

T               =PRESENT UNIVERSAL TIME FOR RELEASE

I               =STATION NUMBER

## \*\*\*\*\*OUTPUT-

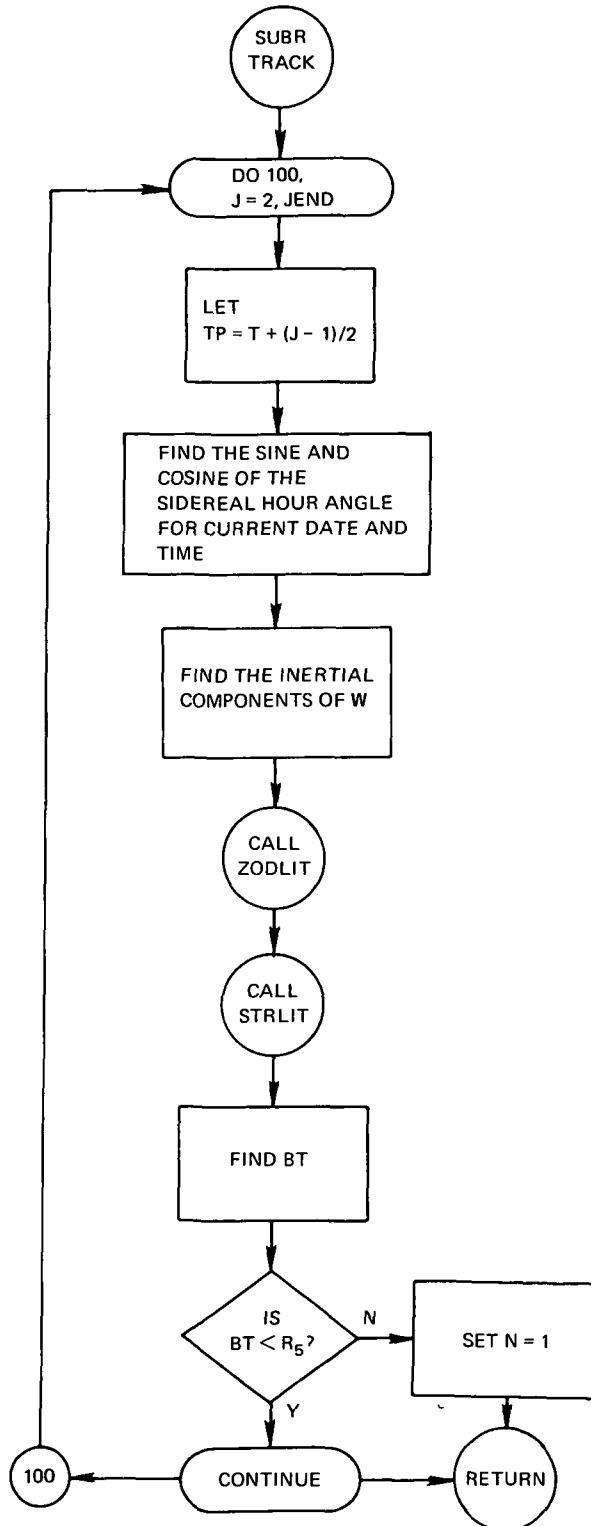
N                =EVENT CODE  
                  = 0, IF BT,LT,R(5)  
                  = 1, IF BT,GT,R(5)

## \*\*\*\*\*RESTRICTIONS-

THIS SUBROUTINE ACCEPTS UP TO A MAXIMUM OF TWELVE TRACKING STATIONS AND COMPUTES A MAXIMUM OF SEVEN DISCRETE POINTS AT 30 MINUTE INTERVALS DURING THE EXPERIMENTAL PERIOD,

## \*\*\*\*\*SUBPROGRAMS REQUIRED-

ZODLIT  
      ITE  
      ZTABLE  
STRLIT



```

*****SUBROUTINE DJT1*****
*****NASA Wallops version of 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE=GE 625
*****PURPOSE=
  TO WRITE THE DAILY RELEASE TIMES PER CONSTRAINT PER STATION ON
  OUTPUT FILE 07,
*****METHOD=
  GIVEN THE PROPER CONSTRAINT INDEX NUMBER, WRITE THE CONSTRAINT
  INDEX NUMBER, THE CURRENT DATE, THE CONSTRAINT NAME, THE STATION
  NAME (IF NOT EARTH SHADOW CONSTRAINT); THE CALCULATED RELEASE
  START/STOP TIMES, AND THE STATION NUMBER IN PROPER BCD FORMAT TO
  INSURE CORRECT PRINTING IN SUBROUTINE OUTPUT,
*****INPUT:
  K          =INDEX FOR CONSTRAINTS
             =1; EARTH SHADOW
             =2; NOT USED
             =3; SUN
             =4; MOON
             =5; TOTAL SKY BACKGROUND BRIGHTNESS

  DJUL      -JULIAN DATE FOR CURRENT DATA

  WINDOW(6,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES,
                =1ST INDEX FOR STORING START/STOP TIMES,
                =1,3,5 FOR START TIMES
                =2,4,6 FOR STOP TIMES
                =2ND INDEX FOR THE CONSTRAINT
                = 1=EARTH SHADOW
                = 2=ELEVATION
                = 3=SUN
                = 4=MOON
                = 5=TOTAL SKY BACKGROUND BRIGHTNESS

  NS        -THE NUMBER OF STATIONS USED IN THE PROGRAM

  NOS(12)   -AN ARRAY CONTAINING THE STATION NUMBERS USED
*****OUTPUT=
  ON FILE 07
  K          -INDEX FOR CONSTRAINTS
             =1, EARTH SHADOW
             =2; NOT USED
             =3, SUN
             =4, MOON
             =5; TOTAL SKY BACKGROUND BRIGHTNESS

  IDAY      -DAY NUMBER FOR DATE OF CURRENT DATA

  IMONTH    -MONTH FOR DATE OF CURRENT DATA

  MONTH     -NAME OF MONTH CORRESPONDING TO IMONTH

  IYEAR     -YEAR FOR DATE OF CURRENT DATA

  NRESTR(3) -ALPHANUMERIC NAME OF CONSTRAINT

```

NAME(3,12)    =NAME OF TRACKING STATIONS USED

WINDOW(6,5,12)=THE DAILY RELEASE WINDOW START/STOP TIMES,  
                   =1ST INDEX FOR STORING START/STOP TIMES,  
                   =1,3,5 FOR START TIMES  
                   =2,4,6 FOR STOP TIMES  
                   =2ND INDEX FOR THE CONSTRAINT  
                   = 1=EARTH SHADOW  
                   = 2=ELEVATION  
                   = 3=SUN  
                   = 4=MOON  
                   = 5=TOTAL SKY BACKGROUND BRIGHTNESS

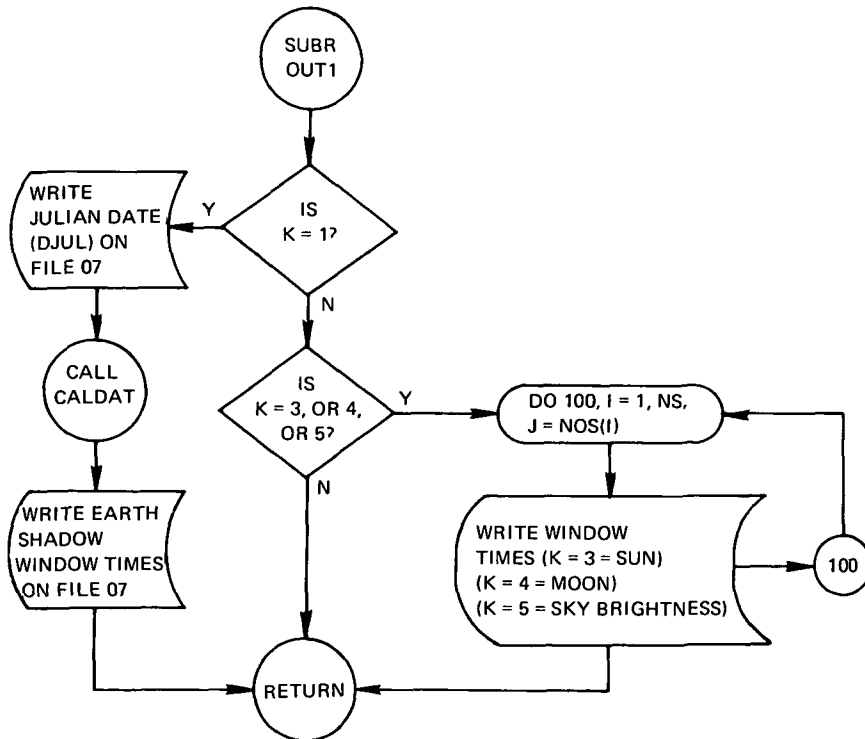
J                =CODE TO SUBROUTINE OUTPTE TO SIGNAL THAT STATION  
                   =BEING READ IS FIRST ONE FOR THAT PARTICULAR  
                   =CONSTRAINT OR IT IS NOT

\*\*\*\*\*RESTRICTIONS-

THIS SUBROUTINE IS SPECIFICALLY DESIGNED FOR PRINTING THE  
 PARAMETERS GENERATED BY THE CURRENT VERSION OF PROGRAM  
 'BICWINDOW'

\*\*\*\*\*SUBPROGRAMS REQUIRED-

CALDAT



\*\*\*\*\*SUBROUTINE CALDAY\*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 02/01/70

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE=GE 625

\*\*\*\*\*PURPOSE-

TO FIND THE DATE OF THE CURRENT DAY

\*\*\*\*\*METHOD-

GIVEN THE YEAR FOR WHICH THE CALCULATIONS BEGIN (KYEAR), AND THE CURRENT NUMBER OF DAYS PAST JANUARY 0 OF THE GIVEN YEAR (IDAY), FIRST DETERMINE IF THE GIVEN YEAR IS THE CURRENT YEAR BY DETERMINING IF 'IDAY' IS BETWEEN 0 AND 365 (366 IF 'KYEAR' IS A LEAP YEAR), THE CURRENT YEAR IS THEN STORED (IYEAR) AND ADJUSTMENT IS MADE TO 'IDAY' TO REFLECT THE NUMBER OF DAYS PAST JANUARY 0 OF 'IYEAR'.

A TABLE OF VALUES IS GIVEN FOR THE NUMBER OF DAYS IN EACH MONTH (ADJUSTMENT MADE FOR FEBRUARY OF A LEAP YEAR), THE MONTH NUMBER IS THEN FOUND BY CHECKING AND ADJUSTING 'IDAY'.

\*\*\*\*\*INPUT-

KYEAR            -YEAR NUMBER FOR STARTING CALCULATIONS

IDAY            -CURRENT NUMBER OF DAYS PAST JANUARY 0 OF KYEAR

\*\*\*\*\*OUTPUT-

IYEAR           -YEAR FOR DATE OF CURRENT DATA

IMONTH          -MONTH FOR DATE OF CURRENT DATA

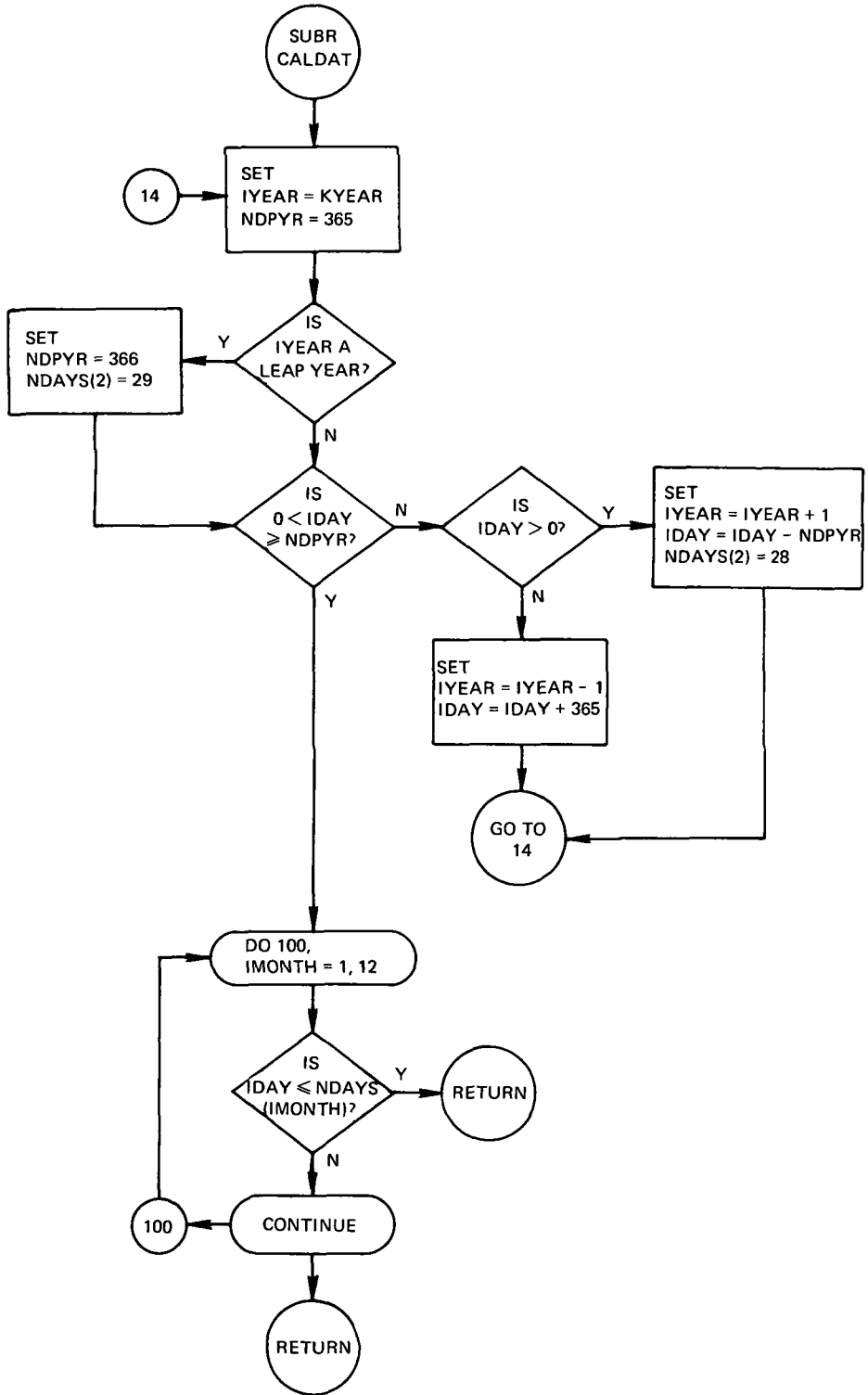
IDAY            -DAY NUMBER FOR DATE OF CURRENT DATA

\*\*\*\*\*RESTRICTIONS-

THIS SUBROUTINE WILL COMPUTE THE YEAR, MONTH NUMBER, AND DAY FOR ANY YEAR EXCEPT THOSE YEARS FOR WHICH 'IYEAR/4' IS AN INTEGRAL VALUE BUT 'IYEAR' IS NOT A LEAP YEAR (I.E., THE YEAR 2000).

\*\*\*\*\*SUBROUTINES REQUIRED-

NONE



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*****SUBROUTINE TTL480*****
*****NASA Wallops version of 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE=GE 625
*****PURPOSE-
      TO COMPUTE THE COMBINED DAILY RELEASE WINDOW FOR THE BIG
      PROJECT
*****METHOD-
      GIVEN THE DAILY RELEASE WINDOWS AS CALCULATED FOR EACH STATION
      AND FOR EACH CONSTRAINT, THE RESULT OF THIS SUBROUTINE IS TO
      DEFINE TIME INTERVALS FOR THE CURRENT DAY WHICH SATISFY EACH OF
      THE GIVEN TIME INTERVALS ALREADY FOUND FOR EACH STATION AND FOR
      EACH CONSTRAINT, THE METHOD CAN BE DIVIDED INTO THREE PHASES.
      FIRST, FIND THE INTERSECTION OF THE DAILY RELEASE WINDOWS FOUND
      FOR THAT STATION FOR EACH CONSTRAINT, THOSE INTERSECTING
      INTERVALS FOUND ARE THEN STORED IN THE 'A' AND 'B' ARRAYS,
      SECOND, THE INTERSECTION OF THE TIME INTERVALS DEFINED IN THESE
      ARRAYS ARE THEN DETERMINED AND STORED IN 'C' AND 'D' ARRAYS,
      THIRD, THESE TIME INTERVALS ARE COMBINED WITH PREVIOUSLY
      COMPUTED CASES OF THIS JOB THRU SUBROUTINE ICAS, THESE ARE THEN
      STORED ON FILE 09 FOR PLOTTING AND/OR PRINTING,
*****INPUT-
      NS           -THE NUMBER OF STATIONS USED IN THE PROGRAM
      NOS(12)      -AN ARRAY CONTAINING THE STATION NUMBERS USED
      WINDOW(6,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES,
                   -1ST INDEX FOR STORING START/STOP TIMES,
                   -1,3,5 FOR START TIMES
                   -2,4,6 FOR STOP TIMES
                   -2ND INDEX FOR THE CONSTRAINT
                   - 1=EARTH SHADOW
                   - 2=ELEVATION
                   - 3=SUN
                   - 4=MOON
                   - 5=TOTAL SKY BACKGROUND BRIGHTNESS
      DJUL         -JULIAN DATE FOR CURRENT DATA
      NDPJD       -NUMBER OF DAYS PAST EPOCH DATE TO DATE FOR
                   -STARTING CALCULATIONS (INTEGER)
      NDTE        -NUMBER OF DAYS PAST EPOCH DATE TO DATE FOR
                   -STOPPING CALCULATIONS (INTEGER)
      ICASE       -INTEGER VALUE OF CASE NUMBER
      IFINAL      -INTEGER CODE NOTING LAST CASE
                   ==0; MORE CASES TO FOLLOW
                   ==1; THIS IS THE FINAL CASE
      I           -CURRENT NUMBER OF DAYS FROM FIRST DAY CALCULATED
*****OUTPUT-
      DJUL        -JULIAN DATE FOR CURRENT DATA

```

IYEAR            -YEAR FOR DATE OF CURRENT DATA  
 IMONTH           -MONTH FOR DATE OF CURRENT DATA  
 IDAY             -DAY NUMBER FOR DATE OF CURRENT DATA  
 C(6)             -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT  
                  -DATE  
 D(6)             -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT  
                  -DATE  
 E(6)             -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT  
                  -DATE FOR ALL INPUT CASES  
 F(6)             -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT  
                  -DATE FOR ALL INPUT CASES

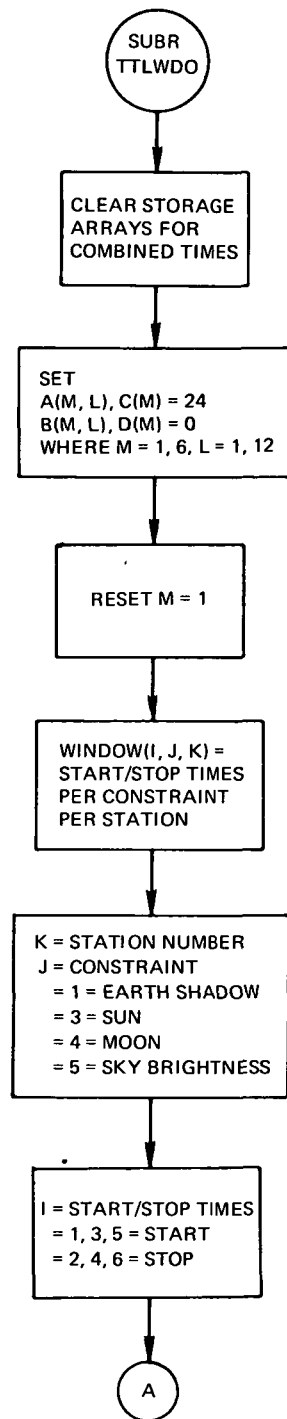
\*\*\*\*\*RESTRICTIONS-

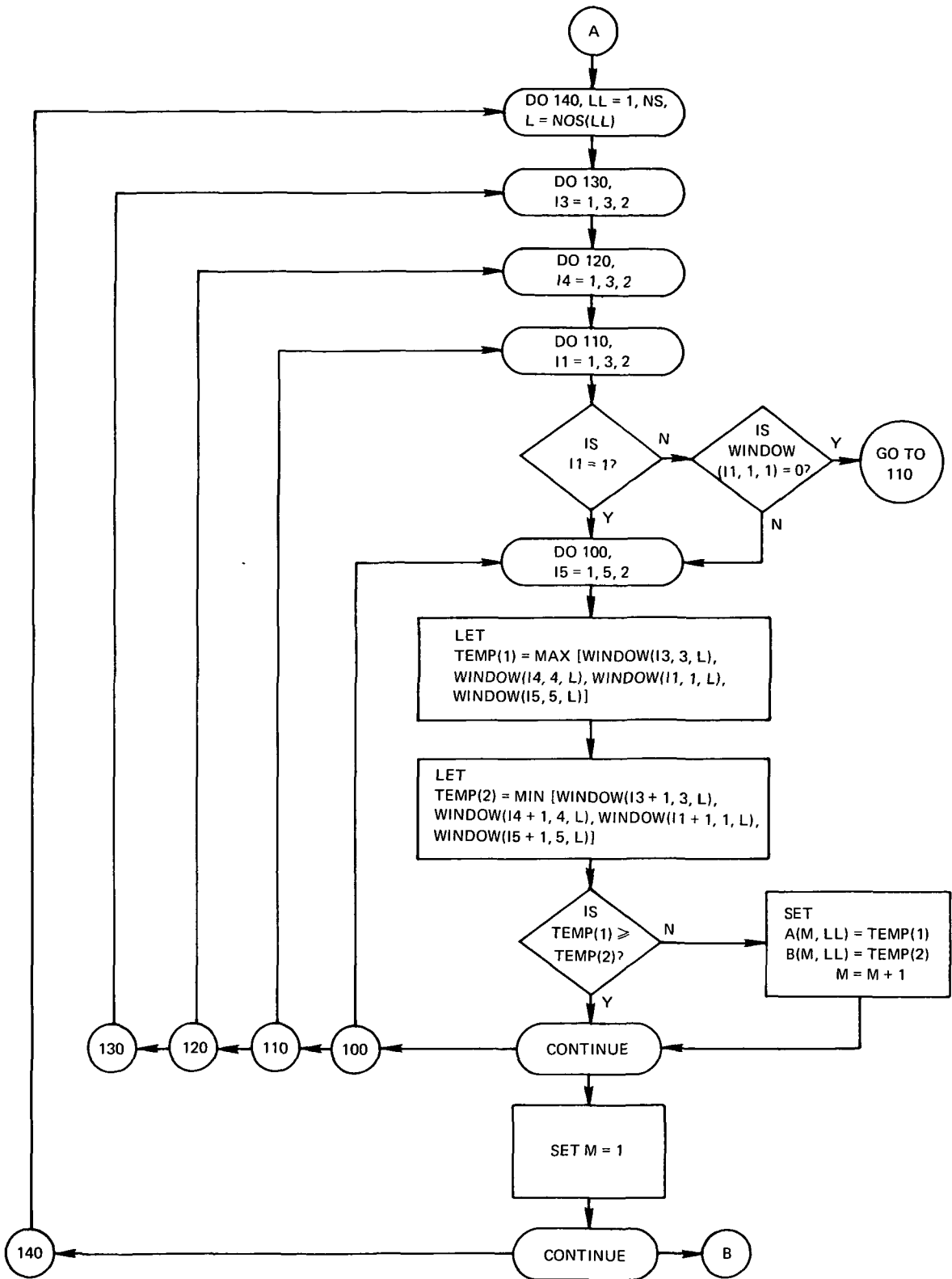
ONLY THOSE CONSTRAINTS AS CURRENTLY COMPUTED IN THE BICWINDOW  
 COMPUTER PROGRAM CAN BE COMBINED,  
 UP TO A MAXIMUM OF TWELVE TRACKING STATIONS CAN BE COMBINED,  
 A MAXIMUM OF SIX COMBINED INTERVALS CAN BE COMPUTED FOR A GIVEN  
 DAY

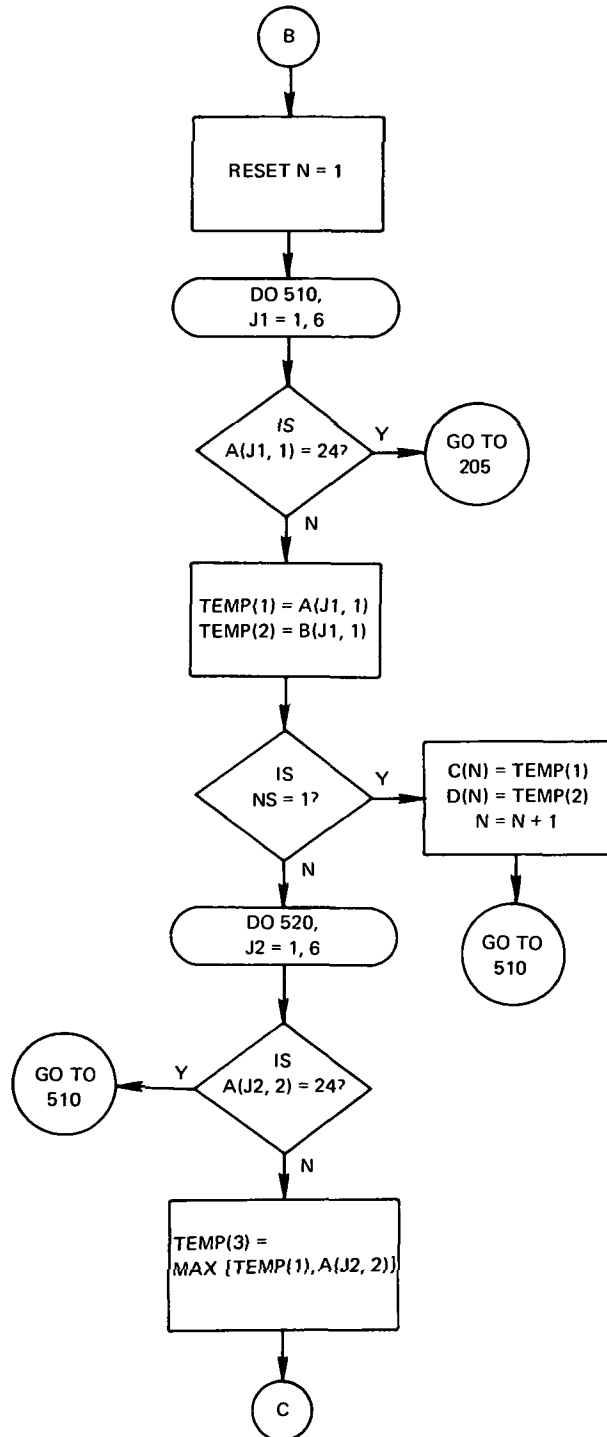
\*\*\*\*\*SUBPROGRAMS REQUIRED-

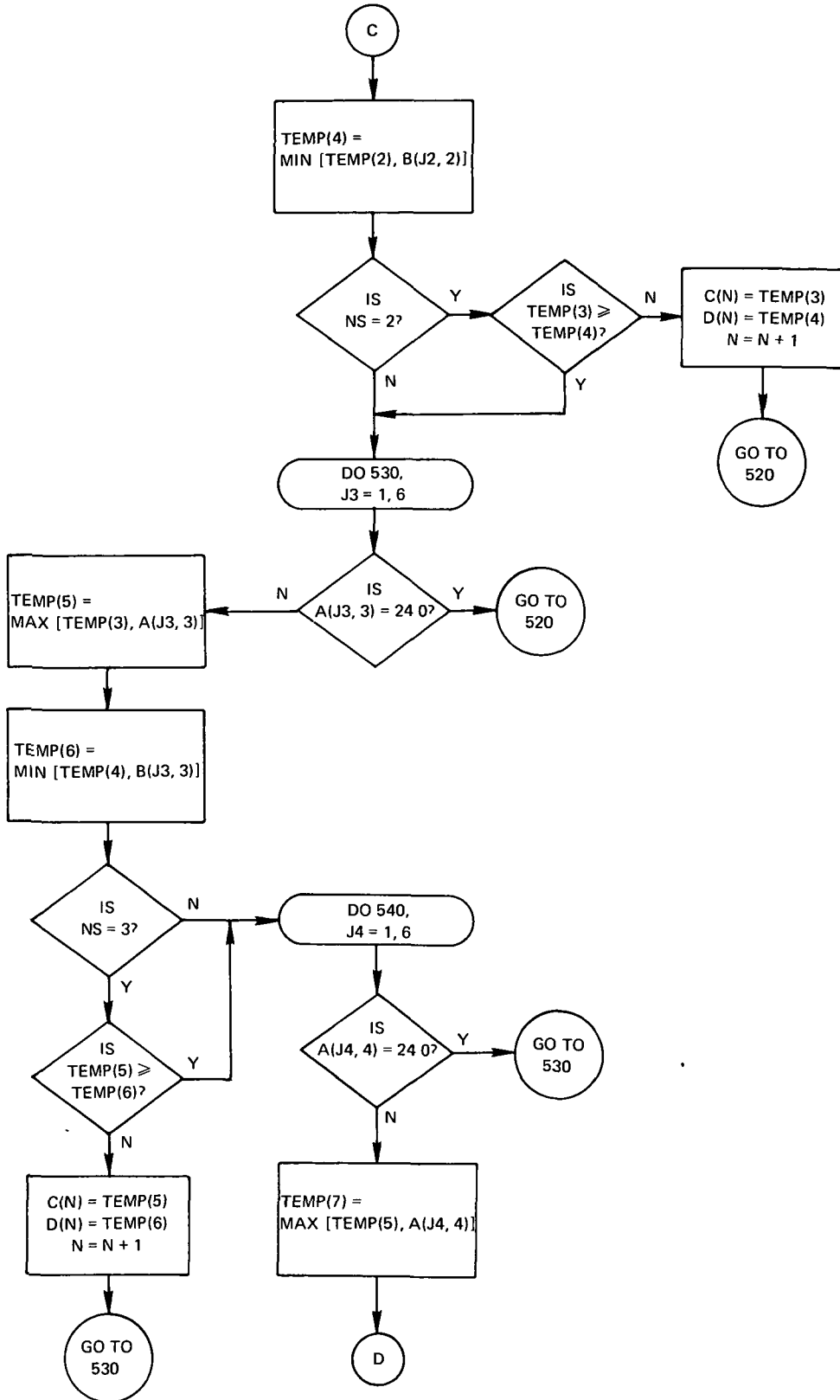
ICAS

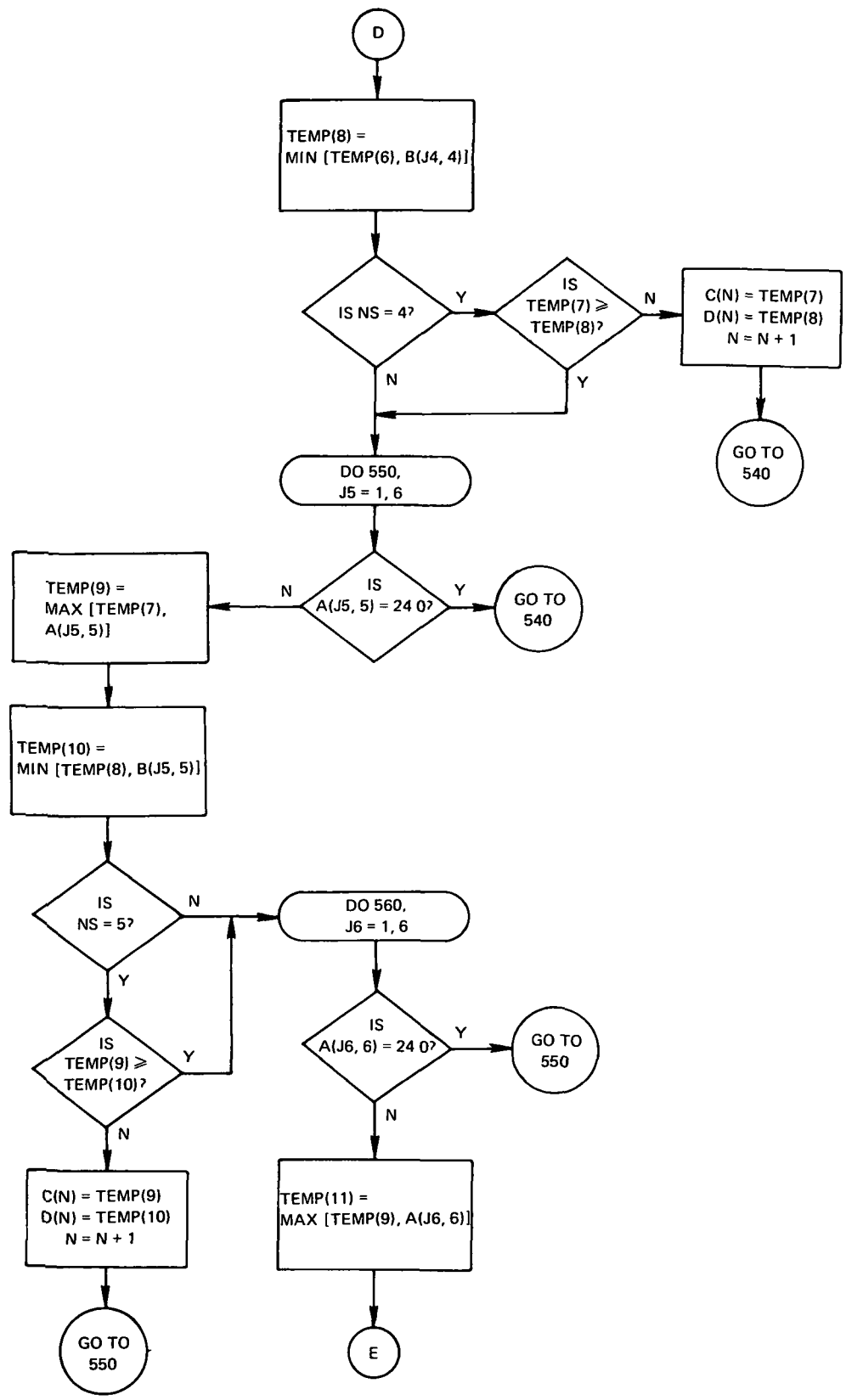


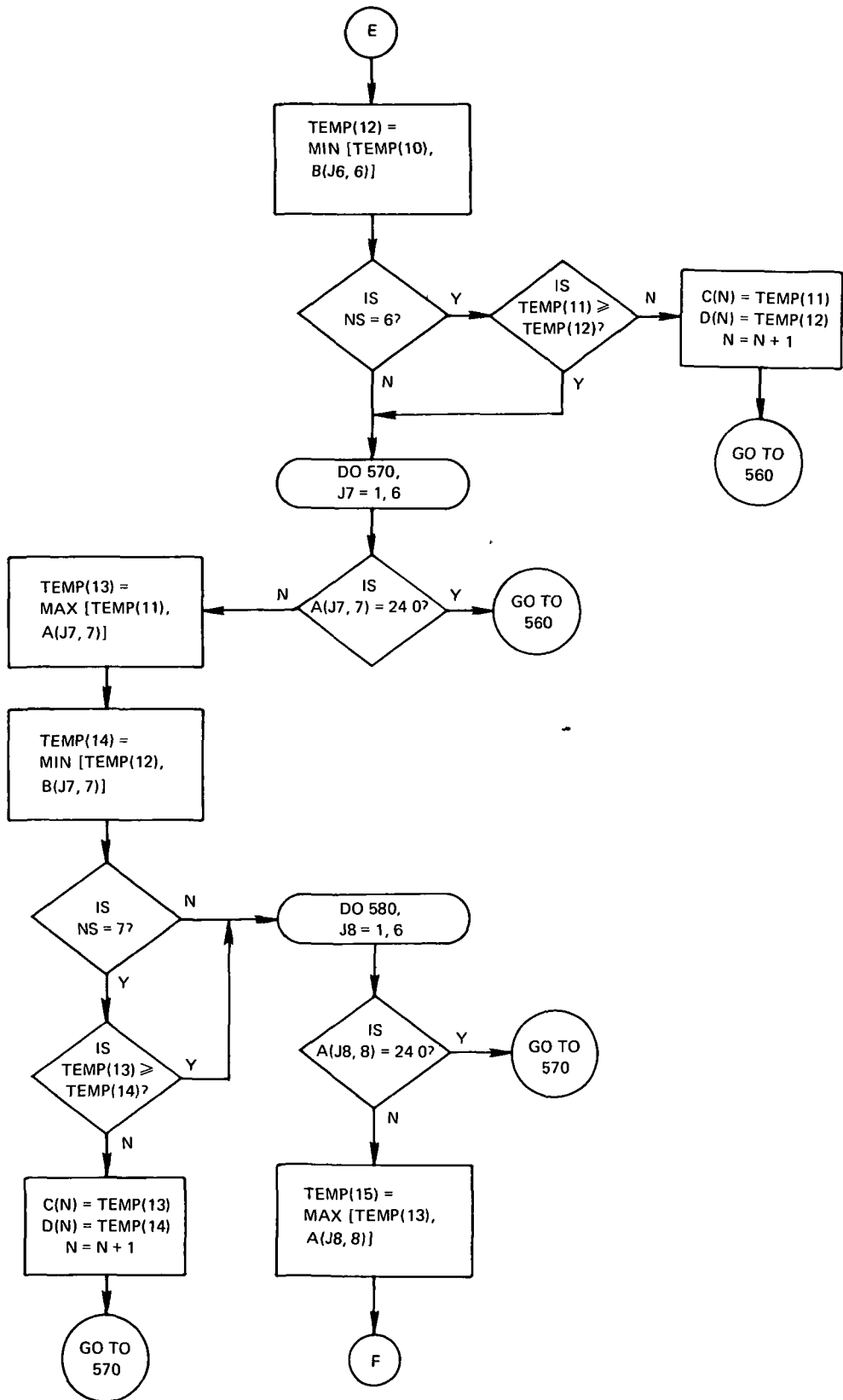


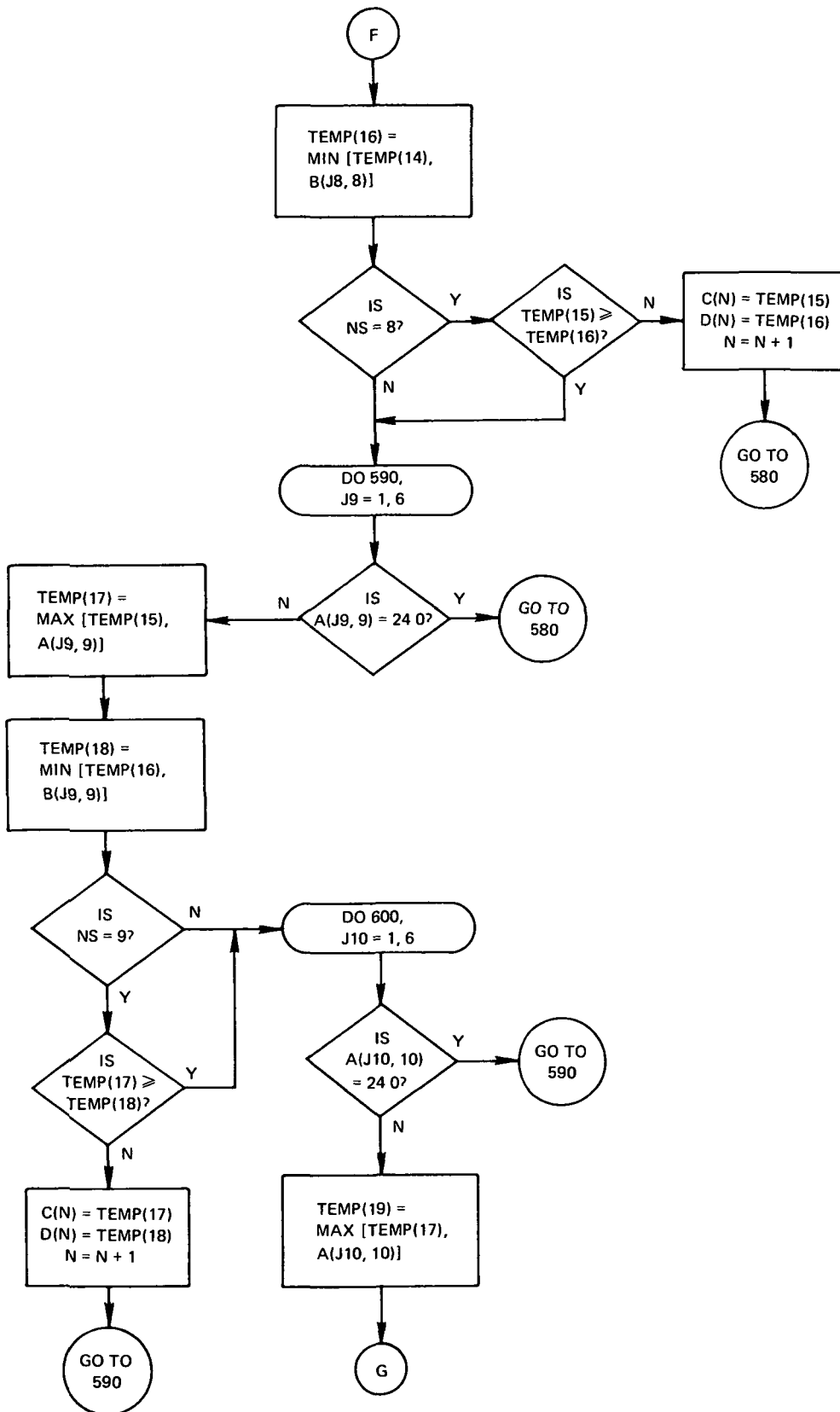


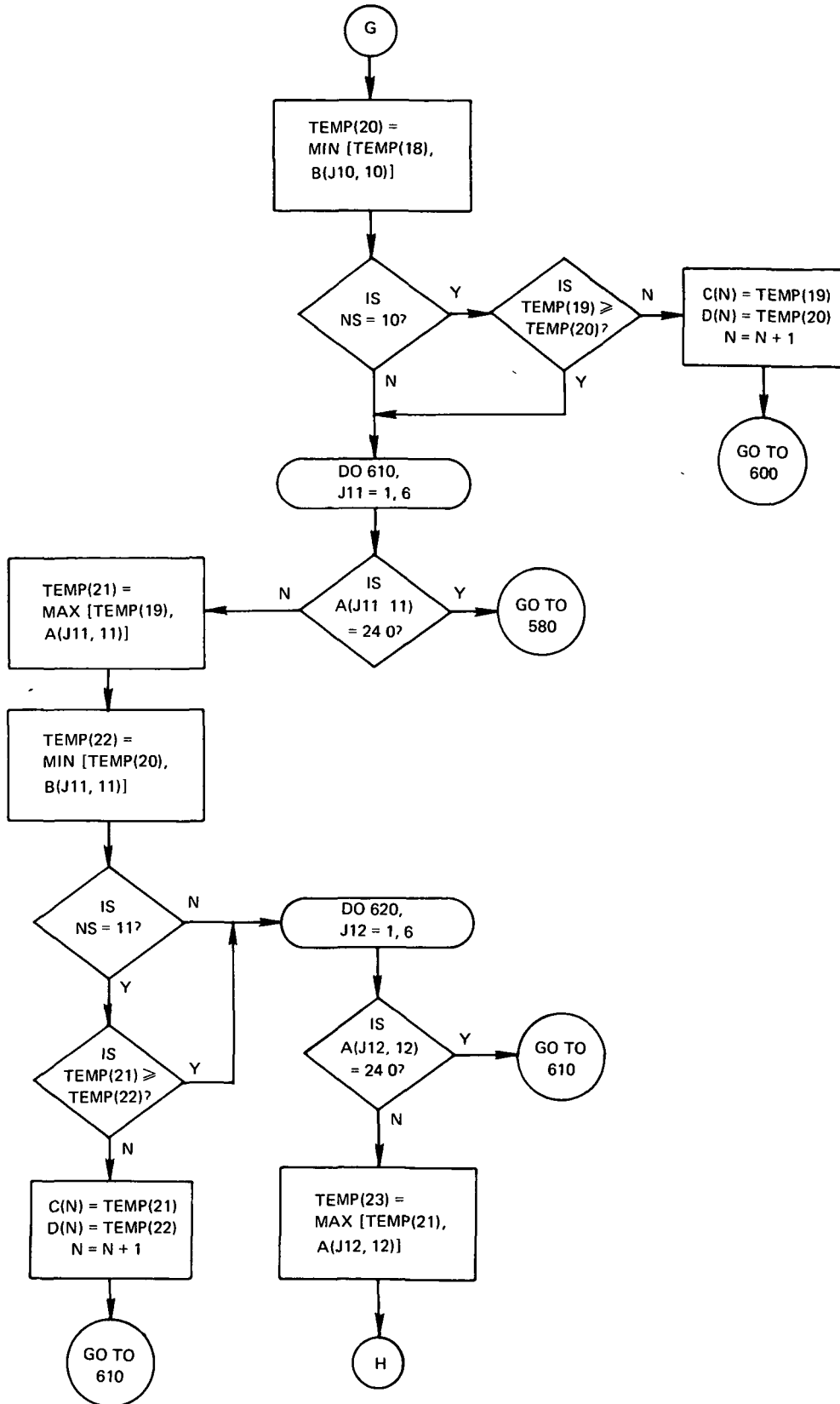




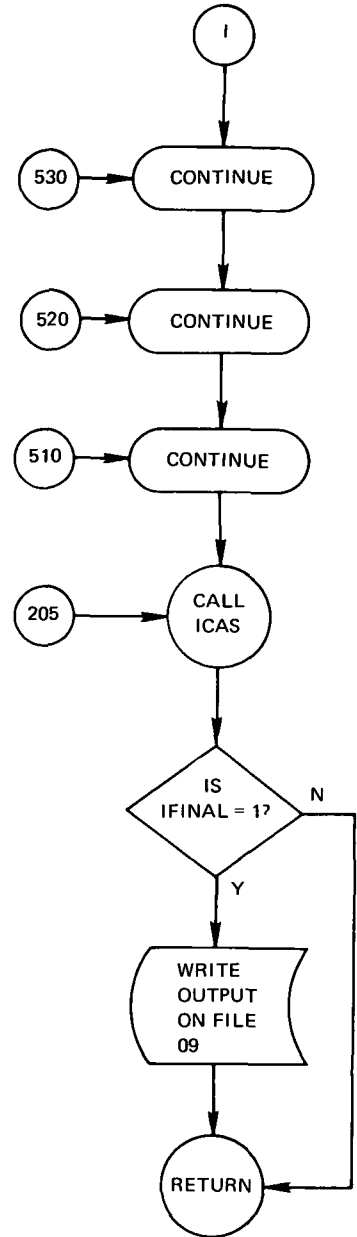
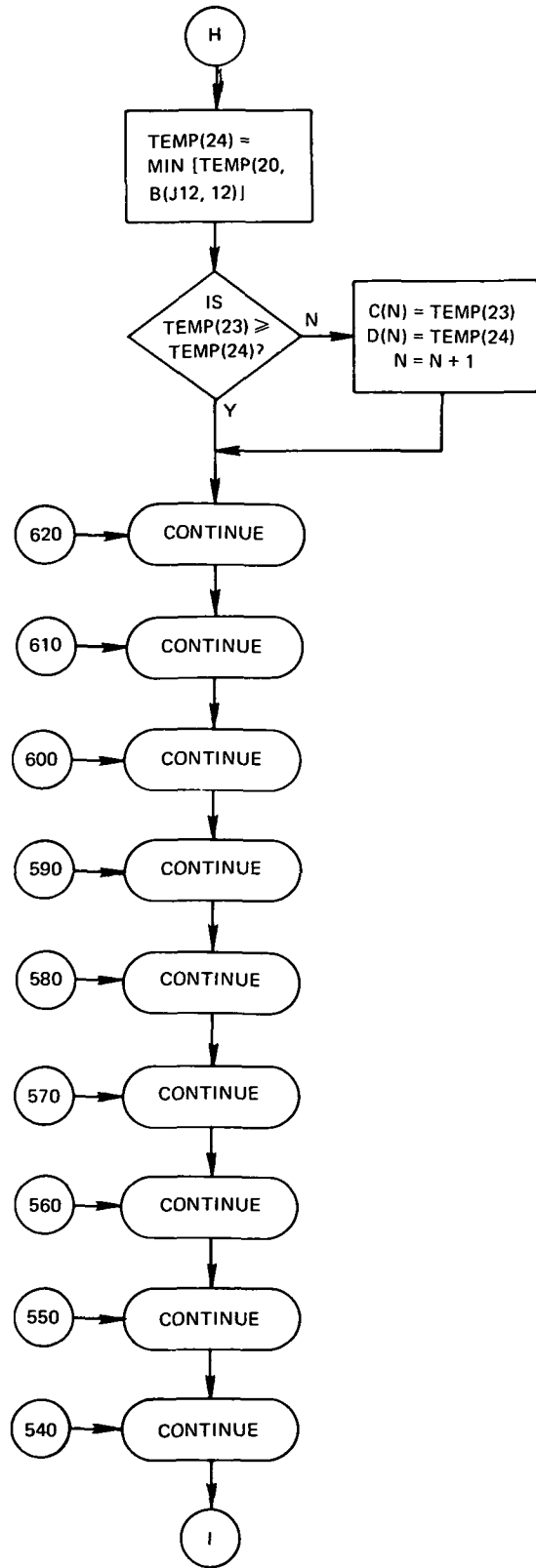












\*\*\*\*\*TEMPORARY FILE 9 DATA\*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 05/01/71

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE=GE 625

\*\*\*\*\*PURPOSE-

TO CALCULATE A COMBINED RELEASE WINDOW FOR VARIOUS RELEASE POINTS AND/OR DEFINED PROBLEM CONSTRAINTS (EXCLUDING THE SUN AND MOON CONSTRAINTS);

\*\*\*\*\*METHOD-

THE MOST RECENT COMBINED RELEASE WINDOW CALCULATED BY SUBROUTINE TTLWBO IS COMBINED WITH THOSE OF PRIOR RUN CASES WITHIN THIS JOB, FOR THE FIRST CASE THE WINDOW IS ONLY RECORDED ON THE TEMPORARY FILE 13, JULIAN DATES ARE CHECKED TO INSURE COMPATIBILITY.

\*\*\*\*\*INPUT-

DJUL            -JULIAN DATE FOR CURRENT DATA,  
 C(6)            -ARRAY OF MOST RECENT CASE OF COMBINED WINDOW  
                   -START TIMES FOR CURRENT DATE,  
 D(6)            -ARRAY OF MOST RECENT CASE OF COMBINED WINDOW  
                   -STOP TIMES FOR CURRENT DATE,  
 ICASE            -CASE NUMBER  
 IDAY            -CURRENT NUMBER OF DAYS FROM FIRST DAY CALCULATED

\*\*\*\*\*OUTPUT-

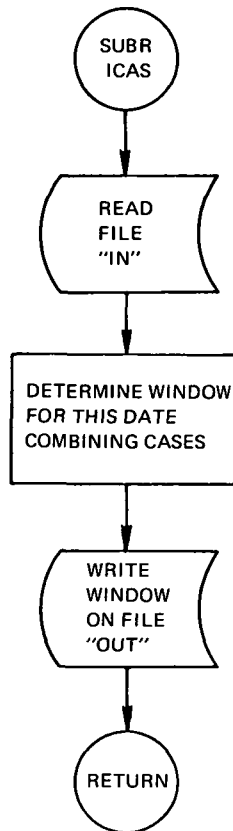
A(6)            -ARRAY OF TOTAL CASES SO FAR CALCULATED OF  
                   -COMBINED WINDOW START TIMES FOR CURRENT DATE,  
 B(6)            -ARRAY OF TOTAL CASES SO FAR CALCULATED OF  
                   -COMBINED WINDOW STOP TIMES FOR CURRENT DATE.

\*\*\*\*\*RESTRICTIONS-

ONLY THOSE CONSTRAINTS CURRENTLY DEFINED IN THE BICWINDOW COMPUTER PROGRAM CAN BE COMBINED,

\*\*\*\*\*SUBPROGRAMS REQUIRED-

NONE



\*\*\*\*\*SUBROUTINE OUT2\*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 02/01/70

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE=GE 625

\*\*\*\*\*PURPOSE-

TO UTILIZE THE PROPER SUBROUTINES FOR OUTPUT PRINTING AND/OR PLOTTING FOR THE TIME PERIOD AS REQUESTED ON INPUT CARD 'B'.

\*\*\*\*\*METHOD-

THIS SUBROUTINE CALCULATES THE JULIAN DATE FOR THOSE DATES REQUESTED FOR PRINTING AND/OR PLOTTING. IT THEN CALLS THE PROPER SUBROUTINES TO EXECUTE THE PRINTING AND/OR PLOTTING AS REQUESTED. IF NO PRINTING OR PLOTTING IS DESIRED THEN THE SUBROUTINE TERMINATES AFTER FINDING THE JULIAN DATES DEFINED ABOVE.

\*\*\*\*\*INPUT-

KMO

-MONTH PLOTTING AND/OR PRINTING TO BEGIN

KDA            -DAY    PLOTTING AND/OR PRINTING TO BEGIN  
 KYR            -YEAR  PLOTTING AND/OR PRINTING TO BEGIN  
 LMQ            -MONTH PLOTTING AND/OR PRINTING TO END  
 LDA            -DAY    PLOTTING AND/OR PRINTING TO END  
 LYR            -YEAR  PLOTTING AND/OR PRINTING TO END  
 IPR7           -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07  
               -0; DATA  
               -0; PRINT FILE 07 DATA  
               -1; DO NOT PRINT FILE 07 DATA  
 IPR9           -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09  
               -0; DATA  
               -0; PRINT FILE 09 DATA  
               -1; DO NOT PRINT FILE 09 DATA  
 IPL0T          -INTEGER CODE TO SIGNAL REQUEST PLOTTING DATA  
               -0; CREATE A TAPE FOR PLOTTING DATA FOR A  
               -    CALENDAR YEAR THROUGH FILE 01 AT 556 BPI  
               -1; CREATE A TAPE FOR PLOTTING DATA FOR A  
               -    CALENDAR MONTH THROUGH FILE 01 AT 556 BPI  
               -2; DO NOT CREATE A PLOT TAPE  
 ICASE          -CASE NUMBER

## \*\*\*\*\*OUTPUT\*

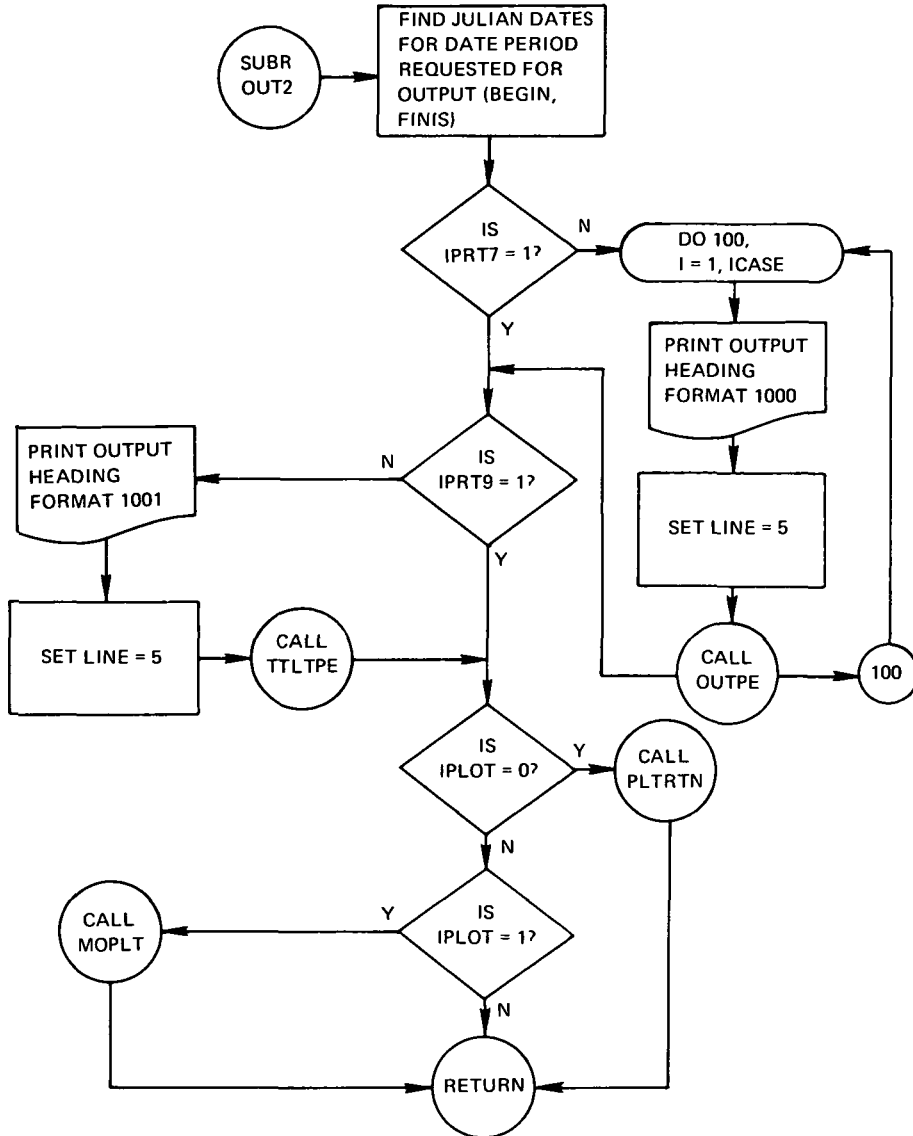
BEGIN          -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING  
 FINIS          -JULIAN DATE TO STOP  PRINTING AND/OR PLOTTING  
 LINE           -LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT  
               -HEADING

## \*\*\*\*\*RESTRICTIONS\*

THIS SUBROUTINE REQUIRES THE EXISTENCE OF FILES 07 AND 09 AND  
 IF EITHER IS TO BE USED THEN THE DATA MUST EXIST FOR THOSE  
 DATES REQUESTED,

## \*\*\*\*\*SUBPROGRAMS REQUIRED\*

DAYNUM  
 OUTTPE  
 TTLTPE  
 PLTRTN



\*\*\*\*\*PRINT ROUTINE FOR FILE 07 DATA\*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 02/01/70

\*\*\*\*\*LANGUAGE-FORTRAN IV

\*\*\*\*\*MACHINE-GE 625

\*\*\*\*\*PURPOSE-

TO PRINT THE DAILY RELEASE WINDOW DATA FOR EACH CONSTRAINT AND FOR EACH STATION,

\*\*\*\*\*METHOD-

THE DAILY RELEASE WINDOW TIMES CALCULATED FOR EACH STATION AND EACH CONSTRAINT STORED ON FILE 07 IS FIRST READ BY THIS SUBROUTINE, THE DATA IS THEN PRINTED IN HOURS AND MINUTES FOR THOSE DAYS WITHIN JULIAN DATES (BEGIN) AND (FINIS), THE DATE, CONSTRAINT NAME AND STATION NAME ARE PRINTED ALONG WITH THE

TIME INTERVALS IN VARIED FORMATS, THIS PROGRAM WILL TERMINATE IF THE JULIAN DATE OF THE CURRENT TAPE RECORD BEING READ IS EITHER GREATER THAN 'FINIS' OR EQUAL TO 999.0.

## \*\*\*\*\*INPUT-

ON FILE 07

LINE -LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT  
-HEADING

BEGIN -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING

FINIS -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING

DJUL -JULIAN DATE FOR CURRENT DATA

K -INDEX FOR CONSTRAINTS  
-#1, EARTH SHADOW  
-#2, NOT USED  
-#3, SUN  
-#4, MOON  
-#5, TOTAL SKY BACKGROUND BRIGHTNESS

IDAY -DAY NUMBER FOR DATE OF CURRENT DATA

IMONTH -MONTH FOR DATE OF CURRENT DATA

IYEAR -YEAR FOR DATE OF CURRENT DATA

NRESTR(3) -ALPHANUMERIC NAME OF CONSTRAINT

NAME(3,12) -NAME OF TRACKING STATIONS USED

WINDOW(6) -THE DAILY RELEASE WINDOW START/STOP TIMES,  
-1ST INDEX FOR STORING START/STOP TIMES,  
-1,3,5 FOR START TIMES  
-2,4,6 FOR STOP TIMES

## \*\*\*\*\*OUTPUT-

ON FILE 06-PRINTER

IDAY -DAY NUMBER FOR DATE OF CURRENT DATA

IMONTH -MONTH FOR DATE OF CURRENT DATA

IYEAR -YEAR FOR DATE OF CURRENT DATA

NRESTR(3) -ALPHANUMERIC NAME OF CONSTRAINT

NAME(3) -NAME OF TRACKING STATIONS USED

IW(6) -INTEGRAL HOUR VALUE OF START/STOP TIMES

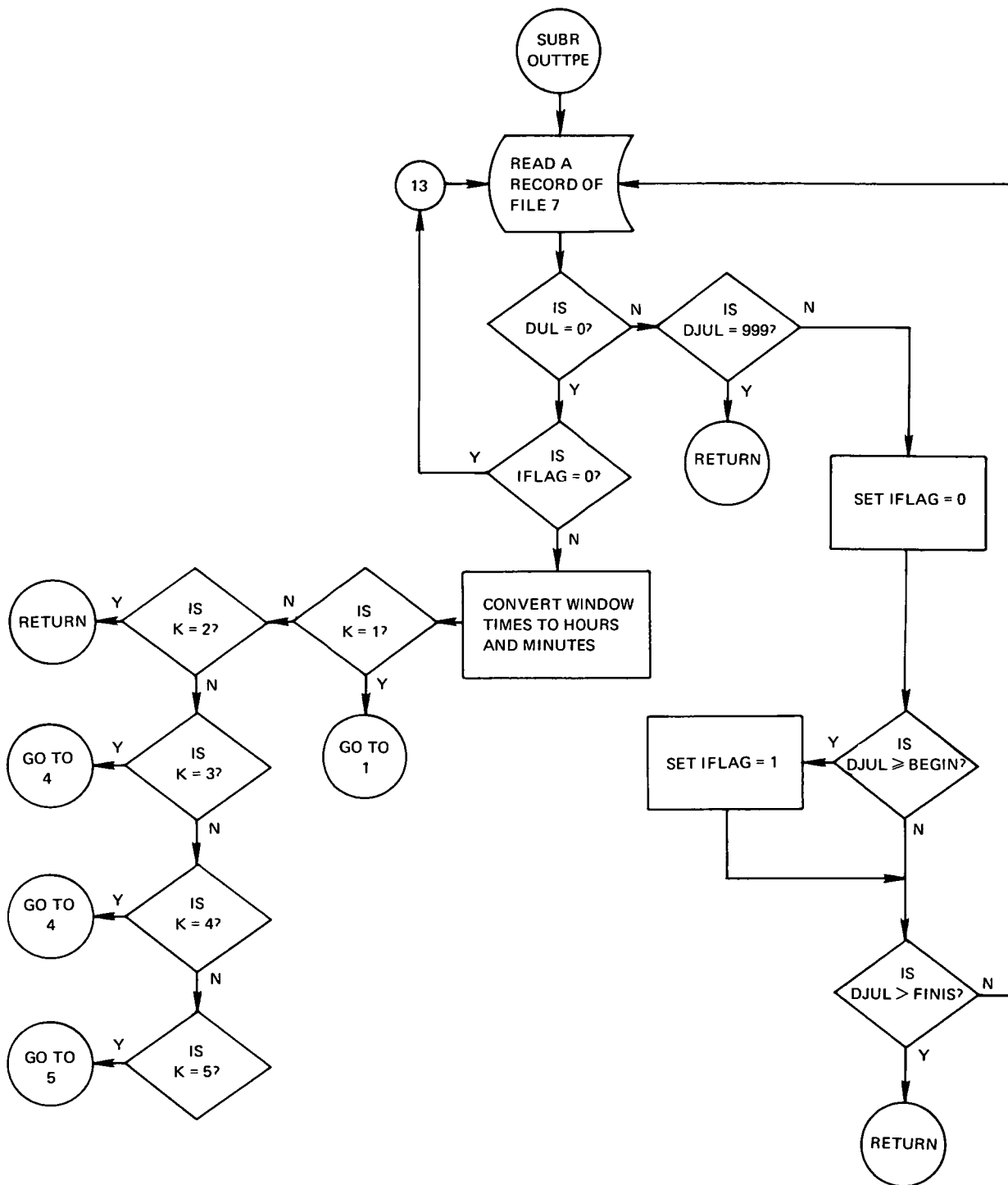
Imin(6) -INTEGRAL MINUTE VALUE OF START/STOP TIMES

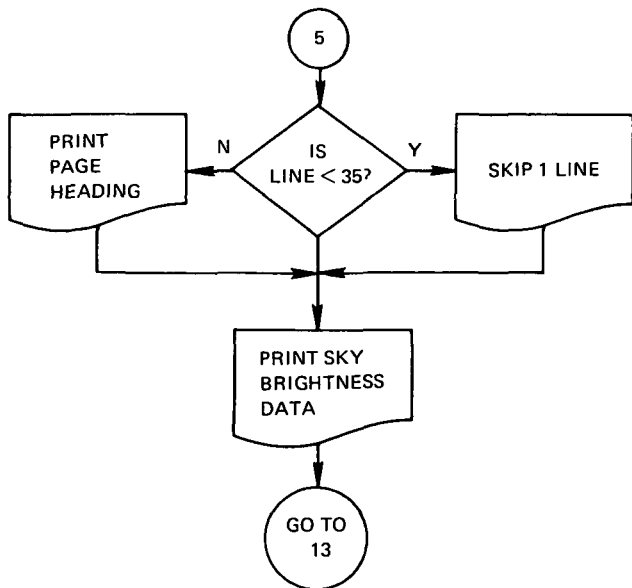
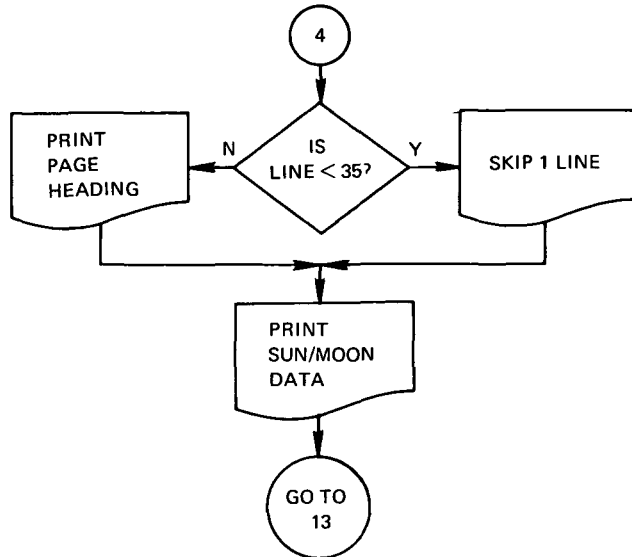
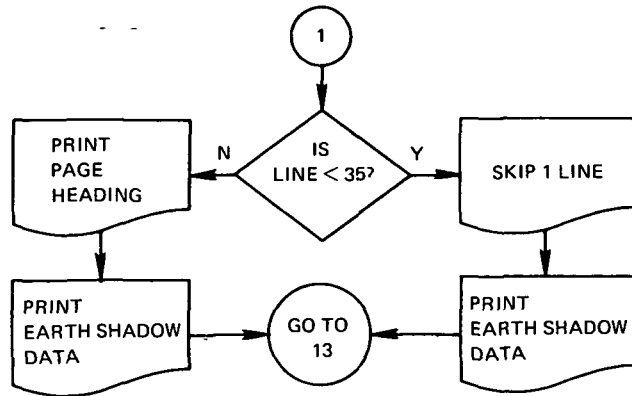
## \*\*\*\*\*RESTRICTIONS-

THE NUMBER OF TIME INTERVALS PER CONSTRAINT IS FIXED BY THE REQUIREMENTS OF THE PROGRAM.  
SUBROUTINE OUTPUTS TIME VARIABLES WITH NO GREATER ACCURACY THAN ONE MINUTE.

## \*\*\*\*\*SUBPROGRAMS REQUIRED-

NONE







```

*****WRITE FILE 09*****
*****NASA Wallops version of 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE=GE 625
*****PURPOSE-
      TO PRINT THE TOTAL COMBINED WINDOW DATA FOR THE DATES REQUESTED
*****METHOD-
      THE COMBINED WINDOW DATA STORED ON FILE 09 IS READ BY THIS
      SUBROUTINE, IT IS CONVERTED TO HOURS AND MINUTES BEFORE PRINTING
      A CHECK IS MADE TO SEE IF THE JULIAN DATE OF THE CURRENT RECORD
      IS WITHIN THE DATES REQUESTED FOR PRINTING, ONLY THE BLOCK OF
      DATA WITHIN THE DATES REQUESTED IS PRINTED AND ONLY THOSE TRUE
      DATA INTERVALS ARE PRINTED, AN END OF FILE CODE WHERE THE JULIAN
      DATE EQUALS 999,0 IS USED TO TERMINATE THIS SUBROUTINE,
*****INPUT-
      ON FILE 09
      EPOCH          -JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS ON
                    -FILE 09
      DJUL           -JULIAN DATE FOR CURRENT DATA
      IDAY           -DAY NUMBER FOR DATE OF CURRENT DATA
      IMONTH         -MONTH FOR DATE OF CURRENT DATA
      IYEAR          -YEAR FOR DATE OF CURRENT DATA
      BEGIN          -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING
      FINIS          -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING
      LINE           -LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT
                    -HEADING
      C(6)           -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT
                    -DATE
      D(6)           -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT
                    -DATE
*****OUTPUT-
      FILE 06-PRINTER
      DJUL           -JULIAN DATE FOR CURRENT DATA
      IDAY           -DAY NUMBER FOR DATE OF CURRENT DATA
      IMONTH         -MONTH FOR DATE OF CURRENT DATA
      IYEAR          -YEAR FOR DATE OF CURRENT DATA
      IC(6)          -INTEGRAL VALUE OF START TIME HOURS
      JC(6)          -INTEGRAL VALUE OF START TIME MINUTES
      ID(6)          -INTEGRAL VALUE OF STOP TIME HOURS

```

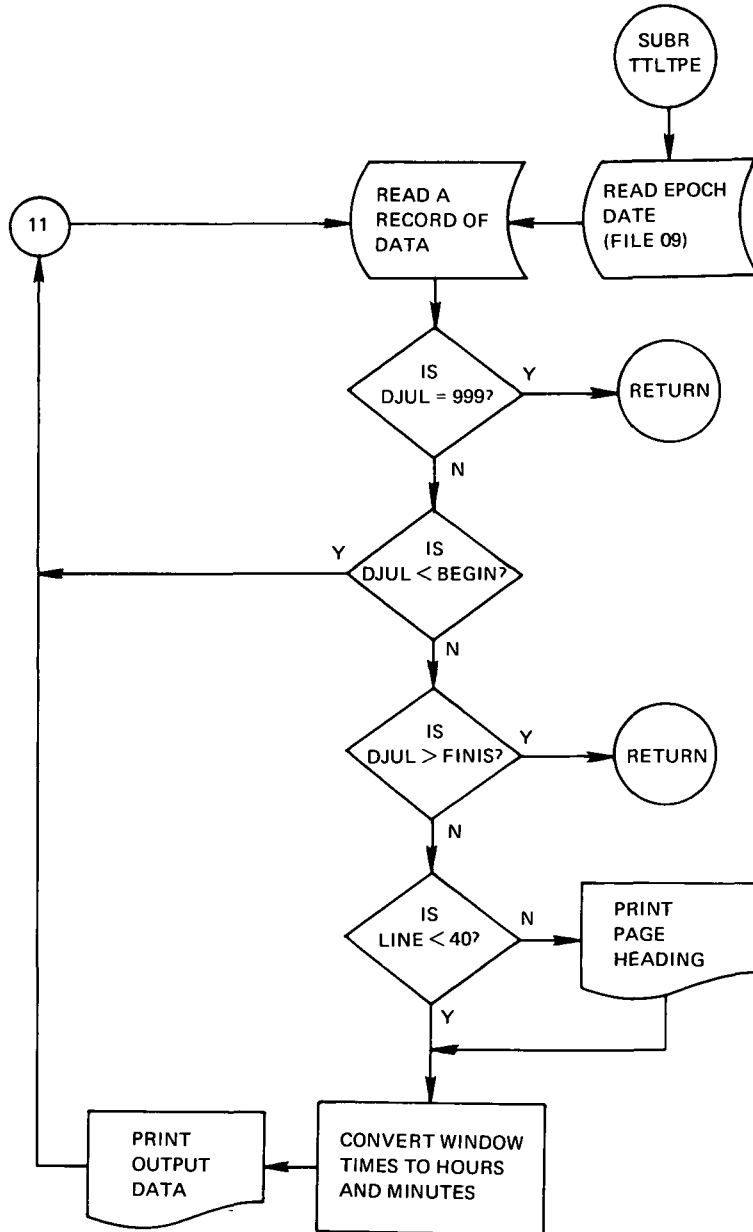
JD(6)            •INTEGRAL VALJE OF STOR TIME MINUTES

\*\*\*\*\*RESTRICTIONS-

UP TO SIX DIFFERENT COMBINED WINDOW TIME INTERVALS CAN BE READ AND PRINTED

\*\*\*\*\*SUBPROGRAMS REQUIRED-

NONE



\*\*\*\*\*PLOT ROUTINE\*\*\*\*\*

\*\*\*\*\*NASA HALLOPS VERSION OF 01/01/69

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE=GE 625

\*\*\*\*\*PURPOSE-

TO GRAPH THE COMPUTED RELEASE WINDOW TIMES FOR A GIVEN YEAR OR PORTION OF A YEAR.

\*\*\*\*\*METHOD-

THIS SUBROUTINE USES EXISTING CALCOMB LIBRARY ROUTINES TO PLOT THE RELEASE TIMES CALCULATED FOR THE BIG PROJECT THROUGH THIS PROGRAM ONTO A GRID AS SET UP IN SUBROUTINE CALDNR. THE INPUT POSITION OF THE RELEASE POINT, THE TRACKING STATIONS USED AND THE VALUE OF EACH CONSTRAINT IS GIVEN IN THE PLOT LABELLING. RELEASE TIMES PLOTTED ARE THOSE DAILY TIMES RECORDED ON FILE 09 BY THIS PROGRAM.

\*\*\*\*\*RESTRICTIONS-

THIS SUBROUTINE WILL PLOT DATA ONLY FOR A GIVEN CALENDAR YEAR OR PORTION OF IT. PLOTTING OF TWO OR MORE CALENDAR YEARS REQUIRES THAT THE PROGRAM BE REINITIATED FOR PLOTTING EACH CALENDAR YEAR. THIS RESTRICTION IS DUE TO THE GRID PLOT GENERATED THROUGH SUBROUTINE CALDNR. A CHECK IS MADE TO INSURE THE NUMBER OF DAYS PAST JANUARY 1 OF THE GIVEN CALENDAR YEAR IS NO MORE THAN 365 DAYS. THIS CHECK IS DONE SO THE PLOTS OF SUCCESSIVE CALENDAR YEARS CAN BE MADE FROM ONE FILE 09 TAPE. NEGLECTING THIS RESTRICTION AND ATTEMPTING TO PLOT SUCCESSIVE CALENDAR YEARS ON THE SAME GRID WILL GIVE AN ERRONEOUS PLOT. (E.G. EVERY JANUARY 1 OF ANY CALENDAR YEAR WILL BE PLOTTED AT THE BEGINNING OF THE GRID)

\*\*\*\*\*INPUT-

1. FOR PLOT LABELLING ONLY-

KYR	-YEAR BEING PLOTTED AND/OR PRINTED
PHIPDG	-GEODETTIC LATITUDE OF RELEASE POINT (DEG)
LAMPDG	-LONGITUDE OF RELEASE POINT (DEG)
HEIGHT	-ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE -(ERU)
RESTR(2)	-MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION -TO THE RELEASE POINT (DEG)
RESTR(3)	-MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH -TRACKING STATION (DEG)
RESTR(4)	-MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH -TRACKING STATION (DEG)

RESTR(5)      -MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE  
 -RELEASE POINT AS SEEN FROM EACH TRACKING STATION  
 -(RAYLEIGHS)

RESTR(6)      -CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD  
 -AFTER RELEASE; RELATIVE TO THE TRACKING STATIONS  
 -(KM/SEC)

RESTR(7)      -MINIMUM TRACKING PERIOD REQUIRED (HRS)

RESTR(8)      -ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE  
 -RELATIVE TO THE EARTH (KM/SEC)

NAME(3,12)    -NAME OF TRACKING STATIONS USED

ICASE          -CASE NUMBER

2. USED FOR DATA PLOTTING-

NS            -THE NUMBER OF STATIONS USED IN THE PROGRAM

NOS(12)      -AN ARRAY CONTAINING THE STATION NUMBERS USED

EPOCH        -JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS ON  
 -FILE 09

UJUL         -JULIAN DATE FOR CURRENT DATA

BEGIN        -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING

FINIS        -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING

C(6)         -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT  
 -DATE

D(6)         -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT  
 -DATE

\*\*\*\*\*OUTPUT-

DATA POINTS FOR PLOT ARE STORED ON TAPE FILE 01 AT 556 BPI

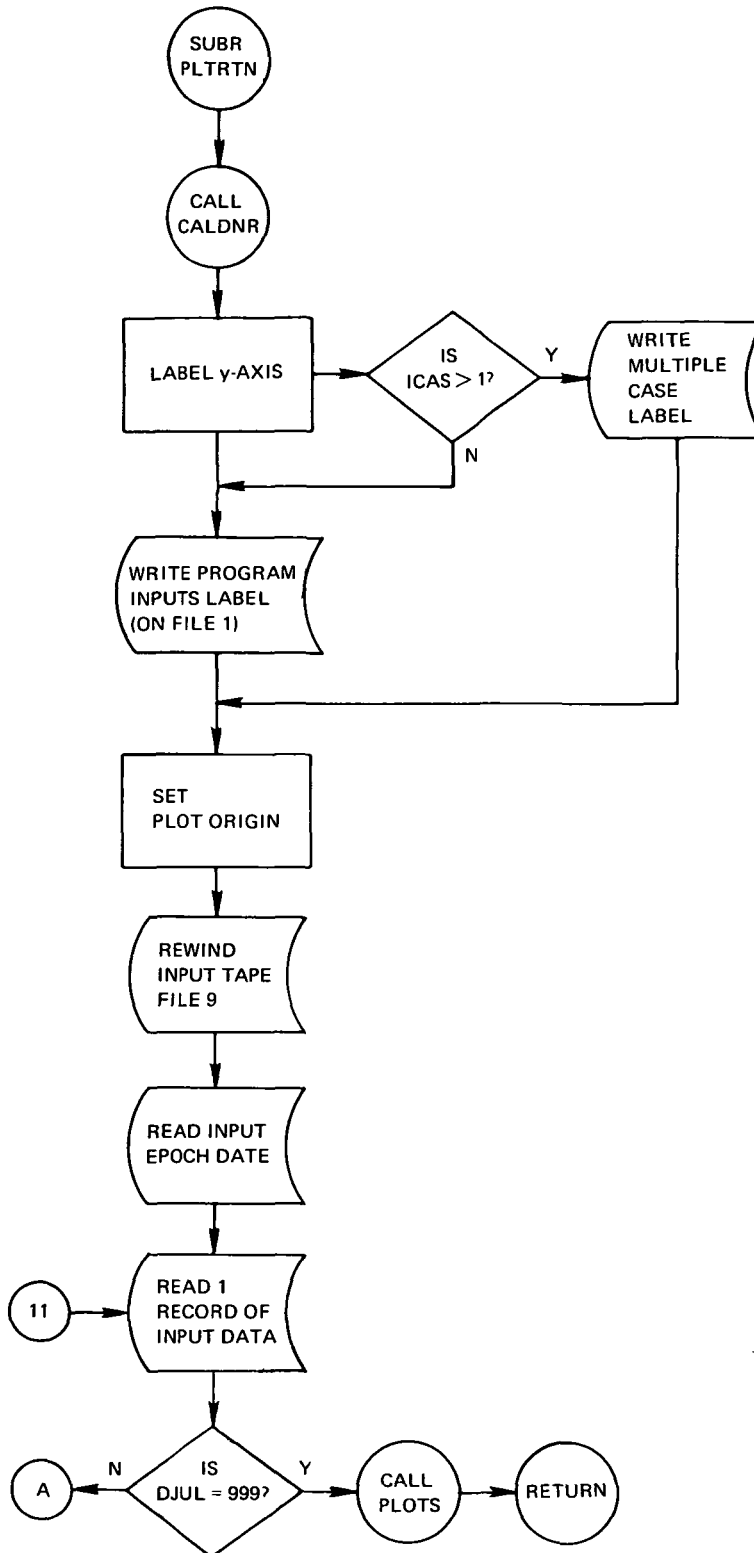
X            -POSITION OF PLOT PEN ON X-AXIS REPRESENTING THE  
 -DATE BEING PLOTTED

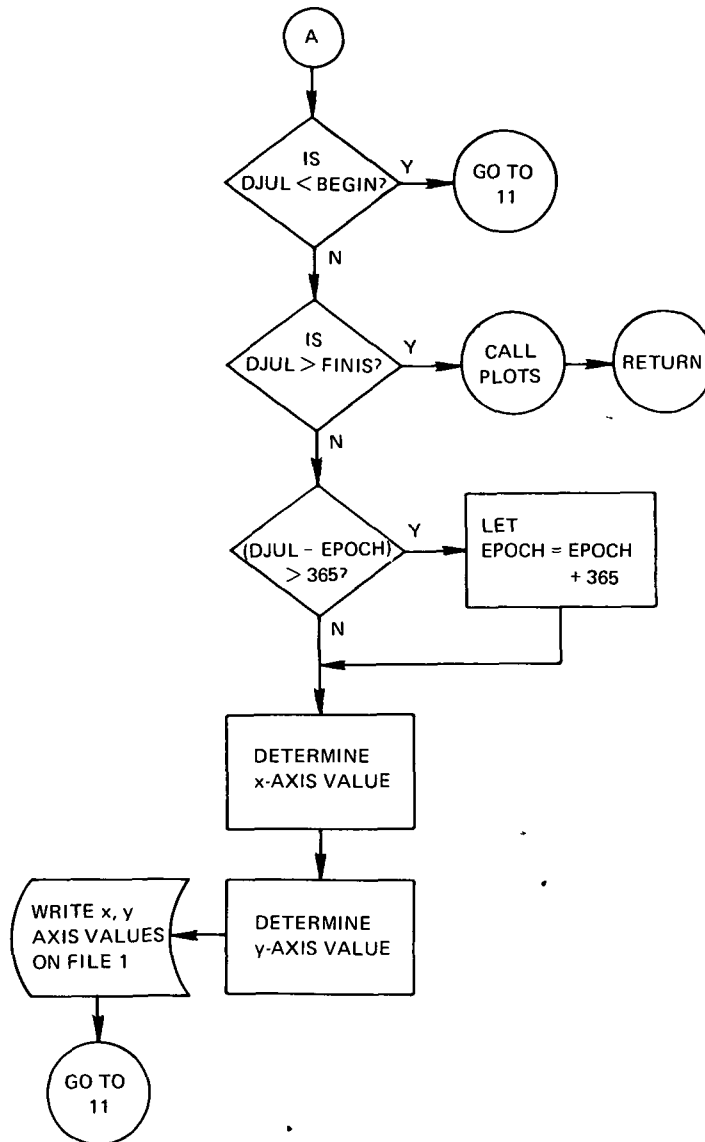
Y            -POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE  
 -START TIME FOR DATE BEING PLOTTED

H            -POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE  
 -STOP TIME FOR DATE BEING PLOTTED

\*\*\*\*\*SUBPROGRAMS REQUIRED-

BAR        (CALCOMP LIBRARY ROUTINE)  
 PLOT      (CALCOMP LIBRARY ROUTINE)  
 NUMBER   (CALCOMP LIBRARY ROUTINE)  
 SYMBOL   (CALCOMP LIBRARY ROUTINE)  
 DATE-    GMAP ASSEMBLY  
 CALDNR





\*\*\*\*\*SUBROUTINE CALND \*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 01/01/69

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE=GE 625

\*\*\*\*\*PURPOSE-

TO PLOT A GRID ON TWELVE INCH PLAIN PAPER REPRESENTING AN ENTIRE 365 DAY YEAR, EACH LINE DRAWN FROM THE ABSCISSA REPRESENTS A DAY OF THE YEAR, THE MONTHS OF THE YEAR ARE ALSO PLOTTED,

\*\*\*\*\*METHOD-

USING TWELVE INCH PAPER, GRIDS FOR THE DAYS ARE DRAWN TO A SCALE FACTOR OF 20 LINES PER INCH USING THE LIBRARY PLOT ROUTINES,

\*\*\*\*\*INPUT-

NONE

## \*\*\*\*\*OUTPUT-

GRID LINES ON OUTPUT TAPE FILE 01.

## \*\*\*\*\*RESTRICTIONS-

THE GRID IS FORMED TO CONSTRUCT A GRID SYSTEM OF 365 DAYS IN A YEAR ONLY.  
THE GRID BEGINS ON JANUARY 1 AND ENDS ON DECEMBER 31 ALWAYS,

## \*\*\*\*\*SUBPROGRAMS REQUIRED-

PLOTS  
FACTOR  
GRID  
NUMBER  
PLOT  
SYMBOL

## \*\*\*\*\*MONTHLY PLOT ROUTINE\*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 01/01/69

\*\*\*\*\*LANGUAGE=FORTRAN IV

\*\*\*\*\*MACHINE-GE 625

## \*\*\*\*\*PURPOSE-

TO GRAPH THE COMPUTED RELEASE WINDOW TIMES FOR A GIVEN MONTH OR PORTION OF IT,

## \*\*\*\*\*METHOD-

THIS SUBROUTINE USES EXISTING CALCOMP LIBRARY ROUTINES TO PLOT THE RELEASE TIMES CALCULATED THROUGH THIS PROGRAM ONTO A GRID AS SET UP IN SUBROUTINE MOCALD. THE INPUT POSITION OF THE TARGET RELEASE POINT, THE TRACKING STATIONS USED AND THE VALUE OF EACH CONSTRAINT IS GIVEN IN THE PLOT LABELLING. RELEASE TIMES PLOTTED ARE THOSE DAILY TIMES RECORDED ON FILE 09 BY THIS PROGRAM.

## \*\*\*\*\*INPUT-

1. FOR PLOT LABELLING ONLY-

KMO            - MONTH BEING PLOTTED AND/OR PRINTED  
KYR            - YEAR BEING PLOTTED AND/OR PRINTED  
PHIPDG        - GEODETIC LATITUDE OF RELEASE POINT (DEG)  
LAMPDG        - LONGITUDE OF RELEASE POINT (DEG)  
HEIGHT        - ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE  
              - (EQU)  
RESTR(2)      - MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION  
              - TO THE RELEASE POINT (DEG)  
RESTR(3)      - MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH  
              - TRACKING STATION (DEG)  
RESTR(4)      - MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH  
              - TRACKING STATION (DEG)  
RESTR(5)      - MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE  
              - RELEASE POINT AS SEEN FROM EACH TRACKING STATION  
              - (RAYLEIGHS)

RESTR(6) -CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD  
 -AFTER RELEASE RELATIVE TO THE TRACKING STATIONS  
 -(KM/SEC)

RESTR(7) -MINIMUM TRACKING PERIOD REQUIRED (HRS)

RESTR(8) -ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE  
 -RELATIVE TO THE EARTH (KM/SEC)

NAME(3,12) -NAME OF TRACKING STATIONS USED

ICASE -CASE NUMBER

## 2. USED FOR DATA PLOTTING-

NS -THE NUMBER OF STATIONS USED IN THE PROGRAM

NOS(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED

EPOCH -JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS ON  
 -FILE 09

0JUL -JULIAN DATE FOR CURRENT DATA

BEGIN -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING

FINIS -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING

C(6) -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT  
 -DATE

D(6) -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT  
 -DATE

## \*\*\*\*\*OUTPUT-

DATA POINTS FOR PLOT ARE STORED ON TAPE FILE 01 AT 556 BPI

X -POSITION OF PLOT PEN ON X-AXIS REPRESENTING THE  
 -DATE BEING PLOTTED

Y -POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE  
 -START TIME FOR DATE BEING PLOTTED

H -POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE  
 -STOP TIME FOR DATE BEING PLOTTED

## \*\*\*\*\*RESTRICTIONS-

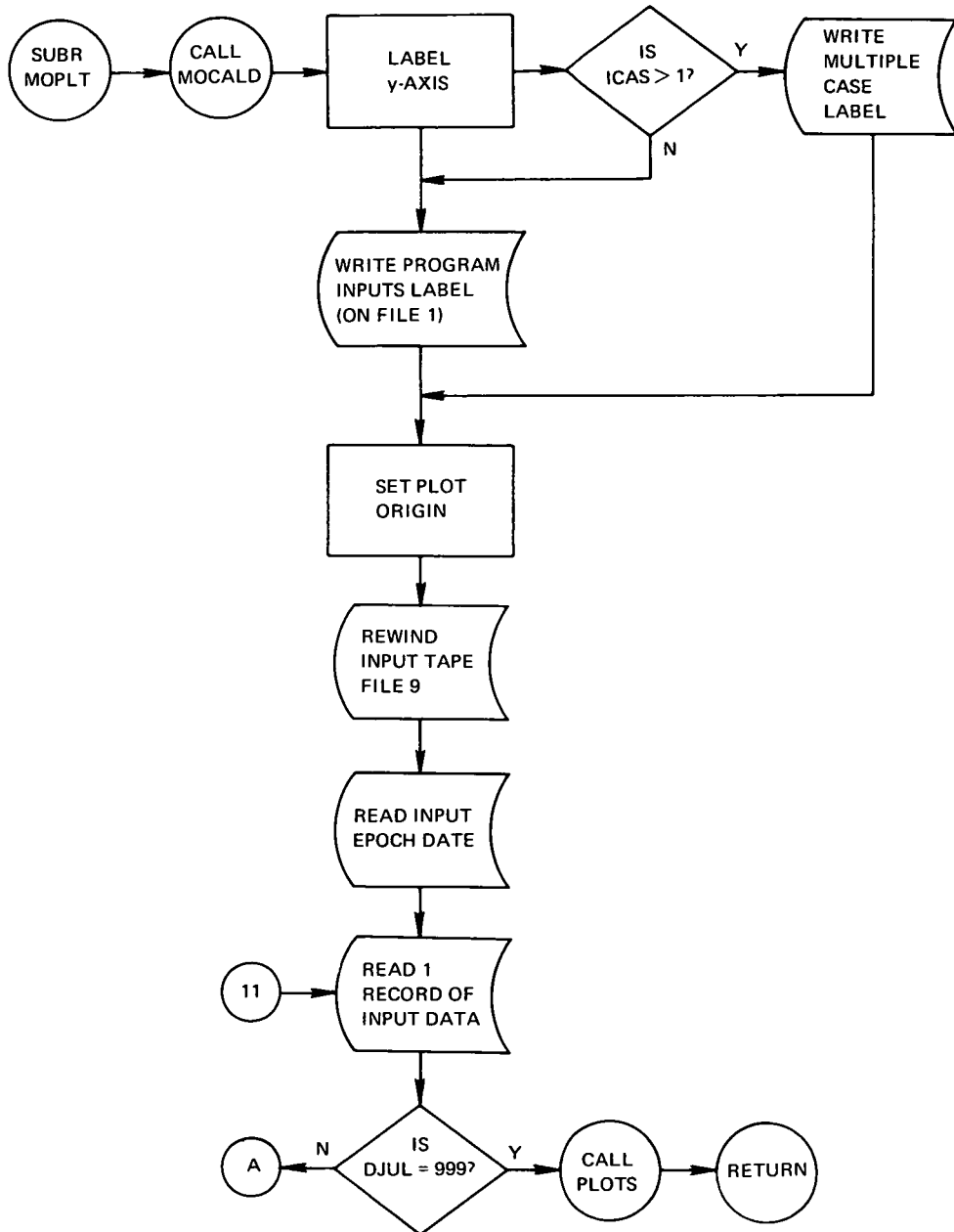
THIS SUBROUTINE WILL PLOT DATA ONLY FOR A GIVEN CALENDAR MONTH OR PORTION OF IT, PLOTTING OF TWO OR MORE CALENDAR MONTHS REQUIRES THAT THE PROGRAM BE REINITIATED FOR PLOTTING EACH CALENDAR MONTH, THIS RESTRICTION IS DUE TO THE GRID PLOT GENERATED THROUGH SUBROUTINE MOCALD, A CHECK IS MADE TO INSURE THE NUMBER OF DAYS PAST THE FIRST OF THE GIVEN CALENDAR MONTH IS WITHIN BOUNDS, THIS CHECK IS DONE SO THE PLOTS OF SUCCESSIVE CALENDAR MONTHS CAN BE MADE FROM ONE FILE 09 TAPE, NEGLECTING THIS RESTRICTION AND ATTEMPTING TO PLOT SUCCESSIVE CALENDAR MONTHS ON THE SAME GRID WILL GIVE AN ERRONEOUS PLOT, THIS PROGRAM HANDLES UP TO 12 STATIONS TO GET COMBINED WINDOWS

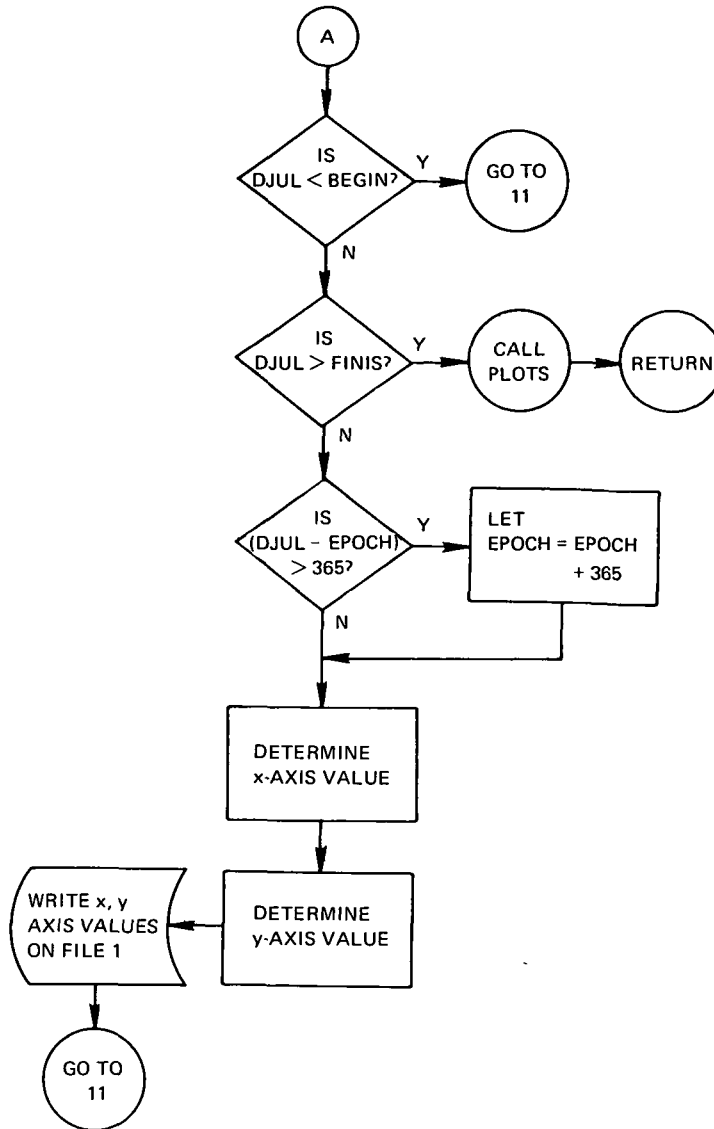
## \*\*\*\*\*SUBPROGRAMS REQUIRED-

BAR (CALCOMP LIBRARY ROUTINE)



PLOT (CALCOMP LIBRARY ROUTINE)  
 NUMBER (CALCOMP LIBRARY ROUTINE)  
 SYMBOL (CALCOMP LIBRARY ROUTINE)  
 DATE- GMAP ASSEMBLY  
 MOCALD





\*\*\*\*\*SUBROUTINE MOCALD \*\*\*\*\*

\*\*\*\*\*NASA Wallops version of 01/01/69

\*\*\*\*\*LANGUAGE-FORTRAN IV

\*\*\*\*\*MACHINE-GE 625

\*\*\*\*\*PURPOSE-

TO PLOT A GRID ON TWELVE INCH PLAIN PAPER REPRESENTING EACH DAY OF THE MONTH, EACH LINE DRAWN FROM THE ABSCISSA REPRESENTS A DAY OF 1KMO,

\*\*\*\*\*METHOD-

USING TWELVE INCH PAPER,GRIDS FOR THE DAYS ARE DRAWN TO A SCALE FACTOR OF 20 LINES PER 3 INCHES USING THE LIBRARY PLOT ROUTINES

\*\*\*\*\*INPUT-  
NONE

\*\*\*\*\*OUTPUT-  
GRID LINES ON OUTPUT TAPE FILE 01.

\*\*\*\*\*RESTRICTIONS--  
THE GRID IS FORMED TO CONSTRUCT A GRID SYSTEM OF THE DAYS OF  
'KMO' ONLY.

\*\*\*\*\*SUBPROGRAMS REQUIRED-  
PLOTS  
FACTOR  
GRID  
NUMBER  
PLOT  
SYMBOL

\*\*\*\*\*SUBROUTINE NXCARD \*\*\*\*\*

#### PROGRAM IDENTIFICATION

PROGRAM TITLE - NXCARD  
PROGRAM NO. - 1.1:1304  
PROGRAMMED BY - THOMAS HARMON  
  
COMPUTER REQUIRED - GE 625/635  
MEMORY REQUIRED - 76 WORDS  
PERIPHERALS - CARD READER  
PROGRAM LANGUAGE - GMAP

#### PURPOSE

NXCARD ALLOWS THE USER TO EXAMINE THE NEXT LOGICAL RECORD  
RESIDING ON FILE 05. THIS NEXT RECORD WILL NOT ACTUALLY  
BE USED AS AN INPUT RECORD UNTIL IT IS REFERENCED BY A  
NORMAL FORTRAN READ STATEMENT.

#### METHOD

THE NEXT LOGICAL RECORD IS EXAMINED USING THE SYSTEM  
SUBROUTINE ,FRDB. AFTER THE NEXT LOGICAL RECORD HAS BEEN  
OUTPUT TO THE CALLING PROGRAM, THE CURRENT RECORD INDEX IS  
RESET TO ITS PREVIOUS VALUE AND A NORMAL RETURN IS EXECUTED.

#### RESTRICTIONS

1. THE FORMAT USED TO CONVERT THE NEXT CARD MUST HAVE ONLY A  
TYPE FIELDS AND MUST READ ONLY ONE LOGICAL RECORD.
2. USE ONLY SINGLE OR NON-SUBSCRIPTED OUTPUT ARRAY NAMES AS  
ARGUMENTS TO THIS SUBROUTINE.
3. ENTER THE INTEGER 1 IN THE FIELD WHICH SPECIFIES THE  
ARRAY SIZE WHENEVER THE OUTPUT ARRAY NAME IS AN UNDIMEN-  
SIONED VARIABLE.
4. THE INPUT FILE MUST HAVE BEEN PREVIOUSLY OPENED BY A  
NORMAL FORTRAN READ BEFORE THIS SUBROUTINE IS CALLED FOR  
THE FIRST TIME.

#### INPUT/OUTPUT

CALLING SEQUENCE ... CALL NXCARD(FORMAT,A,I,B,J,...) WHERE

FORMAT = THE NAME OF THE ARRAY CONTAINING THE BCD FORMAT USED IN DECODING THE NEXT LOGICAL RECORD,

A = THE NAME OF THE FIRST OUTPUT ARRAY AND  
J = THE LENGTH OF ARRAY A.

B = THE NAME OF THE SECOND OUTPUT ARRAY AND  
J = THE LENGTH OF ARRAY B.

ETC.

SYSTEM SUBROUTINES REQUIRED

- .FRDD.
- .FSLI.
- .FRTN.

NO USER SUBROUTINES ARE REQUIRED

\*\*\*\*\*SUBROUTINE DATE\*\*\*\*\*

PROGRAM IDENTIFICATION

PROGRAM TITLE - DATE  
 PROGRAMMED BY - DENNIS MELVIN  
 COMPUTER REQUIRED - GE 625  
 PROGRAM LANGUAGE - GMAP

PURPOSE

DATE RECORDS THE CURRENT DATE AS STORED WITHIN THE COMPUTER SYSTEM.

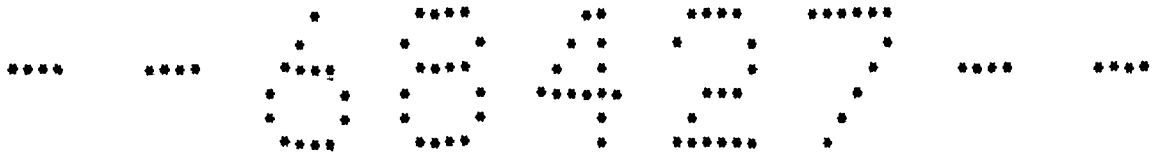
METHOD

THIS ROUTINE FETCHES THE DATE BY USING THE MASTER MODE ENTRY INSTRUCTION--GETIME--,THE DATE IS THEN PROPERLY FORMATTED FOR THE PLOT ROUTINES FOR PROGRAM 1.1.1615, BICWINDOW.

INPUT/OUTPUT

CALLING SEQUENCE,..CALL DATE(TODAY) WHERE  
 TODAY = THE PROPERLY FORMATTED CURRENT DATE, TODAY IS OF DIMENSION 2.

\*\*\*\*\*



\*\*\*\*\*

-6 3 0 -- DATE 09-29-72 TIME 15.838 PR 0 17 DUOPS1

*Appendix C*  
*Computer Printout*

This appendix contains the entire source deck listing of the computer program. The program has been written in FORTRAN IV for the GE-625 computer with the exception of subroutines NXCARD and DATE, which have been written in the GE600 assembly language. Either of these two routines can be omitted after minor modifications to subroutines INPUT, PLTRTN, and MOPLT.

Microfiche supplement for NASA SP-3075, A Computer Program to Determine the Possible Daily Release Window for Sky Target Experiments, by Norman H. Michaud, Wallops Station, Wallops Island, Va.

REPRODUCIBILITY OF THE ORIGINAL COPY IS POOR.



70	C	THE PROGRAM HAS THE FOLLOWING OPTIONS...	STRTO0070
71	C		STRTO0071
72	C	A; UP TO TWELVE FIXED TRACKING STATIONS MAY BE INPUT,	STRTO0072
73	C		STRTO0073
74	C	B; IF A MOVING OR AIRCRAFT TRACKING STATION IS INPUT, WHEN	STRTO0074
75	C	THE MAXIMUM NUMBER OF FIXED STATIONS ALLOWED IS ELEVEN, THE	STRTO0075
76	C	POSITION OF THE MOVING STATION AT RELEASE TIME AND AT HALF	STRTO0076
77	C	HOURLY INCREMENTS INTO THE EXPERIMENTAL PERIOD MUST BE INPUT,	STRTO0077
78	C		STRTO0078
79	C	C; A MAXIMUM OF THREE HOURS FOR THE EXPERIMENTAL PERIOD MAY BE	STRTO0079
80	C	USED IN INCREMENTS OF ONE HALF HOUR,	STRTO0080
81	C		STRTO0081
82	C	D; NOMINAL VALUES FOR PROGRAM CALCULATION DATE PERIOD, GENERAL	STRTO0082
83	C	PROGRAM OPTIONS, TRACKING STATIONS AND RELEASE POINT	STRTO0083
84	C	COORDINATES, AND THE VALUES FOR THE CONSTRAINTS CAN BE PRESET,	STRTO0084
85	C		STRTO0085
86	C	E; THE GENERAL OPTIONS FOR THE PROGRAM CONSIST OF THE	STRTO0086
87	C	FOLLOWING...	STRTO0087
88	C		STRTO0088
89	C	1; PERFORM THE PROGRAM CALCULATIONS,	STRTO0089
90	C		STRTO0090
91	C	2; CREATE A TAPE ON FILE 18 TO STORE THE SUN AND MOON DAILY	STRTO0091
92	C	TIME INTERVALS FOR THE GIVEN TRACKING STATIONS OR USE AN	STRTO0092
93	C	EXISTING TAPE READ IN ON TAPE FILE 18 IN ORDER TO SKIP	STRTO0093
94	C	THESE CALCULATIONS,	STRTO0094
95	C		STRTO0095
96	C	3; CREATE A TAPE ON FILE 07 OF THE DAILY TIME INTERVALS	STRTO0096
97	C	FOUND FOR EACH CONSTRAINT AND FOR EACH STATION AND/OR	STRTO0097
98	C	PRINT AN EXISTING TAPE THROUGH FILE 07?	STRTO0098
99	C		STRTO0099
100	C	4; CREATE A TAPE ON FILE 09 OF THE COMBINED DAILY RELEASE	STRTO0100
101	C	WINDOWS AND/OR PRINT AN EXISTING TAPE THROUGH FILE 09?	STRTO0101
102	C		STRTO0102
103	C	5; CREATE A TAPE FOR PLOTTING FROM THE DATA ON TAPE FILE 09	STRTO0103
104	C	OR NOT,	STRTO0104
105	C		STRTO0105
106	C		STRTO0106
107	C	THE FORMAT OF THIS MAIN PROGRAM IS TO ...	STRTO0107
108	C		STRTO0108
109	C	A; READ THE INPUTS;	STRTO0109
110	C	B; PERFORM PROGRAM CALCULATIONS TO YIELD THE PROGRAM CONSTANTS	STRTO0110
111	C		STRTO0111
112	C	C; CALCULATE THE PARAMETERS FOR THE CONSTRAINTS NOT DEPENDENT	STRTO0112
113	C	UPON TIME,	STRTO0113
114	C		STRTO0114
115	C	D; FIND THE TIME INTERVALS FOR EACH CONSTRAINT AND STORE ON A	STRTO0115
116	C	DAILY BASIS;	STRTO0116
117	C		STRTO0117
118	C	E; PROVIDE THE REQUESTED PRINTED OUTPUT AND/OR PLOT TAPE?	STRTO0118
119	C		STRTO0119
120	C	F; REPEAT A THRU E FOR MULTIPLE CASE RUNS,	STRTO0120
121	C	IN SELECTING THE OPTION NOT TO CALCULATE THEN B, C, AND D ARE	STRTO0121
122	C	OMITTED; FOR DETAILED EXPLANATION OF ENTIRE PROGRAM FUNCTIONS	STRTO0122
123	C	SEE THE COMMENTS AVAILABLE WITH EACH SUBROUTINE,	STRTO0123
124	C		STRTO0124
125	C		STRTO0125
126	C	*****SYSTEMS INPUT FILES-	STRTO0126
127	C		STRTO0127
128	C	FILE 05 = CARD READER	STRTO0128
129	C		STRTO0129
130	C	FILE 07 = IF OPTION 'ICALCV' = 1 AND 'IPRT7' = 0	STRTO0130
131	C		STRTO0131
132	C	FILE 09 = IF OPTION 'ICALCV' = 1 AND 'IPRT9' = 0	STRTO0132
133	C		STRTO0133
134	C	FILE 11 = IF OPTION 'IPRT11' = 0 1	STRTO0134
135	C		STRTO0135
136	C		STRTO0136
137	C	*****SYSTEMS OUTPUT FILES-	STRTO0137
138	C		STRTO0138
139	C	FILE 03 = IF 'IPLOT1' 00, 'XNOTE' TAPE FILE 03 MUST BE RECORDED AT	STRTO0139
140	C	596 BPI)	STRTO0140
141	C		STRTO0141
142	C	FILE 06 = PRINTER	STRTO0142

183	C		CONTAINS DATA FROM FILE 07 IF IPRY7 = 0	STR02843
184	C		CONTAINS DATA FROM FILE 09 IF IPRY9 = 0	STR02844
185	C			STR02845
186	C	FILE 07 = IF IICALC = 0		STR02846
187	C			STR02847
188	C	FILE 09 = IF IICALC = 0		STR02848
189	C			STR02849
190	C	FILE 11 = IF IIPRY11 = 0		STR02850
191	C			STR02851
192	C			STR02852
193	C	*****ADDITIONAL SYSTEMS FILES*		STR02853
194	C			STR02854
195	C	FILE 11 = FOR MORE THAN 1 CASE WITHIN JOB RUN,		STR02855
196	C			STR02856
197	C	FILE 12 = FOR MORE THAN 1 CASE WITHIN JOB RUN,		STR02857
198	C			STR02858
199	C	FILE 13 = ALWAYS REQUIRED,		STR02859
200	C			STR02860
201	C			STR02861
202	C	*****INPUT*		STR02862
203	C			STR02863
204	C	IICALC	-INTEGER CODE TO SIGNAL IF PROGRAM CALCULATIONS -ARE REQUESTED	STR02864
205	C			STR02865
206	C		-0: PERFORM PROGRAM CALCULATIONS	STR02866
207	C		-1: DO NOT PERFORM PROGRAM CALCULATIONS	STR02867
208	C			STR02868
209	C	IIPRY7	-INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07 -0: PRINT FILE 07 DATA	STR02869
210	C			STR02870
211	C		-1: DO NOT PRINT FILE 07 DATA	STR02871
212	C			STR02872
213	C	IIPRY9	-INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09 -DATA	STR02873
214	C			STR02874
215	C		-0: PRINT FILE 09 DATA	STR02875
216	C		-1: DO NOT PRINT FILE 09 DATA	STR02876
217	C			STR02877
218	C	IIPRY11	-INTEGER CODE TO SIGNAL REQUEST CREATING FILE 11 -DATA	STR02878
219	C			STR02879
220	C		-0: DO NOT CREATE FILE 11 TAPES USE EXISTING INPUT	STR02880
221	C		-1: TAPES ON FILE 11	STR02881
222	C		-2: CREATE FILE 11 TAPES	STR02882
223	C		-3: DO NOT USE FILE 11	STR02883
224	C			STR02884
225	C	IICASE	-CASE NUMBER (INTEGER)	STR02885
226	C			STR02886
227	C	IFINAL	-INTEGER CODE TO DESIGNATE LAST INPUT CASE -0: MORE CASES TO FOLLOW	STR02887
228	C			STR02888
229	C		-1: NO MORE CASES	STR02889
230	C			STR02890
231	C	IIBJUL	-JULIAN DATE FOR CURRENT DATA	STR02891
232	C			STR02892
233	C	IINDFD	-NUMBER OF DAYS FROM EPOCH DATE TO DATE FOR -STARTING CALCULATIONS (INTEGER)	STR02893
234	C			STR02894
235	C			STR02895
236	C	IINDFE	-NUMBER OF DAYS FROM EPOCH DATE TO DATE FOR -STOPPING CALCULATIONS (INTEGER)	STR02896
237	C			STR02897
238	C			STR02898
239	C	IIEPOCH	-JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS ON -FILE 09	STR02899
240	C			STR02900
241	C			STR02901
242	C	IIRVG	-RADIAL DISTANCE FROM EARTH CENTER TO RELEASE -POINT (R0)	STR02902
243	C			STR02903
244	C			STR02904
245	C	IDRIFT	-THE SPACEFIXED DRIFT OF CLOUD (DEG/HR)	STR02905
246	C			STR02906
247	C	IIR(2)	-ELEVATION CONSTRAINT (RADIAN)	STR02907
248	C			STR02908
249	C	IIR(6)	-CLOUD DRIFT RATE (RADIAN/HR)	STR02909
250	C			STR02910
251	C	IIR(7)	-MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS)	STR02911
252	C			STR02912
253	C	IINS	-THE NUMBER OF STATIONS USED IN THE PROGRAM	STR02913
254	C			STR02914
255	C	IINOST(12)	-AN ARRAY CONTAINING THE STATION NUMBERS USED	STR02915



216	C				START0216
217	C	RTU	-CONVERSION FACTOR FROM RADIANS TO HOURS		START0217
218	C				START0218
219	C	HVR	-CONVERSION FACTOR FROM HOURS TO RADIANS		START0219
220	C				START0220
221	C	SUHL	-MEAN LONGITUDE OF THE SUN AT 0 HRS,UT,		START0221
222	C				START0222
223	C	GMA	-GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS		START0223
224	C		-UNIVERSAL TIME (HRS)		START0224
225	C				START0225
226	C	SMADON	-RADIUS OF EARTH SHADOW REGION (RADIANS)		START0226
227	C				START0227
228	C	GAMMA	-COSINE OF 'SMADON'		START0228
229	C				START0229
230	C				START0230
231	C	*****OUTPUT*			START0231
232	C				START0232
233	C	WINDOW(1,5,12)	-THE DAILY RELEASE WINDOW START/STOP TIMES,		START0233
234	C		-1ST INDEX FOR STORING START/STOP TIMES,		START0234
235	C		-16875 FOR START TIMES		START0235
236	C		-26475 FOR STOP TIMES		START0236
237	C		-2ND INDEX FOR THE CONSTRAINT		START0237
238	C		- 1-EARTH SHADOW		START0238
239	C		- 2-ELEVATION		START0239
240	C		- 3-MOON		START0240
241	C		- 4-MOON		START0241
242	C		- 5-TOTAL SKY BACKGROUND BRIGHTNESS		START0242
243	C		-3RD INDEX FOR THE STATION NUMBER		START0243
244	C				START0244
245	C	*****RESTRICTIONS-			START0245
246	C		THOSE ALREADY NOTED UNDER METHOD,DETAILED RESTRICTIONS ON		START0246
247	C		VARIOUS PHASES OF THE PROGRAM DEFINITION ARE NOTED IN EACH		START0247
248	C		SUBROUTINE,		START0248
249	C				START0249
250	C	*****SUBPROGRAMS REQUIRED-			START0250
251	C	BLOCK DATA			START0251
252	C	INPUT			START0252
253	C	NGCARD			START0253
254	C	INPRY			START0254
255	C	CONVER			START0255
256	C	DXNUM			START0256
257	C	GDYGC			START0257
258	C	TIME			START0258
259	C	ELENSR			START0259
260	C	ELVDFT			START0260
261	C	AIRGLO			START0261
262	C	ERATR			START0262
263	C	SUNHN			START0263
264	C	ILGUM			START0264
265	C	LTNG			START0265
266	C	GCZTC			START0266
267	C	RDEPH			START0267
268	C		EPHERMERIS TABLES		START0268
269	C	NLIST			START0269
270	C	GETOI			START0270
271	C	TRASK			START0271
272	C	STRCLT			START0272
273	C	ZHDCLT			START0273
274	C		ITE		START0274
275	C		ZYABLE		START0275
276	C	OUY1			START0276
277	C	CXLDAT			START0277
278	C	YTLWDO			START0278
279	C	ICAB			START0279
280	C	OUY2			START0280
281	C	TTCTPE			START0281
282	C	ODTTP			START0282
283	C	DXNUM			START0283
284	C	PLTBYN			START0284
285	C	HBPLOY			START0285
286	C		DATE		START0286
287	C		CALDR		START0287
288	C		MOCALD		START0288

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289 C PLOT STRT0289
290 C STRT0290
291 C *****END OF DOCUMENTATION CARDS***** STRT0291
292 C STRT0292
293 COMMON/BLK1 /MONTH,NDAY ,RYBAR ,LMONTH,LDAY ,LYEAR ,KNO, RDA, STRT0293
294 1 KYR, LMOY LDA, LYR, ICALC, IPRV, IPRY, IPRY1, IPRY2 STRT0294
295 COMMON/BLK2 /DJUL, NDPJO, NDYE, EPDCH STRT0295
296 COMMON/BLK3 /SINCLY, COSCLY, SINCLN, COSCLN, RVC STRT0296
297 COMMON/BLK4 /DRIFT STRT0297
298 COMMON/BLK5 /R(8) STRT0298
299 COMMON/BLK6 /NS, NOS(12) STRT0299
300 COMMON/BLK7 /NAME(3*12), PH1(12), LAMBDA(12), ALT(12), MOVE(12) STRT0300
301 COMMON/BLK8 /DYN, RYD, WVR, WALPWT, RTH, AU, DELTA(4), ERN, BGWA STRT0301
302 COMMON/BLK9 /SUNL, GWA STRT0302
303 COMMON/BLK10 /WINDOW(6,5*12) STRT0303
304 COMMON/BLK11 /ICASE, IFINAL STRT0304
305 COMMON/BLK12 /SHADOW STRT0305
306 COMMON/BLK13 /LINE, IYBAR, INOYE, IDAY STRT0306
307 DOUBLE PRECISION DYN, RYD, WVR, WALPWT STRT0307
308 REAL LAMBDA STRT0308
309 DATA BDPIC/999.0/ STRT0309
310 ARCSIN(X) = ATAN(X/SQR(1.0-X**2)) STRT0310
311 C PROGRAM STARTS HERE STRT0311
312 C STRT0312
313 C READ AND WRITE INPUTS STRT0313
314 1 CALL INPWT STRT0314
315 C CHANGE FILE15 CODE TO HAVE ABILITY TO USE SUN AND MOON DATA WITH STRT0315
316 C STACKED BASES? STRT0316
317 IF (ICASE.EQ.1) GO TO 2 STRT0317 2
318 IF (IFINAL.EQ.0) IPRV1=1 STRT0318 9
319 2 IF (ICASE.EQ.2) IPRY1=0 STRT0319 8
320 CALL INPRT STRT0320 11
321 C STRT0321
322 IF (IBALC.EQ.1) GO TO 21 STRT0322 12
323 C CONVERT INPUTS TO REQUIRED UNITS AND PERFORM THE ONE-TIME CALCULATIONS STRT0323
324 CALL CONVER STRT0324 15
325 C WRITE EPOCH DATE ON FILE 9 STRT0325
326 IF (IBALC.EQ.1) WRITE (9,1084) EPDCH STRT0326 16
327 C CHECK FOR EACH TRACKING STATION'S ELEVATION ANGLE TO INSURE IT BEING STRT0327
328 C GREATER THAN R(2) STRT0328
329 CALL BL ENR STRT0329 21
330 C FOR BIRTH SHADOW FIND THE TIME CORRECTION FOR CLOUD DRIFT DURING STRT0330
331 C TRACKING PERIOD STRT0331
332 DRIFT = (R(4) * 1.0/WVR) * R(2) STRT0332 22
333 C STRT0333
334 C SHADOW COMPUTATIONS STRT0334
335 C STRT0335
336 C THETA IS THE ANGLE BETWEEN THE EARTH-SUN LINE AND STRT0336
337 C THE VANGENCY POINT OF THE BENUWA CONE STRT0337
338 C STRT0338
339 C THE MAXIMUM VALUE OF THETA IS APPROX; 89 DEG 45 MIN, STRT0339
340 C OR PI/2 MINUS THETA IS 1.06436332 RADIAN STRT0340
341 C STRT0341
342 C COMPUTE THE RADIUS OF THE SHADOW IN RADIAN STRT0342
343 SHADOW = ARCSIN( 1.87RVS) * 1.06436332 STRT0343 23
344 C STRT0344
345 C COMPUTE AIRGLOW BRIGHTNESS STRT0345
346 CALL AIRGLB STRT0346 24
347 C STRT0347
348 C COMPUTE START-STOP TIMES FOR SUN AND MOON ON DAY PRIOR TO DAY 2 STRT0348
349 IDAY =NDPJ0 -1 STRT0349 29
350 GWA =TIME(DJUL-1.) STRT0350 26
351 IF (IPRY1.EQ.0) GO TO 31 STRT0351 27
352 DO 200 M=3,4 STRT0352 30
353 CALL SUNRN (IDAY,M) STRT0353 31
354 C TRANSFORM SECOND SUN AND MOON INTERVALS TO FIRST INTERVALS FOR NEXT STRT0354
355 C DAY STRT0355
356 DO 200 L=1,NS STRT0356 32
357 N =NOS(L) STRT0357 33
358 WINDOW(L,M,N) =WINDOW(L,M,N) + 24*0 STRT0358 34
359 200 WINDOW(L,M,N) =WINDOW(L,M,N) + 24*0 STRT0359 35
360 C PERFORM CALCULATIONS AND CREATE OUTPUT FILES ON A DAILY BASIS FOR DATE STRT0360
361 C PERIOD REQUESTED, STRT0361
362 11 DO 100 I = NDPJO,NDYE STRT0362 38

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363	C CALCULATE ANOMALIC HOUR ANGLE FOR CURRENT DATE	START8363
364	CALL SUBR(20,JUL)	START8364 39
365	C COMPUTE RANGE THROUGH CONSTRAINT ON RELEASE POINT	START8365
366	CALL SUBR (1)	START8366 40
367	C STORE RANGE THROUGH RESULTS IN OUTPUT ARRAY AND EXECUTE PRINT	START8367
368	IDAY = 1	START8368 41
369	CALL SUBR (1)	START8369 42
370	C COMPUTE SUN AND MOON START-STOP TIMES FOR CURRENT DAY	START8370
371	DO 388 M=3,4	START8371 43
372	IF (IPTS17E,0) GO TO 32	START8372 44
373	CALL SUNRN (I,M)	START8373 47
374	DO 388 NN=1,NS	START8374 48
375	N = NOS(NB)	START8375 49
376	IF (IPTS17E,2) GO TO 33	START8376 50
377	WRITE (11,1002) DJUL, (WINDOW(L,M,N),L=3,4)	START8377 53
378	C SUBTRACT OFF TRACKING PERIOD FROM SUN AND MOON STOP TIMES ONLY FOR	START8378
379	C THE GROUND STATIONS:	START8379
380	33 IF (MOVE(N),NE,0) GO TO 500	START8380 59
381	WINDOW(2,M,N) = WINDOW(2,M,N) - R(7)	START8381 62
382	WINDOW(4,M,N) = WINDOW(4,M,N) - R(7)	START8382 63
383	500 CONTINUE	START8383 64
384	GO TO 388	START8384 66
385	C READ SUN AND MOON START/STOP TIMES FROM TAPB FILE 11	START8385
386	32 DO 600 NN=1,NS	START8386 67
387	N = NOS(NB)	START8387 68
388	READ (11,1002) DTE, (WINDOW(L,M,N),L=1,6)	START8388 69
389	C SUBTRACT OFF TRACKING PERIOD FROM SUN AND MOON STOP TIMES ONLY FOR	START8389
390	C THE GROUND STATIONS:	START8390
391	IF (MOVE(N),NE,0) GO TO 600	START8391 79
392	WINDOW(2,M,N) = WINDOW(2,M,N) - R(7)	START8392 78
393	WINDOW(4,M,N) = WINDOW(4,M,N) - R(7)	START8393 79
394	600 CONTINUE	START8394 80
395	C WRITE ERROR MESSAGE IF DATE ON TAPB FILE 11 DOES NOT MATCH FOR CURRENT	START8395
396	C DATA BEING CALCULATED,	START8396
397	IF (DJUL,EB,DTE) GO TO 388	START8397 82
398	WRITE (10,1003)	START8398 89
399	STOP	START8399 87
400	C STORE SUN/MOON RESULTS IN OUTPUT LOCATIONS AND EXECUTE PRINT OUTPUT	START8400
401	389 CALL SUBR (M)	START8401 88
402	C CALCULATE TIME INTERVALS FOR TOTAL SUN BACKGROUND BRIGHTNESS	START8402
403	C CONSTRAINT,	START8403
404	CALL BLTB	START8404 90
405	C STORE RESULTS IN OUTPUT LOCATIONS AND EXECUTE OUTPUT PRINTING	START8405
406	CALL SUBR(1)	START8406 91
407	C CALCULATE COMBINED RELEASE POINT FOR CURRENT DAY	START8407
408	CALL YLRDB (1)	START8408 92
409	C UPDATE JULIAN DATE AND MEAN LONGITUDE OF SUN FOR NEXT DAY	START8409
410	DJUL = DJUL + 1.0	START8410 93
411	SUNL = AMOD((SUNL + 0.9985647153687)	START8411 94
412	C TRANSFORM SECOND SUN AND MOON INTERVALS TO FIRST INTERVALS FOR NEXT	START8412
413	C DAY, ADD BACK IN THE TRACKING TIME ON THE STOP TIMES FOR FIXED	START8413
414	C STATIONS ONLY:	START8414
415	DO 408 M=3,4	START8415 95
416	DO 408 L=3,NS	START8416 96
417	N = NOS(L)	START8417 97
418	WINDOW(1,M,N) = WINDOW(3,M,N) + 24.0	START8418 98
419	IF (MOVE(N),EQ,0) GO TO 14	START8419 99
420	WINDOW(2,M,N) = WINDOW(4,M,N) + 24.0	START8420 102
421	GO TO 408	START8421 103
422	14 WINDOW(2,M,N) = WINDOW(4,M,N) + R(7) + 24.0	START8422 104
423	408 CONTINUE	START8423 105
424	108 CONTINUE	START8424 108
425	C COMPLETED COMPUTATION OF PRESENT CASE?	START8425
426	REWIND 11	START8426 110
427	WRITE (11,1000) ENDFIL	START8427 111
428	C COMPUTE NEXT CASE, IF ANY	START8428
429	31 IF (IPTS17E,0) GO TO 2	START8429 114
430	IF (IPTS17E,0) WRITE (10,1001) ENDFIL	START8430 117
431	C REWIND THESE FILES IF REQUESTING THEM PRINTING,	START8431
432	IF (IPTS7,0,0) REWIND 87	START8432 122
433	IF (IPTS9,0,0) REWIND 89	START8433 125
434	C EXECUTE OUTPUT PRINTING AND GENERATING PLOT TAPB ROUTINE,	START8434

435	CALL OUYE	START0635 028
436	STOP	START0636 029
437	0000 FORMAY (P10;2;120X)	START0637 030
438	0001 FORMAY (P10;2;9X;120X)	START0638 030
439	0002 FORMAY (P10;2;9X;9)	START0639 030
440	0003 FORMAY (FATAL ERROR DETECTED IN CHECKING DATE FOR SUN AND MOON	START0640 030
441	ITINGS FROM TAPE IS PROGRAM TERMINATED)	START0641
442	0004 FORMAY (P10;2)	START0642 030
443	END	START0643 030

26843 WORDS OF MEMORY USED BY THIS COMPILATION

07V06 01 09-25-72 11.385

BARTON WINDOW MAIN PROGRAM

#####:0;1625 B10WINDOW MAIN PROGRAM#####

PREPAGE

PROGRAM BREAK 1023  
COMMON LENGTH 0  
V COUNT BITS 6  
PRIMARY SYNDOP ENTRY  
: : : : : 0  
SECONDARY SYNDOP ENTRY

BLOCK	LENGTH
1	BLNK 28
2	BLNK1 4
3	BLNK2 9
4	BLNK3 3
5	BLNK4 10
6	BLNK 19
7	BLNK 124
10	BLNK 26
11	BLNK 2
12	BLNK 556
13	BLNK 2
14	BLNK 3
15	BLNK 4

SYNREF

16 ATAN  
17 OUYE  
20 OUYE  
21 SQRT  
22 TIME  
23 ILLDN  
24 INPRY  
25 INPRY  
26 NLTYE  
27 SUBRN  
30 ATBALD  
31 CONVER  
32 ELNSH  
33 ,FRV,  
34 ,FRTY  
35 ,FRSL,  
36 ,FRDD,  
37 ,FRVN,  
40 ,FRY,  
41 ,FRDD,  
42 TYENDU

1023 IS THE NEXT AVAILABLE LOCATION.

GNAP VERSION/ASSEMBLY DATES JNPA 050178/052871 JNBB 050171/052371 JMPC 050174/052871

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

49 1974P WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY?



07000 01 09-09-72 11,998 NOMINAL INPUTS AND PROGRAM CONSTANTS

\*\*\*\*\*BLOCK DATA SUBPROGRAM\*\*\*\*\*

1	C	DATA	NOMINAL INPUTS AND PROGRAM CONSTANTS	DATA0001
2	C	*****BLOCK DATA SUBPROGRAM*****		DATA0002
3	C			DATA0003
4	C	*****START OF DOCUMENTATION CARDS*****		DATA0004
5	C			DATA0005
6	C	*****NABA HALLOPS VERSION OF 02/01/70		DATA0006
7	C			DATA0007
8	C	*****LANGUAGE-FORTRAN IV		DATA0008
9	C			DATA0009
10	C	*****MACHINE-GE 625		DATA0010
11	C			DATA0011
12	C	*****PURPOSE.		DATA0012
13	C	TO DEFINE NOMINAL INPUT PARAMETERS AND TO DEFINE CONVERSION		DATA0013
14	C	FACTORS FOR USE IN THE BT-WINROW PROGRAM,		DATA0014
15	C			DATA0015
16	C	*****METHOD-		DATA0016
17	C	DEFINE CONSTANTS AND NOMINAL PARAMETERS THROUGH DATA STATEMENTS		DATA0017
18	C			DATA0018
19	C			DATA0019
20	C	*****INPUTS		DATA0020
21	C			DATA0021
22	C	NOISE		DATA0022
23	C			DATA0023
24	C			DATA0024
25	C	*****OUTPUT-		DATA0025
26	C			DATA0026
27	C	KMONTH	-MONTH NUMBER FOR STARTING CALCULATIONS	DATA0027
28	C	KDAY	-DAY NUMBER FOR STARTING CALCULATIONS	DATA0028
29	C	KYEAR	-YEAR NUMBER FOR STARTING CALCULATIONS	DATA0029
30	C			DATA0030
31	C	KYEAR	-YEAR NUMBER FOR STARTING CALCULATIONS	DATA0031
32	C			DATA0032
33	C	LMONTH	-MONTH NUMBER FOR STOPPING CALCULATIONS	DATA0033
34	C			DATA0034
35	C	LDAY	-DAY NUMBER FOR STOPPING CALCULATIONS	DATA0035
36	C			DATA0036
37	C	LYEAR	-YEAR NUMBER FOR STOPPING CALCULATIONS	DATA0037
38	C			DATA0038
39	C	KMB	-MONTH PLOTTING AND/OR PRINTING TO BEGIN	DATA0039
40	C	KDB	-DAY PLOTTING AND/OR PRINTING TO BEGIN	DATA0040
41	C	KYR	-YEAR PLOTTING AND/OR PRINTING TO BEGIN	DATA0041
42	C			DATA0042
43	C	KYR	-YEAR PLOTTING AND/OR PRINTING TO BEGIN	DATA0043
44	C			DATA0044
45	C	LMB	-MONTH PLOTTING AND/OR PRINTING TO END	DATA0045
46	C			DATA0046
47	C	LDB	-DAY PLOTTING AND/OR PRINTING TO END	DATA0047
48	C			DATA0048
49	C	LYR	-YEAR PLOTTING AND/OR PRINTING TO END	DATA0049
50	C			DATA0050
51	C	ICALC	-INTEGER CODE TO SIGNAL IF PROGRAM CALCULATIONS	DATA0051
52	C		ARE REQUESTED	DATA0052
53	C		00: PERFORM PROGRAM CALCULATIONS	DATA0053
54	C		05: DO NOT PERFORM PROGRAM CALCULATIONS	DATA0054
55	C			DATA0055
56	C	IPRT7	-INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07	DATA0056
57	C		00: PRINT FILE 07 DATA	DATA0057
58	C		05: DO NOT PRINT FILE 07 DATA	DATA0058
59	C			DATA0059
60	C	IPRT9	-INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09	DATA0060
61	C		DATA	DATA0061
62	C		00: PRINT FILE 09 DATA	DATA0062
63	C		05: DO NOT PRINT FILE 09 DATA	DATA0063
64	C			DATA0064
65	C	IPRT11	-INTEGER CODE TO SIGNAL REQUEST CREATING FILE 11	DATA0065
66	C		DATA	DATA0066
67	C		00: CREATE FILE 11 TAPE	DATA0067
68	C		05: DO NOT CREATE FILE 11 TAPE USE EXISTING INPUT	DATA0068
69	C		TAPE ON FILE 10	DATA0069

70	C		-#2: DO NOT USE SITE 11	DATA0070
71	C			DATA0071
72	C	IPLOT	-INTEGER CODE TO SIGNAL REQUEST PLOTTING DATA	DATA0072
73	C		-#1: CREATE A TAPE FOR PLOTTING DATA FOR 8	DATA0073
74	C		- CALENDAR YEARS THROUGH FILE 01 AT 590 BP)	DATA0074
75	C		-#6: CREATE A TAPE FOR PLOTTING DATA FOR 8	DATA0075
76	C		- CALENDAR MONTH THROUGH FILE 01 AT 596 BP)	DATA0076
77	C		-#2: DO NOT CREATE A PLOT TAPE	DATA0077
78	C			DATA0078
79	C	PHIPDO	-GEODEVIC LATITUDE OF RELEASE POINT (DEG)	DATA0079
80	C			DATA0080
81	C	LAMPDO	-LONGITUDE OF RELEASE POINT (DEG)	DATA0081
82	C			DATA0082
83	C	HEIGHT	-ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE	DATA0083
84	C		-(FNU)	DATA0084
85	C			DATA0085
86	C	RESTR(2)	-MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION	DATA0086
87	C		-TO THE RELEASE POINT (DEG)	DATA0087
88	C			DATA0088
89	C	RESTR(3)	-MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH	DATA0089
90	C		-TRACKING STATION (DEG)	DATA0090
91	C			DATA0091
92	C	RESTR(4)	-MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH	DATA0092
93	C		-TRACKING STATION (DEG)	DATA0093
94	C			DATA0094
95	C	RESTR(5)	-MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE	DATA0095
96	C		-RELEASE POINT AS SEEN FROM EACH TRACKING STATION	DATA0096
97	C		-(RAYLEIGH)	DATA0097
98	C			DATA0098
99	C	RESTR(6)	-CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD	DATA0099
100	C		-AFTER RELEASE RELATIVE TO THE EARTH (KM/SEC)	DATA0100
101	C			DATA0101
102	C	RESTR(7)	-MINIMUM TRACKING PERIOD REQUIRED (HRS)	DATA0102
103	C			DATA0103
104	C	RESTR(8)	-ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE	DATA0104
105	C		-RELATIVE TO THE EARTH (KM/SEC)	DATA0105
106	C			DATA0106
107	C	NS	-THE NUMBER OF STATIONS USED IN THE PROGRAM	DATA0107
108	C			DATA0108
109	C	NOB(12)	-AN ARRAY CONTAINING THE STATION NUMBERS USED	DATA0109
110	C			DATA0110
111	C	NAME(3,12)	-NAME OF TRACKING STATIONS USED	DATA0111
112	C			DATA0112
113	C	PHI(12)	-GEODEVIC LATITUDE OF TRACKING STATION (DEG)	DATA0113
114	C			DATA0114
115	C	LAMBDA(12)	-LONGITUDE OF TRACKING STATION (DEG)	DATA0115
116	C			DATA0116
117	C	ALY(12)	-ALTITUDE OF TRACKING STATION ABOVE EARTH SURFACE	DATA0117
118	C		-(FT)	DATA0118
119	C			DATA0119
120	C	MOVE(12)	-CODE NUMBER TO DETERMINE IF STATION COORDINATES	DATA0120
121	C		-ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT	DATA0121
122	C		-#0: FOR FIXED STATION	DATA0122
123	C		-#1: FOR AIRCRAFT	DATA0123
124	C			DATA0124
125	C	PNAME(3,7)	-ALPHANUMERIC DESCRIPTION FOR AIRCRAFT POSITION	DATA0125
126	C		-DURING TRACKING PERIOD	DATA0126
127	C			DATA0127
128	C	PLAT(7)	-GEODEVIC LATITUDE OF AIRCRAFT DURING	DATA0128
129	C		-EXPERIMENTAL PERIOD (DEG)	DATA0129
130	C			DATA0130
131	C	PLON(7)	-LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD	DATA0131
132	C		-(DEG)	DATA0132
133	C			DATA0133
134	C	PALT(7)	-ALTITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD	DATA0134
135	C		-(DEG)	DATA0135
136	C			DATA0136
137	C	DTR	-CONVERSION FACTOR FROM DEGREES TO RADIANS	DATA0137
138	C			DATA0138
139	C	RTD	-CONVERSION FACTOR FROM RADIANS TO DEGREES	DATA0139
140	C			DATA0140
141	C	HTR	-CONVERSION FACTOR FROM HOURS TO RADIANS	DATA0141
142	C			DATA0142

183	C	RTM	-CONVERSION FACTOR FROM RADIANS TO HOURS	DATA0243
184	C			DATA0244
185	C	AU	-CONVERSION FACTOR FROM ASTRONOMICAL UNITS TO	DATA0245
186	C		-EARTH RADIUS UNITS	DATA0246
187	C			DATA0247
188	C	DELTA(3)	-APPROXIMATE PERIOD OF SUN MOTION (HRS)	DATA0248
189	C			DATA0249
190	C	DELTA(4)	-APPROXIMATE PERIOD OF MOON MOTION (HRS)	DATA0250
191	C			DATA0251
192	C	ERM	-CONVERSION FACTOR FROM EARTH RADIUS UNITS TO	DATA0252
193	C		-KILOMETERS	DATA0253
194	C			DATA0254
195	C	HALFPT	-VALUE OF 90 DEGREES IN RADIANS	DATA0255
196	C			DATA0256
197	C	WINDOW(8,3,12)	-THE DAILY RELEASE WINDOW START/STOP TIMES,	DATA0257
198	C		-1ST INDEX FOR STORING START/STOP TIMES,	DATA0258
199	C		-19375 FOR START TIMES	DATA0259
200	C		-29476 FOR STOP TIMES	DATA0260
201	C		-2ND INDEX FOR THE CONSTRAINT	DATA0261
202	C		- 1-EARTH SHADOW	DATA0262
203	C		- 2-ELEVATION	DATA0263
204	C		- 3-SUN	DATA0264
205	C		- 4-MOON	DATA0265
206	C		- 5-TOTAL SKY BACKGROUND BRIGHTNESS	DATA0266
207	C		-3RD INDEX FOR THE STATION NUMBER	DATA0267
208	C			DATA0268
209	C	LINE	-LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT	DATA0269
210	C		-HEADING	DATA0270
211	C			DATA0271
212	C	*****RESTRICTIONS-		DATA0272
213	C	NONE KNOWN		DATA0273
214	C			DATA0274
215	C	*****SUBPROGRAMS REQUIRED-		DATA0275
216	C	NONE		DATA0276
217	C			DATA0277
218	C	*****END OF DOCUMENTATION CARDS*****		DATA0278
219	C			DATA0279
220		BLOCK DATA		DATA0280
221		REAL LAMBDA, LAMBDA		DATA0281
222		COMMON/BLK1 /KMONTH, KDAY, KYEAR, LMONTH, LDAY, LYEAR, KMO, KDA,		DATA0282
223		1 KYR, LMO, LDA, LYR, ICALC, IPRT7, IPRT9, IPRT11, IPLOT		DATA0283
224		COMMON/BLK2 /PHIPDG, LAMPDG, HEIGHT		DATA0284
225		COMMON/BLK3 /RSTR(8)		DATA0285
226		COMMON/BLK4 /NS, NOS(12)		DATA0286
227		COMMON/BLK5 /NAME(3*12), PH1(12), LAMBDA(12), ALT(12), MOVE(12)		DATA0287
228		COMMON/BLK6 /PNAME(3*7), PCAT(7), PLONG(7), PALT(7), JAIR		DATA0288
229		COMMON/BLK7 /DTR, RYD, MYR, HALFR1, RTM, AU, DELTA(4), ERM, DG4		DATA0289
230		COMMON/BLK8 / WINDOW(6,3,12)		DATA0290
231		COMMON/BLK9 / LINE, IYEAR, IMONTH, IDAY		DATA0291
232		DOUBLE PRECISION DTR, RYD, MYR, HALFR1		DATA0292
233		DATA KMONTH, KDAY, KYEAR, LMONTH, LDAY, LYEAR /		DATA0293
234		1 2 .1 .5971 .12 .181 .1971 /		DATA0294
235		DATA KMO, KDA, KYR, LMO, LDA, LYR		DATA0295
236		1 1 1 1 .1971 .12 9 31.1971		DATA0296
237		DATA ICALC, IPRT7, IPRT9, IPRT11, IPLOT		DATA0297
238		1 0 0 0 0 0 0 0		DATA0298
239		DATA PHIPDG, LAMPDG, HEIGHT		DATA0299
240		1 7.0892 1-74.9955 .5.132 2		DATA0300
241		DATA RSTR /0,0, 30,0, -18,0, 0, 219, 1, 75, 0, 0, 2, 0, 2, 4/		DATA0301
242		DATA (NAME(1,1)) PH1(1), LAMBDA(1), ALT(1) 0(1,0,0) /		DATA0302
243		1 18WESO, CHILE -29.2668879 -78.7733883 7201.4		DATA0303
244		2 18WERRR TOLOLO, CHILE -35.2699949 -70.7773866 7891.8		DATA0304
245		3 18WARECOIPA, PERU -18.8668259 -71.7493326 8433.2		DATA0305
246		4 18WWHITE SANDS, N.H. 32.42385 -106.759278 5413.46		DATA0306
247		5 18WMY, HOPKINS, ARIZ. 32.8517809 -118.87816 7939.6		DATA0307
248		6 18WKIYY PEAK, ARIZONA 32.9588229 -118.99487 6771.6		DATA0308
249		7 18WHALLSBS STA, VA? 32.85 9-7575 28.0		DATA0309
250		8 18W CV-999 AT RELEASE 32.3478 9-6276542 35830. /		DATA0310
251		DATA (MOVE(1,1), 1, 0) / 800 /		DATA0311
252		DATA (WINDOW(1,1,1), 1, 1, 1, 1, 1, 1, 1) / 0, 0, 0, 0, 0, 0, 2, 4, 0 /		DATA0312
253		DATA NS, (NOS(1), 1, 8, 7) / 7, 2, 2, 3, 3, 8, 8, 6, 8 /		DATA0313
254		DATA AU / 8, 82, 88, 87, 8, 4 /		DATA0314
255		DATA HALFR1 / 1, 57, 67, 9, 8, 3, 2, 6, 9, 9, 4, 8, 6, 8, 1, 9, 8, 6, 1 /		DATA0315
256		DATA DTR / 2, 7, 8, 5, 3, 2, 9, 2, 5, 3, 9, 4, 8, 2, 9, 5, 8, 8, 6, 8, 1 /		DATA0316

217	DATA RYM/8:61971863/	DATA0817
218	DATA RYD/7:5729577951308232090 02/	DATA0818
219	DATA RYR/7:361799388 08/	DATA0819
220	DATA DELTA /0.0, 0.0, 24.0, 24.78/	DATA0820
221	DATA BRN /4371,824/	DATA0821
222	DATA DGMZ/Y:60273791/	DATA0822
223	DATA LINE/35/	DATA0823
224	END	DATA0824

23782 WORDS OF MEMORY USED BY THIS COMPILATION

67906 01 09-25-72 11,598 NOMINAL INPUTS AND PROGRAM CONSTANTS

\*\*\*\*\*BLOCK DATA SUBPROGRAM\*\*\*\*\*

PREPAGE

PROGRAM BREAK 0  
COMMON LENGTH 0  
V BRUNT BITS 9

PRIMARY SYMDEF ENTRY

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1	BLK0	28
2	BLK0	8
3	BLK0	10
4	BLK0	19
5	BLK0	124
6	BLK04	93
7	BLK0	20
10	BLK0	598
11	BLK0	4

SYMDEF

0 IS THE NEXT AVAILABLE LOCATION.

GNAP VERSION/ASSEMBLY DATES JNPA 050171/052571 JMRB 050171/052571 JMPC 050171/052571  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19255 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY.

67906 01 09-25-72 11,599 READ INPUT PARAMETERS

\*\*\*\*\*SUBROUTINE INPUT\*\*\*\*\*

1	CINRU	READ INPUT PARAMETERS	INPU0801
2	C	*****SUBROUTINE INPUT*****	INPU0802
3	C		INPU0803
4	C	*****START OF DOCUMENTATION CARDS*****	INPU0804
5	C		INPU0805
6	C	*****NWSA WOLLOPS VERSION OF 02/01/70	INPU0806
7	C		INPU0807
8	C	*****LANGUAGE-FORTRAN IV	INPU0808
9	C		INPU0809
10	C	*****MACHINE-GE 025	INPU0810
11	C		INPU0811
12	C	*****PURPOSE.	INPU0812
13	C	TO READ INPUT PARAMETERS FROM CARD READER USING THE READING	INPU0813
14	C	PROCESS DEFINED THROUGH SUBROUTINE NXCARD.	INPU0814
15	C		INPU0815
16	C	*****METHOD.	INPU0816
17	C	THIS SUBROUTINE READS INPUT CARDS IN ANY ORDER EXCEPT FOR THE	INPU0817
18	C	110 OR LAST CARD, EACH CARD IS FIRST 'LOGGED AT' USING	INPU0818
19	C	SUBROUTINE NXCARD; COLUMN 1 OF EACH CARD CONTAINS THE CODE	INPU0819
20	C	LETTER SIGNIFYING WHAT VARIABLES ARE CONTAINED ON THE CARD, THE	INPU0820
21	C	CARD CODE IS CHECKED AND THE CARD IS READ INTO THE PROGRAM BY	INPU0821
22	C	THE CORRECT FORMAT AS DETERMINED FROM THE CARD CODE; IT IS NOT	INPU0822



23	C	NECESSARY TO DEFINE ALL INPUT PARAMETERS REQUIRED TO GENERATE	INPU0023
24	C	PROGRAM DATA, EACH INPUT VARIABLE IS DEFINED IN THE BLOCK DATA	INPU0024
25	C	SUBPROGRAM FOR NOMINAL VALUES; CHANGES TO ANY ONE OR MORE	INPU0025
26	C	NOMINAL VALUE DEFINED ON ONE CARD REQUIRED THAT ALL VARIABLES	INPU0026
27	C	SPECIFIED FOR THAT CARD MUST BE INCLUDED; OMISSION OF ANY	INPU0027
28	C	VARIABLE FROM A CARD WILL BE INTERPRETED TO HAVE A VALUE OF	INPU0028
29	C	ZERO AND WILL OVERRIDE THE NOMINAL VALUE STORED THROUGH THE	INPU0029
30	C	BLOCK DATA SUBPROGRAM,	INPU0030
31	C		INPU0031
32	C	*****INPUT*	INPU0032
33	C	VARIABLES ARE CARD INPUTS WITH THE FOLLOWING SPECIFIC CARD AND	INPU0033
34	C	COLUMN LOCATIONS; ALL VARIABLES SPECIFIED AS INTEGERS MUST BE	INPU0034
35	C	RIGHT JUSTIFIED, THOSE VARIABLES NOT SPECIFIED AS INTEGERS;	INPU0035
36	C	HOLLERITH; OR ALPHANUMERIC ARE FLOATING POINT AND MUST BE READ	INPU0036
37	C	IN THE UNITS NOTED;	INPU0037
38	C		INPU0038
39	C	A CARD - START/STOP DATE	INPU0039
40	C	01 * A (HOLLERITH)	INPU0040
41	C	03-04 * STARTING MONTH (INTEGER)	INPU0041
42	C	05-07 * STARTING DAY (INTEGER)	INPU0042
43	C	09-12 * STARTING YEAR (INTEGER)	INPU0043
44	C	13-15 * FINAL MONTH (INTEGER)	INPU0044
45	C	17-18 * FINAL DAY (INTEGER)	INPU0045
46	C	20-23 * FINAL YEAR (INTEGER)	INPU0046
47	C		INPU0047
48	C	B CARD - START/STOP DATE FOR OUTPUT	INPU0048
49	C	01 * B (HOLLERITH)	INPU0049
50	C	03-04 * STARTING MONTH (INTEGER)	INPU0050
51	C	05-07 * STARTING DAY (INTEGER)	INPU0051
52	C	09-12 * STARTING YEAR (INTEGER)	INPU0052
53	C	13-15 * FINAL MONTH (INTEGER)	INPU0053
54	C	17-18 * FINAL DAY (INTEGER)	INPU0054
55	C	20-23 * FINAL YEAR (INTEGER)	INPU0055
56	C		INPU0056
57	C	C CARD - PROGRAM OPTIONS	INPU0057
58	C	01 * C (HOLLERITH)	INPU0058
59	C	04 PROGRAM CALCULATION	INPU0059
60	C	* 0 DO CALCULATIONS FOR DATES SHOWN	INPU0060
61	C	* 1 SKIP CALCULATIONS-ONLY PRINT FILES 01, 07, 09	INPU0061
62	C	08 PRINT FILE 01	INPU0062
63	C	* 0 PRINT FILE 07	INPU0063
64	C	* 1 DO NOT PRINT FILE 07	INPU0064
65	C	08 PRINT FILE 09	INPU0065
66	C	* 0 PRINT FILE 09	INPU0066
67	C	* 1 DO NOT PRINT FILE 09	INPU0067
68	C	10 SUN AND MOON CALCULATIONS	INPU0068
69	C	* 0 USE FILE 11 FOR WINDOW TIMES FOR SUN AND MOON	INPU0069
70	C	* 1 CREATE FILE 11 ON SUN AND MOON TIMES	INPU0070
71	C	* 2 DO NOT USE FILE 11	INPU0071
72	C	12 CALCOMP PLOTTER OPTION	INPU0072
73	C	* 0 GENERATE CALCOMP PLOT DATA ON FILE 01 FOR A	INPU0073
74	C	CALENDAR YEAR	INPU0074
75	C	* 1 GENERATE CALCOMP PLOT DATA ON FILE 01 FOR A	INPU0075
76	C	CALENDAR MONTH	INPU0076
77	C	* 2 DO NOT GENERATE CALCOMP OUTPUT	INPU0077
78	C		INPU0078
79	C	D CARD - LOCATION OF RELEASE POINT	INPU0079
80	C	01 * D (HOLLERITH)	INPU0080
81	C	03-15 * GEODETIC LATITUDE OF RELEASE POINT (DEG)	INPU0081
82	C	16-25 * LONGITUDE OF RELEASE POINT (DEG)	INPU0082
83	C	26-35 * ALTITUDE ABOVE THE EARTH'S SURFACE (FEET)	INPU0083
84	C		INPU0084
85	C	E CARD - BRIGHTNESS AND ELEVATION CONSTRAINTS	INPU0085
86	C	01 * E (HOLLERITH)	INPU0086
87	C	03-10 * MINIMUM ELEVATION OF RELEASE POINT (DEG)	INPU0087
88	C	11-15 * DEPRESSION ANGLE OF THE SUN (DEG)	INPU0088
89	C	16-20 * DEPRESSION ANGLE OF THE MOON (DEG)	INPU0089
90	C	21-25 * TOTAL SKY BACKGROUND BRIGHTNESS (RAYLEIGHS)	INPU0090
91	C	26-30 * DRIFT RATE OF CLOUD (KM/SEC)	INPU0091
92	C	31-35 * TOTAL TRACKING TIME (HRS)	INPU0092
93	C	36-40 * 1/2 CLOUDS GROWTH RATE (KM/SEC)	INPU0093
94	C		INPU0094
95	C	F CARD - STATIONS TO BE COMBINED	INPU0095
96	C	01 * F (HOLLERITH)	INPU0096

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97      C          03-04 = THE NUMBER OF STATIONS TO COMBINE          INPU0097
98      C          06-07 = THE NUMBER OF THE FIRST STATION          INPU0098
99      C
100     C          G CARD = TRACKING SITE POSITIONAL DATA          INPU0100
101     C          0X      = G          (HOLLERITH)          INPU0101
102     C          03-04 = THE CODE NUMBER OF THIS STATION (INTEGER) INPU0102
103     C          05-06 = CODE FOR FIXED OR AIRCRAFT TRACKING STATION (INT.) INPU0103
104     C          =0, STATION IS FIXED          INPU0104
105     C          =1, STATION IS AIRCRAFT          INPU0105
106     C          08-25 = THE NAME OF THE TRACKING SITE (ALPHANUMERIC) INPU0106
107     C          28-35 = GEODETIC LATITUDE (DEG)          INPU0107
108     C          36-45 = LONGITUDE (DEG)          INPU0108
109     C          46-55 = ALTITUDE (FEET)          INPU0109
110     C
111     C          H CARD = POSITIONS OF AIRCRAFT DURING EXPERIMENTAL PERIOD INPU0111
112     C          0Y      = H          (HOLLERITH)          INPU0112
113     C          08-04 = THE NUMBER THE AIRCRAFT STATION (INTEGER) INPU0113
114     C          05-06 = INDEX NUMBER FOR AIRCRAFT POSITION DURING INPU0114
115     C          THE EXPERIMENTAL PERIOD, THE AIRCRAFT POSITION INPU0115
116     C          MUST BE IN HALF HOUR INCREMENTS WITH THE FIRST INPU0116
117     C          INDEX +2 FOR THE POSITION AT .5 HRS. AFTER INPU0117
118     C          RELEASE (INTEGER)          INPU0118
119     C          08-25 = THE NAME OF THE TRACKING SITE (ALPHANUMERIC) INPU0119
120     C          28-35 = GEODETIC LATITUDE (DEG)          INPU0120
121     C          36-45 = LONGITUDE (DEG)          INPU0121
122     C          46-55 = ALTITUDE (FT)          INPU0122
123     C
124     C          I CARD = FINAL CARD TO SPECIFY END OF CASE          INPU0124
125     C          0I      = I (HOLLERITH)          INPU0125
126     C          02-05 = CASE NUMBER (INTEGER)          INPU0126
127     C          08-07 = CODE FOR FINAL INPUT CASE          INPU0127
128     C          =0, MORE CASES TO FOLLOW          INPU0128
129     C          =1, THIS IS THE FINAL CASE          INPU0129
130     C
131     C*****OUTPUT*          INPU0131
132     C          NONE          INPU0132
133     C
134     C*****RESTRICTIONS*          INPU0134
135     C          A BLANK CARD OR BUHNY TITLE MUST PRECEDE ANY INPUT DATA FOR INPU0135
136     C          EACH CASE, THE III CARD MUST ALWAYS BE THE LAST CARD OF EACH CASE INPU0136
137     C          A PROGRAM EXECUTE USING ALL NOMINAL VALUES MUST HAVE AT LEAST INPU0137
138     C          THE BLANK CARD AND THE II CARD FOR INPUT,          INPU0138
139     C
140     C*****SUBPROGRAMS REQUIRED*          INPU0140
141     C          NXCARD          INPU0141
142     C
143     C*****END OF DOCUMENTATION CARDS*****          INPU0143
144     C
145     C          SUBROUTINE INPUT          INPU0145
146     C          COMMON/BLKX /KMONTH, KDAY ,KYEAR ,LMONTH, LDAY ,LYEAR ,KMO, KDA, INPU0146
147     C          1 KYR, LMOY, LDA, LYR, TCALC, IPRTY, IPRTO, IPRTY2, IPILOT INPU0147
148     C          COMMON/BLKB /PHI, PDG, LAMPDG, HEIGHT          INPU0148
149     C          COMMON/BLKE /RESTR(8)          INPU0149
150     C          COMMON/BLKD /NS, NOS(12)          INPU0150
151     C          COMMON/BLKE /NAME(3*12), PHT(12), LAMBDA(12), ALT(12), MOVE(12) INPU0151
152     C          COMMON/BLKE4 /PNAME(3*7), PLAT(7), PLON(7), PALT(7), JAIR          INPU0152
153     C          COMMON/BLKT /ICASE, IFINAL          INPU0153
154     C          DIMENSION FORMAT(2) ,IMAGE(15)          INPU0154
155     C          REAL LAMPDG, LAMBDA          INPU0155
156     C          DATA LA, LB, LC, LD, LE, LF, LG, LH, LI /SMAY, INB, IHC, IHD, IHE, IHF, IHH, INPU0156
157     C          IHW, IHWI          INPU0157
158     C          C READ INPUTS          INPU0158
159     C          DATA FORMAT(1) /I2H(A1, 23A6, A1) /          INPU0159
160     C          WRITE(6, 100)          INPU0160
161     C          C LOOK AT FIRST CARD IMAGE AND PRINT IT?          INPU0161
162     C          4 READ(5, FORMAT) IMAGE          INPU0162 3
163     C          WRITE(6, 110) IMAGE          INPU0163 6
164     C          C LOOK AT CARD IMAGE AND PRINT IT?          INPU0164
165     C          5 CALL NXCARD(FORMAT, IMAGE, 15)          INPU0165 9
166     C          WRITE(6, 110) IMAGE          INPU0166 10
167     C          C READ INPUT CARD USING CORRECT CARD FORMAT AS DETERMINE BY CARD CODE,          INPU0167
168     C          C REPEAT LOGIC FROM STATEMENT 5 UNTIL 81 CARD IS READ,          INPU0168
169     C          IF (IMAGE, NO, LA) GO TO 80          INPU0169 13

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170	IF (IMAGE,EO,LB) GO TO 20	INPU0170	16
171	IF (IMAGE,EO,LC) GO TO 30	INPU0171	19
172	IF (IMAGE,EO,LD) GO TO 40	INPU0172	22
173	IF (IMAGE,EO,LE) GO TO 50	INPU0173	25
174	IF (IMAGE,EO,LF) GO TO 60	INPU0174	28
175	IF (IMAGE,EO,LG) GO TO 70	INPU0175	31
176	IF (IMAGE,EO,LH) GO TO 80	INPU0176	34
177	IF (IMAGE,EO,LI) GO TO 90	INPU0177	37
178	WRITE (6,120)	INPU0178	40
179	GO TO 4	INPU0179	42
180	10 READ (5,210) KMONTH,KDAY ,RYEAR ,LMONTH,LDAY ,LYEAR	INPU0180	43
181	GO TO 5	INPU0181	51
182	20 READ (5,210) KMO, KDAY KYR, LMO, LDA, LYR	INPU0182	52
183	GO TO 5	INPU0183	60
184	30 READ (5,230) ICALC, IRRY7, IRRY9, IRRY10, IPLOT	INPU0184	61
185	GO TO 5	INPU0185	68
186	40 READ (5,240) PHIPDG,LAMPDG,HEIGHT	INPU0186	69
187	GO TO 5	INPU0187	72
188	50 READ (5,250) (RESTRI)I=2,8)	INPU0188	73
189	GO TO 5	INPU0189	78
190	60 READ(5,260) NS,(NOS(I))I=1,NS)	INPU0190	79
191	GO TO 5	INPU0191	85
192	70 READ(5,270) N,MOVE(N);(NAME(J,N),J=0,3),PHI(N),LAMBDA(N),ALTN)	INPU0192	86
193	GO TO 5	INPU0193	94
194	80 READ(5,270) N,JAIR,(NAME(J,JAIR),J=1,3),PLAY(JAIR),PLON(JAIR),	INPU0194	95
195	1	INPU0195	
196	GO TO 5	INPU0196	103
197	90 READ (5,290) ICASE,IFINAL	INPU0197	104
198	RETURN	INPU0198	108
199	100 FORMAT(IH1)	INPU0199	109
200	110 FORMAT(IX X1,13A6,A3)	INPU0200	109
201	120 FORMAT(6H ***** THE FOLLOWING IS ILLEGAL AND WILL BE IGNORED **	INPU0201	109
202	10000 )	INPU0202	
203	210 FORMAT(2X 2(2(I2,1X),I4,1X))	INPU0203	109
204	230 FORMAT (2X,5I2)	INPU0204	109
205	240 FORMAT(5X 3F(0,0))	INPU0205	109
206	250 FORMAT(5X,7F5,0)	INPU0206	109
207	260 FORMAT(2X 23(I2,1X) )	INPU0207	109
208	270 FORMAT(2X,2I2,1X,3A6,3F50,0)	INPU0208	109
209	290 FORMAT(1X,I4,I2)	INPU0209	109
210	END	INPU0210	109

23788 WORDS OF MEMORY USED BY THIS COMPILATION

07900 01 09-25-72 33,604 READ INPUT PARAMETERS

\*\*\*\*\*@ROUTINE INPUT\*\*\*\*\*

PREPAGE

PROGRAM BREAK 594  
COMMON LENGTH 8  
V COUNT 815

PRIMARY SYMDEF ENTRY

INPUT 8

SECONDARY SYMDEF ENTRY

BLK# LENGTH

1	BLK#	21
2	BLK#	3
3	BLK#	10
4	BLK#	15
5	BLK#	124
6	BLK#	98
7	BLK#	8

SYMDEF

10 :PBNV,  
 11 :PPSL,  
 12 :PRDD,  
 13 :PRTN,  
 14 :PSET,  
 15 :PSSD,  
 16 :PWRD,  
 17 :NUMBER

554 IS THE NEXT AVAILABLE LOCATION,  
 GHAP VERSION/ASSEMBLY DATES JHPA 050171/052571 JHRB 050171/052571 JHPC 050171/052571  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
 \*\* 19568 WORDS OF MEMORY WERE USED BY GHAP FOR THIS ASSEMBLY

67906 01 09-25-72 11,608 PRINT INPUT PARAMETERS

\*\*\*\*\*SUBROUTINE INPRY\*\*\*\*\*

1	CINPR	PRINT INPUT PARAMETERS	INPR0001
2	C*****SUBROUTINE INPRY*****		INPR0002
3	C		INPR0003
4	C*****START OF DOCUMENTATION CARDS*****		INPR0004
5	C		INPR0005
6	C*****NASA Wallops version of 02/01/70		INPR0006
7	C		INPR0007
8	C*****LANGUAGE=FORTRAN IV		INPR0008
9	C		INPR0009
10	C*****MACHINE=GE 625		INPR0010
11	C		INPR0011
12	C*****PURPOSE-		INPR0012
13	C	TO WRITE ALL PROGRAM INPUTS IN A FORMAT WHICH COMPLETELY	INPR0013
14	C	DESCRIBES THE INPUT PARAMETERS TO BE USED IN THE PROGRAM	INPR0014
15	C	EXECUTION.	INPR0015
16	C		INPR0016
17	C*****METHOD-		INPR0017
18	C	ALL VARIABLES SPECIFIED IN SUBROUTINE INPUT ARE PRINTED IN A	INPR0018
19	C	MANNER TO DESCRIBE FULLY TO THE PROGRAM USER THE INPUTS USED TO	INPR0019
20	C	GENERATE PROGRAM OUTPUTS?THE FORMAT GENERATOR ROUTINE IS USED	INPR0020
21	C	IN LIEU OF CUMBERSOME NORMAL FORMAT STATEMENTS FOR PRINT	INPR0021
22	C	FORMATS;	INPR0022
23	C		INPR0023
24	C*****INPUTS		INPR0024
25	C		INPR0025
26	C	KMONTH -MONTH NUMBER FOR STARTING CALCULATIONS	INPR0026
27	C		INPR0027
28	C	KDAY -DAY NUMBER FOR STARTING CALCULATIONS	INPR0028
29	C		INPR0029
30	C	KYEAR -YEAR NUMBER FOR STARTING CALCULATIONS	INPR0030
31	C		INPR0031
32	C	LMONTH -MONTH NUMBER FOR STOPPING CALCULATIONS	INPR0032
33	C		INPR0033
34	C	LDAY -DAY NUMBER FOR STOPPING CALCULATIONS	INPR0034
35	C		INPR0035
36	C	LYEAR -YEAR NUMBER FOR STOPPING CALCULATIONS	INPR0036
37	C		INPR0037
38	C	KMO -MONTH PLOTTING AND/OR PRINTING TO BEGIN	INPR0038
39	C		INPR0039
40	C	KDA -DAY PLOTTING AND/OR PRINTING TO BEGIN	INPR0040
41	C		INPR0041
42	C	KYE -YEAR PLOTTING AND/OR PRINTING TO BEGIN	INPR0042
43	C		INPR0043
44	C	LMO -MONTH PLOTTING AND/OR PRINTING TO END	INPR0044
45	C		INPR0045
46	C	LDA -DAY PLOTTING AND/OR PRINTING TO END	INPR0046
47	C		INPR0047
48	C	LYR -YEAR PLOTTING AND/OR PRINTING TO END.	INPR0048
49	C		INPR0049
50	C	ICALC -INTEGER CODE TO SIGNAL IF PROGRAM CALCULATIONS	INPR0050
51	C	-ARE REQUESTED	INPR0051
52	C	=0: PERFORM PROGRAM CALCULATIONS	INPR0052
53	C	=1: DO NOT PERFORM PROGRAM CALCULATIONS	INPR0053
54	C		INPR0054
55	C	IPRY -INTEGER CODE TO SIGNAL REQUEST PRINTING LINE 07	INPR0055



56	C		=DATA	INPR0056
57	C		=0: PRINT FILE 02 DATA	INPR0057
58	C		=1: DO NOT PRINT FILE 02 DATA	INPR0058
59	C			INPR0059
60	C	IPRT9	=INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09	INPR0060
61	C		=DATA	INPR0061
62	C		=0: PRINT FILE 09 DATA	INPR0062
63	C		=1: DO NOT PRINT FILE 09 DATA	INPR0063
64	C			INPR0064
65	C	IPLOT	=INTEGER CODE TO SIGNAL REQUEST PLOTTING DATA	INPR0065
66	C		=0: CREATE A YRFE FOR PLOTTING DATA FOR 8	INPR0066
67	C		= CALENDAR YEAR THROUGH FILE 01 AT 556 BPT	INPR0067
68	C		=1: CREATES A YRFE FOR PLOTTING DATA FOR 8	INPR0068
69	C		= CALENDAR MONTH THROUGH FILE 01 AT 556 BPT	INPR0069
70	C		=2: DO NOT CREATE A PLOT YRFE	INPR0070
71	C			INPR0071
72	C	ICASE	=INTEGER VALUE OF CASE NUMBER	INPR0072
73	C			INPR0073
74	C	IFINAL	=INTEGER CODE NOTING LAST CASE	INPR0074
75	C		=0: MORE CASES TO FOLLOW	INPR0075
76	C		=1: THIS IS THE FINAL CASE	INPR0076
77	C			INPR0077
78	C	PHIPDG	=GEODEVIC LATITUDE OF RELEASE POINT (DEG)	INPR0078
79	C			INPR0079
80	C	LAMPDG	=LONGITUDE OF RELEASE POINT (DEG)	INPR0080
81	C			INPR0081
82	C	HEIGHT	=ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE	INPR0082
83	C		=(GRU)	INPR0083
84	C			INPR0084
85	C	RESTR(2)	=MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION	INPR0085
86	C		=TO THE RELEASE POINT (DEG)	INPR0086
87	C			INPR0087
88	C	RESTR(3)	=MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH	INPR0088
89	C		=TRACKING STATION (DEG)	INPR0089
90	C			INPR0090
91	C	RESTR(4)	=MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH	INPR0091
92	C		=TRACKING STATION (DEG)	INPR0092
93	C			INPR0093
94	C	RESTR(5)	=MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE	INPR0094
95	C		=RELEASE POINT AS SEEN FROM EACH TRACKING STATION	INPR0095
96	C		=(RAYLEIGH)	INPR0096
97	C			INPR0097
98	C	RESTR(6)	=CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD	INPR0098
99	C		=AFTER RELEASE RELATIVE TO THE EARTH (KM/SEC)	INPR0099
100	C			INPR0100
101	C	RESTR(7)	=MINIMUM TRACKING PERIOD REQUIRED (HRS)	INPR0101
102	C			INPR0102
103	C	RESTR(8)	=ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE	INPR0103
104	C		=RELATIVE TO THE EARTH (KM/SEC)	INPR0104
105	C			INPR0105
106	C	NS	=THE NUMBER OF STATIONS USED IN THE PROGRAM	INPR0106
107	C			INPR0107
108	C	NOB(12)	=AN ARRAY CONTAINING THE STATION NUMBERS USED	INPR0108
109	C			INPR0109
110	C	NAME(3,12)	=NAME OF TRACKING STATIONS USED	INPR0110
111	C			INPR0111
112	C	PHI(12)	=GEODEVIC LATITUDE OF TRACKING STATION (DEG)	INPR0112
113	C			INPR0113
114	C	LAMBDA(12)	=LONGITUDE OF TRACKING STATION (DEG)	INPR0114
115	C			INPR0115
116	C	ALV(12)	=ALTITUDE OF TRACKING STATION ABOVE EARTH SURFACE	INPR0116
117	C		=(FT)	INPR0117
118	C			INPR0118
119	C	MODE(12)	=CODE NUMBER TO DETERMINE IF STATION COORDINATES	INPR0119
120	C		=ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT	INPR0120
121	C		=0: FOR FIXED STATION	INPR0121
122	C		=1: FOR AIRCRAFT	INPR0122
123	C			INPR0123
124	C	PNARB(3,7)	=ALPHANUMERIC DESCRIPTION FOR AIRCRAFT POSITION	INPR0124
125	C		=DURING EXPERIMENTAL PERIOD	INPR0125
126	C			INPR0126
127	C	PLBT(7)	=GEODEVIC LATITUDE OF AIRCRAFT DURING	INPR0127
128	C		=EXPERIMENTAL PERIOD (DEG)	INPR0128

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129 C INPR0129
130 C PLON(7) -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD INPR0130
131 C -(DEG) INPR0131
132 C INPR0132
133 C PALT(7) -ALTITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD INPR0133
134 C -(DEG) INPR0134
135 C INPR0135
136 C*****OUTPUT- INPR0136
137 C ON FILE 06-PRINTER INPR0137
138 C ALL VARIABLES LISTED ABOVE ARE USED FOR OUTPUT INPR0138
139 C INPR0139
140 C*****RESTRICTIONS- INPR0140
141 C FORMAT GENERATOR IS A GE-625 SYSTEMS ROUTINE, USE OF THIS INPR0141
142 C SUBROUTINE ON ANOTHER SYSTEM MAY REQUIRE THAT THESE FORMAT INPR0142
143 C GENERATORS BE CHANGED. INPR0143
144 C INPR0144
145 C*****SUBPROGRAMS REQUIRED- INPR0145
146 C NONE INPR0146
147 C INPR0147
148 C*****END OF DOCUMENTATION CARDS***** INPR0148
149 C INPR0149
150 SUBROUTINE INPR1
151 COMMON/BLKX /KMONTH,KDAY ,LYEAR ,LMONTH,LDAY ,LYEAR ,KMO,KDA,
152 1 KYR, LMO, LDA, LYR, ICALC, IPRV, IPRV9, IPRV11, IPLT INPR0152
153 COMMON/BLKE /PH,PDG,LAMPDG,MEI,GHT INPR0153
154 COMMON/BLKE /RESTR(8) INPR0154
155 COMMON/BLKD /NS, NOS(12) INPR0155
156 COMMON/BLKE /NAME(3*12), PH(12), LAMBDA(12), ALT(12), MOVE(12) INPR0156
157 COMMON/BLKE /PNAME(127), PLAT(7), PLON(7), PALT(7), JAIR INPR0157
158 COMMON/BLK1 / ICASE, IFINAL INPR0158
159 DIMENSION OPT(2) INPR0159
160 DATA OPT /8YES ,6NO / INPR0160
161 C INPR0161
162 WRITE(6,1000) ICASE,KMONTH,KDAY,KYEAR,LMONTH,LDAY,LYEAR, INPR0162
163 B PH,PDG,LAMPDG,HEIGHT, INPR0163
164 C (RESTR(I),I=2,8), INPR0164
165 D NS INPR0165
166 C WRITE OUT ONLY THOSE STATIONS BEING USED INPR0166
167 DO 100 I=1,NS INPR0167
168 K =NOS(I) INPR0168
169 WRITE(6,1001) K ,(NAME(J,K),J=1,3),PH(K),LAMBDA(K),ALT(K) INPR0169
170 IF (MOVE(K),EQ,0) GO TO 100 INPR0170
171 C WRITE AIRCRAFT POSITIONS AT HALF HOUR INCREMENTS INTO THE TRACKING INPR0171
172 C PERIOD, INPR0172
173 DO 200 KK=1,7 INPR0173
174 C NO MORE AIRCRAFT POSITIONS TO BE WRITTEN INPR0174
175 IF (PALT(KK),EQ,0) GO TO 100 INPR0175
176 200 WRITE(6,1001) K,(PNAME(J,KK),J=1,5),PLAT(KK),PLON(KK),PALT(KK) INPR0176
177 100 CONTINUE INPR0177
178 IF (IPRV(1-1) 11.12*13 INPR0178
179 11 ICR11 =1 INPR0179
180 JCR11 =0 INPR0180
181 GO TO 14 INPR0181
182 12 ICR11 =0 INPR0182
183 JCR11 =1 INPR0183
184 GO TO 14 INPR0184
185 13 ICR11 =1 INPR0185
186 JCR11 =1 INPR0186
187 14 IRLY =IPLT INPR0187
188 IF (IRLY,NE,0) IPLY = IPLY - 1 INPR0188
189 WRITE (6,1002) OPT(ICALC+1),OPT(IPRV+1),OPT(IPRV9+1),OPT(ICR11+1) INPR0189
190 ,OPT(JCR11 +1),OPT(IPLY +1),KMO,KDA,KYR,LMO,LDA,LYR INPR0190
191 C INPR0191
192 1000 FORMAT GENERATOR INPR0192
193 RESTORE INPR0193
194 ***** RELEASE WINDOW PROGRAM ***** INPR0194
195 XAM INPUT ***** CASE IJ INPR0195
196 SPACE 1 INPR0196
197 EARD CODE INPR0197
198 A *****EPOCH CARD START DATE Y1/M1/D1 STOR DATE Y2/M2/D2 INPR0198
199 X/ 'I 'X INPR0199
200 SPACE 2 INPR0200
201 D *****RELEASE POINT INPR0201

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202          SPACE 1                                INPR0202
203          LATITUDE(DEC) 0      V F4      LONGITUDE(DEC) 0      F4      ALTI INPR0203
204          X RADIUS(EARTH RADIUS) 0      F4                                INPR0204
205          SPACE 2                                INPR0205
206          E          WINDOW RESTRICTIONS                                INPR0206
207          SPACE 1                                INPR0207
208          MIN. LOOK ELEVATION ANGLE(DEC) 0      F2      SUN ELEVATION INPR0208
209          X VIEW ANGLE(DEC) 0      F3                                INPR0209
210          SPACE 1                                INPR0210
211          MOON ELEVATION ANGLE(DEC) 0      F3      TOTAL SKY INPR0211
212          X BRIGHTNESS(RAYLEIGH/A) 0      F3                                INPR0212
213          SPACE 1                                INPR0213
214          DRIFT RATE (KM/SEC) 0      F3      MINIMUM TIME INPR0214
215          X BACKING TIME(HOURS) 0      F3                                INPR0215
216          SPACE 1                                INPR0216
217          GROWTH RATE (KM/SEC) 0      F3                                INPR0217
218          SPACE 2                                INPR0218
219          F          NUMBER OF STATIONS TO COMBINE 0 11 INPR0219
220          SPACE 2                                INPR0220
221          G          NUMBER OF STATIONS TO COMBINE 0 11 INPR0221
222          SPACE 1                                INPR0222
223          NO, STATION NAME          LATITUDE(DEC)  LONGITUDE(DEC)  ALTI INPR0223
224          X IDENTIFY(1)                                INPR0224
225          END OF FORNAY                                INPR0225
226          0001 FORNAY(11X,12,2X,3A6,2X,2F13,4,F35,0//) INPR0226
227          0002 FORNAY GENERATOR                                INPR0227
228          RESTORE                                INPR0228
229          ***** PROGRAM OPTION INPR0229
230          XG *****                                INPR0230
231          SPACE 1                                INPR0231
232          ***** OPTIONS INPR0232
233          SPACE 1                                INPR0233
234          PERFORM PROGRAM CALCULATIONS= 'A INPR0234
235          SPACE 1                                INPR0235
236          PRINT RELEASE WINDOW DAILY TIME INTERVALS PER CONSTRAINT INPR0236
237          X PER STATION= 'A INPR0237
238          SPACE 1                                INPR0238
239          PRINT TOTAL DAILY RELEASE WINDOW TIME INTERVALS= 'A INPR0239
240          SPACE 2                                INPR0240
241          CREATE TAPE OF SUN AND MOON DAILY TIME INTERVALS FOR EACH INPR0241
242          X STATION= 'A INPR0242
243          SPACE 1                                INPR0243
244          USE EXISTING TAPE OF SUN AND MOON DAILY TIME INTERVALS FOR INPR0244
245          X EACH STATION= 'A INPR0245
246          SPACE 1                                INPR0246
247          CREATE A TAPE FOR PLOTTING TOTAL DAILY RELEASE WINDOWS= INPR0247
248          X 'A INPR0248
249          SPACE 2                                INPR0249
250          ***** DATES TO BE PLOTTED AND INPR0250
251          X DATE PRINTED ***** INPR0251
252          SPACE 1                                INPR0252
253          START DATE '1/1/ 11      STOP DATE INPR0253
254          X DATE '1/1/ 11 INPR0254
255          END OF FORNAY                                INPR0255
256          RETURN                                INPR0256
257          END                                INPR0257
    
```

90

90  
91

25784 WORDS OF MEMORY USED BY THIS COMPILE

67986 05 04-25-72 11,633 PRINT INPUT PARAMETERS

\*\*\*\*\*SUBROUTINE INPR02\*\*\*\*\*

PREPAGE

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PROGRAM BREAK 749
COMMON LENGTH 8
V BRUNT DIVS 5
PRIMERS SYNDOP ENTRY
INPR02 8
    
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SECONDARY SYMBOL ENTRY

BLANK	LENGTH
1 BLANK	25
2 BLANK	8
3 BLANK	10
4 BLANK	10
5 BLANK	120
6 BLANK	50
7 BLANK	8

SUBREF

- 10 ,PGRV,
- 11 ,PCEL,
- 12 ,PRED,

745 IS THE NEXT AVAILABLE LOCATION.  
 CHAP VERSION/ASSEMBLY DEVER JHPA 090173/090571 JHRC 090171/090571 JHRC 090173/090571  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
 60 19400 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY

67900 DE 09-25-72 121610 CONVERSION ROUTINE

\*\*\*\*\*SUBROUTINE CONVERSION\*\*\*\*\*

1	CONV	CONVERSION ROUTINE	CONV0001
2	C	*****SUBROUTINE CONVERSION*****	CONV0002
3	C		CONV0003
4	C	*****START OF DOCUMENTATION CARDSET*****	CONV0004
5	C		CONV0005
6	C	*****NASA WALLPS VERSION OF 02X05470	CONV0006
7	C		CONV0007
8	C	*****LANGUAGE-FORTRAN IV	CONV0008
9	C		CONV0009
10	C	*****MACHINE-GE 025	CONV0010
11	C		CONV0011
12	C	*****PURPOSE-	CONV0012
13	C	TO CONVERT STATION AND CLOUD PARAMETERS TO NECESSARY REQUIRING	CONV0013
14	C	VARIABLES USED IN THE ENTIRE PROGRAM	CONV0014
15	C		CONV0015
16	C	*****METHOD-	CONV0016
17	C	GIVEN THE GEOCENTRIC COORDINATES OF THE RELEASE POINT AND OF THE	CONV0017
18	C	STATIONS, CONVERT TO GEOCENTRIC TIME AND CALCULATE THE FOLLOWING	CONV0018
19	C		CONV0019
20	C	A, THE RADII VECTORS FOR THE RELEASE POINT AND STATIONS IN ERU	CONV0020
21	C		CONV0021
22	C	B, THE SINES AND COSINES OF THE GEOCENTRIC COORDINATES	CONV0022
23	C		CONV0023
24	C	C, THE GEOCENTRIC XYZ COORDINATES IN ERU	CONV0024
25	C		CONV0025
26	C	D, THE RESTRICTIONS IN DEGREES TO RADIAN	CONV0026
27	C		CONV0027
28	C	E, THE SRAE FIXED DRIFT OF THE CLOUD IN DEGREES/HOUR	CONV0028
29	C		CONV0029
30	C	F, THE NECESSARY DAYS REFERENCED TO AN EPOCH DATE OF JANUARY 0	CONV0030
31	C	OF THE YEAR REFERENCED TO BEGIN CALCULATIONS,	CONV0031
32	C		CONV0032
33	C	G, THE MEAN LONGITUDE OF THE SUN FOR THE FIRST DAY TO BE	CONV0033
34	C	CALCULATED,	CONV0034
35	C		CONV0035
36	C	H, ROUGH ESTIMATE OF THE SUN AND NOON TIME INTERVALS FOR THE	CONV0036
37	C	FIRST DAY FOR EACH STATION?	CONV0037
38	C		CONV0038
39	C	*****END	CONV0039
40	C		CONV0040
41	C	LWRTM -MONTH NUMBER FOR STOPPING CALCULATIONS	CONV0041
42	C		CONV0042
43	C	LWST -DAY NUMBER FOR STOPPING CALCULATIONS	CONV0043
44	C		CONV0044
45	C	LWYR -YEAR NUMBER FOR STOPPING CALCULATIONS	CONV0045



46	C				CONV0046
47	C	MONTH	-MONTH NUMBER FOR STARTING CALCULATIONS		CONV0047
48	C				CONV0048
49	C	DAY	-DAY NUMBER FOR STARTING CALCULATIONS		CONV0049
50	C				CONV0050
51	C	YEAR	-YEAR NUMBER FOR STARTING CALCULATIONS		CONV0051
52	C				CONV0052
53	C	PHIP00	-GEOGRAPHIC LATITUDE OF RELEASE POINT (DEG)		CONV0053
54	C				CONV0054
55	C	LAMP00	-LONGITUDE OF RELEASE POINT (DEG)		CONV0055
56	C				CONV0056
57	C	ALTS00	-ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE -(FT)		CONV0057
58	C				CONV0058
59	C				CONV0059
60	C	HEHTN(2)	-MAXIMUM OBSERVATION LOOK ANGLE FROM EACH STATION -TO THE RELEASE POINT (DEG)		CONV0060
61	C				CONV0061
62	C				CONV0062
63	C	HEHTN(3)	-MAXIMUM SUN OBSERVATION LOOK ANGLE FROM EACH -TRACKING STATION (DEG)		CONV0063
64	C				CONV0064
65	C				CONV0065
66	C	HEHTN(4)	-MAXIMUM SUN OBSERVATION LOOK ANGLE FROM EACH -TRACKING STATION (DEG)		CONV0066
67	C				CONV0067
68	C				CONV0068
69	C	HEHTN(5)	-MAXIMUM TOTAL SUN BACKSCATTER BRIGHTNESS OF THE -RELEASE POINT AS SEEN FROM EACH TRACKING STATION -(RAYLEIGH)		CONV0069
70	C				CONV0070
71	C				CONV0071
72	C				CONV0072
73	C	HEHTN(6)	-CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD -AFTER RELEASE RELATIVE TO THE EARTH (KM/SEC)		CONV0073
74	C				CONV0074
75	C				CONV0075
76	C	HEHTN(7)	-MAXIMUM TRACKING PERIOD REQUIRED (HRS)		CONV0076
77	C				CONV0077
78	C	HEHTN(8)	-ONE HALF OF CLOUD GROWTH RATE AFTER RELEASE -RELATIVE TO THE EARTH (KM/SEC)		CONV0078
79	C				CONV0079
80	C				CONV0080
81	C	NS	-THE NUMBER OF STATION USED IN THE PROGRAM		CONV0081
82	C				CONV0082
83	C	NS(12)	-AN ARRAY CONTAINING THE STATION NUMBERS USED		CONV0083
84	C				CONV0084
85	C	PHI(12)	-GEOGRAPHIC LATITUDE OF TRACKING STATION (DEG)		CONV0085
86	C				CONV0086
87	C	LAMBDA(12)	-LONGITUDE OF TRACKING STATION (DEG)		CONV0087
88	C				CONV0088
89	C	ALTA(12)	-ALTITUDE OF TRACKING STATION ABOVE EARTH SURFACE -(FT)		CONV0089
90	C				CONV0090
91	C				CONV0091
92	C	HEHTN(12)	-CODE NUMBER TO DETERMINE IF STATION COORDINATES -ARE FOR GROUND FIXED STATION OR FOR AIRCRAFT		CONV0092
93	C				CONV0093
94	C				CONV0094
95	C				CONV0095
96	C				CONV0096
97	C	PHRE(13-7)	-ALPHANUMERIC DESCRIPTION FOR AIRCRAFT POSITION -DURING EXPERIMENTAL PERIOD		CONV0097
98	C				CONV0098
99	C				CONV0099
100	C	PHLA(7)	-GEOGRAPHIC LATITUDE OF AIRCRAFT DURING -EXPERIMENTAL PERIOD (DEG)		CONV0100
101	C				CONV0101
102	C				CONV0102
103	C	PLON(7)	-LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD -(DEG)		CONV0103
104	C				CONV0104
105	C	PLAT(7)	-LATITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD -(DEG)		CONV0105
106	C				CONV0106
107	C				CONV0107
108	C	DTN	-CONVERSION FACTOR FROM DEGREES TO RADIANS		CONV0108
109	C				CONV0109
110	C	HTN	-CONVERSION FACTOR FROM RADIANS TO HOURS		CONV0110
111	C				CONV0111
112	C	ERN	-CONVERSION FACTOR FROM GARY RADII UNITS TO -KILOMETERS		CONV0112
113	C				CONV0113
114	C				CONV0114
115	C				CONV0115
116	C	DATE			CONV0116
117	C				CONV0117
118	C	DATE	-JULIAN DATE FOR CURRENT DATA		CONV0118

119	C				CONV0119
120	C	NDFJD	-NUMBER OF DAYS FROM EPOCH DATE TO DATE FOR		CONV0120
121	C		-STARTING RELOCATIONS (INTEGER)		CONV0121
122	C				CONV0122
123	C	NDFB	-NUMBER OF DAYS FROM EPOCH DATE TO DATE FOR		CONV0123
124	C		-STOPPING RELOCATIONS (INTEGER)		CONV0124
125	C				CONV0125
126	C	SPJCN	-JULIAN DATE OF JANUARY 0 OF YEAR DATA SERIES		CONV0126
127	C				CONV0127
128	C	SINCLV	-SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE		CONV0128
129	C				CONV0129
130	C	COSCLV	-COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE		CONV0130
131	C				CONV0131
132	C	SINCLN	-SINE OF RELEASE POINT'S LONGITUDE		CONV0132
133	C				CONV0133
134	C	COSCLN	-COSINE OF RELEASE POINT'S LONGITUDE		CONV0134
135	C				CONV0135
136	C	RVR	-RADIUS DISTANCE FROM EARTH CENTER TO RELEASE		CONV0136
137	C		-POINT (ERR)		CONV0137
138	C				CONV0138
139	C	CRX	-GEOCENTRIC X COMPONENT OF RELEASE POINT (ERU)		CONV0139
140	C				CONV0140
141	C	CRY	-GEOCENTRIC Y COMPONENT OF RELEASE POINT (ERU)		CONV0141
142	C				CONV0142
143	C	CRZ	-GEOCENTRIC Z COMPONENT OF RELEASE POINT (ERU)		CONV0143
144	C				CONV0144
145	C	PHSP	-GEOCENTRIC LATITUDE OF RELEASE POINT (RADIAN)		CONV0145
146	C				CONV0146
147	C	PLRNB	-LONGITUDE OF RELEASE POINT (RADIAN)		CONV0147
148	C				CONV0148
149	C	R(2)	-ELEVATION CONSTRAINT (RADIAN)		CONV0149
150	C				CONV0150
151	C	R(3)	-MOON ELEVATION CONSTRAINT (RADIAN)		CONV0151
152	C				CONV0152
153	C	R(4)	-MOON ELEVATION CONSTRAINT (RADIAN)		CONV0153
154	C				CONV0154
155	C	R(5)	-INPUT VALUE FOR TOTAL SKY BACKGROUND BRIGHTNESS		CONV0155
156	C		- (RAYLENGTH)		CONV0156
157	C				CONV0157
158	C	R(6)	-CLOUD DRY RATE (RADIAN/HR)		CONV0158
159	C				CONV0159
160	C	R(7)	-METHAN TRACKING PERIOD AFTER RELEASE (HOURS)		CONV0160
161	C				CONV0161
162	C	R(8)	-ONE-HALF OF CLOUD GROWTH RATE (RADIAN/HR)		CONV0162
163	C				CONV0163
164	C	SINSLV(12)	-SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE		CONV0164
165	C				CONV0165
166	C	COSSLV(12)	-COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE		CONV0166
167	C				CONV0167
168	C	SINSLN(12)	-SINE OF TRACKING STATION'S LONGITUDE		CONV0168
169	C				CONV0169
170	C	COSSLN(12)	-COSINE OF TRACKING STATION'S LONGITUDE		CONV0170
171	C				CONV0171
172	C	RVS(12)	-RADIUS VECTOR FROM EARTH CENTER TO TRACKING		CONV0172
173	C		-STATION (ERU)		CONV0173
174	C				CONV0174
175	C	SUX(12)	-GEOCENTRIC X COMPONENT OF TRACKING STATION (ERU)		CONV0175
176	C				CONV0176
177	C	SUY(12)	-GEOCENTRIC Y COMPONENT OF TRACKING STATION (ERU)		CONV0177
178	C				CONV0178
179	C	SUZ(12)	-GEOCENTRIC Z COMPONENT OF TRACKING STATION (ERU)		CONV0179
180	C				CONV0180
181	C	PHS(12)	-GEOCENTRIC LATITUDE OF TRACKING STATION (RADIAN)		CONV0181
182	C				CONV0182
183	C	PLR(12)	-LONGITUDE OF THE TRACKING STATION (RADIAN)		CONV0183
184	C				CONV0184
185	C	SINLAV(12)	-SINE OF AIRSHELL GEOCENTRIC LATITUDE DURING		CONV0185
186	C		-EXPERIMENTAL PERIOD		CONV0186
187	C				CONV0187
188	C	COSLAV(12)	-COSINE OF AIRSHELL GEOCENTRIC LATITUDE DURING		CONV0188
189	C		-EXPERIMENTAL PERIOD		CONV0189
190	C				CONV0190
191	C	SINLON(12)	-SINE OF AIRSHELL LONGITUDE DURING EXPERIMENTAL		CONV0191

192	C		-PERIOD	CONV0192
193	C			CONV0193
194	C	COS(LON1)	-COSINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL	CONV0194
195	C		-PERIOD	CONV0195
196	C			CONV0196
197	C	RVE(1)	-DISTANCE FROM EARTH CENTER TO AIRCRAFT DURING	CONV0197
198	C		-EXPERIMENTAL PERIOD (GRU)	CONV0198
199	C			CONV0199
200	C	AGX(1)	-GEOCENTRIC X COMPONENT OF AIRCRAFT POSITION	CONV0200
201	C		-DURING EXPERIMENTAL PERIOD (GRU)	CONV0201
202	C			CONV0202
203	C	AGY(1)	-GEOCENTRIC Y COMPONENT OF AIRCRAFT POSITION	CONV0203
204	C		-DURING EXPERIMENTAL PERIOD (GRU)	CONV0204
205	C			CONV0205
206	C	AGZ(1)	-GEOCENTRIC Z COMPONENT OF AIRCRAFT POSITION	CONV0206
207	C		-DURING EXPERIMENTAL PERIOD (GRU)	CONV0207
208	C			CONV0208
209	C	RLBY(1)	-GEOCENTRIC LATITUDE OF AIRCRAFT DURING	CONV0209
210	C		-EXPERIMENTAL PERIOD (RADIANS)	CONV0210
211	C			CONV0211
212	C	RLBN(1)	-LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD	CONV0212
213	C		-(RADIANS)	CONV0213
214	C			CONV0214
215	C	SUNL	-MEAN LONGITUDE OF THE SUN AT 0 HRS, UT, FOR 1ST	CONV0215
216	C		-DAY (DEG)	CONV0216
217	C			CONV0217
218	C	WINDOW(8,3,12)	-THE DAILY RELEASE WINDOW START/STOP TIMES,	CONV0218
219	C		-1ST INDEX FOR STARTING START/STOP TIMES,	CONV0219
220	C		-19375 FOR START TIMES	CONV0220
221	C		-24476 FOR STOP TIMES	CONV0221
222	C		-2ND INDEX FOR THE CONSTRAINT	CONV0222
223	C		= 1-EARTH SHADE	CONV0223
224	C		= 2-ELEVATION	CONV0224
225	C		= 3-SUN	CONV0225
226	C		= 4-MOON	CONV0226
227	C		= 5-TOTAL SKY BACKGROUND BRIGHTNESS	CONV0227
228	C		-3RD INDEX FOR THE STATION NUMBER	CONV0228
229	C			CONV0229
230	C	JEND	-NUMBER OF DISCRETE VALUES STORED FOR	CONV0230
231	C		-EXPERIMENTAL PERIOD DATA	CONV0231
232	C			CONV0232
233	C			CONV0233
234	C	*****RESTRICTIONS-		CONV0234
235	C		THE ESTIMATED TIME PERIODS CALCULATED FOR THE SUN AND MOON ARE	CONV0235
236	C		FOR APPROXIMATE TIMES FOR THE OCCURRENCE OF ASTRONOMICAL	CONV0236
237	C		TWILIGHT AND FOR THE MOON TO BE AT THE TRACKING STATION'S LOCAL	CONV0237
238	C		HORIZONTAL OTHER RELATIVE ELEVATION ANGLE OF THESE TWO	CONV0238
239	C		HEAVENLY BODIES TO EACH TRACKING STATION WHICH IS QUITE	CONV0239
240	C		DIFFERENT WILL REQUIRE A PROGRAM CHANGE, THE COEFFICIENTS 19.0	CONV0240
241	C		AND 9.0 ARE THE APPROXIMATE VALUES FOR ASTRONOMICAL TWILIGHT AND	CONV0241
242	C		THE COEFFICIENTS 12.0 AND 9.0 ARE THE APPROXIMATE COEFFICIENTS	CONV0242
243	C		FOR MOONSET AND MOONRISE/TWILIGHT FOR A POINT OF 0 DEGREES	CONV0243
244	C		LATITUDE AND 0 DEGREES LONGITUDE	CONV0244
245	C		THE GEODETIC EARTH MODEL USED IS THE FISHER EARTH MODEL WITH	CONV0245
246	C		AN AVERAGE EARTH RADIUS OF 6378.824 KILOMETERS;	CONV0246
247	C			CONV0247
248	C	*****SUBPROGRAMS REQUIRED-		CONV0248
249	C	SDVDC		CONV0249
250	C			CONV0250
251	C	*****CONTENT OF DOCUMENTATION CARDS*****		CONV0251
252	C			CONV0252
253	C	SUBROUTINE CONVER		CONV0253
254	C	COMMON/BLK1 /KMONTH, KDAY, KYEAR, LMONTH, LDAY, LYEAR, KNOZ, NDA,		CONV0254
255	C	1 KYN, LNOY, BDA, LYR, ICHL, IPRTY, IPRTY, IPRTY, IPRTY, IPRTY,		CONV0255
256	C	COMMON/BLK1 /DJUL, NDUJ, NDUJ, NDUJ,		CONV0256
257	C	COMMON/BLK1 /PHIPDS, LAMDS, NDUJ,		CONV0257
258	C	COMMON/BLK1 /SINGLY, COSCLY, SINGLY, COSCLN, RVC		CONV0258
259	C	COMMON/BLK1 /CCK, CCK, CCK,		CONV0259
260	C	COMMON/BLK1 /PHIP, NLANDA		CONV0260
261	C	COMMON/BLK1 /RBYR(8)		CONV0261
262	C	COMMON/BLK1 /R(8)		CONV0262
263	C	COMMON/BLK1 /NS, NDB(18)		CONV0263
264	C	COMMON/BLK1 /NANS(18), NDB(18), LAMDA(12), ALT(12), HOVE(12)		CONV0264



265	COMMON/BLK#17 SINCLY(12); COSBL(12); SINBL(12); COSBLN(12);	CONV0265
266	1 NVS(12)	CONV0266
267	COMMON/BLK#27 SECX(12); SECY(12); SECZ(12)	CONV0267
268	COMMON/BLK#37RPHI(12); RLAND(12)	CONV0268
269	COMMON/BLK#47 PWAHT(12); PLAT(12); RLON(12); RALT(12); JAIR	CONV0269
270	COMMON/BLK#57SINLAY(12); COSLAY(12); SINLON(12); COSLON(12); RVAL(12)	CONV0270
271	COMMON/BLK#67ACX(12); RVC(12); ABZ(12)	CONV0271
272	COMMON/BLK#77RCLAY(12); RLON(12)	CONV0272
273	COMMON/BLK# 7DTH, RVD, RYR, WALP(12), RYH, AU, DELTA(4), RHM, RGH	CONV0273
274	COMMON/BLK# / SUNL, GHA	CONV0274
275	COMMON/BLK# / WINDOW(12)	CONV0275
276	COMMON/BLK# / PH(12), ME(12), WZ(12), BAS(12), C(12,7), JEED	CONV0276
277	DOUBLE PRECISION DTR, RVD, RYR, WALP(12)	CONV0277
278	REAL GAMMA, LAMP(12)	CONV0278
279	C	CONV0279
280	ARCSTN(X) =ATAN(X/SQRT(1-X**2))	CONV0280
281	SIN(LON(YJC)) = AMOD(1.366E-3 * YJWYUC * 279.87868),.366)	CONV0281
282	C FIND THE JULIAN DATE AT 0000 UT, FOR START DATE	CONV0282
283	DAY =NDAY	CONV0283
284	YEAR =NVEAR	CONV0284 2
285	DNUL =DAYNUM(MONTH,DAY,YEAR)	CONV0285 3
286	C LET JANUARY 8 OF YEAR BE THE EPOCH DATE FOR THE PROGRAM	CONV0286
287	C FIND THE NUMBER OF DAYS PAST THE EPOCH FOR START DATE	CONV0287
288	EPOCH =DAYNUM(1,0,0,0,0,0)	CONV0288 4
289	NDP(1) =DJUL -EPOCH	CONV0289 5
290	C FIND THE MEAN LONGITUDE OF THE SUN FOR START DATE	CONV0290
291	YLS = (EPOCH - 2415019.5)/36525.6	CONV0291 6
292	SUNL =SUNLON(YJC)	CONV0292 7
293	SUNL =AMOD(SUNL + 0.985647365 * (M(1) + NDP(1) - 0.5),.3607)	CONV0293 8
294	C FIND THE NUMBER OF DAYS PAST THE EPOCH FOR STOP DATE	CONV0294
295	DAY =SDAY	CONV0295 9
296	YEAR =SVEAR	CONV0296 10
297	NDYS =DAYNUM(MONTH,DAY,YEAR) - EPOCH	CONV0297 11
298	C CONVERT SUN, MOON AND ELEVATION RESTRICTIONS TO RADIAN	CONV0298
299	R(1) =RSTR(1) * DTR	CONV0299 12
300	R(2) =RSTR(2) * DTR	CONV0300 13
301	R(4) =RSTR(4) * DTR	CONV0301 14
302	R(5) =RSTR(5)	CONV0302 15
303	R(7) =RSTR(7)	CONV0303 16
304	JEED =1.0 * 2.0 * R(1)	CONV0304 17
305	C CONVERT SMOOD ANGLES TO RADIAN AND TRANSFORM TO GEOCENTRIC	CONV0305
306	PHIP =PHIRD * DTR	CONV0306 18
307	RLAND =RLANDE * DTR	CONV0307 19
308	CALL RDTGGE (HEIGHT, DUNNY, PHIP, RPHIP)	CONV0308 20
309	C COMPUTE TRIG FUNCTIONS OF RELEASE AT GEOCENTRIC ANGLES	CONV0309
310	SINCLY =SIN(PHIP)	CONV0310 21
311	COSCLY =COS(PHIP)	CONV0311 22
312	SINBL =SIN(RLAND)	CONV0312 23
313	COSBL =COS(RLAND)	CONV0313 24
314	C CALCULATE RELEASE POINT RADIUS VECTOR AND GEOG. X,Y,Z COMP. IN BRU	CONV0314
315	RVC =R * SINCLY	CONV0315 25
316	COX =RVC * COSCLY * COSBL	CONV0316 26
317	COY =RVC * COSCLY * SINBL	CONV0317 27
318	COZ =RVC * SINCLY	CONV0318 28
319	C CONVERT SMOOD DRIFT RATE AND GROWTH RATE TO RADIAN PER HOUR	CONV0319
320	R(1) = (23600./RHM) * (RSTR(6)/RVC)	CONV0320 29
321	R(1) = (23600./RHM) * (RSTR(6)/RVC)	CONV0321 30
322	C	CONV0322
323	DO 100 I=1,NB	CONV0323 31
324	L =NDY(1)	CONV0324 32
325	C PERFORM DO LOOP ON ONLY STATIONS REQUESTED THRU INPUT	CONV0325
326	C CONVERT STATION ALT TO BRU AND ANGLES TO RAD AND TRANSFORM TO GEOCENTRIC	CONV0326
327	HGT =ALTY(1) * .3048E-3/BRH	CONV0327 33
328	RPH(1) =PHI(1) * DTR	CONV0328 34
329	RLAND(1) =RLAND(1) * DTR	CONV0329 35
330	CALL RDTGGE (HGT, RVC(L), RPH(1), RPH(1))	CONV0330 36
331	C COMPUTE TRIG FUNCS. OF STATION'S GEOCENTRIC ANGLES	CONV0331
332	SINSLY(L) =SIN(RPH(1))	CONV0332 37
333	COSSLY(L) =COS(RPH(1))	CONV0333 38
334	SINBL(L) =SIN(RLAND(1))	CONV0334 39
335	COSBL(L) =COS(RLAND(1))	CONV0335 40
336	C COMPUTE STATION'S GEOCENTRIC X,Y,Z COMPONENTS IN BRU	CONV0336
337	COX(L) =RVC(L) * COSSLY(L) * COSBL(L)	CONV0337 41



CUMBER 8

SECONDARY SYMBOL ENTRY

BLOCK	LENGTH
1 BLR8	28
2 BLR81	8
3 BLR8	8
4 BLR81	8
5 BLR82	8
6 BLR83	8
7 BLR8	38
10 BLR81	38
11 BLR8	38
12 BLR8	188
13 BLR81	78
14 BLR82	48
15 BLR83	68
16 BLR84	58
17 BLR85	48
20 BLR86	28
21 BLR87	18
22 BLR8	28
23 BLR8	8
24 BLR8	888
25 BLR8	818

SYMBOL

- 26 C08
- 27 S18
- 30 A78
- 31 S87
- 32 D8788
- 33 G8788

1312 IS THE NEXT AVAILABLE LOCATION.  
 GMAP VERSION/ASSEMBLY DATA J/JA 890178/052571 JMRB 090171/052571 JMPC 090171/052571  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
 89 1978V WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY?

67806 01 0V-85-72 13.638

\*\*\*\*\*SUBROUTINE GDT088\*\*\*\*\*

1	C0888	GD8C8801
2	C*****SUBROUTINE GDT088*****	GD8C8802
3	C	GD8C8803
4	C*****START OF DOCUMENTATION CARDS*****	GD8C8804
5	C	GD8C8805
6	C*****NASA WALLS'S VERSION OF GEOD17D	GD8C8806
7	C	GD8C8807
8	C*****LANGRAGE-FORTYMAN IV	GD8C8808
9	C	GD8C8809
10	C*****MACHINE-GE 825	GD8C8810
11	C	GD8C8811
12	C*****PURPOSE-	GD8C8812
13	C TO CONVERT GEODETIC COORDINATES TO GEOCENTRIC COORDINATES	GD8C8813
14	C	GD8C8814
15	C*****METHOD OF ATTACK-	GD8C8815
16	C GIVEN THE GEODETIC LATITUDE AND ALTITUDE OF A POINT ABOVE THE	GD8C8816
17	C EARTH'S SURFACE USE THE DIRECT METHOD OF B. EVERTON TO FIND THE	GD8C8817
18	C GEOCENTRIC LATITUDE AND RADIAL VECTOR FROM EARTH CENTER USING	GD8C8818
19	C AN EARTH MODEL WHOSE SEMI-MAJOR AXIS IS 6378,136 KM AND WHOSE	GD8C8819
20	C FLATTENING IS 1./298.25	GD8C8820
21	C	GD8C8821
22	C*****REQUIRED INPUT-	GD8C8822
23	C	GD8C8823
24	C ALT - ALTITUDE ABOVE EARTH'S SURFACE (EQU)	GD8C8824
25	C	GD8C8825
26	C GBLAT - GEODETIC LATITUDE (RADJANS)	GD8C8826
27	C	GD8C8827



28	C*****OUTPUT GENERATED*	GD0C0028
29	C	GD0C0029
30	C       R       -RADIUS VECTOR FROM GROUND CENTER (R00)	GD0C0030
31	C	GD0C0031
32	C       BLAY -SECURITY/LATITUDE (R00/BLANS)	GD0C0032
33	C	GD0C0033
34	C*****RESTRICTIONS*	GD0C0034
35	C       NONE KNOWN	GD0C0035
36	C	GD0C0036
37	C*****SUBPROGRAMS REQUIRED*	GD0C0037
38	C       NONE	GD0C0038
39	C	GD0C0039
40	C*****NAME OF DOCUMENTATION CARDS*****	GD0C0040
41	C	GD0C0041
42	SUBROUTINE GETLOC (ELTYR,CDLAY,SRPT)	GD0C0042
43	DATA 071,0000000000, 00000,0000000000	GD0C0043
44	AN00000000, AYAN0(X) 0000(1,00-000)	GD0C0044
45	C DEFINE THE FUNCTIONS OF LAY	GD0C0045
46	SRPT = SIN(CDLAY)	GD0C0046
47	CSRPT = COS(CDLAY)	GD0C0047
48	TRPT = SRPT/CSRPT	GD0C0048
49	C FIND X AND Y OF BONE 11 AND 12 (SEE WRITEUP ON DIVE LOG)	GD0C0049
50	X = A7 0000(1,       0 0000TRPT,SRPT)	GD0C0050
51	Y = BX 0000TRPT	GD0C0051
52	C FIND S AND T COMPONENTS (SEE BONE 11 AND 12 OF DIVE LOG)	GD0C0052
53	RS = BX 0000CSRPT	GD0C0053
54	RV = BV 0000SRPT	GD0C0054
55	C FIND R,DLAY	GD0C0055
56	R = 0000(P0000 0PT00)	GD0C0056
57	DLAY = ARCSIN(RV/R)	GD0C0057
58	RETURN	GD0C0058
59	END	GD0C0059

28962 WORDS OF MEMORY USED BY THIS COMPLETION

67906 02 00-25-72 33,642

\*\*\*\*\*ROUTINE GETLOC\*\*\*\*\*

PREFACE

PROGRAM BREAK 199  
COMMON LENGTH 0  
V COUNT DIVE 5

PRIMARY SYMBOL 0000

GETLOC 0

SECONDARY SYMBOL 0000

BLANK LABEL

SYMBOL

- 1 C00
- 2 010
- 3 0000
- 4 AVAN0

199 IS THE NEXT AVAILABLE LOCATION.

GMPC VERSION/ASSEMBLY DATE       JMPA 090171/052571       JMRB 090171/052571       JMPC 090171/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

66 19289 WORDS OF MEMORY WERE USED BY GMPC FOR THIS ASSEMBLY.

67905 02 00-25-72 33,649 ELEVATION CONSTRAINT

\*\*\*\*\*ROUTINE ELEVCON\*\*\*\*\*

1	C000       ELEVATION CONSTRAINT	ELCN0001
2	C*****ROUTINE ELEVCON*****	ELCN0002
3	C	ELCN0003

4	C	*****MISTRY OF DOCUMENTATION CENTER*****	ELCN0004
5	C		ELCN0005
6	C	*****SUNBA WALLEPS VERSION CF 02X0170	ELCN0006
7	C		ELCN0007
8	C	*****LANGUAGE FORTRAN IV	ELCN0008
9	C		ELCN0009
10	C	*****MASHING-00 025	ELCN0010
11	C		ELCN0011
12	C	***** PURPOSE.	ELCN0012
13	C	TO DETERMINE IF THE BARIUM ION CLOUD WILL BE VIEWED AT AN	ELCN0013
14	C	ELEVATION ANGLE GREATER THAN THE GIVEN CONSTRAINT R(S) DURING	ELCN0014
15	C	THE ENTIRE EXPERIMENTAL PERIOD?	ELCN0015
16	C		ELCN0016
17	C	*****METHOD.	ELCN0017
18	C	FROM EACH TRACKING STATION, A REGION CAN BE DEFINED WITHIN WHICH	ELCN0018
19	C	ALL POINTS AT ALTITUDE OF THE BARIUM CLOUD CAN BE VIEWED AT AN	ELCN0019
20	C	ELEVATION ANGLE GREATER THAN THE GIVEN CONSTRAINT, THE ARC	ELCN0020
21	C	RADIUS OF THIS REGION WITH CENTER AT THE TRACKING STATION IS	ELCN0021
22	C	FOUND, THE PROJECTION POINT OF THE TRACKING STATION AND OF THE	ELCN0022
23	C	CLOUD IS USED, THE ARC DISTANCE FROM THESE PROJECTED POINTS IS	ELCN0023
24	C	THEN CALCULATED AND IF THIS ARC DISTANCE IS LESS THAN THE ARC	ELCN0024
25	C	RADIUS OF THE DEFINED REGION THEN THE CONSTRAINT IS MET FOR	ELCN0025
26	C	THE OF RELEASE, SUBROUTINE ELDFY IS THEN USED TO DETERMINE IF	ELCN0026
27	C	THIS GIVEN CONSTRAINT WILL BE MET FOR THE EXPERIMENTAL PERIOD,	ELCN0027
28	C		ELCN0028
29	C	*****INPUTS	ELCN0029
30	C		ELCN0030
31	C	NS -THE NUMBER OF STATIONS USED IN THE PROGRAM	ELCN0031
32	C		ELCN0032
33	C	NOB(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED	ELCN0033
34	C		ELCN0034
35	C	RVB -RADIAL DISTANCE FROM EARTH CENTER TO RELEASE	ELCN0035
36	C	-POINT (ERD)	ELCN0036
37	C		ELCN0037
38	C	SINCLT -SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE	ELCN0038
39	C		ELCN0039
40	C	COSCLT -COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE	ELCN0040
41	C		ELCN0041
42	C	SINCLN -SINE OF RELEASE POINT'S LONGITUDE	ELCN0042
43	C		ELCN0043
44	C	COSCLN -COSINE OF RELEASE POINT'S LONGITUDE	ELCN0044
45	C		ELCN0045
46	C	NAME(3,12) -NAME OF TRACKING STATIONS USED	ELCN0046
47	C		ELCN0047
48	C	RVB(12) -RADIAL VECTOR FROM EARTH CENTER TO TRACKING	ELCN0048
49	C	-STATION (ERD)	ELCN0049
50	C		ELCN0050
51	C	SINSLT(12) -SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE	ELCN0051
52	C		ELCN0052
53	C	COSSLT(12) -COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE	ELCN0053
54	C		ELCN0054
55	C	SINSLN(12) -SINE OF TRACKING STATION'S LONGITUDE	ELCN0055
56	C		ELCN0056
57	C	COSSLN(12) -COSINE OF TRACKING STATION'S LONGITUDE	ELCN0057
58	C		ELCN0058
59	C	R(S) -ELEVATION CONSTRAINT (RADIAN)	ELCN0059
60	C		ELCN0060
61	C	R(D) -CLOUD DENSITY RATE (RAD/ANS/HR)	ELCN0061
62	C		ELCN0062
63	C	R(T) -MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS)	ELCN0063
64	C		ELCN0064
65	C	HALFPT -VALUE OF 90 DEGREES IN RADIAN	ELCN0065
66	C		ELCN0066
67	C		ELCN0067
68	C	*****OUTPUT	ELCN0068
69	C		ELCN0069
70	C	PRINT STATEMENT NOTED UNDER PROMPT ? IF CONSTRAINT IS NOT MET	ELCN0070
71	C		ELCN0071
72	C		ELCN0072
73	C	*****INTERNAL PARAMETERS	ELCN0073
74	C		ELCN0074
75	C	OSCALP -COSINE OF THE ARC RADIUS OF THE DEFINED REGION	ELCN0075
76	C		ELCN0076
77	C	L -TRACKING STATION NUMBER	ELCN0077



78	C		ELCNO078
79	C		ELCNO079
80	C	*****REMARKS*****	ELCNO080
81	C	NONE KNOWN	ELCNO081
82	C		ELCNO082
83	C	*****SUBPROGRAMS REQUIRED*****	ELCNO083
84	C	BLVDFY	ELCNO084
85	C		ELCNO085
86	C	*****END OF DOCUMENTATION CARDS*****	ELCNO086
87	C		ELCNO087
88		SUBROUTINE ELCNBR	ELCNO088
89		COMMON/BLK1,SINCLY, COSCLY, SINCLN, COSCLN, RVC	ELCNO089
90		COMMON/BLK2,PR18)	ELCNO090
91		COMMON/BLK3,NOS,NOS(18)	ELCNO091
92		COMMON/BLK4,NAME(30,2),PHI(12),LAMBDA(12),ALTA(12),MOVA(12)	ELCNO092
93		COMMON/BLK5,SINSLY(12),COSCLY(12),SINSLN(12),COSCLN(12)	ELCNO093
94		1 RVC(18)	ELCNO094
95		COMMON/BLK6,DTR, RVD, MTR, HALPR, RTH, AU, DELTA(4), ERH, OGRA	ELCNO095
96		DOUBLE PRECISION DTR, RVD, MTR, HALPR	ELCNO096
97		ARCSTN(X),ATAN(X/SQRT(1-X**2))	ELCNO097
98		DO 100 I=1,N8	ELCNO098
99		C LAMBDA(I)	ELCNO099
100		C FIND THE ARC RADIUS FOR THE LIMIT ANGLE OF BEARING=(COSALP)	ELCNO100
101		COSALP=COS(HALPR-MTR) - ARCSIN(RVD/SIN(2)) * RVC(L)/RVC(I)	ELCNO101
102		C FIND THE ARC RADIUS FOR STATION L(COBBEY)	ELCNO102
103		COSBEY= SINCLY(L)*SINCLY + COSCLY(L)*COSCLY + (COSCLN(L)*COSCLN +	ELCNO103
104		1 SINCLN(L)*SINCLN)	ELCNO104
105		IF(COBBEY,LY,COSALP) WRITE(6,1) NAME(N,L),M+1,3)	ELCNO105
106		C CHECK FOR ELEVATION CONSTRAINT FOR BLVDFY DURING TRACKING PERIOD	ELCNO106
107		IF (R(16),EQ,0.) GO TO 100	ELCNO107
108		IF (R(17),GT,0.) CALL BLVDFY (COSALP,L)	ELCNO108
109		100 CONTINUE	ELCNO109
110		RETURN	ELCNO110
111		7 FORWAY (34MPAYLOAD NOT OBSERVED FROM STATION#JA6X	ELCNO111
112		1 30MPOR GIVEN ELEVATION CONSTRAINT)	ELCNO112
113		END	ELCNO113

25267 WORDS OF MEMORY USED BY THIS COMPIATION

07908 03 09-25-72 13,634 ELEVATION CONSTRAINT

\*\*\*\*\*SUBROUTINE ELCNBR\*\*\*\*\*

REFPAGE

PROGRAM BREAK 230  
COMMON LENGTH 8  
V COUNT BITS 9

PRIMARY SYNDP ENTRY

ELNBR 0

SECONDARY SYNDP ENTRY

BLK# LENGTH

1	BLN01	8
2	BLN01	10
3	BLN0	10
4	BLN0	100
5	BLN01	70
6	BLN0	20

SUBREF

7 COS  
10 AYR  
11 SUBV  
12 ELVDFY  
13 ,RVC,  
14 ,RVL,

19 .PRND,  
 230 IS THE NEXT AVAILABLE LOCATION.  
 GMAP VERSION/ASSEMBLY DATES JMAP 030178/050571 JMRB 030171/050271 JMPC 030178/050571  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
 69 19332 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

07906 02 0V-25-72 22,568 CLOUD DRIFT ON ELEVATION CONSTRAINT

\*\*\*\*\*SUBROUTINE ELDRFT\*\*\*\*\*

1	CBLVD	CLOUD DRIFT ON ELEVATION CONSTRAINT	ELVD0001
2	C*****SUBROUTINE ELDRFT*****		ELVD0002
3	C		ELVD0003
4	C*****START OF DOCUMENTATION CARDS*****		ELVD0004
5	C		ELVD0005
6	C*****HAGA WALKERS VERSION OF 02X01X70		ELVD0006
7	C		ELVD0007
8	C*****LANGUAGE=FORTRAN IV		ELVD0008
9	C		ELVD0009
10	C*****RUNTIME=08 025		ELVD0010
11	C		ELVD0011
12	C*****PURPOSE.		ELVD0012
13	C	TO DETERMINE IF THE ELEVATION CONSTRAINT HOLDS DURING THE	ELVD0013
14	C	REQUIRED TRACKING PERIOD?	ELVD0014
15	C		ELVD0015
16	C*****METHOD-		ELVD0016
17	C	THE LONGITUDINAL DIFFERENCE BETWEEN THE TRACKING STATION TO THE	ELVD0017
18	C	EDGE OF THE REGION AT THE LATITUDE OF THE CLOUD ABOUT THIS	ELVD0018
19	C	STATION AS DEFINED IN SUBROUTINE ELCSR IS FOUND, THERE ARE TWO	ELVD0019
20	C	POINTS ON THE EDGE OF THIS REGION AT THE LATITUDE OF THE CLOUD	ELVD0020
21	C	WHICH ARE AT AN ARC DISTANCE EQUAL TO THE ARC RADIUS OF THIS	ELVD0021
22	C	REGION; FOR AN EASTERLY DRIFT OF THE CLOUD AFTER RELEASE THE	ELVD0022
23	C	POINT EAST OF THE TRACKING STATION IS REQUIRED, AND FOR THE	ELVD0023
24	C	WESTERLY DRIFT THE POINT WEST OF THE TRACKING STATION IS	ELVD0024
25	C	REQUIRED; THE PROBLEM NOW IS TO FIND OUT HOW LONG IT WILL TAKE	ELVD0025
26	C	FOR THE CLOUD TO DRIFT TO THIS POINT ON THE EDGE OF THE DEFINED	ELVD0026
27	C	REGION; IF IT IS SHORTER THAN THE GIVEN TRACKING PERIOD THEN THE	ELVD0027
28	C	ERROR MESSAGE (FORMAY 1000) IS PRINTED;	ELVD0028
29	C		ELVD0029
30	C*****INPUT*		ELVD0030
31	C		ELVD0031
32	C	COCALP -COSINE OF THE ARC RADIUS OF THE DEFINED REGION	ELVD0032
33	C		ELVD0033
34	C	I -TRACKING STATION NUMBER	ELVD0034
35	C		ELVD0035
36	C	SINCLY -SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE	ELVD0036
37	C		ELVD0037
38	C	COCLTY -COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE	ELVD0038
39	C		ELVD0039
40	C	NAME(3,12) -NAME OF TRACKING STATIONS USED	ELVD0040
41	C		ELVD0041
42	C	NLAND(32) -LONGITUDE OF THE TRACKING STATION (RADIANS)	ELVD0042
43	C		ELVD0043
44	C	SINSLY(12) -SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE	ELVD0044
45	C		ELVD0045
46	C	COESLY(12) -COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE	ELVD0046
47	C		ELVD0047
48	C	R(0) -CLOUD DRIFT RATE (RADIANS/HR)	ELVD0048
49	C		ELVD0049
50	C	R(1) -MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS)	ELVD0050
51	C		ELVD0051
52	C		ELVD0052
53	C*****OUTPUT*		ELVD0053
54	C		ELVD0054
55	C	NAME(3,12) -NAME OF TRACKING STATIONS USED	ELVD0055
56	C		ELVD0056
57	C	T -THE CONSTRAINT IS MET FOR GIVEN DRIFT RATE (HR)	ELVD0057
58	C		ELVD0058
59	C	R(1) -VALUE OF T IF T<T1; INPUT VALUE OF R(1)-IN HOURS	ELVD0059
60	C		ELVD0060
61	C*****RESTRICTIONS.		ELVD0061
62	C	THE DRIFT RATE OF THE CLOUD IS ASSUMED TO BE REFLECTED IN A	ELVD0062

63	C	CHANGE ONLY OF LONGITUDE VALUE FOR THE CLOUD'S POSITION AND IS	ELVD0063
64	C	ASSUMED TO BE CONSTANT FOR THE EXPERIMENTAL PERIOD;	ELVD0064
65	C	THE ELEVATION CONSTRAINT FOR THE POSITION OF THE AIRCRAFT AT	ELVD0065
66	C	THE END OF THE EXPERIMENTAL PERIOD IS CALCULATED IN SUBROUTINE	ELVD0066
67	C	EPSTN	ELVD0067
68	C		ELVD0068
69	C	*****SUBPROGRAMS REQUIRED-	ELVD0069
70	C	NONE	ELVD0070
71	C		ELVD0071
72	C	*****END OF DOCUMENTATION CARDS*****	ELVD0072
73	C		ELVD0073
74		SUBROUTINE ELVDFY (BOSALP, I)	ELVD0074
75		COMMON/BLK01/ SINCLV, COSCLV, SINCLN, COSCLN, RVC	ELVD0075
76		COMMON/BLK03/ PHIP, RLAMDA	ELVD0076
77		COMMON/BLK01/R(8)	ELVD0077
78		COMMON/BLK07/ NAME(3,12), PH(12), LAMDA(12), ALT(12), MOVE(12)	ELVD0078
79		COMMON/BLK01/ SINCLV(12), COSCLV(12), SINCLN(12), COSCLN(12),	ELVD0079
80		NYB(12)	ELVD0080
81		COMMON/BLK03/ RPHI(12), RLAMB(12)	ELVD0081
82		REAL LAMDA	ELVD0082
83		REAL LONG	ELVD0083
84		ARCOS(X)=ATAN(SQRT(1-X*X))/8)	ELVD0084
85	C	COMPUTE THE DIFFERENCE IN LONGITUDE FROM THE CENTER OF STATION(I) TO	ELVD0085
86	C	THE EDGE OF THE FAVORABLE ELEVATION REGION AT THE CLOUD'S LATITUDE	ELVD0086
87		DCOSDB= ARCCOS(COSCLV*SINCLV(I)*SINCLV) / (COSCLV(I)*COSCLV)	ELVD0087
88	C	FIND THE LONGITUDE AT THIS POINT	ELVD0088
89	C	IF THE CLOUD IS DRIFTING WESTWARD, FIND THE LONGITUDE WEST OF STATION(I)	ELVD0089
90		IF (R(8),LT,0, ) LONG =BLAND(I)-DLANDA	ELVD0090
91	C	IF THE CLOUD IS DRIFTING EASTWARD, FIND THE LONGITUDE EAST OF STATION(I)	ELVD0091
92		IF (R(8),GT,0, ) LONG =BLAND(I)+DLANDA	ELVD0092
93	C	FIND THE AMOUNT OF TIME (IN HOURS) IT WILL TAKE THE CLOUD TO DRIFT TO	ELVD0093
94	C	THIS LONGITUDE	ELVD0094
95		Y =ABS((LONG-RLAMDA)/R(8))	ELVD0095
96	C	IF Y IS LESS THAN THE REQUIRED DRIFTING PERIOD THEN PRINT STATEMENT	ELVD0096
97		IF (Y,GE,R(7)) GO TO 10	ELVD0097
98		WRITE (6,1000) (NAME(J),J=1,3)Y	ELVD0098
99		10 RETURN	ELVD0099
100		1000 FORMAT (31X, CLOUD DRIFT CAUSES ELEVATION CONSTRAINT TO FALL BELOW	ELVD0100
101		INPUT CONSTRAINT AT STATION, SA, P, 29, 19 HOURS AFTER RELEASE)	ELVD0101
102		END	ELVD0102

28995 WORDS OF MEMORY USED BY THIS COMPILE

67006 01	09-25-72	11,666	CLOUD DRIFT ON ELEVATION CONSTRAINT
*****SUBROUTINE ELVDFY*****			
PREFACE			
PROGRAM BREAK	175		
COMMON LENGTH	0		
V COUNT 0175	5		
PRIMARY SYNDP	0175		
ELVDFY	0		
SECONDARY SYNDP	0175		
BLK01	LENGTH		
1	BLK01	5	
2	BLK03	8	
3	BLK02	16	
4	BLK07	120	
5	BLK01	76	
6	BLK03	86	
SYNREF			
7	ATRN		
10	SRV		



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11 ,PBRV.
12 ,PESL,
13 ,PBRD,
179 IS THE NEXT AVAILABLE LOCATION.
GNAP VERSION/BSUBRMBR DATES      JHPA 050171/052571      JHBB 050171/052571      JHPB 050171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
64 19298 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY

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67986 02 09-29-72 13,691 AIRGLOW CALCULATIONS

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***** SUBROUTINE AIRGLO *****

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1  CTRG      AIRGLOW CALCULATIONS                                AIRG0001
2  C***** SUBROUTINE AIRGLO *****                                AIRG0002
3  C                                                                 AIRG0003
4  C***** SUMMARY OF DOCUMENTATION CARDS *****                AIRG0004
5  C                                                                 AIRG0005
6  C*****NASA BALLOON VERSION OF 02/01/70                      AIRG0006
7  C                                                                 AIRG0007
8  C*****LANGUAGE-FORTRAN IV                                    AIRG0008
9  C                                                                 AIRG0009
10 C*****MACHINE-GE 025                                         AIRG0010
11 C                                                                 AIRG0011
12 C***** PURPOSE.                                             AIRG0012
13 C   TO CALCULATE THE AIRGLOW BRIGHTNESS AS DEFINED FOR THE BIG AIRG0013
14 C   PROJECT;                                                  AIRG0014
15 C                                                                 AIRG0015
16 C*****METHOD.                                               AIRG0016
17 C   THIS SUBROUTINE CALCULATES A VECTOR BETWEEN THE GEOCENTRIC AIRG0017
18 C   COORDINATES OF THE STATION AND THE RELEASE POINT, THE ANGLE AIRG0018
19 C   BETWEEN THIS VECTOR AND THE ZENITH OF THE STATION IS COMPUTED, AIRG0019
20 C   FROM THIS ANGLE THE AIRGLOW BRIGHTNESS IS COMPUTED;      AIRG0020
21 C   IT ALSO USES SUBROUTINE SPAIN TO COMPUTE THE AIRGLOW BRIGHTNESS AIRG0021
22 C   AT DISCRETE POINTS FROM EACH TRACKING STATION TO THE BALLOON'S AIRG0022
23 C   POSITION AFTER RELEASE;                                     AIRG0023
24 C                                                                 AIRG0024
25 C*****INPUT.                                               AIRG0025
26 C                                                                 AIRG0026
27 C   C00X      -GEOCENTRIC X COMPONENT OF RELEASE POINT (ERU) AIRG0027
28 C                                                                 AIRG0028
29 C   C00Y      -GEOCENTRIC Y COMPONENT OF RELEASE POINT (ERU) AIRG0029
30 C                                                                 AIRG0030
31 C   C00Z      -GEOCENTRIC Z COMPONENT OF RELEASE POINT (ERU) AIRG0031
32 C                                                                 AIRG0032
33 C   S00X(12)  -GEOCENTRIC X COMPONENT OF TRACKING STATION (ERU) AIRG0033
34 C                                                                 AIRG0034
35 C   S00Y(12)  -GEOCENTRIC Y COMPONENT OF TRACKING STATION (ERU) AIRG0035
36 C                                                                 AIRG0036
37 C   S00Z(12)  -GEOCENTRIC Z COMPONENT OF TRACKING STATION (ERU) AIRG0037
38 C                                                                 AIRG0038
39 C   PH(12)    -GEOCENTRIC LATITUDE OF TRACKING STATION (DEG) AIRG0039
40 C                                                                 AIRG0040
41 C   STLON(12) - SINE OF TRACKING STATION'S LONGITUDE          AIRG0041
42 C                                                                 AIRG0042
43 C   COSLON(12) - COSINE OF TRACKING STATION'S LONGITUDE      AIRG0043
44 C                                                                 AIRG0044
45 C   RT(9)     -MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS) AIRG0045
46 C                                                                 AIRG0046
47 C   NS        -THE NUMBER OF STATIONS USED IN THE PROGRAM    AIRG0047
48 C                                                                 AIRG0048
49 C   N00(12)   -AN ARRAY CONTAINING THE STATION NUMBERS USED  AIRG0049
50 C                                                                 AIRG0050
51 C   DTR       -CONVERSION FACTOR FROM DEGREES TO RADIANS    AIRG0051
52 C                                                                 AIRG0052
53 C                                                                 AIRG0053
54 C***** OUTPUT.                                             AIRG0054
55 C                                                                 AIRG0055
56 C   VX        -GEOCENTRIC X COMPONENT OF VECTOR FROM STATION TO AIRG0056
57 C   VY        -RELEASE POINT (ERU)                             AIRG0057
58 C                                                                 AIRG0058
59 C   WY        -GEOCENTRIC Y COMPONENT OF VECTOR FROM STATION TO AIRG0059
60 C   VZ        -RELEASE POINT (ERU)                             AIRG0060

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61	C			AIRG0061
62	C	WZ	-GEOMETRIC Z COMPONENT OF VECTOR FROM STATION TO	AIRG0062
63	C		-OR (BASE POINT TERM)	AIRG0063
64	C			AIRG0064
65	C	USX	-X-COMPONENT OF UNIT VECTOR IN DIRECTION OF	AIRG0065
66	C		-TRACKING STATION'S ZENITH	AIRG0066
67	C			AIRG0067
68	C	USY	-Y-COMPONENT OF UNIT VECTOR IN DIRECTION OF	AIRG0068
69	C		-TRACKING STATION'S ZENITH	AIRG0069
70	C			AIRG0070
71	C	USZ	-Z-COMPONENT OF UNIT VECTOR IN DIRECTION OF	AIRG0071
72	C		-TRACKING STATION'S ZENITH	AIRG0072
73	C			AIRG0073
74	C	BA(12,7)	-AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE	AIRG0074
75	C		-GIVEN POSITION OF THE CLOUD (RAYLEIGHS)	AIRG0075
76	C			AIRG0076
77	C	C(12,7)	-EFFICIENT DEPENDENT UPON THE RELATIVE POSITION	AIRG0077
78	C		-OF THE TRACKING STATION TO THE CLOUD AND USED TO	AIRG0078
79	C		-SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS	AIRG0079
80	C			AIRG0080
81	C	JEND	-NUMBER OF DISCRETE VALUES STORED FOR	AIRG0081
82	C		-EXPERIMENTAL RESID DATA	AIRG0082
83	C			AIRG0083
84	C	*****RESTRICTIONS-		AIRG0084
85	C	UP TO TWELVE TRACKING STATIONS CAN BE USED AND UP TO SEVEN		AIRG0085
86	C	DISCRETE VALUES FOR AIRGLOW BRIGHTNESS CAN BE COMPUTED FOR EACH		AIRG0086
87	C	TRACKING STATION.		AIRG0087
88	C			AIRG0088
89	C	*****PROGRAMS REQUIRED-		AIRG0089
90	C	EMAIR		AIRG0090
91	C			AIRG0091
92	C	*****REMARK-		AIRG0092
93	C	ONLY ELEVEN TRACKING STATIONS CAN BE USED IF ONE OF THESE		AIRG0093
94	C	STATIONS IS A MOVING OR DISCRETE STATION.		AIRG0094
95	C			AIRG0095
96	C	*****END OF DOCUMENTATION CARDS*****		AIRG0096
97	C			AIRG0097
98	C	SUBROUTINE AIRGLO		AIRG0098
99	C	COMMON/BLK2/ CGCX, CGCY, CGCZ		AIRG0099
100	C	COMMON/BLK1/ R(6)		AIRG0100
101	C	COMMON/BLK3/ NS, NOS(12)		AIRG0101
102	C	COMMON/BLK4/ NAME(3,12), PHI(12), LAMBDA(12), ALT(12), MOVE(12)		AIRG0102
103	C	COMMON/BLK1/ SINSLV(12), COSSLV(12), SINSLN(12), COSSLN(12),		AIRG0103
104	C	RVB(12)		AIRG0104
105	C	COMMON/BLK2/ SECX(12), SECY(12), SECZ(12)		AIRG0105
106	C	COMMON/BLK4/ DTR, RTD, WTR, HALPZ, RTH, AU, DELTA(4), ERM, DGHA		AIRG0106
107	C	COMMON/BLK5/ WX(12), WY(12), WZ(12), BA(12,7), C(12,7), JEND		AIRG0107
108	C	COMMON/BLK4/ USX, USY, USZ		AIRG0108
109	C	REAL LAMBDA, LAMBDA, LAMBDA, LAMBDA		AIRG0109
110	C	DOUBLE PRECISION DTR, RVD, WTR, HALPZ		AIRG0110
111	C	CALCULATE VALUE FOR JEND		AIRG0111
112	C	JEND = 1.0 + 2.0 * R(7)		AIRG0112
113	C	DO 100 L=1,NS		AIRG0113
114	C	I = NOS(L)		AIRG0114
115	C	C COMPUTE COMPONENTS OF W VECTOR AND ITS MAGNITUDE		AIRG0115
116	C	WX(I) = CGCX - SECX(I)		AIRG0116
117	C	WY(I) = CGCY - SECY(I)		AIRG0117
118	C	WZ(I) = CGCZ - SECZ(I)		AIRG0118
119	C	WVZ = SQRT(WX(I)**2 + WY(I)**2 + WZ(I)**2)		AIRG0119
120	C	C COMPUTE UNIT VECTOR IN DIRECTION OF STATION ZENITH		AIRG0120
121	C	YWR = COS(PHI(I) * DTR)		AIRG0121
122	C	USX = YWR * COSSLN(I)		AIRG0122
123	C	USY = YWR * SINSLN(I)		AIRG0123
124	C	USZ = SIN(PHI(I) * DTR)		AIRG0124
125	C	C CALCULATE AIRGLOW BRIGHTNESS FOR STATION(I)		AIRG0125
126	C	SEC = WVZ / (USX * WX(I) + USY * WY(I) + USZ * WZ(I))		AIRG0126
127	C	C(I,7) = 0.73 * SEC		AIRG0127
128	C	BA(I,6) = 0.92 * 10 ** (C(I,1) * WVZ)		AIRG0128
129	C	C CALL SPAIN ONLY IF REQUIRED TO CALCULATE WINDOW TIMES FOR A TRACKING		AIRG0129
130	C	PERIOD.		AIRG0130
131	C	IF (JEND * 0.7) CALL EMAIR (I)		AIRG0131
132	C	DO CONTINUE		AIRG0132
133	C	DO CONTINUE		AIRG0133

134 RETURN  
135 END

AIRG0834 21  
AIRG0835 22

25789 WORDS OF MEMORY USED BY THIS COMPILATION

67906 01 09-25-72 33,696 AIRGLOW CALCULATIONS

\*\*\*\*\* SUBROUTINE AIRGLO \*\*\*\*\*

PREPAGE

PROGRAM BREAK 269  
COMMON LENGTH 0  
V SECTY BITS 5

PRIMARY SYMDEF ENTRY

AIRGLO 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1	BLK02	3
2	BLK01	10
3	BLK0	15
4	BLK0	179
5	BLK01	76
6	BLK02	49
7	BLK0	20
10	BLK0	315
11	BLK04	3

SYMDEF

12 COS  
13 SIN  
14 SUBV  
15 ENGR  
16 FDEPZ

269 IS THE NEXT AVAILABLE LOCATION.  
GMAP VERSION/ASSEMBLY DATES JMAP 050171/052571 JMRB 050171/052571 JMPC 050171/052571  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
66 19365 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY

67906 01 09-25-72 33,702 AIRGLOW DURING TRACKING PERIOD

\*\*\*\*\* SUBROUTINE EPA18 \*\*\*\*\*

1	CEP01	AIRGLOW DURING TRACKING PERIOD	EPA10001
2	C	***** SUBROUTINE EPA18 *****	EPA10002
3	C		EPA10003
4	C	***** START OF DOCUMENTATION CARDS *****	EPA10004
5	C		EPA10005
6	C	***** NABA WALLOPS VERSION OF 02/01/70 *****	EPA10006
7	C		EPA10007
8	C	***** LANGUAGE FORTRAN IV *****	EPA10008
9	C		EPA10009
10	C	***** MACHINE GE 625 *****	EPA10010
11	C		EPA10011
12	C	***** PURPOSE *****	EPA10012
13	C	TO CALCULATE THE DIFFERENT AIRGLOW BRIGHTNESS FOR EACH THIRTY	EPA10013
14	C	(30) MINUTE TIME INTERVAL DURING THE DESIRED EXPERIMENT TIME,	EPA10014
15	C		EPA10015
16	C	***** METHOD *****	EPA10016
17	C	THE GEOCENTRIC X-Y-Z-COMPONENTS OF THE VECTOR FROM EARTH CENTER	EPA10017
18	C	TO THE CLOUD IS MODIFIED AT 30 MINUTE INCREMENTS TO INCORPORATE	EPA10018
19	C	ITS POSITION AFTER RELEASE DUE TO THE EAST/WEST DRIFT OF THE	EPA10019
20	C	CLOUD. THE CLOUD DRIFT IS ASSUMED TO BE CONSTANT AND IN THE SAME	EPA10020
21	C	DIRECTION AND IS ASSUMED TO BE SOLELY A CHANGE IN LONGITUDE	EPA10021

22	C	ANGLE; THE X, Y, Z-COMPONENTS OF THE VECTOR FROM STATION(I) TO THE	EPAI0022
23	C	POSITION OF THE CLOUD AT DISCRETE POINTS DURING THE	EPAI0023
24	C	EXPERIMENTAL PERIOD IS CALCULATED; THE AIRFLOW BRIGHTNESS AND	EPAI0024
25	C	THE COEFFICIENT VALUES ARE FOUND AS IN SUBROUTINE AIRGLE FOR	EPAI0025
26	C	THESE POINTS,	EPAI0026
27	C	THE ELEVATION CONSTRAINT FOR THE LAST POSITION OF THE MOVING	EPAI0027
28	C	TRACKING STATION IS CHECKED USING THE ZENITH ANGLE(SECZ),	EPAI0028
29	C		EPAI0029
30	C	*****INPUT*	EPAI0030
31	C		EPAI0031
32	C	I -INDEX FOR STATION NUMBER	EPAI0032
33	C		EPAI0033
34	C	JEND -NUMBER OF DISCRETE VALUES STORED FOR	EPAI0034
35	C	-EXPERIMENTAL PERIOD DATA	EPAI0035
36	C		EPAI0036
37	C	R(6) -CLOUD DRIEY RATE (RAD/ANS/HR)	EPAI0037
38	C		EPAI0038
39	C	CGGX -GEOCENTRIC X COMPONENT OF RELEASE POINT (ERU)	EPAI0039
40	C		EPAI0040
41	C	CGGY -GEOCENTRIC Y COMPONENT OF RELEASE POINT (ERU)	EPAI0041
42	C		EPAI0042
43	C	CGGZ -GEOCENTRIC Z COMPONENT OF RELEASE POINT (ERU)	EPAI0043
44	C		EPAI0044
45	C	SGGX(12) -GEOCENTRIC X COMPONENT OF TRACKING STATION (ERU)	EPAI0045
46	C		EPAI0046
47	C	SGGY(12) -GEOCENTRIC Y COMPONENT OF TRACKING STATION (ERU)	EPAI0047
48	C		EPAI0048
49	C	SGGZ(12) -GEOCENTRIC Z COMPONENT OF TRACKING STATION (ERU)	EPAI0049
50	C		EPAI0050
51	C	USX -X-COMPONENT OF UNIT VECTOR IN DIRECTION OF	EPAI0051
52	C	-TRACKING STATION'S ZENITH	EPAI0052
53	C		EPAI0053
54	C	USY -Y-COMPONENT OF UNIT VECTOR IN DIRECTION OF	EPAI0054
55	C	-TRACKING STATION'S ZENITH	EPAI0055
56	C		EPAI0056
57	C	USZ -Z-COMPONENT OF UNIT VECTOR IN DIRECTION OF	EPAI0057
58	C	-TRACKING STATION'S ZENITH	EPAI0058
59	C		EPAI0059
60	C	PLAT(7) -GEOGRAPHIC LATITUDE OF AIRCRAFT DURING	EPAI0060
61	C	-EXPERIMENTAL PERIOD (DEG)	EPAI0061
62	C		EPAI0062
63	C	SIGLON(7) -SINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL	EPAI0063
64	C	-PERIOD	EPAI0064
65	C		EPAI0065
66	C	COGLON(7) -COSINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL	EPAI0066
67	C	-PERIOD	EPAI0067
68	C		EPAI0068
69	C	AGGX(7) -GEOCENTRIC X COMPONENT OF AIRCRAFT POSITION	EPAI0069
70	C	-DURING EXPERIMENTAL PERIOD (ERU)	EPAI0070
71	C		EPAI0071
72	C	AGGY(7) -GEOCENTRIC Y COMPONENT OF AIRCRAFT POSITION	EPAI0072
73	C	-DURING EXPERIMENTAL PERIOD (ERU)	EPAI0073
74	C		EPAI0074
75	C	AGGZ(7) -GEOCENTRIC Z COMPONENT OF AIRCRAFT POSITION	EPAI0075
76	C	-DURING EXPERIMENTAL PERIOD (ERU)	EPAI0076
77	C		EPAI0077
78	C	MOVE(12) -CODE NUMBER TO DETERMINE IF STATION COORDINATES	EPAI0078
79	C	-ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT	EPAI0079
80	C	-00, FOR FIXED STATION	EPAI0080
81	C	-01, FOR AIRCRAFT	EPAI0081
82	C		EPAI0082
83	C	DTR -CONVERSION FACTOR FROM DEGREES TO RADIANS	EPAI0083
84	C		EPAI0084
85	C		EPAI0085
86	C	*****OUTPUT*	EPAI0086
87	C		EPAI0087
88	C	WPK(12,7) -VALUE OF GEOCENTRIC X COMPONENT OF VECTOR FROM	EPAI0088
89	C	-STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE	EPAI0089
90	C		EPAI0090
91	C	WPK(12,7) -VALUE OF GEOCENTRIC Y COMPONENT OF VECTOR FROM	EPAI0091
92	C	-STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE	EPAI0092
93	C		EPAI0093
94	C	WPK(12,7) -VALUE OF GEOCENTRIC Z COMPONENT OF VECTOR FROM	EPAI0094



95	C		-STATION TO CLOUD BY DESCRIBE TIMES AFTER RELEASE	EPA10095
96	C			EPA10096
97	C	BA(12,7)	-AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE	EPA10097
98	C		-GIVEN POSITION OF THE CLOUD (RAYLEIGNS)	EPA10098
99	C			EPA10099
100	C	C(12,7)	-COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION	EPA10100
101	C		-OF THE TRACKING STATION TO THE CLOUD AND USED TO	EPA10101
102	C		-SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS	EPA10102
103	C			EPA10103
104	C	*****RESTRICTIONS-		EPA10104
105	C	UP TO TWELVE TRACKING STATIONS CAN BE USED AND UP TO SEVEN		EPA10105
106	C	DESCRIBE VALUES FOR AIRGLOW BRIGHTNESS CAN BE COMPUTED FOR EACH		EPA10106
107	C	TRACKING STATION.		EPA10107
108	C			EPA10108
109	C	*****SUBPROGRAMS REQUIRED-		EPA10109
110	C	NONE		EPA10110
111	C			EPA10111
112	C	*****REMARK-		EPA10112
113	C	ONLY ELEVEN TRACKING STATIONS CAN BE USED AS INPUT IF ONE OF		EPA10113
114	C	THESE STATIONS IS AN AIRCRAFT.		EPA10114
115	C			EPA10115
116	C	*****END OF DOCUMENTATION CARDS*****		EPA10116
117	C			EPA10117
118		SUBROUTINE EBATH (1)		EPA10118
119		COMMON/BLK027 C0CX, C0CY, C0CZ		EPA10119
120		COMMON/BLK017R(8)		EPA10120
121		COMMON/BLK07 NAME(3,12), PHZ(12), LMBD0(12), ALT(12), MOVE(12)		EPA10121
122		COMMON/BLK027 S0CX(12), S0CY(12), S0CZ(12)		EPA10122
123		COMMON/BLK047 PNAME(3,7), PLAT(7), PLONG(7), PALY(7), JAIR		EPA10123
124		COMMON/BLK057 SINLAT(7), COSLAT(7), SINLON(7), COSLON(7), REA(7)		EPA10124
125		COMMON/BLK067 ABCX(7), ABCY(7), ABCZ(7)		EPA10125
126		COMMON/BLK07 DTR, RVD, WYR, WLP(12), WYH, AU, DELTA(4), ERN, DGM		EPA10126
127		COMMON/BLK07 PHZ(12), WY(12), WZ(12), BA(12,7), C(12,7), JE0D		EPA10127
128		COMMON/BLK047 USX, USY, USZ		EPA10128
129		COMMON/BLK057 WPX(12,7), WPY(12,7), WPZ(12,7)		EPA10129
130		DOUBLE PRECISION DTR, RVD, WYR, WLP(12)		EPA10130
131		DO 100 J=2,12		EPA10131
132		TJ = J		EPA10132
133	C	CALCULATE THE CHANGE IN THE CLOUD'S LONGITUDE FOR TJ HOURS AFTER		EPA10133
134	C	RELEASE AND CALCULATE ITS SINE AND COSINE.		EPA10134
135		Y = 0.200(TJ-1)		EPA10135
136		CS = COS(R(0)+Y)		EPA10136
137		SN = SIN(R(0)+Y)		EPA10137
138	C	DETERMINE THE X,Y,Z-COMPONENTS OF THE VECTOR FROM EARTH CENTER TO THE		EPA10138
139	C	CLOUD TJ HOURS AFTER RELEASE.		EPA10139
140		C0CXP = (C0CX*CS) - (C0CY*SN)		EPA10140
141		C0CYP = (C0CX*SN) + (C0CY*CS)		EPA10141
142		C0CZP = C0CZ		EPA10142
143		IF (MOVE(1),EQ,0) GO TO 11		EPA10143
144	C	FIND THE UNIT VECTOR IN THE DIRECTION OF THE AIRCRAFT'S POSITION AT		EPA10144
145	C	TJ HOURS INTO TRACKING PERIOD.		EPA10145
146		Y0MP = COS(PLAT(J)*DTR)		EPA10146
147		USX = Y0MP * COSLON(J)		EPA10147
148		USY = Y0MP * SINLON(J)		EPA10148
149		USZ = SIN(PLAT(J)*DTR)		EPA10149
150	C	FIND THE VECTOR FROM THE AIRCRAFT TO THE CLOUD TJ HOURS AFTER RELEASE		EPA10150
151		WPX(1,J) = C0CXP - A00X(1,J)		EPA10151
152		WPY(1,J) = C0CYP - A00Y(1,J)		EPA10152
153		WPZ(1,J) = C0CZP - A00Z(1,J)		EPA10153
154		GO TO 12		EPA10154
155	C	FIND THE VECTOR FROM STATION(I) TO THE CLOUD TJ HOURS AFTER RELEASE		EPA10155
156		11 WPX(1,J) = S0CX(1)		EPA10156
157		WPY(1,J) = S0CY(1)		EPA10157
158		WPZ(1,J) = S0CZ(1)		EPA10158
159		12 WPXYZ(1,0) / SQR(WPX(1,J)**2 + WPY(1,J)**2 + WPZ(1,J)**2)		EPA10159
160		1 = WPZ(1,J) / WPZ(1,0)		EPA10160
161		WPX(1,J) = WPX(1,0) * WPYZ		EPA10161
162		WPY(1,J) = WPY(1,0) * WPYZ		EPA10162
163		WPZ(1,J) = WPZ(1,0) * WPYZ		EPA10163
164	C	FIND THE AIRGLOW BRIGHTNESS AND USE VALUE FOR THE ABOVE VECTOR		EPA10164
165		S0CZ = 0.07 (USX*WPX(1,J) + USY*WPY(1,J) + USZ*WPZ(1,J))		EPA10165
166		C(1,J) = 0.73 * S0CZ		EPA10166
167		100 BA(1,J) = 3700000410 C(1,J) * S0CZ		EPA10167



168	IF (MOVE(1),00.0) RETURN	EPA10268	31
169	C DETERMINE IF ELEVATION CONSTRAINT IS MET FOR THE AIRCRAFT AT THE END	EPA10269	
170	C OF THE TRACKING PERIOD	EPA10270	
171	COMPUTE SUBROUTINE (SECZ=SECZ -0.0) XSECZ	EPA10271	34
172	IF (COS(SUBT,GT,(COS(R(2)))) WRITE (0,1000)	EPA10272	39
173	20 CONTINUE	EPA10273	39
174	RETURN	EPA10274	40
175	1000 FORMAY(ING, 95H.....ELEVATION CONSTRAINT NOT MET FOR AIRCRAFT	EPA10275	41
176	1 STATION AT END OF TRACKING PERIOD.....//)	EPA10276	
177	END	EPA10277	41

28935 WORDS OF MEMORY USED BY THIS COMPIATION

07906 01 09-25-72 11,710 AIRCRAFT DURING TRACKING PERIOD

.....SUBROUTINE EPA1R .....

PREPAGE

PROGRAM BREAK	648
COMMON LENGTH	0
V COUNT BYTS	5
PRIMARY SYMDEF	ENTRY
EPSTR	0
SECONDARY SYMDEF	ENTRY

BLOCK	LENGTH
1 BLK02	3
2 BLK01	10
3 BLK0	120
4 BLK02	44
5 BLK04	58
6 BLK05	45
7 BLK06	29
10 BLK0	20
11 BLK0	319
12 BLK04	5
13 BLK05	370

SYMDEF

14 COS
15 SIN
16 SUBV
17 ,FDRP2
20 ,FESL,
21 ,FWRD,

443 IS THE NEXT AVAILABLE LOCATION,  
 GHAP VERSION/ASSEMBLY BYTES JMPA 050171/052571 JMRB 050171/052571 JMPC 050171/052571  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
 64 19488 WORDS OF MEMORY WERE USED BY GHAP FOR THIS ASSEMBLY

07906 01 09-25-72 11,710 POLARIS FUNCTION TIME

.....SUBROUTINE TIME .....

1	CVIME	POLARIS FUNCTION TIME	TIME0001
2	C.....SUBROUTINE TIME .....		TIME0002
3	C		TIME0003
4	C.....SUBSTARY OR DOCUMENTATION CARDS.....		TIME0004
5	C		TIME0005
6	C	FUNCTION TIME (DAYRUM)	TIME0006
7	C		TIME0007
8	C	PURPOSE	TIME0008
9	C	TO COMPUTE THE GREENWICH MEAN SIDEREAL TIME AT ZERO HOURS	TIME0009
10	C	UNIVERSAL TIME FOR ANY JULIAN DATE AFTER 2415020.0 ON	TIME0010

11	C	JANUARY 0,1900	TIME0011	
12	C		TIME0012	
13	C	LANGUAGE	TIME0013	
14	C	FORTRAN IV	TIME0014	
15	C		TIME0015	
16	C	CALLING SEQUENCE	TIME0016	
17	C	GMSTDT = TIME(DAYNUM) (TIME IS A DOUBLE PRECISION FUNCT)	TIME0017	
18	C		TIME0018	
19	C	INPUTS	TIME0019	
20	C	DAYNUM = JULIAN DATE AT ZERO HOURS UNIVERSAL TIME	TIME0020	
21	C		TIME0021	
22	C	OUTPUTS	TIME0022	
23	C	TIME(DAYNUM) = GREENWICH MEAN SIDEREAL TIME AT ZERO HOURS	TIME0023	
24	C	UNIVERSAL, (HOUR ANGLE OF THE FIRST POINT OF ARIES?)	TIME0024	
25	C	ANSWER IS IN HOURS AND DECIMAL FRACTIONS OF HOURS, TO	TIME0025	
26	C	CONVERT TO DEGREES MULTIPLY BY 15.0 (DOUBLE PRECISION)	TIME0026	
27	C		TIME0027	
28	C	REFERENCE	TIME0028	
29	C	1) AMERICAN EPHEMERIS AND NAUTICAL ALMANAC, 1961	TIME0029	
30	C	2) EXPLANATORY SUPPLEMENT TO AMERICAN EPHEMERIS AND	TIME0030	
31	C	NAUTICAL ALMANAC, HER MAJESTY'S STATIONARY OFFICE, LONDON	TIME0031	
32	C		TIME0032	
33	C	METHOD	TIME0033	
34	C	VALUES OF GREENWICH MEAN SIDEREAL TIME ARE OBTAINED BY AD	TIME0034	
35	C	TWELVE HOURS TO NEWCOMB'S VA, PTA, Eq of 1898, PART 1) EXPR	TIME0035	
36	C	FOR THE RIGHT ASCENSION OF THE MEAN SUN,	TIME0036	
37	C		TIME0037	
38	C	RESTRICTIONS	TIME0038	
39	C	NONE KNOWN	TIME0039	
40	C		TIME0040	
41	C	SUBPROGRAMS REQUIRED	TIME0041	
42	C	NONE	TIME0042	
43	C		TIME0043	
44	C	ANALYSIS	TIME0044	
45	C	FRANK E. HOGE	TIME0045	
46	C	APPLIED MATH SECTION	TIME0046	
47	C	NASA	TIME0047	
48	C	Wallops Station, VA.	TIME0048	
49	C		TIME0049	
50	C	PROGRAMMER	TIME0050	
51	C	DENNIS MELVIN	TIME0051	
52	C	APPLIED MATH SECTION	TIME0052	
53	C	NASA	TIME0053	
54	C	Wallops Station, VA.	TIME0054	
55	C		TIME0055	
56	C	*****END OF DOCUMENTATION CARDS*****	TIME0056	
57	C		TIME0057	
58	C	DOUBLE PRECISION FUNCTION TIME(DAYNUM)	TIME0058	
59	C		TIME0059	
60	C	DOUBLE PRECISION C1=C2*E3,RDP12,70	TIME0060	
61	C		TIME0061	
62	C	DATA V1900,C1,C2,C3/241902076.6,0.86666555555555556D00,2.40005126166	TIME0062	
63	C	1666667D03,2,58055555555555556D-07	TIME0063	
64	C		TIME0064	
65	C	TH=(DAYNUM-V1900)/36525.0	TIME0065	
66	C		TIME0066	
67	C	RDP12=C2*V0	TIME0067	2
68	C		TIME0068	
69	C	K1= RDP12/24.0	TIME0069	3
70	C		TIME0070	
71	C	RDP12,RDP12= FLOAT(K1) *24.0	TIME0071	4
72	C		TIME0072	
73	C	TIME = C1 + RDP12 *C3*TH**2	TIME0073	5
74	C		TIME0074	
75	C	IF (TIME<0) 1:2:0	TIME0075	6
76	C		TIME0076	
77	C	2 TIME =TIME-24.0	TIME0077	7
78	C		TIME0078	
79	C	1 RETURN	TIME0079	8
80	C		TIME0080	
81	C	END	TIME0081	9

67906 01 09-25-72 11,722 POLARIS FUNCTION TIME

\*\*\*\*\*SUBROUTINE TIME \*\*\*\*\*

## PREFACE

PROGRAM BREAK 110  
COMMON LENGTH 0  
V COUNT BYTS 5

PRIMARY SYMDEF ENRYM

TIME 0

SECONDARY SYMDEF ENRYM

BLOCK LENGTH

SYMDEF

110 IS THE NEXT AVAILABLE LOCATION.

GMAP VERSION/ASSEMBLY DATES JMPA 090171/052571 JMRB 090171/052571 JMPC 090171/052571  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19200 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

67906 01 09-25-72 11,722 POLARIS FUNCTION DAYNUM

\*\*\*\*\*SUBROUTINE DAYNUM \*\*\*\*\*

1	CDAYN	POLARIS FUNCTION DAYNUM	DAYN0001
2	C	*****SUBROUTINE DAYNUM *****	DAYN0002
3	C		DAYN0003
4	C	*****START OF DOCUMENTATION CARDS*****	DAYN0004
5	C		DAYN0005
6	C	FUNCTION DAYNUM(MONTH, DAY, YEAR)	DAYN0006
7	C		DAYN0007
8	C	PURPOSE	DAYN0008
9	C	TO COMPUTE THE JULIAN DATE AT ZERO HOURS UNIVERSAL TIME	DAYN0009
10	C	FOR ANY DAY FROM THE YEAR 2000 TO THE YEAR 2000	DAYN0010
11	C		DAYN0011
12	C	LANGUAGE	DAYN0012
13	C	FORTRAN IV	DAYN0013
14	C		DAYN0014
15	C	CALLING SEQUENCE	DAYN0015
16	C	Y = DAYNUM(MONTH, DAY, YEAR)	DAYN0016
17	C	YEAR, AND DAY BEING FLOATING POINT VARIABLES,	DAYN0017
18	C	MONTH BEING AN INTEGER VARIABLE	DAYN0018
19	C		DAYN0019
20	C	INPUTS	DAYN0020
21	C	MONTH = CALENDAR MONTH (INTEGER)	DAYN0021
22	C	DAY = CALENDAR DAY (FLOATING POINT)	DAYN0022
23	C	YEAR = CALENDAR YEAR (FLOATING POINT)	DAYN0023
24	C		DAYN0024
25	C	OUTPUTS	DAYN0025
26	C	DAYNUM = JULIAN DAY NUMBER AT ZERO HOUR FOR THE ABOVE DATE	DAYN0026
27	C		DAYN0027
28	C	REFERENCE	DAYN0028
29	C	1, AMERICAN EPHEMERIS AND NAUTICAL ALMANAC	DAYN0029
30	C		DAYN0030
31	C	METHOD	DAYN0031
32	C	THE NUMBER OF DAYS ELAPSED FROM ZERO HOURS UNIVERSAL TIME,	DAYN0032
33	C	JANUARY 0, 1600 ARE ADDED TO THE JULIAN DAY NUMBER OF THAT	DAYN0033
34	C	PARTICULAR DAY (250946875)	DAYN0034
35	C		DAYN0035
36	C	RESTRICTIONS	DAYN0036
37	C	PROGRAM CHECKED TO THE YEAR 2000 A.D.	DAYN0037
38	C		DAYN0038
39	C	SUBPROGRAMS REQUIRED	DAYN0039
40	C	NONE	DAYN0040
41	C		DAYN0041
42	C	ANALYSTS	DAYN0042
43	C	FRANK B. MOSE	DAYN0043

44	C	APPLIED MATHEMATICS SECTION	DAYN0044
45	C	WACLOPS STATION, VA?	DAYN0045
46	C		DAYN0046
47	C	PROGRAMMER	DAYN0047
48	C	DENNIS MELVIN	DAYN0048
49	C	APPLIED MATHEMATICS SECTION	DAYN0049
50	C	WACLOPS STATION, VA?	DAYN0050
51	C		DAYN0051
52	C	*****END OF DOCUMENTATION CARDS*****	DAYN0052
53	C		DAYN0053
54	C	FUNCTION DAYNUM (MONTH, DAY, YEAR)	DAYN0054
55	C		DAYN0055
56	C	REAL MONTH(12)	DAYN0056
57	C		DAYN0057
58	C	DATA (MONTH(1))=1, 271, 0, 31, 0, 59, 0, 90, 0, 120, 0, 151, 0, 182, 0,	DAYN0058
59	C	1222, 0, 243, 0, 273, 0, 304, 0, 334, 0, 2	DAYN0059
60	C		DAYN0060
61	C	RYEAR = YEAR - 1600, 0	DAYN0061
62	C		DAYN0062
63	C	CORRECTIONS FOR LEAP YEARS SINCE 1600	DAYN0063
64	C		DAYN0064
65	C	NOPLY = (RYEAR-1, 0) / 4, 0 + 1, 0	DAYN0065 2
66	C		DAYN0066
67	C	KR = (RYEAR-1, 0) / 400, 0	DAYN0067 3
68	C		DAYN0068
69	C	KR1 = (RYEAR-1, 0) / 100, 0	DAYN0069 4
70	C		DAYN0070
71	C	NOPLY = NOPLY + KR - KR1	DAYN0071 5
72	C		DAYN0072
73	C	IF (AMOD(RYEAR, 400, 0)) 01, 10, 11	DAYN0073 6
74	C		DAYN0074
75	C	11 IF (AMOD(RYEAR, 100, 0)) 12, 20, 12	DAYN0075 7
76	C		DAYN0076
77	C	12 IF (AMOD(RYEAR, 4, 0)) 20, 10, 20	DAYN0077 8
78	C		DAYN0078
79	C	10 IF (MONTH=2) 20, 20, 21	DAYN0079 9
80	C		DAYN0080
81	C	21 NOPLY + NOPLY + 1	DAYN0081 10
82	C		DAYN0082
83	C	00 DAYNUM = 2505446, 5 * RYEAR + 365, 0 * FLOOR(NOPLY) + MONTH(MONTH) * DAY	DAYN0083 11
84	C		DAYN0084
85	C	RETURN	DAYN0085 12
86	C		DAYN0086
87	C	END	DAYN0087 13

23589 WORDS OF MEMORY USED BY THIS COMPILE

67906 01 09-25-72 13,732

POLARIS FUNCTION DAYNUM

\*\*\*\*\*SUBROUTINE DAYNUM\*\*\*\*\*

PREFACE

PROGRAM BREAK 258  
 COMMON LENGTH 0  
 V COUNT BITS 9

PRIMARY SYMDEF ENTRY

DAYNUM 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

SVMREF

213 IS THE NEXT AVAILABLE LOCATION,  
 GMAP VERSION/ASSEMBLY DATES JMAP 050171/052571 JMRB 050171/052571 JMPC 050171/052571  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
 19218 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY

67906 01 09-25-72 11,738 SUN AND MOON ELEVATION CONSTRAINTS

\*\*\*\*\*SUBROUTINE SUNMN\*\*\*\*\*

1	CGUIN	SUN AND MOON ELEVATION CONSTRAINTS	SUNM0001
2	CG*****SUBROUTINE SUNMN*****		SUNM0002
3	C		SUNM0003
4	CG*****START OF DOCUMENTATION CARDS*****		SUNM0004
5	C		SUNM0005
6	CG*****NASA WALLBPS VERSION OF 02/01/70		SUNM0006
7	C		SUNM0007
8	CG*****LANGUAGE-FORTRAN IV		SUNM0008
9	C		SUNM0009
10	CG*****MACHINE-GE 025		SUNM0010
11	C		SUNM0011
12	CG*****PURPOSE-		SUNM0012
13	C	TO DETERMINE THE DAILY TIME INTERVAL FOR WHICH THE SUN AND MOON	SUNM0013
14	C	WILL BE BELOW THE RESPECTIVE ELEVATION ANGLES AT EACH TRACKING	SUNM0014
15	C	STATION'S LOCAL HORIZON,	SUNM0015
16	C		SUNM0016
17	CG*****METHOD-		SUNM0017
18	C	THE SOLUTION FOR DETERMINING THE TIME PERIODS FOR WHICH THE SUN	SUNM0018
19	C	AND MOON CONSTRAINTS ARE MET FOR EACH STATION ARE DEVELOPED	SUNM0019
20	C	USING SIMILAR ANALYSIS,AN APPROXIMATE TIME FOR THE DEFINED	SUNM0020
21	C	CONSTRAINT (SUN OR MOON) TO BE MET IS DETERMINED FROM THE	SUNM0021
22	C	FIRST INTERVAL FOR THE DAY PLUS DELTA(M),THE POSITION OF THE	SUNM0022
23	C	SUN OR MOON FOR THAT TIME IS FOUND AND IS THEN TRANSFORMED TO	SUNM0023
24	C	THE TOPOCENTRIC COORDINATES OF THE TRACKING STATION,THE	SUNM0024
25	C	ELEVATION ANGLE OF THE SUN (OR MOON) AT THIS TRACKING STATION	SUNM0025
26	C	IS FOUND FOR THE CURRENT POSITION OF THE SUN (MOON),A THREE	SUNM0026
27	C	POINT INTERPOLATION METHOD IS USED TO APPROXIMATE THE NEXT	SUNM0027
28	C	GUESS AT THE TIME FOR WHICH THE CONSTRAINT IS MET,THE PROCESS	SUNM0028
29	C	OF DEFINING THE POSITION OF THE SUN (MOON) FOR THE LATEST	SUNM0029
30	C	UNIVERSAL TIME,TRANSFORMING TO TOPOCENTRIC COORDINATES AND	SUNM0030
31	C	CHECKING THE ELEVATION ANGLE IS REPEATED UNTIL EITHER A TIME IS	SUNM0031
32	C	FOUND FOR WHICH THE RATIO OF THE ELEVATION ANGLE TO THE	SUNM0032
33	C	REQUIRED CONSTRAINT IS ACCURATE TO .0001 OR THAT THE ITERATIVE	SUNM0033
34	C	PROCESS IS TOO LONG AND IMPLIES A WEAK CONVERGENCE OR	SUNM0034
35	C	DIVERGENCE,THE TIME PERIOD FOUND IS STORED AS THE SECOND TIME	SUNM0035
36	C	PERIOD FOR THE DAY,THE MAIN PROGRAM TREATS THIS AS THE FIRST	SUNM0036
37	C	TIME PERIOD OF THE NEXT DAY BY SUBTRACTING 24 HOURS FROM THESE	SUNM0037
38	C	VALUES,	SUNM0038
39	C	IF A MOVING TRACKING STATION IS INPUT,THEN THE TIME OF DAY	SUNM0039
40	C	FOR WHICH ITS POSITION AT THE END OF THE EXPERIMENTAL PERIOD	SUNM0040
41	C	SATISFIES THE SUN AND MOON ELEVATION CONSTRAINTS IS FOUND,	SUNM0041
42	C	THESE TIMES ARE STORED IN THE WINDOW ARRAY AND THE WINDOW TIMES	SUNM0042
43	C	FOR THE MOVING TRACKING STATION ARE DETERMINED SUCH THAT THE	SUNM0043
44	C	SUN AND MOON CONSTRAINTS WILL BE SATISFIED FOR ITS POSITION AT	SUNM0044
45	C	TIME OF RELEASE AND DURING THE EXPERIMENTAL PERIOD,	SUNM0045
46	C		SUNM0046
47	CG*****INPUTS		SUNM0047
48	C		SUNM0048
49	C	NS -THE NUMBER OF STATIONS USED IN THE PROGRAM	SUNM0049
50	C		SUNM0050
51	C	NOS(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED	SUNM0051
52	C		SUNM0052
53	C	WINDOW(5,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES,	SUNM0053
54	C	-1ST INDEX FOR STORING START/STOP TIMES,	SUNM0054
55	C	-1 FOR START TIME	SUNM0055
56	C	-2 FOR STOP TIME	SUNM0056
57	C	-2ND INDEX FOR THE CONSTRAINT	SUNM0057
58	C	= 3: SUN	SUNM0058
59	C	= 4: MOON	SUNM0059
60	C	-3RD INDEX FOR THE STATION NUMBER	SUNM0060
61	C		SUNM0061
62	C	KYEAR -YEAR NUMBER FOR STARTING CALCULATIONS	SUNM0062
63	C		SUNM0063
64	C	I -CURRENT NUMBER OF DAYS PAST JANUARY 0 OF 'YEAR'	SUNM0064
65	C		SUNM0065
66	C	M -INDEX TO INDICATE CONSTRAINT	SUNM0066
67	C	= 3: SUN	SUNM0067
68	C	= 4: MOON	SUNM0068
69	C		SUNM0069
70	C	DELTA(3) -APPROXIMATE PERIOD OF SUN MOTION (HRS)	SUNM0070



71	C			SUNM0071
72	C	DELTA(4)	=APPROXIMATE PERIOD OF MOON MOTION (HRS)	SUNM0072
73	C			SUNM0073
74	C	NAME(3,12)	=NAME OF TRACKING STATIONS USED	SUNM0074
75	C			SUNM0075
76	C	LAMBDA(12)	=LONGITUDE OF TRACKING STATION (DEG)	SUNM0076
77	C			SUNM0077
78	C	RVS(12)	=RADIUS VECTOR FROM EARTH CENTER TO TRACKING STATION (ERU)	SUNM0078
79	C			SUNM0079
80	C			SUNM0080
81	C	GHA	=GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS	SUNM0081
82	C		=UNIVERSAL TIME (HRS)	SUNM0082
83	C			SUNM0083
84	C	R(3)	=SUN ELEVATION CONSTRAINT (RADIAN)	SUNM0084
85	C			SUNM0085
86	C	R(4)	=MOON ELEVATION CONSTRAINT (RADIAN)	SUNM0086
87	C			SUNM0087
88	C	ANS(3)	=DISTANCE FROM EARTH CENTER TO SUN (ASTRONOMICAL UNITS)	SUNM0088
89	C			SUNM0089
90	C			SUNM0090
91	C	ANS(4)	=INERTIAL X COMPONENT OF VECTOR FROM EARTH CENTER TO SUN (AU)	SUNM0091
92	C			SUNM0092
93	C			SUNM0093
94	C	ANS(5)	=INERTIAL Y COMPONENT OF VECTOR FROM EARTH CENTER TO SUN (AU)	SUNM0094
95	C			SUNM0095
96	C			SUNM0096
97	C	ANS(6)	=INERTIAL Z COMPONENT OF VECTOR FROM EARTH CENTER TO SUN (AU)	SUNM0097
98	C			SUNM0098
99	C			SUNM0099
100	C	ANS(9)	=DISTANCE FROM EARTH CENTER TO MOON (ERU)	SUNM0100
101	C			SUNM0101
102	C	ANS(10)	=INERTIAL X COMPONENT OF VECTOR FROM EARTH CENTER TO MOON (ERU)	SUNM0102
103	C			SUNM0103
104	C			SUNM0104
105	C	ANS(11)	=INERTIAL Y COMPONENT OF VECTOR FROM EARTH CENTER TO MOON (ERU)	SUNM0105
106	C			SUNM0106
107	C			SUNM0107
108	C	ANS(12)	=INERTIAL Z COMPONENT OF VECTOR FROM EARTH CENTER TO MOON (ERU)	SUNM0108
109	C			SUNM0109
110	C			SUNM0110
111	C	AGG27C(3,3)	=ELEMENTS OF TRANSFORMATION MATRIX FROM THE INERTIAL SYSTEM TO THE TOPOCENTRIC SYSTEM	SUNM0111
112	C			SUNM0112
113	C			SUNM0113
114	C	DTR	=CONVERSION FACTOR FROM DEGREES TO RADIAN	SUNM0114
115	C			SUNM0115
116	C	RTM	=CONVERSION FACTOR FROM RADIAN TO HOURS	SUNM0116
117	C			SUNM0117
118	C	MTR	CONVERSION FACTOR FROM HOURS TO RADIAN	SUNM0118
119	C			SUNM0119
120	C	AU	=CONVERSION FACTOR FROM ASTRONOMICAL UNITS TO EARTH RADIUS UNITS	SUNM0120
121	C			SUNM0121
122	C			SUNM0122
123	C	MOVE(12)	=CODE NUMBER TO DETERMINE IF STATION COORDINATES ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT	SUNM0123
124	C			SUNM0124
125	C		=0, FOR FIXED STATION	SUNM0125
126	C		=1, FOR AIRCRAFT	SUNM0126
127	C			SUNM0127
128	C	SINLAT(7)	=SINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING EXPERIMENTAL PERIOD	SUNM0128
129	C			SUNM0129
130	C			SUNM0130
131	C	COBLAT(7)	=COSINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING EXPERIMENTAL PERIOD	SUNM0131
132	C			SUNM0132
133	C			SUNM0133
134	C	SINLON(7)	=SINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL PERIOD	SUNM0134
135	C			SUNM0135
136	C			SUNM0136
137	C	COBLON(7)	=COSINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL PERIOD	SUNM0137
138	C			SUNM0138
139	C			SUNM0139
140	C	RVA(7)	=DISTANCE FROM EARTH CENTER TO AIRCRAFT DURING EXPERIMENTAL PERIOD (ERU)	SUNM0140
141	C			SUNM0141
142	C			SUNM0142
143	C	RLAT(7)	=GEOCENTRIC LATITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD (RADIAN)	SUNM0143
144	C			SUNM0144

145	C			SUNM0145	
146	C	ALOR(7)	=LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD	SUNM0146	
147	C		=(RADIANS)	SUNM0147	
148	C			SUNM0148	
149	C	JEND	=NUMBER OF DISCRETE VALUES STORED FOR	SUNM0149	
150	C		=EXPERIMENTAL PERIOD DATA	SUNM0150	
151	C			SUNM0151	
152	C			SUNM0152	
153	C	*****OUTPUT-		SUNM0153	
154	C			SUNM0154	
155	C	DELTA(3)	=APPROXIMATE PERIOD OF SUN MOTION (HRS)	SUNM0155	
156	C			SUNM0156	
157	C	DELTA(4)	=APPROXIMATE PERIOD OF MOON MOTION (HRS)	SUNM0157	
158	C			SUNM0158	
159	C	WINDOW(8,5,12)	=THE DAILY RELEASE WINDOW START/STOP TIMES,	SUNM0159	
160	C		=1ST INDEX FOR STORING START/STOP TIMES,	SUNM0160	
161	C		=3 FOR START TIME	SUNM0161	
162	C		=4 FOR STOP TIME	SUNM0162	
163	C		=END INDEX FOR THE CONSTRAINT	SUNM0163	
164	C		= 3=SUN	SUNM0164	
165	C		= 4=MOON	SUNM0165	
166	C		=3RD INDEX FOR THE STATION NUMBER	SUNM0166	
167	C			SUNM0167	
168	C	*****RESTRICTIONS-		SUNM0168	
169	C		TIME PERIODS FOR UP TO TWELVE TRACKING STATIONS CAN BE FOUND,	SUNM0169	
170	C		ROUTINE DEPENDS UPON THE AVAILABLE DATA ON THE SUN AND MOON	SUNM0170	
171	C		POSITION TO BE DEFINED IN THE EPHEMERIS TABLES FOR THE DATES	SUNM0171	
172	C		REQUIRED; PRESENT VERSION CONTAINS DATA FOR THE YEARS 1969,1970,	SUNM0172	
173	C		1971; ADDITIONAL DATA CAN BE MADE AVAILABLE WHEN NECESSARY?	SUNM0173	
174	C			SUNM0174	
175	C	*****SUBPROGRAMS REQUIRED-		SUNM0175	
176	C	RDEPH		SUNM0176	
177	C		EPHEMERIS TABLES	SUNM0177	
178	C	GC2YC		SUNM0178	
179	C			SUNM0179	
180	C	*****REMARK-		SUNM0180	
181	C		ONLY ELEVEN TRACKING STATIONS CAN BE USED AS INPUT IF ONE OF	SUNM0181	
182	C		THESE STATIONS IS AN AIRCRAFT;	SUNM0182	
183	C			SUNM0183	
184	C	*****END OF DOCUMENTATION CARDS*****		SUNM0184	
185	C			SUNM0185	
186	C	SUBROUTINE SUNMN (10M)		SUNM0186	
187	C	COMMON/BLKX /XMONTH,XDAY ,RYEAR ,LMONTH,LDAY ,LYEAR ,KHO, KDA,		SUNM0187	
188	C	1 KYR, LNO, LDA, LPR, ICALC, IPRY, IPRY, IPRY, IPRY, IPRY,		SUNM0188	
189	C	COMMON/BLK1, R(8)		SUNM0189	
190	C	COMMON/BLK2 /NS, NOS(12)		SUNM0190	
191	C	COMMON/BLK3 /NAME(3,12), PH(12), LMBDA(12), ALT(12), MOVE(12)		SUNM0191	
192	C	COMMON/BLK4 /SINSLT(12), COSSLT(12), SINSLN(12), COSSLN(12),		SUNM0192	
193	C	1 RV(12)		SUNM0193	
194	C	COMMON/BLK5 /SINLAT(7), COSLAT(7), SINLON(7), COSLON(7), RVAL(7)		SUNM0194	
195	C	COMMON/BLK6 /RLAT(7), RLON(7)		SUNM0195	
196	C	COMMON/BLK7 /DTR, RTD, WTR, HALFT, RTH, AU, DELTA(4), ERM, DGHA		SUNM0196	
197	C	COMMON/BLK8 /SUNL, GHA		SUNM0197	
198	C	COMMON/BLK9 /WINDOW(6,7,9,12)		SUNM0198	
199	C	COMMON/BLK10 /WX(12), WY(12), WZ(12), BA(12,7), CA(2,7), JEND		SUNM0199	
200	C	COMMON /MATRIX /A(3,8)		SUNM0200	
201	C	DOUBLE PRECISION DYN, RVD, WVB, HALFP		SUNM0201	
202	C	DIMENSION XNS(12)		SUNM0202	
203	C	REAL LAMBDA		SUNM0203	
204	C			SUNM0204	
205	C	ARGSI(12) =ATAN(X/SQRT(1.0-X**2))		SUNM0205	
206	C	IF (MOVE(J),EQ,0) GO TO 41		SUNM0206	
207	C	FOR EACH TRACKING STATION		SUNM0207	
208	C	LYEAR =0		SUNM0208	
209	C	DO 100 L=1,NS		SUNM0209	2
210	C	J = (NOS(L))		SUNM0210	3
211	C	KEEP FIRST WINDOW TIMES LESS THAN 24 HOURS		SUNM0211	
212	C	IF (MOVE(J),EQ,0) GO TO 41		SUNM0212	4
213	C	NVEMP = NOS(12) + 1		SUNM0213	7
214	C	IF (WINDOW(2,RVJ),GE,24.0) GO TO 31		SUNM0214	8
215	C	IF (WINDOW(2,MVTEMP),LY,24.0) GO TO 31		SUNM0215	11
216	C	IF (WINDOW(3,H,J) # WINDOW(8,M,J))		SUNM0216	14
217	C	WINDOW(4,H,J) # WINDOW(8,M,J))		SUNM0217	15
218	C	WINDOW(3,H,MTEMP) # WINDOW(8,M,MTEMP)		SUNM0218	16

217	WINDOW(4,H,NTERR) = WINDOW(2,H,NTERR)	SUNH0219	17
220	WINDOW(3,H,DT) = ANGLE(WINDOW(5,H,NUB)) / (WINDOW(5,H,NTERR) - R(7))	SUNH0220	18
221	WINDOW(4,H,DT) = ANGLE(WINDOW(5,H,NUB)) / (WINDOW(5,H,NTERR) - R(7))	SUNH0221	19
222	WINDOW(4,H,NTERR) = WINDOW(5,H,NTERR) - 24.0	SUNH0222	20
223	WINDOW(2,H,NTERR) = WINDOW(1,H,NTERR) - 24.0	SUNH0223	21
224	GO TO 100	SUNH0224	22
225	IF (WINDOW(2,H,NUB) .LT. 24.0) GO TO 21	SUNH0225	23
226	WINDOW(3,H,DT) = WINDOW(5,H,NUB)	SUNH0226	26
227	WINDOW(4,H,DT) = WINDOW(5,H,NUB)	SUNH0227	27
228	GO TO 100	SUNH0228	28
229	IF DO 200 K = 112	SUNH0229	29
230	ITER = 0	SUNH0230	30
231	C GET FIRST GUESS FOR TIME FOR WHICH RESTRICTION IS MET	SUNH0231	
232	DT = WINDOW(4,H,DT) + DELT(H)	SUNH0232	31
233	C SKIP TO 40 IF THIS IS AIRCRAFT ELEVATION	SUNH0233	
234	IF (J,EG,LYERR) GO TO 40	SUNH0234	32
235	C FIND HOUR ANGLE FOR STATION(J) IN RADIANS	SUNH0235	
236	OMEGA = (OMEGA(1) + OMEGA(2)) / 2 + LAMBDA(J) / DTR	SUNH0236	35
237	GO TO 40	SUNH0237	36
238	40 OMEGA = (OMEGA(1) + OMEGA(2)) / 2 + LAMBDA(J) / DTR	SUNH0238	37
239	C DETERMINE SUN/HOON EPHMERIS DATA AT TIME UX FOR CURRENT DATE	SUNH0239	
240	43 CALL RDBPH(YEAR, I, H, T, YRS)	SUNH0240	38
241	C DETERMINE ELEVATION ANGLE FOR SUN/HOON BY TIME DT BY TRANSFORMING TO	SUNH0241	
242	C TOPOCENTRIC COORDINATES BY SVAXEN(J)	SUNH0242	
243	CALL RDBTC(OMEGA, J)	SUNH0243	39
244	C SKIP TO 40 IF THIS IS AIRCRAFT ELEVATION	SUNH0244	
245	IF (J,EG,LYERR) GO TO 40	SUNH0245	40
246	C FIND THE Z-COMPONENT AND THE MAGNITUDE OF THE VECTOR FROM STATION(J)	SUNH0246	
247	C FOR THE SUN USE THE FOLLOWING, FOR THE MOON SKIP TO 12	SUNH0247	
248	(7,H,GO,0) GO TO 12	SUNH0248	43
249	XB = (AGC2TC(1,1) * ANS(14) + AGC2TC(2,2) * ANS(5) + AGC2TC(1,3) * ANS(6))	SUNH0249	46
250	1 (7,XU - RVS(J))	SUNH0250	
251	XHAB = (ANS(13) / AU - RVS(J))	SUNH0251	47
252	GO TO 15	SUNH0252	48
253	C	SUNH0253	
254	C CALCULATE XB, XHAB FOR MOON	SUNH0254	
255	42 XB = (AGC2TC(1,1) * ANS(10) + AGC2TC(2,2) * ANS(11) + AGC2TC(1,3) * ANS(12))	SUNH0255	49
256	1 (7,XU - RVS(J))	SUNH0256	
257	XHAB = (ANS(13) / AU - RVS(J))	SUNH0257	50
258	GO TO 15	SUNH0258	51
259	44 IF (H,EG,4) GO TO 45	SUNH0259	52
260	XB = (AGC2TC(1,1) * ANS(14) + AGC2TC(2,2) * ANS(5) + AGC2TC(1,3) * ANS(6))	SUNH0260	55
261	1 (7,XU - RVA(JEND))	SUNH0261	
262	XHAB = (ANS(13) / AU - RVA(JEND))	SUNH0262	56
263	GO TO 15	SUNH0263	57
264	45 XB = (AGC2TC(1,1) * ANS(10) + AGC2TC(2,2) * ANS(11) + AGC2TC(1,3) * ANS(12))	SUNH0264	58
265	1 (7,XU - RVA(JEND))	SUNH0265	
266	XHAB = (ANS(13) / AU - RVA(JEND))	SUNH0266	59
267	C	SUNH0267	
268	C CALCULATE THE ELEVATION ANGLE	SUNH0268	
269	45 ELV = (ANCSIN(XB / XHAB))	SUNH0269	60
270	C	SUNH0270	
271	C CHECK FOR CONVERGENCE	SUNH0271	
272	IF (ABS(ELV - ELV(ITER)), .GT. 17E-4) GO TO 30	SUNH0272	61
273	C PRINT ERROR MESSAGE FOR NO CONVERGENCE IF ITER IS GREATER THAN 30	SUNH0273	
274	ITER = ITER + 1	SUNH0274	64
275	IF (ITER,LT,35) GO TO 45	SUNH0275	65
276	IF (H,EG,4) GO TO 14	SUNH0276	68
277	WRITE (6,20) (NAME(H, J), H, 1, 3)	SUNH0277	71
278	30 FORNAY (37) NO CONVERGENCE FOR SUN CONSTRAINY FOR, JAB)	SUNH0278	76
279	STOP	SUNH0279	76
280	30 WRITE (6,20) (NAME(H, J), H, 1, 3)	SUNH0280	77
281	20 FORNAY (38) NO CONVERGENCE FOR HOON CONSTRAINY FOR, JAB)	SUNH0281	82
282	STOP	SUNH0282	82
283	C ITERATE TO FIND TIME FOR ELV TO MEET CONSTRAINY	SUNH0283	
284	35 IF (ITER,GT,3) GO TO 10	SUNH0284	83
285	DT = (HLO - R(H)) / OTH	SUNH0285	86
286	C SAVE ELV FOR NEXT ITERATION	SUNH0286	
287	ELV1 = ELV	SUNH0287	87
288	GO TO 17	SUNH0288	88
289	C USE THIS EQUATION FOR SUCCESSIVE ITERATIONS AFTER THE FIRST	SUNH0289	
290	35 DT = (ABS( DT / (ELV - ELV1)) + (ERR - R(H)))	SUNH0290	89
291	ELV1 = ELV	SUNH0291	90





20 RDRM  
 21 ,PENV,  
 22 ,PRTY,  
 23 ,FPL,  
 24 ,PRDY

1202 IS THE NEXT AVAILABLE LOCATION,

GNAP VERSION/ASSEMBLY DATES JHPA 090171/052571 JMRB 090171/052571 JMPC 090171/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

68 19799 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY.

67906 01 09-25-72 11,754 INERTIAL TO TOPOCENTRIC TRANSFORMATION

\*\*\*\*\*SUBROUTINE GCCTC\*\*\*\*\*

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1  GCCTC      INERTIAL TO TOPOCENTRIC TRANSFORMATION      GCCTC0001
2  C*****SUBROUTINE GCCTC*****GCCTC0002
3  C      GCCTC0003
4  C*****START OF DOCUMENTATION CARDS*****GCCTC0004
5  C      GCCTC0005
6  C*****NASA Wallops version of 02/01/70      GCCTC0006
7  C      GCCTC0007
8  C*****LANGUAGE=FORTRAN IV      GCCTC0008
9  C      GCCTC0009
10 C*****MACHINE=GE 625      GCCTC0010
11 C      GCCTC0011
12 C*****PURPOSE.      GCCTC0012
13 C      TO COMPUTE THE ELEMENTS OF THE TRANSFORMATION MATRIX FOR THE      GCCTC0013
14 C      ROTATION FROM INERTIAL RECTANGULAR COORDINATES TO A TOPOCENTRIC      GCCTC0014
15 C      SYSTEM WITH ORIGIN AT THE ORIGIN OF THE INERTIAL SYSTEM?      GCCTC0015
16 C      GCCTC0016
17 C*****METHOD.      GCCTC0017
18 C      GIVEN A POINT OF GEOCENTRIC LATITUDE AND LONGITUDE AND THE      GCCTC0018
19 C      CURRENT HOUR ANGLE, CALCULATE THE ELEMENTS OF THE TRANSFORMATION      GCCTC0019
20 C      MATRIX. COORDINATE TRANSFORMATION BY THIS MATRIX WILL TRANSFORM      GCCTC0020
21 C      THE COMPONENTS FROM AN INERTIAL RECTANGULAR SYSTEM TO A      GCCTC0021
22 C      TOPOCENTRIC SYSTEM. THE INERTIAL COORDINATE SYSTEM IS DEFINED AS      GCCTC0022
23 C      HAVING ITS ORIGIN AT THE EARTH'S CENTER WITH THE X-AXIS IN THE      GCCTC0023
24 C      DIRECTION OF THE FIRST POINT OF ARIES, THE Y-AXIS IN THE      GCCTC0024
25 C      EQUATORIAL PLANE 90 DEGREES COUNTERCLOCKWISE FROM X AND THE Z-      GCCTC0025
26 C      AXIS DIRECTED TOWARDS THE ZENITH IN A RIGHT HANDED SYSTEM. THE      GCCTC0026
27 C      TOPOCENTRIC SYSTEM HAS ITS X-AXIS DIRECTED TOWARDS THE      GCCTC0027
28 C      GEOCENTRIC INPUT POINT, THE Z-AXIS DIRECTED TOWARD THE SAME      GCCTC0028
29 C      LATITUDE BUT AT 90 DEGREES FROM THE INPUT LONGITUDE AND THE Y-      GCCTC0029
30 C      AXIS POSITIONED AS TO COMPLETE THE RIGHT HANDED SYSTEM,      GCCTC0030
31 C      GCCTC0031
32 C*****INPUT.      GCCTC0032
33 C      GCCTC0033
34 C      HA      -THE STATION'S HOUR ANGLE (RADJANS)      GCCTC0034
35 C      J      -THE INDEX NUMBER OF THE STATION      GCCTC0035
36 C      NOB(I)      -AN ARRAY CONTAINING THE STATION NUMBERS USED      GCCTC0036
37 C      NS      -THE NUMBER OF STATIONS USED IN THE PROGRAM      GCCTC0037
38 C      SINSLY(X2)      -SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE      GCCTC0038
39 C      COSSLY(X2)      -COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE      GCCTC0039
40 C      SINLAT(Y)      -SINE OF AVERAGE GEOCENTRIC LATITUDE DURING      GCCTC0040
41 C      COSLAT(Y)      -COSINE OF AVERAGE GEOCENTRIC LATITUDE DURING      GCCTC0041
42 C      SINLAT(Y)      -SINE OF AVERAGE GEOCENTRIC LATITUDE DURING      GCCTC0042
43 C      COSLAT(Y)      -COSINE OF AVERAGE GEOCENTRIC LATITUDE DURING      GCCTC0043
44 C      SINLAT(Y)      -SINE OF AVERAGE GEOCENTRIC LATITUDE DURING      GCCTC0044
45 C      COSLAT(Y)      -COSINE OF AVERAGE GEOCENTRIC LATITUDE DURING      GCCTC0045
46 C      SINLAT(Y)      -SINE OF AVERAGE GEOCENTRIC LATITUDE DURING      GCCTC0046
47 C      COSLAT(Y)      -COSINE OF AVERAGE GEOCENTRIC LATITUDE DURING      GCCTC0047
48 C      SINLAT(Y)      -SINE OF AVERAGE GEOCENTRIC LATITUDE DURING      GCCTC0048
49 C      COSLAT(Y)      -COSINE OF AVERAGE GEOCENTRIC LATITUDE DURING      GCCTC0049
50 C      SINLAT(Y)      -SINE OF AVERAGE GEOCENTRIC LATITUDE DURING      GCCTC0050
51 C      COSLAT(Y)      -COSINE OF AVERAGE GEOCENTRIC LATITUDE DURING      GCCTC0051
52 C      SINLAT(Y)      -SINE OF AVERAGE GEOCENTRIC LATITUDE DURING      GCCTC0052
53 C*****OUTPUT.      GCCTC0053
54 C      GCCTC0054
55 C      A(3,3)      -ELEMENTS OF TRANSFORMATION MATRIX FROM THE      GCCTC0055
56 C      INERTIAL SYSTEM TO THE TOPOCENTRIC SYSTEM      GCCTC0056
57 C      GCCTC0057
58 C*****RESTRICTIONS.      GCCTC0058
59 C      NS CANNOT BE GREATER THAN 1000.      GCCTC0059
    
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60	C		GCYC0060	
61	C	*****SUBPROGRAMS REQUIRED-	GCYC0061	
62	C	NONE	GCYC0062	
63	C		GCYC0063	
64	C	*****END OF DOCUMENTATION CARDS*****	GCYC0064	
65	C		GCYC0065	
66		SUBROUTINE GC2TC(HA, J)	GCYC0066	
67		COMMON/BLK9 /NS, NOS(12)	GCYC0067	
68		COMMON/BLK1 / SINL9(12), COSL9(12), SINLN(12), COSLN(12),	GCYC0068	
69	1	RVS(12)	GCYC0069	
70		COMMON/BLK5 /SINL9(7), COSL9(7), SINLN(7), COSLN(7), RVA(7)	GCYC0070	
71		COMMON/BLK3 /WX(12), WY(12), UZ(12), WAB(12,7), C(12,7), JEND	GCYC0071	
72		COMMON /TMYTRX/ AGC2TC(1,3)	GCYC0072	
73	C	SKIP TO 12 IF TRANSFORMATION IS ON AN UNSAFE LOCATION AFTER RELEASE	GCYC0073	
74		IF (J,GT,NOS(NS)) GO TO 11	GCYC0074	
75		SINL9 =SINL9(J)	GCYC0075	4
76		COSL9 =COSL9(J)	GCYC0076	5
77		GO TO 12	GCYC0077	6
78	11	SINL9 =SINL9(JEND)	GCYC0078	7
79		COSL9 =COSL9(JEND)	GCYC0079	8
80	C	DEFINE THE ELEMENTS OF THE TRANSFORMATION MATRIX	GCYC0080	
81	12	SINHA = SIN(HA)	GCYC0081	9
82		COSHA = COS(HA)	GCYC0082	10
83		AGC2TC(1,1) = COSL9 * COSHA	GCYC0083	11
84		AGC2TC(1,2) = COSL9 * SINHA	GCYC0084	12
85		AGC2TC(1,3) = SINL9	GCYC0085	13
86		AGC2TC(2,1) = -SINHA	GCYC0086	14
87		AGC2TC(2,2) = COSHA	GCYC0087	15
88		AGC2TC(2,3) = 0.0	GCYC0088	16
89		AGC2TC(3,1) = -SINL9 * COSHA	GCYC0089	17
90		AGC2TC(3,2) = -SINL9 * SINHA	GCYC0090	18
91		AGC2TC(3,3) = COSL9	GCYC0091	19
92		RETURN	GCYC0092	20
93		END	GCYC0093	21

23987 WORDS OF MEMORY USED BY THIS COMPILATION

67906 01 09-25-72 12,768 INERTIAL TO TOROGENERIC TRANSFORMATION

\*\*\*\*\*SUBROUTINE GC2TC\*\*\*\*\*

PREFACE

PROGRAM BREAK 114  
COMMON LENGTH 0  
V COUNT BITS 8

PRIMARY SYMDEF ENY44

GC2TC 0

SECONDARY SYMDEF ENYRV

BLK# LENGTH

1 BLN0 18  
2 BLN1 74  
3 BLN5 43  
4 BLN9 319  
5 TMYTRX 11

SYMDEF

6 COS  
7 SIN

114 IS THE NEXT AVAILABLE LOCATION.

GNAP VERSION/ASSEMBLY DATES JHMA 050174/052571 JHRB 050171/052571 JHPC 050174/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

\*\* 19292 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY \*

67906 01 09-25-72 11,766 EARTH SHADOW CONSTRAINT

\*\*\*\*\*SUBROUTINE ILLUM\*\*\*\*\*

1	C	ILLU	EARTH SHADOW CONSTRAINT	ILLU0001
2	C	*****SUBROUTINE ILLUM*****		ILLU0002
3	C			ILLU0003
4	C	*****START OF DOCUMENTATION CARDS*****		ILLU0004
5	C			ILLU0005
6	C	*****NASA WALLOPS VERSION OF 02X01470		ILLU0006
7	C			ILLU0007
8	C	*****LANGUAGE:FORTRAN IV		ILLU0008
9	C			ILLU0009
10	C	*****MACHINE-GE 025		ILLU0010
11	C			ILLU0011
12	C	*****PURPOSE.		ILLU0012
13	C	TO DETERMINE THE TIME INTERVAL FOR THE CURRENT DAY FOR WHICH		ILLU0013
14	C	THE POSITION OF THE CLOUD WIL BE WITHIN THE EARTH'S SHADOW,		ILLU0014
15	C			ILLU0015
16	C	*****METHOD.		ILLU0016
17	C	THIS SUBROUTINE ASSUMES THAT THE DECLINATION OF THE SUN IS		ILLU0017
18	C	FIXED FOR THE CURRENT DAY, THIS ASSUMPTION WILL HAVE AN ERROR OF		ILLU0018
19	C	LESS THAN 30 SECONDS IN TIME FOR A CLOUD AT LONGITUDE OF 75		ILLU0019
20	C	DEGREES; THE SUBROUTINE FIRST FINDS THE SUN'S DECLINATION AT		ILLU0020
21	C	ZERO HOURS UNIVERSAL TIME, THEN A CHECK IS MADE TO SEE IF THE		ILLU0021
22	C	CLOUD'S POSITION WILL BE WITHIN THE PRE-DEFINED EARTH SHADOW		ILLU0022
23	C	REGION, IF SO, THEN THE TIME ENTERING AND LEAVING THIS REGION DUE		ILLU0023
24	C	TO THE GEOCENTRIC POSITION OF THE CLOUD IS FOUND, THE CLOUD'S		ILLU0024
25	C	GROWTH AND DRIFT AFTER RELEASE IS USED TO DEFINE THE		ILLU0025
26	C	ILLUMINATION OF THE TOTAL CLOUD, THE RESULT OF THIS SUBROUTINE		ILLU0026
27	C	IS TO DEFINE THE TIME PERIOD(S) FOR POSSIBLE RELEASE WHICH		ILLU0027
28	C	EXCLUDES THE EARTH SHADOW REGION.		ILLU0028
29	C			ILLU0029
30	C	*****INPUT.		ILLU0030
31	C			ILLU0031
32	C	MYEAR	-YEAR NUMBER FOR STARTING CALCULATIONS	ILLU0032
33	C			ILLU0033
34	C	I	-CURRENT NUMBER OF DAYS PAST JANUARY 0 OF MYEAR	ILLU0034
35	C			ILLU0035
36	C	PHIP	-GEOCENTRIC LATITUDE OF RELEASE POINT (RADIAN)	ILLU0036
37	C			ILLU0037
38	C	SINCLY	-SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE	ILLU0038
39	C			ILLU0039
40	C	COSCLY	-COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE	ILLU0040
41	C			ILLU0041
42	C	SHADOW	-RADIUS OF EARTH SHADOW REGION (RADIAN)	ILLU0042
43	C			ILLU0043
44	C	CANNA	-COSINE OF SHADOW	ILLU0044
45	C			ILLU0045
46	C	DRIFT	-THE SPACE-FIXED DRIFT OF CLOUD (DEG/HR)	ILLU0046
47	C			ILLU0047
48	C	GHA	-GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS	ILLU0048
49	C			ILLU0049
50	C			ILLU0050
51	C	ANS(1)	-RIGHT ASCENSION OF THE SUN (RADIAN)	ILLU0051
52	C			ILLU0052
53	C	ANS(2)	-DECLINATION OF THE SUN (RADIAN)	ILLU0053
54	C			ILLU0054
55	C	RTW	-CONVERSION FACTOR FROM RADIAN TO HOURS	ILLU0055
56	C			ILLU0056
57	C			ILLU0057
58	C	*****OUTPUT.		ILLU0058
59	C			ILLU0059
60	C	WINDOW(6,1:1)	-THE DAILY RELEASE WINDOW START/STOP TIMES,	ILLU0060
61	C		-1ST INDEX FOR STORING START/STOP TIMES,	ILLU0061
62	C		-1:375 FOR START TIMES	ILLU0062
63	C		-2:416 FOR STOP TIMES	ILLU0063
64	C		-2ND INDEX FOR THE CONSTRAINT	ILLU0064
65	C		= 1-EARTH SHADOW	ILLU0065
66	C		-3RD INDEX DOWN (NORMALLY STATION NUMBER)	ILLU0066
67	C			ILLU0067
68	C			ILLU0068
69	C	*****INTERNAL PARAMETERS.		ILLU0069
70	C			ILLU0070



71	C	G1	-TOTAL SPACE-FIXED ANGULAR DISPLACEMENT DUE TO	ILLU0071	
72	C		-CLOUD DRIEY FOR THE EXPERIMENTAL PERIOD,	ILLU0072	
73	C			ILLU0073	
74	C	G2	-ONE-HALF OF THE SPACE-FIXED ANGULAR DISPLACEMENT	ILLU0074	
75	C		-DUE TO CLOUD GROWTH FOR THE EXPERIMENTAL PERIOD,	ILLU0075	
76	C			ILLU0076	
77	C	X0	-RIGHT ASCENSION OF EARTH SHADOW CENTER (RADIAN)	ILLU0077	
78	C			ILLU0078	
79	C	Y0	-DECLINATION OF EARTH SHADOW CENTER (RADIAN)	ILLU0079	
80	C			ILLU0080	
81	C	PHIP2	-LARGEST VALUE OF CLOUD'S DECLINATION DUE TO	ILLU0081	
82	C		-CLOUD GROWTH (RADIAN)	ILLU0082	
83	C			ILLU0083	
84	C	PHIP3	-SMALLEST VALUE OF CLOUD'S DECLINATION DUE TO	ILLU0084	
85	C		-CLOUD GROWTH (RADIAN)	ILLU0085	
86	C			ILLU0086	
87	C	ST(3)	-START TIME AS CALCULATED FOR EACH SIDE OF	ILLU0087	
88	C		-TRIANGLE MODEL OF CLOUD'S REGION,	ILLU0088	
89	C			ILLU0089	
90	C	STR(3)	-STOP TIME AS CALCULATED FOR EACH SIDE OF	ILLU0090	
91	C		-TRIANGLE MODEL OF CLOUD'S REGION,	ILLU0091	
92	C			ILLU0092	
93	C		*****RESTRICTIONS-	ILLU0093	
94	C		ACCURACY OF OUTPUT AS DEFINED ABOVE UNDER 'METHOD';	ILLU0094	
95	C			ILLU0095	
96	C		*****SUBPROGRAMS REQUIRED-	ILLU0096	
97	C		LIN;	ILLU0097	
98	C		RDEPH	ILLU0098	
99	C		EPHEMERIS TABLES	ILLU0099	
100	C			ILLU0100	
101	C		*****END OF DOCUMENTATION CARDS*****	ILLU0101	
102	C			ILLU0102	
103			SUBROUTINE ILLUM()	ILLU0103	
104			COMMON/BLKX /KMONTH,KDAY ,KYEAR ,LMONTH,LDAY ,LYEAR ,KMO, KDA,	ILLU0104	
105			1 KYR, LMO, LDA, LYR, ICALC, IPR7, IPR9, IPR21, IPLY	ILLU0105	
106			COMMON/BLK1/SINCL, COSCL, SINL, COSL, RVC	ILLU0106	
107			COMMON/BLK3/ PHIP, RLANDA	ILLU0107	
108			COMMON/BLK2/R(8)	ILLU0108	
109			COMMON/BLK4 /DTR, RVD, MTR, HALPR2, RTH, AU, DELTA(4), ERN, BGWA	ILLU0109	
110			COMMON/BLK5/ SUNL, SHA	ILLU0110	
111			COMMON/BLK6/ WINDOW(479*12)	ILLU0111	
112			COMMON/BLK7 /SHADOW	ILLU0112	
113			DOUBLE PRECISION DTR, RVD, MTR, HALPPI	ILLU0113	
114			DIMENSION Y(10)	ILLU0114	
115			DIMENSION XNS(12)	ILLU0115	
116			DIMENSION ST(3), STR(3)	ILLU0116	
117	C		SETUP SUBROUTINE CONSTANTS	ILLU0117	
118			C1 =R(6) * MTR	ILLU0118	
119			C2 =R(8)	ILLU0119	2
120			C3 =SQR(C1*C1 + C2*C2)	ILLU0120	3
121			PHIP2 =PHIP / C2	ILLU0121	4
122			PHIP3 =PHIP * C2	ILLU0122	5
123			UT =-1.0*RLANDA*RTH	ILLU0123	6
124			UT =AMOD(UT*24,0)	ILLU0124	7
125			IF (UT .LT.0) UT = UT + 24.0	ILLU0125	8
126	C		FIND RA AND DECL OF SUN FOR LOCAL MIDNIGHT OF RELEASE POINT	ILLU0126	
127			CALL RDEPH (KYEAR,I,UT*FANS)	ILLU0127	11
128	C		CONVERT RA AND DECL OF SUN TO CENTER OF SHADOW	ILLU0128	
129			X0 =ANS(1) *2.0*HALPPI	ILLU0129	12
130			Y0 =-1.0*ANS(2)	ILLU0130	13
131	C		INITIALIZE START, STOP TIMES TO 0; AND 24, RESPECTIVELY,	ILLU0131	
132			DO 500 I =1,8	ILLU0132	14
133			ST(I) =0.0	ILLU0133	15
134			100 ST(I)=24.0	ILLU0134	16
135			DO 50 Y(I) =0.0	ILLU0135	18
136			Y(I) =0.0	ILLU0136	19
137			J =3	ILLU0137	21
138			IF (PHIP .Y0) 101,102,102	ILLU0138	22
139			101 IF (Y0-PHIP2) 11,102,102	ILLU0139	23
140			102 IF (ABS(PHIP2-Y0),LN,SHADOW) GO TO 21	ILLU0140	24
141			IF (ABS(PHIP -Y0),GV,SHADOW) GO TO 21	ILLU0141	27
142	C		FIND TIMES WHEN EARTH SHADOW REGION IS TANGENT TO LINE 1,	ILLU0142	
143			21 Y12 =0.0 * 21*SHADOW/CS	ILLU0143	30
144			Y12 =0.0 * C1*SHADOW/CS	ILLU0144	31

145	IF ((PHIP = Y11), 07, 0,) GO TO 12	ILLU0245	1
146	IF ((V11 = PHIP2), 07, 0,) GO TO 12	ILLU0246	35
147	BZ1 = ((C1*Y1) - C2*X1) * SHADOW/CS	ILLU0247	36
148	Y11 = ((C1/E2) * (PHIP - BZ1) - BLANDR) * RYM - GWA) / DGWA	ILLU0248	39
149	Y11 = SHOD(Y(1), 24, 0)	ILLU0249	40
150	IF (Y11) < LT, 0,) Y(1) = Y11 & 24, 0	ILLU0250	41
151	GO TO 13	ILLU0251	44
152	12 CONTINUE	ILLU0252	45
153	IF (PHIP, 07, Y11) CALL LINE (NO, YB, PHIP, 0, 0, 0, Y(J), Y(J+1))	ILLU0253	46
154	J = J + 2	ILLU0254	49
155	IF (PHIP2, 07, Y11) CALL LINE (NO, YB, PHIP2, C1, 0, Y(J), Y(J+1))	ILLU0255	50
156	J = J + 2	ILLU0256	53
157	13 CONTINUE	ILLU0257	54
158	IF ((PHIP = Y12), 07, 0,) GO TO 14	ILLU0258	55
159	IF ((V12 = PHIP2), 07, 0,) GO TO 14	ILLU0259	58
160	BZ2 = ((C1*Y2) - C2*X2) * SHADOW/CS	ILLU0260	61
161	Y12 = ((C1/E2) * (PHIP2 - BZ2) - BLANDR) * RYM - GWA) / DGWA	ILLU0261	62
162	Y12 = SHOD(Y(2), 24, 0)	ILLU0262	63
163	IF (Y12) < LT, 0,) Y(2) = Y12 & 24, 0	ILLU0263	64
164	GO TO 15	ILLU0264	67
165	14 CONTINUE	ILLU0265	68
166	IF (PHIP, 07, Y12) CALL LINE (NO, YB, PHIP, 0, 0, 0, Y(J), Y(J+1))	ILLU0266	69
167	J = J + 2	ILLU0267	72
168	IF (PHIP2, 07, Y12) CALL LINE (NO, YB, PHIP2, C1, 0, Y(J), Y(J+1))	ILLU0268	73
169	15 DO 200 K=3, J, 2	ILLU0269	76
170	IF (Y(K) < EB, 0,) GO TO 200	ILLU0270	77
171	IF (Y(K) - Y(K+1)) > 201, 200, 203	ILLU0271	80
172	201 STP(1) = SMIN1(STP(1), Y(K))	ILLU0272	81
173	SV(1) = ANAS1(ST(1), V(K+1))	ILLU0273	82
174	GO TO 200	ILLU0274	83
175	202 STP(1) = SMIN1(STP(1), Y(K+1))	ILLU0275	84
176	SV(1) = ANAS1(ST(1), V(K))	ILLU0276	85
177	200 CONTINUE	ILLU0277	86
178	IF (Y11) < EB, 0,) GO TO 16	ILLU0278	88
179	STP(1) = SMIN1(STP(1), Y(1))	ILLU0279	91
180	SV(1) = ANAS1(ST(1), V(1))	ILLU0280	92
181	16 CONTINUE	ILLU0281	93
182	IF (Y12) < EB, 0,) GO TO 21	ILLU0282	94
183	STP(2) = SMIN1(STP(2), Y(2))	ILLU0283	97
184	SV(2) = ANAS1(ST(2), V(2))	ILLU0284	98
185	21 DO 190 I=1, 18	ILLU0285	99
186	190 Y(I) = 0.0	ILLU0286	100
187	J = 13	ILLU0287	102
188	IF (PHIP3 = Y0) 103, 104, 104	ILLU0288	103
189	103 IF (YB = PHIP) 22, 104, 104	ILLU0289	104
190	104 IF (ABS(PHIP - Y0), LB, SHADOW) GO TO 22	ILLU0290	105
191	IF (ABS(PHIP2 - Y0), 07, SHADOW) GO TO 21	ILLU0291	106
192	C FIND Y1 AND WUBR EARTH SHADOW REGION AS YACENT TO LINE 2,	ILLU0292	
193	22 Y21 = YB & C1 * SHADOW / CS	ILLU0293	111
194	Y22 = YB - C1 * SHADOW / CS	ILLU0294	112
195	IF ((PHIP3 = Y21), 07, 0,) GO TO 23	ILLU0295	113
196	IF ((Y22 = PHIP3), 07, 0,) GO TO 23	ILLU0296	116
197	BZ3 = ((C1*Y2) - C2*X2) * SHADOW/CS	ILLU0297	119
198	Y11 = ((C1/E2) * (PHIP3 - BZ3) - BLANDR) * RYM - GWA) / DGWA	ILLU0298	120
199	Y11 = SHOD(Y(1), 24, 0)	ILLU0299	121
200	IF (Y11) < LT, 0,) Y(1) = Y11 & 24, 0	ILLU0300	122
201	GO TO 24	ILLU0301	125
202	23 CONTINUE	ILLU0302	126
203	IF (PHIP3, 07, Y21) CALL LINE (NO, YB, PHIP3, C1, 0, Y(J), Y(J+1))	ILLU0303	127
204	J = J + 2	ILLU0304	130
205	IF (PHIP3, 07, Y21) CALL LINE (NO, YB, PHIP3, C1, 0, Y(J), Y(J+1))	ILLU0305	131
206	J = J + 2	ILLU0306	134
207	24 CONTINUE	ILLU0307	135
208	IF ((PHIP3 = Y22), 07, 0,) GO TO 25	ILLU0308	136
209	IF ((Y22 = PHIP3), 07, 0,) GO TO 25	ILLU0309	139
210	BZ2 = ((C1*Y2) - C2*X2) * SHADOW/CS	ILLU0310	142
211	Y12 = ((C1/E2) * (PHIP3 - BZ2) - BLANDR) * RYM - GWA) / DGWA	ILLU0311	143
212	Y12 = SHOD(Y(2), 24, 0)	ILLU0312	144
213	IF (Y12) < LT, 0,) Y(2) = Y12 & 24, 0	ILLU0313	145
214	GO TO 26	ILLU0314	148
215	25 CONTINUE	ILLU0315	149
216	IF (PHIP3, 07, Y22) CALL LINE (NO, YB, PHIP3, C1, 0, Y(J), Y(J+1))	ILLU0316	150
217	J = J + 2	ILLU0317	153



67906 01 09-25-72 11,777

EARTH SHADOW CONSTRAINT

\*\*\*\*\*ROUTINE ILLUM\*\*\*\*\*

PREFACE

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PROGRAM BREAK 2017
COMMON LENGTH 0
V COUNT 0195 9
PRIMARY SYMDEF ENTRV
ILLUM 8
SECONDARY SYMDEF ENTRV
```

BLOCK	LENGTH
1 BLWA	21
2 BLW01	9
3 BLW03	2
4 BLW01	10
5 BLWA	20
6 BLW0	2
7 BLWA	590
10 BLW0	1

SYNREF

```
11 LINE
12 SORV
13 RDS0H
2017 IS THE NEXT AVAILABLE LOCATION.
GNAP VERSION/ASSEMBLY DATES JMPA 050171/052571 JMRB 050171/052571 JMPC 050171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
** 19978 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY?
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67906 01 09-25-72 11,778

REPETITIVE EARTH SHADOW CALCULATIONS

\*\*\*\*\*SUBROUTINE LIN\*\*\*\*\*

1	CLINI	REPETITIVE EARTH SHADOW CALCULATIONS	LIN10001
2	C	*****SUBROUTINE LIN*****	LIN10002
3	C		LIN10003
4	C	*****START OF DOCUMENTATION CARDS*****	LIN10004
5	C		LIN10005
6	C	*****NASA WALLEPS VERSION OF 00/01/71	LIN10006
7	C		LIN10007
8	C	*****LANGUAGE:FORTRAN IV	LIN10008
9	C		LIN10009
10	C	*****MACHINE:MN625	LIN10010
11	C		LIN10011
12	C	*****PURPOSE.	LIN10012
13	C	TO CALCULATE THE POSSIBLE RELEASE TIMES FOR THE CLOUD	LIN10013
14	C	ILLUMINATION CONSTRAINT.	LIN10014
15	C		LIN10015
16	C	*****METHOD.	LIN10016
17	C	THIS SUBROUTINE IS USED TO SOLVE THE POSSIBLE RELEASE TIME	LIN10017
18	C	CALCULATIONS AS DEFINED IN SUBROUTINE ILLUM USING AN EQUATION	LIN10018
19	C	THAT IS COMMON TO MANY CASES OF THE PROBLEM. THIS ROUTINE IS	LIN10019
20	C	USED TO SIMPLIFY THE MANIPULATIONS OF SUBROUTINE ILLUM.	LIN10020
21	C		LIN10021
22	C	*****INPUT.	LIN10022
23	C		LIN10023
24	C	XD -RIGHT ASCENSION OF EARTH SHADOW CENTER (RADIANS)	LIN10024
25	C		LIN10025
26	C	YD -DECLINATION OF EARTH SHADOW CENTER (RADIANS)	LIN10026
27	C		LIN10027
28	C	SHADOW -RADIUS OF EARTH SHADOW REGION (RADIANS)	LIN10028
29	C		LIN10029
30	C	GHA -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURSLIN10030	LIN10030



31	C		-UNIVERSAL TIME (HRS)	LIN10031
32	C			LIN10032
33	C	DGWA	-HOURLY CHANGE FOR SIDEREAL TIME	LIN10033
34	C			LIN10034
35	C	RTW	-CONVERSION FACTOR FROM RADJANS TO HOURS	LIN10035
36	C			LIN10036
37	C	RLANDA	-LONGITUDE OF RELEASE POINT (RADJANS)	LIN10037
38	C			LIN10038
39	C	PHI	-DECLINATION OF INTERSECTING POINT FOR CASE IN	LIN10039
40	C		-QUESTION (RADJANS)	LIN10040
41	C			LIN10041
42	C	C	-APPLICABLE CONSTANT FOR CLOUD DRIFT (RADJANS/HR)	LIN10042
43	C			LIN10043
44	C			LIN10044
45	C	*****OU7PU7-		LIN10045
46	C			LIN10046
47	C	T1	-POSSIBLE TIME OF RELEASE FOR CASE IN QUESTION (HR)	LIN10047
48	C			LIN10048
49	C	T2	-POSSIBLE TIME OF RELEASE FOR CASE IN QUESTION (HR)	LIN10049
50	C			LIN10050
51	C	*****SUBPROGRAMS REQUIRED-		LIN10051
52	C	NONE		LIN10052
53	C			LIN10053
54	C	*****RESTRICTIONS-		LIN10054
55	C	NONE KNOWN		LIN10055
56	C			LIN10056
57	C	*****END OF DOCUMENTATION CARDS*****		LIN10057
58	C			LIN10058
59		SUBROUTINE LIN1 (X0,PHI,C,T1,T2)		LIN10059
60		COMMON/BLK037 PHIP,RLANDA		LIN10060
61		COMMON/BLK0 /DTR, RVD, MYR, HALFR1, RTH, AU, DELTA(4), ERN, DGWA		LIN10061
62		COMMON/BLK0 /SUNL, GWA		LIN10062
63		COMMON/BLK1 /SHADOW		LIN10063
64		DOUBLE PRECISION DTR, RVD, MYR, HALFR1		LIN10064
65		TEMP =SRT(SHADOW*SHADOW-(RMI-Y2)*PHI*(Y0)+RTH/DGWA		LIN10065
66		T2 =((X0-RLANDA*B)*RTH/GWA)/DTR		LIN10066 2
67		T1 =Y2 +TEMP		LIN10067 3
68		T2 =Y2 -TEMP		LIN10068 4
69		T1 =AHOD(T1*24,0)		LIN10069 5
70		T2 =AHOD(T2*24,0)		LIN10070 6
71		IF (T2.LT.0) T2 =T2 + 24.0		LIN10071 7
72		IF (T1.LT.0) T1 =T1 + 24.0		LIN10072 10
73		RETURN		LIN10073 13
74		END		LIN10074 14

23857 WORDS OF MEMORY USED BY THIS COMPILATION

67906 01 09-25-72 11,799 REPEITIVE EARTH SHADOW CALCULATIONS

\*\*\*\*\*ROUTINE LIN1\*\*\*\*\*

PREFACE

PROGRAM BREAK 168  
COMMON LENGTH 8  
V COUNT BITS 9

PRIMARY SYMDEF ENTRV

LIN1 8

SECONDARY SYMDEF ENTRV

BLOCK LENGTH

1 BLK03 8  
2 BLK0 20  
3 BLK0 2  
4 BLK1 1

SYMDEF

3 80RV  
 164 TO THE NEXT AVAILABLE LOCATION.  
 GMAP VERSION/ASSEMBLY DATES JMAP 090171/052571 JMRB 090171/052571 JMPC 050171/052571  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
 66 19279 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY?

67906 01 0V-05-72 15.80E SUBROUTINE RDEPH

1	CRDEP	SUBROUTINE RDEPH	RDEP0001
2	C		RDEP0003
3		SUBROUTINE RDEPH(YEAR, DAY, ET, ANS)	RDEP0002
4	C	.....START OF DOCUMENTATION CARDS.....	RDEP0005
5	C		RDEP0006
6	C	NASA/HALLOES VERSION OF 01/01/69	RDEP0007
7	C		RDEP0008
8	C	LANGUAGE = FORTRAN IV	RDEP0009
9	C		RDEP0004
10	C	MACHINE = GE 625	RDEP0010
11	C		RDEP0011
12	C	PURPOSE	RDEP0012
13	C	RDEPH COMPUTES THE SUN AND MOONS' POSITION VECTOR	RDEP0013
14	C		RDEP0014
15	C	METHOD	RDEP0015
16	C	THIS ROUTINE USES A THIRD DEGREE POLYNOMIAL TO INTERPOLATE	RDEP0016
17	C	TO A DESIRED ACCURACY OF APPROXIMATELY 5 ARC SECONDS	RDEP0017
18	C		RDEP0018
19	C	RESTRICTIONS	RDEP0019
20	C		RDEP0020
21	C	EPHEMERIS DATA IS PRESENTLY AVAILABLE FOR THE YEARS 1972-1980	RDEP0021
22	C		RDEP0022
23	C	CALLING SEQUENCE	RDEP0023
24	C		RDEP0024
25	C	CALL RDEPH(YEAR, DAY, ET, ANS)	RDEP0025
26	C		RDEP0026
27	C	INPUT	RDEP0027
28	C		RDEP0028
29	C	YEAR = THE YEAR NUMBER	RDEP0029
30	C	DAY = THE DAY OF YEAR	RDEP0030
31	C	ET = THE EPHEMERIS TIME PAST THE EPOCH DATE (HOURS)	RDEP0031
32	C		RDEP0032
33	C	OUTPUT	RDEP0033
34	C		RDEP0034
35	C	ANS(1) = THE SUN'S RIGHT ASCENSION (RADIAN)	RDEP0035
36	C	ANS(2) = THE SUN'S DECLINATION (RADIAN)	RDEP0036
37	C	ANS(3) = THE SUN'S RADIUS VECTOR (A, U,)	RDEP0037
38	C		RDEP0038
39	C	ANS(4-6) = THE INERTIAL X, Y, Z COORDINATES OF THE SUN (AU)	RDEP0039
40	C		RDEP0040
41	C	ANS(7) = THE MOONS RIGHT ASCENSION (RADIAN)	RDEP0041
42	C	ANS(8) = THE MOONS DECLINATION (RADIAN)	RDEP0042
43	C	ANS(9) = THE MOONS RADIUS VECTOR (EARTH RADII)	RDEP0043
44	C		RDEP0044
45	C	ANS(10-12) = THE INERTIAL X, Y, Z COORDINATES OF THE MOON (EARTH RADII)	RDEP0045
46	C	SUBPROGRAMS REQUIRED	RDEP0046
47	C	SUBROUTINE TABLE	RDEP0047
48	C		RDEP0048
49	C	.....END OF DOCUMENTATION CARDS.....	RDEP0049
50	C		RDEP0050
51		INTEGER YEAR, DAY, XRT, YRLAST	RDEP0051
52		DIMENSION NAME(9)	RDEP0052
53		DIMENSION ANS(12), BETAS(24), Y(4), SUM(2), DIF(2)	RDEP0053
54		DOUBLE PRECISION BEVA, X, Y, SUM, DIF	RDEP0054
55		DOUBLE PRECISION PI	RDEP0055
56		COMMON /EPRB[K/ Y, I	RDEP0056
57		DATA PI/3.141592653589793238D 01/	RDEP0057
58		DATA NAME/ 6HYEAR72,6HYEAR73,6HYEAR74,6HYEAR75,6HYEAR76,6HYEAR77,	RDEP0058
59	1	6HYEAR78,6HYEAR79,6HYEAR80/, ILAST/0/, YRLAST/0/	RDEP0059
60	C		RDEP0060
61		YR = YEAR	RDEP0061
62	C	ADJUST THE DAY NUMBER	RDEP0062

63	C		RDEP0063	
64		I = EY/24,0	RDEP0064	2
65		I = DAY b I	RDEP0065	3
66	C		RDEP0066	
67	C	COMPUTE THE CODED VALUE OF X	RDEP0067	
68	C		RDEP0068	
69		TIME = AMOD(EY,24,0)	RDEP0069	4
70		X = TIME/12,000 = 1,000	RDEP0070	5
71		5 IF(I,GT,0,AND,I,LT,566) GO TO 20	RDEP0071	6
72	C		RDEP0072	
73	C	COMPUTE THE NUMBER OF DAYS IN THE CURRENT YEAR	RDEP0073	
74	C		RDEP0074	
75		NDPYR = 365	RDEP0075	9
76		IF(MOD(YR,4),EQ,0) NDPYR=366	RDEP0076	10
77		IF(1-NDPYR) 10*20,15	RDEP0077	13
78		10 YR = YR-1	RDEP0078	14
79		I = 1+365	RDEP0079	15
80	C		RDEP0080	
81	C	IS THE NEW YEAR OF EPOCH A LEAP YEAR	RDEP0081	
82	C		RDEP0082	
83		IF(MOD(YR,4),EQ,0) I=1+1	RDEP0083	16
84		GO TO 5	RDEP0084	19
85		15 YR = YR-1	RDEP0085	20
86		I = 1-NDPYR	RDEP0086	21
87		GO TO 5	RDEP0087	22
88		20 IF(YR,LT,1972,OR,YR,GT,1980) GO TO 200	RDEP0088	23
89	C		RDEP0089	
90	C	HAS THE YEAR CHANGED SINCE THE LAST CALL	RDEP0090	
91	C		RDEP0091	
92		IF(YR,EQ,YRLAST) GO TO 25	RDEP0092	26
93		YRLAST = YR	RDEP0093	29
94		IYR = YR - 1971	RDEP0094	30
95		LNAME = NAME(IYR)	RDEP0095	31
96	C		RDEP0096	
97	C	LOAD THE LINK FOR THE CORRECT YEAR	RDEP0097	
98	C		RDEP0098	
99		CALL LLINK(LNAME)	RDEP0099	32
100		24 GO TO 30	RDEP0100	33
101	C		RDEP0101	
102	C	HAS THE DAY OF YEAR CHANGED SINCE THE LAST ENTRY	RDEP0102	
103	C		RDEP0103	
104		25 IF(I,NO,ILAST) GO TO 75	RDEP0104	34
105		30 ILAST = I	RDEP0105	37
106	C		RDEP0106	
107	C	INTERPOLATE FOR ALL SIX TABLE ENTRIES	RDEP0107	
108		DO 50 J=1,24,4	RDEP0108	38
109	C	SUBROUTINE TABLE = CONTAINS THE EPOCH'S DATA	RDEP0109	
110		CALL TABLE	RDEP0110	39
111	C	MAKE SURE Y'S FOR R,A, ARE NOT MODULAR	RDEP0111	
112		IF (J,EQ,1) GO TO 36	RDEP0112	40
113		IF (J,NE,13) GO TO 35	RDEP0113	43
114		36 IF (DABS(Y(1)-Y(2)),GT,P1) Y(2) = Y(2)+2,DO*P1	RDEP0114	46
115		IF (DABS(Y(2)-Y(3)),GT,P1) Y(3) = Y(3)+2,DO*P1	RDEP0115	49
116		IF (DABS(Y(3)-Y(4)),GT,P1) Y(4) = Y(4)+2,DO*P1	RDEP0116	52
117		35 SUM(1) = Y(1)+Y(4)	RDEP0117	55
118		SUM(2) = Y(2)+Y(3)	RDEP0118	56
119		DIF(1) = Y(4)-Y(1)	RDEP0119	57
120		DIF(2) = Y(3)-Y(2)	RDEP0120	58
121	C		RDEP0121	
122	C	COMPUTE THE COEFFICIENTS FOR A THIRD DEGREE POLYNOMIAL	RDEP0122	
123	C		RDEP0123	
124		BETA(J) = 27,0*SUM(2) = 3,0*SUM(1)	RDEP0124	59
125		BETA(J+1) = 27,0*DIF(2) = DIF(1)	RDEP0125	60
126		BETA(J+2) = 3,0*(SUM(1)-SUM(2))	RDEP0126	61
127		BETA(J+3) = DIF(1) = 3,0*DIF(2)	RDEP0127	62
128		50 I = I + 369	RDEP0128	63
129	C		RDEP0129	
130	C	COMPUTE THE RIGHT ASCENSION AND DECLINATION FOR THE SUN AND MOON	RDEP0130	
131	C		RDEP0131	
132		75 J = 1	RDEP0132	65
133		DO 80 K=1,2,6	RDEP0133	66
134		M = L+2	RDEP0134	67
135		DC 80 K=L,M	RDEP0135	68
136		ANS(K) = ((( BETA(J+3)*X+BETA(J+2))**X+BETA(J+1)*X+BETA(J))/6670	RDEP0136	69

137	00	Jed04	RDEP0137	70
138	C		RDEP0138	
139	C	COMPUTE THE W, Y, Z COORDINATES OF THE SUN AND MOON	RDEP0139	
140	C		RDEP0140	
141		DO 90 K01,7.6	RDEP0141	73
142		RA = ANS(K)	RDEP0142	74
143		DB = ANS(K21)	RDEP0143	75
144		R = ANS(K22)	RDEP0144	76
145		COSRA = COS(RA)	RDEP0145	77
146		SINRA = SIN(RA)	RDEP0146	78
147		RCOSDB = RCOS(DB)	RDEP0147	79
148		ANS(K63) = RCOSDB * COSRA	RDEP0148	80
149		ANS(K64) = RCOSDB * SINRA	RDEP0149	81
150		ANS(K65) = R * SIN(DB)	RDEP0150	82
151	90	CONTINUE	RDEP0151	83
152	100	RETURN	RDEP0152	85
153	200	WRITE(6,306) I, YR	RDEP0153	86
154		TOP	RDEP0154	89
155	300	FORMAT(6H ABNORMAL TERMINATION * EPHMERIS DATA NOT AVAILABLE FOR	RDEP0155	90
156		1 THE 14, 7H DAY OF 15)	RDEP0156	
157		END	RDEP0157	90

28781 WORDS OF MEMORY USED BY THIS COMPILATION

67906 01 09-25-72 11,816 SUBROUTINE RBERM

PREFACE

PROGRAM BREAK 678  
COMMON LENGTH 0  
V COUNT BITS 5  
PRIMARY SYMDEF ENTRY

RBERM 0

SECONDARY SYMDEF ENTRY

ELBLK LENGTH

1 ENBLK 11

SYMREF

- 2 COS
- 3 SIN
- 4 LLTAK
- 5 TABLE
- 6 ,FENV,
- 7 ,FEXIT
- 10 ,FPL,
- 11 ,FORD,

673 IS THE NEXT AVAILABLE LOCATION

GNAP VERSION/ASSEMBLY DATES JMAP 050172/052571 JMRB 046171/052571 JMPC 050171/052571  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19497 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY

67906 01 09-25-72 11,816 TOTAL SKY BRIGHTNESS MAIN SUBPROGRAM

1	CNLIT	TOTAL SKY BRIGHTNESS MAIN SUBPROGRAM	NLIT0001
2	C		NLIT0002
3	C	***** NIVE L'ITE *****	NLIT0003
4	C		NLIT0004
5	C	*****STARY OF DOCUMENTATION CARDS*****	NLIT0005
6	C		NLIT0006
7	C	*****NASA WACLOPS VERSION OF 02X017X0	NLIT0007

8	C		NLIT0008
9	C	*****LANGUAGE=FORTRAN IV	NLIT0009
10	C		NLIT0010
11	C	*****MACHINE=GE 625	NLIT0011
12	C		NLIT0012
13	C	*****PURPOSE	NLIT0013
14	C	TO DETERMINE FROM DAILY TIME PERIODS, THAT PORTION OF THE STATED	NLIT0014
15	C	PERIOD FOR WHICH THE TOTAL SKY BACKGROUND BRIGHTNESS OF THE	NLIT0015
16	C	IONIZED BARIUM CLOUD AS SEEN FROM A GIVEN TRACKING STATION WILL	NLIT0016
17	C	BE LOWER THAN THE STATED CONSTRAINT,	NLIT0017
18	C		NLIT0018
19	C	*****METHOD	NLIT0019
20	C	THIS SET OF SUBPROGRAMS DETERMINES THE TOTAL SKY BACKGROUND	NLIT0020
21	C	BRIGHTNESS FOR DISCRETE UNIVERSAL TIMES OF THE CURRENT DAY,	NLIT0021
22	C	CHECKS ARE MADE EACH TIME THE TOTAL SKY BACKGROUND BRIGHTNESS	NLIT0022
23	C	IS CALCULATED TO DETERMINE IF THE GIVEN VALUE OF THIS	NLIT0023
24	C	CONSTRAINT HAS BEEN EXCEEDED OR NOT, INTEGER VARIABLES N,M,L ARE	NLIT0024
25	C	USED TO RECORD THESE EVENTS, FOR THE EVENT THAT THE CONSTRAINT	NLIT0025
26	C	IS EXCEEDED, THE PROPER VARIABLE N,M,L IS GIVEN A VALUE OF ONE,	NLIT0026
27	C	IF THE CONSTRAINT IS NOT EXCEEDED THEN THE PROPER INTEGER	NLIT0027
28	C	VARIABLE IS SET TO ZERO?	NLIT0028
29	C		NLIT0029
30	C	USING THE INI AND IMI INTEGER VARIABLES, SUCCESSIVE POINTS ARE	NLIT0030
31	C	CALCULATED IN HALF HOUR TIME INCREMENTS UNTIL A CHANGE OF EVENT	NLIT0031
32	C	OCCURS (N NOT EQUAL TO M), THE INI MAINTAINS THE CODE OF WHAT	NLIT0032
33	C	THE CHANGE IN EVENT IS FROM, THE IMI VARIABLE RECORDS THE	NLIT0033
34	C	EVENT OF THE CALCULATION PERFORMED AT A TIME BETWEEN THOSE OF	NLIT0034
35	C	EVENTS INI AND IMI, THE CALCULATION FOR THE IMI EVENT WHEN	NLIT0035
36	C	REPLACES THOSE OF EITHER THE INI OR IMI EVENT, WHICHEVER IS THE	NLIT0036
37	C	SAME AS THE IMI EVENT, THIS PROCESS IS REPEATED UNTIL THE	NLIT0037
38	C	ROUTINE CONVERGES TO THE TIME OF EVENT CHANGE WITH AN ACCURACY	NLIT0038
39	C	OF .008 HOURS,	NLIT0039
40	C		NLIT0040
41	C	THESE TIMES FOUND ARE THEN THE START/STOP RELEASE TIME	NLIT0041
42	C	INTERVALS FOR SATISFYING THE TOTAL SKY BRIGHTNESS CONSTRAINT	NLIT0042
43	C	FOR A GIVEN STATION ON A GIVEN DAY,	NLIT0043
44	C		NLIT0044
45	C	IN ADDITION, IF THE EVENT RECORDED FOR A GIVEN UNIVERSAL TIME IS	NLIT0045
46	C	ZERO (A GOOD RELEASE TIME), THE SUBROUTINE TRACK1 CHECKS TO	NLIT0046
47	C	MAKE SURE THE CONSTRAINT IS NOT EXCEEDED DURING THE	NLIT0047
48	C	EXPERIMENTAL PERIOD, IF THE BRIGHTNESS CONSTRAINT IS EXCEEDED	NLIT0048
49	C	DURING THE EXPERIMENTAL PERIOD, THEN THE UNIVERSAL TIME RECORDED	NLIT0049
50	C	IS CONSIDERED AS NOT FAVORABLE AND THE EVENT CODE FOR THAT TIME	NLIT0050
51	C	IS CHANGED TO ONE,	NLIT0051
52	C		NLIT0052
53	C	*****INPUTS	NLIT0053
54	C		NLIT0054
55	C	NS -THE NUMBER OF STATIONS USED IN THE PROGRAM	NLIT0055
56	C		NLIT0056
57	C	NOB(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED	NLIT0057
58	C		NLIT0058
59	C	R(5) -INPUT VALUE FOR TOTAL SKY BACKGROUND BRIGHTNESS	NLIT0059
60	C	-(RAYLEIGHTS)	NLIT0060
61	C		NLIT0061
62	C	R(7) -MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS)	NLIT0062
63	C		NLIT0063
64	C	BA(12,7) -AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE	NLIT0064
65	C	-GIVEN POSITION OF THE CLOUD (RAYLEIGHTS)	NLIT0065
66	C		NLIT0066
67	C	C(22,7) -COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION	NLIT0067
68	C	-OF THE TRACKING STATION TO THE CLOUD AND USED TO	NLIT0068
69	C	-SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS	NLIT0069
70	C		NLIT0070
71	C	ZD -ZODIACAL CLOUD BRIGHTNESS OF A POINT IN THE SKY	NLIT0071
72	C	-(RAYLEIGHTS)	NLIT0072
73	C		NLIT0073
74	C	ST -UNRESOLVED STAR BRIGHTNESS OF A POINT IN THE SKY	NLIT0074
75	C	-(RAYLEIGHTS)	NLIT0075
76	C		NLIT0076
77	C		NLIT0077
78	C	*****OUTPUT	NLIT0078
79	C		NLIT0079
80	C	WINDOWS(6,5,12) -THE DAILY RELEASE WINDOW START/STOP TIMES,	NLIT0080



81	C	-1ST INDEX FOR STOPPING STABY/STOP TIMES;	NLIT0081
82	C	-1ST INDEX FOR START TIMES	NLIT0082
83	C	-2ND INDEX FOR STOP TIMES	NLIT0083
84	C	-2ND INDEX FOR TIME CONSTRAINT	NLIT0084
85	C	- 5-TOTAL SKY BACKGROUND BRIGHTNESS	NLIT0085
86	C	-3RD INDEX FOR THE STATION NUMBER	NLIT0086
87	C		NLIT0087
88	C	*****RESTRICTIONS*	NLIT0088
89	C	YSTOP MUST BE NUMERICALLY GREATER THAN YSTART, ONLY TWELVE	NLIT0089
90	C	STATIONS MAY BE USED, YSTOP AND YSTART ARE ACCURATE TO ONE	NLIT0090
91	C	HOUR OF TIME,	NLIT0091
92	C		NLIT0092
93	C	*****SUBPROGRAMS REQUIRED*	NLIT0093
94	C	CEVOI	NLIT0094
95	C	ZODLIT	NLIT0095
96	C	ITR	NLIT0096
97	C	ZTABLE	NLIT0097
98	C	STRLIT	NLIT0098
99	C	TRACK	NLIT0099
100	C		NLIT0100
101	C	*****REMARK*	NLIT0101
102	C	ONLY ELEVEN TRACKING STATIONS CAN BE USED AS INPUT IF ONE OF	NLIT0102
103	C	THESE STATIONS IS AN AIRCRAFT,	NLIT0103
104	C		NLIT0104
105	C	*****END OF DOCUMENTATION CARDS*****	NLIT0105
106	C		NLIT0106
107		SWROU TIME NLITR	NLIT0107
108		COMMON/BLK17R(8)	NLIT0108
109		COMMON/BLK17NS, NOS(12)	NLIT0109
110		COMMON/BLK17 WINDOW(675,12)	NLIT0110
111		COMMON/BLK17 WX(127, NY(12), UZ(22), BA(12,7), C(12,7), JEND	NLIT0111
112		COMMON/BLK17ZD, S9	NLIT0112
113	C		NLIT0113
114	C	BEGIN CALCULATION OF TOTAL BRIGHTNESS FOR EACH STATION	NLIT0114
115		DO 100 I=1,NS	NLIT0115
116		I = NS(I)	NLIT0116
117	C	SET FIRST STORAGE TIME TO ZERO FOR STATION (I)	NLIT0117
118		WINDOW(I,1) = 0.0	NLIT0118
119	C	SET STORAGE FOR TIMES TO 24.0 FOR STATION(I)	NLIT0119
120		DO 200 K=1,24	NLIT0120
121		200 WINDOW(I,K) = 24.0	NLIT0121
122		K=1	NLIT0122
123		YSTART=0.	NLIT0123
124		Y = YSTART	NLIT0124
125	C	FIND INERTIAL COMPONENTS OF VECTOR W	NLIT0125
126		CALL NCV01 (Y1)	NLIT0126
127	C	FIND THE BRIGHTNESS DUE TO ZODIACAL LIGHT AND STARLIGHT AT TIME Y1	NLIT0127
128		CALL ZODLIT (Y1)	NLIT0128
129		CALL STRLIT	NLIT0129
130	C	FIND TOTAL BRIGHTNESS AT TIME Y1	NLIT0130
131		BY = WA(Y,1) + (ZD*ST) + E(1,1)	NLIT0131
132	C	IF BY LESS THAN RESTR	NLIT0132
133		IF (BY - R(1)) 24.25*23	NLIT0133
134	C	NO - THEN SET FLAG=1	NLIT0134
135		IF N = 1	NLIT0135
136		GO TO 11	NLIT0136
137	C	YES - THEN SET FLAG=0 AND CHECK FOR BRIGHTNESS DURING THE TRACKING	NLIT0137
138	C	PERIOD,	NLIT0138
139		IF N = 0	NLIT0139
140		IF (JEND,GT,1) CALL TRACK (Y1,N,0)	NLIT0140
141	C	CHECK POINT HALF HOUR LATER AND USE SAME LOGIC	NLIT0141
142		IF Y = Y1 + 0.5	NLIT0142
143		CALL NCV01 (Y2)	NLIT0143
144		CALL ZODLIT (Y2)	NLIT0144
145		CALL STRLIT	NLIT0145
146		BY = WA(Y,1) + (ZD*ST) + E(1,1)	NLIT0146
147		IF (BY - R(1)) 24.25*23	NLIT0147
148		IF N = 1	NLIT0148
149		GO TO 27	NLIT0149
150		IF N = 0	NLIT0150
151		IF (JEND,GT,1) CALL TRACK (Y2,N,0)	NLIT0151
152	C	IF N=1	NLIT0152
153		IF (N-N) 24.25*23	NLIT0153
154	C	YES - WHEN NO CHANGE IN EVENT DURING 24HOUR-CHECK NEXT TIME INCREMENT	NLIT0154

155	20 Y1	= T2	NLIT0155	34	
156	IF (Y2,LY,24.0) GO TO 11		NLIT0156	35	
157	Y2	= 24.0	NLIT0157	38	
158	GO TO 38		NLIT0158	39	
159	C NO - TIME CHANGE OF EVENT OCCURRED-MUST SHOW KIND TIME OF CHANGE			NLIT0159	
160	29 IF (Y2-Y1);LY,000) GO TO 35		NLIT0160	40	
161	Y3	= Y2 + 0.24(Y2-Y1)	NLIT0161	43	
162	32 CALL BCY01 (Y3,1)		NLIT0162	44	
163	CALL ZODLIY (Y3)		NLIT0163	45	
164	CALL BYRLIT		NLIT0164	46	
165	BY	= BAY(Y,1) + (ZD*SY) + E(Y,1)	NLIT0165	47	
166	IF (BY > Y3) 32,31,31		NLIT0166	48	
167	31 L	= 1	NLIT0167	49	
168	GO TO 33		NLIT0168	50	
169	32 L	= 0	NLIT0169	51	
170	IF (JEND;GY,1) CALL FRACK (Y3,L,1)		NLIT0170	52	
171	33 IF (L-N) 39,34,39		NLIT0171	55	
172	C IF YES THEN TIME OF CHANGE IS BETWEEN Y2 AND Y3			NLIT0172	
173	C IF NO THEN TIME OF CHANGE IS BETWEEN Y2 AND Y3			NLIT0173	
174	34 Y2	= Y3	NLIT0174	56	
175	GO TO 29		NLIT0175	57	
176	35 Y3	= Y3	NLIT0176	58	
177	GO TO 29		NLIT0177	59	
178	C IS Y3 LESS THAN TSTOP-IF NOT THEN ENTIRE INTERVAL HAS BEEN CHECKED			NLIT0178	
179	36 IF (Y3,LY,24.0) GO TO 38		NLIT0179	60	
180	Y3	= 24.0	NLIT0180	63	
181	38 IF (N) 41,42,41		NLIT0181	64	
182	41 YSTARV;Y3		NLIT0182	65	
183	N	= 0	NLIT0183	66	
184	GO TO 43		NLIT0184	67	
185	C STORE TIME INTERVAL FOR SKY BRIGHTNESS CONSTRAINT			NLIT0185	
186	42 WINDOW(K;1,5,1);Y3		NLIT0186	68	
187	WINDOW(K;1,5,1);Y3		NLIT0187	69	
188	K;K;2		NLIT0188	70	
189	YSTARV;Y3		NLIT0189	71	
190	N	= 1	NLIT0190	72	
191	43 IF (Y3,LY,24.0) GO TO 11		NLIT0191	73	
192	100 CONTINUE			NLIT0192	76
193	RETURN			NLIT0193	78
194	END			NLIT0194	79

28884 WORDS OF MEMORY USED BY THIS COMPILATION

67906 01 09-25-72 11,822 TOTAL SKV BRIGHTNESS MAIN SUBPROGRAM

PREFACE

PROGRAM BREAK 405  
COMMON LENGTH 8  
V COUNT BITS 8

PRIMARY SYMDEF ENTRY

NLIVE 8

SECONDARY SYMDEF ENTRY

BLOCK	LENGTH
1 BLK01	18
2 BLK02	19
3 BLK03	558
4 BLK04	319
5 BLK05	8

SYMDEF

6 BCY01  
7 FRACK

10 SYBUT

11 ZODUIT

404 IS THE NEXT AVAILABLE LOCATION,

GMAP VERSION/ASSEMBLY DATES JMAP 050171/052571 JMRB 050171/052571 JMPC 050171/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

\*\* 19429 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY\*

07906 01 09-25-72 11,842

1	C	CECTI		GCT10001
2	C			GCT10002
3	C	***** SUBROUTINE CECTI *****		GCT10003
4	C			GCT10004
5	C	***** START OF DOCUMENTATION CARDS *****		GCT10005
6	C			GCT10006
7	C	***** NASA WALLEPS VERSION OF 02/01/70		GCT10007
8	C			GCT10008
9	C	***** LANGUAGE = FORTRAN IV		GCT10009
10	C			GCT10010
11	C	***** MACHINE = GE 625		GCT10011
12	C			GCT10012
13	C	***** PURPOSE		GCT10013
14	C	TO CONVERT GEOCENTRIC COORDINATES TO INERTIAL COORDINATES?		GCT10014
15	C			GCT10015
16	C	***** METHOD		GCT10016
17	C	FIRST THE SIN AND COS OF THE GREENWICH MEAN SIDEREAL HOUR ANGLE		GCT10017
18	C	IS CALCULATED FOR THE SPECIFIC TIME IN QUESTION, THESE VALUES		GCT10018
19	C	ARE THEN USED TO CONVERT THE GEOCENTRIC COORDINATES TO INERTIAL		GCT10019
20	C			GCT10020
21	C	***** INPUT		GCT10021
22	C			GCT10022
23	C	GHA	-GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS	GCT10023
24	C		-UNIVERSAL TIME (HRS)	GCT10024
25	C			GCT10025
26	C	WX	-GEOCENTRIC X COMPONENT OF INPUT VECTOR	GCT10026
27	C			GCT10027
28	C	WY	-GEOCENTRIC Y COMPONENT OF INPUT VECTOR	GCT10028
29	C			GCT10029
30	C	WZ	-GEOCENTRIC Z COMPONENT OF INPUT VECTOR	GCT10030
31	C			GCT10031
32	C	T	-CURRENT UNIVERSAL TIME (HOURS)	GCT10032
33	C			GCT10033
34	C	I	-TRACKING STATION NUMBER	GCT10034
35	C			GCT10035
36	C	HTR	-CONVERSION FROM HOURS TO RADIAN	GCT10036
37	C			GCT10037
38	C	DGHA	-HOURLY CHANGE FOR SIDEREAL TIME	GCT10038
39	C			GCT10039
40	C			GCT10040
41	C	***** OUTPUT		GCT10041
42	C			GCT10042
43	C	W1	-INERTIAL X COMPONENT OF OUTPUT VECTOR	GCT10043
44	C			GCT10044
45	C	W2	-INERTIAL Y COMPONENT OF OUTPUT VECTOR	GCT10045
46	C			GCT10046
47	C	W3	-INERTIAL Z COMPONENT OF OUTPUT VECTOR	GCT10047
48	C			GCT10048
49	C	***** RESTRICTIONS		GCT10049
50	C	NOBE KNOWN		GCT10050
51	C			GCT10051
52	C	***** SUBPROGRAMS REQUIRED		GCT10052
53	C	NOBE		GCT10053
54	C			GCT10054
55	C	***** END OF DOCUMENTATION CARDS *****		GCT10055
56	C			GCT10056
57	C	SUBROUTINE CECTI(I,J)		GCT10057
58	C	COMMON/BLK1 /DTN, RTD, WTR, HALPRT, RTM, AU, DELTA(4), ERN, DGHA		GCT10058
59	C	COMMON/BLK2 /SUNL, GHA		GCT10059
60	C	COMMON/BLK3 /WX(12), WY(12), WZ(12), BA(12,7), C(12,7), JEQD		GCT10060
61	C	COMMON/BLK4 /W1, W2, W3		GCT10061



62	DOUBLE PRECISION DVR; RVD, MYB, WALPPI	GCT10062
63	SN = SIN((GWA +Y*DGWA)*MYB)	GCT10063
64	CS = COS((GWA +Y*DGWA)*MYB)	GCT10064 2
65	WZ = WX(I)*CS - WY(I)*SN	GCT10065 3
66	WZ = WX(I)*SN + WY(I)*CS	GCT10066 4
67	WJ = WZ(I)	GCT10067 5
68	RETURN	GCT10068 6
69	END	GCT10069 7

28883 WORDS OF MEMORY USED BY THIS COMPIATION

07906 01 09-25-72 11,849

PREFACE

PROGRAM BREAK 72  
COMMON LENGTH 6  
V COUNTY DIVS 9

PRIMARY SYMDEF ENTRY

GCT01 8

SECONDARY SYMDEF ENTRY

BLK#	LENGTH
1 BLK#	20
2 BLK#	8
3 BLK#	319
4 BLK#1	3

SYNREF

5 CDB  
6 SIB

72 IS THE NEXT AVAILABLE LOCATION,  
GNAP VERSION/ASSEMBLY DATES JMPA 050172/052571 JMRB 056171/052571 JMPC 050173/052571  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
66 19238 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY.

07906 01 09-25-72 11,848 ZODIACAL LIGHT

\*\*\*\*\* SUBROUTINE ZODLTY \*\*\*\*\*

1	CZODL ZODIACAL LIGHT	ZODL0001
2	C***** SUBROUTINE ZODLTY *****	ZODL0002
3	C	ZODL0003
4	C*****START OF DOCUMENTATION CARDS*****	ZODL0004
5	C	ZODL0005
6	C*****NASA WALLEPS VERSION OF 02201/70	ZODL0006
7	C	ZODL0007
8	C*****LANGUAGE=FORTRAN IV	ZODL0008
9	C	ZODL0009
10	C*****MACHINE=GE 625	ZODL0010
11	C	ZODL0011
12	C***** PURPOSE	ZODL0012
13	C TO CALCULATE THE ZODIACAL LIGHT FOR A GIVEN SET OF LOOK	ZODL0013
14	C COORDINATES	ZODL0014
15	C	ZODL0015
16	C*****METHOD	ZODL0016
17	C FIRST SUBROUTINE ITS IS CALLED AND THE INERTIAL COORDINATES	ZODL0017
18	C OF THE VECTOR FROM THE STATION TO THE TEST CLOUD ARE CONVERTED	ZODL0018
19	C TO AN ECLIPYIC LATITUDE AND LONGITUDE; THE ECLIPYIC LATITUDE	ZODL0019
20	C AND LONGITUDE ARE THEN MADE ABSOLUTE VALUES, SUBROUTINE ZVABLE	ZODL0020
21	C IS THEN CALLED TO TRANSLATE THESE VALUES INTO ZODIACAL LIGHT	ZODL0021
22	C VALUES IN RAYLEIGHS	ZODL0022
23	C	ZODL0023
24	C*****INPUT	ZODL0024

25	C				ZODL0025
26	C	W1	-INERTIAL X COMPONENT OF VECTOR FROM STATION(I)		ZODL0026
27	C		-% CLOUD		ZODL0027
28	C				ZODL0028
29	C	W2	-INERTIAL Y COMPONENT OF VECTOR FROM STATION(I)		ZODL0029
30	C		-% CLOUD		ZODL0030
31	C				ZODL0031
32	C	W3	-INERTIAL Z COMPONENT OF VECTOR FROM STATION(I)		ZODL0032
33	C		-% CLOUD		ZODL0033
34	C				ZODL0034
35	C				ZODL0035
36	C	***** OUTPUT			ZODL0036
37	C				ZODL0037
38	C	ZD	-ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY		ZODL0038
39	C		-(RAYLEIGH)		ZODL0039
40	C				ZODL0040
41	C	*****RESTRICTIONS			ZODL0041
42	C	NONE			ZODL0042
43	C				ZODL0043
44	C	*****SUBPROGRAMS REQUIRED-			ZODL0044
45	C	IYB			ZODL0045
46	C	ZYABL			ZODL0046
47	C				ZODL0047
48	C	*****END OF DOCUMENTATION CARDS*****			ZODL0048
49	C				ZODL0049
50		SUBROUTINE ZODLIT (V)			ZODL0050
51		COMMON/BLKN2/PHIE, OMEGA			ZODL0051
52	C	TRANSFORM INERTIAL RECTANGULAR COMPONENTS OF INPUT VECTOR TO ELLIPTIC			ZODL0052
53	C	COORDINATES			ZODL0053
54		CALL IYB			ZODL0054
55		PUTE GAUS(PHIE)			ZODL0055
56	C	PERFORM TABLE LOOKUP FOR VALUE OF ZODIACAL LIGHT,			ZODL0056
57		CALL ZYABL (Y)			ZODL0057
58		RETURN			ZODL0058
59		END			ZODL0059

25762 WORDS OF MEMORY USED BY THIS COMPILATION

67906 01 09-25-72 11,892 ZODIACAL LIGHT

\*\*\*\*\* SUBROUTINE ZODLIT \*\*\*\*\*

PREPAGE

PROGRAM BREAK 26  
COMMON LENGTH 8  
V COUNT BITS 9

PRIMARY SYNDP ENTRY

ZODLIT 8

SECONDARY SYNDP ENTRY

BLKX LENGTH

1 BLKN2 8

SUBREF

2 IYB

3 ZYABL

26 IS THE NEXT AVAILABLE LOCATION,

GNAP VERSION/ASSEMBLY DATES JHPA 050171/052971 JNRB 050171/052971 JHPC 050171/052971  
THERE WERE 80 WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19168 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY,

67066 01 09-25-72 11,856 INERTIAL TO ECLIPTIC TRANSFORMATION

\*\*\*\*\* SUBROUTINE IYE \*\*\*\*\*

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1      C:ITWO      INERTIAL TO ECLIPTIC TRANSFORMATION      IYE00001
2      C***** SUBROUTINE IYE ***** IYE00002
3      C      IYE00003
4      C***** START OF DOCUMENTATION CARDS ***** IYE00004
5      C      IYE00005
6      C***** NASA WALLDPS VERSION OF 02101470 IYE00006
7      C      IYE00007
8      C***** LANGUAGE FORTRAN IV IYE00008
9      C      IYE00009
10     C***** MACHINE-GE 625 IYE00010
11     C      IYE00011
12     C***** PURPOSE IYE00012
13     C      TO TRANSFORM FROM AN INERTIAL RECTANGULAR COORDINATE SYSTEM AS IYE00013
14     C      DESCRIBED IN USER DOCUMENTATION AND TO FIND THE IYE00014
15     C      ECLIPTIC LATITUDE AND LONGITUDE OF A POINT OF INTERSECTION OF IYE00015
16     C      AN INPUT VECTOR WITH A CELESTIAL SPHERE, IYE00016
17     C      IYE00017
18     C***** METHOD IYE00018
19     C      ROTATION IS PERFORMED ON THE INERTIAL X,Y,Z COMPONENTS TO GIVE IYE00019
20     C      ECLIPTIC X,Y,Z VALUES. THESE VALUES ARE USED TO CALCULATE THE IYE00020
21     C      ECLIPTIC LATITUDE AND LONGITUDE, IYE00021
22     C      IYE00022
23     C***** INPUT IYE00023
24     C      IYE00024
25     C      W1      -INERTIAL X COMPONENT OF VECTOR FROM STATION(1) IYE00025
26     C      -TO CLOUD IYE00026
27     C      IYE00027
28     C      W2      -INERTIAL Y COMPONENT OF VECTOR FROM STATION(1) IYE00028
29     C      -TO CLOUD IYE00029
30     C      IYE00030
31     C      W3      -INERTIAL Z COMPONENT OF VECTOR FROM STATION(1) IYE00031
32     C      -TO CLOUD IYE00032
33     C      IYE00033
34     C      IYE00034
35     C***** OUTPUT IYE00035
36     C      IYE00036
37     C      PHIE      -ECLIPTIC LATITUDE (DEG) IYE00037
38     C      IYE00038
39     C      OMEGA     -ECLIPTIC LONGITUDE (DEG) IYE00039
40     C      IYE00040
41     C      IYE00041
42     C***** INTERNAL PARAMETERS IYE00042
43     C      IYE00043
44     C      XE      -X COMPONENT OF INPUT VECTOR IN ECLIPTIC IYE00044
45     C      COORDINATES IYE00045
46     C      IYE00046
47     C      YE      -Y COMPONENT OF INPUT VECTOR IN ECLIPTIC IYE00047
48     C      COORDINATES IYE00048
49     C      IYE00049
50     C      ZE      -Z COMPONENT OF INPUT VECTOR IN ECLIPTIC IYE00050
51     C      COORDINATES IYE00051
52     C      IYE00052
53     C***** RESTRICTIONS IYE00053
54     C      NONE KNOWN IYE00054
55     C      IYE00055
56     C***** SUBPROGRAMS REQUIRED IYE00056
57     C      NONE IYE00057
58     C      IYE00058
59     C***** END OF DOCUMENTATION CARDS ***** IYE00059
60     C      IYE00060
61     SUBROUTINE IYE IYE00061
62     COMMON/BLKN1/W1, W2, W3 IYE00062
63     COMMON/BLKN2/PHIE, OMEGA IYE00063
64     C PERFORM TRANSFORMATION IYE00064
65     XE = W1 IYE00065
66     YE = 6.91748*W2+8.39979*W3 IYE00066
67     ZE = 8.9039779*W2+8.91748*W3 IYE00067
68     C INSURE XE, YE, ZE ARE COMPONENTS OF A UNITY VECTOR IYE00068
69     RB = 1.0/ SQRT(XE**2 + YE**2 + ZE**2) IYE00069

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70	XE	OXHORE	ITE00070	5
71	YE	OYHORE	ITE00071	6
72	ZB	OZHORE	ITE00072	7
73	C	FIND ONIH, OHNGX	ITE00073	
74		PUTE =AVAN(ZE/SORT(11?-ZE=ZB))=57,295779513	ITE00074	8
75		OMEGAB,AVAN2(YE,XB)=57,295779513	ITE00075	9
76	80	CONTINUE	ITE00076	10
77		RETURN	ITE00077	11
78		END	ITE00078	12

23591 WORDS OF MEMORY USED BY THIS COMPILATION

67906 01 09-25-72 13,868 INERTIAL TO RECTANGULAR TRANSFORMATION

\*\*\*\*\* SUBROUTINE IVE \*\*\*\*\*

PREPARE

PROGRAM BREAK 109  
COMMON LENGTH 9  
V COUNT 0195

PRIMARY SYNDOP ENTRY

IVE 0

SECONDARY SYNDOP ENTRY

BLOCK LENGTH

1 BLK1 3  
2 BLK2 2

SYNREF

3 AYBN  
4 SQBY  
5 AYBN2

139 TO THE NEXT AVAILABLE LOCATION.

GNAP VERSION/ASSEMBLY DATES JHPA 050172/052571 JHRB 050271/052571 JHPC 050172/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

\*\* 19219 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY \*

67906 01 09-25-72 11,935 TABLE OF ZODIACAL LIGHT

\*\*\*\*\* SUBROUTINE ZTABLE \*\*\*\*\*

1	CZTAB	TABLE OF ZODIACAL LIGHT	ZTAB0001
2	C	***** SUBROUTINE ZTABLE *****	ZTAB0002
3	C		ZTAB0003
4	C	*****START OF DOCUMENTATION CARDS*****	ZTAB0004
5	C		ZTAB0005
6	C	*****NABA WALLIPS VERSION OF 02X01/70	ZTAB0006
7	C		ZTAB0007
8	C	*****LANGUAGE PORTMAN IV	ZTAB0008
9	C		ZTAB0009
10	C	*****MACHINE PAGE 025	ZTAB0010
11	C		ZTAB0011
12	C	*****PURPOSE	ZTAB0012
13	C	TO FIND THE ZODIACAL LIGHT BRIGHTNESS AT A PARTICULAR POINT,	ZTAB0013
14	C		ZTAB0014
15	C	*****METHOD	ZTAB0015
16	C	THIS IS A TABLE LOOKUP WITH DOUBLE INTERPOLATION,	ZTAB0016
17	C		ZTAB0017
18	C	*****INRUYS	ZTAB0018
19	C		ZTAB0019
20	C	PHIE -ECLIPIC LATITUDE (DEG)	ZTAB0020
21	C		ZTAB0021
22	C	OMEGAB -ECLIPIC LONGITUDE (DEG)	ZTAB0022
23	C		ZTAB0023

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24 C ZYAB0024
25 C***** OUTPUT ZYAB0025
26 C ZYAB0026
27 C ZD -ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY ZYAB0027
28 C -(RAYLIGHT) ZYAB0028
29 C ZYAB0029
30 C ZYAB0030
31 C*****INTERNAL PARAMETERS ZYAB0031
32 C ZYAB0032
33 C P1 -ECLIPYIC LATITUDE FOR BRIGHTNESS AT POINT #1 ZYAB0033
34 C P2 -ECLIPYIC LATITUDE FOR BRIGHTNESS AT POINT #1.1 ZYAB0034
35 C P3 -ECLIPYIC LONG, FOR BRIGHTNESS AT POINT #1 ZYAB0035
36 C P4 -ECLIPYIC LONG, FOR BRIGHTNESS AT POINT #1.1 ZYAB0036
37 C P5 -ECLIPYIC LONG, FOR BRIGHTNESS AT POINT #1 ZYAB0037
38 C P6 -ECLIPYIC LONG, FOR BRIGHTNESS AT POINT #1.1 ZYAB0038
39 C ZD2 -VALUE OF ZODIACAL LIGHT AT (P1,QA) ZYAB0039
40 C ZD3 -VALUE OF ZODIACAL LIGHT AT (P2,QA) ZYAB0040
41 C ZYAB0041
42 C ZYAB0042
43 C ZYAB0043
44 C ZYAB0044
45 C*****RESTRICTIONS ZYAB0045
46 C NONE KNOWN ZYAB0046
47 C ZYAB0047
48 C*****SUBPROGRAMS REQUIRED ZYAB0048
49 C NONE ZYAB0049
50 C ZYAB0050
51 C*****END OF DOCUMENTATION CARDS***** ZYAB0051
52 C ZYAB0052
53 SUBROUTINE ZTABLE (N) ZYAB0053
54 COMMON/BLK0/SUNL, QNA ZYAB0054
55 COMMON/BLK2/PWIE, OMEGA ZYAB0055
56 COMMON/BLK3/ZD, SY ZYAB0056
57 DIMENSION ZODIAC(10,19) ZYAB0057
58 C DEFINE ZODIACAL LIGHT TABLE ZYAB0058
59 DATA(ZODIAC(1,J),J=1,19)/ 3000, 2000, 1500, 1200, 950, ZYAB0059
60 1 700, 635, 510, 420, 300, 180, 160, 145, 136, ZYAB0060
61 2 33, 138, 146, 160, 180, 200, 190, 180, 170, ZYAB0061
62 DATA(ZODIAC(2,J),J=1,19)/ 1400, 1200, 1000, 900, 700, ZYAB0062
63 1 480, 355, 270, 220, 185, 165, 149, 135, 129, ZYAB0063
64 2 126, 138, 136, 143, 146, 144, 143, 143, 143, ZYAB0064
65 DATA(ZODIAC(3,J),J=1,19)/ 800, 700, 620, 500, 370, ZYAB0065
66 1 380, 255, 200, 175, 155, 147, 129, 122, 120, ZYAB0066
67 2 117, 125, 124, 124, 127, 130, 130, 130, 130, ZYAB0067
68 DATA(ZODIAC(4,J),J=1,19)/ 400, 400, 400, 300, 200, ZYAB0068
69 1 279, 188, 160, 144, 133, 120, 112, 108, 106, ZYAB0069
70 2 103, 107, 106, 106, 100, 100, 100, 100, 100, ZYAB0070
71 DATA(ZODIAC(5,J),J=1,19)/ 270, 250, 220, 190, 175, ZYAB0071
72 1 255, 145, 130, 120, 108, 108, 107, 99, 98, 97, ZYAB0072
73 2 99, 98, 93, 93, 93, 93, 93, 93, 93, 93, ZYAB0073
74 DATA(ZODIAC(6,J),J=1,19)/ 180, 170, 160, 150, 135, ZYAB0074
75 1 128, 112, 101, 97, 94, 93, 90, 89, 88, ZYAB0075
76 2 87, 87, 87, 87, 86, 85, 85, 85, 85, ZYAB0076
77 DATA(ZODIAC(7,J),J=1,19)/ 130, 121, 125, 117, 107, ZYAB0077
78 1 98, 93, 90, 86, 84, 83, 83, 82, 82, ZYAB0078
79 2 81, 81, 80, 79, 78, 78, 78, 78, 78, ZYAB0079
80 DATA(ZODIAC(8,J),J=1,19)/ 105, 101, 99, 96, 90, ZYAB0080
81 1 83, 82, 78, 78, 78, 77, 76, 76, 76, ZYAB0081
82 DATA(ZODIAC(9,J),J=1,19)/ 80, 79, 78, 77, 74, ZYAB0082
83 1393, 987, 882, ZYAB0083
84 DATA(ZODIAC(10,J),J=1,19)/ 1997, ZYAB0084
85 C FIND SCIENTIFIC NOTATION ZYAB0085
86 QA GAMBONOGAE =SINL -0.0418889-7 ZYAB0086
87 88 IF (QA,QY,800,.) QAOQA=800, ZYAB0087
88 88 IF (QA,QY,360,.) QO YD 18 ZYAB0088
89 88 IF (QA,QY,105,.) QAO800.=QA ZYAB0089
90 C FIND K AND J ZYAB0090
91 K =0.24PHIS *1.0 ZYAB0091
92 P1 = 10*(K-1) ZYAB0092
93 P2 = P1*10 ZYAB0093
94 J =0.14QA *1.0 ZYAB0094
95 01 = 100*(J-1) ZYAB0095
96 02 = 01*10 ZYAB0096

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97	C INTERPOLATE TO FIND BRIGHTNESS AT POINT (P1,QA)	ZTAB0097
98	ZD1 = ZODIAC(K,J+1) - (ZODIAC(K,J+1) - ZODIAC(K,J)) * (Q2-QA) / (Q2-Q1)	ZTAB0098 17
99	C INTERPOLATE TO FIND BRIGHTNESS AT POINT (P2,QA)	ZTAB0099
100	ZD2 = ZODIAC(K+1,J+1) - (ZODIAC(K+1,J+1) - ZODIAC(K+1,J)) * (Q2-QA) / (Q2-Q1)	ZTAB0100 18
101	1	ZTAB0101
102	C INTERPOLATE TO FIND BRIGHTNESS AT POINT (PHIE,QA)	ZTAB0102
103	ZD = ZD2 - (ZD2 - ZD1) * (P2 - PHIE) / (P2 - P1)	ZTAB0103 19
104	C CALCULATE BRIGHTNESS FOR WAVELENGTH=WAVE	ZTAB0104
105	ZD = ZD010839	ZTAB0105 20
106	RETURN	ZTAB0106 21
107	END	ZTAB0107 22

23785 WORDS OF MEMORY USED BY THIS COMPIATION

67906 01 0V-85-72 11,948 TABLE OF ZODIACAL LIGHT

\*\*\*\*\* SUBROUTINE ZYABLE \*\*\*\*

PREFACE

PROGRAM BREAK	917
COMMON LENGTH	0
V COUNT DIVS	5
PRIMARY SYNDX	ENTRY
ZYABLE	0
SECONDARY SYNDX	ENTRY

BLOCK LENGTH

1	BLK1	2
2	BLK2	2
3	BLK3	2

SYNREF

917 IS THE NEXT AVAILABLE LOCATION.  
 GHAP VERSION/ASSEMBLY DATES JMPA 030171/052971 JMRB 050171/052571 JMPC 030171/050571  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
 68 19288 WORDS OF MEMORY WERE USED BY GHAP FOR THIS ASSEMBLY.



69	5	77	77	977	767	787	767	747	73	73	72	STRL0069
70	6	71	70	997	987	967	977	987	60	66	65	STRL0070
71	7	69	65	947	947	907	937	927	62	61	61	STRL0071
72	8	61	60	907	/	/	/	/	/	/	/	STRL0072
73		DATA	ISYAR	(K3)	K08	73	/	/	/	/	/	STRL0073
74	1	58	58	957	957	957	947	94	54	54	55	STRL0074
75	2	58	56	977	977	977	967	927	63	64	64	STRL0075
76	3	68	67	987	977	977	977	977	81	84	88	STRL0076
77	4	91	95	987	1017	1007	1067	1087	110	110	110	STRL0077
78	5	110	109	1077	1097	1097	997	987	92	89	85	STRL0078
79	6	88	79	967	937	927	997	987	67	68	66	STRL0079
80	7	68	64	927	9617	9617	967	997	59	58	57	STRL0080
81	8	97	96	987	/	/	/	/	/	/	/	STRL0081
82		DATA	ISYAR	(K4)	K08	73	/	/	/	/	/	STRL0082
83	1	58	52	917	9507	9577	9507	9477	49	50	58	STRL0083
84	2	51	51	927	9547	9577	9777	9977	62	64	65	STRL0084
85	3	66	69	927	9767	9877	9877	9977	103	111	120	STRL0085
86	4	127	135	1407	1447	1487	1927	1947	196	198	198	STRL0086
87	5	150	157	1597	1927	1477	1487	1487	131	123	114	STRL0087
88	6	109	96	997	927	977	977	977	92	69	67	STRL0088
89	7	88	84	927	9617	9677	9977	9977	58	57	56	STRL0089
90	8	99	94	937	/	/	/	/	/	/	/	STRL0090
91		DATA	ISYAR	(K5)	K08	73	/	/	/	/	/	STRL0091
92	1	58	49	987	9477	9877	9467	9477	45	45	46	STRL0092
93	2	47	48	997	9517	9877	9977	9877	61	69	66	STRL0093
94	3	67	73	997	9877	9877	1127	1287	141	154	169	STRL0094
95	4	178	188	2007	2097	2277	2267	2387	240	243	244	STRL0095
96	5	242	237	2317	2247	2187	2207	1987	185	173	161	STRL0096
97	6	148	129	1857	997	827	987	987	72	78	69	STRL0097
98	7	67	65	937	9627	9877	9677	9877	97	55	54	STRL0098
99	8	98	91	987	/	/	/	/	/	/	/	STRL0099
100		DATA	ISYAR	(K6)	K08	73	/	/	/	/	/	STRL0100
101	1	47	48	997	9447	9277	9277	942	42	42	43	STRL0101
102	2	44	45	977	9497	9277	9977	9877	62	67	68	STRL0102
103	3	72	79	917	9107	1287	1917	1787	193	217	239	STRL0103
104	4	261	292	3327	9377	4687	9497	5227	536	537	529	STRL0104
105	5	513	487	4917	9457	9887	93267	2977	272	250	226	STRL0105
106	6	204	181	1957	9807	1087	9927	9877	96	74	72	STRL0106
107	7	68	68	947	9627	9877	9977	9977	85	88	81	STRL0107
108	8	98	48	977	/	/	/	/	/	/	/	STRL0108
109		DATA	ISYAR	(K7)	K08	73	/	/	/	/	/	STRL0109
110	1	44	43	927	9417	9877	9407	9467	39	48	41	STRL0110
111	2	42	43	967	9487	9877	9577	9977	64	69	72	STRL0111
112	3	78	91	1417	91407	1727	9287	1241	276	318	386	STRL0112
113	4	914	636	6947	97037	6887	96487	6687	578	557	547	STRL0113
114	5	547	550	9887	99807	9887	95637	5217	438	366	323	STRL0114
115	6	287	250	2847	9177	1187	91127	987	83	78	76	STRL0115
116	7	71	67	997	9627	9877	9977	9977	53	51	49	STRL0116
117	8	47	45	947	/	/	/	/	/	/	/	STRL0117
118		DATA	ISYAR	(K8)	K08	73	/	/	/	/	/	STRL0118
119	1	41	40	997	9387	9877	9387	9877	38	38	39	STRL0119
120	2	40	42	947	9487	9877	9977	9877	66	72	77	STRL0120
121	3	88	109	1637	91867	2387	92817	9387	613	599	739	STRL0121
122	4	742	673	9947	94737	3987	93647	93617	328	328	320	STRL0122
123	5	828	829	9807	93817	4187	94817	95487	988	881	866	STRL0123
124	6	588	635	9287	92887	1987	91467	11887	94	89	81	STRL0124
125	7	78	69	967	9627	977	9967	987	81	48	46	STRL0125
126	8	43	42	917	/	/	/	/	/	/	/	STRL0126
127		DATA	ISYAR	(K9)	K08	73	/	/	/	/	/	STRL0127
128	1	38	37	977	9377	9377	9377	9377	37	37	38	STRL0128
129	2	39	41	947	9487	9877	9377	9877	91	77	83	STRL0129
130	3	109	137	1867	92467	3887	93687	4877	719	742	834	STRL0130
131	4	484	570	93827	92717	2487	92247	92847	218	218	221	STRL0131
132	5	238	244	93867	92887	2887	92997	3227	426	529	585	STRL0132
133	6	548	628	93887	93047	2487	91907	1487	111	94	86	STRL0133
134	7	78	71	967	9627	977	9967	987	47	49	42	STRL0134
135	8	48	39	987	/	/	/	/	/	/	/	STRL0135
136		DATA	ISYAR	(K10)	K08	73	/	/	/	/	/	STRL0136
137	1	38	38	997	9507	9887	9967	9877	36	37	38	STRL0137
138	2	39	41	947	9487	9887	9607	9877	96	83	96	STRL0138
139	3	128	175	2537	92997	3787	95137	7287	657	491	848	STRL0139
140	4	289	2817	1977	91497	13387	91277	11887	189	144	159	STRL0140
141	5	189	184	2807	92147	2287	92387	2927	294	328	446	STRL0141



142	6	552	555	4207	3577	2977	2377	179	33	106	93	STRL0142
143	7	53	73	677	617	577	517	48	44	42	40	STRL0143
144	8	38	36	887	/	/	/	/	/	/	/	STRL0144
145		DATA	ISVAR(K,11),K=8,73) /									STRL0145
146	1	33	34	847	557	387	557	347	34	39	36	STRL0146
147	2	38	41	497	497	587	627	707	81	92	113	STRL0147
148	3	153	213	2867	3457	4587	5647	5727	387	267	207	STRL0148
149	4	156	121	1817	957	987	987	1027	105	111	118	STRL0149
150	5	126	135	1467	1607	1787	1907	2027	215	236	273	STRL0150
151	6	382	508	5517	3987	3227	2787	2187	168	129	103	STRL0151
152	7	58	76	877	607	547	497	497	41	39	37	STRL0152
153	8	36	34	837	/	/	/	/	/	/	/	STRL0153
154		DATA	ISVAR(K,12),K=8,73) /									STRL0154
155	1	33	34	847	557	387	337	387	33	34	35	STRL0155
156	2	37	41	497	507	577	647	787	87	104	132	STRL0156
157	3	182	239	3847	3887	5487	5087	3867	238	126	129	STRL0157
158	4	188	87	847	817	877	827	84	86	89	93	STRL0158
159	5	99	102	1887	1167	1287	1367	158	164	188	205	STRL0159
160	6	241	343	4717	4707	3487	2947	2487	193	145	115	STRL0160
161	7	95	79	897	617	597	497	857	41	37	35	STRL0161
162	8	34	33	887	/	/	/	/	/	/	/	STRL0162
163		DATA	ISVAR(K,13),K=8,73) /									STRL0163
164	1	34	35	867	367	387	377	327	32	33	35	STRL0164
165	2	37	46	497	507	587	667	787	94	117	152	STRL0165
166	3	202	254	3817	4567	4577	3887	2897	162	128	97	STRL0166
167	4	85	77	887	727	787	737	78	74	75	76	STRL0167
168	5	78	80	837	877	927	1007	118	119	131	150	STRL0168
169	6	188	217	3217	4867	3787	2947	2557	116	164	129	STRL0169
170	7	103	84	817	627	587	497	447	40	38	36	STRL0170
171	8	35	34	847	/	/	/	/	/	/	/	STRL0171
172		DATA	ISVAR(K,14),K=8,73) /									STRL0172
173	1	35	32	897	537	387	327	31	31	32	34	STRL0173
174	2	39	40	497	517	587	687	827	103	129	163	STRL0174
175	3	205	258	3857	4187	3087	2807	1817	129	104	87	STRL0175
176	4	75	68	867	847	637	637	63	63	68	64	STRL0176
177	5	64	65	877	707	737	777	887	90	98	109	STRL0177
178	6	129	159	1987	3097	3987	2927	2497	223	183	142	STRL0178
179	7	112	88	887	637	587	487	447	41	38	37	STRL0179
180	8	38	35	857	/	/	/	/	/	/	/	STRL0180
181		DATA	ISVAR(K,15),K=8,73) /									STRL0181
182	1	38	34	827	537	387	327	32	32	33	34	STRL0182
183	2	36	40	457	527	597	707	877	116	137	171	STRL0183
184	3	203	259	3887	3157	2887	1637	1897	115	94	78	STRL0184
185	4	67	62	887	867	587	547	54	55	55	55	STRL0185
186	5	55	57	897	607	627	647	69	73	79	86	STRL0186
187	6	98	117	1457	1937	2977	3267	2887	215	191	152	STRL0187
188	7	128	93	897	637	557	497	457	42	39	37	STRL0188
189	8	37	37	887	/	/	/	/	/	/	/	STRL0189
190		DATA	ISVAR(K,16),K=8,73) /									STRL0190
191	1	38	34	827	527	387	327	32	33	33	34	STRL0191
192	2	36	40	457	527	687	727	91	114	139	161	STRL0192
193	3	195	283	3847	2207	1657	91487	1297	103	88	69	STRL0193
194	4	68	55	827	507	487	487	48	48	49	49	STRL0194
195	5	49	51	827	537	587	577	687	65	69	74	STRL0195
196	6	80	90	1447	1387	2887	7287	2847	203	188	158	STRL0196
197	7	128	98	887	657	577	517	487	43	48	38	STRL0197
198	8	36	37	867	/	/	/	/	/	/	/	STRL0198
199		DATA	ISVAR(K,17),K=8,73) /									STRL0199
200	1	38	33	827	517	387	327	33	34	34	34	STRL0200
201	2	38	48	457	517	687	747	987	113	138	148	STRL0201
202	3	197	311	2837	9787	1587	91427	1687	98	71	59	STRL0202
203	4	93	44	877	447	487	437	487	43	43	44	STRL0203
204	5	49	46	877	487	497	517	587	59	69	69	STRL0204
205	6	74	88	947	1157	1387	92167	2547	197	179	161	STRL0205
206	7	138	102	807	677	547	527	487	44	41	39	STRL0206
207	8	38	37	857	/	/	/	/	/	/	/	STRL0207
208		DATA	ISVAR(K,18),K=8,73) /									STRL0208
209	1	38	33	817	517	387	337	347	34	35	36	STRL0209
210	2	39	48	457	517	687	747	917	109	128	142	STRL0210
211	3	238	300	2837	1627	1677	1267	977	78	62	52	STRL0211
212	4	47	48	817	477	387	397	397	39	39	39	STRL0212
213	5	48	43	837	447	487	477	587	59	61	67	STRL0213
214	6	71	78	887	1007	1487	91547	2887	208	179	162	STRL0214
215	7	138	104	837	687	597	537	487	45	42	39	STRL0215







363	2	78, : 69, v 88? v 88? v 67? v 64? v 60? v 63, : 62, : 66, v	STRLO363
364	3	59, : 57, v 55? v 54? v 48? v 47? v 42? v 50, : 49, : 49, v	STRLO364
365	4	48, : 48, v 48? v 47? v 48? v 47? v 47? v 50, : 51, : 52, v	STRLO365
366	5	49, : 49, v 48? v 48? v 49? v 50? v 50, : 51, : 52, : 53, v	STRLO366
367	6	53, : 54, v 55? v 56? v 57? v 58? v 59, : 60, : 61, : 62, v	STRLO367
368	7	63, : 64, v 65? v 66? v 67? v 68? v 68? v 69, : 69, : 70, v	STRLO368
369	8	78, : 70, v 71? /	STRLO369
370		DATA (STAR(K,36),K=8,73) /	STRLO370
371	1	64, : 64, v 64? v 64? v 65? v 64? v 64, : 64, : 64, : 63, v	STRLO371
372	2	63, : 63, v 62? v 62? v 63? v 61? v 60, : 59, : 59, : 58, v	STRLO372
373	3	59, : 57, v 56? v 55? v 50? v 54? v 53, : 53, : 53, : 52, v	STRLO373
374	4	52, : 52, v 52? v 51? v 58? v 51? v 52, : 51, : 51, : 51, v	STRLO374
375	5	51, : 52, v 52? v 52? v 58? v 53? v 53, : 53, : 54, : 54, v	STRLO375
376	6	55, : 55, v 56? v 56? v 57? v 57? v 58, : 58, : 59, : 59, v	STRLO376
377	7	60, : 60, v 61? v 61? v 65? v 62? v 65, : 63, : 63, : 63, v	STRLO377
378	8	64, : 64, v 64? /	STRLO378
379		DATA (STAR(K,37),K=8,73) / 73057.0 /	STRLO379
380		ARCSIN(X)=ATAN2(X,SQRT(1.-X*X))	STRLO380
381		C DETERMINE THE INERTIAL LATITUDE AND LONGITUDE OF THE POINT IN THE SKY	STRLO381
382		MHAG = 1.02SQRT(W1*W1 + W2*W2 + W3*W3)	STRLO382
383		A1 = MHAG*MHAG	STRLO383 2
384		A2 = W2*W2*MHAG	STRLO384 3
385		A3 = W3*W2*MHAG	STRLO385 4
386		PHIG = ARCSIN(A3)*CRD	STRLO386 5
387		OMEGAG = ATAN2(A2,A1)*RTD	STRLO387 6
388		IF (OMEGAG.LY.0.) OMEGAG=360. + OMBGAG	STRLO388 7
389		C DETERMINE THE LATITUDE AND LONGITUDE AREA OF THE TABLE TO BE	STRLO389
390		C CONSIDERED	STRLO390
391		K = 0.2*OMEGAG + 0.0	STRLO391 10
392		J = 0.2*(PHIG+90.0) + 1.0	STRLO392 11
393		C CALCULATE LONGITUDE INTERVAL FOR PROPER TABLE AREA	STRLO393
394		Q2 = 5*Q	STRLO394 12
395		Q1 = Q2 - 5.0	STRLO395 13
396		C CALCULATE LATITUDE INTERVAL FOR PROPER TABLE AREA	STRLO396
397		P2 = 5*J - 90	STRLO397 14
398		P1 = P2 - 5.0	STRLO398 15
399		C CALCULATE STAR BRIGHTNESS AT (P1,OMEGAG)	STRLO399
400		ST1 = STAR(K+1,J) - (STAR(K+1,J) - STAR(K,J)) * (Q2-OMEGAG)/(Q2-Q1)	STRLO400 16
401		1)	STRLO401
402		C CALCULATE STAR BRIGHTNESS AT (P2,OMEGAG)	STRLO402
403		S*2 = STAR(K+1,J+1) - (STAR(K+1,J+1) - STAR(K,J+1)) * (Q2-OMEGAG)/(Q2-Q1)	STRLO403 17
404		1	STRLO404
405		C CALCULATE STAR BRIGHTNESS AT (PHIG,OMEGAG)	STRLO405
406		STR = S*2 * ((ST2-ST1) * (P2 - PHIG)) / (P2 - P1)	STRLO406 18
407		C CONVERT STAR BRIGHTNESS TO RAYLEIGHS PER ANGSTROMS	STRLO407
408		ST = 0.0039 * STR	STRLO408 19
409		GO CONTINUE	STRLO409 20
410		RETURN	STRLO410 21
411		END	STRLO411 22

27356 WORDS OF MEMORY USED BY THIS COMPILATION

67906 02 09-25-72 12,229 TABLE OF UNRESOLVED STARLIGHT

\*\*\*\*\* SUBROUTINE STRLIT \*\*\*\*\*

PREFACE

PROGRAM BREAK	5938
COMMON LENGTH	8
V COUNT BYTS	9
PRIMARY SYNDSP	ENTRY
STRTT	0
SECONDARY SYNDSP	ENTRY
BLOCK	LENGTH
1 BLOCK	25
2 BLOCK	3

3 BLANKS

B

SECRET

4 SORT

5 AVAN2

5911 IS THE NEXT AVAILABLE LOCATION.

GMAP VERSION/ASSEMBLY DATES JHPA 050171/052571 JHRB 050171/052571 JMPC 050171/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

\*\* 19289 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

67906 ON 09-25-72 12,233 TOTAL SKY BRIGHTNESS AFTER RELEASE

\*\*\*\*\*SUBROUTINE TRACK\*\*\*\*\*

1	CYREC	TOTAL SKY BRIGHTNESS AFTER RELEASE	TRAC0001
2	C*****	SUBROUTINE TRACK*****	TRAC0002
3	C		TRAC0003
4	C*****	START OF DOCUMENTATION CARDS*****	TRAC0004
5	C		TRAC0005
6	C*****	NASA WACLOPS VERSION OF 02X01A70	TRAC0006
7	C		TRAC0007
8	C*****	LANGUAGE-FORTRAN IV	TRAC0008
9	C		TRAC0009
10	C*****	MACHINE-GE 625	TRAC0010
11	C		TRAC0011
12	C	PURPOSE:	TRAC0012
13	C	TO DETERMINE IF THE TOTAL SKY BACKGROUND BRIGHTNESS WILL EXCEED	TRAC0013
14	C	THE CONSTRAINT LIMITATION DURING THE REQUIRED EXPERIMENTAL	TRAC0014
15	C	PERIOD.	TRAC0015
16	C		TRAC0016
17	C*****	METHOD:	TRAC0017
18	C	GIVEN A FAVORABLE TIME OR RELEASE FOR STATION(I) FROM	TRAC0018
19	C	SUBROUTINE WLTG, DETERMINE IF THE TOTAL SKY BACKGROUND	TRAC0019
20	C	BRIGHTNESS IS EXCEEDED DURING THE EXPERIMENTAL PERIOD BY	TRAC0020
21	C	CHECKING THIS AT 30 MINUTE INTERVALS, THE INERTIAL RECTANGULAR	TRAC0021
22	C	COMPONENTS OF THE VECTOR FROM STATION(I) TO THE CLOUD'S	TRAC0022
23	C	POSITION DURING THE EXPERIMENTAL PERIOD ARE FIRST CALCULATED,	TRAC0023
24	C	THE VALUES OF ZODIACAL LIGHT AND STALIGHT ARE DETERMINED	TRAC0024
25	C	THROUGH SUBROUTINES ZODLIT AND STRLIT RESPECTIVELY, THEN THE	TRAC0025
26	C	TOTAL SKY BACKGROUND BRIGHTNESS IS CALCULATED USING THE	TRAC0026
27	C	RESPECTIVE VALUES OF AIRGLOW BRIGHTNESS AS FOUND IN	TRAC0027
28	C	SUBROUTINE WPAIR, THEN THE TOTAL SKY BACKGROUND BRIGHTNESS IS	TRAC0028
29	C	CHECKED AGAINST THE GIVEN CONSTRAINT, IF THE GIVEN CONSTRAINT IS	TRAC0029
30	C	EXCEEDED AT ANY POINT CHECKED, THEN THE EVENT CODE IN: IS SET TO	TRAC0030
31	C	ONE AND THE SUBROUTINE TERMINATES;	TRAC0031
32	C		TRAC0032
33	C*****	INPUTS	TRAC0033
34	C		TRAC0034
35	C	R(5) -INPUT VALUE FOR TOTAL SKY BACKGROUND BRIGHTNESS	TRAC0035
36	C	- (RAYLEIGHS)	TRAC0036
37	C		TRAC0037
38	C	GHA -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS	TRAC0038
39	C	-UNIVERSAL TIME (HRS)	TRAC0039
40	C		TRAC0040
41	C	W(1,2,7) -AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE	TRAC0041
42	C	-GIVEN POSITION OF THE CLOUD (RAYLEIGHS)	TRAC0042
43	C		TRAC0043
44	C	C(2,9) -COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION	TRAC0044
45	C	-OF THE TRACKING STATION TO THE CLOUD AND USED TO	TRAC0045
46	C	-SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS	TRAC0046
47	C		TRAC0047
48	C	JEND -NUMBER OF DISCRETE VALUES STORED FOR	TRAC0048
49	C	-EXPERIMENTAL PERIOD DATA	TRAC0049
50	C		TRAC0050
51	C	ZB -ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY	TRAC0051
52	C	- (RAYLEIGHS)	TRAC0052
53	C		TRAC0053
54	C	SY -UNRESOLVED STAR BRIGHTNESS OF A POINT IN THE SKY	TRAC0054
55	C	- (RAYLEIGHS)	TRAC0055
56	C		TRAC0056
57	C	W(1,2,7) -VALUE OF DISCRETE X COMPONENT OF VECTOR FROM	TRAC0057
58	C	-STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE	TRAC0058



59	C				TRAC0059
60	C	WPY(12,7)	-VALUE OF GEOCENTRIC Y COMPONENT OF VECTOR FROM	TRAC0060	
61	C		-STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE	TRAC0061	
62	C			TRAC0062	
63	C	WPZ(12,7)	-VALUE OF GEOCENTRIC Z COMPONENT OF VECTOR FROM	TRAC0063	
64	C		-STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE	TRAC0064	
65	C			TRAC0065	
66	C	T	-PRESENT UNIVERSAL TIME FOR RELEASE	TRAC0066	
67	C			TRAC0067	
68	C	I	-STATION NUMBER	TRAC0068	
69	C			TRAC0069	
70	C			TRAC0070	
71	C	*****OUTPUT-		TRAC0071	
72	C			TRAC0072	
73	C	N	-EVENT CODE	TRAC0073	
74	C		- 001P BY(LT,R(S))	TRAC0074	
75	C		- 011P BY(OT,R(S))	TRAC0075	
76	C			TRAC0076	
77	C	*****RESTRICTIONS-		TRAC0077	
78	C		THIS SUBROUTINE ACCEPTS UP TO A MAXIMUM OF TWELVE TRACKING	TRAC0078	
79	C		STATIONS AND COMPUTES A MAXIMUM OF SEVEN DISCRETE POINTS AT 30	TRAC0079	
80	C		MINUTE INTERVALS DURING THE EXPERIMENTAL PERIOD.	TRAC0080	
81	C			TRAC0081	
82	C	*****SUBPROGRAMS REQUIRED-		TRAC0082	
83	C	ZODLIY		TRAC0083	
84	C	TYE		TRAC0084	
85	C	ZYABLH		TRAC0085	
86	C	STRLIY		TRAC0086	
87	C			TRAC0087	
88	C			TRAC0088	
89	C	*****END OF DOCUMENTATION CARDS*****		TRAC0089	
90	C			TRAC0090	
91		SUBROUTINE TRACK (TPNTI)		TRAC0091	
92		COMMON/BLK1/R(S)		TRAC0092	
93		COMMON/BLK2/DTR, RVD, MTR, HALPRI, RTH, AU, DELTA(4), ERN, DGWA		TRAC0093	
94		COMMON/BLK3/SUNL, GWA		TRAC0094	
95		COMMON/BLK4/WX(12), WY(12), WZ(12), WA(12,7), C(12,7), JEND		TRAC0095	
96		COMMON/BLK5/W1, W2, W3		TRAC0096	
97		COMMON/BLK6/ZD, ST		TRAC0097	
98		COMMON/BLK7/WPX(12,7), WPY(12,7), WPZ(12,7)		TRAC0098	
99		DOUBLE PRECISION DTR, RVD, MTR, HALPRI		TRAC0099	
100	C	CALLULATE THE UNIVERSAL TIME IN HOURS FOR THE POINT TO BE COMPUTED,		TRAC0100	
101		DO 100 J=2,JEND		TRAC0101	
102		YJ = J		TRAC0102	2
103		YR = Y - 0.50*(YJ-126)		TRAC0103	3
104	C	CALLULATE THE SINE AND COSINE OF THE HOUR ANGLE FOR TIME TP,		TRAC0104	
105		SN = SIN(DGWA + YR * DGHA) * MTR		TRAC0105	4
106		CS = COS(DGWA + YR * DGHA) * MTR		TRAC0106	5
107	C	DETERMINE THE INERTIAL RECTANGULAR COMPONENTS OF THE VECTOR FROM		TRAC0107	
108	C	STATION(I) TO THE CLOUD'S PRESENT POSITION		TRAC0108	
109		W1 = WPX(I,J) * CS - WPY(I,J) * SN		TRAC0109	6
110		W2 = WPX(I,J) * SN + WPY(I,J) * CS		TRAC0110	7
111		W3 = WPZ(I,J)		TRAC0111	8
112	C	FIND THE SKY BRIGHTNESS DUE TO ZODIACAL LIGHT AND STARLIGHT		TRAC0112	
113		CALL ZODLIY (YJ)		TRAC0113	9
114		CALL STRLIY		TRAC0114	10
115	C	FIND TOTAL SKY BRIGHTNESS		TRAC0115	
116		BT = WA(I,J) + ((BY+ZD) * C(I,J))		TRAC0116	11
117		GO CONTINUE		TRAC0117	12
118	C	RETURN IF BY,LT,R(S), OTHERWISE CONTINUE		TRAC0118	
119		IF (BY,LT,R(S)) GO TO 100		TRAC0119	13
120		N = 1		TRAC0120	16
121		RETURN		TRAC0121	17
122		100 CONTINUE		TRAC0122	18
123		RETURN		TRAC0123	20
124		END		TRAC0124	21

23889 WORDS OF MEMORY USED BY THIS COMPILATION

67906 08 09-25-72 12,236 TOTAL SKY BRIGHTNESSES AFTER RELEASE

\*\*\*\*\*SUBROUTINE TRACK\*\*\*\*\*

PREPAGE

PROGRAM BREAK 178  
COMMON LENGTH 8  
V COUNT DIVS 5

PRIMARY SYNDOP ENTRY

TRKSK 8

SECONDARY SYNDOP ENTRY

BLKSK	LENGTH
1 BLK01	18
2 BLK02	28
3 BLK03	8
4 BLK04	319
5 BLK05	8
6 BLK06	8
7 BLK07	378

SYNREF

- 10 C03
- 11 SIN
- 12 SYNOPT
- 13 ZODIAC

174 IS THE NEXT AVAILABLE LOCATION.  
GMAP VERSION/ASSEMBLY DATES JHPA 050178/052571 JMRB 056271/052571 JHPC 050172/052571  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19309 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

67906 08 09-25-72 12,240 LAUNCH WINDOW OUTPUT

\*\*\*\*\*SUBROUTINE OUTPUT\*\*\*\*\*

1	CBUT1	LAUNCH WINDOW OUTPUT	OUT10001
2	C*****	SUBROUTINE OUTPUT*****	OUT10002
3	C		OUT10003
4	C*****	START OF DOCUMENTATION CARDS*****	OUT10004
5	C		OUT10005
6	C*****	NASA WALLOPS VERSION OF 02/01/70	OUT10006
7	C		OUT10007
8	C*****	LANGUAGE=FORTRAN IV	OUT10008
9	C		OUT10009
10	C*****	MACHINE=CR 625	OUT10010
11	C		OUT10011
12	C*****	PURPOSE	OUT10012
13	C	TO WRITE THE DAILY RELEASE TIMES PER CONSTRAINT PER STATION ON	OUT10013
14	C	OUTPUT FILE 07.	OUT10014
15	C		OUT10015
16	C*****	METHOD	OUT10016
17	C	GIVEN THE PROPER CONSTRAINT INDEX NUMBER, WRITE THE CONSTRAINT	OUT10017
18	C	INDEX NUMBER, THE CURRENT DATE, THE CONSTRAINT NAME, THE STATION	OUT10018
19	C	NAME (IF NOT EARLY SHADOW CONSTRAINT), THE CALCULATED RELEASE	OUT10019
20	C	START/STOP TIMES, AND THE STATION NUMBER IN PROPER BCD FORMAT TO	OUT10020
21	C	INSURE CORRECT PRINTING IN SUBROUTINE 'OUTPUT',	OUT10021
22	C		OUT10022
23	C*****	INPUTS	OUT10023
24	C		OUT10024
25	C	K -INDEX FOR CONSTRAINTS	OUT10025
26	C	##1, EARLY SHADOW	OUT10026
27	C	##2, NOT USED	OUT10027
28	C	##3, SUN	OUT10028
29	C	##4, MOON	OUT10029
30	C	##9, TOTAL SKY BACKGROUND BRIGHTNESS	OUT10030

31	C			OUT10031
32	C	DJUL	-JULIAN DATE FOR CURRENT DATA	OUT10032
33	C			OUT10033
34	C	WINDOW(5,5,12)	-THE DAILY RELEASE WINDOW START/STOP TIMES,	OUT10034
35	C		-1ST INDEX FOR STORING START/STOP TIMES,	OUT10035
36	C		-1st 375 FOR START TIMES	OUT10036
37	C		-2nd 476 FOR STOP TIMES	OUT10037
38	C		-2ND INDEX FOR THE CONSTRAINT	OUT10038
39	C		- 1=EARTH SHADOW	OUT10039
40	C		- 2=ELEVATION	OUT10040
41	C		- 3=SUN	OUT10041
42	C		- 4=MOON	OUT10042
43	C		- 5=TOTAL SKY BACKGROUND BRIGHTNESS	OUT10043
44	C			OUT10044
45	C	NS	-THE NUMBER OF STATIONS USED IN THE PROGRAM	OUT10045
46	C			OUT10046
47	C	NOB(12)	-AN ARRAY CONTAINING THE STATION NUMBERS USED	OUT10047
48	C			OUT10048
49	C			OUT10049
50	C	*****OUPVUV-		OUT10050
51	C	ON FILE 07		OUT10051
52	C			OUT10052
53	C	K	-INDEX FOR CONSTRAINTS	OUT10053
54	C		-#1,EARTH SHADG.	OUT10054
55	C		-#2,NOT USED	OUT10055
56	C		-#3,SUN	OUT10056
57	C		-#4,MOON	OUT10057
58	C		-#5,TOTAL SKY BACKGROUND BRIGHTNESS	OUT10058
59	C			OUT10059
60	C	IDAY	-DAY NUMBER FOR DATE OF CURRENT DATA	OUT10060
61	C			OUT10061
62	C	IMONTH	-MONTH FOR DATE OF CURRENT DATA	OUT10062
63	C			OUT10063
64	C	MONTH	-NAME OF MONTH CORRESPONDING TO IMONTH	OUT10064
65	C			OUT10065
66	C	IYEAR	-YEAR FOR DATE OF CURRENT DATA	OUT10066
67	C			OUT10067
68	C	NRSTR(3)	-ALPHANUMERIC NAME OF CONSTRAINT	OUT10068
69	C			OUT10069
70	C	NAME(5,12)	-NAME OF TRACKING STATIONS USED	OUT10070
71	C			OUT10071
72	C	WINDOW(5,5,12)	-THE DAILY RELEASE WINDOW START/STOP TIMES,	OUT10072
73	C		-1ST INDEX FOR STORING START/STOP TIMES,	OUT10073
74	C		-1st 375 FOR START TIMES	OUT10074
75	C		-2nd 476 FOR STOP TIMES	OUT10075
76	C		-2ND INDEX FOR THE CONSTRAINT	OUT10076
77	C		- 1=EARTH SHADG	OUT10077
78	C		- 2=ELEVATION	OUT10078
79	C		- 3=SUN	OUT10079
80	C		- 4=MOON	OUT10080
81	C		- 5=TOTAL SKY BACKGROUND BRIGHTNESS	OUT10081
82	C			OUT10082
83	C	J	-CODE TO SUBROUTINE OUTTYPE TO SIGNAL THAT STATION	OUT10083
84	C		-BEING READ IS FIRST ONE FOR THAT PARTICULAR	OUT10084
85	C		-CONSTRAINT OR IT IS NOT	OUT10085
86	C			OUT10086
87	C	*****RESTRICTIONS-		OUT10087
88	C		THIS SUBROUTINE IS SPECIFICALLY DESIGNED FOR PRINTING THE	OUT10088
89	C		PARAMETERS GENERATED BY THE CURRENT VERSION OF PROGRAM	OUT10089
90	C	IBWINDOW		OUT10090
91	C			OUT10091
92	C	*****SUBPROGRAMS REQUIRED-		OUT10092
93	C	CALDAY		OUT10093
94	C			OUT10094
95	C	*****END OF DOCUMENTATION CARDS*****		OUT10095
96	C			OUT10096
97	C	SUBROUTINE OUT1 (K)		OUT10097
98	C	COMMON/BLK12 DJUL, NDF, NS, NDT, EP, ECH		OUT10098
99	C	COMMON/BLK7 NS, NOB(12)		OUT10099
100	C	COMMON/BLK8 /NAME(UP12), PH(12), LAMBDA(12), ALT(12), MOVE(12)		OUT10100
101	C	COMMON/BLK9 /WINDOW(5,5,12)		OUT10101
102	C	COMMON/BLK10 /LINE, IYEAR, IMONTH, IDAY		OUT10102
103	C	DIMENSION NLCUM(3)		OUT10103



104	DIMENSION MONTH(12)	OUT10104
105	DIMENSION NRESTR(3,5)	OUT10105
106	DATA NILUM(6) ALL(6) STAT(,5)ONS /	OUT10106
107	DATA MONTH(3)JAN,3)FEB,3)MAR,3)APR,3)MAY,3)JUN,3)JUL,3)AUG,3)SEP,	OUT10107
108	1 3)OCT,3)NOV,3)DEC/	OUT10108
109	DATA (NRESTR(I,1),I,173)/6M EAR,6)MTH SHA,6)NDOW /	OUT10109
110	DATA (NRESTR(I,2),I,173)/6M .6M .6M /	OUT10110
111	DATA (NRESTR(I,3),I,173)/6M .6M SUN .6M /	OUT10111
112	DATA (NRESTR(I,4),I,173)/6M .6M MOON .6M /	OUT10112
113	DATA (NRESTR(I,5),I,173)/6M SKY .6M)BRIGHT,6)NESS /	OUT10113
114	GO TO (1,2,3,3)K	OUT10114
115	C EARTH SHADOW DATA IS FIRST PRINTED FOR THIS DATE, PRINT JULIAN DATE,	OUT10115
116	C FIND THE CURRENT DATE FROM THE GIVEN DAY NUMBER, AND WRITE OUTPUT	OUT10116
117	C PARAMETERS ON TAPE FILE 07,	OUT10117
118	1 WRITE (7,100) DJUL	OUT10118 2
119	CALL CALDAY	OUT10119 5
120	J	OUT10120 6
121	WRITE (7,100) K, IDAY, MONTH(INMTH), IYEAR, (NRESTR(L,K))L(1,3),	OUT10121 7
122	1 NILUM, (WINDOW(L,K))L(1,6), J	OUT10122
123	GO TO 2	OUT10123 18
124	C WRITE DATA FOR 'K' CONSTRAINT ON TAPE FILE 07,	OUT10124
125	3 DO 100 I(1)ONS	OUT10125 19
126	J =NOS(I)	OUT10126 20
127	100 WRITE (7,100) K, IDAY, MONTH(INMTH), IYEAR, (NRESTR(L,K))L(1,3),	OUT10127 21
128	1 (NAME(L,I))L(1,3), (WINDOW(L,K))L(1,6), I	OUT10128
129	2 RETURN	OUT10129 35
130	1000 FORMAT (F10,2,120X)	OUT10130 36
131	1001 FORMAT (I0X,2I2,A3,1476A6,6E12,5,I1)	OUT10131 36
132	END	OUT10132 36

23737 WORDS OF MEMORY USED BY THIS COMPILATION

67906 02 09-25-72 12,244 LAUNCH WINDOW OUTPUT

\*\*\*\*\*SUBROUTINE OUT1\*\*\*\*\*

PREPAGE

PROGRAM BREAK	334
COMMON LENGTH	0
V COUNT BITS	5

PRIMARY SYMDEF ENTRY

OUT1 0

SECONDARY SYMDEF ENTRY

BLK#	LENGTH
1 BLK#1	4
2 BLK#2	15
3 BLK#3	124
4 BLK#4	550
5 BLK#5	4

SYMDEF

- 6 CALDAY
- 7 FENV,
- 10 FEXIT
- 11 FPIL,
- 12 FUGO,
- 13 FWRD,
- 14 FXGM,

334 IS THE NEXT AVAILABLE LOCATION.

GMAP VERSION/ASSEMBLY DATES JMRB 050171/052571 JMRB 050171/052571 J4PC 050171/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

66 19339 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY

07906 02 09-25-72 12,247 DEFINITION OF DAYS

\*\*\*\*\*SUBROUTINE CALDAY\*\*\*\*\*

1	CBALD	DEFINITION OF DAYS	CALD0001
2	C*****SUBROUTINE CALDAY*****		CALD0002
3	C		CALD0003
4	C*****START OF DOCUMENTATION CARDS*****		CALD0004
5	C		CALD0005
6	C*****NABA WALLOPS VERSION OF 52701AY0		CALD0006
7	C		CALD0007
8	C*****LANGUAGE-FORTRAN IV		CALD0008
9	C		CALD0009
10	C*****MAGWINE-GE 025		CALD0010
11	C		CALD0011
12	C*****PURPOSE-		CALD0012
13	C	TO FIND THE DATE OF THE CURRENT DAY	CALD0013
14	C		CALD0014
15	C*****METHOD-		CALD0015
16	C	GIVEN THE YEAR FOR WHICH THE CALCULATIONS BEGIN (KYEAR), AND THE	CALD0016
17	C	CURRENT NUMBER OF DAYS PAST JANUARY 0 OF THE GIVEN YEAR (IDAY),	CALD0017
18	C	FIRST DETERMINE IF THE GIVEN YEAR IS THE CURRENT YEAR BY	CALD0018
19	C	DETERMINING IF 'IDAY' IS BETWEEN 0 AND 365 (366 IF 'KYEAR' IS A	CALD0019
20	C	LEAP YEAR), THE CURRENT YEAR IS THEN STORED (IYEAR) AND	CALD0020
21	C	ADJUSTMENT IS MADE TO 'IDAY' TO REFLECT THE NUMBER OF DAYS PAST	CALD0021
22	C	JANUARY 0 OF 'IYEAR';	CALD0022
23	C	A TABLE OF VALUES IS GIVEN FOR THE NUMBER OF DAYS IN EACH MONTH	CALD0023
24	C	(ADJUSTMENT MADE FOR FEBRUARY OF A LEAP YEAR); THE MONTH NUMBER	CALD0024
25	C	IS THEN FOUND BY CHECKING AND ADJUSTING 'IDAY';	CALD0025
26	C		CALD0026
27	C*****INPUT-		CALD0027
28	C		CALD0028
29	C	KYEAR -YEAR NUMBER FOR STARTING CALCULATIONS	CALD0029
30	C		CALD0030
31	C	IDAY -CURRENT NUMBER OF DAYS PAST JANUARY 0 OF KYEAR	CALD0031
32	C		CALD0032
33	C		CALD0033
34	C*****OUTPUT-		CALD0034
35	C		CALD0035
36	C	IYEAR -YEAR FOR DATE OF CURRENT DATA	CALD0036
37	C		CALD0037
38	C	IMONTH -MONTH FOR DATE OF CURRENT DATA	CALD0038
39	C		CALD0039
40	C	IDAY -DAY NUMBER FOR DATE OF CURRENT DATA	CALD0040
41	C		CALD0041
42	C*****RESTRICTIONS-		CALD0042
43	C	THIS SUBROUTINE WILL COMPUTE THE YEAR, MONTH NUMBER, AND DAY FOR	CALD0043
44	C	ANY YEAR EXCEPT THOSE YEARS FOR WHICH 'IYEAR/4' IS AN INTEGRAL	CALD0044
45	C	VALUE BUT 'IYEAR' IS NOT A LEAP YEAR (I.E., THE YEAR 2000),	CALD0045
46	C		CALD0046
47	C*****SUBROUTINES REQUIRED-		CALD0047
48	C	NONE	CALD0048
49	C		CALD0049
50	C*****END OF DOCUMENTATION CARDS*****		CALD0050
51	C		CALD0051
52	C	SUBROUTINE CALDAY	CALD0052
53	C	COMMON/BLKX /KMONTH, IDAY, KYEAR, LMONTH, LDAY, LYEAR, KMO, KDA,	CALD0053
54	C	1 KYR, LMOY, LDA, LYR, ICALE, IPRTY, IWRTY, IPRTY1, IPLYT	CALD0054
55	C	COMMON/BLK0 /LINE, IYEAR, IMONTH, IDAY	CALD0055
56	C	DIMENSION NDAYS(12)	CALD0056
57	C	DATA NDAYS/31,28,31,30,31,30,31,31,30,31,30,31/	CALD0057
58	C	IYEAR =KYEAR	CALD0058
59	C	14 NDPYR =365	CALD0059 2
60	C	IF THIS A LEAP YEAR	CALD0060
61	C	IF (MOD(IYEAR,4).EQ.0) GO TO 21	CALD0061 3
62	C	GO TO 12	CALD0062 6
63	C	CHANGE THE NUMBER OF DAYS PER YEAR AND THE NUMBER OF DAYS IN FEBRUARY	CALD0063
64	C	FOR CORRECT LEAP YEAR VALUES,	CALD0064
65	C	11 NDPYR =366	CALD0065 7
66	C	NDAYS(2) =29	CALD0066 8
67	C	CHECK FOR KYEAR TO BE THE CURRENT YEAR,	CALD0067
68	C	12 IF (IDAY,GT,0) AND (IDAY,LT,(NDPYR+1)) GO TO 13	CALD0068 9
69	C	IF (IDAY,GT,0) GO TO 21	CALD0069 12

70	C CURRENT YEAR IS PRIOR YEAR TO GIVEN YEAR;	CALD00070	
71	1 YEAR 01 YEAR -1	CALD00071	15
72	1 DAY 01 DAY 0300	CALD00072	16
73	GO TO 14	CALD00073	17
74	C CURRENT YEAR IS NEXT YEAR TO GIVEN YEAR;	CALD00074	
75	23 1 YEAR 01 YEAR 01	CALD00075	18
76	1 DAY 01 DAY 0000	CALD00076	19
77	NDAYS(12)020	CALD00077	20
78	GO TO 14	CALD00078	21
79	C DETERMINING THE CORRECT MONTH NUMBER AND DAY OF CURRENT MONTH,	CALD00079	
80	03 DO 100 1 MONTH 01 12	CALD00080	22
81	IF (1 DAY 0NDAYS(1 MONTH)) 01 01 010	CALD00081	23
82	100 1 DAY 01 DAY 0NDAYS(1 MONTH)	CALD00082	24
83	01 RETURN	CALD00083	25
84	END	CALD00084	27

23896 WORDS OF MEMORY USED BY THIS COMPIATION

07906 02 09-25-72 12,250 DEFINITION OF DATE

\*\*\*\*\*SUBROUTINE CALDAY\*\*\*\*\*

PREPAGE

PROGRAM BREAK 102  
COMMON LENGTH 0  
V LENGTH BYTS 5

PRIMARY SYMDEF ENTRY

CALDAY 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1 BLMB 22  
2 BLMD 6

SUMREP

122 IS THE NEXT AVAILABLE LOCATION.

GMAP VERSION/ASSEMBLY DATES JMA 050172/052521 JMRB 050171/052521 JMPC 050171/052571  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19277 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

07906 02 09-25-72 12,250 COMBINED WINDOW INTERVALS

\*\*\*\*\*SUBROUTINE YTLW00\*\*\*\*\*

1	CYTLN	COMBINED WINDOW INTERVALS	YTLW0001
2	C*****SUBROUTINE YTLW00*****		YTLW0002
3	C		YTLW0003
4	C*****STORY OF DOCUMENTATION ERRORS*****		YTLW0004
5	C		YTLW0005
6	C*****FRAGA WALLIPS VERSION OF 02201470		YTLW0006
7	C		YTLW0007
8	C*****LANGUAGE=FORTRAN IV		YTLW0008
9	C		YTLW0009
10	C*****RUNTIME-OR 025		YTLW0010
11	C		YTLW0011
12	C*****PURPOSE		YTLW0012
13	C	TO COMPUTE THE COMBINED DAILY RELEASE WINDOW FOR THE DIB	YTLW0013
14	C	PREJECT	YTLW0014
15	C		YTLW0015
16	C*****METHOD-		YTLW0016
17	C	BEVEN THE DAILY RELEASE WINDOWS AS CALCULATED FOR EACH STATION	YTLW0017
18	C	AND FOR EACH CONSTRAINT, THE RESULT OF THIS SUBROUTINE IS TO	YTLW0018
19	C	SET THE TIME INTERVALS FOR THE CURRENT DAY WHICH SATISFY EACH OF	YTLW0019

20	C	THE GIVEN TIME INTERVALS ALWAYS FOUND FOR EACH STATION AND FOR EACH	YTLW0020
21	C	SUCH CONSTRAINT, THE METHOD USE OF DETERMINING THESE THREE NUMBERS,	YTLW0021
22	C	IDENTIFYING THE INTERSECTION OF THE DAILY RELEASE WINDOWS FOUND	YTLW0022
23	C	FOR THAT STATION FOR EACH CONSTRAINT, THESE INTERSECTING	YTLW0023
24	C	INTERVALS FOUND ARE THEN STORED IN THE 'A' AND 'B' ARRAYS	YTLW0024
25	C	SECOND, THE INTERSECTION OF THE TIME INTERVALS DEFINED IN THESE	YTLW0025
26	C	ARRAYS ARE THEN DETERMINED AND STORED IN 'C' AND 'D' ARRAYS;	YTLW0026
27	C	THIRD, THESE TIME INTERVALS ARE COMBINED WITH BACKGROUND	YTLW0027
28	C	COMPUTED BASES OF THIS JOB THE SUBSEQUENT CASES, THESE ARE THEN	YTLW0028
29	C	STORED IN FILE OF FOR PLOTTER AND/OR PRINTING;	YTLW0029
30	C		YTLW0030
31	C	*****INPUY*	YTLW0031
32	C		YTLW0032
33	C	NS -THE NUMBER OF STATIONS USED IN THE PROGRAM	YTLW0033
34	C		YTLW0034
35	C	NDI(50) -AN ARRAY CONTAINING THE STATION NUMBERS USED	YTLW0035
36	C		YTLW0036
37	C	WINDOW(5,5,22)-THE DAILY RELEASE WINDOW START/STOP TIMES,	YTLW0037
38	C	-207 INDEX FOR STARTING START/STOP TIMES;	YTLW0038
39	C	-10073 FOR START TIMES	YTLW0039
40	C	-20476 FOR STOP TIMES	YTLW0040
41	C	-2ND INDEX FOR THE CONSTRAINT	YTLW0041
42	C	- 1-WARTH SHADOW	YTLW0042
43	C	- 2-SHRAVATION	YTLW0043
44	C	- 3-SHON	YTLW0044
45	C	- 4-SHON	YTLW0045
46	C	- 5-TOTAL SKY BACKGROUND BRIGHTNESS	YTLW0046
47	C		YTLW0047
48	C	DJUL -JULIAN DATE FOR CURRENT DATA	YTLW0048
49	C		YTLW0049
50	C	NDP(5) -NUMBER OF DAYS RAST FROM DATE TO DATE FOR	YTLW0050
51	C	-STARTING CALCULATIONS (INTEGER)	YTLW0051
52	C		YTLW0052
53	C	NDVE -NUMBER OF DAYS RAST FROM DATE TO DATE FOR	YTLW0053
54	C	-STOPPING CALCULATIONS (INTEGER)	YTLW0054
55	C		YTLW0055
56	C	ICASE -INTEGER VALUE OR CASE NUMBER	YTLW0056
57	C		YTLW0057
58	C	IFINAL -INTEGER CODE NOTING LAST CASE	YTLW0058
59	C	-00, MORE CASES TO FOLLOW	YTLW0059
60	C	-01, THIS IS THE FINAL CASE	YTLW0060
61	C		YTLW0061
62	C	I -CURRENT NUMBER OF DAYS FROM FIRST DAY CALCULATED	YTLW0062
63	C		YTLW0063
64	C		YTLW0064
65	C	*****OUTPUT*	YTLW0065
66	C		YTLW0066
67	C	DJUL -JULIAN DATE FOR CURRENT DATA	YTLW0067
68	C		YTLW0068
69	C	IYEAR -YEAR FOR DATE OF CURRENT DATA	YTLW0069
70	C		YTLW0070
71	C	IMONTH -MONTH FOR DATE OF CURRENT DATA	YTLW0071
72	C		YTLW0072
73	C	IDAY -DAY NUMBER FOR DATE OF CURRENT DATA	YTLW0073
74	C		YTLW0074
75	C	G(I) -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT	YTLW0075
76	C	-DATE	YTLW0076
77	C		YTLW0077
78	C	B(I) -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT	YTLW0078
79	C	-DATE	YTLW0079
80	C		YTLW0080
81	C	B(0) -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT	YTLW0081
82	C	-DATE FOR ALL INPUT CASES	YTLW0082
83	C		YTLW0083
84	C	F(I) -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT	YTLW0084
85	C	-DATE FOR ALL INPUT CASES	YTLW0085
86	C		YTLW0086
87	C	*****RESTRICTIONS*	YTLW0087
88	C	ONLY THESE CONSTRAINTS ARE CURRENTLY COMPUTED IN THE ORIGINAL	YTLW0088
89	C	COMPILED PROGRAM CAN BE COMPUTED	YTLW0089
90	C	UP TO A MAXIMUM OF TWELVE TRANSITION STATIONS CAN BE CONSIDERED,	YTLW0090
91	C	A MAXIMUM OF SIX COMBINED INTERVALS CAN BE COMPUTED FOR A GIVEN	YTLW0091
92	C	DAY	YTLW0092



93	C		YTLW0803	
94	C	-----SUBROUTINE PROGRAMS REQUIRED-	YTLW0804	
95	C	LWRS	YTLW0805	
96	C		YTLW0806	
97	C	-----ORDER OF DOCUMENTATION CARDS-----	YTLW0807	
98	C		YTLW0808	
99		SUBROUTINE YTLW08 (1)	YTLW0809	
100		COMMON/BLK1/ BUJL, NBNJ0, NBT0, NPB0H	YTLW0810	
101		COMMON/BLK2/ PNA, NBT(12)	YTLW0811	
102		COMMON/BLK3/ WINDOW(12)	YTLW0812	
103		COMMON/BLK4/ ICASE, OPTVAL	YTLW0813	
104		COMMON/BLK5/ LINDT, IYEAR, IMONTH, IDAY	YTLW0814	
105		DIMENSION X(6,12), B(6,12), Y(12,12), C(6), D(6)	YTLW0815	
106		DIMENSION E(6), F(6)	YTLW0816	
107		DIMENSION MONTH(12)	YTLW0817	
108		DATA NBNV1, NBNJ1, NBNB1, NBNH1, NBNM1, NBNW1, NBNJUL1, NBNM1, NBNSEP1,	YTLW0818	
109	1	ZHO0Y, ZHO0V, ZHO0DEB/	YTLW0819	
110	C		YTLW0820	
111	C	CLEAN THE A, B, E, F ARRAYS BEFORE STARTING SUBROUTINE CALCULATIONS	YTLW0821	
112		DO 300 M=1,6	YTLW0822	
113		DO 400 L=1,12	YTLW0823	2
114		A(M,L) = 0.0	YTLW0824	3
115	400	B(M,L) = 0.0	YTLW0825	4
116		C(M) = 0.0	YTLW0826	5
117	300	D(M) = 0.0	YTLW0827	6
118		H = 0	YTLW0828	7
119	C	FIND THE COMBINED WINDOWS SEPARATELY FOR EACH STATION	YTLW0829	8
120		DO 140 L=1,12	YTLW0830	9
121		L = NOSTEL	YTLW0831	10
122	C	CHECK THE SUN'S FIRST INTERVAL WITH THE OTHER INTERVALS FOR STATION(L)	YTLW0832	11
123	C	WHEN THE SUN'S SECOND INTERVAL	YTLW0833	
124		DO 120 I=1,3	YTLW0834	12
125	C	CHECK THE MOON'S FIRST INTERVAL THEN ITS SECOND INTERVAL WITH THE	YTLW0835	
126	C	OTHERS FOR STATION(L),	YTLW0836	
127		DO 120 I=1,3	YTLW0837	13
128	C	CHECK THE EARTH SHADOW INTERVALS ONLY IF THEY EXIST FOR THIS DAY?	YTLW0838	
129		DO 120 I=1,3	YTLW0839	14
130		IF (I=1,2,3) GO TO 119	YTLW0840	15
131		IF (WINDOW(I,1,1) > 0.0) GO TO 116	YTLW0841	16
132	C	CHECK THE FIRST, THEN SECOND, THEN THIRD INTERVAL FOR THE TOTAL SKY	YTLW0842	
133	C	BRIGHTNESS WITH THE OTHERS FOR STATION(L),	YTLW0843	
134		DO 120 I=1,3	YTLW0844	20
135		YEMP(I) = SAHAI(WINDOW(I,1,1), WINDOW(I,4,1))	YTLW0845	21
136		YEMP(I) = SAHAI(YEMP(I), WINDOW(I,2,1))	YTLW0846	22
137		YEMP(I) = SAHAI(YEMP(I), WINDOW(I,3,1))	YTLW0847	23
138		YEMP(I) = SAHAI(WINDOW(I,1,1), WINDOW(I,4,1))	YTLW0848	24
139		YEMP(I) = SAHAI(YEMP(I), WINDOW(I,2,1))	YTLW0849	25
140		YEMP(I) = SAHAI(YEMP(I), WINDOW(I,3,1))	YTLW0850	26
141	C	IF COMBINED STOP TIME IS LONGER THAN COMBINED START TIME FOUND ABOVE	YTLW0851	27
142	C	WHEN NO INTERSECTION EXISTS, DO NOT STORE THESE TIMES IN IAT AND IBT	YTLW0852	
143	C	ARRAYS,	YTLW0853	
144		IF (YEMP(I) > 0.0, YEMP(I)) GO TO 100	YTLW0854	28
145	C	STORE INTERVAL INTERSECTIONS IN A AND B ARRAYS AND CHECK FOR ANOTHER	YTLW0855	
146	C	INTERVAL FOR STATION (L)? (INCREASE M BY 1)	YTLW0856	
147		A(M,L) = YEMP(I)	YTLW0857	31
148		B(M,L) = YEMP(I)	YTLW0858	32
149		M = M + 1	YTLW0859	33
150	100	CONTINUE	YTLW0860	34
151	100	CONTINUE	YTLW0861	35
152	100	CONTINUE	YTLW0862	36
153	100	CONTINUE	YTLW0863	37
154	100	CONTINUE	YTLW0864	38
155	C	ALL POSSIBLE COMBINATIONS OF INTERVALS FOR STATION(L) HAVE BEEN	YTLW0865	39
156	C	CHECKED, REINITIALIZE M TO 0 AND CHECK NEXT STATION,	YTLW0866	40
157		M = 0	YTLW0867	41
158	100	CONTINUE	YTLW0868	42
159		DO 150 J=1,12	YTLW0869	43
160		IF (NBJ(J) > 0.0) GO TO 100	YTLW0870	44
161		YEMP(J) = SAHAI(1)	YTLW0871	45
162		YEMP(J) = SAHAI(1)	YTLW0872	46
163		IF (NBN(J) > 0.0) GO TO 112	YTLW0873	47
164		C(N) = YEMP(J)	YTLW0874	48
165		D(N) = YEMP(J)	YTLW0875	49

166	N	6N63			TTLW0266	57
167	GO TO 520				TTLW0267	58
168	521 DO 520 J2 01,6				TTLW0268	59
169	IF (A1J2, 2, 1, 60, 2400) GO TO 520				TTLW0269	60
170	TEMP(1) = AHAN1(TEMP1) / PA(J2, 2)				TTLW0270	61
171	TEMP(2) = AHAN1(TEMP2) / PB(J2, 2)				TTLW0271	62
172	IF (NO, NO, 2) GO TO 521				TTLW0272	63
173	IF (TEMP(3) > GE, TEMP(4)) GO TO 520				TTLW0273	64
174	C(N) = YEMR(3)				TTLW0274	71
175	D(N) = YEMR(4)				TTLW0275	72
176	N	6N63			TTLW0276	73
177	GO TO 520				TTLW0277	74
178	521 DO 520 J3 01,6				TTLW0278	75
179	IF (A1J3, 3, 1, 60, 2400) GO TO 520				TTLW0279	76
180	TEMP(5) = AHAN1(TEMP5) / PA(J3, 3)				TTLW0280	79
181	TEMP(6) = AHAN1(TEMP6) / PB(J3, 3)				TTLW0281	80
182	IF (NO, NO, 3) GO TO 521				TTLW0282	81
183	IF (TEMP(5) > GE, TEMP(6)) GO TO 520				TTLW0283	84
184	C(N) = YEMR(5)				TTLW0284	87
185	D(N) = YEMR(6)				TTLW0285	88
186	N	6N63			TTLW0286	89
187	GO TO 520				TTLW0287	90
188	521 DO 520 J4 01,6				TTLW0288	91
189	IF (A1J4, 4, 1, 60, 2400) GO TO 520				TTLW0289	92
190	TEMP(7) = AHAN1(TEMP7) / PA(J4, 4)				TTLW0290	95
191	TEMP(8) = AHAN1(TEMP8) / PB(J4, 4)				TTLW0291	96
192	IF (NO, NO, 4) GO TO 521				TTLW0292	97
193	IF (TEMP(7) > GE, TEMP(8)) GO TO 520				TTLW0293	100
194	C(N) = YEMR(7)				TTLW0294	103
195	D(N) = YEMR(8)				TTLW0295	104
196	N	6N63			TTLW0296	105
197	GO TO 520				TTLW0297	106
198	521 DO 520 J5 01,6				TTLW0298	107
199	IF (A1J5, 5, 1, 60, 2400) GO TO 520				TTLW0299	108
200	TEMP(9) = AHAN1(TEMP9) / PA(J5, 5)				TTLW0300	111
201	TEMP(10) = AHAN1(TEMP10) / PB(J5, 5)				TTLW0301	112
202	IF (NO, NO, 5) GO TO 521				TTLW0302	113
203	IF (TEMP(9) > GE, TEMP(10)) GO TO 520				TTLW0303	116
204	C(N) = YEMR(9)				TTLW0304	119
205	D(N) = YEMR(10)				TTLW0305	120
206	N	6N63			TTLW0306	121
207	GO TO 520				TTLW0307	122
208	521 DO 520 J6 01,6				TTLW0308	123
209	IF (A1J6, 6, 1, 60, 2400) GO TO 520				TTLW0309	124
210	TEMP(11) = AHAN1(TEMP11) / PA(J6, 6)				TTLW0310	127
211	TEMP(12) = AHAN1(TEMP12) / PB(J6, 6)				TTLW0311	128
212	IF (NO, NO, 6) GO TO 521				TTLW0312	129
213	IF (TEMP(11) > GE, TEMP(12)) GO TO 520				TTLW0313	132
214	C(N) = YEMR(11)				TTLW0314	135
215	D(N) = YEMR(12)				TTLW0315	136
216	N	6N63			TTLW0316	137
217	GO TO 520				TTLW0317	138
218	521 DO 520 J7 01,6				TTLW0318	139
219	IF (A1J7, 7, 1, 60, 2400) GO TO 520				TTLW0319	140
220	TEMP(13) = AHAN1(TEMP13) / PA(J7, 7)				TTLW0320	143
221	TEMP(14) = AHAN1(TEMP14) / PB(J7, 7)				TTLW0321	144
222	IF (NO, NO, 7) GO TO 521				TTLW0322	145
223	IF (TEMP(13) > GE, TEMP(14)) GO TO 520				TTLW0323	148
224	C(N) = YEMR(13)				TTLW0324	151
225	D(N) = YEMR(14)				TTLW0325	152
226	N	6N63			TTLW0326	153
227	GO TO 520				TTLW0327	154
228	521 DO 520 J8 01,6				TTLW0328	155
229	IF (A1J8, 8, 1, 60, 2400) GO TO 520				TTLW0329	156
230	TEMP(15) = AHAN1(TEMP15) / PA(J8, 8)				TTLW0330	159
231	TEMP(16) = AHAN1(TEMP16) / PB(J8, 8)				TTLW0331	160
232	IF (NO, NO, 8) GO TO 521				TTLW0332	161
233	IF (TEMP(15) > GE, TEMP(16)) GO TO 520				TTLW0333	164
234	C(N) = YEMR(15)				TTLW0334	167
235	D(N) = YEMR(16)				TTLW0335	168
236	N	6N63			TTLW0336	169
237	GO TO 520				TTLW0337	170
238	521 DO 520 J9 01,6				TTLW0338	171





67906 02 09-25-72 12,269 COMBINED WINDOW INTERVALS

\*\*\*\*\*SUBROUTINE YLWDO\*\*\*\*\*

WREFAGE

PROGRAM BREAK 2345

COMMON LENGTH 8

Y COMMON DIVS 5

PRIMARY SYNDOP 05YRV

YLRDO 8

SECONDARY SYNDOP 05YRV

BLOCK LENGTH

- 1 BLMS1 8
- 2 BLMD 15
- 3 BLMH 528
- 4 BLMS 8
- 5 BLMO 4

SVMREF

- 6 ISSU
- 7 ,PENV,
- 10 ,PESI,
- 11 ,PENV,
- 12 ,PWRD,

2345 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JMA 050178/052571 JMB 050271/052571 JMC 050178/052571

THERE WERE 00 WARNING FLAGS IN THE ABOVE ASSEMBLY

04 20138 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY

67906 02 09-25-72 12,269 TEMPORARY STORAGE OF KILE 9 DATA

\*\*\*\*\*TEMPORARY FILE 9 DATA\*\*\*\*\*

1	CICAS	TEMPORARY STORAGE OF KILE 9 DATA	ICAS0001
2	C	*****TEMPORARY FILE 9 DATA*****	ICAS0002
3	C		ICAS0003
4	C	*****START OF DOCUMENTATION CARDS*****	ICAS0004
5	C		ICAS0005
6	C	*****NASA WALLER'S VERSION OF 052571	ICAS0006
7	C		ICAS0007
8	C	*****LANGUAGE-FORTRAN IV	ICAS0008
9	C		ICAS0009
10	C	*****MACHINE-05 025	ICAS0010
11	C		ICAS0011
12	C	*****PURPOSE-	ICAS0012
13	C	TO CALCULATE A COMBINED RELEASE WINDOW FOR VARIOUS RELEASE	ICAS0013
14	C	POINTS AND/OR DERIVED PROBLEM CONSTRAINTS (EXCLUDING THE SUN	ICAS0014
15	C	AND SUN CONSTRAINTS).	ICAS0015
16	C		ICAS0016
17	C	*****METHOD-	ICAS0017
18	C	THE MOST RECENT COMBINED RELEASE WINDOW CALCULATED BY	ICAS0018
19	C	SUBROUTINE YLWDO IS COMBINED WITH THOSE OF PRIOR RUN CASES	ICAS0019
20	C	WITHIN THIS JOB, FOR THE FIRST CASE THE WINDOW IS ONLY RECORDED	ICAS0020
21	C	ON THE TEMPORARY FILE 9, JULIAN DATES ARE CHECKED TO INSURE	ICAS0021
22	C	COMPATIBILITY.	ICAS0022
23	C		ICAS0023
24	C	*****INPUTS	ICAS0024
25	C		ICAS0025
26	C	DOUL -JULIAN DATE FOR CURRENT DATE,	ICAS0026
27	C		ICAS0027
28	C	C(6) -ARRAY OF MOST RECENT DATE OF COMBINED WINDOW	ICAS0028
29	C	-ARRAY TIMES FOR CURRENT DATE,	ICAS0029
30	C		ICAS0030
31	C	D(6) -ARRAY OF MOST RECENT DATE OF COMBINED WINDOW	ICAS0031



32	C		-OVER TIME FOR CURRENT DATE,	ICAS0032	
33	C			ICAS0033	
34	C	ISUB	-CASE NUMBER	ICAS0034	
35	C			ICAS0035	
36	C	ISUB	-CURRENT NUMBER OF DAYS FROM FIRST DAY CALCULATED	ICAS0036	
37	C			ICAS0037	
38	C			ICAS0038	
39	C	ISUB		ICAS0039	
40	C			ICAS0040	
41	C	A(I)	-ARRAY OF TOTAL CASES SO FAR CALCULATED OF	ICAS0041	
42	C		-COMBINED WINDOW START TIMES FOR CURRENT DATE,	ICAS0042	
43	C			ICAS0043	
44	C	B(I)	-ARRAY OF TOTAL CASES SO FAR CALCULATED OF	ICAS0044	
45	C		-COMBINED WINDOW STOP TIMES FOR CURRENT DATE,	ICAS0045	
46	C			ICAS0046	
47	C			ICAS0047	
48	C		ONLY THOSE CONSTRAINTS CURRENTLY DEFINED IN THE WINDOW	ICAS0048	
49	C		COMPUTER PROGRAM CAN BE MONITORED,	ICAS0049	
50	C			ICAS0050	
51	C			ICAS0051	
52	C			ICAS0052	
53	C			ICAS0053	
54	C			ICAS0054	
55	C			ICAS0055	
56	C			ICAS0056	
57	C			ICAS0057	
58	C			ICAS0058	
59	C			ICAS0059	
60	C			ICAS0060	
61	C			ICAS0061	
62	C			ICAS0062	4
63	C		COMPUTE PROPER FILES FOR INPUT AND OUTPUT FOR FIRST DAY OF THIS CASE,	ICAS0063	
64	C			ICAS0064	7
65	C			ICAS0065	8
66	C			ICAS0066	9
67	C			ICAS0067	10
68	C			ICAS0068	11
69	C			ICAS0069	12
70	C			ICAS0070	13
71	C		READ COMBINED WINDOW FROM PRIOR CASES AND CHECK JULIAN DATE	ICAS0071	
72	C			ICAS0072	19
73	C		INCLUDE RESULTS OF LATEST CASE WITH COMBINED WINDOW	ICAS0073	
74	C			ICAS0074	22
75	C			ICAS0075	23
76	C			ICAS0076	24
77	C			ICAS0077	25
78	C			ICAS0078	26
79	C			ICAS0079	29
80	C			ICAS0080	30
81	C			ICAS0081	
82	C			ICAS0082	33
83	C			ICAS0083	34
84	C			ICAS0084	35
85	C			ICAS0085	36
86	C			ICAS0086	38
87	C		FILL REMAINDER OF A AND B ARRAYS WITH 20'S AND 0'S RESPECTIVELY,	ICAS0087	
88	C			ICAS0088	40
89	C			ICAS0089	43
90	C			ICAS0090	44
91	C			ICAS0091	45
92	C		WRITE LATEST COMBINED RELEASE WINDOW ON PROPER TEMPORARY FILE,	ICAS0092	
93	C			ICAS0093	47
94	C		CHANGE FROM DESIGNATOR CODE IN WINDOW COMPUTED HAS FOR LAST DAY,	ICAS0094	
95	C			ICAS0095	53
96	C			ICAS0096	54
97	C		COPY DATA ONTO FILE 13 IF THIS IS FIRST CASE,	ICAS0097	
98	C			ICAS0098	57
99	C			ICAS0099	58
100	C			ICAS0100	59
101	C			ICAS0101	60
102	C			ICAS0102	61
103	C			ICAS0103	63
104	C		PRINT MESSAGE ON JULIAN DATE CHECK; RETURN MESSAGE-TERMINATE PROGRAM,	ICAS0104	

105	SE HWYS (03390) ICASB	ICAS0005	64
106	2000 FORMAT (VEN. 2.12P.000)	ICAS0006	67
107	2002 FORMAT (VEN. 2.12P.000) PVAL ERROR- DATES DO NOT MEET FOR WINDOW CALCUL	ICAS0007	67
108	1470000 USING CASE, IS, ISM-PROGRAM TERMINATED 0000,	ICAS0008	
109	STOP	ICAS0009	67
110	END	ICAS0010	66

28857 WORDS OF MEMORY USED BY THIS COMPILE

07906 ON 09-25-72 12,273 TEMPORARY STORAGE OF FILE 9 DATA

TEMPORARY FILE 9 DATA

PREPAGE

PROGRAM BREAK 410  
COMMON LENGTH 0  
Y COMMON DIVS 0

PRIMARY SYNDET ENTRY

1000 0

SECONDARY SYNDET ENTRY

BLOCK LENGTH

1 BLK01 0  
2 BLK02 0

SUBREF

3 .P00V  
4 .P00Y  
5 .P00L  
6 .P00D  
7 .P00V  
10 .P00D

410 IS THE NEXT AVAILABLE LOCATION

CHAP VERSION/ISSUANCE DATES JMW 050171/052571 JMW 050171/052571 JMW 050171/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

28429 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY

07906 ON 09-25-72 12,276 PRINT OUTPUT SUBROUTINE

PRINT OUTPUT SUBROUTINE

1	CH002	PRINT OUTPUT SUBROUTINE	OUT20001
2	C	.....SUBROUTINE	OUT20002
3	C		OUT20003
4	C	.....EVERY OF DOCUMENTATION CARDS	OUT20004
5	C		OUT20005
6	C	.....NASA HALLEPS VERSION OF 02/01/70	OUT20006
7	C		OUT20007
8	C	.....LABORER-FORTRAN IV	OUT20008
9	C		OUT20009
10	C	.....INFORM-85 025	OUT20010
11	C		OUT20011
12	C	.....	OUT20012
13	C	TO UTILIZE THE PROPER SUBROUTINE FOR OUTPUT PRINTING AND/OR	OUT20013
14	C	FLATTING FOR THE TIME PERIOD AS REQUESTED ON INPUT CARD IN,	OUT20014
15	C		OUT20015
16	C	.....	OUT20016
17	C	THIS SUBROUTINE CALCULATES THE JULIAN DATE FOR THOSE DATES	OUT20017
18	C	REQUESTED FOR PRINTING AND/OR PLOTTING, IT THEN CALLS THE PROPER	OUT20018
19	C	SUBROUTINES TO EXECUTE THE PRINTING AND/OR PLOTTING AS	OUT20019
20	C	REQUESTED, IF NO PRINTING OR PLOTTING IS DESIRED THEN THE	OUT20020
21	C	SUBROUTINE TERMINATES AFTER FINDING THE JULIAN DATES DESIRED	OUT20021
22	C	ABOVE.	OUT20022
23	C		OUT20023

24	C	*****INPUT*		OUT20024
25	C			OUT20025
26	C	KMB	-MONTH PLOTTING AND/OR PRINTING TO BEGIN	OUT20026
27	C			OUT20027
28	C	KDB	-DAY PLOTTING AND/OR PRINTING TO BEGIN	OUT20028
29	C			OUT20029
30	C	KYR	-YEAR PLOTTING AND/OR PRINTING TO BEGIN	OUT20030
31	C			OUT20031
32	C	LMB	-MONTH PLOTTING AND/OR PRINTING TO END	OUT20032
33	C			OUT20033
34	C	LDB	-DAY PLOTTING AND/OR PRINTING TO END	OUT20034
35	C			OUT20035
36	C	LYR	-YEAR PLOTTING AND/OR PRINTING TO END	OUT20036
37	C			OUT20037
38	C	IPRT7	-INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07	OUT20038
39	C		-DATA	OUT20039
40	C		-00: PRINT FILE 07 DATA	OUT20040
41	C		-01: DO NOT PRINT FILE 07 DATA	OUT20041
42	C			OUT20042
43	C	IPRT9	-INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09	OUT20043
44	C		-DATA	OUT20044
45	C		-00: PRINT FILE 09 DATA	OUT20045
46	C		-01: DO NOT PRINT FILE 09 DATA	OUT20046
47	C			OUT20047
48	C	IPLOT	-INTEGER CODE TO SIGNAL REQUEST PLOTTING DATA	OUT20048
49	C		-00: CREATE A FILE FOR PLOTTING DATA FOR 8	OUT20049
50	C		-01: CALENDAR YEAR THROUGH FILE 01 AT 556 BP1	OUT20050
51	C		-02: CREATE A FILE FOR PLOTTING DATA FOR 9	OUT20051
52	C		-03: CALENDAR MONTH THROUGH FILE 01 AT 556 BP1	OUT20052
53	C		-04: DO NOT CREATE A PLOT FILE	OUT20053
54	C			OUT20054
55	C	IBASE	-BASE NUMBER	OUT20055
56	C			OUT20056
57	C			OUT20057
58	C	*****OUTPUT*		OUT20058
59	C			OUT20059
60	C	BEGIN	-JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING	OUT20060
61	C			OUT20061
62	C	FINIS	-JULIAN DATE TO STOP PRINTING AND/OR PLOTTING	OUT20062
63	C			OUT20063
64	C	LINE	-LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT	OUT20064
65	C		-HEADING	OUT20065
66	C			OUT20066
67	C	*****RESTRICTIONS*		OUT20067
68	C		THIS SUBROUTINE REQUIRES THE EXISTENCE OF FILES 07 AND 09 AND	OUT20068
69	C		IF EITHER IS TO BE USED WHEN THE DATA MUST EXIST FOR THESE	OUT20069
70	C		DATES REQUESTED,	OUT20070
71	C			OUT20071
72	C	*****SUBPROGRAMS REQUIRED*		OUT20072
73	C	DAYNUM		OUT20073
74	C	OUTYR		OUT20074
75	C	TYLPR		OUT20075
76	C	PLVRYN		OUT20076
77	C			OUT20077
78	C	*****END OF DOCUMENTATION CARDS*		OUT20078
79	C			OUT20079
80		SUBROUTINE OUT2		OUT20080
81		COMMON/BLK1 /KMONTH,KDAY ,KYEAR ,LMONTH,LDAY ,LYEAR ,KMO2 ,KDA1		OUT20081
82		1 KYR, LMO2 ,LDA, LYR, ICBLS, IPRT7, IPRT9, IPRT12,IPLOT		OUT20082
83		COMMON/BLK2 /BEGIN, FINIS		OUT20083
84		COMMON/BLK3 /IBASE,IPINAL		OUT20084
85	C	FOUND THE JULIAN DATE FOR THE BEGINNING AND ENDING DATES ASKED TO BE		OUT20085
86	C	PRINTED AND/OR PLOTTED.		OUT20086
87		DAY GKDA		OUT20087
88		YEAR GKYR		OUT20088
89		BEGIN GDAYNUM (KMO, DAY, YEAR)		OUT20089
90		DAY GLDA		OUT20090
91		YEAR GLYR		OUT20091
92		FINIS GDAYNUM (LMO, DAY, YEAR)		OUT20092
93	C	PRINT DATA FOR DAILY RELEASE TIMES FOR CONSTRAINT PER STATION ONLY IF		OUT20093
94	C	IPRT7 = 0		OUT20094





67906 02 09-25-72 12,283 FILE 07 00V00Y

## PRINT ROUTINE FOR FILE 07 DATA\*\*\*\*\*

1	C	00V0Y	FILE 07 00V0Y	OUTT0001
2	C	*****PRINT ROUTINE FOR FILE 07 DATA*****		OUTT0002
3	C			OUTT0003
4	C	*****START OF DOCUMENTATION CARDS*****		OUTT0004
5	C			OUTT0005
6	C	*****NASK MACROPS VERSION OF 02X052Y0		OUTT0006
7	C			OUTT0007
8	C	*****LANGUAGE=FORTRAN IV		OUTT0008
9	C			OUTT0009
10	C	*****MACHINE=GE 625		OUTT0010
11	C			OUTT0011
12	C	*****PURPOSE:		OUTT0012
13	C	TO PRINT THE DAILY RELEASE WINDOW DATA FOR EACH CONSTRAINT AND		OUTT0013
14	C	FOR EACH STATION.		OUTT0014
15	C			OUTT0015
16	C	*****METHOD:		OUTT0016
17	C	THE DAILY RELEASE WINDOW TIMES CALCULATED FOR EACH STATION AND		OUTT0017
18	C	EACH CONSTRAINT STORED ON FILE 07 IS FIRST READ BY THIS		OUTT0018
19	C	SUBROUTINE, THE DATA IS THEN RETURNED IN HOURS AND MINUTES FOR		OUTT0019
20	C	THOSE DAYS WITHIN JULIAN DATES 'BEGIN' AND 'FINIS', THE DATE,		OUTT0020
21	C	CONSTRAINT NAME AND STATION NAME ARE PRINTED ALONG WITH THE		OUTT0021
22	C	TIME INTERVALS IN VARIED FORMATS. THIS PROGRAM WILL TERMINATE IF		OUTT0022
23	C	THE JULIAN DATE OF THE CURRENT TAPE RECORD BEING READ IS EITHER		OUTT0023
24	C	GREATER THAN 'FINIS' OR EQUAL TO 99970.		OUTT0024
25	C			OUTT0025
26	C	*****INPUT:		OUTT0026
27	C	ON FILE 07		OUTT0027
28	C			OUTT0028
29	C	LINE	-LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT	OUTT0029
30	C		-HEADING	OUTT0030
31	C			OUTT0031
32	C	BEGIN	-JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING	OUTT0032
33	C			OUTT0033
34	C	FINIS	-JULIAN DATE TO STOP PRINTING AND/OR PLOTTING	OUTT0034
35	C			OUTT0035
36	C	BJUL	-JULIAN DATE FOR CURRENT DATA	OUTT0036
37	C			OUTT0037
38	C	K	-INDEX FOR CONSTRAINTS	OUTT0038
39	C		=1, EARTH SHADOW	OUTT0039
40	C		=2, NOT USED	OUTT0040
41	C		=3, SUN	OUTT0041
42	C		=4, MOON	OUTT0042
43	C		=5, TOTAL SKY BACKGROUND BRIGHTNESS	OUTT0043
44	C			OUTT0044
45	C	IDAY	-DAY NUMBER FOR DATE OF CURRENT DATA	OUTT0045
46	C			OUTT0046
47	C	IMONTH	-MONTH FOR DATE OF CURRENT DATA	OUTT0047
48	C			OUTT0048
49	C	IYEAR	-YEAR FOR DATE OF CURRENT DATA	OUTT0049
50	C			OUTT0050
51	C	NR0STR(3)	-ALPHANUMERIC NAME OF CONSTRAINT	OUTT0051
52	C			OUTT0052
53	C	NAME(5,32)	-NAME OF TRACKING STATIONS USED	OUTT0053
54	C			OUTT0054
55	C	WINDOW(6)	-THE DAILY RELEASE WINDOW START/STOP TIMES,	OUTT0055
56	C		-1ST INDEX FOR STARTING START/STOP TIMES,	OUTT0056
57	C		-1,375 FOR START TIMES	OUTT0057
58	C		-2,475 FOR STOP TIMES	OUTT0058
59	C			OUTT0059
60	C			OUTT0060
61	C	*****OUTPUT:		OUTT0061
62	C	ON FILE 06-PRINTER		OUTT0062
63	C			OUTT0063
64	C	IDAY	-DAY NUMBER FOR DATE OF CURRENT DATA	OUTT0064
65	C			OUTT0065
66	C	IMONTH	-MONTH FOR DATE OF CURRENT DATA	OUTT0066
67	C			OUTT0067
68	C	IYEAR	-YEAR FOR DATE OF CURRENT DATA	OUTT0068
69	C			OUTT0069

70	C	NRSTR(13)	-ALPHANUMERIC NAME OF CONSTRAINT	OUTT0070	
71	C			OUTT0071	
72	C	NAME(13)	-NAME OF TRACK(OR STATIONS USED	OUTT0072	
73	C			OUTT0073	
74	C	JH(6)	-INTEGRAL HOUR VALUE OF START/STOP TIMES	OUTT0074	
75	C			OUTT0075	
76	C	JM(6)	-INTEGRAL MINUTE VALUE OF START/STOP TIMES	OUTT0076	
77	C			OUTT0077	
78	C	CONSTRAINT RESTRICTIONS:		OUTT0078	
79	C	THE NUMBER OF TIME INTERVALS PER CONSTRAINT IS FIXED BY THE		OUTT0079	
80	C	REQUIREMENTS OF THE PROGRAM.		OUTT0080	
81	C	SUBROUTINE OUTPUTS TIME VARIABLES WITH NO WEATHER ACCURACY THAN		OUTT0081	
82	C	ONE MINUTE.		OUTT0082	
83	C			OUTT0083	
84	C	SUBPROGRAMS REQUIRED:		OUTT0084	
85	C	NONE		OUTT0085	
86	C			OUTT0086	
87	C	END OF DOCUMENTATION CARDS		OUTT0087	
88	C			OUTT0088	
89		SUBROUTINE OUTTYPE (LINE)		OUTT0089	
90		COMMON/BLKX2/BSGIN, FIBIS		OUTT0090	
91		DIMENSION NRSTR(13), NAME(13), WINDOW(6), JH(6), JM(6), PRTSGN(6),		OUTT0091	
92		1 SGN(2)		OUTT0092	
93		DATA SGN / 18-13H /		OUTT0093	
94	C	READ A RECORD OF DATA		OUTT0094	
95		33 READ 17,2050) DJUL,K, IDAY,IMONTH,LYEAR,NRSTR,NAME,WINDOW,1		OUTT0095	
96	C	IF DJUL,0, THEN RECORD CONTAINS DATA FOR PRINTING		OUTT0096	
97		IF (DJUL) 1,12,11		OUTT0097	8
98	C	CHECK TO SEE IF THE JULIAN DATA IS WITHIN THE TIME PERIOD REQUESTED		OUTT0098	
99	C	FOR PRINTING,		OUTT0099	
100		11 IF (DJUL,EE,999,0) GO TO 01		OUTT0100	9
101		IFLAG = 0		OUTT0101	12
102		IF (DJUL,GE,BEGIN) IFLAG = 1		OUTT0102	13
103		IF (DJUL,GT,FINIS) RETURN		OUTT0103	16
104		GO TO 13		OUTT0104	19
105		12 IF (IFLAG,EO,0) GO TO 13		OUTT0105	20
106	C	CHANGE TIMES FROM HOURS AND DECIMAL OF HOURS TO HOURS AND MINUTES		OUTT0106	
107		DO 100 L=3,6		OUTT0107	23
108		IN(L) = WINDOW(L)		OUTT0108	24
109		IF (IN(L),NE,0) GO TO 42		OUTT0109	29
110		IF (WINDOW(L),LT,0.) PRTSGN(L) = SGN(1)		OUTT0110	28
111		GO TO 42		OUTT0111	31
112		41 PRTSGN(L) = SGN(2)		OUTT0112	32
113		42 TEMP = JH(L)		OUTT0113	33
114		100 JH(L) = ABS(WINDOW(L) - TEMP) * 60,		OUTT0114	34
115		GO TO 1176X(4,4) * K		OUTT0115	36
116	C	PRINT EACH WINDOW CONSTRAINT TIMES		OUTT0116	
117		1 IF (LENB,LT,40) GO TO 32		OUTT0117	37
118		WRITE (1,1000)		OUTT0118	40
119		IF (WINDOW(2),NE,24,0) GO TO 32		OUTT0119	42
120		WRITE (1,1001) IDAY,IMONTH,LYEAR,NRSTR,NAME,(PRTSGN(L),JH(L),		OUTT0120	45
121		1 JM(L),L=2)		OUTT0121	
122		LINE = 6		OUTT0122	51
123		GO TO 13		OUTT0123	52
124		32 WRITE (1,1002) IDAY,IMONTH,LYEAR,NRSTR,NAME,(PRTSGN(L),JH(L),		OUTT0124	53
125		1 JM(L),L=4)		OUTT0125	
126		LINE = 6		OUTT0126	59
127		GO TO 13		OUTT0127	60
128		32 WRITE (1,1003)		OUTT0128	61
129		IF (WINDOW(2),NE,24,0) GO TO 33		OUTT0129	63
130		WRITE (1,1004) IDAY,IMONTH,LYEAR,NRSTR,NAME,(PRTSGN(L),JH(L),		OUTT0130	66
131		1 JM(L),L=2)		OUTT0131	
132		LINE = LINE + 3		OUTT0132	72
133		GO TO 13		OUTT0133	73
134		33 WRITE (1,1005) IDAY,IMONTH,LYEAR,NRSTR,NAME,(PRTSGN(L),JH(L),		OUTT0134	74
135		1 JM(L),L=4)		OUTT0135	
136		LINE = LINE + 3		OUTT0136	80
137		GO TO 13		OUTT0137	81
138	C	PRINT SUN TIMES IF K=3		OUTT0138	
139	C	PRINT MOON TIMES IF K=4		OUTT0139	
140		1 IF (LENB,LT,40) GO TO 34		OUTT0140	82
141		WRITE (1,1006)		OUTT0141	85
142		WRITE (1,1007) IDAY,IMONTH,LYEAR,NRSTR,NAME,(PRTSGN(L),JH(L),		OUTT0142	87



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143      1          JW(L),L=4)
144      LINE 56
145      GO TO 13
146      21 IF (I,NO,3) GO TO 22
147      WRITE (9,3005)
148      WRITE (9,3006) NAME$(PRYSGN(L),INCL),JW(L),L=4)
149      LINE 5,LINE 3
150      GO TO 13
151      22 WRITE (9,3007) NAME$(PRYSGN(L),INCL),JW(L),L=4)
152      LINE 5,LINE 3
153      GO TO 13
154      C PRINT TOTAL SKY BACKGROUND BRIGHTNESS CONSTRAINT TIMES
155      3 IF (LNRH,L,50) GO TO 30
156      WRITE (9,3008)
157      WRITE (9,3009) (DAY,MONTH,LYEAR)NAME$(PRYSGN(L),INCL),
158      1          JW(L),L=6)
159      LINE 56
160      GO TO 13
161      31 IF (I,NO,1) GO TO 32
162      WRITE (9,3009)
163      WRITE (9,3007) NAME$(PRYSGN(L),INCL),JW(L),L=3)
164      LINE 5,LINE 3
165      GO TO 13
166      32 WRITE (9,3008) NAME$(PRYSGN(L),INCL),JW(L),L=3)
167      LINE 5,LINE 3
168      GO TO 13
169      01 RETURN
170      2000 FORMAT (I2,2X,I7,2H0000RELEASE WINDOW DAILY TIME INTERVALS PER CON
171      1STRAINT PER STATION,/,X,4HRTN,205,10HCONSTRAINT,9X,
172      2          7HSTATION, 9X, 3(SMSTRTYV(2X,4MSTOP,7H)/,
173      3          9X, 6(3H,6HUR/HIN,3E))
174      2001 FORMAT (2X,12,1X,A3,2X,14, 5A5, 8(1H,A1,13,2U/P(2,4X))
175      2002 FORMAT (2X,12,1X,A3,2X,14, 5A5, 8(1H,A1,13,2U/P(2,4X))
176      2003 FORMAT (END)
177      2004 FORMAT (142,6A6,6(1X,A1,13,2U/P(2,4X))
178      2005 FORMAT (322,6A6,6(1X,A1,13,2U/P(2,4X))
179      2006 FORMAT (2X,12,1X,A3,2X,14, 5A5, 8(1H,A1,13,2U/P(2,4X))
180      2007 FORMAT (142,6A6,6(1X,A1,13,2U/P(2,4X))
181      2008 FORMAT (322,6A6,6(1X,A1,13,2U/P(2,4X))
182      2009 FORMAT (P10,2,2I2,25,1496A6,6H12I5,9I)
183      END
184      25559 WORDS OF MEMORY USED BY THIS COMPILE

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07906 DE 09-25-72 12,287 FILE 07 OUTPUT  
 PRINT ROUTINE FOR FILE 07 DATA

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PREPAGE
PROGRAM BREAK 1299
COMMON LENGTH 0
V UNIT BYTS 5
PRIMARY SYMBL ENTRY
OUTYPE 0
SECONDARY SYMBL ENTRY
BLOCK LENGTH
1 BLN2 2
SYMBL
2 :FBNV.
3 :FBNV
4 :FBNV.
5 :FBNV.
6 :FBNV.

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7 ,F801,  
 10 ,F800,  
 11 ,F800,  
 12 ,F800,  
 1255 IS THE NEXT AVAILABLE LOCATION.  
 CHAP VERSION/ASSEMBLY DATES JMDA 050108/052571 JMRB 050107/052571 JMPC 050173/052574  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
 \*\* 19639 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY\*\*

67906 02 09-25-72 12,292 SUBROUTINE VTYPE

\*\*\*\*\*VTYPE FILE \*\*\*\*\*

1	C	VTYPE	SUBROUTINE VTYPE	TTLT0001
2	C	*****	WRITE FILE *****	TTLT0002
3	C			TTLT0003
4	C	*****	START OF DOCUMENTATION CARDS *****	TTLT0004
5	C			TTLT0005
6	C	*****	NASA MACLOPS VERSION OF 02Y01X10	TTLT0006
7	C			TTLT0007
8	C	*****	LANGUAGE-FORTRAN IV	TTLT0008
9	C			TTLT0009
10	C	*****	MACHINE-GE 025	TTLT0010
11	C			TTLT0011
12	C	*****	PURPOSE.	TTLT0012
13	C		TO PRINT THE TOTAL COMBINED WINDOW DATA FOR THE DATES REQUESTED	TTLT0013
14	C			TTLT0014
15	C	*****	METHOD.	TTLT0015
16	C		THE COMBINED WINDOW DATA STORED ON FILE 09 IS READ BY THIS	TTLT0016
17	C		SUBROUTINE, IT IS CONVERTED TO HOURS AND MINUTES BEFORE PRINTING	TTLT0017
18	C		A CHECK IS MADE TO SEE IF THE JULIAN DATE OF THE CURRENT RECORD	TTLT0018
19	C		IS WITHIN THE DATES REQUESTED FOR PRINTING, ONLY THE BLOCK OF	TTLT0019
20	C		DATA WITHIN THE DATES REQUESTED IS PRINTED AND ONLY THOSE TRUE	TTLT0020
21	C		DATA INTERVALS ARE PRINTED AT AN END OF FILE CODE WHERE THE JULIAN	TTLT0021
22	C		DATE EQUALS 999.8 IS USED TO TERMINATE THIS SUBROUTINE,	TTLT0022
23	C			TTLT0023
24	C	*****	INPUTS	TTLT0024
25	C		ON FILE 09	TTLT0025
26	C			TTLT0026
27	C	EPDCH	-JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS ON	TTLT0027
28	C		-FILE 09	TTLT0028
29	C			TTLT0029
30	C	DJUL	-JULIAN DATE FOR CURRENT DATA	TTLT0030
31	C			TTLT0031
32	C	IDAY	-DAY NUMBER FOR DATE OF CURRENT DATA	TTLT0032
33	C			TTLT0033
34	C	IMONTH	-MONTH FOR DATE OF CURRENT DATA	TTLT0034
35	C			TTLT0035
36	C	IYEAR	-YEAR FOR DATE OF CURRENT DATA	TTLT0036
37	C			TTLT0037
38	C	BBRN	-JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING	TTLT0038
39	C			TTLT0039
40	C	VBRTS	-JULIAN DATE TO STOP PRINTING AND/OR PLOTTING	TTLT0040
41	C			TTLT0041
42	C	LINE	-LINE COUNT USED TO SKIP TO NEW PAGE AND ERASE	TTLT0042
43	C		-HEADING	TTLT0043
44	C			TTLT0044
45	C	C(6)	-ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT	TTLT0045
46	C		-DATE	TTLT0046
47	C			TTLT0047
48	C	B(6)	-ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT	TTLT0048
49	C		-DATE	TTLT0049
50	C			TTLT0050
51	C			TTLT0051
52	C	*****	OUTPUT.	TTLT0052
53	C		FILE 06-PRINTER	TTLT0053
54	C			TTLT0054
55	C	DJUL	-JULIAN DATE FOR CURRENT DATA	TTLT0055
56	C			TTLT0056
57	C	IDAY	-DAY NUMBER FOR DATE OF CURRENT DATA	TTLT0057
58	C			TTLT0058
59	C	IMONTH	-MONTH FOR DATE OF CURRENT DATA	TTLT0059



60	C			TTLT0060
61	C	IXEAR	-YEAR FOR DATA OR CURRENT DATA	TTLT0061
62	C			TTLT0062
63	C	ISUB	-INTEGRAL VALUE OF STAGY TIME HOURS	TTLT0063
64	C			TTLT0064
65	C	JSUB	-INTEGRAL VALUE OF STAGY TIME MINUTES	TTLT0065
66	C			TTLT0066
67	C	ISUB	-INTEGRAL VALUE OF STOR TIME HOURS	TTLT0067
68	C			TTLT0068
69	C	JSUB	-INTEGRAL VALUE OF STOR TIME MINUTES	TTLT0069
70	C			TTLT0070
71	C	*****INSTRUCTIONS-		TTLT0071
72	C	UP TO SIX DIFFERENT COMBINED WINDOW TIME INTERVALS CAN BE READ		TTLT0072
73	C	AND PRINTED		TTLT0073
74	C			TTLT0074
75	C	*****SUBPROGRAMS REQUIRED-		TTLT0075
76	C	NONE		TTLT0076
77	C			TTLT0077
78	C	*****END OF DOCUMENTATION CARDS*****		TTLT0078
79	C			TTLT0079
80		SUBROUTINE TTYPE (LINE)		TTLT0080
81		COMMON/BUCKXZ/BUXTN, FINIS		TTLT0081
82		DIMENSION E(6) F D(6)		TTLT0082
83		DIMENSION IC(6), JC(6), ID(6), JS(6), SGN(6), SGN(2)		TTLT0083
84		DATA SEN / 1H-12H /		TTLT0084
85	C	READ SPOCH DATE		TTLT0085
86		READ (9,2002) SPOCH		TTLT0086
87	C	READ A DAY OF DATA		TTLT0087
88		22 READ (9,2000) DJUL, IDAY, IMONTH, IYEAR, (C(1), D(1), E(1,6))		TTLT0088
89		IF (DJUL, EQ, 999, 0) GO TO 12		TTLT0089
90	C	IF DAYS IS WITHIN THAT PERIOD REQUESTED THEN PRINT, IF NOT THEN READ		TTLT0090
91	C	ANOTHER RECORD		TTLT0091
92		IF (DJUL, LT, BEGIN) GO TO 11		TTLT0092
93		IF (DJUL, GT, FINIS) GO TO 12		TTLT0093
94		IF (DEND, LT, 20) GO TO 22		TTLT0094
95		WRITE (013008)		TTLT0095
96		LINE 69		TTLT0096
97	C	CHANGE TIME VALUES TO HOURS AND MINUTES		TTLT0097
98		25 DO 100, 63, 6		TTLT0098
99		I(6) = C(I)		TTLT0099
100		IF (I(6), NE, 0) GO TO 32		TTLT0100
101		IF (C(1), LT, 6, ) SGN(1) = SGN(6)		TTLT0101
102		GO TO 32		TTLT0102
103		26 SGN(4) = SGN(2)		TTLT0103
104		27 TEMP = I(1)		TTLT0104
105		JC(1) = (C(1) - TEMP) / 60		TTLT0105
106		ID(1) = D(1)		TTLT0106
107		IF (ID(1), NE, 0) GO TO 33		TTLT0107
108		IF (D(1), LT, 6, ) SGN(1) = SGN(6)		TTLT0108
109		GO TO 34		TTLT0109
110		28 SGN(1) = SGN(2)		TTLT0110
111		29 TEMP = ID(1)		TTLT0111
112		30 JC(1) = (D(1) - TEMP) / 60		TTLT0112
113	C	DETERMINE HOW MANY TIME INTERVALS ARE TO BE PRINTED BY CHECKING THE		TTLT0113
114	C	VALUE OF C(1); PRINT 1-6 INTERVALS AND READ ANOTHER RECORD OF DATA		TTLT0114
115		IF (C(1), NE, 24, 0) GO TO 22		TTLT0115
116		WRITE (013001) IDAY, IMONTH, IYEAR		TTLT0116
117		LINE 6 LINE 2		TTLT0117
118		GO TO 15		TTLT0118
119		22 IF (C(2), NE, 24, 0) GO TO 28		TTLT0119
120		WRITE (013002) IDAY, IMONTH, IYEAR, SGN(1), I(6), JC(1), SGN(1),		TTLT0120
121		ID(1), JD(1)		TTLT0121
122		LINE 6 LINE 1		TTLT0122
123		GO TO 15		TTLT0123
124		23 IF (C(3), NE, 24, 0) GO TO 24		TTLT0124
125		WRITE (013003) IDAY, IMONTH, IYEAR, SGN(1), I(6), JC(1), SGN(1),		TTLT0125
126		ID(1), JD(1), I(6), S(1)		TTLT0126
127		LINE 6 LINE 1		TTLT0127
128		GO TO 15		TTLT0128
129		24 IF (C(4), NE, 24, 0) GO TO 29		TTLT0129
130		WRITE (013004) IDAY, IMONTH, IYEAR, SGN(1), I(6), JC(1), SGN(1),		TTLT0130
131		ID(1), JD(1), I(6), S(1)		TTLT0131
132		LINE 6 LINE 1		TTLT0132
132				87

133	GO TO 11	TTLT0233	88
134	27 IF (8651)NE(24.0) GO TO 26	TTLT0234	89
135	WRITE (6(2000)) (DAY,MONTH,2YBARV) (SNG(1),IB(1),JC(1),SGND(1),	TTLT0235	92
136	1 (D(1),JD(1)),2(2,4)	TTLT0236	
137	LINE 6LINE 6 1	TTLT0237	98
138	GO TO 11	TTLT0238	99
139	28 IF (865)NE(24.0) GO TO 27	TTLT0239	200
140	WRITE (6(2006)) (DAY,MONTH,2YBARV) (SNG(1),IB(1),JC(1),SGND(1),	TTLT0240	203
141	1 (D(1),JD(1)),2(2,5)	TTLT0241	
142	LINE 6LINE 6 1	TTLT0242	209
143	GO TO 11	TTLT0243	210
144	27 WRITE (6(2007)) (DAY,MONTH,2YBARV) (SNG(1),IB(1),JC(1),SGND(1),	TTLT0244	211
145	1 (D(1),JD(1)),2(2,6)	TTLT0245	
146	LINE 6LINE 6 1	TTLT0246	217
147	GO TO 11	TTLT0247	218
148	C NO MORE DATA REQUESTED OR FILE 99 ENDED-RETURN	TTLT0248	
149	82 RETURN	TTLT0249	219
150	2000 FORMAT (2X,12X,51H000000000000 DAILY RELEASE WINDOW TIME INTERVALS	TTLT0250	220
151	10000/2,2X,2HDATE,2X, 61HSTART,3X,4HSTOP,4X) /,16X,12(6HHR/MIN,2X)	TTLT0251	
152	2/2)	TTLT0252	
153	2001 FORMAT (2X,12,1X,A302X)14,32(61H000000 NO RELEASE WINDOW FOR THIS DAY	TTLT0253	220
154	1750000)	TTLT0254	
155	2002 FORMAT (2X,12,1X,A302X)14, 3(6X,2X,12,14/,1212X))	TTLT0255	220
156	2003 FORMAT (2X,12,1X,A302X)14, 4(6X,2X,12,14/,1272X))	TTLT0256	220
157	2004 FORMAT (2X,12,1X,A302X)14, 5(6X,2X,12,14/,1292X))	TTLT0257	220
158	2005 FORMAT (2X,12,1X,A302X)14, 6(6X,2X,12,14/,1212X))	TTLT0258	220
159	2006 FORMAT (2X,12,1X,A302X)14,10(6X,2X,12,14/,1272X))	TTLT0259	220
160	2007 FORMAT (2X,12,1X,A302X,14,12(6X,2X,12,14/,1292X))	TTLT0260	220
161	2008 FORMAT (P20,2,12,A3014/01278079)	TTLT0261	220
162	2001 FORMAT (P10,2)	TTLT0262	220
163	END	TTLT0263	220

23927 WORDS OF MEMORY USED BY THIS COMPIATION

67906 02 09-25-72 2,298

SUBROUTINE TTLTPE

\*\*\*\*\*FILE BY\*\*\*\*\*

PREFACE

PROGRAM BREAK	1012
COMMON LENGTH	0
V COUNT DIVS	5

PRIMARY SYNDOP ENTRY

TYPE 0

SECONDARY SYNDOP ENTRY

BLOCK	LENGTH
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1	BLK2	2
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SUMREF

- 2 .FURN.
- 3 .FNSL.
- 4 .FRDD.
- 5 .FVFN.
- 6 .FRDD.

1012 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JMDA 090176/052921 JMRB 090171/052921 JMPC 090171/050571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

66 19558 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY

67906 02 09-25-72 2,298 SUBROUTINE PLVRYN

\*\*\*\*\*ROUTINE\*\*\*\*\*

1 CELYR SUBROUTINE PLVRYN

PLTR0001

2	C	.....PLOT ROUTINE.....	PLTR0002
3	C		PLTR0003
4	C	.....STORY OR DOCUMENTATION CARD.....	PLTR0004
5	C		PLTR0005
6	C	.....NABA WALLPS VERSION OF 05/01/69	PLTR0006
7	C		PLTR0007
8	C	.....LANGUAGE-FORTRAN IV	PLTR0008
9	C		PLTR0009
10	C	.....MACHINE-GE 625	PLTR0010
11	C		PLTR0011
12	C		PLTR0012
13	C	.....PURPOSE-	PLTR0013
14	C	TO SHOW THE COMPUTED RELEASE WINDOW TIMES FOR THE NABA/MR!	PLTR0014
15	C	BASED ON CLOUD PROJECT FOR A GIVEN YEAR OR PORTION OF A YEAR	PLTR0015
16	C		PLTR0016
17	C	.....METHOD-	PLTR0017
18	C	THIS SUBROUTINE USES EXISTING SAUCOMR LIBRARY ROUTINES TO PLOT	PLTR0018
19	C	THE RELEASE TIMES CALCULATED FOR THE SIC PROJECT THROUGH THIS	PLTR0019
20	C	PROGRAM ONTO A GRID AS SET UP IN SUBROUTINE CALDR; THE INPUT	PLTR0020
21	C	POSITION OF THE RELEASE POINTS THE TRACKING STATIONS USED AND	PLTR0021
22	C	THE VALUE OF EACH CONSTRAINT IS GIVEN IN THE PLOT LABELING;	PLTR0022
23	C	RELEASE TIMES PLOTTED ARE THOSE DAILY TIMES RECORDED ON	PLTR0023
24	C	FILE 09 BY THIS PROGRAM,	PLTR0024
25	C		PLTR0025
26	C	.....RESTRICTIONS-	PLTR0026
27	C	THIS SUBROUTINE WILL PLOT DATA ONLY FOR A GIVEN CALENDAR YEAR	PLTR0027
28	C	OR PORTION OF IT (PLOTTING OF TWO OR MORE CALENDAR YEARS	PLTR0028
29	C	REQUIRES THAT THE PROGRAM BE REINITIALIZED FOR PLOTTING EACH	PLTR0029
30	C	CALENDAR YEAR; THIS RESTRICTION IS DUE TO THE GRID PLOT	PLTR0030
31	C	GENERATED THROUGH SUBROUTINE CALDR, & CHECK IS MADE TO ENSURE	PLTR0031
32	C	THE NUMBER OF DAYS PAST JANUARY 1 OF THE GIVEN CALENDAR YEAR IS	PLTR0032
33	C	NO MORE THAN 365 DAYS; THIS CHECK IS DONE BY THE PLOTS OF	PLTR0033
34	C	SUCCESSIVE CALENDAR YEARS CAN BE MADE FROM ONE FILE OR TAPE;	PLTR0034
35	C	NEGLIGTING THIS RESTRICTION AND ATTEMPTING TO PLOT SUCCESSIVE	PLTR0035
36	C	CALENDAR YEARS ON THE SAME GRID WILL GIVE AN ERRONEOUS PLOT;	PLTR0036
37	C	I.E., EVERY JANUARY 1 OF ANY CALENDAR YEAR WILL BE PLOTTED AT	PLTR0037
38	C	THE BEGINNING OF THE GRID;	PLTR0038
39	C		PLTR0039
40	C	.....INPUT-	PLTR0040
41	C		PLTR0041
42	C	1. FOR PLOT LABELLING ONLY-	PLTR0042
43	C		PLTR0043
44	C	KYR                    -YEAR BEING PLOTTED AND/OR PRINTED	PLTR0044
45	C		PLTR0045
46	C	PHIPDB                -GEODEVIC LATITUDE OF RELEASE POINT (DEG)	PLTR0046
47	C		PLTR0047
48	C	LAMPDB                -LONGITUDE OF RELEASE POINT (DEG)	PLTR0048
49	C		PLTR0049
50	C	HEIGHT                -ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE	PLTR0050
51	C	-(KM)	PLTR0051
52	C		PLTR0052
53	C	RESTR(2)                -MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION	PLTR0053
54	C	-TO THE RELEASE POINT (DEG)	PLTR0054
55	C		PLTR0055
56	C	RESTR(3)                -MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH	PLTR0056
57	C	-TRACKING STATION (DEG)	PLTR0057
58	C		PLTR0058
59	C	RESTR(4)                -MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH	PLTR0059
60	C	-TRACKING STATION (DEG)	PLTR0060
61	C		PLTR0061
62	C	RESTR(5)                -MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE	PLTR0062
63	C	-RELEASE POINT AS SEEN FROM EACH TRACKING STATION	PLTR0063
64	C	-(RAYLEIGH)	PLTR0064
65	C		PLTR0065
66	C	RESTR(6)                -CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD	PLTR0066
67	C	-AFTER RELEASE RELATIVE TO THE TRACKING STATIONS	PLTR0067
68	C	-(KM/SEC)	PLTR0068
69	C		PLTR0069
70	C	RESTR(7)                -MINIMUM TRACKING PERIOD REQUIRED (HRS)	PLTR0070
71	C		PLTR0071
72	C	RESTR(8)                -ONE-HALF HP CLOUD GROWTH RATE AFTER RELEASE	PLTR0072
73	C	-RELATIVE TO THE EARTH (KM/SEC)	PLTR0073
74	C		PLTR0074
75	C	NAME(J,X2)             -NAME OF TRACKING STATIONS USED	PLTR0075



76	C			PLTR0076
77	C	IBASE	-BASE NUMBER	PLTR0077
78	C			PLTR0078
79	C			PLTR0079
80	C	2,USED FOR DATA PLOTTING-		PLTR0080
81	C			PLTR0081
82	C	NS	-THE NUMBER OF STATIONS USED IN THE PROGRAM	PLTR0082
83	C			PLTR0083
84	C	NOS(12)	-AN ARRAY CONTAINING THE STATION NUMBERS USED	PLTR0084
85	C			PLTR0085
86	C	EPOCH	-JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS ON	PLTR0086
87	C		-FILE 09	PLTR0087
88	C			PLTR0088
89	C	DJUL	-JULIAN DATE FOR CURRENT DATA	PLTR0089
90	C			PLTR0090
91	C	BEGIN	-JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING	PLTR0091
92	C			PLTR0092
93	C	FINIS	-JULIAN DATE TO STOP PRINTING AND/OR PLOTTING	PLTR0093
94	C			PLTR0094
95	C	C(6)	-ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT	PLTR0095
96	C		-DATE	PLTR0096
97	C			PLTR0097
98	C	D(6)	-ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT	PLTR0098
99	C		-DATE	PLTR0099
100	C			PLTR0100
101	C			PLTR0101
102	C	*****OUTPUT-		PLTR0102
103	C	DATA POINTS FOR PLOT ARE STORED ON TAPE FILE 51 AT 556 BP:		PLTR0103
104	C			PLTR0104
105	C	X	-POSITION OF PLOT PEN ON X-AXIS REPRESENTING THE	PLTR0105
106	C		-DATE BEING PLOTTED	PLTR0106
107	C			PLTR0107
108	C	Y	-POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE	PLTR0108
109	C		-START TIME FOR DATA BEING PLOTTED	PLTR0109
110	C			PLTR0110
111	C	W	-POSITION OF PLOT PEN ON W-AXIS REPRESENTING THE	PLTR0111
112	C		-STOP TIME FOR DATA BEING PLOTTED	PLTR0112
113	C			PLTR0113
114	C	*****SUBPROGRAMS REQUIRED-		PLTR0114
115	C	BAR (CALCOMP LIBRARY ROUTINE)		PLTR0115
116	C	PLOT (CALCOMP LIBRARY ROUTINE)		PLTR0116
117	C	NUMBER (CALCOMP LIBRARY ROUTINE)		PLTR0117
118	C	SYMBOL (CALCOMP LIBRARY ROUTINE)		PLTR0118
119	C	DATE GMAP ASSEMBLY		PLTR0119
120	C	CALDNR		PLTR0120
121	C			PLTR0121
122	C	*****END OF DOCUMENTATION CARDS*****		PLTR0122
123	C			PLTR0123
124	C	SUBROUTINE PLOTYN		PLTR0124
125	C	COMMON/BLK1 /KMONTH,MDAY ,KYEAR ,LMONTH,LDAY ,LYEAR ,KNO, NDA,		PLTR0125
126	C	1 KVR, LBOX LDA, LTR, ICALS, IPRY7, IBRY9, IPRY21, IPRY22,		PLTR0126
127	C	COMMON/BLK2 /BEGIN, FINIS		PLTR0127
128	C	COMMON/BLK3 /PIPDG,LANPDG,MEIOWT		PLTR0128
129	C	COMMON/BLK4 /NSYR(6)		PLTR0129
130	C	COMMON/BLK5 /NS, NOS(12)		PLTR0130
131	C	COMMON/BLK6 /NAME(3,12), RW(12), LAMBDA(12), ALT(12), MOVE(12)		PLTR0131
132	C	COMMON/BLK7 /IBASE, IFINAL		PLTR0132
133	C	DIMENSION E(6), D(6)		PLTR0133
134	C	REAL GMAPDG		PLTR0134
135	C	250 Y = Y00,9		PLTR0135
136	C	CALL CALDNR		PLTR0136
137	C	LABEL V=XTS		PLTR0137
138	C	CALL NUMBER (-,24,1900700,02700,0,0-3)		PLTR0138
139	C	CALL NUMBER (-,24,23070000,02700,0700-5)		PLTR0139
140	C	X = 0.0		PLTR0140
141	C	Y = 0.0		PLTR0141
142	C	DO 240 I = 1,120		PLTR0142
143	C	CALL NUMBER ( "1671:0.00,X007000X")		PLTR0143
144	C	Z = X01,0		PLTR0144
145	C	250 Y = Y00,9		PLTR0145
146	C	DO 250 I = 1,120		PLTR0146
147	C	CALL NUMBER ( "2470:0.00,X007000X")		PLTR0147
148	C	X = X01,0		PLTR0148
149	C	250 Y = Y00,9		PLTR0149

150	CALL SYMBOL(15.40.3.0070.00.23HUBUNIVERSAL TIME IN HOURS,90.0,23)	PLTR0150	16
151	C WRITE PROGRAM INPUT DATA ON PLOT	PLTR0151	
152	C	PLTR0152	
153	CALL SYMBOL(15.5.7.9270.00.20HAWAII PLANK ION CLOUD,0.0,20)	PLTR0153	17
154	CALL SYMBOL(15.5.7.7670.00.20HAWAII RELEASE TIMES .0.0,20)	PLTR0154	18
155	CALL SYMBOL(15.5.7.0070.00.20HAWAII FOR .0.0,20)	PLTR0155	19
156	CALL NUMBER(16.3.7.0070.00.0L0AY(KYR),070,-2)	PLTR0156	20
157	IF (L0AY,07,1) GO TO 24	PLTR0157	21
158	CALL SYMBOL(15.5.7.3670.00.20HAWAII RELEASE POINT,0.0,23)	PLTR0158	24
159	CALL SYMBOL(15.5.7.207.00.0HAWAII LTY =1070.0)	PLTR0159	25
160	CALL NUMBER(16.22.7.207.00.0HAWAII LTY=1070.3)	PLTR0160	26
161	CALL SYMBOL(15.5.7.047.00.0HAWAII LTY =1070.8)	PLTR0161	27
162	CALL NUMBER(16.22.7.047.00.0HAWAII LTY=1070.3)	PLTR0162	28
163	CALL SYMBOL(15.5.6.007.00.0HAWAII AW =1070.8)	PLTR0163	29
164	CALL NUMBER(16.22.6.007.00.0HAWAII AW=1070.3)	PLTR0164	30
165	CALL SYMBOL(15.5.6.0.0.0.20HAWAII SUB ELEVATION = DEG,2070,29)	PLTR0165	31
166	CALL NUMBER(16.94.6.0.0.0.0.20HAWAII RESTR(3)90,0,1)	PLTR0166	32
167	CALL SYMBOL(15.5.6.0.0.0.0.20HAWAII SUB ELEVATION = DEG,2070,29)	PLTR0167	33
168	CALL NUMBER(16.94.6.0.0.0.0.0.20HAWAII RESTR(2)90,0,1)	PLTR0168	34
169	CALL SYMBOL(15.5.6.2.0.0.0.20HAWAII GLOB ELEVATION = DEG,2070,29)	PLTR0169	35
170	CALL NUMBER(16.94.6.2.0.0.0.0.0.20HAWAII RESTR(2)90,0,1)	PLTR0170	36
171	CALL SYMBOL(15.5.6.0.0.0.0.20HAWAII BRIGHTNESS = R/A,0.0,28)	PLTR0171	37
172	CALL NUMBER(16.94.6.0.0.0.0.0.0.20HAWAII RESTR(5)90,0,2)	PLTR0172	38
173	CALL SYMBOL(15.5.4.3.0.0.0.0.20HAWAII GROUND DRIFT = KM/SEC,070,28)	PLTR0173	39
174	CALL NUMBER(16.94.3.0.0.0.0.0.0.20HAWAII RESTR(6)90,0,2)	PLTR0174	40
175	CALL SYMBOL(15.5.5.0.0.0.0.20HAWAII CLOUD GROWTH = KM/SEC,070,29)	PLTR0175	41
176	CALL NUMBER(16.94.5.0.0.0.0.0.0.20HAWAII RESTR(8)90,0,1)	PLTR0176	42
177	CALL SYMBOL(15.06.5.470.00.27HAWAII TRACKING TIME = HRS,.0.0,27)	PLTR0177	43
178	CALL NUMBER(16.94.5.470.00.27HAWAII RESTR(7)90,0,2)	PLTR0178	44
179	GO TO 22	PLTR0179	45
180	C PLOT TITLE FOR MULTIPLE CASE PLOT	PLTR0180	
181	21 CALL SYMBOL(15.5.7.3670.00.20HAWAII MULTIPLE CASE INPUT ,0.0,20)	PLTR0181	46
182	22 CALL SYMBOL(15.5.5.2.0.0.0.12HAWAII IONS COMBINED,0.0,17)	PLTR0182	47
183	Y = 4.84	PLTR0183	48
184	DO 59 IN 1,NS	PLTR0184	49
185	J = NBS(I)	PLTR0185	50
186	CALL SYMBOL(15.08.5.0.0.0.0.NAMES(I,J),0.0,28)	PLTR0186	51
187	55 Y = Y - 18	PLTR0187	52
188	CALL SYMBOL(15.9.1.3.0.0.0.7HAWAII EMPLOYED ,0.0,7)	PLTR0188	54
189	C GET THE DATE OF TODAY	PLTR0189	
190	CALL DATE (TODAY)	PLTR0190	55
191	CALL SYMBOL(15.74.2.3470.00.TODAY,0.0,8)	PLTR0191	56
192	C	PLTR0192	
193	C SET ORIGIN ON ZERO TIME	PLTR0193	
194	C	PLTR0194	
195	CALL PLOT (0.0,2.5,-3)	PLTR0195	57
196	C REWIND INPUT DATA TAPE	PLTR0196	
197	REWIND 09	PLTR0197	58
198	C READ EPOCH DATE	PLTR0198	
199	READ (9,1001) EPOCH	PLTR0199	59
200	C READ A DAY OF DATA	PLTR0200	
201	21 READ (9,1000) DJUL,3DAY*THOM*H,1YEAR,(C(1),D(1)),1,1,4)	PLTR0201	62
202	C END PLOT FILE IF NO MORE INPUT DATA ON TAPE	PLTR0202	
203	IF (DJUL,END,999,0) GO TO 12	PLTR0203	70
204	C SKIP OVER TO NEXT RECORD IF DATA NOT WITHIN DATES REQUESTED	PLTR0204	
205	IF (DJUL,LT,BEGIN) GO TO 11	PLTR0205	73
206	IF (DJUL,GT,FINIS) GO TO 12	PLTR0206	76
207	IF ((DJUL-EPOCH).GT,365*10) EPOCH = EPOCH + 365*10	PLTR0207	79
208	C SET UP DATA IN PLOT FORMAT	PLTR0208	
209	X = (DJUL-(EPOCH*178))/25.0	PLTR0209	82
210	DO 109 IN 1,6	PLTR0210	83
211	IF (C(I),EQ,24,0) GO TO 11	PLTR0211	84
212	C MAKE SURE INTERVAL IS BETWEEN -3.0 AND 23.0 HRS, U, T,	PLTR0212	
213	IF (C(I),LT,13,0) GO TO 13	PLTR0213	87
214	C(I) = C(I) + 24.0	PLTR0214	90
215	D(I) = D(I) + 24.0	PLTR0215	91
216	C MOVE X-AXIS TO POSITION FOR NEXT DAY	PLTR0216	
217	X = X + 184	PLTR0217	92
218	IF (C(I),LT,(-3,0)) C(I) = -3.0	PLTR0218	93
219	33 Y = C(I)/2.0	PLTR0219	96
220	H = (D(I)-C(I))/2.0	PLTR0220	97
221	C DENY PLOT IF Y POSITION IS OFF LOWER END OF SCALE	PLTR0221	
222	IF (H,LT,070) GO TO 188	PLTR0222	98
223	CALL BAR(X,Y,0.0,H),0.07H,3.2)	PLTR0223	99











30	C	KMB	-MONTH BEING PLOTTED AND/OR PRINTED	MOPL0030
31	C			MOPL0031
32	C	KYR	-YEAR BEING PLOTTED AND/OR PRINTED	MOPL0032
33	C			MOPL0033
34	C	PHIPDG	-GEODEVIC LATITUDE OF RELEASE POINT(DEG)	MOPL0034
35	C			MOPL0035
36	C	LAMPDG	-LONGITUDE OF RELEASE POINT (DEG)	MOPL0036
37	C			MOPL0037
38	C	HGHTGY	-ALTIITUDE OF RELEASE POINT ABOVE EARTH SURFACE	MOPL0038
39	C		-(HR)	MOPL0039
40	C			MOPL0040
41	C	RSBYR(2)	-MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION	MOPL0041
42	C		-TO THE RELEASE POINT (DEG)	MOPL0042
43	C			MOPL0043
44	C	RSBYR(3)	-MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH	MOPL0044
45	C		-TRACKING STATION (DEG)	MOPL0045
46	C			MOPL0046
47	C	RSBYR(4)	-MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH	MOPL0047
48	C		-TRACKING STATION (DEG)	MOPL0048
49	C			MOPL0049
50	C	RSBYR(5)	-MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE	MOPL0050
51	C		-RELEASE POINT TO BEEN FROM EACH TRACKING STATION	MOPL0051
52	C		-(RAYLENGTHS)	MOPL0052
53	C			MOPL0053
54	C	RSBYR(6)	-CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD	MOPL0054
55	C		-AFTER RELEASE RELATIVE TO THE TRACKING STATIONS	MOPL0055
56	C		-(KM/SEC)	MOPL0056
57	C			MOPL0057
58	C	RSBYR(7)	-MINIMUM TRACKING PERIOD REQUIRED (HRS)	MOPL0058
59	C			MOPL0059
60	C	RSBYR(8)	-ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE	MOPL0060
61	C		-RELATIVE TO THE EARTH (KM/SEC)	MOPL0061
62	C			MOPL0062
63	C	NAME(3,2)	-NAME OF TRACKING STATIONS USED	MOPL0063
64	C			MOPL0064
65	C	ICASE	-CASE NUMBER	MOPL0065
66	C			MOPL0066
67	C			MOPL0067
68	C		2. USED FOR DATA PLOTTING-	MOPL0068
69	C			MOPL0069
70	C	NS	-THE NUMBER OF STATIONS USED IN THE PROGRAM	MOPL0070
71	C			MOPL0071
72	C	NOB(12)	-AN ARRAY CONTAINING THE STATION NUMBERS USED	MOPL0072
73	C			MOPL0073
74	C	EWBCH	-JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS ON	MOPL0074
75	C		-FILE #	MOPL0075
76	C			MOPL0076
77	C	BJUL	-JULIAN DATE FOR CURRENT DATA	MOPL0077
78	C			MOPL0078
79	C	BBYIN	-JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING	MOPL0079
80	C			MOPL0080
81	C	FBYIS	-JULIAN DATE TO STOP PRINTING AND/OR PLOTTING	MOPL0081
82	C			MOPL0082
83	C	C(6)	-ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT	MOPL0083
84	C		-DATE	MOPL0084
85	C			MOPL0085
86	C	B(6)	-ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT	MOPL0086
87	C		-DATE	MOPL0087
88	C			MOPL0088
89	C			MOPL0089
90	C		*****OUTPUT*	MOPL0090
91	C			MOPL0091
92	C		DATA POINTS FOR PLOT ARE STORED ON TAPE FILE 01 AT 556 BP	MOPL0092
93	C			MOPL0093
94	C	X	-POSITION OF PLOT PEN ON X-AXIS REPRESENTING THE	MOPL0094
95	C		-DATE BEING PLOTTED	MOPL0095
96	C			MOPL0096
97	C	Y	-POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE	MOPL0097
98	C		-START TIME FOR DATE BEING PLOTTED	MOPL0098
99	C			MOPL0099
100	C	H	-POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE	MOPL0100
101	C		-STOP TIME FOR DATE BEING PLOTTED	MOPL0101
102	C			MOPL0102
103	C		*****RESTRICTIONS*	MOPL0103

104	C	THIS SUBROUTINE WILL PLOT DATA ONLY FOR A GIVEN CALENDER MONTH	MOPLO204
105	C	OR PORTION OF IT, PLOTTING OF TWO OR MORE CALENDAR MONTHS	MOPLO205
106	C	REQUIRES THAT THE PROGRAM BE REINITIATED FOR PLOTTING EACH	MOPLO206
107	C	CALENDAR MONTH, THIS RESTRICTION IS DUE TO THE GRID PLOT	MOPLO207
108	C	GENERATED THROUGH SUBROUTINE MOCALD, A CHECK IS MADE TO INSURE	MOPLO208
109	C	THE NUMBER OF DAYS PAST THE FIRST OF THE GIVEN CALENDAR MONTH	MOPLO209
110	C	IS WITHIN BOUNDS; THIS CHECK IS DONE SO THE PLOTS OF	MOPLO210
111	C	SUCCESSIVE CALENDAR MONTHS CAN BE MADE FROM ONE FILE OR TAPE,	MOPLO211
112	C	VIOLATING THIS RESTRICTION AND ATTEMPTING TO PLOT SUCCESSIVE	MOPLO212
113	C	CALENDAR MONTHS ON THE SAME GRID WILL GIVE AN ERRONEOUS PLOT,	MOPLO213
114	C	THIS PROGRAM HANDLES UP TO 12 STATIONS TO GET COMBINED WINDOWS	MOPLO214
115	C		MOPLO215
116	C	*****SUBPROGRAMS REQUIRED*****	MOPLO216
117	C	BAR (CALCOMP LIBRARY ROUTINE)	MOPLO217
118	C	PLOT (CALCOMP LIBRARY ROUTINE)	MOPLO218
119	C	NUMBER (CALCOMP LIBRARY ROUTINE)	MOPLO219
120	C	SYMBOL (CALCOMP LIBRARY ROUTINE)	MOPLO220
121	C	DATE= CHAN ASSEMBLY	MOPLO221
122	C	MOCALD	MOPLO222
123	C		MOPLO223
124	C	*****END OF DOCUMENTATION CARDS*****	MOPLO224
125	C		MOPLO225
126		SUBROUTINE MOPLOT	MOPLO226
127		COMMON/BLKX 2KMONTH,KDAY ,LYEAR ,LMONTH,LDAY ,LYEAR ,KNO, NDA,	MOPLO227
128	1	KYR, LNO, LDA, LYR, ICALG, IPR1, IPR2, IPR3, IPR4, IPR5, IPR6, IPR7, IPR8, IPR9, IPR10, IPR11, IPR12, IPR13, IPR14, IPR15, IPR16, IPR17, IPR18, IPR19, IPR20, IPR21, IPR22, IPR23, IPR24, IPR25, IPR26, IPR27, IPR28, IPR29, IPR30, IPR31, IPR32, IPR33, IPR34, IPR35, IPR36, IPR37, IPR38, IPR39, IPR40, IPR41, IPR42, IPR43, IPR44, IPR45, IPR46, IPR47, IPR48, IPR49, IPR50, IPR51, IPR52, IPR53, IPR54, IPR55, IPR56, IPR57, IPR58, IPR59, IPR60, IPR61, IPR62, IPR63, IPR64, IPR65, IPR66, IPR67, IPR68, IPR69, IPR70, IPR71, IPR72, IPR73, IPR74, IPR75, IPR76, IPR77, IPR78, IPR79, IPR80, IPR81, IPR82, IPR83, IPR84, IPR85, IPR86, IPR87, IPR88, IPR89, IPR90, IPR91, IPR92, IPR93, IPR94, IPR95, IPR96, IPR97, IPR98, IPR99, IPR100	MOPLO228
129		COMMON/BLKX2/BEGIN, FINIS	MOPLO229
130		COMMON/BLKX 7PRIPDG,LAMPDG,HEIGHT	MOPLO230
131		COMMON/BLKX 7RSTR10	MOPLO231
132		COMMON/BLKX /NS, N00(2)	MOPLO232
133		COMMON/BLKX /NAME(30), RWT(12), LAMBDA(12), ALT(12), MOVE(12)	MOPLO233
134		COMMON/BLKX /ICASE, IPR1AL	MOPLO234
135		DIMENSION C(6), D(6)	MOPLO235
136		DIMENSION NDAYS(12)	MOPLO236
137		REAL LAMPDG	MOPLO237
138		DATA NDAYS/31,28,31,30,31,30,31,31,30,31,30,31/	MOPLO238
139	C	SET UP PLOT GRID	MOPLO239
140		CALL MOCALD (KNO)	MOPLO240
141	C	LABEL YAXIS	MOPLO241
142		CALL NUMBER (-,24, 90000, -270,0,0,-2)	MOPLO242
143		CALL NUMBER (-,24, 90000, -270,0,0,-2)	MOPLO243
144		X = 0,0	MOPLO244
145		Y = 3,5	MOPLO245
146		DO 240 I = 1,10	MOPLO246
147		CALL NUMBER (-,16, 9,0,00, X+0.70, X)	MOPLO247
148		X = X+0.70	MOPLO248
149	240	Y = Y+0.70	MOPLO249
150		DO 250 I = 1,8	MOPLO250
151		CALL NUMBER (-,24, 9,0,00, X+0.70, X)	MOPLO251
152		X = X+0.70	MOPLO252
153	250	Y = Y+0.70	MOPLO253
154		CALL SYMBOL (-,40, 3,00, 0,00, 23HUNIVERSAL TIME IN HOURS, 90, 0, 23)	MOPLO254
155	C	WRITE PROGRAM INPUT DATA ON PLOT	MOPLO255
156	C		MOPLO256
157		CALL PLOT (-,11,0,0,0,-3)	MOPLO257
158		CALL SYMBOL (-,15, 5,7, 92, 0,00, 20HMAN PLANCK ION CLOUD, 0, 0, 20)	MOPLO258
159		CALL SYMBOL (-,15, 5,7, 92, 0,00, 20H RELEAS TIME, 0, 0, 20)	MOPLO259
160		CALL SYMBOL (-,15, 5,7, 92, 0,00, 20H FOR, 0, 0, 20)	MOPLO260
161		CALL NUMBER (-,10, 0, 7, 00, 0,00, LCMAT/KYR, -3)	MOPLO261
162		IF (IABS, N, 1) GO TO 22	MOPLO262
163		CALL SYMBOL (-,15, 5,7, 92, 0,00, 20HRELEASE POINT, 0, 0, 13)	MOPLO263
164		CALL SYMBOL (-,15, 5,7, 92, 0,00, 20H LTT, 0, 0, 0)	MOPLO264
165		CALL NUMBER (-,10, 22, 0, 20, 0,00, RWIPDG, 0, 0, 3)	MOPLO265
166		CALL SYMBOL (-,15, 5,7, 92, 0,00, 20H LAMB, 0, 0, 0)	MOPLO266
167		CALL NUMBER (-,10, 22, 0, 20, 0,00, LAMPDG, 0, 0, 3)	MOPLO267
168		CALL SYMBOL (-,15, 5,6, 00, 0,00, 20H ADT, 0, 0, 0)	MOPLO268
169		CALL NUMBER (-,10, 22, 0, 20, 0,00, HEIGHT, 0, 0, 3)	MOPLO269
170		CALL SYMBOL (-,15, 5,6, 0, 0,00, 20H SUN ELEVATION, DEG, 0, 70, 29)	MOPLO270
171		CALL NUMBER (-,10, 24, 0, 0, 0,00, RSTR10, 0, 0, 1)	MOPLO271
172		CALL SYMBOL (-,15, 5,6, 0, 0,00, 20H SUN ELEVATION, DEG, 0, 70, 29)	MOPLO272
173		CALL NUMBER (-,10, 24, 0, 0, 0,00, RSTR10, 0, 0, 1)	MOPLO273
174		CALL SYMBOL (-,15, 5,6, 0, 0,00, 20H SUN ELEVATION, DEG, 0, 70, 29)	MOPLO274
175		CALL NUMBER (-,10, 24, 0, 0, 0,00, RSTR10, 0, 0, 1)	MOPLO275
176		CALL SYMBOL (-,15, 5,6, 0, 0,00, 20H SKY BRIGHTNESS, R/A, 0, 0, 28)	MOPLO276
177		CALL NUMBER (-,10, 24, 0, 0, 0,00, RSTR10, 0, 0, 2)	MOPLO277





67906 02 09-25-72 12,322 SUBROUTINE MOPLY

\*\*\*\*\*MONTHLY PLOT ROUTINE\*\*\*\*\*

PREFACE

PROGRAM BREAK 1423

COMMON LENGTH 0

V COUNT DIVS 5

PRIMARY SYNDOP ENYRW

MURNT 0

SECONDARY SYNDOP ENYRW

BLOCK LENGTH

1	BLK1	28
2	BLK2	8
3	BLK3	8
4	BLK4	10
5	BLK5	10
6	BLK6	100
7	BLK7	8

SYNDOP

- 10 BAR
- 11 DAY
- 12 PLW
- 13 ,F0RV,
- 14 ,F0RD,
- 15 ,F0VN,
- 16 ,F0VT,
- 17 MONTHS
- 20 NUMBER
- 21 SYMBOL

1423 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JHRA 050172/052521 JHRB 056171/052521 JMPC 050172/052521

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

\*\* 19688 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY \*

67986 02 09-25-72 12,328 MONTHLY CALENDAR PLOT ROUTINE

\*\*\*\*\*ROUTINE MOCALN\*\*\*\*\*

1	CHOGA	MONTHLY CALENDAR PLOT ROUTINE	MOCA0001
2	C	SUBROUTINE MOCALN	MOCA0002
3	C		MOCA0003
4	C	START OF DOCUMENTATION CARDS	MOCA0004
5	C		MOCA0005
6	C	NASA WALLPIS VERSION OF 01/01/69	MOCA0006
7	C		MOCA0007
8	C	LANGUAGE=FORTRAN IV	MOCA0008
9	C		MOCA0009
10	C	MACHINE=GE 625	MOCA0010
11	C		MOCA0011
12	C	PURPOSE.	MOCA0012
13	C	TO PLOT A GRID ON TWELVE INCH PAPER REPRESENTING EACH	MOCA0013
14	C	DAY OF THE MONTH. EACH LINE DRAWN FROM THE ABSCISSA REPRESENTS	MOCA0014
15	C	A DAY OR 'KMO'.	MOCA0015
16	C		MOCA0016
17	C	METHOD.	MOCA0017
18	C	USING TWELVE INCH PAPER,GRIDS FOR THE DAYS ARE DRAWN TO A SCALE	MOCA0018
19	C	FACTOR OF 20 LINES PER 3 INCHES USING THE LIBRARY PLOT ROUTINES	MOCA0019
20	C		MOCA0020
21	C	INPUTS	MOCA0021
22	C	NAME	MOCA0022





SNUGS = 67986, ACTIVITY # 03, REPORT CODE = 76, RECORD COUNT = 00208

67986 ON 69-85-72 18,488 THIS ROUTINE FETCHES THE NEXT CARD IMAGE

FROM THE I/O BUFFER

REFPAGE

PROGRAM BREAK 330  
COMMON LENGTH 8  
V COUNT BITS 8

PRIMARY SYNDX ENTYP

NXCARD 8

SECONDARY SYNDX ENTYP

BLANK LENGTH

SUBREF

- 1 PDHPP
- 2 ,FRDD,
- 3 ,PRVN,
- 4 ,PDDI,

```

1 *
2 .....SUBROUTINE NXCARD .....
3 *
4 *      PROGRAM IDENTIFICATION
5 *
6 *      PROGRAM TITLE = NXCARD
7 *      PROGRAM NO. = 1.1.2304
8 *      PROGRAMMED BY = THOMAS WAGMON
9 *
10 *      COMPUTER REQUIRED = GE 625/635
11 *      MEMORY REQUIRED = 26 WORDS
12 *      PERIPHERALS = CARD READER
13 *      PROGRAM LANGUAGE = QMAP
14 *
15 *      PURPOSE
16 *
17 *      NXCARD ALLOWS THE USER TO EXAMINE THE NEXT LOGICAL RECORD
18 *      RESIDING ON FILE 05. THIS NEXT RECORD WILL NOT ACTUALLY
19 *      BE USED AS AN INPUT RECORD UNTIL IT IS REFERENCED BY A
20 *      NORMAL FORTRAN READ STATEMENT.
21 *
22 *      KEYWORD
23 *
24 *      THE NEXT LOGICAL RECORD IS EXAMINED USING THE SYSTEM
25 *      SUBROUTINE ,FRDD. AFTER THE NEXT LOGICAL RECORD HAS BEEN
26 *      OUTPUT TO THE CALLING PROGRAM, THE CURRENT RECORD INDEX IS
27 *      RESET TO ITS PREVIOUS VALUE AND A NORMAL RETURN IS EXECUTED.
28 *
29 *      RESTRICTIONS
30 *
31 *      1. THE FORMAT USED TO CONVERT THE NEXT CARD MUST HAVE ONLY A
32 *      TYPE FIELDS AND MUST READ ONLY ONE LOGICAL RECORD.
33 *
34 *      2. USE ONLY SINGLE OR NONSUBSCRIPTED OUTPUT ARRAY NAMES AS
35 *      ARGUMENTS TO THIS SUBROUTINE.
36 *
37 *      3. ENTER THE INTEGER 1 IN THE FIELD WHICH SPECIFIES THE
38 *      ARRAY SIZE WHENEVER THE OUTPUT ARRAY NAME IS AN UNDIMEN-
39 *      SIONED VARIABLE.
40 *
41 *      4. THE INPUT FILE MUST HAVE BEEN PREVIOUSLY OPENED BY A
42 *      NORMAL FORTRAN READ BEFORE THIS SUBROUTINE IS CALLED FOR
43 *      THE FIRST TIME.
44 *
45 *      INPUT/OUTPUT
46 *
47 *      CALLING SEQUENCE ... CALL NXCARD(FORMAT,A,I,B,J,?,?) WHERE
48 *
49 *      FORMAT = THE NAME OF THE ARRAY CONTAINING THE BCD FORMAT
50 *      USED IN DECODING THE NEXT LOGICAL RECORD.
51 *
52 *      A = THE NAME OF THE FIRST OUTPUT ARRAY AND
53 *      I = THE LENGTH OF ARRAY A?
54 *
55 *      B = THE NAME OF THE SECOND OUTPUT ARRAY AND

```

NXCA0085  
NXCA0086  
NXCA0087  
NXCA0088  
NXCA0089  
NXCA0090  
NXCA0091  
NXCA0092  
NXCA0093  
NXCA0094  
NXCA0095  
NXCA0096  
NXCA0097  
NXCA0098  
NXCA0099  
NXCA0100  
NXCA0101  
NXCA0102  
NXCA0103  
NXCA0104  
NXCA0105  
NXCA0106  
NXCA0107  
NXCA0108  
NXCA0109  
NXCA0110  
NXCA0111  
NXCA0112  
NXCA0113  
NXCA0114  
NXCA0115  
NXCA0116  
NXCA0117  
NXCA0118  
NXCA0119  
NXCA0120  
NXCA0121  
NXCA0122  
NXCA0123  
NXCA0124  
NXCA0125  
NXCA0126  
NXCA0127  
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NXCA0151  
NXCA0152  
NXCA0153  
NXCA0154  
NXCA0155







080007 080000000000 000  
 080010 486723219124 000

GENERAL

080012 797777007977 000  
 080013 529353535893 000

Nx840124

114 IS THE NEXT AVAILABLE LOCATION, 124 END  
 GMAP VERSION/ASSEMBLY DATES JMPA 090177/052571 JMRB 090171/052571 JMPC 050171/052571  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

07906 03 09-25-72 18,409 THIS ROUTINE FETCHES THE NEXT CARD IMAGE

SYMBOL	SYMBOL	REFERENCES BY ALTER NO.
74	BDQSM	113 88 113
100	AGAIN	117 111 117
76	BUFR2	118 90 119
106	WIVE	120 104 123
31	ROUND	88 80 88
62	ENPUY	109 107 108 109
104	ENSEBY	122 100 121
56	ENST2	105 101 105 110 119 120
107	SE,LT,	72 85 108 109 112
2	PRDD,	104
3	PRTH,	112
4	PSLT,	109
0	HXCARD	72 72 86 110
1	RDQHE	85
36	READY	93 87 92
30	SKIP	89 87 91
11	STARV	74 74 92
22	STOP	85 78 83 99

\*\* 10217 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY \*\*

SHUBB = 69983, ACTIVITY # = 04, REPORT CODE = 54, RECORD COUNT = 00090

69986 04 00-04-72 20,488 PROGRAM TO GIVE MONTH, DAY, YEAR OF PRESENT DAY

PREFACE

PROGRAM BREAK 27  
COMMON LENGTH 0  
V LENGTH BY 9

PRIMARY SYMBOL ENTRY

DATE 0

SECONDARY SYMBOL ENTRY

BLANK LENGTH

SUMMARY

78237 01 02-05-73 21.723 PROGRAM TO GIVE MONTH, DAY, YEAR OF PRESENT DAY

```

1 * .....SUBROUTINE DATE..... DATE0001
2 * ..... DATE0002
3 * ..... DATE0003
4 * .....START OF DOCUMENTATION COMMENT CARDS..... DATE0004
5 * ..... DATE0005
6 * PROGRAM IDENTIFICATION DATE0006
7 * ..... DATE0007
8 * PROGRAM TITLE = DATE DATE0008
9 * PROGRAMMED BY = DENNIS MELVIN DATE0009
10 * COMPUTER REQUIRED = GE 625 DATE0010
11 * PROGRAM LANGUAGE = GMAP DATE0011
12 * ..... DATE0012
13 * PURPOSE DATE0013
14 * ..... DATE0014
15 * DATE RECORDS THE CURRENT DATE AS STORED WITHIN THE DATE0015
16 * COMPUTER SYSTEM. DATE0016
17 * ..... DATE0017
18 * METHOD DATE0018
19 * ..... DATE0019
20 * THIS ROUTINE FETCHES THE DATE BY USING THE MASTER MODE DATE0020
21 * ENTRY INSTRUCTION=GETIME= THE DATE IS THEN PROPERLY DATE0021
22 * FORMATTED FOR THE PLOT ROUTINES FOR PROGRAM 1.1.1619, DATE0022
23 * BICHINJON, DATE0023
24 * ..... DATE0024
25 * INPUT/OUTPUT DATE0025
26 * ..... DATE0026
27 * CALLING SEQUENCE...CALL DATE(TODAY) WHERE DATE0027
28 * TODAY = THE PROPERLY FORMATTED CURRENT DATE, TODAY IS OF DATE0028
29 * DIMENSION 2. DATE0029
30 * ..... DATE0030
31 * .....END OF DOCUMENTATION COMMENT CARDS..... DATE0031
32 * ..... DATE0032
33 * BL DATE DATE0033
    
```

78237 01 02-05-73 21.723 PROGRAM TO GIVE MONTH, DAY, YEAR OF PRESENT DAY

```

35 ..... DATE0035
36 ..... DATE0036
37 DATE SAVE 3 ..... DATE0037
38 .....
39 .....
40 .....
41 .....
42 .....
43 .....
44 .....
45 .....
46 .....
47 .....
48 .....
49 .....
50 RETURN DATE ..... DATE0049
51 ..... DATE0050
    
```

ERROR LINKAGE

000024 0000000000 000  
000025 24416325202 000

## LITERALS

000026 00002022020 000 51 END DATE0051  
 27 IS THE NEXT AVAILABLE LOCATION.  
 GMAP VERSION/ASSEMBLY DATES JHPA 110171/102971 JHPB 110171/102971 JHPC 110171/102971  
 THERE WERE 1 WARNING FLAGS IN THE ABOVE ASSEMBLY  
 ON PAGE NO. 3

67906 04 09-25-72 38,452 PROGRAM TO GIVE MONTH, DAY, YEAR OF PRESENT DAY

SYMBOL REFERENCE BY ALYER NO.

U	DATE	37	37	50
21	GETIME		58	
23	SE,LL,		37	

\*\* 18168 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY

SNUM = 67908, ACTIVITY = 6 05, REPORT CODE = F4, RECORD COUNT = 00687

67908 05 09-25-72 18,574 1972 EPHEMERIS

LINE	TEXT	DATA	LINE
1	COPY 2		
2	1972 EPHEMERIS		
3	SUBROUTINE TABLE	DATA	1
4	DIMENSION RASUN (369), DCSUN (367), RSUN (369)	DATA	2
5	DIMENSION RAMOON (369), DCMOON (367), RMOON (369)	DATA	3
6	DIMENSION XARRAY (2216)	DATA	4
7	DOUBLE PRECISION Y		
8	EQUIVALENCE (RASUN, ARRAY, (DCSUN, ARRAY (370)), (RSUN, ARRAY (789))		
9	EQUIVALENCE (RAMOON, ARRAY (1408)), (DCMOON, ARRAY (1477))		
10	EQUIVALENCE (RMOON, ARRAY (1848))		
11	COMMON /EPMO(K/ Y(1)Z 1		
12	Y(1) = ARRY(I+1)		
13	Y(2) = ARRY(I+2)		
14	Y(3) = ARRY(I+3)		
15	RETURN		
16	DATA BRABUN (I)= 19 861/	DATA	6
17	11 4,8768779E 00, 4,8988711E 00, 4,9101439E 00, 4,9348980E 00	DATA	7
18	12 4,9538817E 00, 4,9728160E 00, 4,9939855E 00, 5,0111226E 00	DATA	8
19	13 5,030234E 00, 5,049303E 00, 5,0663409E 00, 5,0878392E 00	DATA	9
20	14 5,1066992E 00, 5,1282376E 00, 5,1440898E 00, 5,1629166E 00	DATA	10
21	15 5,1817003E 00, 5,2064873E 00, 5,2191150E 00, 5,2377482E 00	DATA	11
22	16 5,2772232E 00, 5,2762458E 00, 5,2953219E 00, 5,3117223E 00	DATA	12
23	17 5,7688737E 00, 5,8463679E 00, 5,3666036E 00, 5,3847883E 00	DATA	13
24	18 5,0020976E 00, 5,4289553E 00, 5,4389533E 00, 5,4568925E 00	DATA	14
25	19 5,0747903E 00, 5,4925898E 00, 5,5103508E 00, 5,5288522E 00	DATA	15
26	DATA BRABUN (I)= 871 92/	DATA	16
27	21 5,5488958E 00, 5,5632814E 00, 5,5888998E 00, 5,5982807E 00	DATA	17
28	22 5,6258950E 00, 5,6380532E 00, 5,6588552E 00, 5,6676029E 00	DATA	18
29	23 5,6849932E 00, 5,7049888E 00, 5,7190124E 00, 5,7360407E 00	DATA	19
30	24 5,7338156E 00, 5,7699879E 00, 5,7858084E 00, 5,8038280E 00	DATA	20
31	25 5,8203974E 00, 5,8391177E 00, 5,8537898E 00, 5,8704190E 00	DATA	21
32	26 5,8869943E 00, 5,9635298E 00, 5,9280205E 00, 5,9528798E 00	DATA	22
33	27 5,9692589E 00, 5,9855858E 00, 5,9058837E 00, 6,0181486E 00	DATA	23
34	28 6,034884E 00, 6,0505836E 00, 6,0667967E 00, 6,0829021E 00	DATA	24
35	29 6,0998245E 00, 6,1151126E 00, 6,1351872E 00, 6,1472381E 00	DATA	25
36	DATA BRABUN (I)= 7371881/	DATA	26
37	31 6,283264E 00, 6,272730E 00, 6,2952632E 00, 6,2112383E 00	DATA	27
38	32 6,2871937E 00, 6,2481368E 00, 6,2590661E 00, 6,2749888E 00	DATA	28
39	33 7,0952082E-03, 6,3882448E-02, 6,9491378E-02, 5,5378987E-02	DATA	29
40	34 7,2251187E-02, 6,7124688E-02, 6,8299614E-01, 1,1886784E-01	DATA	30
41	35 1,8474028E-01, 1,5861638E-01, 1,6649735E-01, 1,8238495E-01	DATA	31
42	36 1,9829080E-01, 1,1478646E-01, 1,350349E-01, 2,4603382E-01	DATA	32
43	37 2,6199984E-01, 1,7943749E-01, 2,9391427E-01, 3,099821E-01	DATA	33
44	38 3,2992373E-01, 1,4195879E-01, 3,5881548E-01, 3,7409490E-01	DATA	34
45	39 3,9019849E-01, 1,8882619E-01, 4,2257962E-01, 4,3865922E-01	DATA	35
46	DATA BRABUN (I)= 1899144/	DATA	36
47	41 4,8486538E-01, 4,7289917E-01, 4,8736125E-01, 5,08365245E-01	DATA	37
48	42 5,0997380E-01, 5,3882588E-01, 5,5271018E-01, 5,6912782E-01	DATA	38
49	43 5,8599940E-01, 6,028644E-01, 6,1888974E-01, 6,35919026E-01	DATA	39
50	44 6,5174843E-01, 6,688598E-01, 6,858489E-01, 7,0174899E-01	DATA	40
51	45 7,1289811E-01, 7,3533758E-01, 7,5257868E-01, 7,6906280E-01	DATA	41
52	46 7,8598799E-01, 8,029566E-01, 8,199682E-01, 8,3702247E-01	DATA	42
53	47 8,5412937E-01, 8,712602E-01, 8,8854827E-01, 9,0566511E-01	DATA	43
54	48 9,2292987E-01, 9,402386E-01, 9,5737902E-01, 9,7499926E-01	DATA	44
55	49 9,9237938E-01, 1,0698374E 00, 1,0273329E 00, 1,0844864E 00	DATA	45
56	DATA BRABUN (I)= 1499180/	DATA	46
57	51 1,082834E 00, 1,080395E 00, 1,0976802E 00, 1,1153555E 00	DATA	47
58	52 1,2538652E 00, 1,1588083E 00, 1,1683842E 00, 1,1868929E 00	DATA	48
59	53 1,2042385E 00, 1,2220998E 00, 1,2399964E 00, 1,2579217E 00	DATA	49
60	54 1,2756737E 00, 1,2938512E 00, 1,3118538E 00, 1,3298715E 00	DATA	50
61	55 1,3479256E 00, 1,3659898E 00, 1,3838072E 00, 1,4021786E 00	DATA	51
62	56 1,4222822E 00, 1,4384049E 00, 1,4553888E 00, 1,4748999E 00	DATA	52
63	57 1,4928261E 00, 1,5109879E 00, 1,5291178E 00, 1,5472678E 00	DATA	53
64	58 1,5688188E 00, 1,5888638E 00, 1,6087048E 00, 1,6198488E 00	DATA	54
65	59 1,6397962E 00, 1,6598088E 00, 1,6781988E 00, 1,6922893E 00	DATA	55
66	DATA BRABUN (I)= 1817226/	DATA	56
67	61 1,7203792E 00, 1,7284488E 00, 1,7465018E 00, 1,7645389E 00	DATA	57
68	62 1,9825539E 00, 1,885569E 00, 1,8122268E 00, 1,8364777E 00	DATA	58
69	63 1,8544090E 00, 1,8725125E 00, 1,8991867E 00, 1,9088397E 00	DATA	59



70	64	1:922505K8E	00.	0.9486855E	00V	0.9483852E	00Z	1:9798995E	00.	DATA	60		
71	65	1:9969772E	00.	0.8144178E	00V	0.8140154E	00Z	2:0499804E	00.	DATA	61		
72	66	2:0671023E	00.	0.8845032E	00V	0.8840228E	00Z	2:18194203E	00.	DATA	62		
73	67	2:0869783E	00.	0.940078E	00V	0.9373560E	00Z	2:1885822E	00.	DATA	63		
74	68	2:0897623E	00.	0.2229022E	00V	0.2239977E	00Z	2:18578494E	00.	DATA	64		
75	69	2:0748540E	00.	0.2940239E	00V	0.3679473E	00Z	2:3248240E	00/	DATA	65		
76		DATA (IRANUM (I) = 287282) /										DATA	66
77	71	2:0418888E	00.	0.2584632E	00V	0.25782175E	00Z	2:3919292E	00.	DATA	67		
78	72	2:4089985E	00.	0.4252253E	00V	0.4488099E	00Z	2:4588539E	00.	DATA	68		
79	73	2:4748322E	00.	0.4983210E	00V	0.5077299E	00Z	2:5241087E	00.	DATA	69		
80	74	2:5484486E	00.	0.5587435E	00V	0.5730042E	00Z	2:5892224E	00.	DATA	70		
81	75	2:6094180E	00.	0.6225648E	00V	0.6336809E	00Z	2:6537643E	00.	DATA	71		
82	76	2:6898330E	00.	0.6880315E	00V	0.7082209E	00Z	2:717780E	00.	DATA	72		
83	77	2:7339132E	00.	0.7496208E	00V	0.7659044E	00Z	2:7813692E	00.	DATA	73		
84	78	2:7972018E	00.	0.8180246E	00V	0.8288238E	00Z	2:8446053E	00.	DATA	74		
85	79	2:8883615E	00.	0.8781172E	00V	0.8988906E	00Z	2:9079693E	00/	DATA	75		
86		DATA (IRANUM (I) = 2897288) /										DATA	76
87	81	2:9232733E	00.	0.9389692E	00V	0.9586538E	00Z	2:9703288E	00.	DATA	77		
88	82	2:9899999E	00.	0.002564E	00V	0.0173117E	00Z	3:0329680E	00.	DATA	78		
89	83	3:0488187E	00.	0.0242595E	00V	0.0779072E	00Z	3:0995986E	00.	DATA	79		
90	84	3:1122094E	00.	0.1288875E	00V	0.1485522E	00Z	3:1582097E	00.	DATA	80		
91	85	3:2738900E	00.	0.2898869E	00V	0.3202982E	00Z	3:2218297E	00.	DATA	81		
92	86	3:2569720E	00.	0.2585332E	00V	0.2683204E	00Z	3:2844222E	00.	DATA	82		
93	87	3:2999573E	00.	0.3188119E	00V	0.3356929E	00Z	3:3478082E	00.	DATA	83		
94	88	3:3639385E	00.	0.3795025E	00V	0.3984997E	00Z	3:4113291E	00.	DATA	84		
95	89	3:4278928E	00.	0.4486892E	00V	0.4598222E	00Z	3:4759921E	00/	DATA	85		
96		DATA (IRANUM (I) = 2899324) /										DATA	86
97	91	3:4922081E	00.	0.5884473E	00V	0.5247348E	00Z	3:5418639E	00.	DATA	87		
98	92	3:5574328E	00.	0.5788519E	00V	0.5983139E	00Z	3:6068284E	00.	DATA	88		
99	93	3:6233816E	00.	0.6399902E	00V	0.6586509E	00Z	3:6738688E	00.	DATA	89		
100	94	3:6981336E	00.	0.7889542E	00V	0.7288339E	00Z	3:7407693E	00.	DATA	90		
101	95	3:7577629E	00.	0.7748149E	00V	0.7989262E	00Z	3:8098989E	00.	DATA	91		
102	96	3:8263279E	00.	0.8488198E	00V	0.8689919E	00Z	3:8783886E	00.	DATA	92		
103	97	3:8958388E	00.	0.9283939E	00V	0.9389902E	00Z	3:9486471E	00.	DATA	93		
104	98	3:9663649E	00.	0.9881432E	00V	0.8019819E	00Z	4:0198880E	00.	DATA	94		
105	99	4:0378381E	00.	0.858899E	00V	0.0759334E	00Z	4:0928793E	00/	DATA	95		
106		DATA (IRANUM (I) = 3259380) /										DATA	96
107	101	4:1026283E	00.	0.128921E	00V	0.1488352E	00Z	4:1652012E	00.	DATA	97		
108	102	4:1838371E	00.	0.2821238E	00V	0.2284665E	00Z	4:2392681E	00.	DATA	98		
109	103	4:2579159E	00.	0.2786205E	00V	0.2928757E	00Z	4:3141838E	00.	DATA	99		
110	104	4:338374E	00.	0.3549388E	00V	0.3788859E	00Z	4:3898780E	00.	DATA	100		
111	105	4:4089038E	00.	0.4299722E	00V	0.4440769E	00Z	4:4662195E	00.	DATA	101		
112	106	4:4893858E	00.	0.5885852E	00V	0.5238117E	00Z	4:5438629E	00.	DATA	102		
113	107	4:5623884E	00.	0.5826268E	00V	0.6089868E	00Z	4:6202623E	00.	DATA	103		
114	108	4:6398008E	00.	0.6589902E	00V	0.6783092E	00Z	4:6978784E	00.	DATA	104		
115	109	4:7178423E	00.	0.7384163E	00V	0.7587884E	00Z	4:7751581E	00/	DATA	105		
116		DATA (IRANUM (I) = 3619888) /										DATA	106
117	111	4:7949287E	00.	0.8188822E	00V	0.8382322E	00Z	4:8529783E	00.	DATA	107		
118	112	4:8718987E	00.	0.8922028E	00V	0.9184918E	00Z	4:9297993E	00/	DATA	108		
119		DATA (DCRUM (I) = (9 88) /										DATA	108
120	121	-4:0429786E-01.	-01.	-0.8383463E-01V	-01.	-0.8167740E-01Z	-01.	-4:0018688E-01.	-01.	DATA	109		
121	122	-3:9898320E-01.	-01.	-0.8686952E-01V	-01.	-0.9492045E-01Z	-01.	-3:9290287E-01.	-01.	DATA	110		
122	123	-3:9099589E-01.	-01.	-0.8847989E-01V	-01.	-0.8687657E-01Z	-01.	-3:8354672E-01.	-01.	DATA	111		
123	124	-3:8089215E-01.	-01.	-0.7881358E-01V	-01.	-0.7881252E-01Z	-01.	-3:7217071E-01.	-01.	DATA	112		
124	125	-3:6984980E-01.	-01.	-0.5989952E-01V	-01.	-0.6241374E-01Z	-01.	-3:5892322E-01.	-01.	DATA	113		
125	126	-3:5931981E-01.	-01.	-0.5188472E-01V	-01.	-0.4728018E-01Z	-01.	-3:4384724E-01.	-01.	DATA	114		
126	127	-3:4989226E-01.	-01.	-0.3986862E-01V	-01.	-0.3182168E-01Z	-01.	-3:2707674E-01.	-01.	DATA	115		
127	128	-3:2883388E-01.	-01.	-0.1889072E-01V	-01.	-0.1385449E-01Z	-01.	-3:0872488E-01.	-01.	DATA	116		
128	129	-3:5898372E-01.	-01.	-0.989927E-01V	-01.	-0.9399385E-01Z	-01.	-2:8889889E-01/	-01.	DATA	117		
129		DATA (DCRUM (I) = (9 92) /										DATA	118
130	131	-2:857397E-01.	-01.	-0.7848822E-01V	-01.	-0.7339652E-01Z	-01.	-2:8774684E-01.	-01.	DATA	119		
131	132	-2:8284084E-01.	-01.	-0.9889935E-01V	-01.	-0.5186848E-01Z	-01.	-2:4536394E-01.	-01.	DATA	120		
132	133	-2:5999283E-01.	-01.	-0.8899582E-01V	-01.	-0.2785539E-01Z	-01.	-2:1897381E-01.	-01.	DATA	121		
133	134	-2:3587188E-01.	-01.	-0.999817E-01V	-01.	-0.0389928E-01Z	-01.	-1:9747222E-01.	-01.	DATA	122		
134	135	-1:92344E-01.	-01.	-0.849472E-01V	-01.	-0.7881538E-01Z	-01.	-1:223486E-01.	-01.	DATA	123		
135	136	-1:6581278E-01.	-01.	-0.598499E-01V	-01.	-0.5284782E-01Z	-01.	-1:3978320E-01.	-01.	DATA	124		
136	137	-0.8812482E-01.	-01.	-0.2848282E-01V	-01.	-0.1981139E-01Z	-01.	-1:1311189E-01.	-01.	DATA	125		
137	138	-0.6538488E-01.	-01.	-0.988399E-01V	-01.	-0.2888442E-01Z	-01.	-0.6068993E-01.	-01.	DATA	126		
138	139	-0.9247389E-01.	-01.	-0.2484702E-01V	-01.	-0.5886524E-01Z	-01.	-5:1870478E-01/	-01.	DATA	127		
139		DATA (DCRUM (I) = (9 97 88) /										DATA	128
140	141	-0.2831199E-01.	-01.	-0.4947943E-01V	-01.	-0.8086917E-01Z	-01.	-3:1160088E-01.	-01.	DATA	129		
141	142	-0.8299257E-01.	-01.	-0.738641E-01V	-01.	-0.0483409E-01Z	-01.	-3:8921180E-01.	-01.	DATA	130		
142	143	3.849481E-01.	01.	0.8287679E-01V	01.	0.7122718E-01Z	01.	2:3998884E-01.	01.	DATA	131		

143	144	3.0844389E-02	5.2987666E-02	6.4587138E-02	5.1381206E-02	DATA	132	
144	145	3.0188329E-02	5.4996929E-02	7.1785424E-02	7.0498297E-02	DATA	133	
145	146	3.5219823E-02	7.1984949E-02	9.8586478E-02	1.0523093E-01	DATA	134	
146	147	1.2184533E-01	3.1842828E-01	3.2497808E-01	1.3149299E-01	DATA	135	
147	148	1.8997136E-01	4.4411398E-01	2.5081119E-01	1.7571692E-01	DATA	136	
148	149	1.8340350E-01	3.6995259E-01	2.7597458E-01	1.6214785E-01	DATA	137	
149	DATA (DCSUN (I),I=1099244)/						DATA	138
150	151	1.8827087E-01	3.9484048E-01	2.6556988E-01	2.0633781E-01	DATA	139	
151	152	2.2222183E-01	2.1806679E-01	2.2385184E-01	2.2957529E-01	DATA	140	
152	153	2.8529386E-01	2.4883158E-01	2.4686237E-01	2.7182379E-01	DATA	141	
153	154	2.5728737E-01	2.6254048E-01	2.6729167E-01	2.7296996E-01	DATA	142	
154	155	2.9807284E-01	2.8389933E-01	2.8884807E-01	2.9291744E-01	DATA	143	
155	156	2.9970589E-01	3.2241139E-01	3.0783809E-01	3.1156988E-01	DATA	144	
156	157	3.2681813E-01	3.2887868E-01	3.2449288E-01	3.2882892E-01	DATA	145	
157	158	3.8298492E-01	3.3690715E-01	3.4680888E-01	3.4460375E-01	DATA	146	
158	159	3.4838550E-01	3.5290798E-01	3.5580998E-01	3.5881080E-01	DATA	147	
159	DATA (DCSUN (I),I=1489200)/						DATA	148
160	161	3.6210884E-01	3.6589208E-01	3.6839234E-01	3.7137488E-01	DATA	149	
161	162	3.7429188E-01	3.7782088E-01	3.7958127E-01	3.8223237E-01	DATA	150	
162	163	3.8469259E-01	3.8780153E-01	3.8981828E-01	3.9132187E-01	DATA	151	
163	164	3.9331136E-01	3.9528988E-01	3.9694492E-01	3.9858780E-01	DATA	152	
164	165	4.0111390E-01	4.0152262E-01	4.0281362E-01	4.0398681E-01	DATA	153	
165	166	4.0504032E-01	4.0597528E-01	4.0679082E-01	4.0748671E-01	DATA	154	
166	167	4.0806273E-01	4.0851868E-01	4.0885448E-01	4.0907020E-01	DATA	155	
167	168	4.0916555E-01	4.0924098E-01	4.0899622E-01	4.0873187E-01	DATA	156	
168	169	4.0834711E-01	4.0784868E-01	4.0722064E-01	4.0647859E-01	DATA	157	
169	DATA (DCSUN (I),I=1817226)/						DATA	158
170	171	4.058784E-01	4.0483868E-01	4.0354132E-01	4.0232627E-01	DATA	159	
171	172	4.0097324E-01	3.9954455E-01	3.9797897E-01	3.9629788E-01	DATA	160	
172	173	3.9438138E-01	3.9259092E-01	3.9086712E-01	3.8843083E-01	DATA	161	
173	174	3.8619384E-01	3.8322468E-01	3.8135658E-01	3.7877981E-01	DATA	162	
174	175	3.7309755E-01	3.7380458E-01	3.7040814E-01	3.6740748E-01	DATA	163	
175	176	3.6438332E-01	3.6189719E-01	3.5790198E-01	3.5438388E-01	DATA	164	
176	177	3.5087834E-01	3.4787588E-01	3.4377388E-01	3.3978383E-01	DATA	165	
177	178	3.3589873E-01	3.3191712E-01	3.2784618E-01	3.2368524E-01	DATA	166	
178	179	3.2948519E-01	3.2589747E-01	3.2087858E-01	3.1661849E-01	DATA	167	
179	DATA (DCSUN (I),I=2077282)/						DATA	168
180	181	3.0159215E-01	2.9889777E-01	2.9254285E-01	2.8730922E-01	DATA	169	
181	182	2.8739857E-01	2.7741132E-01	2.7235849E-01	2.6723692E-01	DATA	170	
182	183	2.821222E-01	2.587385E-01	2.5139672E-01	2.459782E-01	DATA	171	
183	184	2.4021584E-01	2.349798E-01	2.2938238E-01	2.2372485E-01	DATA	172	
184	185	2.2880827E-01	2.223538E-01	2.1640659E-01	2.1052313E-01	DATA	173	
185	186	1.9438834E-01	1.8880178E-01	1.8256519E-01	1.7648029E-01	DATA	174	
186	187	1.7634797E-01	1.6417088E-01	1.5794788E-01	1.5168295E-01	DATA	175	
187	188	1.4537675E-01	1.3983108E-01	1.3284939E-01	1.2628754E-01	DATA	176	
188	189	1.297738E-01	1.238598E-01	1.1627674E-01	1.1021982E-01	DATA	177	
189	DATA (DCSUN (I),I=2537288)/						DATA	178
190	191	9.8844237E-02	8.7842538E-02	8.0416376E-02	7.3767429E-02	DATA	179	
191	192	6.9077375E-02	6.0487852E-02	5.3780505E-02	4.6976898E-02	DATA	180	
192	193	4.8238892E-02	3.3487863E-02	2.625475E-02	1.9958367E-02	DATA	181	
193	194	1.4178977E-02	3.888968E-02	4.0647094E-02	7.2028788E-03	DATA	182	
194	195	-1.4081279E-02	8.886758E-02	-2.759955E-02	3.4398078E-02	DATA	183	
195	196	-4.2188774E-02	4.799592E-02	-4.755842E-02	-6.1523610E-02	DATA	184	
196	197	-6.8284883E-02	9.5851078E-02	-3.762596E-02	-8.8477529E-02	DATA	185	
197	198	-9.5174800E-02	8.289022E-01	-8.880424E-01	-1.1513446E-01	DATA	186	
198	199	-1.2173856E-01	-5.2881508E-01	-2.8486198E-01	-1.4137782E-01	DATA	187	
199	DATA (DCSUN (I),I=2897388)/						DATA	188
200	201	-1.4785939E-01	5.3430629E-01	-3.6031612E-01	-1.6708785E-01	DATA	189	
201	202	-1.7341720E-01	5.7990487E-01	-2.8594829E-01	-1.9214576E-01	DATA	190	
202	203	-1.9829552E-01	2.8439585E-01	-2.044498E-01	-2.1644091E-01	DATA	191	
203	204	-2.2238282E-01	2.2826618E-01	-2.3492138E-01	-2.3985580E-01	DATA	192	
204	205	-2.4553647E-01	2.5129242E-01	-2.5626123E-01	-2.6228078E-01	DATA	193	
205	206	-2.6788928E-01	2.7384448E-01	-2.7832448E-01	-2.8352788E-01	DATA	194	
206	207	-2.8865046E-01	2.9389258E-01	-2.9851388E-01	-3.0352490E-01	DATA	195	
207	208	-3.0831222E-01	3.1388833E-01	-3.1781438E-01	-3.2212736E-01	DATA	196	
208	209	-3.265452E-01	3.3888688E-01	-3.3598975E-01	-3.3923253E-01	DATA	197	
209	DATA (DCSUN (I),I=3897388)/						DATA	198
210	211	-3.4323844E-01	3.473988E-01	-3.5896309E-01	-3.5466890E-01	DATA	199	
211	212	-3.5828538E-01	3.6195203E-01	-3.652667E-01	-3.6838785E-01	DATA	200	
212	213	-3.7133834E-01	3.7456212E-01	-3.7747245E-01	-3.8028287E-01	DATA	201	
213	214	-3.8293198E-01	3.8587832E-01	-3.8790077E-01	-3.9019786E-01	DATA	202	
214	215	-3.9238852E-01	3.9441158E-01	-3.9632588E-01	-3.9811080E-01	DATA	203	
215	216	-3.9976427E-01	4.0228858E-01	-4.0287648E-01	-4.0398382E-01	DATA	204	



216	217	=4.0505578E-01	=4.0604402E-01	=4.0609725E-01	=4.0761505E-01	DATA 205
217	218	=4.0581977E-01	=4.0664303E-01	=4.0795269E-01	=4.0912577E-01	DATA 206
218	219	=4.05918289E-01	=4.066152E-01	=4.0802394E-01	=4.0844953E-01	DATA 207
219	DATA (RSUN (I))=18617368/					DATA 208
220	221	=4.0798771E-01	=4.0768923E-01	=4.0680424E-01	=4.0558296E-01	DATA 209
221	222	=4.0432592E-01	=4.053362E-01	=4.0280667E-01	=4.0054577E-01	DATA 210
222	DATA (RSUN (I))=1786/					DATA 210
223	231	9.8389982E-01	9.8388159E-01	9.8387079E-01	9.8386639E-01	DATA 211
224	232	9.8386820E-01	9.8387633E-01	9.8389844E-01	9.8391032E-01	DATA 212
225	233	9.8393571E-01	9.8396632E-01	9.8400197E-01	9.8404284E-01	DATA 213
226	234	9.8408726E-01	9.8413649E-01	9.8418982E-01	9.8424787E-01	DATA 214
227	235	9.8430884E-01	9.8437252E-01	9.8444059E-01	9.8451245E-01	DATA 215
228	236	9.8458799E-01	9.8466723E-01	9.8475069E-01	9.8483885E-01	DATA 216
229	237	9.8493095E-01	9.8502856E-01	9.8513139E-01	9.8523999E-01	DATA 217
230	238	9.8535380E-01	9.8547363E-01	9.8559968E-01	9.8573187E-01	DATA 218
231	239	9.8588928E-01	9.8601262E-01	9.8616172E-01	9.8631624E-01	DATA 219
232	DATA (RSUN (I))=18792/					DATA 220
233	241	9.8664002E-01	9.8668097E-01	9.8670897E-01	9.8672233E-01	DATA 221
234	242	9.8713949E-01	9.8714049E-01	9.872490E-01	9.8732899E-01	DATA 222
235	243	9.8798289E-01	9.8809542E-01	9.8829067E-01	9.8848827E-01	DATA 223
236	244	9.8868793E-01	9.8888973E-01	9.8909389E-01	9.8930087E-01	DATA 224
237	245	9.899828E-01	9.899229E-01	9.8993905E-01	9.9015837E-01	DATA 225
238	246	9.9038190E-01	9.9040932E-01	9.904082E-01	9.9131684E-01	DATA 226
239	247	9.9133979E-01	9.9180742E-01	9.923899E-01	9.9233389E-01	DATA 227
240	248	9.9297225E-01	9.9283369E-01	9.9309938E-01	9.9336458E-01	DATA 228
241	249	9.9363870E-01	9.9390457E-01	9.9417699E-01	9.9445086E-01	DATA 229
242	DATA (RSUN (I))=1739288/					DATA 230
243	251	9.9472459E-01	9.9499934E-01	9.9527435E-01	9.9554912E-01	DATA 231
244	252	9.9582244E-01	9.9609882E-01	9.9637358E-01	9.9664859E-01	DATA 232
245	253	9.9692398E-01	9.9720002E-01	9.9747692E-01	9.9775473E-01	DATA 233
246	254	9.9803439E-01	9.9811536E-01	9.9829775E-01	9.9888181E-01	DATA 234
247	255	9.9916755E-01	9.9949488E-01	9.9974366E-01	1.0000339E 00	DATA 235
248	256	1.00082253E 00	1.0006172E 00	1.0009109E 00	1.0012047E 00	DATA 236
249	257	1.0014988E 00	1.0017928E 00	1.0020864E 00	1.0023790E 00	DATA 237
250	258	1.0026705E 00	1.0029608E 00	1.0032487E 00	1.0035346E 00	DATA 238
251	259	1.0038178E 00	1.0040982E 00	1.0043767E 00	1.0046524E 00	DATA 239
252	DATA (RSUN (I))=1897144/					DATA 240
253	261	1.0049257E 00	1.0051968E 00	1.0054659E 00	1.0057334E 00	DATA 241
254	262	1.0059996E 00	1.0062644E 00	1.0065284E 00	1.0067922E 00	DATA 242
255	263	1.0070533E 00	1.0073144E 00	1.0075747E 00	1.0078322E 00	DATA 243
256	264	1.0080927E 00	1.0083502E 00	1.0086064E 00	1.0088613E 00	DATA 244
257	265	1.0091146E 00	1.0093662E 00	1.0096153E 00	1.0098620E 00	DATA 245
258	266	1.0101059E 00	1.0103465E 00	1.0105835E 00	1.0108185E 00	DATA 246
259	267	1.0110449E 00	1.0112769E 00	1.0115082E 00	1.0117389E 00	DATA 247
260	268	1.0119328E 00	1.0121582E 00	1.0123819E 00	1.0125944E 00	DATA 248
261	269	1.0127098E 00	1.0128992E 00	1.0130862E 00	1.0132695E 00	DATA 249
262	DATA (RSUN (I))=1459186/					DATA 250
263	271	1.0134580E 00	1.0136272E 00	1.0138024E 00	1.0139744E 00	DATA 251
264	272	1.0141438E 00	1.0143103E 00	1.0144747E 00	1.0146359E 00	DATA 252
265	273	1.0147943E 00	1.0149492E 00	1.0151014E 00	1.0152496E 00	DATA 253
266	274	1.0153940E 00	1.0155584E 00	1.0156995E 00	1.0157998E 00	DATA 254
267	275	1.0159237E 00	1.0160439E 00	1.0161574E 00	1.0162689E 00	DATA 255
268	276	1.0163861E 00	1.0164612E 00	1.0165512E 00	1.0166351E 00	DATA 256
269	277	1.0167139E 00	1.0167872E 00	1.0168564E 00	1.0169289E 00	DATA 257
270	278	1.0169889E 00	1.0170368E 00	1.0170887E 00	1.0171389E 00	DATA 258
271	279	1.0171844E 00	1.0172224E 00	1.0172598E 00	1.0172988E 00	DATA 259
272	DATA (RSUN (I))=1817246/					DATA 260
273	281	1.0173245E 00	1.0173515E 00	1.0173748E 00	1.0173942E 00	DATA 261
274	282	1.0174096E 00	1.0174206E 00	1.0174268E 00	1.0174279E 00	DATA 262
275	283	1.0174235E 00	1.0174134E 00	1.0173973E 00	1.0173752E 00	DATA 263
276	284	1.0173466E 00	1.0173217E 00	1.0172707E 00	1.0172238E 00	DATA 264
277	285	1.0171730E 00	1.0171326E 00	1.0170499E 00	1.0169883E 00	DATA 265
278	286	1.0169089E 00	1.0168290E 00	1.0167464E 00	1.0166657E 00	DATA 266
279	287	1.0165788E 00	1.0164773E 00	1.0163805E 00	1.0162824E 00	DATA 267
280	288	1.0161722E 00	1.0160710E 00	1.0159618E 00	1.0158489E 00	DATA 268
281	289	1.0157330E 00	1.0156234E 00	1.0154902E 00	1.0153636E 00	DATA 269
282	DATA (RSUN (I))=2872252/					DATA 270
283	291	1.01593386E 00	1.01590938E 00	1.01589522E 00	1.01588091E 00	DATA 271
284	292	1.0146526E 00	1.0144943E 00	1.01433813E 00	1.0141837E 00	DATA 272
285	293	1.0139889E 00	1.0138103E 00	1.0136265E 00	1.0134384E 00	DATA 273
286	294	1.0132482E 00	1.0130502E 00	1.0128503E 00	1.0126412E 00	DATA 274
287	295	1.0124411E 00	1.0122222E 00	1.0120020E 00	1.0118012E 00	DATA 275
288	296	1.0115918E 00	1.0113745E 00	1.0111554E 00	1.0109336E 00	DATA 276

289	297	1.0187132E 00.	8.0284888E 00	2.0182614E 60.	1.0108329E 60	DATA 277
290	298	1.0098007E 00.	8.0095675E 00	2.0093304E 60.	1.0096898E 60.	DATA 278
291	299	1.0088456E 00.	8.0089978E 00	2.0083464E 60.	1.0088913E 60.	DATA 279
292		DATA (RSUN (I):I=255286)/				DATA 280
293	301	1.0078327E 00.	8.0099704E 00	2.0023054E 60.	1.0078311E 60.	DATA 281
294	302	1.0067650E 00.	8.0064925E 00	2.0022168E 60.	1.0059392E 60.	DATA 282
295	303	1.0057599E 00.	8.0053794E 00	2.0020982E 60.	1.0048141E 60.	DATA 283
296	304	1.0048380E 00.	8.0042519E 00	2.0019708E 60.	1.0036886E 60.	DATA 284
297	305	1.0038078E 00.	8.0031274E 00	2.0018478E 60.	1.0025619E 60.	DATA 285
298	306	1.0028282E 00.	8.0020088E 00	2.0017275E 60.	1.0014482E 60.	DATA 286
299	307	1.0018163E 00.	8.0008883E 00	2.0016095E 60.	1.0003098E 60.	DATA 287
300	308	1.0008237E 00.	7.9997343E-01	2.0014504E-61.	9.9991545E-61.	DATA 288
301	309	9.9886388E-01.	9.9887245E-01	9.9888079E-61.	9.9798926E-61.	DATA 289
302		DATA (RSUN (I):I=2897324)/				DATA 290
303	311	9.9759781E-01.	9.9740714E-01	9.9711758E-61.	9.9682927E-61.	DATA 291
304	312	9.9694273E-01.	9.9689828E-01	9.9697628E-61.	9.9567695E-61.	DATA 292
305	313	9.9542844E-01.	9.9524762E-01	9.9467748E-61.	9.9461025E-61.	DATA 293
306	314	9.9434589E-01.	9.9408388E-01	9.9382422E-61.	9.9356671E-61.	DATA 294
307	315	9.9338090E-01.	9.9305674E-01	9.9280412E-61.	9.9259290E-61.	DATA 295
308	316	9.9238295E-01.	9.9205431E-01	9.9180702E-61.	9.9156189E-61.	DATA 296
309	317	9.9131685E-01.	9.9107383E-01	9.9083282E-61.	9.9059379E-61.	DATA 297
310	318	9.9035696E-01.	9.9002262E-01	9.8989119E-61.	9.8966289E-61.	DATA 298
311	319	9.8943862E-01.	9.8921704E-01	9.8900032E-61.	9.8878822E-61.	DATA 299
312		DATA (RSUN (I):I=3237580)/				DATA 300
313	321	9.8858126E-01.	9.8837937E-01	9.8818264E-61.	9.8799120E-61.	DATA 301
314	322	9.8786493E-01.	9.8762875E-01	9.8744737E-61.	9.8727590E-61.	DATA 302
315	323	9.8718778E-01.	9.8694413E-01	9.8678432E-61.	9.8662826E-61.	DATA 303
316	324	9.8647584E-01.	9.8622618E-01	9.8608007E-61.	9.8603750E-61.	DATA 304
317	325	9.8589774E-01.	9.856142E-01	9.8542853E-61.	9.8549963E-61.	DATA 305
318	326	9.8539384E-01.	9.8525083E-01	9.8503263E-61.	9.8503889E-61.	DATA 306
319	327	9.8498917E-01.	9.8480455E-01	9.8460914E-61.	9.8463184E-61.	DATA 307
320	328	9.8452372E-01.	9.844212E-01	9.8426699E-61.	9.8429821E-61.	DATA 308
321	329	9.8423626E-01.	9.8408072E-01	9.8403314E-61.	9.8408821E-61.	DATA 309
322		DATA (RSUN (I):I=3617388)/				DATA 310
323	331	9.8398052E-01.	9.8381844E-01	9.8399168E-61.	9.8396976E-61.	DATA 311
324	332	9.8393257E-01.	9.8393993E-01	9.8393169E-61.	9.8392793E-61.	DATA 312
325		DATA (RAMOON(I):I=17 86)/				DATA 312
326	341	1.8246289E 00.	1.7948894E 00	2.0498053E 00.	2.2861229E 00.	DATA 313
327	342	2.8046756E 00.	2.7888066E 00	2.9029328E 00.	3.0917385E 00.	DATA 314
328	343	3.2797720E 00.	3.4723814E 00	3.6784898E 00.	3.8803229E 00.	DATA 315
329	344	4.2028352E 00.	4.3399951E 00	4.5880222E 00.	4.8338423E 00.	DATA 316
330	345	5.0828827E 00.	5.3292599E 00	5.5681668E 00.	5.8871679E 00.	DATA 317
331	346	6.0088512E 00.	6.2291861E 00	6.6958309E-01.	4.0108487E-61.	DATA 318
332	347	6.8375491E-01.	8.9928168E-01	1.1652278E 00.	1.4358922E 00.	DATA 319
333	348	1.7029523E 00.	3.9588612E 00	2.1991678E 00.	2.4231294E 00.	DATA 320
334	349	2.0327525E 00.	2.8325705E 00	3.0238869E 00.	3.7213298E 00.	DATA 321
335		DATA (RAMOON(I):I=377 92)/				DATA 322
336	351	3.8044655E 00.	3.6089608E 00	3.8080558E 00.	4.0221241E 00.	DATA 323
337	352	4.2380680E 00.	4.4887808E 00	4.7326768E 00.	4.9831387E 00.	DATA 324
338	353	5.2292458E 00.	5.4897458E 00	5.7037894E 00.	5.9327525E 00.	DATA 325
339	354	6.2597986E 00.	6.392242E-01	3.4098832E-01	5.8562888E-01	DATA 326
340	355	8.4093438E-01.	1.1851892E 00	2.3730312E 00.	1.8373280E 00.	DATA 327
341	356	1.0918480E 00.	2.1328113E 00	2.554848E 00.	2.7677985E 00.	DATA 328
342	357	2.0512192E 00.	3.1525885E 00	3.3423637E 00.	3.6378499E 00.	DATA 329
343	358	3.0598096E 00.	3.9522448E 00	4.2730478E 00.	4.4048973E 00.	DATA 330
344	359	4.0434954E 00.	4.8881127E 00	5.1284982E 00.	5.3675424E 00.	DATA 331
345		DATA (RAMOON(I):I=737288)/				DATA 332
346	361	5.6022186E 00.	5.8333839E 00	6.0636234E 00.	1.3408928E-02	DATA 333
347	362	2.8886452E-01.	3.0265919E-01	7.8327119E-61.	1.0333387E 00.	DATA 334
348	363	1.8072736E 00.	4.5768901E 00	2.8351684E 00.	2.0778090E 00.	DATA 335
349	364	2.8048152E 00.	2.5156558E 00	7.150638E 00.	2.9091255E 00.	DATA 336
350	365	3.0987725E 00.	3.2887805E 00	3.4883828E 00.	3.6825853E 00.	DATA 337
351	366	3.8914086E 00.	4.1897239E 00	3.3389219E 00.	4.5707623E 00.	DATA 338
352	367	4.8078435E 00.	5.0445753E 00	5.2782738E 00.	5.8079495E 00.	DATA 339
353	368	5.954386E 00.	5.985475E 00	4.1898824E 00.	1.0843088E-61	DATA 340
354	369	3.9182332E-01.	6.3425993E-01	9.2983649E-61.	1.02122284E 00.	DATA 341
355		DATA (RAMOON(I):I=1897244)/				DATA 342
356	371	1.4931236E 00.	4.7880318E 00	2.0156654E 00.	2.0498098E 00.	DATA 343
357	372	2.4637788E 00.	3.6837908E 00	2.8627474E 00.	3.0528484E 00.	DATA 344
358	373	3.2408333E 00.	3.4327425E 00	3.6389608E 00.	3.837748E 00.	DATA 345
359	374	4.0541586E 00.	4.2995818E 00	4.5124972E 00.	4.7468386E 00.	DATA 346
360	375	4.9818488E 00.	5.212816E 00	5.4383914E 00.	5.6578297E 00.	DATA 347
361	376	5.0757418E 00.	6.0983563E 00	6.8386412E-02.	2.7893362E-01	DATA 348



362	377	5,8292898E-01	5,8368976E-01	5,886017E-01	1,3774183E-00	DATA 349
363	378	1,8888939E-00	5,9288255E-00	2,1721207E-00	2,4022323E-00	DATA 350
364	379	2,8127558E-00	8,6136222E-00	8,0029823E-00	3,8928920E-00	DATA 351
365	DATA (RAMOBN(I),I=1859280)/					DATA 352
366	381	3,3838298E-00	3,5943735E-00	3,7859445E-00	3,9983651E-00	DATA 353
367	382	4,8225772E-00	4,4565444E-00	4,6985127E-00	4,9268089E-00	DATA 354
368	383	5,2578131E-00	5,5888677E-00	5,6087147E-00	5,8151887E-00	DATA 355
369	384	6,8298252E-00	6,8487708E-00	6,9027926E-01	4,3876084E-01	DATA 356
370	385	6,8848535E-01	9,6388918E-01	2,2497917E-00	1,8385387E-00	DATA 357
371	386	1,8169837E-00	2,8778532E-00	2,3180334E-00	2,8396287E-00	DATA 358
372	387	2,7465059E-00	2,9485682E-00	3,1356984E-00	3,3274404E-00	DATA 359
373	388	3,5228422E-00	3,7252735E-00	3,9370638E-00	4,6590383E-00	DATA 360
374	389	4,3908895E-00	4,6268128E-00	5,8649329E-00	5,8999020E-00	DATA 361
375	DATA (RAMOBN(I),I=1817226)/					DATA 362
376	391	5,3286613E-00	5,5503025E-00	5,7650518E-00	5,9788185E-00	DATA 363
377	392	6,2926580E-00	6,2989728E-01	3,5932258E-01	6,8418620E-01	DATA 364
378	393	8,6558297E-01	1,1411014E-00	1,4239734E-00	1,7039520E-00	DATA 365
379	394	1,7718043E-00	2,2285469E-00	2,4530354E-00	2,6686926E-00	DATA 366
380	395	2,8726170E-00	3,8694532E-00	3,2637176E-00	3,4595626E-00	DATA 367
381	396	3,8888974E-00	3,8896208E-00	4,9881992E-00	4,3161972E-00	DATA 368
382	397	4,5515659E-00	4,7983572E-00	5,0283514E-00	5,2618284E-00	DATA 369
383	398	5,4883994E-00	5,7697932E-00	5,9265688E-00	6,8426088E-00	DATA 370
384	399	7,8878384E-02	3,8682493E-01	3,4584005E-01	7,9785486E-01	DATA 371
385	DATA (RAMOBN(I),I=2877252)/					DATA 372
386	401	1,8637824E-00	1,8380759E-00	2,6127470E-00	1,8792673E-00	DATA 373
387	402	2,2316082E-00	2,3696142E-00	2,5884588E-00	2,7972973E-00	DATA 374
388	403	2,9981287E-00	3,1980797E-00	3,3928951E-00	3,5926081E-00	DATA 375
389	404	3,7994988E-00	4,0186212E-00	4,2384824E-00	4,4698523E-00	DATA 376
390	405	4,7068674E-00	4,9484428E-00	5,1785109E-00	5,4090286E-00	DATA 377
391	406	5,8883250E-00	5,8583294E-00	6,0728716E-00	1,3487426E-02	DATA 378
392	407	2,8758185E-01	4,8776233E-01	7,4085452E-01	1,8037967E-00	DATA 379
393	408	1,2748297E-00	1,5461699E-00	2,8182039E-00	2,8861348E-00	DATA 380
394	409	2,2973488E-00	2,5190077E-00	2,7290524E-00	2,9318959E-00	DATA 381
395	DATA (RAMOBN(I),I=2537288)/					DATA 382
396	411	3,2289591E-00	3,3262928E-00	3,5253482E-00	3,7317684E-00	DATA 383
397	412	3,9443899E-00	4,1645583E-00	4,3968808E-00	4,6235222E-00	DATA 384
398	413	4,8971020E-00	5,0894768E-00	5,3186378E-00	5,5448682E-00	DATA 385
399	414	5,7688466E-00	5,9894242E-00	6,2122408E-00	1,8495987E-01	DATA 386
400	415	6,8847686E-01	6,6488897E-01	9,3287352E-01	1,2889792E-00	DATA 387
401	416	1,4842576E-00	1,7527565E-00	2,0052858E-00	2,2428944E-00	DATA 388
402	417	2,4643388E-00	2,6740158E-00	2,8752566E-00	3,0728288E-00	DATA 389
403	418	3,2888638E-00	3,4686352E-00	3,6783677E-00	3,8889522E-00	DATA 390
404	419	4,8988988E-00	4,8282898E-00	4,5589238E-00	4,2818687E-00	DATA 391
405	DATA (RAMOBN(I),I=2897324)/					DATA 392
406	421	5,8102735E-00	5,2352318E-00	5,4583214E-00	5,6746873E-00	DATA 393
407	422	5,8928688E-00	6,1144288E-00	6,0428275E-02	3,8145283E-01	DATA 394
408	423	5,5743895E-01	6,2887453E-01	1,1157927E-00	1,3978765E-00	DATA 395
409	424	1,8769372E-00	1,9488928E-00	2,1850982E-00	2,4133185E-00	DATA 396
410	425	2,8257650E-00	2,8271988E-00	3,025137E-00	3,2183172E-00	DATA 397
411	426	3,4147035E-00	3,6180635E-00	3,8244239E-00	4,0405205E-00	DATA 398
412	427	4,2635404E-00	4,4921962E-00	4,7280714E-00	4,9469485E-00	DATA 399
413	428	5,2693950E-00	5,3866308E-00	5,5995909E-00	5,8106425E-00	DATA 400
414	429	6,8234586E-00	6,2424625E-00	1,8936198E-01	4,3507081E-01	DATA 401
415	DATA (RAMOBN(I),I=3257580)/					DATA 402
416	431	6,9918787E-01	9,8862639E-01	1,2727837E-00	1,5645183E-00	DATA 403
417	432	1,8444124E-00	2,1852538E-00	2,3454027E-00	2,5673284E-00	DATA 404
418	433	2,7754679E-00	2,9748135E-00	3,1781352E-00	3,3657054E-00	DATA 405
419	434	3,5651082E-00	3,7710112E-00	3,9848309E-00	4,2063724E-00	DATA 406
420	435	4,3336924E-00	4,6634459E-00	4,8937964E-00	5,1556888E-00	DATA 407
421	436	5,3338994E-00	5,5445952E-00	5,758261E-00	5,9582888E-00	DATA 408
422	437	6,2878520E-00	6,8225538E-01	3,3289107E-01	5,8896186E-01	DATA 409
423	438	8,4827296E-01	1,1384848E-00	1,428558E-00	1,7158524E-00	DATA 410
424	439	1,9908820E-00	2,2471437E-00	2,4835279E-00	2,7032361E-00	DATA 411
425	DATA (RAMOBN(I),I=3817388)/					DATA 412
426	441	2,9109456E-00	3,1226258E-00	3,3098919E-00	3,5097783E-00	DATA 413
427	442	3,7145070E-00	3,9282257E-00	4,1456257E-00	4,3716798E-00	DATA 414
428	DATA (RAMOBN(I),I=1786)/					DATA 414
429	451	4,6483421E-01	4,3890086E-01	3,8353688E-01	3,1880987E-01	DATA 415
430	452	2,2517681E-01	1,3284109E-01	3,6484862E-02	-5,8719881E-02	DATA 416
431	453	-1,8043583E-02	-2,3827875E-02	-3,1357409E-02	-3,7840786E-02	DATA 417
432	454	-4,2835750E-03	-4,3925745E-03	-4,6785583E-03	-4,8126350E-03	DATA 418
433	455	-4,8972620E-04	-5,4491098E-04	-6,0879022E-04	-1,8171383E-03	DATA 419
434	456	5,8877471E-02	5,7187102E-02	1,6589221E-01	2,6576981E-01	DATA 420

435	897	3.514363E-01	6.1680898E-01	8.5632776E-01	4.6794080E-01	DATA	421
436	898	4.5005283E-01	4.0597159E-01	3.4086899E-01	2.8881688E-01	DATA	422
437	899	1.8778909E-01	8.598848E-02	-2.4987568E-02	-1.18907623E-01	DATA	423
438		DATA (DCROBN(I))	377 921/			DATA	424
439	901	-2.877184E-01	-2.8812604E-01	-8.5747029E-01	-4.12268130E-01	DATA	425
440	902	-4.8038334E-01	-4.6786678E-01	-8.6067917E-01	-4.2921295E-01	DATA	426
441	903	-8.9838970E-01	-8.9592963E-01	-8.9996979E-01	-9.2142886E-02	DATA	427
442	904	2.8888430E-02	5.3480825E-01	2.4083457E-01	3.3191685E-01	DATA	428
443	905	4.8814929E-01	4.4987127E-01	8.6698298E-01	4.5622986E-01	DATA	429
444	906	4.5928354E-01	5.6883332E-01	2.8471472E-01	1.8388053E-01	DATA	430
445	907	7.5943688E-02	-8.7589838E-02	-8.7837118E-01	-2.6162085E-01	DATA	431
446	908	-8.8468895E-01	-8.943012XE-01	-4.3788412E-01	-4.6152797E-01	DATA	432
447	909	-4.8868177E-01	-8.4288203E-01	-8.9786182E-01	-3.18978228E-01	DATA	433
448		DATA (DCROBN(I))	7391881/			DATA	434
449	471	-2.8298154E-01	-3.3991444E-01	-2.7233741E-02	8.8817294E-02	DATA	435
450	472	2.807951E-01	5.8883078E-01	3.8111404E-01	4.3639482E-01	DATA	436
451	473	4.6288539E-01	4.5880893E-01	4.2672285E-01	3.7284452E-01	DATA	437
452	474	3.8171434E-01	2.1848965E-01	2.2733877E-01	3.3418623E-02	DATA	438
453	475	-6.6978879E-02	-5.5223078E-01	-2.8784132E-01	-3.6291172E-01	DATA	439
454	476	-3.7611138E-01	-4.2374212E-01	-8.5293472E-01	-4.6136868E-01	DATA	440
455	477	-4.4788691E-01	-4.1237723E-01	-8.5329679E-01	-2.7629453E-01	DATA	441
456	478	-1.8251056E-01	-9.831388E-02	3.7049053E-02	1.8098988E-01	DATA	442
457	479	2.8768279E-01	8.4887178E-01	4.1528030E-01	4.5283002E-01	DATA	443
458		DATA (DCROBN(I))	18991441/			DATA	444
459	481	4.5819771E-01	4.5389539E-01	3.8432285E-01	3.5622279E-01	DATA	445
460	482	2.3524409E-01	1.4682187E-01	3.3464482E-02	-3.9879187E-02	DATA	446
461	483	-1.3100585E-01	-2.1691238E-01	-2.9488894E-01	-3.5997559E-01	DATA	447
462	484	-4.2114385E-01	-4.4884725E-01	-8.5722602E-01	-4.4921980E-01	DATA	448
463	485	-4.2882905E-01	-8.6788433E-01	-2.9789393E-01	-2.8157085E-01	DATA	449
464	486	-1.6298366E-01	-5.8785148E-01	8.0584662E-01	2.1228592E-01	DATA	450
465	487	3.8988722E-01	5.8783265E-01	3.8889134E-01	4.5695778E-01	DATA	451
466	488	4.2883071E-01	4.0816188E-01	3.5883929E-01	2.5889386E-01	DATA	452
467	489	1.8719336E-01	9.4121228E-02	-2.9698832E-02	-1.8129683E-01	DATA	453
468		DATA (DCROBN(I))	14571801/			DATA	454
469	491	-1.9798155E-01	-2.7894675E-01	-8.4588904E-01	-3.9980691E-01	DATA	455
470	492	-4.3738919E-01	-4.5882188E-01	-8.5112599E-01	-4.8918086E-01	DATA	456
471	493	-3.7821395E-01	-8.1245939E-01	-2.3093185E-01	-1.3709275E-01	DATA	457
472	494	-8.4751274E-02	7.1784263E-02	2.730592E-01	2.7578397E-01	DATA	458
473	495	3.5953529E-01	4.2889988E-01	4.5251718E-01	4.5162999E-01	DATA	459
474	496	0.2941652E-01	3.6127735E-01	2.8445117E-01	1.9597554E-01	DATA	460
475	497	1.0166132E-01	5.9598319E-03	-8.7720461E-02	-1.7657721E-01	DATA	461
476	498	-8.5881182E-01	-8.2982975E-01	-8.8789864E-01	-4.2970980E-01	DATA	462
477	499	-4.9278856E-01	-4.5429365E-01	-8.3386928E-01	-3.9079481E-01	DATA	463
478		DATA (DCROBN(I))	18192261/			DATA	464
479	501	-8.8333966E-01	-8.4988222E-01	-8.5723508E-01	-5.6938994E-02	DATA	465
480	502	4.7821281E-02	3.5235989E-01	2.5036272E-01	3.3649925E-01	DATA	466
481	503	4.8388996E-01	4.4528022E-01	8.5689751E-01	4.3615253E-01	DATA	467
482	504	3.8774139E-01	3.1740198E-01	2.3110358E-01	1.3692822E-01	DATA	468
483	505	3.9392527E-02	-9.7880688E-02	-2.4957358E-01	-2.3409187E-01	DATA	469
484	506	-3.6921570E-01	-8.7189179E-01	-8.1984905E-01	-4.4823827E-01	DATA	470
485	507	-4.5881754E-01	-4.4289489E-01	-8.0627061E-01	-3.4872781E-01	DATA	471
486	508	-2.7288280E-01	-8.8280672E-01	-8.2132228E-02	2.3399271E-02	DATA	472
487	509	1.2892685E-01	2.2899228E-01	8.1789255E-01	3.8869683E-01	DATA	473
488		DATA (DCROBN(I))	28772821/			DATA	474
489	511	4.3838252E-01	4.5822275E-01	4.4683992E-01	4.87665695E-01	DATA	475
490	512	3.8535953E-01	2.4528659E-01	2.7377188E-01	7.6573457E-02	DATA	476
491	513	-2.8489999E-02	-2.1648899E-01	-2.8494957E-01	-2.8421789E-01	DATA	477
492	514	-8.9191338E-01	-4.8425093E-01	-8.3988627E-01	-4.5511488E-01	DATA	478
493	515	-4.4923845E-01	-4.2188441E-01	-8.7189817E-01	-3.8148090E-01	DATA	479
494	516	-8.1918083E-01	-8.1821818E-01	-9.8189989E-03	9.8504088E-02	DATA	480
495	517	2.8288770E-01	2.9886417E-01	3.7283948E-01	4.8589888E-01	DATA	481
496	518	4.5212755E-01	4.4982228E-01	8.1887078E-01	3.6394188E-01	DATA	482
497	519	2.9042015E-01	2.8381413E-01	2.0983635E-01	1.8401378E-02	DATA	483
498		DATA (DCROBN(I))	25372881/			DATA	484
499	521	-8.3418850E-02	-8.7489642E-01	-2.5689686E-01	-3.2835998E-01	DATA	485
500	522	-3.8888281E-01	-4.2681972E-01	-4.4897309E-01	-4.8062325E-01	DATA	486
501	523	-4.8088971E-01	-8.8989978E-01	-8.2884933E-01	-2.4994585E-01	DATA	487
502	524	-1.5648487E-01	-8.2488038E-02	5.6787868E-02	1.6488449E-01	DATA	488
503	525	2.8488627E-01	3.4985958E-01	3.1071788E-01	4.4461389E-01	DATA	489
504	526	4.4888173E-01	4.2486527E-01	3.7478154E-01	3.8623126E-01	DATA	490
505	527	2.2488388E-01	3.8388878E-01	3.8599093E-02	-5.6147983E-02	DATA	491
506	528	-4.4738829E-01	-2.3293518E-01	-8.0689294E-01	-3.8743084E-01	DATA	492
507	529	-4.1298892E-01	-4.4848493E-01	-4.4883838E-01	-4.3506085E-01	DATA	493



508	DATA (DCMOON(I))I=2897324/				DATA 494	0
509	531	-4,8168533E-02	-8,488668E-01	-2,784902E-01	-1,9296882E-01	DATA 495
510	532	-9,8442252E-02	8,8845418E-02	1,823587E-01	2,2259788E-01	DATA 496
511	533	3,2508074E-01	8,8751622E-01	8,3289885E-01	4,4654570E-01	DATA 497
512	534	4,8928511E-01	8,8498579E-01	8,1959514E-01	2,3972583E-01	DATA 498
513	535	1,8092253E-01	8,7823458E-02	-3,573575E-02	-1,8656974E-01	DATA 499
514	536	-2,1148282E-01	-8,8768455E-01	-3,5184028E-01	-4,8071292E-01	DATA 500
515	537	-4,8241119E-01	-8,6492895E-01	-3,3614927E-01	-4,8866498E-01	DATA 501
516	538	-8,8168533E-01	-8,9791522E-01	-2,1933605E-01	-1,88664963E-01	DATA 502
517	539	-2,9488835E-02	9,4494866E-02	1,7851043E-01	2,7478721E-01	DATA 503
518	DATA (DCMOON(I))I=3257366/				DATA 504	0
519	541	3,5644781E-01	4,1459425E-01	8,4237398E-01	4,3697197E-01	DATA 505
520	542	4,8064617E-01	8,3948053E-01	8,6894498E-01	1,7196083E-01	DATA 506
521	543	7,8118717E-02	-6,6322156E-02	-2,9746907E-01	-1,9394844E-01	DATA 507
522	544	-2,7192582E-01	-8,3792588E-01	-2,9030484E-01	-4,82596084E-01	DATA 508
523	545	-4,4267436E-01	-4,3914727E-01	-1,529125E-01	-3,7223920E-01	DATA 509
524	546	-3,2207773E-01	-2,3746895E-01	-2,513528E-01	-5,6858375E-02	DATA 510
525	547	4,2607960E-02	6,4297816E-01	2,3957157E-01	3,8475895E-01	DATA 511
526	548	3,9211160E-01	6,8350558E-01	4,4329844E-01	4,8828078E-01	DATA 512
527	549	3,8787724E-01	8,9343722E-01	2,0425999E-01	1,8891883E-01	DATA 513
528	DATA (DCMOON(I))I=3619368/				DATA 514	0
529	551	1,1478217E-02	-8,3420522E-02	-2,725443E-01	-2,5320278E-01	DATA 515
530	552	-3,8286444E-01	-8,7898502E-01	-2,1993823E-01	-4,4071429E-01	DATA 516
531	DATA (DCMOON(I))I=1738/				DATA 516	0
532	561	5,8259544E 01	5,8881278E 01	5,9474103E 01	6,9233596E 01	DATA 517
533	562	6,2016325E 01	6,1786933E 01	6,2424987E 01	6,8948676E 01	DATA 518
534	563	6,3276851E 01	6,3411944E 01	6,3339889E 01	6,3078082E 01	DATA 519
535	564	6,2638800E 01	6,2857388E 01	6,1399599E 01	6,0708885E 01	DATA 520
536	565	6,8036458E 01	5,9427297E 01	5,8948088E 01	5,8518187E 01	DATA 521
537	566	5,8241946E 01	5,8897915E 01	5,8053862E 01	5,8037072E 01	DATA 522
538	567	5,8131526E 01	5,8294477E 01	5,8527732E 01	5,8837128E 01	DATA 523
539	568	5,9228178E 01	5,9781812E 01	6,0247758E 01	6,0847380E 01	DATA 524
540	569	6,1468818E 01	6,2872068E 01	6,2652223E 01	6,3044370E 01	DATA 525
541	DATA (DCMOON(I))I=37792/				DATA 526	0
542	571	6,8328190E 01	6,5432167E 01	6,3336955E 01	6,3037884E 01	DATA 527
543	572	6,2546582E 01	6,1891005E 01	6,1153292E 01	6,0276324E 01	DATA 528
544	573	5,9439581E 01	5,8671988E 01	5,8034552E 01	5,7578321E 01	DATA 529
545	574	5,7313448E 01	5,7256863E 01	5,7383861E 01	5,7661282E 01	DATA 530
546	575	5,8048926E 01	5,8588598E 01	5,9089192E 01	5,9529282E 01	DATA 531
547	576	6,8058430E 01	6,8384453E 01	6,1189458E 01	6,2123275E 01	DATA 532
548	577	6,2584884E 01	5,2987228E 01	6,3381994E 01	6,3498693E 01	DATA 533
549	578	6,5548014E 01	6,5426177E 01	6,3158157E 01	6,2623387E 01	DATA 534
550	579	6,1948323E 01	6,212875E 01	6,0289812E 01	5,9254525E 01	DATA 535
551	DATA (DCMOON(I))I=937988/				DATA 536	0
552	581	5,8337353E 01	5,7558667E 01	5,6944408E 01	5,6554632E 01	DATA 537
553	582	5,6454193E 01	5,6618588E 01	5,7054708E 01	5,7589327E 01	DATA 538
554	583	5,8288394E 01	5,9827667E 01	5,9780282E 01	6,0500585E 01	DATA 539
555	584	6,1164458E 01	6,1759107E 01	6,2274748E 01	6,2724250E 01	DATA 540
556	585	6,3092189E 01	6,3398919E 01	6,357594E 01	6,3669960E 01	DATA 541
557	586	6,3644384E 01	6,3481723E 01	6,3168805E 01	6,2898384E 01	DATA 542
558	587	6,2852973E 01	6,1288377E 01	6,0387408E 01	5,9397394E 01	DATA 543
559	588	5,8423280E 01	5,7322267E 01	5,6786105E 01	5,6259182E 01	DATA 544
560	589	5,6825130E 01	5,6896492E 01	5,6459998E 01	5,7069488E 01	DATA 545
561	DATA (DCMOON(I))I=1897144/				DATA 546	0
562	591	5,9857911E 01	5,8748759E 01	5,9688638E 01	6,0555782E 01	DATA 547
563	592	6,2563867E 01	6,2883472E 01	6,2639409E 01	6,3027885E 01	DATA 548
564	593	6,3412243E 01	6,3619788E 01	6,3737092E 01	6,3708787E 01	DATA 549
565	594	6,3993283E 01	6,3893365E 01	6,3037118E 01	6,2588486E 01	DATA 550
566	595	6,2008480E 01	6,1381295E 01	6,3497989E 01	5,9619770E 01	DATA 551
567	596	5,8712053E 01	5,7835689E 01	5,705792E 01	5,6468421E 01	DATA 552
568	597	5,6118788E 01	5,6858262E 01	5,6299574E 01	5,6828282E 01	DATA 553
569	598	5,7568924E 01	5,8468348E 01	5,9437717E 01	6,0404475E 01	DATA 554
570	599	6,1302258E 01	6,2883153E 01	6,2736658E 01	6,3188386E 01	DATA 555
571	DATA (DCMOON(I))I=1457180/				DATA 556	0
572	881	6,3497084E 01	6,3851522E 01	6,3656733E 01	6,3559989E 01	DATA 557
573	882	6,3347840E 01	6,3844184E 01	6,2658659E 01	6,2196885E 01	DATA 558
574	883	6,2661784E 01	6,1885568E 01	6,0388049E 01	5,9678488E 01	DATA 559
575	884	5,8928835E 01	5,8281052E 01	5,7537158E 01	5,6995423E 01	DATA 560
576	885	5,8638797E 01	5,8584598E 01	5,6633927E 01	5,7024085E 01	DATA 561
577	886	5,7848332E 01	5,8446792E 01	5,9353038E 01	6,0295152E 01	DATA 562
578	887	6,1198464E 01	6,1995328E 01	6,2649804E 01	6,3138580E 01	DATA 563
579	888	6,3428498E 01	6,3327188E 01	6,3479937E 01	6,3276585E 01	DATA 564
580	889	6,2954886E 01	6,2544077E 01	6,2071448E 01	6,1559898E 01	DATA 565



BLOCK	LENGTH
1 ERWDLK	12

SYNREF

4273 TO THE NEXT AVAILABLE LOCATION.  
 GHAP VERSION/ASSEMBLY DATES JMPA 050171/052571 JMRB 050171/052571 JMPC 050171/052571  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
 \*\* 19198 WORDS OF MEMORY WERE USED BY GHAP FOR THIS ASSEMBLY.



SNUMB = 71034, ACTIVITY # = 02, REPORT CODE = 74, RECORD COJNT = 05304

71034 02 11-03-72 11.623 1973 EPHEMERIS

Line	Code	Description	DATA	Line
1	C=1973*	1973 EPHEMERIS		1
2		SUBROUTINE TABLE		2
3		DIMENSION RASUN (369), DCSUN (369), RSUN (369),		3
4		DIMENSION RAMOON(369), DCMOON(369), RMOON(369)		4
5		DIMENSION ARRAY(2214)		
6		DOUBLE PRECISION Y		
7		EQUIVALENCE (RASUN,ARRAY), (DCSUN,ARRAY(370)), (RSUN,ARRAY(739))		
8		EQUIVALENCE (RAMOON,ARRAY(1108)), (DCMOON,ARRAY(1477))		
9		EQUIVALENCE (RMOON,ARRAY(1846))		
10		COMMON /EPHBLK/ Y(4), I		
11		Y(1) = ARRAY(I)		
12		Y(2) = ARRAY(I+1)		
13		Y(3) = ARRAY(I+2)		
14		Y(4) = ARRAY(I+3)		
15		RETURN		
16		DATA (RASUN (I), I = 1, 36) /		6
17	11	4.8912026E 00, 4.9104916E 00, 4.9297592E 00, 4.9490029E 00,	DATA	7
18	12	4.9682201E 00, 4.9874083E 00, 4.9965632E 00, 5.0056882E 00,	DATA	8
19	13	5.0147753E 00, 5.0238242E 00, 5.0328328E 00, 5.0417992E 00,	DATA	9
20	14	5.0507219E 00, 5.0595992E 00, 5.0684297E 00, 5.0772118E 00,	DATA	10
21	15	5.0859443E 00, 5.0946263E 00, 5.1032566E 00, 5.1118343E 00,	DATA	11
22	16	5.1203585E 00, 5.1288286E 00, 5.1372441E 00, 5.1456047E 00,	DATA	12
23	17	5.1539099E 00, 5.1621591E 00, 5.1703518E 00, 5.1784877E 00,	DATA	13
24	18	5.1865664E 00, 5.1946587E 00, 5.2026502E 00, 5.2106447E 00,	DATA	14
25	19	5.2186300E 00, 5.2266086E 00, 5.2345814E 00, 5.2425481E 00,	DATA	15
26		DATA (RASUN (I), I = 37, 72) /		6
27	21	5.5390901E 00, 5.5766387E 00, 5.5941279E 00, 5.6115579E 00,	DATA	17
28	22	5.6289291E 00, 5.6462420E 00, 5.6634971E 00, 5.6806948E 00,	DATA	18
29	23	5.6978359E 00, 5.7149212E 00, 5.7319515E 00, 5.7489278E 00,	DATA	19
30	24	5.7658511E 00, 5.7827229E 00, 5.7995443E 00, 5.8163171E 00,	DATA	20
31	25	5.8330423E 00, 5.8497217E 00, 5.8663552E 00, 5.8829457E 00,	DATA	21
32	26	5.8994937E 00, 5.9160000E 00, 5.9324673E 00, 5.9488952E 00,	DATA	22
33	27	5.9652852E 00, 5.9816387E 00, 5.9979566E 00, 6.0142401E 00,	DATA	23
34	28	6.0304904E 00, 6.0467086E 00, 6.0628939E 00, 6.0790535E 00,	DATA	24
35	29	6.0951828E 00, 6.1112849E 00, 6.1273612E 00, 6.1434126E 00,	DATA	25
36		DATA (RASUN (I), I = 73, 108) /		6
37	31	6.1594407E 00, 6.1754469E 00, 6.1914327E 00, 6.2073994E 00,	DATA	27
38	32	6.2233493E 00, 6.239283E 00, 6.2552046E 00, 6.2711139E 00,	DATA	28
39	33	3.8281628E-03, 1.9719598E-02, 3.9604665E-02, 5.1485086E-02,	DATA	29
40	34	6.7362388E-02, 8.3239099E-02, 9.9113703E-02, 1.1499068E-01,	DATA	30
41	35	1.3087038E-01, 1.4675415E-01, 1.6264334E-01, 1.7853939E-01,	DATA	31
42	36	1.9444341E-01, 2.1035663E-01, 2.2628025E-01, 2.4221550E-01,	DATA	32
43	37	2.5816343E-01, 2.7412503E-01, 2.9010131E-01, 3.0609298E-01,	DATA	33
44	38	3.2210129E-01, 3.3812736E-01, 3.5417237E-01, 3.7023747E-01,	DATA	34
45	39	3.663241E-01, 4.0243394E-01, 4.3856823E-01, 4.7472830E-01,	DATA	35
46		DATA (RASUN (I), I = 109, 144) /		6
47	41	4.5091609E-01, 4.6713231E-01, 4.8337840E-01, 4.9965563E-01,	DATA	37
48	42	5.1596504E-01, 5.3230765E-01, 5.4868449E-01, 5.6509647E-01,	DATA	38
49	43	5.8154441E-01, 5.9802912E-01, 6.1455133E-01, 6.3111188E-01,	DATA	39
50	44	6.4771122E-01, 6.6434985E-01, 6.8102819E-01, 6.9774667E-01,	DATA	40
51	45	7.1450529E-01, 7.3130401E-01, 7.4814273E-01, 7.6502106E-01,	DATA	41
52	46	7.8193916E-01, 7.9889702E-01, 8.1589472E-01, 8.3293221E-01,	DATA	42
53	47	8.5000993E-01, 8.6712808E-01, 8.8428690E-01, 9.0148654E-01,	DATA	43
54	48	9.1827279E-01, 9.3600851E-01, 9.5333078E-01, 9.7069376E-01,	DATA	44
55	49	9.8809721E-01, 1.0055409E 00, 1.0230243E 00, 1.0405471E 00,	DATA	45
56		DATA (RASUN (I), I = 145, 180) /		6
57	51	1.0581087E 00, 1.1757087E 00, 1.0933442E 00, 1.2110208E 00,	DATA	47
58	52	1.1287314E 00, 1.1464773E 00, 1.1642571E 00, 1.1820701E 00,	DATA	48
59	53	1.1999144E 00, 1.2177883E 00, 1.2356902E 00, 1.2536181E 00,	DATA	49
60	54	1.2715704E 00, 1.2895453E 00, 1.3075419E 00, 1.3255579E 00,	DATA	50
61	55	1.3435925E 00, 1.3616442E 00, 1.3797118E 00, 1.3977939E 00,	DATA	51
62	56	1.4158892E 00, 1.4339962E 00, 1.4521135E 00, 1.4702395E 00,	DATA	52
63	57	1.4883729E 00, 1.5065122E 00, 1.5246537E 00, 1.5428021E 00,	DATA	53
64	58	1.5609497E 00, 1.5790971E 00, 1.5972427E 00, 1.6153851E 00,	DATA	54
65	59	1.6335227E 00, 1.6516539E 00, 1.6697769E 00, 1.6878901E 00,	DATA	55
66		DATA (RASUN (I), I = 181, 216) /		6
67	61	1.7059914E 00, 1.7241784E 00, 1.7421492E 00, 1.7602014E 00,	DATA	57
68	62	1.7782332E 00, 1.7962427E 00, 1.8142282E 00, 1.8321879E 00,	DATA	58
69	63	1.8501208E 00, 1.8680294E 00, 1.8859007E 00, 1.9037454E 00,	DATA	59

70	64	1.9215584E 00,	1.9393387E 00,	1.9570831E 00,	1.9747969E 00,	DATA 60
71	65	1.9924731E 00,	2.0101130E 00,	2.0277158E 00,	2.0452809E 00,	DATA 61
72	66	2.0628076E 00,	2.0802956E 00,	2.0977443E 00,	2.1151935E 00,	DATA 62
73	67	2.1325227E 00,	2.1498516E 00,	2.1671397E 00,	2.1843868E 00,	DATA 63
74	68	2.2015920E 00,	2.2187546E 00,	2.2358739E 00,	2.2529493E 00,	DATA 64
75	69	2.2699803E 00,	2.2869666E 00,	2.3039078E 00,	2.3208036E 00,	DATA 65
76		DATA (RASUN I), I=217, 252, /				DATA 66
77	71	2.3376544E 00,	2.3544603E 00,	2.3712213E 00,	2.3879381E 00,	DATA 67
78	72	2.4046106E 00,	2.4212394E 00,	2.4378245E 00,	2.4543675E 00,	DATA 68
79	73	2.4708681E 00,	2.4873273E 00,	2.5037459E 00,	2.5201246E 00,	DATA 69
80	74	2.5364646E 00,	2.5527667E 00,	2.5690322E 00,	2.5852620E 00,	DATA 70
81	75	2.6014574E 00,	2.6176194E 00,	2.6337489E 00,	2.6498470E 00,	DATA 71
82	76	2.6659144E 00,	2.6819517E 00,	2.6979597E 00,	2.7139392E 00,	DATA 72
83	77	2.7298909E 00,	2.7458156E 00,	2.7617144E 00,	2.7775880E 00,	DATA 73
84	78	2.7934376E 00,	2.8092644E 00,	2.8250693E 00,	2.8408539E 00,	DATA 74
85	79	2.8566189E 00,	2.8723657E 00,	2.8880956E 00,	2.9038099E 00,	DATA 75
86		DATA (RASUN I), I=253, 288, /				DATA 76
87	81	2.9195101E 00,	2.9351977E 00,	2.9508741E 00,	2.9665409E 00,	DATA 77
88	82	2.9821999E 00,	2.9978528E 00,	3.0135015E 00,	3.0291477E 00,	DATA 78
89	83	3.0447931E 00,	3.0604395E 00,	3.0760883E 00,	3.0917414E 00,	DATA 79
90	84	3.1073997E 00,	3.1230648E 00,	3.1387378E 00,	3.1544202E 00,	DATA 80
91	85	3.1701132E 00,	3.1858182E 00,	3.2015363E 00,	3.2172689E 00,	DATA 81
92	86	3.2330173E 00,	3.2487828E 00,	3.2645666E 00,	3.2803700E 00,	DATA 82
93	87	3.2961943E 00,	3.3120408E 00,	3.3279109E 00,	3.3438060E 00,	DATA 83
94	88	3.3597276E 00,	3.3756770E 00,	3.3916559E 00,	3.4076657E 00,	DATA 84
95	89	3.4237083E 00,	3.4397854E 00,	3.4558988E 00,	3.4720500E 00,	DATA 85
96		DATA (RASUN I), I=289, 324, /				DATA 86
97	91	3.4882409E 00,	3.5044729E 00,	3.5207476E 00,	3.5370664E 00,	DATA 87
98	92	3.5534305E 00,	3.5698408E 00,	3.5862937E 00,	3.6028054E 00,	DATA 88
99	93	3.6193618E 00,	3.6359688E 00,	3.6526274E 00,	3.6693383E 00,	DATA 89
100	94	3.6861024E 00,	3.7029203E 00,	3.7197925E 00,	3.7367197E 00,	DATA 90
101	95	3.7537023E 00,	3.7707411E 00,	3.7878354E 00,	3.8049888E 00,	DATA 91
102	96	3.8221988E 00,	3.8394670E 00,	3.8567938E 00,	3.8741798E 00,	DATA 92
103	97	3.8916257E 00,	3.9091321E 00,	3.9266997E 00,	3.9443288E 00,	DATA 93
104	98	3.9620200E 00,	3.9797736E 00,	3.9975899E 00,	4.0154689E 00,	DATA 94
105	99	4.0334105E 00,	4.0514145E 00,	4.0694807E 00,	4.0876089E 00,	DATA 95
106		DATA (RASUN I), I=325, 360, /				DATA 96
107	101	4.1057983E 00,	4.1240485E 00,	4.1423585E 00,	4.1607276E 00,	DATA 97
108	102	4.1791545E 00,	4.1976380E 00,	4.2161768E 00,	4.2347695E 00,	DATA 98
109	103	4.2534147E 00,	4.2721108E 00,	4.2908561E 00,	4.3096493E 00,	DATA 99
110	104	4.3284885E 00,	4.3473721E 00,	4.3662934E 00,	4.3852658E 00,	DATA 100
111	105	4.4042727E 00,	4.4233176E 00,	4.4423987E 00,	4.4615142E 00,	DATA 101
112	106	4.4806624E 00,	4.4998416E 00,	4.5190499E 00,	4.5382856E 00,	DATA 102
113	107	4.5575462E 00,	4.5768299E 00,	4.5961343E 00,	4.6154578E 00,	DATA 103
114	108	4.6347976E 00,	4.6541515E 00,	4.6735168E 00,	4.6928909E 00,	DATA 104
115	109	4.7122711E 00,	4.7316545E 00,	4.7510384E 00,	4.7704199E 00,	DATA 105
116		DATA (RASUN I), I=361, 368, /				DATA 106
117	111	4.7897962E 00,	4.8091645E 00,	4.8285221E 00,	4.8478664E 00,	DATA 107
118	112	4.8671947E 00,	4.8865044E 00,	4.9057931E 00,	4.9250585E 00,	DATA 108
119		DATA (BCSUN I), I= 1, 36, /				DATA 108
120	121	-4.0333362E-01,	-4.0200667E-01,	-4.0054577E-01,	-3.9895162E-01,	DATA 109
121	122	-3.9722508E-01,	-3.9536703E-01,	-3.9337851E-01,	-3.9126045E-01,	DATA 110
122	123	-3.8901394E-01,	-3.8664018E-01,	-3.8414029E-01,	-3.8151560E-01,	DATA 111
123	124	-3.7876736E-01,	-3.7589693E-01,	-3.7290578E-01,	-3.6979540E-01,	DATA 112
124	125	-3.6656722E-01,	-3.6322275E-01,	-3.5976345E-01,	-3.5619085E-01,	DATA 113
125	126	-3.5250639E-01,	-3.4871168E-01,	-3.4480816E-01,	-3.4079745E-01,	DATA 114
126	127	-3.3668121E-01,	-3.3246120E-01,	-3.2813921E-01,	-3.2371707E-01,	DATA 115
127	128	-3.1919667E-01,	-3.1457994E-01,	-3.0986886E-01,	-3.0506535E-01,	DATA 116
128	129	-3.0017147E-01,	-2.9518926E-01,	-2.9012079E-01,	-2.8496807E-01,	DATA 117
129		DATA (BCSUN I), I= 37, 72, /				DATA 118
130	131	-2.7973324E-01,	-2.7441836E-01,	-2.6902552E-01,	-2.6355680E-01,	DATA 119
131	132	-2.5801429E-01,	-2.5240004E-01,	-2.46671614E-01,	-2.4096479E-01,	DATA 120
132	133	-2.3514787E-01,	-2.2926741E-01,	-2.2332537E-01,	-2.1732368E-01,	DATA 121
133	134	-2.1126416E-01,	-2.0514858E-01,	-1.9897909E-01,	-1.9279707E-01,	DATA 122
134	135	-1.8648465E-01,	-1.8016369E-01,	-1.7379609E-01,	-1.6738379E-01,	DATA 123
135	136	-1.6092879E-01,	-1.5443305E-01,	-1.4789857E-01,	-1.4132734E-01,	DATA 124
136	137	-1.3472140E-01,	-1.2808275E-01,	-1.2141343E-01,	-1.1471540E-01,	DATA 125
137	138	-1.0799071E-01,	-1.0124138E-01,	-9.4469375E-02,	-8.7676697E-02,	DATA 126
138	139	-8.0865259E-02,	-7.4037005E-02,	-6.7193867E-02,	-6.0337841E-02,	DATA 127
139		DATA (BCSUN I), I= 73, 108, /				DATA 128
140	141	-5.3470694E-02,	-4.6594233E-02,	-3.9710222E-02,	-3.2820411E-02,	DATA 129
141	142	-2.5926429E-02,	-1.9029902E-02,	-1.2132436E-02,	-5.2359946E-03,	DATA 130
142	143	1.6589940E-03,	8.5495611E-03,	1.5434565E-02,	2.2312314E-02,	DATA 131



143	144	2.9181074E=02,	3.6039120E=02,	4.2884709E=02,	4.9716109E=02,	DATA 132
144	145	5.6531528E=02,	6.3329183E=02,	7.0107286E=02,	7.6864121E=02,	DATA 133
145	146	8.3997824E=02,	9.0306607E=02,	9.6998701E=02,	1.0364234E=01,	DATA 134
146	147	1.1026577E=01,	1.1685723E=01,	1.2341498E=01,	1.2993716E=01,	DATA 135
147	148	1.3642217E=01,	1.4286835E=01,	1.4927406E=01,	1.5563770E=01,	DATA 136
148	149	1.6195775E=01,	1.6823271E=01,	1.7446109E=01,	1.8064144E=01/	DATA 137
149		DATA (BCSUN (I), I=109,144)/				DATA 138
150	151	1.8677221E=01,	1.9285192E=01,	1.9887900E=01,	2.0485195E=01,	DATA 139
151	152	2.1076920E=01,	2.1662915E=01,	2.2243019E=01,	2.2817075E=01,	DATA 140
152	153	2.3384915E=01,	2.3946382E=01,	2.4501307E=01,	2.5049531E=01,	DATA 141
153	154	2.5390890E=01,	2.6125222E=01,	2.6652362E=01,	2.7172163E=01,	DATA 142
154	155	2.7684459E=01,	2.8189092E=01,	2.8685908E=01,	2.9174739E=01,	DATA 143
155	156	2.9655444E=01,	3.0127871E=01,	3.0591872E=01,	3.1047308E=01,	DATA 144
156	157	3.1494040E=01,	3.1931942E=01,	3.2360882E=01,	3.2780734E=01,	DATA 145
157	158	3.3191371E=01,	3.3592670E=01,	3.3984500E=01,	3.4366741E=01,	DATA 146
158	159	3.4739266E=01,	3.5101949E=01,	3.5454668E=01,	3.5797302E=01/	DATA 147
159		DATA (BCSUN (I), I=145,180)/				DATA 148
160	161	3.6129728E=01,	3.6451827E=01,	3.6763481E=01,	3.7064575E=01,	DATA 149
161	162	3.7355002E=01,	3.7634654E=01,	3.7903433E=01,	3.8161242E=01,	DATA 150
162	163	3.8407991E=01,	3.8643595E=01,	3.8867962E=01,	3.9081011E=01,	DATA 151
163	164	3.9282664E=01,	3.9472843E=01,	3.9651493E=01,	3.9818515E=01,	DATA 152
164	165	3.9973886E=01,	4.0117546E=01,	4.0249449E=01,	4.0369553E=01,	DATA 153
165	166	4.0477822E=01,	4.0574221E=01,	4.0658718E=01,	4.0731283E=01,	DATA 154
166	167	4.0791890E=01,	4.0840517E=01,	4.0877147E=01,	4.0901762E=01,	DATA 155
167	168	4.0914348E=01,	4.0914902E=01,	4.0903415E=01,	4.087963E=01,	DATA 156
168	169	4.0844345E=01,	4.0796784E=01,	4.0737243E=01,	4.0663745E=01/	DATA 157
169		DATA (BCSUN (I), I=181,216)/				DATA 158
170	171	4.0582337E=01,	4.0487058E=01,	4.0379951E=01,	4.0261097E=01,	DATA 159
171	172	4.0130518E=01,	3.9988277E=01,	3.9834439E=01,	3.9669072E=01,	DATA 160
172	173	3.9492246E=01,	3.9304033E=01,	3.9104512E=01,	3.8893773E=01,	DATA 161
173	174	3.8671891E=01,	3.8438959E=01,	3.8195064E=01,	3.7940297E=01,	DATA 162
174	175	3.7674748E=01,	3.7398512E=01,	3.7111685E=01,	3.6814364E=01,	DATA 163
175	176	3.6506647E=01,	3.6188633E=01,	3.5860432E=01,	3.5522148E=01,	DATA 164
176	177	3.5173896E=01,	3.4815797E=01,	3.4447977E=01,	3.4070561E=01,	DATA 165
177	178	3.3683694E=01,	3.3287523E=01,	3.2882187E=01,	3.2467835E=01,	DATA 166
178	179	3.2044606E=01,	3.1612650E=01,	3.1172109E=01,	3.0723137E=01/	DATA 167
179		DATA (BCSUN (I), I=217,252)/				DATA 168
180	181	3.0265873E=01,	2.9800468E=01,	2.9327063E=01,	2.8845813E=01,	DATA 169
181	182	2.8356861E=01,	2.7860355E=01,	2.7356439E=01,	2.6845254E=01,	DATA 170
182	183	2.6326946E=01,	2.5801655E=01,	2.5269519E=01,	2.4730681E=01,	DATA 171
183	184	2.4185277E=01,	2.3633447E=01,	2.3075329E=01,	2.2511057E=01,	DATA 172
184	185	2.1940782E=01,	2.1364656E=01,	2.0740282E=01,	2.0195449E=01,	DATA 173
185	186	1.9602692E=01,	1.9004724E=01,	1.8401716E=01,	1.7793826E=01,	DATA 174
186	187	1.7181227E=01,	1.6564086E=01,	1.5942566E=01,	1.5316842E=01,	DATA 175
187	188	1.4687067E=01,	1.4053406E=01,	1.3411019E=01,	1.275071E=01,	DATA 176
188	189	1.2130718E=01,	1.1483119E=01,	1.0832429E=01,	1.0178803E=01/	DATA 177
189		DATA (BCSUN (I), I=253,288)/				DATA 178
190	191	9.5223930E=02,	8.8633483E=02,	8.2018186E=02,	7.5379536E=02,	DATA 179
191	192	6.8718951E=02,	6.2037864E=02,	5.5337721E=02,	4.8619959E=02,	DATA 180
192	193	4.1886110E=02,	3.5137713E=02,	2.8376366E=02,	2.1603623E=02,	DATA 181
193	194	1.4821286E=02,	8.0310928E=03,	1.2347971E=03,	5.5658821E=03,	DATA 182
194	195	-1.2369150E=02,	-1.9173238E=02,	-2.5976379E=02,	-3.2776758E=02,	DATA 183
195	196	-3.9572665E=02,	-4.6362336E=02,	-5.3143993E=02,	-5.9915844E=02,	DATA 184
196	197	-6.6676134E=02,	-7.3423178E=02,	-8.0155170E=02,	-8.6870384E=02,	DATA 185
197	198	-9.3567109E=02,	-1.0024363E=01,	-1.0689826E=01,	-1.1352923E=01,	DATA 186
198	199	-1.2013497E=01,	-1.2671380E=01,	-1.3326409E=01,	-1.3978414E=01/	DATA 187
199		DATA (BCSUN (I), I=289,324)/				DATA 188
200	201	-1.4627226E=01,	-1.5272836E=01,	-1.5914555E=01,	-1.6552714E=01,	DATA 189
201	202	-1.7186941E=01,	-1.7817042E=01,	-1.8442814E=01,	-1.9064069E=01,	DATA 190
202	203	-1.9680602E=01,	-2.0292211E=01,	-2.0898703E=01,	-2.1499873E=01,	DATA 191
203	204	-2.2095528E=01,	-2.2685460E=01,	-2.3269474E=01,	-2.3847364E=01,	DATA 192
204	205	-2.4418933E=01,	-2.4983983E=01,	-2.5542314E=01,	-2.6093728E=01,	DATA 193
205	206	-2.6638025E=01,	-2.7175017E=01,	-2.7704503E=01,	-2.8226293E=01,	DATA 194
206	207	-2.8740206E=01,	-2.9246033E=01,	-2.9743652E=01,	-3.0232820E=01,	DATA 195
207	208	-3.0713373E=01,	-3.1185128E=01,	-3.1647892E=01,	-3.2101478E=01,	DATA 196
208	209	-3.2545690E=01,	-3.2980328E=01,	-3.3405201E=01,	-3.3820120E=01/	DATA 197
209		DATA (BCSUN (I), I=325,360)/				DATA 198
210	211	-3.4224898E=01,	-3.4619351E=01,	-3.5003300E=01,	-3.5376570E=01,	DATA 199
211	212	-3.5738986E=01,	-3.6090380E=01,	-3.6443058E=01,	-3.6759432E=01,	DATA 200
212	213	-3.7076767E=01,	-3.7382432E=01,	-3.7676729E=01,	-3.7958157E=01,	DATA 201
213	214	-3.8227930E=01,	-3.8485461E=01,	-3.8730621E=01,	-3.8963286E=01,	DATA 202
214	215	-3.9183340E=01,	-3.9390672E=01,	-3.9585186E=01,	-3.9766780E=01,	DATA 203
215	216	-3.9935360E=01,	-4.0090843E=01,	-4.0233134E=01,	-4.0362152E=01,	DATA 204



216	217	=4.0477815E-01,	=4.0580045E-01,	=4.0668782E-01,	=4.0743958E-01,	DATA 205
217	218	=4.0805532E-01,	=4.0853464E-01,	=4.0887726E-01,	=4.0908295E-01,	DATA 206
218	219	=4.0915158E-01,	=4.0908312E-01,	=4.0887754E-01,	=4.0853491E-01/	DATA 207
219		DATA (RSUN (I), I=361, 368)/				DATA 208 6
220	221	=4.0805545E-01,	=4.0743933E-01,	=4.0668689E-01,	=4.0579846E-01,	DATA 209
221	222	=4.0477457E-01,	=4.0361568E-01,	=4.0232236E-01,	=4.0089529E-01/	DATA 210
222		DATA (RSUN (I), I=1, 36)/				DATA 210 6
223	231	9.8393993E-01,	9.8393165E-01,	9.8392755E-01,	9.8392748E-01,	DATA 211
224	232	9.8393138E-01,	9.8393920E-01,	9.8395090E-01,	9.8396640E-01,	DATA 212
225	233	9.8398588E-01,	9.8400944E-01,	9.8403728E-01,	9.8406943E-01,	DATA 213
226	234	9.8410630E-01,	9.8414821E-01,	9.8419546E-01,	9.8424837E-01,	DATA 214
227	235	9.8430716E-01,	9.8437207E-01,	9.8444331E-01,	9.8452122E-01,	DATA 215
228	236	9.8460594E-01,	9.8469612E-01,	9.8479283E-01,	9.8489546E-01,	DATA 216
229	237	9.8500376E-01,	9.8511744E-01,	9.8523617E-01,	9.8535961E-01,	DATA 217
230	238	9.8548753E-01,	9.8561968E-01,	9.8575578E-01,	9.8589561E-01,	DATA 218
231	239	9.8603895E-01,	9.8618562E-01,	9.8633544E-01,	9.8648823E-01/	DATA 219
232		DATA (RSUN (I), I=37, 72)/				DATA 220 6
233	241	9.8664402E-01,	9.8680282E-01,	9.8696467E-01,	9.8712949E-01,	DATA 221
234	242	9.8729765E-01,	9.8746937E-01,	9.8764489E-01,	9.8782448E-01,	DATA 222
235	243	9.8800837E-01,	9.8819683E-01,	9.8839006E-01,	9.8858842E-01,	DATA 223
236	244	9.8879174E-01,	9.8900000E-01,	9.8921310E-01,	9.8943101E-01,	DATA 224
237	245	9.8965342E-01,	9.8988006E-01,	9.9011064E-01,	9.9034484E-01,	DATA 225
238	246	9.9058235E-01,	9.9082291E-01,	9.9106617E-01,	9.9131186E-01,	DATA 226
239	247	9.9155965E-01,	9.9180924E-01,	9.9206039E-01,	9.9231277E-01,	DATA 227
240	248	9.9256629E-01,	9.9282085E-01,	9.9307634E-01,	9.9333255E-01,	DATA 228
241	249	9.9358977E-01,	9.9384820E-01,	9.9410799E-01,	9.9436934E-01/	DATA 229
242		DATA (RSUN (I), I=73, 108)/				DATA 230 6
243	251	9.9463250E-01,	9.9489775E-01,	9.9516927E-01,	9.9543545E-01,	DATA 231
244	252	9.9570820E-01,	9.9598359E-01,	9.9626159E-01,	9.9654227E-01,	DATA 232
245	253	9.9682540E-01,	9.9711075E-01,	9.9739811E-01,	9.9768723E-01,	DATA 233
246	254	9.9797781E-01,	9.9826956E-01,	9.9856217E-01,	9.9885535E-01,	DATA 234
247	255	9.9914873E-01,	9.9944195E-01,	9.9973471E-01,	1.0000267E 00,	DATA 235
248	256	1.0003176E 00,	1.0006072E 00,	1.0008953E 00,	1.0011815E 00,	DATA 236
249	257	1.0014662E 00,	1.0017493E 00,	1.0020310E 00,	1.0023114E 00,	DATA 237
250	258	1.0025908E 00,	1.0028695E 00,	1.0031477E 00,	1.0034257E 00,	DATA 238
251	259	1.0037037E 00,	1.0039816E 00,	1.0042596E 00,	1.0045377E 00/	DATA 239
252		DATA (RSUN (I), I=109, 144)/				DATA 240 6
253	261	1.0048160E 00,	1.0050941E 00,	1.0053721E 00,	1.0056498E 00,	DATA 241
254	262	1.0059269E 00,	1.0062032E 00,	1.0064784E 00,	1.0067523E 00,	DATA 242
255	263	1.0070245E 00,	1.0072947E 00,	1.0075625E 00,	1.0078277E 00,	DATA 243
256	264	1.0080898E 00,	1.0083486E 00,	1.0086038E 00,	1.0088548E 00,	DATA 244
257	265	1.0091019E 00,	1.0093451E 00,	1.0095844E 00,	1.0098198E 00,	DATA 245
258	266	1.0100516E 00,	1.0102801E 00,	1.0105055E 00,	1.0107203E 00,	DATA 246
259	267	1.0109486E 00,	1.0111664E 00,	1.0113820E 00,	1.0115956E 00,	DATA 247
260	268	1.0118071E 00,	1.0120166E 00,	1.0122239E 00,	1.0124291E 00,	DATA 248
261	269	1.0126320E 00,	1.0128325E 00,	1.0130304E 00,	1.0132255E 00/	DATA 249
262		DATA (RSUN (I), I=145, 180)/				DATA 250 6
263	271	1.0134174E 00,	1.0136060E 00,	1.0137909E 00,	1.0139719E 00,	DATA 251
264	272	1.0141485E 00,	1.0143204E 00,	1.0144873E 00,	1.0146487E 00,	DATA 252
265	273	1.0148045E 00,	1.0149549E 00,	1.0150995E 00,	1.0152384E 00,	DATA 253
266	274	1.0153719E 00,	1.0155002E 00,	1.0156236E 00,	1.0157425E 00,	DATA 254
267	275	1.0158571E 00,	1.0159676E 00,	1.0160742E 00,	1.0161772E 00,	DATA 255
268	276	1.0162766E 00,	1.0163727E 00,	1.0164654E 00,	1.0165547E 00,	DATA 256
269	277	1.0166408E 00,	1.0167235E 00,	1.0168027E 00,	1.0168783E 00,	DATA 257
270	278	1.0169502E 00,	1.0170182E 00,	1.0170819E 00,	1.0171413E 00,	DATA 258
271	279	1.0171959E 00,	1.0172453E 00,	1.0172893E 00,	1.0173274E 00/	DATA 259
272		DATA (RSUN (I), I=181, 216)/				DATA 260 6
273	281	1.0173595E 00,	1.0173855E 00,	1.0174052E 00,	1.0174182E 00,	DATA 261
274	282	1.0174250E 00,	1.0174259E 00,	1.0174209E 00,	1.0174105E 00,	DATA 262
275	283	1.0173949E 00,	1.0173744E 00,	1.0173493E 00,	1.0173198E 00,	DATA 263
276	284	1.0172863E 00,	1.0172488E 00,	1.0172075E 00,	1.0171626E 00,	DATA 264
277	285	1.0171142E 00,	1.0170623E 00,	1.0170070E 00,	1.0169483E 00,	DATA 265
278	286	1.0168860E 00,	1.0168201E 00,	1.0167504E 00,	1.0166768E 00,	DATA 266
279	287	1.0165989E 00,	1.0165165E 00,	1.0164293E 00,	1.0163368E 00,	DATA 267
280	288	1.0162390E 00,	1.0161356E 00,	1.0160263E 00,	1.0159109E 00,	DATA 268
281	289	1.0157896E 00,	1.0156625E 00,	1.0155299E 00,	1.0153919E 00/	DATA 269
282		DATA (RSUN (I), I=217, 252)/				DATA 270 6
283	291	1.0152488E 00,	1.0151010E 00,	1.0149488E 00,	1.0147925E 00,	DATA 271
284	292	1.0146325E 00,	1.0144688E 00,	1.0143019E 00,	1.0141319E 00,	DATA 272
285	293	1.0139590E 00,	1.0137834E 00,	1.0136053E 00,	1.0134247E 00,	DATA 273
286	294	1.0132418E 00,	1.0130563E 00,	1.0128684E 00,	1.0126780E 00,	DATA 274
287	295	1.0124848E 00,	1.0122886E 00,	1.0120891E 00,	1.0118861E 00,	DATA 275
288	296	1.0116792E 00,	1.0114684E 00,	1.0112533E 00,	1.0110335E 00,	DATA 276

289	297	1.0108092E 00,	1.0105806E 00,	1.01033477E 00,	1.0101105E 00,	DATA 277
290	298	1.0098694E 00,	1.0096247E 00,	1.0093767E 00,	1.0091257E 00,	DATA 278
291	299	1.0088721E 00,	1.0086160E 00,	1.0083580E 00,	1.0080981E 00,	DATA 279
292		DATA (RSUN (I), I=253, 288)/				DATA 280
293	301	1.0078368E 00,	1.0075743E 00,	1.0073108E 00,	1.0070466E 00,	DATA 281
294	302	1.0067817E 00,	1.0065164E 00,	1.0062503E 00,	1.0059844E 00,	DATA 282
295	303	1.0057176E 00,	1.0054501E 00,	1.0051816E 00,	1.0049120E 00,	DATA 283
296	304	1.0046410E 00,	1.0043683E 00,	1.0040938E 00,	1.0038169E 00,	DATA 284
297	305	1.0035379E 00,	1.0032566E 00,	1.0029732E 00,	1.0026875E 00,	DATA 285
298	306	1.0023998E 00,	1.0021104E 00,	1.0018195E 00,	1.0015274E 00,	DATA 286
299	307	1.0012345E 00,	1.0009409E 00,	1.0006470E 00,	1.0003532E 00,	DATA 287
300	308	1.0000597E 00,	9.9976698E-01,	9.9947527E-01,	9.9918488E-01,	DATA 288
301	309	9.9889604E-01,	9.9860895E-01,	9.9832381E-01,	9.9804087E-01,	DATA 289
302		DATA (RSUN (I), I=289, 324)/				DATA 290
303	311	9.9775995E-01,	9.9748093E-01,	9.9720366E-01,	9.9692807E-01,	DATA 291
304	312	9.9665385E-01,	9.9638075E-01,	9.9610849E-01,	9.9583677E-01,	DATA 292
305	313	9.9556555E-01,	9.9529471E-01,	9.9502421E-01,	9.9475390E-01,	DATA 293
306	314	9.9448397E-01,	9.9421456E-01,	9.9394584E-01,	9.9367797E-01,	DATA 294
307	315	9.9341123E-01,	9.9314588E-01,	9.9288217E-01,	9.9262041E-01,	DATA 295
308	316	9.9236095E-01,	9.9210411E-01,	9.9185023E-01,	9.9159960E-01,	DATA 296
309	317	9.9135257E-01,	9.9110944E-01,	9.9087047E-01,	9.9063607E-01,	DATA 297
310	318	9.9040610E-01,	9.9018052E-01,	9.8995929E-01,	9.8974243E-01,	DATA 298
311	319	9.8952959E-01,	9.8932052E-01,	9.8911493E-01,	9.8891246E-01,	DATA 299
312		DATA (RSUN (I), I=325, 360)/				DATA 300
313	321	9.8871303E-01,	9.8851644E-01,	9.8832256E-01,	9.8813118E-01,	DATA 301
314	322	9.8794237E-01,	9.8775616E-01,	9.8757259E-01,	9.8739172E-01,	DATA 302
315	323	9.8721373E-01,	9.8703878E-01,	9.8686709E-01,	9.8669884E-01,	DATA 303
316	324	9.8653433E-01,	9.8637386E-01,	9.8621771E-01,	9.8606608E-01,	DATA 304
317	325	9.8591944E-01,	9.8577810E-01,	9.8564237E-01,	9.8551270E-01,	DATA 305
318	326	9.8538905E-01,	9.8527152E-01,	9.8516010E-01,	9.8505504E-01,	DATA 306
319	327	9.8495586E-01,	9.8486236E-01,	9.8477422E-01,	9.8469105E-01,	DATA 307
320	328	9.8461272E-01,	9.8453898E-01,	9.8446934E-01,	9.8440415E-01,	DATA 308
321	329	9.8434277E-01,	9.8428529E-01,	9.8423166E-01,	9.8418178E-01,	DATA 309
322		DATA (RSUN (I), I=361, 368)/				DATA 310
323	331	9.8413575E-01,	9.8409360E-01,	9.8405541E-01,	9.8402127E-01,	DATA 311
324	332	9.8399139E-01,	9.8396596E-01,	9.8394520E-01,	9.8392923E-01,	DATA 312
325		DATA (RAMOON(I), I= 1, 36)/				DATA 312
326	341	3.9262257E 00,	4.1456257E 00,	4.3716735E 00,	4.6017005E 00,	DATA 313
327	342	4.8320243E 00,	5.0590464E 00,	5.2802947E 00,	5.4950165E 00,	DATA 314
328	343	5.7042153E 00,	5.9103500E 00,	6.1169520E 00,	6.3094914E 02,	DATA 315
329	344	2.6577257E-01,	5.0020875E-01,	7.5153591E-01,	1.0199767E 00,	DATA 316
330	345	1.3012705E 00,	1.5867303E 00,	1.8660258E 00,	2.1311788E 00,	DATA 317
331	346	2.3788143E 00,	2.6097481E 00,	2.8273089E 00,	3.0358215E 00,	DATA 318
332	347	3.2396933E 00,	3.4429523E 00,	3.6489778E 00,	3.8602468E 00,	DATA 319
333	348	4.0780343E 00,	4.3021402E 00,	4.5308340E 00,	4.7612216E 00,	DATA 320
334	349	4.9900503E 00,	5.2146716E 00,	5.4337639E 00,	5.6475902E 00,	DATA 321
335		DATA (RAMOON(I), I= 37, 72)/				DATA 322
336	351	5.8578619E 00,	6.0674140E 00,	6.2798446E 00,	6.494985E-01,	DATA 323
337	352	4.4595623E-01,	6.8959696E-01,	9.4766763E-01,	1.2176310E 00,	DATA 324
338	353	1.4933431E 00,	1.7666221E 00,	2.0301391E 00,	2.2797165E 00,	DATA 325
339	354	2.5147694E 00,	2.7373483E 00,	2.9508713E 00,	3.1591684E 00,	DATA 326
340	355	3.3659052E 00,	3.5742357E 00,	3.7865318E 00,	4.0041212E 00,	DATA 327
341	356	4.2270713E 00,	4.4541460E 00,	4.6830826E 00,	4.9112150E 00,	DATA 328
342	357	5.1362575E 00,	5.3569531E 00,	5.5733826E 00,	5.7869359E 00,	DATA 329
343	358	6.0000789E 00,	6.2160344E 00,	6.43221633E-01,	6.644714E-01,	DATA 330
344	359	6.3205145E-01,	6.551482E-01,	6.782841E 00,	7.014296523E 00,	DATA 331
345		DATA (RAMOON(I), I= 73, 108)/				DATA 332
346	361	1.6992279E 00,	1.9594557E 00,	2.2065906E 00,	2.4401033E 00,	DATA 333
347	362	2.6418806E 00,	2.8751182E 00,	3.0834467E 00,	3.2903734E 00,	DATA 334
348	363	3.4989215E 00,	3.7113434E 00,	3.9288518E 00,	4.1514152E 00,	DATA 335
349	364	4.377431E 00,	4.6055918E 00,	4.8323915E 00,	5.0560015E 00,	DATA 336
350	365	5.2753134E 00,	5.4905267E 00,	5.7031131E 00,	5.9156160E 00,	DATA 337
351	366	6.1313500E 00,	7.0895639E-02,	3.0432923E-01,	5.5128188E-01,	DATA 338
352	367	8.1245285E-01,	1.0851635E 00,	1.8630673E 00,	1.6377763E 00,	DATA 339
353	368	1.9018475E 00,	2.1311216E 00,	2.3831294E 00,	2.6060769E 00,	DATA 340
354	369	2.8175451E 00,	3.0235254E 00,	3.82278455E 00,	3.4338204E 00,	DATA 341
355		DATA (RAMOON(I), I=109, 144)/				DATA 342
356	371	3.6439674E 00,	3.8597137E 00,	4.0811378E 00,	4.3068929E 00,	DATA 343
357	372	4.5344892E 00,	4.7609728E 00,	4.9837940E 00,	5.2015204E 00,	DATA 344
358	373	5.4141673E 00,	5.6231602E 00,	5.8311027E 00,	6.0414991E 00,	DATA 345
359	374	6.2984734E 00,	2.0320044E-01,	4.5594535E-01,	7.8569841E-01,	DATA 346
360	375	9.8119828E-01,	1.2653367E 00,	1.5520923E 00,	1.8279834E 00,	DATA 347
361	376	2.0877281E 00,	2.3295512E 00,	2.5553615E 00,	2.7690249E 00,	DATA 348



362	377	2,9750357E 00,	3,1777681E 00,	3,8810854E 00,	3,5880678E 00,	DATA 349
363	378	3,8007246E 00,	4,0196828E 00,	4,2439891E 00,	4,4712421E 00,	DATA 350
364	379	4,6981968E 00,	4,9217089E 00,	5,1396382E 00,	5,3513637E 00,	DATA 351
365		DATA (RAMOON(I),I=145,180)/				DATA 352
366	381	5,5578389E 00,	5,7613614E 00,	5,9652752E 00,	6,1737020E 00,	DATA 353
367	382	1,0809371E-01,	3,3952975E-01,	5,8868911E-01,	8,5690016E-01,	DATA 354
368	383	1,1412590E 00,	1,4332261E 00,	1,7214760E 00,	1,9961264E 00,	DATA 355
369	384	2,2321762E 00,	2,4896467E 00,	2,7117722E 00,	2,9231358E 00,	DATA 356
370	385	3,1285014E 00,	3,3322294E 00,	3,5379620E 00,	3,7483854E 00,	DATA 357
371	386	3,9647752E 00,	4,1870223E 00,	4,4132908E 00,	4,6409615E 00,	DATA 358
372	387	4,8654510E 00,	5,0852039E 00,	5,2984215E 00,	5,5053104E 00,	DATA 359
373	388	5,7875413E 00,	5,9079482E 00,	6,1102397E 00,	6,3277491E-02,	DATA 360
374	389	2,5303488E-01,	4,8993762E-01,	7,4349377E-01,	1,0158854E 00,	DATA 361
375		DATA (RAMOON(I),I=181,216)/				DATA 362
376	391	1,3022128E 00,	1,5931698E 00,	1,8775871E 00,	2,1471343E 00,	DATA 363
377	392	2,3985570E 00,	2,6330232E 00,	2,8542118E 00,	3,0668668E 00,	DATA 364
378	393	3,2749461E 00,	3,4829349E 00,	3,6937405E 00,	3,9093107E 00,	DATA 365
379	394	4,1301816E 00,	4,3553419E 00,	4,5824339E 00,	4,8083831E 00,	DATA 366
380	395	5,0302994E 00,	5,2462902E 00,	5,4558918E 00,	5,6600848E 00,	DATA 367
381	396	5,8610617E 00,	6,0619378E 00,	6,2664948E 00,	1,9574968E-01,	DATA 368
382	397	4,2031804E-01,	6,6058353E-01,	9,1820061E-01,	1,1913895E 00,	DATA 369
383	398	1,4739403E 00,	1,7567654E 00,	2,0309078E 00,	2,2908099E 00,	DATA 370
384	399	2,5351883E 00,	2,7659905E 00,	2,9868270E 00,	3,2017680E 00,	DATA 371
385		DATA (RAMOON(I),I=217,252)/				DATA 372
386	401	3,4146269E 00,	3,6283407E 00,	3,8456652E 00,	4,0669280E 00,	DATA 373
387	402	4,2918797E 00,	4,5188161E 00,	4,7452332E 00,	4,9685800E 00,	DATA 374
388	403	5,1868986E 00,	5,3995087E 00,	5,6069363E 00,	5,8108784E 00,	DATA 375
389	404	6,0139359E 00,	6,2193588E 00,	1,4760300E-01,	3,6873097E-01,	DATA 376
390	405	6,0273313E-01,	8,5135783E-01,	1,1137827E 00,	1,3858489E 00,	DATA 377
391	406	1,6606207E 00,	1,9305508E 00,	2,1900524E 00,	2,4368402E 00,	DATA 378
392	407	2,6716437E 00,	2,8970925E 00,	3,1166059E 00,	3,3336022E 00,	DATA 379
393	408	3,5809856E 00,	3,7707900E 00,	3,9939199E 00,	4,2200286E 00,	DATA 380
394	409	4,4476367E 00,	4,6745537E 00,	4,8985248E 00,	5,1178849E 00,	DATA 381
395		DATA (RAMOON(I),I=253,288)/				DATA 382
396	411	5,3319939E 00,	5,5413706E 00,	5,7475906E 00,	5,9530729E 00,	DATA 383
397	412	6,1808404E 00,	7,1074832E-02,	3,1330802E-01,	5,4772394E-01,	DATA 384
398	413	7,9521190E-01,	1,0549029E 00,	1,8229000E 00,	1,5929257E 00,	DATA 385
399	414	1,8582610E 00,	2,1139410E 00,	2,3579170E 00,	2,5908583E 00,	DATA 386
400	415	2,8152187E 00,	3,0342548E 00,	3,2512814E 00,	3,4691498E 00,	DATA 387
401	416	3,6898529E 00,	3,9142218E 00,	4,1417732E 00,	4,3708302E 00,	DATA 388
402	417	4,5989881E 00,	4,8238248E 00,	5,0436009E 00,	5,2577002E 00,	DATA 389
403	418	5,4667372E 00,	5,6724204E 00,	5,8773187E 00,	6,0846222E 00,	DATA 390
404	419	1,4709324E-02,	2,3755080E-01,	4,7302554E-01,	7,2274096E-01,	DATA 391
405		DATA (RAMOON(I),I=289,324)/				DATA 392
406	421	9,8570479E-01,	1,2575892E 00,	1,5313502E 00,	1,7994398E 00,	DATA 393
407	422	2,0363687E 00,	2,2999993E 00,	2,5312268E 00,	2,7528693E 00,	DATA 394
408	423	2,9685805E 00,	3,1820787E 00,	3,3966302E 00,	3,6146464E 00,	DATA 395
409	424	3,8373259E 00,	4,0643954E 00,	4,2941179E 00,	4,5237171E 00,	DATA 396
410	425	4,7501780E 00,	4,9711309E 00,	5,1854634E 00,	5,3935054E 00,	DATA 397
411	426	5,5968820E 00,	5,7982335E 00,	6,0009466E 00,	6,2089280E 00,	DATA 398
412	427	1,4312887E-01,	3,7397303E-01,	6,2106165E-01,	8,8483180E-01,	DATA 399
413	428	1,1618112E 00,	1,4444738E 00,	1,7233703E 00,	1,9906342E 00,	DATA 400
414	429	2,2423790E 00,	2,4787632E 00,	2,7026306E 00,	2,9180461E 00,	DATA 401
415		DATA (RAMOON(I),I=325,360)/				DATA 402
416	431	3,1292897E 00,	3,3402602E 00,	3,5540744E 00,	3,7727039E 00,	DATA 403
417	432	3,9966386E 00,	4,2247159E 00,	4,4543301E 00,	4,6821325E 00,	DATA 404
418	433	4,9650192E 00,	5,1209973E 00,	5,2960777E 00,	5,5318946E 00,	DATA 405
419	434	5,7301272E 00,	5,9274886E 00,	6,1278348E 00,	5,2317245E-02,	DATA 406
420	435	2,7185243E-01,	5,0743400E-01,	7,8173041E-01,	1,8341788E 00,	DATA 407
421	436	1,3195081E 00,	1,6082189E 00,	1,8898423E 00,	2,1569484E 00,	DATA 408
422	437	2,4069645E 00,	2,6413696E 00,	2,8638859E 00,	3,0790559E 00,	DATA 409
423	438	3,2910582E 00,	3,5037446E 00,	3,7197609E 00,	3,9404729E 00,	DATA 410
424	439	4,1656665E 00,	4,3935522E 00,	4,6212032E 00,	4,8453966E 00,	DATA 411
425		DATA (RAMOON(I),I=361,368)/				DATA 412
426	441	5,0635530E 00,	5,2743903E 00,	5,4781197E 00,	5,6762863E 00,	DATA 413
427	442	5,8714746E 00,	6,0670382E 00,	6,2669036E 00,	1,9220380E-01,	DATA 414
428		DATA (RAMOON(I),I=369,369)/				DATA 414
429	451	-3,7898502E-01,	-4,1903623E-01,	-4,4071419E-01,	-4,4239708E-01,	DATA 415
430	452	-4,2348881E-01,	-3,8466371E-01,	-3,2778018E-01,	-2,5557062E-01,	DATA 416
431	453	-1,7127786E-01,	-7,8397205E-02,	-1,9400469E-02,	-1,1816310E-01,	DATA 417
432	454	2,1341612E-01,	2,9988632E-01,	3,7139361E-01,	4,2124538E-01,	DATA 418
433	455	4,4345056E-01,	4,3458230E-01,	3,9526432E-01,	3,3011600E-01,	DATA 419
434	456	2,4617799E-01,	1,5097797E-01,	5,1223697E-02,	-4,7681224E-02,	DATA 420

435	457	=1.4156317E-01,	=2.2715631E-01,	=3.0174243E-01,	=3.6287296E-01,	DATA 421
436	458	=4.0824197E-01,	=4.3574570E-01,	=4.6371718E-01,	=4.8125242E-01,	DATA 422
437	459	=3.9848502E-01,	=3.4668137E-01,	=2.7813100E-01,	=1.9591508E-01/	DATA 423
438		DATA (BCMOQN(I), I=	37, 72, /			DATA 424
439	461	=1.0366988E-01,	=5.4267507E-03,	9.4443665E-02,	1.9119536E-01,	DATA 425
440	462	2.7963215E-01,	3.5410865E-01,	4.0880257E-01,	4.3846453E-01,	DATA 426
441	463	4.3962187E-01,	4.1172891E-01,	3.5750724E-01,	2.8220963E-01,	DATA 427
442	464	1.9231430E-01,	9.4364719E-02,	5.7534319E-03,	1.8305513E-01,	DATA 428
443	465	=1.9344329E-01,	=2.7354635E-01,	=3.4053203E-01,	=3.9197689E-01,	DATA 429
444	466	=4.2584366E-01,	=4.4057786E-01,	=4.8528014E-01,	=4.8987058E-01,	DATA 430
445	467	=3.6516557E-01,	=3.0284810E-01,	=2.2537895E-01,	=1.8591823E-01,	DATA 431
446	468	=3.8279797E-02,	6.3048565E-02,	1.0292838E-01,	2.5562457E-01,	DATA 432
447	469	3.3501450E-01,	3.9505250E-01,	4.5057969E-01,	4.8836846E-01/	DATA 433
448		DATA (BCMOQN(I), I=	73, 108, /			DATA 434
449	471	4.1795634E-01,	3.7173964E-01,	3.0424625E-01,	2.2106244E-01,	DATA 435
450	472	1.2794594E-01,	3.0324169E-02,	6.0889931E-01,	=1.5937245E-01,	DATA 436
451	473	=2.4236049E-01,	=3.1520975E-01,	=3.7234745E-01,	=4.4234002E-01,	DATA 437
452	474	=4.3350593E-01,	=4.3494042E-01,	=4.1658241E-01,	=3.7917826E-01,	DATA 438
453	475	=3.2416091E-01,	=2.5352281E-01,	=1.0977663E-01,	=7.5972697E-02,	DATA 439
454	476	2.4029933E-02,	1.2547066E-01,	2.2253208E-01,	3.0849740E-01,	DATA 440
455	477	3.7632741E-01,	4.1976317E-01,	4.3474875E-01,	4.2052066E-01,	DATA 441
456	478	3.7964646E-01,	3.1698097E-01,	2.3827544E-01,	1.4916466E-01,	DATA 442
457	479	5.4730843E-02,	=4.0532154E-02,	=1.3259001E-01,	=2.1773131E-01/	DATA 443
458		DATA (BCMOQN(I), I=	109, 144, /			DATA 444
459	481	=2.9250117E-01,	=3.5373865E-01,	=3.9872190E-01,	=4.2539091E-01,	DATA 445
460	482	=4.3257060E-01,	=4.2008775E-01,	=3.0871014E-01,	=3.3993154E-01,	DATA 446
461	483	=2.7871466E-01,	=1.9831970E-01,	=1.029729E-01,	=1.4659752E-02,	DATA 447
462	484	8.4809179E-02,	1.8320014E-01,	2.7425573E-01,	3.5056611E-01,	DATA 448
463	485	4.0451222E-01,	4.3002816E-01,	4.2452750E-01,	3.8973461E-01,	DATA 449
464	486	3.3075890E-01,	2.5418262E-01,	1.0644206E-01,	7.8068688E-02,	DATA 450
465	487	=2.1382454E-02,	=1.1308695E-01,	=1.9365116E-01,	=2.7489312E-01,	DATA 451
466	488	=3.3876554E-01,	=3.8744666E-01,	=4.1858409E-01,	=4.3061516E-01,	DATA 452
467	489	=4.2302532E-01,	=3.9640457E-01,	=3.5226418E-01,	=2.9271100E-01/	DATA 453
468		DATA (BCMOQN(I), I=	145, 180, /			DATA 454
469	491	=2.2014089E-01,	=1.3707806E-01,	=4.0209590E-02,	4.9391784E-02,	DATA 455
470	492	1.4590029E-01,	2.3831965E-01,	3.2022071E-01,	3.8400849E-01,	DATA 456
471	493	4.2215449E-01,	4.2938609E-01,	4.0476465E-01,	3.9205796E-01,	DATA 457
472	494	2.7808345E-01,	1.9041456E-01,	9.5798021E-02,	=3.4680493E-04,	DATA 458
473	495	=9.3796602E-02,	=1.8114034E-01,	=2.5940874E-01,	=3.2583274E-01,	DATA 459
474	496	=3.7778311E-01,	=4.1290626E-01,	=4.2941659E-01,	=4.2642668E-01,	DATA 460
475	497	=4.0416432E-01,	=3.6391639E-01,	=3.0778767E-01,	=2.3834343E-01,	DATA 461
476	498	=1.5833302E-01,	=7.0573555E-02,	2.1982959E-02,	1.1601785E-01,	DATA 462
477	499	2.0749573E-01,	2.9129643E-01,	3.8105308E-01,	4.0958917E-01/	DATA 463
478		DATA (BCMOQN(I), I=	181, 216, /			DATA 464
479	501	4.3033974E-01,	4.1954577E-01,	3.7796294E-01,	3.1070101E-01,	DATA 465
480	502	2.2532668E-01,	1.2968628E-01,	3.0565100E-02,	=6.4697381E-02,	DATA 466
481	503	=1.5801692E-01,	=2.4017483E-01,	=3.1045724E-01,	=3.6643696E-01,	DATA 467
482	504	=4.0594462E-01,	=4.2722562E-01,	=4.2921282E-01,	=4.178142E-01,	DATA 468
483	505	=3.7584616E-01,	=3.2324662E-01,	=2.5648419E-01,	=1.7843776E-01,	DATA 469
484	506	=9.2165882E-02,	=8.4578301E-04,	9.2146706E-02,	1.8304022E-01,	DATA 470
485	507	2.6740835E-01,	3.3996770E-01,	3.9466809E-01,	4.253950E-01,	DATA 471
486	508	4.2743402E-01,	3.9918501E-01,	3.4305854E-01,	2.6482463E-01,	DATA 472
487	509	1.7193054E-01,	7.1849112E-02,	=2.8912281E-02,	=1.2512359E-01/	DATA 473
488		DATA (BCMOQN(I), I=	217, 252, /			DATA 474
489	511	=2.1271784E-01,	=2.8850979E-01,	=3.4992846E-01,	=3.9486728E-01,	DATA 475
490	512	=4.2168824E-01,	=4.2935283E-01,	=4.1759465E-01,	=3.8702645E-01,	DATA 476
491	513	=3.3911502E-01,	=2.7603792E-01,	=2.8049560E-01,	=1.1558430E-01,	DATA 477
492	514	=2.4562816E-02,	6.8849139E-02,	1.0070220E-01,	2.4656121E-01,	DATA 478
493	515	3.2146324E-01,	3.8001760E-01,	4.1687190E-01,	4.2765924E-01,	DATA 479
494	516	4.1021121E-01,	3.6541116E-01,	2.9712601E-01,	2.1127581E-01,	DATA 480
495	517	1.1462175E-01,	1.3786119E-02,	8.9321435E-02,	=1.772792E-01,	DATA 481
496	518	=2.5939635E-01,	=3.2712635E-01,	=3.7845545E-01,	=4.1162168E-01,	DATA 482
497	519	=4.2559313E-01,	=4.2011850E-01,	=3.9573429E-01,	=3.8369473E-01/	DATA 483
498		DATA (BCMOQN(I), I=	253, 288, /			DATA 484
499	521	=2.9584710E-01,	=2.2451104E-01,	=1.4241235E-01,	=5.2687663E-02,	DATA 485
500	522	4.1058994E-02,	1.3467039E-01,	2.2341183E-01,	3.8200420E-01,	DATA 486
501	523	3.6488555E-01,	4.0676979E-01,	4.2353384E-01,	4.1318749E-01,	DATA 487
502	524	3.7644015E-01,	3.1651377E-01,	2.3835283E-01,	1.4770756E-01,	DATA 488
503	525	5.0445009E-02,	=4.7848301E-02,	=1.4206575E-01,	=2.2768517E-01,	DATA 489
504	526	=3.0084377E-01,	=3.9841938E-01,	=3.9812914E-01,	=4.1862582E-01,	DATA 490
505	527	=4.1953893E-01,	=4.0140842E-01,	=3.4550664E-01,	=3.1361057E-01,	DATA 491
506	528	=2.4781637E-01,	=1.7046444E-01,	=8.4195433E-02,	7.8880833E-03,	DATA 492
507	529	1.0200698E-01,	1.9352023E-01,	2.9688636E-01,	3.4592756E-01/	DATA 493
508		DATA (BCMOQN(I), I=	289, 324, /			DATA 494



909	531	3.9454631E-01,	4.1788984E-01,	4.1356324E-01,	3.8230401E-01,	DATA 495
910	532	3.2756041E-01,	2.5441636E-01,	1x0847631E-01,	7.5181664E-02,	DATA 496
911	533	-2.0434217E-02,	-1.1374493E-01,	-2x0047107E-01,	-2.2667623E-01,	DATA 497
912	534	-3.3888933E-01,	-3.8420961E-01,	-4x1076688E-01,	-4.1771688E-01,	DATA 498
913	535	-4.0937235E-01,	-3.7499779E-01,	-3x2848324E-01,	-2.6801776E-01,	DATA 499
914	536	-1.9388451E-01,	-1.1443013E-01,	-2x0203698E-02,	6.5772294E-02,	DATA 500
915	537	1.5765964E-01,	2.4449952E-01,	3x2014278E-01,	3.7770607E-01,	DATA 501
916	538	4.1078849E-01,	4.1524494E-01,	3x9061127E-01,	3.4016323E-01,	DATA 502
917	539	2.6959499E-01,	1.8532762E-01,	9x0362790E-02,	-1.1282050E-03,	DATA 503
918		DATA (MOON (1)), I=325,360,/				DATA 504
919	541	-9.3739803E-02,	-1.8059657E-01,	-2x9814702E-01,	-3.2309302E-01,	DATA 505
920	542	-3.7249664E-01,	-4.0404537E-01,	-4x1637681E-01,	-4.8937146E-01,	DATA 506
921	543	-3.8378635E-01,	-3.4168706E-01,	-2x8535511E-01,	-2.1720140E-01,	DATA 507
922	544	-1.3995828E-01,	-5.5781866E-02,	3x2674718E-02,	1.3240197E-01,	DATA 508
923	545	2.0955191E-01,	2.8907638E-01,	3x9463972E-01,	3.9919554E-01,	DATA 509
924	546	4.1652915E-01,	4.0339481E-01,	3x0986809E-01,	2.9437407E-01,	DATA 510
925	547	2.1738222E-01,	1.1752146E-01,	2x1008299E-02,	-7.3717014E-02,	DATA 511
926	548	-1.6260152E-01,	-2.4227707E-01,	-3x0978863E-01,	-3.6249496E-01,	DATA 512
927	549	-3.9816814E-01,	-4.1524806E-01,	-4x1312855E-01,	-3.9231114E-01,	DATA 513
928		DATA (MOON (1)), I=361,368,/				DATA 514
929	551	-3.5432230E-01,	-3.0142353E-01,	-2x3624991E-01,	-1.6151882E-01,	DATA 515
930	552	-7.9888783E-02,	6.0182706E-03,	9x8448413E-02,	1.7923171E-01,	DATA 516
931		DATA (MOON (1)), I=37,72,/				DATA 516
932	561	6.3582675E 01,	6.3646485E 01,	6x3564017E 01,	6.3359992E 01,	DATA 517
933	562	6.3059383E 01,	6.2684186E 01,	6x2251190E 01,	6.1771149E 01,	DATA 518
934	563	6.1249581E 01,	6.0689085E 01,	6x0092875E 01,	5.9468978E 01,	DATA 519
935	564	5.8834291E 01,	5.8217374E 01,	5x7658822E 01,	5.7208358E 01,	DATA 520
936	565	5.6918392E 01,	5.6834759E 01,	5x8986648E 01,	5.7378663E 01,	DATA 521
937	566	5.7987663E 01,	5.8765440E 01,	5x9646206E 01,	6.0556420E 01,	DATA 522
938	567	6.1424328E 01,	6.2187487E 01,	6x2797679E 01,	6.3223387E 01,	DATA 523
939	568	6.3450293E 01,	6.3480292E 01,	6x3329412E 01,	6.3024898E 01,	DATA 524
940	569	6.2601604E 01,	6.2097909E 01,	6x1551461E 01,	6.0995259E 01,	DATA 525
941		DATA (MOON (1)), I=37,72,/				DATA 526
942	571	6.0454723E 01,	5.9946340E 01,	5x9478250E 01,	5.9052761E 01,	DATA 527
943	572	5.8470299E 01,	5.8333795E 01,	5x8052299E 01,	5.7842655E 01,	DATA 528
944	573	5.7728498E 01,	5.7736433E 01,	5x7890017E 01,	5.8203001E 01,	DATA 529
945	574	5.8673701E 01,	5.9282171E 01,	5x9990993E 01,	6.0749360E 01,	DATA 530
946	575	6.1499243E 01,	6.2182144E 01,	6x2745198E 01,	6.3145934E 01,	DATA 531
947	576	6.3355339E 01,	6.3360719E 01,	6x3164315E 01,	6.2784791E 01,	DATA 532
948	577	6.2254596E 01,	6.1617394E 01,	6x0924096E 01,	6.0227791E 01,	DATA 533
949	578	5.9578040E 01,	5.9015359E 01,	5x8567018E 01,	5.8245243E 01,	DATA 534
950	579	5.8648392E 01,	5.7964820E 01,	5x7978333E 01,	5.8073665E 01,	DATA 535
951		DATA (MOON (1)), I=73,108,/				DATA 536
952	581	5.8240454E 01,	5.8474803E 01,	5x8778173E 01,	5.9154149E 01,	DATA 537
953	582	5.9604043E 01,	6.0122628E 01,	6x0695130E 01,	6.1296264E 01,	DATA 538
954	583	6.1891438E 01,	6.2439766E 01,	6x2898190E 01,	6.3225968E 01,	DATA 539
955	584	6.3388936E 01,	6.3363171E 01,	6x8137884E 01,	6.2717445E 01,	DATA 540
956	585	6.2422437E 01,	6.1389479E 01,	6x0569517E 01,	5.9724237E 01,	DATA 541
957	586	5.8920413E 01,	5.8222421E 01,	5x7683870E 01,	5.7340121E 01,	DATA 542
958	587	5.7203833E 01,	5.7265016E 01,	5x7495636E 01,	5.7857262E 01,	DATA 543
959	588	5.8309351E 01,	5.8819979E 01,	5x9349751E 01,	5.9892651E 01,	DATA 544
960	589	6.0434345E 01,	6.0968874E 01,	6x1490801E 01,	6.1991796E 01,	DATA 545
961		DATA (MOON (1)), I=109,144,/				DATA 546
962	591	6.2458312E 01,	6.2870761E 01,	6x3204253E 01,	6.3430707E 01,	DATA 547
963	592	6.3521895E 01,	6.3453043E 01,	6x3206515E 01,	6.2775314E 01,	DATA 548
964	593	6.2166127E 01,	6.1401631E 01,	6x0521609E 01,	5.9582244E 01,	DATA 549
965	594	5.8652940E 01,	5.7810187E 01,	5x7128424E 01,	5.6668982E 01,	DATA 550
966	595	5.6469684E 01,	5.6538417E 01,	5x8893039E 01,	5.7367672E 01,	DATA 551
967	596	5.8023064E 01,	5.8757603E 01,	5.9516179E 01,	6.0255478E 01,	DATA 552
968	597	6.0945643E 01,	6.1569060E 01,	6x2117340E 01,	6.2587550E 01,	DATA 553
969	598	6.2978446E 01,	6.3287245E 01,	6x8507921E 01,	6.3628492E 01,	DATA 554
970	599	6.3635703E 01,	6.3512868E 01,	6x3244673E 01,	6.2820302E 01,	DATA 555
971		DATA (MOON (1)), I=145,180,/				DATA 556
972	601	6.2237219E 01,	6.1504804E 01,	6x0647438E 01,	5.9706561E 01,	DATA 557
973	602	5.8740450E 01,	5.7821446E 01,	5x7029210E 01,	5.6440340E 01,	DATA 558
974	603	5.6115602E 01,	5.6088111E 01,	5x6356513E 01,	5.6885820E 01,	DATA 559
975	604	5.7615539E 01,	5.8471981E 01,	5x9380112E 01,	6.0276158E 01,	DATA 560
976	605	6.1107174E 01,	6.1838833E 01,	6x2451339E 01,	6.2937232E 01,	DATA 561
977	606	6.3297748E 01,	6.3538927E 01,	6x8667936E 01,	6.3690208E 01,	DATA 562
978	607	6.3607771E 01,	6.3418803E 01,	6x3118378E 01,	6.2700483E 01,	DATA 563
979	608	6.2161147E 01,	6.1502208E 01,	6x0735150E 01,	5.9884571E 01,	DATA 564
980	609	5.8990530E 01,	5.8108792E 01,	5x7307791E 01,	5.6661672E 01,	DATA 565
981		DATA (MOON (1)), I=181,216,/				DATA 566

982	611	5.62399444E 01,	5.6092793E 01,	5.6243933E 01,	5.6681084E 01,	DATA 567
983	612	5.73598399E 01,	5.8212396E 01,	5.9159884E 01,	6.8124434E 01,	DATA 568
984	613	6.10382311E 01,	6.1848786E 01,	6.2920790E 01,	6.3033399E 01,	DATA 569
985	614	6.33879111E 01,	6.3584527E 01,	6.4838665E 01,	6.8567208E 01,	DATA 570
986	615	6.3387177E 01,	6.3113198E 01,	6.2755965E 01,	6.2321907E 01,	DATA 571
987	616	6.1814281E 01,	6.1233997E 01,	6.8591986E 01,	5.9891963E 01,	DATA 572
988	617	5.2159967E 01,	5.8428831E 01,	5.7745036E 01,	5.7164617E 01,	DATA 573
989	618	5.674731E 01,	5.6346539E 01,	5.6597439E 01,	5.6910216E 01,	DATA 574
990	619	5.7464663E 01,	5.8214526E 01,	5.9092513E 01,	6.8023917E 01,	DATA 575
991	DATA (RMOON (I), I=217, 252, /					DATA 576
992	621	6.0935333E 01,	6.1762816E 01,	6.2456833E 01,	6.2984420E 01,	DATA 577
993	622	6.3329218E 01,	6.3489991E 01,	6.4478133E 01,	6.3314633E 01,	DATA 578
994	623	6.3026326E 01,	6.2642421E 01,	6.2190977E 01,	6.1696137E 01,	DATA 579
995	624	6.1176422E 01,	6.0644433E 01,	6.8108124E 01,	5.9573456E 01,	DATA 580
996	625	5.9047939E 01,	5.8544279E 01,	5.8083100E 01,	5.2693715E 01,	DATA 581
997	626	5.7412161E 01,	5.7276295E 01,	5.7318561E 01,	5.7558125E 01,	DATA 582
998	627	5.7994619E 01,	5.8605518E 01,	5.9347987E 01,	6.8164518E 01,	DATA 583
999	628	6.0990623E 01,	6.1762646E 01,	6.2424329E 01,	6.2931481E 01,	DATA 584
000	629	6.3254726E 01,	6.3380580E 01,	6.3311176E 01,	6.3062923E 01,	DATA 585
001	DATA (RMOON (I), I=253, 288, /					DATA 586
002	631	6.2664230E 01,	6.2152375E 01,	6.1369647E 01,	6.8958990E 01,	DATA 587
003	632	6.0359608E 01,	5.9803187E 01,	5.9311486E 01,	5.8895888E 01,	DATA 588
004	633	5.8959117E 01,	5.8298729E 01,	5.8111444E 01,	5.7997103E 01,	DATA 589
005	634	5.7961067E 01,	5.8014259E 01,	5.8170666E 01,	5.8442842E 01,	DATA 590
006	635	5.8836597E 01,	5.9346401E 01,	5.9952833E 01,	6.0622755E 01,	DATA 591
007	636	6.1312125E 01,	6.1970659E 01,	6.2347279E 01,	6.2995396E 01,	DATA 592
008	637	6.3277339E 01,	6.3367707E 01,	6.3255605E 01,	6.2945787E 01,	DATA 593
009	638	6.2458726E 01,	6.1829535E 01,	6.1105568E 01,	6.0342567E 01,	DATA 594
010	639	5.9599319E 01,	5.8931214E 01,	5.8383631E 01,	5.7986848E 01,	DATA 595
011	DATA (RMOON (I), I=289, 324, /					DATA 596
012	641	5.7751815E 01,	5.7673930E 01,	5.7734177E 01,	5.7906870E 01,	DATA 597
013	642	5.8165890E 01,	5.8489773E 01,	5.8864282E 01,	5.9282209E 01,	DATA 598
014	643	5.9740847E 01,	6.0238071E 01,	6.0768232E 01,	6.1318924E 01,	DATA 599
015	644	6.1869399E 01,	6.2390837E 01,	6.2848633E 01,	6.3205348E 01,	DATA 600
016	645	6.3425005E 01,	6.3477127E 01,	6.3340467E 01,	6.3006263E 01,	DATA 601
017	646	6.2480758E 01,	6.1786006E 01,	6.0964215E 01,	6.8068389E 01,	DATA 602
018	647	5.9166734E 01,	5.8332474E 01,	5.7636049E 01,	5.7135246E 01,	DATA 603
019	648	5.6866262E 01,	5.6838388E 01,	5.7034179E 01,	5.7415139E 01,	DATA 604
020	649	5.7931016E 01,	5.8529715E 01,	5.9165277E 01,	5.9802602E 01,	DATA 605
021	DATA (RMOON (I), I=325, 360, /					DATA 606
022	651	6.0418695E 01,	6.1001047E 01,	6.1944118E 01,	6.2045158E 01,	DATA 607
023	652	6.2900309E 01,	6.2901660E 01,	6.235672E 01,	6.3483176E 01,	DATA 608
024	653	6.3620904E 01,	6.3624180E 01,	6.3470413E 01,	6.3142983E 01,	DATA 609
025	654	6.2632181E 01,	6.1953797E 01,	6.1122031E 01,	6.8181196E 01,	DATA 610
026	655	5.9190475E 01,	5.8223888E 01,	5.7363704E 01,	5.6690184E 01,	DATA 611
027	656	5.6268925E 01,	5.6138828E 01,	5.6304677E 01,	5.6737113E 01,	DATA 612
028	657	5.7380108E 01,	5.8163131E 01,	5.9013926E 01,	5.9868886E 01,	DATA 613
029	658	6.0677523E 01,	6.1407394E 01,	6.2039883E 01,	6.2568344E 01,	DATA 614
030	659	6.2993872E 01,	6.3320873E 01,	6.3553354E 01,	6.8692011E 01,	DATA 615
031	DATA (RMOON (I), I=361, 368, /					DATA 616
032	661	6.3732701E 01,	6.3666407E 01,	6.3480575E 01,	6.8161719E 01,	DATA 617
033	662	6.2699014E 01,	6.2088429E 01,	6.1336888E 01,	6.8468013E 01,	DATA 618
034	END					DATA 619

29748 WORDS OF MEMORY USED BY THIS COMPILATION

71084 02 11-03-72 11.636 1973 EPHEMERIS

PREFACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

PRIMARY SYMDEF ENTRY

TABLE 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

3 ERMHLK

11

SVWREF

END OF BINARY CARD \*1973\*19  
 4273 IS THE NEXT AVAILABLE LOCATION.  
 GMAP VERSION/ASSEMBLY DATES JMAP 110171/102971 JMAP 110171/102971 JMPC 110171/102971  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
 \*\* 19411 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

71084 02 11-03-72 11.650 1974 EPHEMERIS

Line	Code	Description	DATA	Index
1	C*1974*	1974 EPHEMERIS	DATA	1
2		SUBROUTINE TABLE	DATA	2
3		DIMENSION RASUN (369), DCSUN (369), RSUN (369)	DATA	3
4		DIMENSION RAMOON(369), DCMOON(369), RMOON(369)	DATA	4
5		DIMENSION ARRAY(2214)		
6		DOUBLE PRECISION Y		
7		EQUIVALENCE (RASUN,ARRAY), (DCSUN,ARRAY(370)), (RSUN,ARRAY(739))		
8		EQUIVALENCE (RAMOON,ARRAY(1108)), (DCMOON,ARRAY(1477))		
9		EQUIVALENCE (RMOON,ARRAY(1846))		
10		COMMON /EPMHLK/ Y(4), I		
11		Y(1) = ARRAY(I)		
12		Y(2) = ARRAY(I+1)		
13		Y(3) = ARRAY(I+2)		
14		Y(4) = ARRAY(I+3)		
15		RETURN		
16		DATA (RASUN (I)), I= 1, 36)/	DATA	6
17	11	4.8865044E 00, 4.9057931E 00, 4.9250585E 00, 4.9442984E 00,	DATA	7
18	12	4.9635108E 00, 4.9826937E 00, 5.0018446E 00, 5.0209623E 00,	DATA	8
19	13	5.0400447E 00, 5.0590903E 00, 5.0780975E 00, 5.0970646E 00,	DATA	9
20	14	5.1159905E 00, 5.1348737E 00, 5.1537133E 00, 5.1725078E 00,	DATA	10
21	15	5.1912557E 00, 5.2099559E 00, 5.2286069E 00, 5.2472074E 00,	DATA	11
22	16	5.2657561E 00, 5.2842516E 00, 5.3026928E 00, 5.3210785E 00,	DATA	12
23	17	5.3394079E 00, 5.3576798E 00, 5.3758936E 00, 5.3940485E 00,	DATA	13
24	18	5.4121438E 00, 5.4301792E 00, 5.4481542E 00, 5.4660687E 00,	DATA	14
25	19	5.4839226E 00, 5.5017158E 00, 5.5194482E 00, 5.5371200E 00/	DATA	15
26		DATA (RASUN (I)), I= 37, 72)/	DATA	16
27	21	5.5547316E 00, 5.5722835E 00, 5.5897760E 00, 5.6072100E 00,	DATA	17
28	22	5.6245862E 00, 5.6419057E 00, 5.6591695E 00, 5.6763784E 00,	DATA	18
29	23	5.6935332E 00, 5.7106346E 00, 5.7276835E 00, 5.7446806E 00,	DATA	19
30	24	5.7616265E 00, 5.7785219E 00, 5.7953677E 00, 5.8121645E 00,	DATA	20
31	25	5.8289133E 00, 5.8456149E 00, 5.8622701E 00, 5.8788799E 00,	DATA	21
32	26	5.8954453E 00, 5.9119673E 00, 5.9284471E 00, 5.9448857E 00,	DATA	22
33	27	5.9612843E 00, 5.9776440E 00, 5.9939639E 00, 6.0102513E 00,	DATA	23
34	28	6.0265018E 00, 6.0427187E 00, 6.0589035E 00, 6.0750579E 00,	DATA	24
35	29	6.0911840E 00, 6.1072834E 00, 6.1233583E 00, 6.1394103E 00/	DATA	25
36		DATA (RASUN (I)), I= 73, 108)/	DATA	26
37	31	6.1554410E 00, 6.1714520E 00, 6.1874430E 00, 6.2034213E 00,	DATA	27
38	32	6.2193823E 00, 6.2353296E 00, 6.2512643E 00, 6.2671881E 00,	DATA	28
39	33	6.2831020E 00, 6.2989980E 00, 6.3148731E 00, 6.3307273E 00,	DATA	29
40	34	6.3501772E 00, 6.3660873E 00, 6.3819770E 00, 6.3978462E 00,	DATA	30
41	35	6.4127035E 00, 6.4285930E 00, 6.4444570E 00, 6.4602955E 00,	DATA	31
42	36	6.4761140E 00, 6.4919870E 00, 6.5078230E 00, 6.5236320E 00,	DATA	32
43	37	6.5394030E 00, 6.5551720E 00, 6.5709120E 00, 6.5867230E 00,	DATA	33
44	38	6.6024930E 00, 6.6182430E 00, 6.6339540E 00, 6.6496260E 00,	DATA	34
45	39	6.6651580E 00, 6.6807870E 00, 6.6963800E 00, 6.7119370E 00/	DATA	35
46		DATA (RASUN (I)), I=109, 144)/	DATA	36
47	41	6.7274670E 00, 6.7430360E 00, 6.7585670E 00, 6.7740600E 00,	DATA	37
48	42	6.7895150E 00, 6.8049280E 00, 6.8203050E 00, 6.8356460E 00,	DATA	38
49	43	6.8509410E 00, 6.8662720E 00, 6.8815670E 00, 6.8968270E 00,	DATA	39
50	44	6.9120720E 00, 6.9271680E 00, 6.9422290E 00, 6.9572550E 00,	DATA	40
51	45	6.9721660E 00, 6.9872270E 00, 6.9972730E 00, 7.0072840E 00,	DATA	41
52	46	7.0172500E 00, 7.0272110E 00, 7.0371470E 00, 7.0470480E 00,	DATA	42
53	47	7.0569140E 00, 7.0667500E 00, 7.0765470E 00, 7.0863050E 00,	DATA	43
54	48	7.0959340E 00, 7.1057210E 00, 7.1154740E 00, 7.1251830E 00,	DATA	44
55	49	7.1347480E 00, 7.1444270E 00, 7.1540720E 00, 7.1636830E 00/	DATA	45
56		DATA (RASUN (I)), I=145, 180)/	DATA	46
57	51	7.1732580E 00, 7.1827330E 00, 7.1921740E 00, 7.2015810E 00,	DATA	47
58	52	7.2109460E 00, 7.2202190E 00, 7.2294570E 00, 7.2386600E 00,	DATA	48
59	53	7.2478380E 00, 7.2570950E 00, 7.2663170E 00, 7.2755040E 00,	DATA	49
60	54	7.2845660E 00, 7.2937270E 00, 7.3028120E 00, 7.3118120E 00,	DATA	50
61	55	7.3207270E 00, 7.3296480E 00, 7.3385240E 00, 7.3473550E 00/	DATA	51



62	56	1.4115490E 00	1.4296603E 00	1.4477846E 00	1.4659196E 00	DATA	92
63	57	1.4840636E 00	1.50222149E 00	1.5203718E 00	1.5385318E 00	DATA	93
64	58	1.5566926E 00	1.5748521E 00	1.5930079E 00	1.6111880E 00	DATA	94
65	59	1.6293009E 00	1.6474337E 00	1.6655556E 00	1.6836649E 00	DATA	95
66		DATA (RASUN I), I:181, 218, /				DATA	96
67	61	1.7017600E 00	1.7198397E 00	1.7379023E 00	1.7559465E 00	DATA	97
68	62	1.7739708E 00	1.7919740E 00	1.8099547E 00	1.8279118E 00	DATA	98
69	63	1.8458439E 00	1.8637499E 00	1.8816287E 00	1.8994792E 00	DATA	99
70	64	1.9173003E 00	1.9350912E 00	1.9528508E 00	1.9705780E 00	DATA	100
71	65	1.9882720E 00	2.0059315E 00	2.0235557E 00	2.0411431E 00	DATA	101
72	66	2.0586923E 00	2.0762020E 00	2.0936712E 00	2.110987E 00	DATA	102
73	67	2.1284838E 00	2.1458258E 00	2.1631239E 00	2.1803778E 00	DATA	103
74	68	2.1975874E 00	2.2147524E 00	2.2318725E 00	2.2489477E 00	DATA	104
75	69	2.2659779E 00	2.2829631E 00	2.2999037E 00	2.3167997E 00	DATA	105
76		DATA (RASUN I), I:217, 252, /				DATA	106
77	71	2.3336515E 00	2.3504595E 00	2.3672241E 00	2.3839457E 00	DATA	107
78	72	2.4006251E 00	2.4172626E 00	2.4338592E 00	2.4504152E 00	DATA	108
79	73	2.4669313E 00	2.4834080E 00	2.4998461E 00	2.5162455E 00	DATA	109
80	74	2.5326066E 00	2.5489297E 00	2.5652153E 00	2.5814639E 00	DATA	110
81	75	2.5976759E 00	2.6138520E 00	2.629928E 00	2.6460993E 00	DATA	111
82	76	2.6621724E 00	2.6782131E 00	2.6942222E 00	2.7102008E 00	DATA	112
83	77	2.7261900E 00	2.7420711E 00	2.7579653E 00	2.7738338E 00	DATA	113
84	78	2.7896783E 00	2.8055000E 00	2.8213004E 00	2.8370811E 00	DATA	114
85	79	2.8528436E 00	2.8685896E 00	2.8843205E 00	2.9000380E 00	DATA	115
86		DATA (RASUN I), I:253, 288, /				DATA	116
87	81	2.9157435E 00	2.9314384E 00	2.9471243E 00	2.9628021E 00	DATA	117
88	82	2.9784729E 00	2.9941381E 00	3.0097959E 00	3.0254564E 00	DATA	118
89	83	3.0411119E 00	3.0567664E 00	3.0724211E 00	3.0880775E 00	DATA	119
90	84	3.1037368E 00	3.1194003E 00	3.1350691E 00	3.1507449E 00	DATA	120
91	85	3.1664290E 00	3.1821229E 00	3.1978282E 00	3.2135465E 00	DATA	121
92	86	3.2292796E 00	3.2450290E 00	3.2607965E 00	3.2765840E 00	DATA	122
93	87	3.2923931E 00	3.3082238E 00	3.3240837E 00	3.3399686E 00	DATA	123
94	88	3.3558820E 00	3.3718255E 00	3.3878008E 00	3.4038089E 00	DATA	124
95	89	3.4198912E 00	3.4359290E 00	3.4520439E 00	3.4681967E 00	DATA	125
96		DATA (RASUN I), I:289, 324, /				DATA	126
97	91	3.4843886E 00	3.5006208E 00	3.5168941E 00	3.5332097E 00	DATA	127
98	92	3.5495684E 00	3.5659713E 00	3.5824190E 00	3.5989127E 00	DATA	128
99	93	3.6154935E 00	3.6320423E 00	3.6486802E 00	3.6653683E 00	DATA	129
100	94	3.6821078E 00	3.6988998E 00	3.7157454E 00	3.7326458E 00	DATA	130
101	95	3.7496021E 00	3.7666155E 00	3.7836868E 00	3.8008172E 00	DATA	131
102	96	3.8180073E 00	3.8352581E 00	3.8525701E 00	3.8699438E 00	DATA	132
103	97	3.8873796E 00	3.9048778E 00	3.9224390E 00	3.9400631E 00	DATA	133
104	98	3.9577500E 00	3.9754995E 00	3.9933115E 00	4.0111853E 00	DATA	134
105	99	4.0291206E 00	4.0471166E 00	4.0651726E 00	4.0832881E 00	DATA	135
106		DATA (RASUN I), I:325, 360, /				DATA	136
107	101	4.1014622E 00	4.1196946E 00	4.1379842E 00	4.1563305E 00	DATA	137
108	102	4.1747326E 00	4.1931899E 00	4.2117015E 00	4.2302665E 00	DATA	138
109	103	4.2488842E 00	4.2675537E 00	4.2862737E 00	4.3050433E 00	DATA	139
110	104	4.3238614E 00	4.3427264E 00	4.3616373E 00	4.3805923E 00	DATA	140
111	105	4.3995899E 00	4.4186284E 00	4.4377062E 00	4.4568211E 00	DATA	141
112	106	4.4759712E 00	4.4951539E 00	4.5143670E 00	4.5336079E 00	DATA	142
113	107	4.5528738E 00	4.5721623E 00	4.5914704E 00	4.6107956E 00	DATA	143
114	108	4.6301331E 00	4.6494865E 00	4.6688847E 00	4.6882144E 00	DATA	144
115	109	4.7075858E 00	4.7269589E 00	4.7463313E 00	4.7657006E 00	DATA	145
116		DATA (RASUN I), I:361, 368, /				DATA	146
117	111	4.7850646E 00	4.8044210E 00	4.8237673E 00	4.8431015E 00	DATA	147
118	112	4.8624215E 00	4.8817250E 00	4.9010103E 00	4.9202750E 00	DATA	148
119		DATA (BCSUN I), I: 1, 38, /				DATA	149
120	121	-4.0361568E-01	-4.0232236E-01	-4.0089529E-01	-3.9933519E-01	DATA	150
121	122	-3.9764287E-01	-3.9581921E-01	-3.9386520E-01	-3.9178172E-01	DATA	151
122	123	-3.8956977E-01	-3.8723033E-01	-3.8476444E-01	-3.8217314E-01	DATA	152
123	124	-3.7945759E-01	-3.7641894E-01	-3.7365839E-01	-3.7057739E-01	DATA	153
124	125	-3.6737736E-01	-3.6405981E-01	-3.6062637E-01	-3.5707866E-01	DATA	154
125	126	-3.5341832E-01	-3.4964713E-01	-3.4576682E-01	-3.4177915E-01	DATA	155
126	127	-3.3768988E-01	-3.3346912E-01	-3.2919047E-01	-3.2479196E-01	DATA	156
127	128	-3.2029542E-01	-3.1570282E-01	-3.1101612E-01	-3.0623726E-01	DATA	157
128	129	-3.0136823E-01	-2.9641109E-01	-2.9136764E-01	-2.8624004E-01	DATA	158
129		DATA (BCSUN I), I: 37, 72, /				DATA	159
130	131	-2.8103010E-01	-2.7573974E-01	-2.7037078E-01	-2.6492511E-01	DATA	160
131	132	-2.5940487E-01	-2.5381097E-01	-2.4814609E-01	-2.4241803E-01	DATA	161
132	133	-2.3651070E-01	-2.3074421E-01	-2.2481455E-01	-2.1882384E-01	DATA	162
133	134	-2.127416E-01	-2.0666755E-01	-2.0050616E-01	-1.9429203E-01	DATA	163
134	135	-1.8802724E-01	-1.8171392E-01	-1.7535411E-01	-1.6894983E-01	DATA	164
135	136	-1.6250320E-01	-1.5601627E-01	-1.4949095E-01	-1.4292935E-01	DATA	165

136	137	=1.3633344E-01,	=1.2970518E-01,	=1.2304663E-01,	=1.4639961E-01,	DATA	125
137	138	=1.0964598E-01,	=1.0290754E-01,	=9.6146110E-02,	=8.9363354E-02,	DATA	126
138	139	=8.2860958E-02,	=7.5740587E-02,	=6.8903830E-02,	=6.2052559E-02,	DATA	127
139		DATA (BCSUN (I), I=73,108)/				DATA	128
140	141	=5.5188483E-02,	=4.8313417E-02,	=4.1429139E-02,	=3.4537521E-02,	DATA	129
141	142	=2.7640413E-02,	=2.0739669E-02,	=1.48837130E-02,	=6.9346556E-03,	DATA	130
142	143	=3.4098163E-03,	=6.8626997E-03,	=1.8753931E-02,	=2.8637729E-02,	DATA	131
143	144	=2.7512274E-02,	=4.375756E-02,	=4.1226368E-02,	=4.8062330E-02,	DATA	132
144	145	=5.4881897E-02,	=6.1683169E-02,	=6.8464429E-02,	=7.5223996E-02,	DATA	133
145	146	=8.1960191E-02,	=8.8671374E-02,	=9.5355902E-02,	=1.0201228E-01,	DATA	134
146	147	=1.0863899E-01,	=1.1523454E-01,	=1.2179749E-01,	=1.2832613E-01,	DATA	135
147	148	=1.3481901E-01,	=1.4127450E-01,	=1.4769099E-01,	=1.5406680E-01,	DATA	136
148	149	=1.6040020E-01,	=1.6668973E-01,	=1.7293348E-01,	=1.7912989E-01,	DATA	137
149		DATA (BCSUN (I), I=109,144)/				DATA	138
150	151	=1.8927715E-01,	=1.9137366E-01,	=1.9741778E-01,	=2.0340778E-01,	DATA	139
151	152	=2.0934199E-01,	=2.1521875E-01,	=2.2103642E-01,	=2.2679337E-01,	DATA	140
152	153	=2.3248790E-01,	=2.3811837E-01,	=2.4368312E-01,	=2.4918059E-01,	DATA	141
153	154	=2.5460919E-01,	=2.5996738E-01,	=2.6525367E-01,	=2.7046659E-01,	DATA	142
154	155	=2.7560481E-01,	=2.8066691E-01,	=2.8565148E-01,	=2.9055713E-01,	DATA	143
155	156	=2.9338242E-01,	=2.9801259E-01,	=3.0247863E-01,	=3.0736205E-01,	DATA	144
156	157	=3.1385166E-01,	=3.1825373E-01,	=3.2256685E-01,	=3.2678958E-01,	DATA	145
157	158	=3.3092050E-01,	=3.3495823E-01,	=3.3890146E-01,	=3.4274882E-01,	DATA	146
158	159	=3.4649901E-01,	=3.5015078E-01,	=3.5370288E-01,	=3.5715413E-01,	DATA	147
159		DATA (BCSUN (I), I=145,180)/				DATA	148
160	161	=3.6050332E-01,	=3.6374918E-01,	=3.6689064E-01,	=3.6992649E-01,	DATA	149
161	162	=3.7285572E-01,	=3.7567727E-01,	=3.7839016E-01,	=3.8099355E-01,	DATA	150
162	163	=3.8348648E-01,	=3.8586823E-01,	=3.8813797E-01,	=3.9029495E-01,	DATA	151
163	164	=3.9233839E-01,	=3.9426757E-01,	=3.9608181E-01,	=3.9778040E-01,	DATA	152
164	165	=3.9936268E-01,	=4.0082806E-01,	=4.0217593E-01,	=4.0340883E-01,	DATA	153
165	166	=4.0451720E-01,	=4.0550963E-01,	=4.0638277E-01,	=4.0713626E-01,	DATA	154
166	167	=4.0776990E-01,	=4.0828352E-01,	=4.0867699E-01,	=4.0895025E-01,	DATA	155
167	168	=4.0910327E-01,	=4.0913611E-01,	=4.0904875E-01,	=4.0884128E-01,	DATA	156
168	169	=4.0851386E-01,	=4.0806663E-01,	=4.0749988E-01,	=4.0681386E-01,	DATA	157
169		DATA (BCSUN (I), I=181,216)/				DATA	158
170	171	=4.0600894E-01,	=4.0508551E-01,	=4.0404401E-01,	=4.0288492E-01,	DATA	159
171	172	=4.0160868E-01,	=4.0021580E-01,	=3.9870684E-01,	=3.9708229E-01,	DATA	160
172	173	=3.9334283E-01,	=3.9348907E-01,	=3.9152165E-01,	=3.8944135E-01,	DATA	161
173	174	=3.8724883E-01,	=3.8494496E-01,	=3.8253057E-01,	=3.8000660E-01,	DATA	162
174	175	=3.7737399E-01,	=3.7463385E-01,	=3.7178722E-01,	=3.6883826E-01,	DATA	163
175	176	=3.6877919E-01,	=3.6262028E-01,	=3.5935967E-01,	=3.5098641E-01,	DATA	164
176	177	=3.5253831E-01,	=3.4898004E-01,	=3.4532514E-01,	=3.4157483E-01,	DATA	165
177	178	=3.3773044E-01,	=3.3379329E-01,	=3.2976465E-01,	=3.2564594E-01,	DATA	166
178	179	=3.2143839E-01,	=3.1714337E-01,	=3.1276215E-01,	=3.0829604E-01,	DATA	167
179		DATA (BCSUN (I), I=217,252)/				DATA	168
180	181	=3.0374634E-01,	=2.9911445E-01,	=2.9440166E-01,	=2.8960932E-01,	DATA	169
181	182	=2.8473879E-01,	=2.7979147E-01,	=2.7476872E-01,	=2.6967204E-01,	DATA	170
182	183	=2.6450291E-01,	=2.5926287E-01,	=2.5395340E-01,	=2.4857622E-01,	DATA	171
183	184	=2.4313301E-01,	=2.3762534E-01,	=2.3205490E-01,	=2.2642329E-01,	DATA	172
184	185	=2.2073211E-01,	=2.1498300E-01,	=2.0917762E-01,	=2.0331753E-01,	DATA	173
185	186	=1.9740428E-01,	=1.9143941E-01,	=1.8542455E-01,	=1.7936121E-01,	DATA	174
186	187	=1.7325086E-01,	=1.6709505E-01,	=1.6089524E-01,	=1.5465287E-01,	DATA	175
187	188	=1.4836944E-01,	=1.4204637E-01,	=1.3568514E-01,	=1.2928718E-01,	DATA	176
188	189	=1.2285395E-01,	=1.1638691E-01,	=1.0988753E-01,	=1.0335734E-01,	DATA	177
189		DATA (BCSUN (I), I=253,288)/				DATA	178
190	191	=9.6797903E-02,	=9.0210808E-02,	=8.3597613E-02,	=7.6960091E-02,	DATA	179
191	192	=7.0299948E-02,	=6.3618901E-02,	=5.6918609E-02,	=5.0200828E-02,	DATA	180
192	193	=4.3467264E-02,	=3.6719630E-02,	=2.9959720E-02,	=2.3189132E-02,	DATA	181
193	194	=1.6409552E-02,	=9.6226690E-03,	=2.8301961E-03,	=3.9662424E-03,	DATA	182
194	195	=-1.0765009E-02,	=-1.7564480E-02,	=-2.4363304E-02,	=-3.1159120E-02,	DATA	183
195	196	=-3.7951099E-02,	=-4.4737391E-02,	=-5.1516396E-02,	=-5.8286543E-02,	DATA	184
196	197	=-6.3046237E-02,	=-7.1793877E-02,	=-7.9527834E-02,	=-8.5246434E-02,	DATA	185
197	198	=-9.1947968E-02,	=-9.8630686E-02,	=-1.0529285E-01,	=-1.1193255E-01,	DATA	186
198	199	=-1.1854789E-01,	=-1.2513700E-01,	=-1.3169804E-01,	=-1.3822905E-01,	DATA	187
199		DATA (BCSUN (I), I=289,324)/				DATA	188
200	201	=-1.4472813E-01,	=-1.5119336E-01,	=-1.5762276E-01,	=-1.6401447E-01,	DATA	189
201	202	=-1.7036656E-01,	=-1.7667708E-01,	=-1.8294406E-01,	=-1.8916561E-01,	DATA	190
202	203	=-1.9533980E-01,	=-2.0146475E-01,	=-2.0753854E-01,	=-2.1359932E-01,	DATA	191
203	204	=-2.1952519E-01,	=-2.2543425E-01,	=-2.3128467E-01,	=-2.3707461E-01,	DATA	192
204	205	=-2.4280217E-01,	=-2.4846557E-01,	=-2.5406288E-01,	=-2.5959221E-01,	DATA	193
205	206	=-2.6805161E-01,	=-2.7043920E-01,	=-2.7575293E-01,	=-2.8099079E-01,	DATA	194
206	207	=-2.9412074E-01,	=-2.9123075E-01,	=-2.9622884E-01,	=-3.0114303E-01,	DATA	195
207	208	=-3.2197129E-01,	=-3.1071168E-01,	=-3.1536226E-01,	=-3.1997106E-01,	DATA	196
208	209	=-3.2438618E-01,	=-3.2875572E-01,	=-3.3302768E-01,	=-3.3720029E-01,	DATA	197
209		DATA (BCSUN (I), I=325,360)/				DATA	198



210	211	03.4127166E-01,	03.4524001E-01,	03.4910334E-01,	03.5286053E-01,	DATA 199
211	212	03.5650933E-01,	03.6004821E-01,	03.6347561E-01,	03.6678993E-01,	DATA 200
212	213	03.6998973E-01,	03.7307346E-01,	03.7603968E-01,	03.7888696E-01,	DATA 201
213	214	03.8161389E-01,	03.8421909E-01,	03.8670117E-01,	03.8905880E-01,	DATA 202
214	215	03.9129065E-01,	03.9339555E-01,	03.9537235E-01,	03.9721993E-01,	DATA 203
215	216	03.9893740E-01,	04.0052378E-01,	04.0197823E-01,	04.0329999E-01,	DATA 204
216	217	04.0448831E-01,	04.0554255E-01,	04.0646205E-01,	04.0724632E-01,	DATA 205
217	218	04.0789489E-01,	04.0840736E-01,	04.0878342E-01,	04.0902283E-01,	DATA 206
218	219	04.0912544E-01,	04.0909112E-01,	04.0891989E-01,	04.0861184E-01,	DATA 207
219		DATA (RSUN (I), I=361, 368) /				DATA 208
220	221	04.0816708E-01,	04.0758581E-01,	04.0696831E-01,	04.0601495E-01,	DATA 209
221	222	04.0502602E-01,	04.0390192E-01,	04.0264303E-01,	04.0124999E-01,	DATA 210
222		DATA (RSUN (I), I=361, 368) /				DATA 210
223	231	9.8396596E-01,	9.8394520E-01,	9.8392922E-01,	9.8391847E-01,	DATA 211
224	232	9.8391325E-01,	9.8391386E-01,	9.8392064E-01,	9.8393372E-01,	DATA 212
225	233	9.8395330E-01,	9.8397990E-01,	9.8401263E-01,	9.8405228E-01,	DATA 213
226	234	9.8409621E-01,	9.8415017E-01,	9.8420785E-01,	9.8427096E-01,	DATA 214
227	235	9.8433921E-01,	9.8441228E-01,	9.8448973E-01,	9.8457154E-01,	DATA 215
228	236	9.8465741E-01,	9.8474718E-01,	9.8484068E-01,	9.8493784E-01,	DATA 216
229	237	9.8503857E-01,	9.8514286E-01,	9.8525064E-01,	9.8536200E-01,	DATA 217
230	238	9.8547705E-01,	9.8559590E-01,	9.8571859E-01,	9.8584847E-01,	DATA 218
231	239	9.8597679E-01,	9.8611282E-01,	9.8625376E-01,	9.8639991E-01,	DATA 219
232		DATA (RSUN (I), I=377, 72) /				DATA 220
233	241	9.8655147E-01,	9.8670865E-01,	9.8687183E-01,	9.8704066E-01,	DATA 221
234	242	9.8721502E-01,	9.8739470E-01,	9.8757955E-01,	9.8776920E-01,	DATA 222
235	243	9.8796330E-01,	9.8816151E-01,	9.8836339E-01,	9.8856871E-01,	DATA 223
236	244	9.8877721E-01,	9.8898859E-01,	9.8920260E-01,	9.8941904E-01,	DATA 224
237	245	9.8963775E-01,	9.8985852E-01,	9.9008123E-01,	9.9030384E-01,	DATA 225
238	246	9.9053236E-01,	9.9076077E-01,	9.9099103E-01,	9.9122340E-01,	DATA 226
239	247	9.9145809E-01,	9.9169528E-01,	9.9193914E-01,	9.9217798E-01,	DATA 227
240	248	9.9242403E-01,	9.9267355E-01,	9.9292687E-01,	9.9318381E-01,	DATA 228
241	249	9.9344438E-01,	9.9370845E-01,	9.9397602E-01,	9.9424672E-01,	DATA 229
242		DATA (RSUN (I), I=73, 108) /				DATA 230
243	251	9.9452023E-01,	9.9479623E-01,	9.9507430E-01,	9.9535418E-01,	DATA 231
244	252	9.9563555E-01,	9.9591807E-01,	9.9620143E-01,	9.9648533E-01,	DATA 232
245	253	9.9676952E-01,	9.9705375E-01,	9.9733774E-01,	9.9762139E-01,	DATA 233
246	254	9.9790458E-01,	9.9818721E-01,	9.9846910E-01,	9.9875051E-01,	DATA 234
247	255	9.9903154E-01,	9.9931234E-01,	9.9959302E-01,	9.9987391E-01,	DATA 235
248	256	1.0001553E 00,	1.0004373E 00,	1.0007204E 00,	1.0010046E 00,	DATA 236
249	257	1.0012898E 00,	1.0015761E 00,	1.0018637E 00,	1.0021522E 00,	DATA 237
250	258	1.0024413E 00,	1.0027309E 00,	1.0030206E 00,	1.0033102E 00,	DATA 238
251	259	1.0035993E 00,	1.0038876E 00,	1.0041749E 00,	1.0044606E 00,	DATA 239
252		DATA (RSUN (I), I=109, 144) /				DATA 240
253	261	1.0047447E 00,	1.0050266E 00,	1.0053063E 00,	1.0055833E 00,	DATA 241
254	262	1.0058576E 00,	1.0061288E 00,	1.0063969E 00,	1.0066619E 00,	DATA 242
255	263	1.0069239E 00,	1.0071829E 00,	1.0074392E 00,	1.0076929E 00,	DATA 243
256	264	1.0079444E 00,	1.0081939E 00,	1.0084418E 00,	1.0086882E 00,	DATA 244
257	265	1.0089332E 00,	1.0091769E 00,	1.0094199E 00,	1.0096609E 00,	DATA 245
258	266	1.0099039E 00,	1.0101394E 00,	1.0103762E 00,	1.0106111E 00,	DATA 246
259	267	1.0108438E 00,	1.0110741E 00,	1.0113016E 00,	1.0115261E 00,	DATA 247
260	268	1.0117472E 00,	1.0119647E 00,	1.0121782E 00,	1.0123875E 00,	DATA 248
261	269	1.0125922E 00,	1.0127922E 00,	1.0129870E 00,	1.0131767E 00,	DATA 249
262		DATA (RSUN (I), I=145, 180) /				DATA 250
263	271	1.0133615E 00,	1.0135412E 00,	1.0137159E 00,	1.0138859E 00,	DATA 251
264	272	1.0140515E 00,	1.0142131E 00,	1.0143710E 00,	1.0145253E 00,	DATA 252
265	273	1.0146763E 00,	1.0148241E 00,	1.0149691E 00,	1.0151111E 00,	DATA 253
266	274	1.0152503E 00,	1.0153865E 00,	1.0155197E 00,	1.0156498E 00,	DATA 254
267	275	1.0157766E 00,	1.0158999E 00,	1.0160196E 00,	1.0161353E 00,	DATA 255
268	276	1.0162468E 00,	1.0163538E 00,	1.0164561E 00,	1.0165534E 00,	DATA 256
269	277	1.0166453E 00,	1.0167314E 00,	1.0168116E 00,	1.0168857E 00,	DATA 257
270	278	1.0169938E 00,	1.0170156E 00,	1.0170711E 00,	1.0171207E 00,	DATA 258
271	279	1.0171647E 00,	1.0172034E 00,	1.0172371E 00,	1.0172660E 00,	DATA 259
272		DATA (RSUN (I), I=181, 216) /				DATA 260
273	281	1.0172906E 00,	1.0173109E 00,	1.0173274E 00,	1.0173402E 00,	DATA 261
274	282	1.0173493E 00,	1.0173548E 00,	1.0173568E 00,	1.0173553E 00,	DATA 262
275	283	1.0173502E 00,	1.0173414E 00,	1.0173288E 00,	1.0173123E 00,	DATA 263
276	284	1.0172916E 00,	1.0172666E 00,	1.0172370E 00,	1.0172026E 00,	DATA 264
277	285	1.0171631E 00,	1.0171181E 00,	1.0170673E 00,	1.0170106E 00,	DATA 265
278	286	1.0169478E 00,	1.0168789E 00,	1.0168034E 00,	1.0167219E 00,	DATA 266
279	287	1.0166346E 00,	1.0165417E 00,	1.0164436E 00,	1.0163409E 00,	DATA 267
280	288	1.0162328E 00,	1.0161209E 00,	1.0160051E 00,	1.0158857E 00,	DATA 268
281	289	1.0157627E 00,	1.0156364E 00,	1.0155069E 00,	1.0153744E 00,	DATA 269
282		DATA (RSUN (I), I=217, 252) /				DATA 270

283	291	1,0452388E 00,	1,0131003E 00,	1,0149588E 00,	1,0148142E 00,	DATA 271
284	292	1,0446655E 00,	1,0143154E 00,	1,0143361E 00,	1,0142030E 00,	DATA 272
285	293	1,0140411E 00,	1,0138749E 00,	1,0137049E 00,	1,0135291E 00,	DATA 273
286	294	1,0133490E 00,	1,0131637E 00,	1,0129731E 00,	1,0127773E 00,	DATA 274
287	295	1,0129766E 00,	1,0123712E 00,	1,0121612E 00,	1,0119470E 00,	DATA 275
288	296	1,0117291E 00,	1,0113076E 00,	1,0112833E 00,	1,0110361E 00,	DATA 276
289	297	1,0108264E 00,	1,0105944E 00,	1,0103609E 00,	1,0101248E 00,	DATA 277
290	298	1,0098875E 00,	1,0094487E 00,	1,0094084E 00,	1,0091668E 00,	DATA 278
291	299	1,0089238E 00,	1,0086794E 00,	1,0084336E 00,	1,0081862E 00,	DATA 279
292		DATA (RSUN (I)) I=253,288, /				DATA 280
293	301	1,0079369E 00,	1,0076856E 00,	1,0074320E 00,	1,0071760E 00,	DATA 281
294	302	1,0069171E 00,	1,0066553E 00,	1,0063901E 00,	1,0061217E 00,	DATA 282
295	303	1,0058502E 00,	1,0055757E 00,	1,0052982E 00,	1,0050182E 00,	DATA 283
296	304	1,0047389E 00,	1,0044517E 00,	1,0041661E 00,	1,0038792E 00,	DATA 284
297	305	1,0035916E 00,	1,0033033E 00,	1,0030149E 00,	1,0027265E 00,	DATA 285
298	306	1,0024384E 00,	1,0021508E 00,	1,0018639E 00,	1,0015778E 00,	DATA 286
299	307	1,0012927E 00,	1,0010083E 00,	1,0007234E 00,	1,0004433E 00,	DATA 287
300	308	1,0001619E 00,	9,9988110E -01,	9,9966083E -01,	9,9933072E -01,	DATA 288
301	309	9,9904054E -01,	9,9876002E -01,	9,9847883E -01,	9,9819702E -01,	DATA 289
302		DATA (RSUN (I)) I=289,324, /				DATA 290
303	311	9,9791452E -01,	9,9763136E -01,	9,9734739E -01,	9,9706298E -01,	DATA 291
304	312	9,9677841E -01,	9,9649393E -01,	9,9620990E -01,	9,9592660E -01,	DATA 292
305	313	9,9564435E -01,	9,9536350E -01,	9,9508438E -01,	9,9480730E -01,	DATA 293
306	314	9,9453236E -01,	9,9426045E -01,	9,9399122E -01,	9,9372908E -01,	DATA 294
307	315	9,9346223E -01,	9,9320283E -01,	9,9294707E -01,	9,9269482E -01,	DATA 295
308	316	9,9244299E -01,	9,9220046E -01,	9,9195823E -01,	9,9171890E -01,	DATA 296
309	317	9,9148226E -01,	9,9124800E -01,	9,9101581E -01,	9,9078561E -01,	DATA 297
310	318	9,9055725E -01,	9,9033062E -01,	9,9010532E -01,	9,8988219E -01,	DATA 298
311	319	9,8966074E -01,	9,8944138E -01,	9,8922426E -01,	9,8900967E -01,	DATA 299
312		DATA (RSUN (I)) I=305,360, /				DATA 300
313	321	9,8879790E -01,	9,8858920E -01,	9,8838390E -01,	9,8818230E -01,	DATA 301
314	322	9,8798469E -01,	9,8779139E -01,	9,8760264E -01,	9,8741874E -01,	DATA 302
315	323	9,8723996E -01,	9,8706652E -01,	9,8689874E -01,	9,8673651E -01,	DATA 303
316	324	9,8657980E -01,	9,8642857E -01,	9,8628286E -01,	9,8614231E -01,	DATA 304
317	325	9,8600662E -01,	9,8587551E -01,	9,8574862E -01,	9,8562579E -01,	DATA 305
318	326	9,8550680E -01,	9,8539142E -01,	9,8527939E -01,	9,8517079E -01,	DATA 306
319	327	9,8505561E -01,	9,8496391E -01,	9,8486570E -01,	9,8477118E -01,	DATA 307
320	328	9,8466031E -01,	9,8459389E -01,	9,8451133E -01,	9,8443368E -01,	DATA 308
321	329	9,8436059E -01,	9,8429254E -01,	9,8422970E -01,	9,8417244E -01,	DATA 309
322		DATA (RSUN (I)) I=361,368, /				DATA 310
323	331	9,8412105E -01,	9,8407579E -01,	9,8403697E -01,	9,8400459E -01,	DATA 311
324	332	9,8397874E -01,	9,8395942E -01,	9,8394682E -01,	9,8394050E -01,	DATA 312
325		DATA (RAMOON(I)) I= 1, 38, /				DATA 312
326	341	6,0670382E 00,	6,2669036E 00,	1,9220380E -01,	4,1370770E -01,	DATA 313
327	342	6,5203494E -01,	9,3914908E -01,	1,1835082E 00,	1,4689927E 00,	DATA 314
328	343	1,7860198E 00,	2,0350126E 00,	2,2998619E 00,	2,5490243E 00,	DATA 315
329	344	2,7844333E 00,	3,0097928E 00,	3,2292587E 00,	3,4466476E 00,	DATA 316
330	345	3,6649668E 00,	3,8860826E 00,	4,1104821E 00,	4,3372174E 00,	DATA 317
331	346	4,5641676E 00,	4,7886517E 00,	5,0082214E 00,	5,2213315E 00,	DATA 318
332	347	5,4276737E 00,	5,6281690E 00,	5,8247625E 00,	6,0201776E 00,	DATA 319
333	348	6,2177085E 00,	6,3785791E -01,	6,5089161E -01,	6,6108111E -01,	DATA 320
334	349	8,1920569E -01,	1,0773391E 00,	1,8491900E 00,	1,6278097E 00,	DATA 321
335		DATA (RAMOON(I)) I= 37, 72, /				DATA 322
336	351	1,9053206E 00,	2,1747618E 00,	2,4323833E 00,	2,6778964E 00,	DATA 323
337	352	2,9134231E 00,	3,1422033E 00,	3,5675690E 00,	3,9923072E 00,	DATA 324
338	353	3,8162300E 00,	4,0459300E 00,	4,2747415E 00,	4,5029827E 00,	DATA 325
339	354	4,7284772E 00,	4,9492127E 00,	5,3639034E 00,	5,7722900E 00,	DATA 326
340	355	5,5751624E 00,	5,7742068E 00,	5,9717973E 00,	6,1708000E 00,	DATA 327
341	356	9,1207087E -02,	3,0265819E -01,	5,2497448E -01,	7,6031567E -01,	DATA 328
342	357	1,0091796E 00,	1,2696234E 00,	1,5371188E 00,	1,8055751E 00,	DATA 329
343	358	2,0492702E 00,	2,3245774E 00,	2,5705657E 00,	2,8089122E 00,	DATA 330
344	359	3,0409470E 00,	3,2707308E 00,	3,5003361E 00,	3,7313291E 00,	DATA 331
345		DATA (RAMOON(I)) I= 73,108, /				DATA 332
346	361	3,9640504E 00,	4,1975608E 00,	4,4299261E 00,	4,6588109E 00,	DATA 333
347	362	4,8821843E 00,	5,0988729E 00,	5,3088038E 00,	5,5129722E 00,	DATA 334
348	363	5,7132214E 00,	5,9120309E 00,	6,2123013E 00,	6,4983914E -02,	DATA 335
349	364	2,4658784E -01,	4,6970562E -01,	7,0516823E -01,	9,5310114E -01,	DATA 336
350	365	1,2112798E 00,	1,4751974E 00,	1,7389633E 00,	1,9975096E 00,	DATA 337
351	366	2,2476869E 00,	2,4889201E 00,	2,7226920E 00,	2,9516843E 00,	DATA 338
352	367	3,1789407E 00,	3,4071775E 00,	3,6382188E 00,	3,8725603E 00,	DATA 339
353	368	4,1091756E 00,	4,3457248E 00,	4,5792149E 00,	4,8269855E 00,	DATA 340
354	369	5,0270463E 00,	5,2792913E 00,	5,4445493E 00,	5,6448330E 00,	DATA 341
355		DATA (RAMOON(I)) I=209,144, /				DATA 342



856	371	5.8428476E 00,	6.0417883E 00,	6.2451296E 00,	1.7321810E-01,	DATA 343
857	372	3.9564925E-01,	6.3153029E-01,	8.6131993E-01,	1.1427676E 00,	DATA 344
858	373	1.4107646E 00,	1.6785463E 00,	1.9399017E 00,	2.1910687E 00,	DATA 345
859	374	2.4313046E 00,	2.6622890E 00,	2.9871010E 00,	3.1093021E 00,	DATA 346
860	375	3.3822347E 00,	3.5584543E 00,	3.7892585E 00,	4.0248663E 00,	DATA 347
861	376	4.2814301E 00,	4.4974949E 00,	4.7289539E 00,	4.9532029E 00,	DATA 348
862	377	5.1686392E 00,	5.3759146E 00,	5.5765790E 00,	5.7732816E 00,	DATA 349
863	378	5.9692433E 00,	6.1682296E 00,	9.0976248E-02,	3.0775397E-01,	DATA 350
864	379	5.3870542E-01,	7.8565808E-01,	1.0477189E 00,	1.8204826E 00,	DATA 351
865		DATA (RAMOON(I), I=145, 180) /				DATA 352
866	381	1.5963177E 00,	1.8673338E 00,	2.1275905E 00,	2.3748216E 00,	DATA 353
867	382	2.6100159E 00,	2.8361921E 00,	3.0372119E 00,	3.2769295E 00,	DATA 354
868	383	3.4985968E 00,	3.7243738E 00,	3.9549042E 00,	4.1890793E 00,	DATA 355
869	384	4.4242212E 00,	4.6568032E 00,	4.8033033E 00,	5.1021324E 00,	DATA 356
870	385	5.3120785E 00,	5.3142509E 00,	5.7107564E 00,	5.9045447E 00,	DATA 357
871	386	6.0991418E 00,	1.5281775E-02,	2.3346437E-01,	4.4450889E-01,	DATA 358
872	387	6.8161512E-01,	9.3603103E-01,	1.8036990E 00,	1.4846507E 00,	DATA 359
873	388	1.7643096E 00,	2.0365134E 00,	2.2962572E 00,	2.5424729E 00,	DATA 360
874	389	2.7770979E 00,	3.0036475E 00,	3.2260595E 00,	3.4479257E 00,	DATA 361
875		DATA (RAMOON(I), I=181, 216) /				DATA 362
876	391	3.6719609E 00,	3.8995847E 00,	4.1306366E 00,	4.3633800E 00,	DATA 363
877	392	4.5949479E 00,	4.8221837E 00,	5.0425635E 00,	5.2548229E 00,	DATA 364
878	393	5.4891278E 00,	5.6568986E 00,	5.8505023E 00,	6.0429738E 00,	DATA 365
879	394	6.2378178E 00,	1.5567183E-01,	3.6684223E-01,	5.9178416E-01,	DATA 366
880	395	8.3306591E-01,	1.0910157E 00,	1.8625951E 00,	1.6413209E 00,	DATA 367
881	396	1.9190333E 00,	2.1887839E 00,	2.4469076E 00,	2.6932289E 00,	DATA 368
882	397	2.9299815E 00,	3.1604939E 00,	3.8881688E 00,	3.6157960E 00,	DATA 369
883	398	3.8450865E 00,	4.0763850E 00,	4.8086327E 00,	4.5306808E 00,	DATA 370
884	399	4.7669365E 00,	4.9881341E 00,	5.2019371E 00,	5.4081948E 00,	DATA 371
885		DATA (RAMOON(I), I=217, 252) /				DATA 372
886	401	5.6078829E 00,	5.8028786E 00,	5.9957154E 00,	6.1803861E 00,	DATA 373
887	402	1.0400598E-01,	3.0939212E-01,	5.2567916E-01,	7.5556315E-01,	DATA 374
888	403	1.0003284E 00,	1.2589299E 00,	1.9274905E 00,	1.7999326E 00,	DATA 375
889	404	2.0498384E 00,	2.3323558E 00,	2.9861567E 00,	2.8313747E 00,	DATA 376
890	405	3.0704217E 00,	3.3060365E 00,	3.5406332E 00,	3.7757249E 00,	DATA 377
891	406	4.0115948E 00,	4.2472626E 00,	4.4807993E 00,	4.7099301E 00,	DATA 378
892	407	4.9327201E 00,	5.1480866E 00,	5.3560069E 00,	5.5574511E 00,	DATA 379
893	408	5.7341813E 00,	5.9485224E 00,	6.1431738E 00,	5.7882511E-02,	DATA 380
894	409	2.6200474E-01,	4.7517904E-01,	6.9967072E-01,	9.3662257E-01,	DATA 381
895		DATA (RAMOON(I), I=253, 288) /				DATA 382
896	411	1.1854245E 00,	1.4433607E 00,	1.7059811E 00,	1.9683159E 00,	DATA 383
897	412	2.2363992E 00,	2.4782757E 00,	2.7240920E 00,	2.9654986E 00,	DATA 384
898	413	3.2047926E 00,	3.4440959E 00,	3.6846853E 00,	3.9245577E 00,	DATA 385
899	414	4.1683434E 00,	4.4076631E 00,	4.6418467E 00,	4.8687302E 00,	DATA 386
900	415	5.0872074E 00,	5.2973918E 00,	5.5004696E 00,	5.6984206E 00,	DATA 387
901	416	5.8937463E 00,	6.0892576E 00,	4.7255682E-03,	2.8945177E-01,	DATA 388
902	417	4.2290816E-01,	6.4708864E-01,	8.9278898E-01,	1.1290710E 00,	DATA 389
903	418	1.3830623E 00,	1.6404539E 00,	1.8967013E 00,	2.1483823E 00,	DATA 390
904	419	2.3940212E 00,	2.6341142E 00,	2.8705873E 00,	3.1060396E 00,	DATA 391
905		DATA (RAMOON(I), I=289, 324) /				DATA 392
906	421	3.3429782E 00,	3.5831099E 00,	3.8267520E 00,	4.0725287E 00,	DATA 393
907	422	4.3175820E 00,	4.5583599E 00,	4.7916933E 00,	5.0156596E 00,	DATA 394
908	423	5.2299137E 00,	5.4355320E 00,	5.6346304E 00,	5.8299809E 00,	DATA 395
909	424	6.0247275E 00,	6.2221905E 00,	1.4250481E-01,	3.8510985E-01,	DATA 396
910	425	5.7921616E-01,	8.1391780E-01,	1.0643124E 00,	1.3211499E 00,	DATA 397
911	426	1.5813443E 00,	1.8394262E 00,	2.0912471E 00,	2.3350022E 00,	DATA 398
912	427	2.5712401E 00,	2.8022087E 00,	3.0310245E 00,	3.2609044E 00,	DATA 399
913	428	3.4944764E 00,	3.7331301E 00,	3.9764837E 00,	4.2221308E 00,	DATA 400
914	429	4.4666011E 00,	4.7056783E 00,	4.9356272E 00,	5.1554866E 00,	DATA 401
915		DATA (RAMOON(I), I=325, 360) /				DATA 402
916	431	5.3652879E 00,	5.5667111E 00,	5.7624115E 00,	5.9556289E 00,	DATA 403
917	432	6.1499310E 00,	6.5850983E-02,	2.7343073E-01,	4.9279830E-01,	DATA 404
918	433	7.2608755E-01,	9.7376345E-01,	1.2333913E 00,	1.4997711E 00,	DATA 405
919	434	1.7661764E 00,	2.0265647E 00,	2.7273955E 00,	2.5181239E 00,	DATA 406
920	435	2.7305716E 00,	2.9779098E 00,	3.8037399E 00,	3.4313452E 00,	DATA 407
921	436	3.6631712E 00,	3.9000385E 00,	4.2413326E 00,	4.3834091E 00,	DATA 408
922	437	4.6232114E 00,	4.8566325E 00,	5.0809443E 00,	5.2952874E 00,	DATA 409
923	438	5.5002263E 00,	5.6977743E 00,	5.8907413E 00,	6.0824683E 00,	DATA 410
924	439	6.2766094E 00,	1.9379327E-01,	4.0414706E-01,	6.2776470E-01,	DATA 411
925		DATA (RAMOON(I), I=361, 368) /				DATA 412
926	441	8.6470383E-01,	1.1207837E 00,	1.3867574E 00,	1.6585221E 00,	DATA 413
927	442	1.9288469E 00,	2.1918297E 00,	2.6445328E 00,	2.6870799E 00,	DATA 414
928		DATA (RAMOON(I), I= 1, 36) /				DATA 414

429	431	6,04827066E-03,	9,3448413E-02,	1,7923171E-01,	2,5943321E-01,	DATA 415
430	432	3,2905591E-01,	3,8204379E-01,	4,21196086E-01,	4,1357039E-01,	DATA 416
431	433	3,8483349E-01,	3,2805030E-01,	2,4923077E-01,	1,5619917E-01,	DATA 417
432	434	5,6718959E-02,	-4,2585013E-02,	-1,3650091E-01,	-2,2103787E-01,	DATA 418
433	435	-2,9302271E-01,	-3,5018234E-01,	-3,9033744E-01,	-4,1216662E-01,	DATA 419
434	436	-4,1502245E-01,	-3,9915096E-01,	-3,6571404E-01,	-3,1664907E-01,	DATA 420
435	437	-2,5442434E-01,	-1,8178784E-01,	-1,6158788E-01,	-1,6700991E-02,	DATA 421
436	438	6,9932735E-02,	1,5917028E-01,	2,3346365E-01,	3,8663990E-01,	DATA 422
437	439	3,6379879E-01,	4,0154598E-01,	4,1480055E-01,	4,8016039E-01,	DATA 423
438		DATA (BCMOQN(I),I)=37,721,				DATA 424
439	461	3,3728576E-01,	2,8939449E-01,	2,8257922E-01,	1,8435282E-01,	DATA 425
440	462	2,2451643E-03,	-9,7108836E-02,	-1,8833758E-01,	-2,6732438E-01,	DATA 426
441	463	-3,3103421E-01,	-3,7734156E-01,	-4,0494110E-01,	-4,333582E-01,	DATA 427
442	464	-4,0284046E-01,	-3,7453318E-01,	-3,8013262E-01,	-2,7183186E-01,	DATA 428
443	465	-2,0214389E-01,	-1,2379937E-01,	-3,9708385E-02,	4,7021884E-02,	DATA 429
444	466	1,3302690E-01,	2,1460029E-01,	2,8762013E-01,	3,4759352E-01,	DATA 430
445	467	3,8970156E-01,	4,0968495E-01,	4,0437429E-01,	3,8277809E-01,	DATA 431
446	468	3,1855183E-01,	2,3981162E-01,	1,8840473E-01,	4,9008099E-02,	DATA 432
447	469	-5,1665224E-02,	-1,4744565E-01,	-2,8306938E-01,	-3,8436955E-01,	DATA 433
448		DATA (BCMOQN(I),I)=73,108,				DATA 434
449	471	-3,5833036E-01,	-3,9313951E-01,	-4,0811202E-01,	-4,8360300E-01,	DATA 435
450	472	-3,8080940E-01,	-3,151902E-01,	-2,8787163E-01,	-2,2219781E-01,	DATA 436
451	473	-1,4696416E-01,	-6,4817509E-02,	2,1326531E-02,	1,8812790E-01,	DATA 437
452	474	1,9174842E-01,	2,6780719E-01,	3,8150068E-01,	3,7799445E-01,	DATA 438
453	475	4,0286197E-01,	4,0331479E-01,	3,7851495E-01,	3,3000740E-01,	DATA 439
454	476	2,6133499E-01,	1,7737296E-01,	8,3683670E-02,	1,2945481E-02,	DATA 440
455	477	-1,0981028E-01,	-1,9853760E-01,	-2,7534017E-01,	-3,8629555E-01,	DATA 441
456	478	-3,7862099E-01,	-4,0087081E-01,	-4,0296427E-01,	-3,8599304E-01,	DATA 442
457	479	-3,5185888E-01,	-3,0287495E-01,	-2,6146528E-01,	-1,7062885E-01,	DATA 443
458		DATA (BCMOQN(I),I)=109,144,				DATA 444
459	481	-9,0966619E-02,	-6,8300688E-03,	7,9459336E-02,	1,6437827E-01,	DATA 445
460	482	2,4363580E-01,	3,1219059E-01,	3,8459945E-01,	3,9579998E-01,	DATA 446
461	483	4,0221431E-01,	3,8272411E-01,	3,8895810E-01,	2,7473849E-01,	DATA 447
462	484	1,9310402E-01,	1,0546156E-01,	1,1119103E-02,	8,2862854E-02,	DATA 448
463	485	-1,7168137E-01,	-2,5082327E-01,	-3,1621531E-01,	-3,6451375E-01,	DATA 449
464	486	-3,9346591E-01,	-4,0219354E-01,	-3,9123322E-01,	-3,6227608E-01,	DATA 450
465	487	-3,1771377E-01,	-2,6018605E-01,	-1,9228098E-01,	-1,2643688E-01,	DATA 451
466	488	-3,5022785E-02,	4,9452113E-02,	1,3404950E-01,	2,1509936E-01,	DATA 452
467	489	2,8796275E-01,	3,4713066E-01,	3,8676030E-01,	4,6189738E-01,	DATA 453
468		DATA (BCMOQN(I),I)=145,180,				DATA 454
469	491	3,8995810E-01,	3,5166962E-01,	2,9081384E-01,	2,3301051E-01,	DATA 455
470	492	1,2437889E-01,	3,0686351E-02,	-6,2943328E-02,	-1,5198005E-01,	DATA 456
471	493	-2,3233991E-01,	-3,0030924E-01,	-3,5264076E-01,	-3,8681459E-01,	DATA 457
472	494	-4,0138397E-01,	-3,9621693E-01,	-3,7247456E-01,	-3,3230254E-01,	DATA 458
473	495	-2,7837560E-01,	-2,1348600E-01,	-1,4029765E-01,	-6,329184E-02,	DATA 459
474	496	2,1125458E-02,	1,0439633E-01,	1,8550565E-01,	2,6065852E-01,	DATA 460
475	497	3,2506512E-01,	3,7306509E-01,	3,9888352E-01,	3,9809334E-01,	DATA 461
476	498	3,6924432E-01,	3,1462473E-01,	2,3958686E-01,	1,5097424E-01,	DATA 462
477	499	5,5649785E-02,	-4,0325281E-02,	-1,3189640E-01,	-2,1488276E-01,	DATA 463
478		DATA (BCMOQN(I),I)=181,216,				DATA 464
479	501	-2,8976969E-01,	-3,4159734E-01,	-3,8001932E-01,	-3,9950788E-01,	DATA 465
480	502	-3,9958889E-01,	-3,8094745E-01,	-3,4530548E-01,	-2,9510415E-01,	DATA 466
481	503	-2,3312555E-01,	-1,6218866E-01,	-8,4988194E-02,	-4,8831227E-03,	DATA 467
482	504	7,7989695E-02,	1,5850595E-01,	2,3428403E-01,	3,8141867E-01,	DATA 468
483	505	3,5515434E-01,	3,9013159E-01,	4,8125491E-01,	3,8514544E-01,	DATA 469
484	506	3,4156853E-01,	2,7390232E-01,	1,8831668E-01,	9,2234738E-02,	DATA 470
485	507	-7,0668361E-03,	-1,0327180E-01,	-1,9127094E-01,	-2,4707533E-01,	DATA 471
486	508	-3,2763829E-01,	-3,7074602E-01,	-3,9502859E-01,	-4,8004360E-01,	DATA 472
487	509	-3,8632681E-01,	-3,5532131E-01,	-3,0917297E-01,	-2,8043889E-01,	DATA 473
488		DATA (BCMOQN(I),I)=217,252,				DATA 474
489	511	-1,8193791E-01,	-1,0638398E-01,	-2,4520165E-02,	5,4954275E-02,	DATA 475
490	512	1,3525955E-01,	2,1137410E-01,	2,9935239E-01,	3,3669323E-01,	DATA 476
491	513	3,7739465E-01,	3,9737261E-01,	3,9284778E-01,	3,6201147E-01,	DATA 477
492	514	3,0593107E-01,	2,2865786E-01,	1,3647842E-01,	3,6730761E-02,	DATA 478
493	515	-6,3316463E-02,	-1,5723587E-01,	-2,3981876E-01,	-3,8716292E-01,	DATA 479
494	516	-3,5662244E-01,	-3,8673126E-01,	-3,9712865E-01,	-3,8845276E-01,	DATA 480
495	517	-3,6216530E-01,	-3,2031921E-01,	-2,6532353E-01,	-1,9976152E-01,	DATA 481
496	518	-1,2628842E-01,	-4,7604860E-02,	3,5513564E-02,	1,4415080E-01,	DATA 482
497	519	1,9116592E-01,	2,6111239E-01,	3,2020473E-01,	3,6440809E-01,	DATA 483
498		DATA (BCMOQN(I),I)=253,288,				DATA 484
499	521	3,8974606E-01,	3,9287904E-01,	3,7188892E-01,	3,2678455E-01,	DATA 485
500	522	2,6006059E-01,	1,7616476E-01,	8,1066310E-02,	-1,8494913E-02,	DATA 486
501	523	-1,1572348E-01,	-2,0439321E-01,	-2,7933061E-01,	-3,9573529E-01,	DATA 487



502	524	-3.7433727E-01,	-3.9138827E-01,	-3.8847959E-01,	-3.6721236E-01,	DATA 488
503	525	-3.2980467E-01,	-2.7874613E-01,	-2.1637736E-01,	-1.4581088E-01,	DATA 489
504	526	-6.8964100E-02,	1.1340966E-02,	9.2253407E-02,	1.7058107E-01,	DATA 490
505	527	2.4272720E-01,	3.0472346E-01,	3.5241989E-01,	3.8188310E-01,	DATA 491
506	528	3.8998617E-01,	3.7503900E-01,	3.8720879E-01,	2.7895233E-01,	DATA 492
507	529	2.0270846E-01,	1.1445869E-01,	1.9326202E-02,	-7.6760704E-02/	DATA 493
508		DATA (BMOON I), I=289, 324/				DATA 494 6
509	531	-1.6780836E-01,	-2.4816751E-01,	-3.1301799E-01,	-3.9885665E-01,	DATA 495
510	532	-3.8385207E-01,	-3.8791800E-01,	-3.7244327E-01,	-3.3977789E-01,	DATA 496
511	533	-2.9268368E-01,	-2.3393248E-01,	-1.8611963E-01,	-9.1669889E-02,	DATA 497
512	534	-1.2967680E-02,	6.7438822E-02,	1.4662981E-01,	2.2113983E-01,	DATA 498
513	535	2.8690336E-01,	3.3941775E-01,	3.7421605E-01,	3.8763897E-01,	DATA 499
514	536	3.7768150E-01,	3.4452027E-01,	2.9044258E-01,	2.8927850E-01,	DATA 500
515	537	1.3571014E-01,	4.4769398E-02,	4.8403861E-02,	-1.3864889E-01,	DATA 501
516	538	-2.2087522E-01,	-2.9028723E-01,	-3.4279215E-01,	-3.7351963E-01,	DATA 502
517	539	-3.8725240E-01,	-3.7853013E-01,	-3.9133272E-01,	-3.8848728E-01/	DATA 503
518		DATA (BMOON I), I=325, 360/				DATA 504 6
519	541	-2.5306935E-01,	-1.8800199E-01,	-1.1590535E-01,	-3.9149408E-02,	DATA 505
520	542	3.9962211E-02,	1.1893731E-01,	1.9482047E-01,	2.6396645E-01,	DATA 506
521	543	3.2197697E-01,	3.6396847E-01,	3.9531081E-01,	3.8275042E-01,	DATA 507
522	544	3.5545268E-01,	3.0534828E-01,	2.8658118E-01,	1.9447331E-01,	DATA 508
523	545	6.4999136E-02,	-2.7728878E-02,	-1.1760097E-01,	-2.8046555E-01,	DATA 509
524	546	-2.7209239E-01,	-3.2868316E-01,	-3.6717939E-01,	-3.8569033E-01,	DATA 510
525	547	-3.8383465E-01,	-3.6277496E-01,	-3.2488232E-01,	-2.7318484E-01,	DATA 511
526	548	-2.1084201E-01,	-1.4080799E-01,	-6.5717307E-02,	1.2049614E-02,	DATA 512
527	549	9.0180963E-02,	1.6617522E-01,	2.3706296E-01,	2.9915941E-01/	DATA 513
528		DATA (BMOON I), I=361, 368/				DATA 514 6
529	551	3.4801684E-01,	3.7874619E-01,	3.8689281E-01,	3.6073078E-01,	DATA 515
530	552	3.2738084E-01,	2.6304198E-01,	1.8219088E-01,	9.3301940E-02/	DATA 516
531		DATA (BMOON I), I=369, 376/				DATA 516 6
532	561	6.2088429E 01,	6.1336888E 01,	6.0466013E 01,	5.9514833E 01,	DATA 517
533	562	5.8940477E 01,	5.7615742E 01,	5.6822605E 01,	5.6241383E 01,	DATA 518
534	563	5.5936960E 01,	5.5945591E 01,	5.4826677E 01,	5.4663310E 01,	DATA 519
535	564	5.7665574E 01,	5.8604688E 01,	5.9586258E 01,	6.0541145E 01,	DATA 520
536	565	6.1411946E 01,	6.2159429E 01,	6.2761899E 01,	6.3212912E 01,	DATA 521
537	566	6.3515662E 01,	6.3682776E 01,	6.3728226E 01,	6.3689703E 01,	DATA 522
538	567	6.3505565E 01,	6.3253376E 01,	6.2909827E 01,	6.2472140E 01,	DATA 523
539	568	6.1936854E 01,	6.1303562E 01,	6.0579095E 01,	5.9781853E 01,	DATA 524
540	569	5.8944049E 01,	5.8114925E 01,	5.7356803E 01,	5.6740158E 01/	DATA 525
541		DATA (BMOON I), I=377, 72/				DATA 526 6
542	571	5.6333476E 01,	5.6190727E 01,	5.6339554E 01,	5.6774108E 01,	DATA 527
543	572	5.7455198E 01,	5.8317617E 01,	5.9281869E 01,	6.0266513E 01,	DATA 528
544	573	6.1198205E 01,	6.2018206E 01,	6.2685442E 01,	6.3178821E 01,	DATA 529
545	574	6.3485627E 01,	6.3618742E 01,	6.3593159E 01,	6.3432142E 01,	DATA 530
546	575	6.3161380E 01,	6.2805475E 01,	6.2385131E 01,	6.1915478E 01,	DATA 531
547	576	6.1405889E 01,	6.0861396E 01,	6.0285499E 01,	5.9683964E 01,	DATA 532
548	577	5.9068956E 01,	5.8462473E 01,	5.7897951E 01,	5.7419049E 01,	DATA 533
549	578	5.7075082E 01,	5.6913314E 01,	5.6969461E 01,	5.7258889E 01,	DATA 534
550	579	5.7771255E 01,	5.8470431E 01,	5.9299603E 01,	6.0189840E 01/	DATA 535
551		DATA (BMOON I), I=73, 108/				DATA 536 6
552	581	6.1069504E 01,	6.1872600E 01,	6.2544796E 01,	6.3046993E 01,	DATA 537
553	582	6.3356762E 01,	6.3468127E 01,	6.3390121E 01,	6.3144423E 01,	DATA 538
554	583	6.2762242E 01,	6.230592E 01,	6.1738194E 01,	6.1171354E 01,	DATA 539
555	584	6.0610453E 01,	6.0077639E 01,	5.9586323E 01,	5.9142579E 01,	DATA 540
556	585	5.8748268E 01,	5.8405105E 01,	5.8118597E 01,	5.8000663E 01,	DATA 541
557	586	5.7769992E 01,	5.7749698E 01,	5.7862532E 01,	5.8124712E 01,	DATA 542
558	587	5.8540011E 01,	5.9095851E 01,	5.9762536E 01,	6.049593E 01,	DATA 543
559	588	6.1241838E 01,	6.1943634E 01,	6.2547067E 01,	6.3008124E 01,	DATA 544
560	589	6.3286712E 01,	6.3369102E 01,	6.3249129E 01,	6.2938267E 01/	DATA 545
561		DATA (BMOON I), I=109, 144/				DATA 546 6
562	591	6.2462615E 01,	6.1860763E 01,	6.1180493E 01,	6.0474285E 01,	DATA 547
563	592	5.9793918E 01,	5.9184787E 01,	5.8680978E 01,	5.8302236E 01,	DATA 548
564	593	5.8053639E 01,	5.7928165E 01,	5.7911416E 01,	5.7987117E 01,	DATA 549
565	594	5.8141845E 01,	5.8367712E 01,	5.8662502E 01,	5.9027442E 01,	DATA 550
566	595	5.9463407E 01,	5.9966719E 01,	6.0525743E 01,	6.119142E 01,	DATA 551
567	596	6.1716208E 01,	6.2279076E 01,	6.2766276E 01,	6.3136961E 01,	DATA 552
568	597	6.3355136E 01,	6.3393508E 01,	6.3236633E 01,	6.2883267E 01,	DATA 553
569	598	6.2347800E 01,	6.1660604E 01,	6.0867028E 01,	6.0244649E 01,	DATA 554
570	599	5.9198494E 01,	5.8454288E 01,	5.7850342E 01,	5.7429593E 01/	DATA 555
571		DATA (BMOON I), I=145, 180/				DATA 556 6
572	601	5.7213797E 01,	5.7201740E 01,	5.7372093E 01,	5.7690003E 01,	DATA 557
573	602	5.8115286E 01,	5.8609851E 01,	5.9142702E 01,	5.9691910E 01,	DATA 558
574	603	6.0243831E 01,	6.0790365E 01,	6.1325322E 01,	6.1840891E 01,	DATA 559



975	604	6.2324963E	01,	6.2759812E	01,	6.3122302E	01,	6.3385497E	01,	DATA 560		
976	605	6.3521367E	01,	6.3504151E	01,	6.3314006E	01,	6.2940571E	01,	DATA 561		
977	606	6.2386139E	01,	6.1668162E	01,	6.0820776E	01,	5.9894794E	01,	DATA 562		
978	607	5.8955442E	01,	5.8077286E	01,	5.7336060E	01,	5.6798141E	01,	DATA 563		
979	608	5.6809715E	01,	5.6488822E	01,	5.6723071E	01,	5.7173920E	01,	DATA 564		
980	609	5.7785937E	01,	5.8497833E	01,	5.9252138E	01,	6.0001652E	01/	DATA 565		
981		DATA (RMOON (I),I=181,216)/										
982	611	6.0712215E	01,	6.1362321E	01,	6.1940584E	01,	6.2442160E	01,	DATA 567		
983	612	6.2864979E	01,	6.3206376E	01,	6.3460640E	01,	6.3617925E	01,	DATA 568		
984	613	6.3664549E	01,	6.3584501E	01,	6.3361924E	01,	6.2984430E	01,	DATA 569		
985	614	6.2468400E	01,	6.1754898E	01,	6.0928502E	01,	6.0004094E	01,	DATA 570		
986	615	5.9035137E	01,	5.8090524E	01,	5.7248678E	01,	5.6588387E	01,	DATA 571		
987	616	5.6176484E	01,	5.6055381E	01,	5.6234424E	01,	5.6688297E	01,	DATA 572		
988	617	5.7363159E	01,	5.8188097E	01,	5.9087918E	01,	5.993770E	01,	DATA 573		
989	618	6.0849923E	01,	6.1616623E	01,	6.2269733E	01,	6.2798388E	01,	DATA 574		
990	619	6.3201324E	01,	6.3483223E	01,	6.3865086E	01,	6.3710055E	01/	DATA 575		
991		DATA (RMOON (I),I=217,252)/										
992	621	6.3663568E	01,	6.3510411E	01,	6.3246195E	01,	6.2864770E	01,	DATA 577		
993	622	6.2361053E	01,	6.1734685E	01,	6.0993925E	01,	6.0159282E	01,	DATA 578		
994	623	5.9266311E	01,	5.8366616E	01,	5.7525909E	01,	5.6818226E	01,	DATA 579		
995	624	5.6316139E	01,	5.6078263E	01,	5.6137146E	01,	5.6491545E	01,	DATA 580		
996	625	5.7106060E	01,	5.7918278E	01,	5.8850718E	01,	5.9823488E	01,	DATA 581		
997	626	6.0764484E	01,	6.1615856E	01,	6.2336846E	01,	6.2903760E	01,	DATA 582		
998	627	6.3307977E	01,	6.3552859E	01,	6.3850151E	01,	6.3616221E	01,	DATA 583		
999	628	6.3468576E	01,	6.3222994E	01,	6.2891597E	01,	6.2482068E	01,	DATA 584		
600	629	6.1998271E	01,	6.1442299E	01,	6.0817644E	01,	6.0132957E	01/	DATA 585		
601		DATA (RMOON (I),I=253,288)/										
602	631	5.9405823E	01,	5.8663768E	01,	5.7955423E	01,	5.7328786E	01,	DATA 587		
603	632	5.6845883E	01,	5.6563940E	01,	5.6526534E	01,	5.6753551E	01,	DATA 588		
604	633	5.7235249E	01,	5.7932608E	01,	5.8783820E	01,	5.9714557E	01,	DATA 589		
605	634	6.0648810E	01,	6.1517816E	01,	6.2266069E	01,	6.2854456E	01,	DATA 590		
606	635	6.3260980E	01,	6.3479709E	01,	6.3518538E	01,	6.3396230E	01,	DATA 591		
607	636	6.3138945E	01,	6.2776531E	01,	6.2338885E	01,	6.1852532E	01,	DATA 592		
608	637	6.1338743E	01,	6.0812201E	01,	6.0281687E	01,	5.9753270E	01,	DATA 593		
609	638	5.9231726E	01,	5.8726443E	01,	5.8253808E	01,	5.7839192E	01,	DATA 594		
610	639	5.7516212E	01,	5.7322955E	01,	5.7295444E	01,	5.7459610E	01/	DATA 595		
611		DATA (RMOON (I),I=289,324)/										
612	641	5.7823917E	01,	5.8374926E	01,	5.9077261E	01,	5.9877904E	01,	DATA 597		
613	642	6.0713407E	01,	6.1518006E	01,	6.2230935E	01,	6.2802001E	01,	DATA 598		
614	643	6.3195185E	01,	6.3390453E	01,	6.3384053E	01,	6.3187606E	01,	DATA 599		
615	644	6.2826186E	01,	6.2335486E	01,	6.1758130E	01,	6.1139294E	01,	DATA 600		
616	645	6.0321991E	01,	5.9942650E	01,	5.9427789E	01,	5.8992555E	01,	DATA 601		
617	646	5.8641586E	01,	5.8372045E	01,	5.8178081E	01,	5.8055469E	01,	DATA 602		
618	647	5.8005129E	01,	5.8034476E	01,	5.8156087E	01,	5.8383938E	01,	DATA 603		
619	648	5.8728122E	01,	5.9189513E	01,	5.9755933E	01,	6.0400871E	01,	DATA 604		
620	649	6.1089050E	01,	6.1760347E	01,	6.2375058E	01,	6.2879440E	01/	DATA 605		
621		DATA (RMOON (I),I=325,360)/										
622	651	6.3230709E	01,	6.3397885E	01,	6.3360431E	01,	6.3118534E	01,	DATA 607		
623	652	6.2685270E	01,	6.2090290E	01,	6.1377712E	01,	6.0601879E	01,	DATA 608		
624	653	5.9823496E	01,	5.9102787E	01,	5.8492460E	01,	5.8031115E	01,	DATA 609		
625	654	5.7738816E	01,	5.7616170E	01,	5.7647272E	01,	5.7805664E	01,	DATA 610		
626	655	5.8061504E	01,	5.8387937E	01,	5.8765287E	01,	5.9182055E	01,	DATA 611		
627	656	5.9633547E	01,	6.0118261E	01,	6.0633543E	01,	6.1171636E	01,	DATA 612		
628	657	6.1717066E	01,	6.2245868E	01,	6.2726699E	01,	6.3123547E	01,	DATA 613		
629	658	6.3399461E	01,	6.3520723E	01,	6.3460938E	01,	6.3204682E	01,	DATA 614		
630	659	6.2750529E	01,	6.2113269E	01,	6.1325023E	01,	6.0434917E	01/	DATA 615		
631		DATA (RMOON (I),I=361,368)/										
632	661	5.9306640E	01,	5.8613507E	01,	5.7830741E	01,	5.7225577E	01,	DATA 617		
633	662	5.6847003E	01,	5.6717946E	01,	5.6832482E	01,	5.7159197E	01/	DATA 618		
634		END										
										DATA 619	6	

29748 WORDS OF MEMORY USED BY THIS COMPILATION

71034 02 11-03-72 11.666 1974 ERMEMERIS

PREFACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

PRIMARY SYMDEF ENTRY

TABLE 0  
SECONDARY SYMDEF ENTRY

BLOCK	LENGTH
1 EPHBLK	11
SYMPREF	

END OF BINARY CARD \*1974\*19  
4273 IS THE NEXT AVAILABLE LOCATION,  
GMAP VERSION/ASSEMBLY DATES JMAP 110171/102971 JMPB 110171/102971 JMPC 110171/102971  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19421 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY;

71034 02 11-03-72 11.690 1975 EPHEMERIS

LINE	SYMBOL	TEXT	DATA	INDEX
1	C*1975*	1975 EPHEMERIS	DATA	1
2		SUBROUTINE TABLE	DATA	2
3		DIMENSION RASUN (369), DCSUN (369), RSUN (369)	DATA	3
4		DIMENSION RAMOON(369), DCMOON(369), RMOON(369)	DATA	4
5		DIMENSION ARRAY(2214)		
6		DOUBLE PRECISION Y		
7		EQUIVALENCE (RASUN,ARRAY), (DCSUN,ARRAY(370)), (RSUN,ARRAY(739))		
8		EQUIVALENCE (RAMOON,ARRAY(1108)), (DCMOON,ARRAY(1477))		
9		EQUIVALENCE (RMOON,ARRAY(1846))		
10		COMMON /EPHBLK/ Y(4), I		
11		Y(1) = ARRAY(I)		
12		Y(2) = ARRAY(I+1)		
13		Y(3) = ARRAY(I+2)		
14		Y(4) = ARRAY(I+3)		
15		RETURN		
16		DATA (RASUN (I), I = 1, 36)/	DATA	6
17	11	4.8817290E 00, 4.9010103E 00, 4.9202750E 00, 4.9395173E 00,	DATA	7
18	12	4.9587352E 00, 4.9779271E 00, 4.9970906E 00, 5.0162236E 00,	DATA	8
19	13	5.0353240E 00, 5.0543898E 00, 5.0734189E 00, 5.0924081E 00,	DATA	9
20	14	5.1113565E 00, 5.1302617E 00, 5.1491218E 00, 5.1679350E 00,	DATA	10
21	15	5.1866998E 00, 5.2054146E 00, 5.2240780E 00, 5.2426887E 00,	DATA	11
22	16	5.2612435E 00, 5.2797475E 00, 5.2981937E 00, 5.3165835E 00,	DATA	12
23	17	5.3349159E 00, 5.3531902E 00, 5.3714063E 00, 5.3895636E 00,	DATA	13
24	18	5.4076622E 00, 5.4257017E 00, 5.4433682E 00, 5.4616047E 00,	DATA	14
25	19	5.4794684E 00, 5.4972744E 00, 5.5150225E 00, 5.5327128E 00/	DATA	15
26		DATA (RASUN (I), I = 37, 72)/	DATA	16
27	21	5.5503454E 00, 5.5679204E 00, 5.5854379E 00, 5.6028980E 00,	DATA	17
28	22	5.6203008E 00, 5.6376464E 00, 5.6549334E 00, 5.6721680E 00,	DATA	18
29	23	5.6893446E 00, 5.7064658E 00, 5.7235323E 00, 5.7405446E 00,	DATA	19
30	24	5.7575034E 00, 5.7744097E 00, 5.7912642E 00, 5.8080680E 00,	DATA	20
31	25	5.8248218E 00, 5.8415266E 00, 5.8581836E 00, 5.8747941E 00,	DATA	21
32	26	5.8913594E 00, 5.9078839E 00, 5.9243603E 00, 5.9407994E 00,	DATA	22
33	27	5.9571998E 00, 5.9735634E 00, 5.9898917E 00, 6.0061359E 00,	DATA	23
34	28	6.0224476E 00, 6.0386780E 00, 6.0548783E 00, 6.0710498E 00,	DATA	24
35	29	6.0871937E 00, 6.1033113E 00, 6.1194039E 00, 6.1354727E 00/	DATA	25
36		DATA (RASUN (I), I = 73, 108)/	DATA	26
37	31	6.1515190E 00, 6.1675441E 00, 6.1835494E 00, 6.1995336E 00,	DATA	27
38	32	6.2155055E 00, 6.2314590E 00, 6.2473978E 00, 6.2633233E 00,	DATA	28
39	33	6.2792368E 00, 6.2954059E=02, 6.311847394E=02, 6.32876E=02,	DATA	29
40	34	6.3486928E=02, 6.366928E=02, 6.3859040E=02, 6.40523047E=01,	DATA	30
41	35	1.2310315E=01, 1.2497907E=01, 1.2685974E=01, 1.2874676E=01,	DATA	31
42	36	1.3064163E=01, 1.3254593E=01, 1.3446086E=01, 1.3638774E=01,	DATA	32
43	37	1.3832784E=01, 1.4028242E=01, 1.4225273E=01, 1.4423998E=01,	DATA	33
44	38	1.4624528E=01, 1.4826978E=01, 1.5031459E=01, 1.5238057E=01,	DATA	34
45	39	1.5446883E=01, 1.5658027E=01, 1.5871071E=01, 1.6086014E=01/	DATA	35
46		DATA (RASUN (I), I=109, 144)/	DATA	36
47	41	4.4306216E=01, 4.5274555E=01, 4.62551433E=01, 4.7248248E=01,	DATA	37
48	42	5.0808004E=01, 5.2440793E=01, 5.4076762E=01, 5.5716041E=01,	DATA	38
49	43	5.7358753E=01, 5.9003021E=01, 6.0654935E=01, 6.2308592E=01,	DATA	39
50	44	6.3966072E=01, 6.5627465E=01, 6.7292823E=01, 6.8962202E=01,	DATA	40
51	45	7.0635653E=01, 7.2313225E=01, 7.39994955E=01, 7.5680871E=01,	DATA	41
52	46	7.7370995E=01, 7.9065344E=01, 8.0763918E=01, 8.2466704E=01,	DATA	42
53	47	8.4173687E=01, 8.5884841E=01, 8.7600123E=01, 8.9319485E=01,	DATA	43
54	48	9.1042871E=01, 9.2770218E=01, 9.4501492E=01, 9.6236655E=01,	DATA	44

55	49	9.7975674E-01,	9.9718493E-01,	1.0146512E 00,	1.8321552E 00/	DATA	45
56		DATA (RASUN I), I=145, 180, /				DATA	46
57	51	1.0496969E 00,	1.0672756E 00,	1.0848911E 00,	1.1025426E 00,	DATA	47
58	52	1.1202296E 00,	1.1379516E 00,	1.1557074E 00,	1.1734965E 00,	DATA	48
59	53	1.1913176E 00,	1.2091700E 00,	1.2270524E 00,	1.2449637E 00,	DATA	49
60	54	1.2629026E 00,	1.2808679E 00,	1.2988579E 00,	1.3168710E 00,	DATA	50
61	55	1.3349057E 00,	1.3529601E 00,	1.3710322E 00,	1.3891200E 00,	DATA	51
62	56	1.4072213E 00,	1.4253343E 00,	1.4434573E 00,	1.4615884E 00,	DATA	52
63	57	1.4797238E 00,	1.4978678E 00,	1.5160130E 00,	1.5341600E 00,	DATA	53
64	58	1.5823074E 00,	1.5704536E 00,	1.5885971E 00,	1.6067364E 00,	DATA	54
65	59	1.6248700E 00,	1.6429966E 00,	1.6611143E 00,	1.6792224E 00/	DATA	55
66		DATA (RASUN I), I=16, 216, /				DATA	56
67	61	1.6973187E 00,	1.7154021E 00,	1.7334710E 00,	1.7515240E 00,	DATA	57
68	62	1.7695595E 00,	1.7875762E 00,	1.8055724E 00,	1.8235465E 00,	DATA	58
69	63	1.8414969E 00,	1.8594220E 00,	1.8773199E 00,	1.8951888E 00,	DATA	59
70	64	1.9130270E 00,	1.9308328E 00,	1.9486049E 00,	1.9663419E 00,	DATA	60
71	65	1.9840428E 00,	2.0017063E 00,	2.0193318E 00,	2.0369185E 00,	DATA	61
72	66	2.0544657E 00,	2.0719726E 00,	2.0894387E 00,	2.1068635E 00,	DATA	62
73	67	2.1242466E 00,	2.1415878E 00,	2.1588868E 00,	2.1761433E 00,	DATA	63
74	68	2.1933572E 00,	2.2105286E 00,	2.2276573E 00,	2.2447432E 00,	DATA	64
75	69	2.2617866E 00,	2.2787872E 00,	2.2957453E 00,	2.3126606E 00/	DATA	65
76		DATA (RASUN I), I=217, 252, /				DATA	66
77	71	2.3295332E 00,	2.3463632E 00,	2.3631501E 00,	2.3798939E 00,	DATA	67
78	72	2.3965943E 00,	2.4132514E 00,	2.4298654E 00,	2.4464363E 00,	DATA	68
79	73	2.4629647E 00,	2.4794506E 00,	2.4958947E 00,	2.5122979E 00,	DATA	69
80	74	2.5286606E 00,	2.5449835E 00,	2.5612675E 00,	2.5775134E 00,	DATA	70
81	75	2.5937223E 00,	2.6098953E 00,	2.6260335E 00,	2.6421381E 00,	DATA	71
82	76	2.6582102E 00,	2.6742512E 00,	2.6902622E 00,	2.7062447E 00,	DATA	72
83	77	2.7221998E 00,	2.7381289E 00,	2.7540331E 00,	2.7699137E 00,	DATA	73
84	78	2.7857717E 00,	2.8016085E 00,	2.8174248E 00,	2.8332216E 00,	DATA	74
85	79	2.8489998E 00,	2.8647606E 00,	2.8805049E 00,	2.8962339E 00/	DATA	75
86		DATA (RASUN I), I=253, 288, /				DATA	76
87	81	2.9119486E 00,	2.9276499E 00,	2.9433393E 00,	2.9590181E 00,	DATA	77
88	82	2.9746875E 00,	2.9903486E 00,	3.0060031E 00,	3.0216523E 00,	DATA	78
89	83	3.0372980E 00,	3.0529417E 00,	3.0685852E 00,	3.0842301E 00,	DATA	79
90	84	3.0998782E 00,	3.1155312E 00,	3.1311909E 00,	3.1468590E 00,	DATA	80
91	85	3.1625373E 00,	3.1782274E 00,	3.1939310E 00,	3.2096496E 00,	DATA	81
92	86	3.2253848E 00,	3.2411382E 00,	3.2569110E 00,	3.2727045E 00,	DATA	82
93	87	3.2885199E 00,	3.3043590E 00,	3.3202226E 00,	3.3361121E 00,	DATA	83
94	88	3.3520286E 00,	3.3679729E 00,	3.3839466E 00,	3.3999507E 00,	DATA	84
95	89	3.4159864E 00,	3.4320546E 00,	3.4481569E 00,	3.4642947E 00/	DATA	85
96		DATA (RASUN I), I=289, 324, /				DATA	86
97	91	3.4804693E 00,	3.4966823E 00,	3.5129351E 00,	3.5292293E 00,	DATA	87
98	92	3.5455644E 00,	3.5619477E 00,	3.5783749E 00,	3.5948494E 00,	DATA	88
99	93	3.6113725E 00,	3.6279456E 00,	3.6445700E 00,	3.6612469E 00,	DATA	89
100	94	3.6779772E 00,	3.6947623E 00,	3.7116029E 00,	3.7284998E 00,	DATA	90
101	95	3.7454538E 00,	3.7624660E 00,	3.7795367E 00,	3.7966663E 00,	DATA	91
102	96	3.8138552E 00,	3.8311035E 00,	3.8484113E 00,	3.8657788E 00,	DATA	92
103	97	3.8832060E 00,	3.9006928E 00,	3.9182394E 00,	3.9358461E 00,	DATA	93
104	98	3.9535130E 00,	3.9712403E 00,	3.9890280E 00,	4.0068763E 00,	DATA	94
105	99	4.0247354E 00,	4.0427551E 00,	4.0607854E 00,	4.0788762E 00/	DATA	95
106		DATA (RASUN I), I=325, 360, /				DATA	96
107	101	4.0970274E 00,	4.1152383E 00,	4.1335093E 00,	4.1518393E 00,	DATA	97
108	102	4.1702277E 00,	4.1886740E 00,	4.2071773E 00,	4.2257367E 00,	DATA	98
109	103	4.2443511E 00,	4.2630196E 00,	4.2817407E 00,	4.3009127E 00,	DATA	99
110	104	4.3193340E 00,	4.3382025E 00,	4.35731163E 00,	4.3760734E 00,	DATA	100
111	105	4.3950713E 00,	4.4141079E 00,	4.43331810E 00,	4.4522889E 00,	DATA	101
112	106	4.4714292E 00,	4.4905999E 00,	4.5097987E 00,	4.5290243E 00,	DATA	102
113	107	4.5482739E 00,	4.5675454E 00,	4.5868370E 00,	4.6061464E 00,	DATA	103
114	108	4.6254715E 00,	4.6448099E 00,	4.6641595E 00,	4.6835182E 00,	DATA	104
115	109	4.7028837E 00,	4.7222539E 00,	4.7416263E 00,	4.7609988E 00/	DATA	105
116		DATA (RASUN I), I=361, 368, /				DATA	106
117	111	4.7803691E 00,	4.7997351E 00,	4.8190940E 00,	4.8384433E 00,	DATA	107
118	112	4.8577803E 00,	4.8771024E 00,	4.8964067E 00,	4.9156903E 00/	DATA	108
119		DATA (RASUN I), I=1, 36, /				DATA	109
120	121	-4.0390192E-01,	-4.0264305E-01,	-4.0124999E-01,	-3.9972333E-01,	DATA	109
121	122	-3.9806370E-01,	-3.9627186E-01,	-3.9434874E-01,	-3.9229829E-01,	DATA	110
122	123	-3.9011262E-01,	-3.87800183E-01,	-3.85336409E-01,	-3.8280069E-01,	DATA	111
123	124	-3.8011287E-01,	-3.7730200E-01,	-3.7436946E-01,	-3.7131668E-01,	DATA	112
124	125	-3.6814309E-01,	-3.6483629E-01,	-3.6145178E-01,	-3.5793318E-01,	DATA	113
125	126	-3.5430211E-01,	-3.5056027E-01,	-3.4670931E-01,	-3.4279099E-01,	DATA	114
126	127	-3.3868707E-01,	-3.3451935E-01,	-3.3024957E-01,	-3.2587941E-01,	DATA	115
127	128	-3.2141066E-01,	-3.1684498E-01,	-3.1218414E-01,	-3.0742999E-01,	DATA	116



128	129	-3.0258427E=01,	=2.9764878E=01,	=2.9262554E=01,	=2.0751656E=01/	DATA	117
129		DATA (BCSUN (I), I=37, 72)/					118
130	131	-2.8232390E=01,	=2.7704963E=01,	=2.7169577E=01,	=2.6626450E=01,	DATA	119
131	132	-2.6075784E=01,	=2.5517794E=01,	=2.4952685E=01,	=2.4380664E=01,	DATA	120
132	133	-2.3801947E=01,	=2.3216735E=01,	=2.2625243E=01,	=2.2027672E=01,	DATA	121
133	134	-2.1424229E=01,	=2.0815124E=01,	=2.0200557E=01,	=1.9580729E=01,	DATA	122
134	135	-1.8955849E=01,	=1.8326117E=01,	=1.7691725E=01,	=1.7052860E=01,	DATA	123
135	136	-1.6409709E=01,	=1.5762454E=01,	=1.5111274E=01,	=1.4456345E=01,	DATA	124
136	137	-1.3797844E=01,	=1.3135943E=01,	=1.2470838E=01,	=1.1802721E=01,	DATA	125
137	138	-1.1131786E=01,	=1.0458226E=01,	=9.7822397E=02,	=9.1040222E=02,	DATA	126
138	139	=8.4237593E=02,	=7.7416742E=02,	=7.0379304E=02,	=6.3727293E=02/	DATA	127
139		DATA (BCSUN (I), I=73, 108)/					128
140	141	=5.6862613E=02,	=4.9987168E=02,	=4.3102846E=02,	=3.6211523E=02,	DATA	129
141	142	=2.9315053E=02,	=2.2415290E=02,	=1.5514060E=02,	=8.6131897E=03,	DATA	130
142	143	=1.7144926E=03,	=5.1801662E=03,	=1.2069115E=02,	=1.8950653E=02,	DATA	131
143	144	=2.5823113E=02,	=3.2684829E=02,	=3.9534273E=02,	=4.6369913E=02,	DATA	132
144	145	=5.3190206E=02,	=5.9993636E=02,	=6.7785616E=02,	=7.3543261E=02,	DATA	133
145	146	=8.0286064E=02,	=8.7005299E=02,	=9.3699194E=02,	=1.0036601E=01,	DATA	134
146	147	=1.0700400E=01,	=1.1361145E=01,	=1.2018662E=01,	=1.2672780E=01,	DATA	135
147	148	=1.3323326E=01,	=1.3970130E=01,	=1.4613019E=01,	=1.5251825E=01,	DATA	136
148	149	=1.5886376E=01,	=1.6516504E=01,	=1.7142041E=01,	=1.7762817E=01/	DATA	137
149		DATA (BCSUN (I), I=109, 144)/					138
150	151	=1.8378666E=01,	=1.8989412E=01,	=1.9594899E=01,	=2.0194965E=01,	DATA	139
151	152	=2.0789454E=01,	=2.1378207E=01,	=2.1961081E=01,	=2.2537932E=01,	DATA	140
152	153	=2.3108616E=01,	=2.3672986E=01,	=2.4230889E=01,	=2.4782180E=01,	DATA	141
153	154	=2.5326697E=01,	=2.5864295E=01,	=2.6394807E=01,	=2.6918078E=01,	DATA	142
154	155	=2.7433947E=01,	=2.7942267E=01,	=2.8442874E=01,	=2.8935022E=01,	DATA	143
155	156	=2.9420356E=01,	=2.9896923E=01,	=3.0365180E=01,	=3.0824977E=01,	DATA	144
156	157	=3.1271166E=01,	=3.1718604E=01,	=3.2152153E=01,	=3.2576661E=01,	DATA	145
157	158	=3.2991946E=01,	=3.3398014E=01,	=3.3794577E=01,	=3.4181558E=01,	DATA	146
158	159	=3.455825E=01,	=3.4926261E=01,	=3.5283744E=01,	=3.5631169E=01/	DATA	147
159		DATA (BCSUN (I), I=145, 180)/					148
160	161	=3.5968418E=01,	=3.6295391E=01,	=3.6611977E=01,	=3.6918066E=01,	DATA	149
161	162	=3.7213555E=01,	=3.7498337E=01,	=3.7772312E=01,	=3.8033370E=01,	DATA	150
162	163	=3.8287423E=01,	=3.8528373E=01,	=3.8758134E=01,	=3.8976621E=01,	DATA	151
163	164	=3.9183750E=01,	=3.9379452E=01,	=3.9563654E=01,	=3.9736290E=01,	DATA	152
164	165	=3.9897300E=01,	=4.0046634E=01,	=4.0184233E=01,	=4.0310049E=01,	DATA	153
165	166	=4.0424038E=01,	=4.0526156E=01,	=4.0616365E=01,	=4.0694637E=01,	DATA	154
166	167	=4.0760937E=01,	=4.0815257E=01,	=4.0857375E=01,	=4.0887884E=01,	DATA	155
167	168	=4.0906182E=01,	=4.0912466E=01,	=4.0906741E=01,	=4.0889011E=01,	DATA	156
168	169	=4.0859292E=01,	=4.0817567E=01,	=4.0763879E=01,	=4.0698236E=01/	DATA	157
169		DATA (BCSUN (I), I=181, 216)/					158
170	171	=4.0620671E=01,	=4.0531208E=01,	=4.0429885E=01,	=4.0316742E=01,	DATA	159
171	172	=4.0191828E=01,	=4.0055198E=01,	=3.9906908E=01,	=3.9747026E=01,	DATA	160
172	173	=3.9575626E=01,	=3.9392779E=01,	=3.9198569E=01,	=3.8993079E=01,	DATA	161
173	174	=3.8776395E=01,	=3.8548613E=01,	=3.8309813E=01,	=3.8060092E=01,	DATA	162
174	175	=3.7799548E=01,	=3.7528285E=01,	=3.7246403E=01,	=3.6954009E=01,	DATA	163
175	176	=3.6651210E=01,	=3.6338120E=01,	=3.6014849E=01,	=3.5681501E=01,	DATA	164
176	177	=3.5338194E=01,	=3.4985035E=01,	=3.4622141E=01,	=3.4249631E=01,	DATA	165
177	178	=3.3867622E=01,	=3.3476238E=01,	=3.3075610E=01,	=3.2669856E=01,	DATA	166
178	179	=3.2247115E=01,	=3.1819520E=01,	=3.1383214E=01,	=3.0938338E=01/	DATA	167
179		DATA (BCSUN (I), I=217, 252)/					168
180	181	=3.0485040E=01,	=3.0023468E=01,	=2.9553781E=01,	=2.9076130E=01,	DATA	169
181	182	=2.8990678E=01,	=2.8097377E=01,	=2.7396974E=01,	=2.7089030E=01,	DATA	170
182	183	=2.6573892E=01,	=2.6051725E=01,	=2.5522675E=01,	=2.4986893E=01,	DATA	171
183	184	=2.4444534E=01,	=2.3895743E=01,	=2.3340672E=01,	=2.2779465E=01,	DATA	172
184	185	=2.2212267E=01,	=2.1639218E=01,	=2.1060465E=01,	=2.0476150E=01,	DATA	173
185	186	=1.9886416E=01,	=1.9291407E=01,	=1.8691278E=01,	=1.8086166E=01,	DATA	174
186	187	=1.7476227E=01,	=1.6861608E=01,	=1.6242468E=01,	=1.5618963E=01,	DATA	175
187	188	=1.4991253E=01,	=1.4359495E=01,	=1.3728363E=01,	=1.3084527E=01,	DATA	176
188	189	=1.2441653E=01,	=1.1795407E=01,	=1.1145956E=01,	=1.0493466E=01/	DATA	177
189		DATA (BCSUN (I), I=253, 288)/					178
190	191	=9.8381018E=02,	=9.1800406E=02,	=8.5194349E=02,	=7.8544472E=02,	DATA	179
191	192	=7.1912399E=02,	=6.5239755E=02,	=5.8548090E=02,	=5.1838950E=02,	DATA	180
192	193	=4.5113871E=02,	=3.8374355E=02,	=3.1621926E=02,	=2.4858107E=02,	DATA	181
193	194	=1.8084420E=02,	=1.1302400E=02,	=4.5113591E=03,	=2.2864472E=03,	DATA	182
194	195	=9.0781407E=03,	=1.5877897E=02,	=2.2678080E=02,	=2.9477026E=02,	DATA	183
195	196	=3.6273036E=02,	=4.3064434E=02,	=4.9849376E=02,	=5.6626067E=02,	DATA	184
196	197	=6.3392705E=02,	=7.0147552E=02,	=7.6888734E=02,	=8.3614432E=02,	DATA	185
197	198	=9.0322815E=02,	=9.7011906E=02,	=1.0368013E=01,	=1.1032546E=01,	DATA	186
198	199	=1.1694614E=01,	=1.2354027E=01,	=1.3010608E=01,	=1.3664178E=01/	DATA	187
199		DATA (BCSUN (I), I=289, 324)/					188
200	201	=1.4314559E=01,	=1.4961574E=01,	=1.5605046E=01,	=1.6244798E=01,	DATA	189

201	202	01.6880652E-01,	01.7512429E-01,	01.8139949E-01,	01.8763031E-01,	DATA 190
202	203	01.9381494E-01,	01.9995192E-01,	02.0603816E-01,	02.1207296E-01,	DATA 191
203	204	02.1405401E-01,	02.2397934E-01,	02.2984695E-01,	02.3565476E-01,	DATA 192
204	205	02.4140085E-01,	02.4708320E-01,	02.5269977E-01,	02.5824856E-01,	DATA 193
205	206	02.6372756E-01,	02.6913467E-01,	02.7446795E-01,	02.7972537E-01,	DATA 194
206	207	02.8490489E-01,	02.9000447E-01,	02.9502213E-01,	02.9995998E-01,	DATA 195
207	208	03.0480400E-01,	03.0956437E-01,	03.1423314E-01,	03.1881451E-01,	DATA 196
208	209	03.2330061E-01,	03.2769159E-01,	03.3198568E-01,	03.3618110E-01,	DATA 197
209		DATA (BCSUN (I), I=325, 360),				DATA 198
210	211	03.4027605E-01,	03.4426879E-01,	03.4815752E-01,	03.5194053E-01,	DATA 199
211	212	03.5861609E-01,	03.5918243E-01,	03.6263783E-01,	03.6598068E-01,	DATA 200
212	213	03.6920928E-01,	03.7232213E-01,	03.7531735E-01,	03.7819441E-01,	DATA 201
213	214	03.8095097E-01,	03.8358598E-01,	03.8609808E-01,	03.8848594E-01,	DATA 202
214	215	03.9074836E-01,	03.9288408E-01,	03.9489194E-01,	03.9677091E-01,	DATA 203
215	216	03.9851993E-01,	04.0013812E-01,	04.0162456E-01,	04.0297846E-01,	DATA 204
216	217	04.0419911E-01,	04.0528582E-01,	04.0623804E-01,	04.0705519E-01,	DATA 205
217	218	04.0773682E-01,	04.0828252E-01,	04.0869192E-01,	04.0896470E-01,	DATA 206
218	219	04.0910066E-01,	04.0909935E-01,	04.0896129E-01,	04.0868585E-01,	DATA 207
219		DATA (BCSUN (I), I=361, 368),				DATA 208
220	221	04.0827325E-01,	04.0772368E-01,	04.0703742E-01,	04.0621481E-01,	DATA 209
221	222	04.0525630E-01,	04.0416246E-01,	04.0293380E-01,	04.0157301E-01,	DATA 210
222		DATA (RSUN (I), I=1, 36),				DATA 210
223	231	9.8395943E-01,	9.8394183E-01,	9.8394030E-01,	9.8394019E-01,	DATA 211
224	232	9.8394576E-01,	9.8395628E-01,	9.8397207E-01,	9.8399264E-01,	DATA 212
225	233	9.8401770E-01,	9.8404688E-01,	9.8408014E-01,	9.8411734E-01,	DATA 213
226	234	9.8415840E-01,	9.8420320E-01,	9.8425180E-01,	9.8430426E-01,	DATA 214
227	235	9.8436065E-01,	9.8442105E-01,	9.8448563E-01,	9.8455455E-01,	DATA 215
228	236	9.8462800E-01,	9.8470608E-01,	9.8478915E-01,	9.8487747E-01,	DATA 216
229	237	9.8497130E-01,	9.8507088E-01,	9.8517636E-01,	9.8528790E-01,	DATA 217
230	238	9.8540562E-01,	9.8552981E-01,	9.8566002E-01,	9.8579601E-01,	DATA 218
231	239	9.8593753E-01,	9.8608425E-01,	9.8623583E-01,	9.8639192E-01,	DATA 219
232		DATA (RSUN (I), I=37, 72),				DATA 220
233	241	9.8655214E-01,	9.8671605E-01,	9.8688349E-01,	9.8705424E-01,	DATA 221
234	242	9.8722810E-01,	9.8740484E-01,	9.8758440E-01,	9.8776670E-01,	DATA 222
235	243	9.8795168E-01,	9.8813932E-01,	9.8832959E-01,	9.8852283E-01,	DATA 223
236	244	9.8871884E-01,	9.8891778E-01,	9.8911991E-01,	9.8932544E-01,	DATA 224
237	245	9.8953459E-01,	9.8974752E-01,	9.8996452E-01,	9.9018579E-01,	DATA 225
238	246	9.9041151E-01,	9.9064205E-01,	9.9087708E-01,	9.9111643E-01,	DATA 226
239	247	9.9135994E-01,	9.9160743E-01,	9.9185848E-01,	9.9211272E-01,	DATA 227
240	248	9.9236973E-01,	9.9262903E-01,	9.9289040E-01,	9.9315355E-01,	DATA 228
241	249	9.9341818E-01,	9.9368398E-01,	9.9395075E-01,	9.9421841E-01,	DATA 229
242		DATA (RSUN (I), I=73, 108),				DATA 230
243	251	9.9448672E-01,	9.9475556E-01,	9.9502490E-01,	9.9529472E-01,	DATA 231
244	252	9.9556502E-01,	9.9583576E-01,	9.9610715E-01,	9.9637936E-01,	DATA 232
245	253	9.9665255E-01,	9.9692682E-01,	9.9720251E-01,	9.9747987E-01,	DATA 233
246	254	9.9775912E-01,	9.9804062E-01,	9.9832423E-01,	9.9860992E-01,	DATA 234
247	255	9.9889760E-01,	9.9918732E-01,	9.9947864E-01,	9.9977122E-01,	DATA 235
248	256	1.0000647E 00,	1.0003386E 00,	1.0006526E 00,	1.0009465E 00,	DATA 236
249	257	1.0012399E 00,	1.0015325E 00,	1.0018239E 00,	1.0021140E 00,	DATA 237
250	258	1.0024025E 00,	1.0026897E 00,	1.0029741E 00,	1.0032569E 00,	DATA 238
251	259	1.0035377E 00,	1.0038162E 00,	1.0040927E 00,	1.0043673E 00,	DATA 239
252		DATA (RSUN (I), I=109, 144),				DATA 240
253	261	1.0046401E 00,	1.0049112E 00,	1.0051809E 00,	1.0054495E 00,	DATA 241
254	262	1.0057172E 00,	1.0059845E 00,	1.0062512E 00,	1.0065176E 00,	DATA 242
255	263	1.0067836E 00,	1.0070494E 00,	1.0073148E 00,	1.0075794E 00,	DATA 243
256	264	1.0078429E 00,	1.0081051E 00,	1.0083656E 00,	1.0086242E 00,	DATA 244
257	265	1.0088805E 00,	1.0091341E 00,	1.0093847E 00,	1.0096322E 00,	DATA 245
258	266	1.0098761E 00,	1.0101164E 00,	1.0103527E 00,	1.0105848E 00,	DATA 246
259	267	1.0108128E 00,	1.0110363E 00,	1.0112554E 00,	1.0114704E 00,	DATA 247
260	268	1.0116811E 00,	1.0118878E 00,	1.0120907E 00,	1.0122901E 00,	DATA 248
261	269	1.0124863E 00,	1.0126796E 00,	1.0128703E 00,	1.0130584E 00,	DATA 249
262		DATA (RSUN (I), I=145, 180),				DATA 250
263	271	1.0132442E 00,	1.0134279E 00,	1.0136093E 00,	1.0137883E 00,	DATA 251
264	272	1.0139647E 00,	1.0141385E 00,	1.0143092E 00,	1.0144767E 00,	DATA 252
265	273	1.0146407E 00,	1.0148008E 00,	1.0149569E 00,	1.0151085E 00,	DATA 253
266	274	1.0152555E 00,	1.0153976E 00,	1.0155348E 00,	1.0156661E 00,	DATA 254
267	275	1.0157921E 00,	1.0159121E 00,	1.0160265E 00,	1.0161350E 00,	DATA 255
268	276	1.0162379E 00,	1.0163350E 00,	1.0164267E 00,	1.0165134E 00,	DATA 256
269	277	1.0165953E 00,	1.0166728E 00,	1.0167461E 00,	1.0168155E 00,	DATA 257
270	278	1.0168813E 00,	1.0169438E 00,	1.0170028E 00,	1.0170585E 00,	DATA 258
271	279	1.0171108E 00,	1.0171596E 00,	1.0172051E 00,	1.0172467E 00,	DATA 259
272		DATA (RSUN (I), I=181, 216),				DATA 260
273	281	1.0172844E 00,	1.0173179E 00,	1.0173470E 00,	1.0173716E 00,	DATA 261
274	282	1.0173912E 00,	1.0174058E 00,	1.0174150E 00,	1.0174185E 00,	DATA 262



275	283	1.0174162E 00,	1.0174078E 00,	1.0173932E 00,	1.0173723E 00,	DATA 263
276	284	1.0173453E 00,	1.0173118E 00,	1.0172724E 00,	1.0172274E 00,	DATA 264
277	285	1.0171770E 00,	1.0171216E 00,	1.0170615E 00,	1.0169970E 00,	DATA 265
278	286	1.0169284E 00,	1.0168563E 00,	1.0167803E 00,	1.0167012E 00,	DATA 266
279	287	1.0166186E 00,	1.0165328E 00,	1.0164436E 00,	1.0163511E 00,	DATA 267
280	288	1.0162551E 00,	1.0161556E 00,	1.0160523E 00,	1.0159452E 00,	DATA 268
281	289	1.0158339E 00,	1.0157181E 00,	1.0155935E 00,	1.0154737E 00,	DATA 269
282		DATA (RSUN (I), I=217, 252, /				DATA 270
283	291	1.0153439E 00,	1.0152089E 00,	1.0150683E 00,	1.0149225E 00,	DATA 271
284	292	1.0147709E 00,	1.0146134E 00,	1.0144503E 00,	1.0142823E 00,	DATA 272
285	293	1.0141092E 00,	1.0139315E 00,	1.0137495E 00,	1.0135636E 00,	DATA 273
286	294	1.0133741E 00,	1.0131817E 00,	1.0129863E 00,	1.0127883E 00,	DATA 274
287	295	1.0125878E 00,	1.0123850E 00,	1.0121800E 00,	1.0119729E 00,	DATA 275
288	296	1.0117636E 00,	1.0115522E 00,	1.0113386E 00,	1.0111227E 00,	DATA 276
289	297	1.0109045E 00,	1.0106838E 00,	1.0104603E 00,	1.0102339E 00,	DATA 277
290	298	1.0100043E 00,	1.0097714E 00,	1.0095349E 00,	1.0092946E 00,	DATA 278
291	299	1.0090504E 00,	1.0088018E 00,	1.0085493E 00,	1.0082930E 00,	DATA 279
292		DATA (RSUN (I), I=253, 288, /				DATA 280
293	301	1.0080332E 00,	1.0077699E 00,	1.0075037E 00,	1.0072349E 00,	DATA 281
294	302	1.0069640E 00,	1.0066914E 00,	1.0064173E 00,	1.0061421E 00,	DATA 282
295	303	1.0058660E 00,	1.0055894E 00,	1.0053123E 00,	1.0050350E 00,	DATA 283
296	304	1.0047575E 00,	1.0044800E 00,	1.0042025E 00,	1.0039250E 00,	DATA 284
297	305	1.0036474E 00,	1.0033697E 00,	1.0030919E 00,	1.0028135E 00,	DATA 285
298	306	1.0025347E 00,	1.0022551E 00,	1.0019745E 00,	1.0016926E 00,	DATA 286
299	307	1.0014093E 00,	1.0011241E 00,	1.0008373E 00,	1.0005489E 00,	DATA 287
300	308	1.0002589E 00,	9.9996747E-01,	9.9996749E-01,	9.9938180E-01,	DATA 288
301	309	9.9908832E-01,	9.9879504E-01,	9.9850219E-01,	9.9821013E-01,	DATA 289
302		DATA (RSUN (I), I=289, 324, /				DATA 290
303	311	9.9791919E-01,	9.9762971E-01,	9.9734193E-01,	9.9705607E-01,	DATA 291
304	312	9.9677233E-01,	9.9649089E-01,	9.9621186E-01,	9.9593533E-01,	DATA 292
305	313	9.9566132E-01,	9.9538993E-01,	9.9512100E-01,	9.9485442E-01,	DATA 293
306	314	9.9459003E-01,	9.9432781E-01,	9.9406738E-01,	9.9380847E-01,	DATA 294
307	315	9.9355087E-01,	9.9329422E-01,	9.9303834E-01,	9.9278373E-01,	DATA 295
308	316	9.9252977E-01,	9.9227645E-01,	9.9202421E-01,	9.9177331E-01,	DATA 296
309	317	9.9152406E-01,	9.9127682E-01,	9.9103189E-01,	9.9078956E-01,	DATA 297
310	318	9.9055022E-01,	9.9031424E-01,	9.9008183E-01,	9.8985331E-01,	DATA 298
311	319	9.8962890E-01,	9.8940884E-01,	9.8919331E-01,	9.8898242E-01,	DATA 299
312		DATA (RSUN (I), I=325, 360, /				DATA 300
313	321	9.8877634E-01,	9.8857520E-01,	9.8837887E-01,	9.8818731E-01,	DATA 301
314	322	9.8800039E-01,	9.8781809E-01,	9.8764006E-01,	9.8746601E-01,	DATA 302
315	323	9.8729569E-01,	9.8712978E-01,	9.8696511E-01,	9.8680451E-01,	DATA 303
316	324	9.8664679E-01,	9.8649166E-01,	9.8633939E-01,	9.8619011E-01,	DATA 304
317	325	9.8604400E-01,	9.8590119E-01,	9.8576200E-01,	9.8562670E-01,	DATA 305
318	326	9.8549555E-01,	9.8536892E-01,	9.8524703E-01,	9.8513015E-01,	DATA 306
319	327	9.8501855E-01,	9.8491245E-01,	9.8481209E-01,	9.8471767E-01,	DATA 307
320	328	9.8462936E-01,	9.8454737E-01,	9.8447163E-01,	9.8440211E-01,	DATA 308
321	329	9.8433875E-01,	9.8428159E-01,	9.8423024E-01,	9.8418439E-01,	DATA 309
322		DATA (RSUN (I), I=361, 368, /				DATA 310
323	331	9.8414378E-01,	9.8410806E-01,	9.8407695E-01,	9.8405027E-01,	DATA 311
324	332	9.8402764E-01,	9.8400871E-01,	9.8399335E-01,	9.8398223E-01,	DATA 312
325		DATA (RAMOON(I), I= 1, 36, /				DATA 312
326	341	2.4445326E 00,	2.4445326E 00,	2.4445326E 00,	2.4445326E 00,	DATA 313
327	342	3.1517784E 00,	3.1517784E 00,	3.1517784E 00,	3.1517784E 00,	DATA 314
328	343	4.0810732E 00,	4.0810732E 00,	4.0810732E 00,	4.0810732E 00,	DATA 315
329	344	5.0150548E 00,	5.0150548E 00,	5.0150548E 00,	5.0150548E 00,	DATA 316
330	345	5.8340186E 00,	5.8340186E 00,	5.8340186E 00,	5.8340186E 00,	DATA 317
331	346	3.3176544E-01,	3.3176544E-01,	3.3176544E-01,	3.3176544E-01,	DATA 318
332	347	1.2674763E 00,	1.2674763E 00,	1.2674763E 00,	1.2674763E 00,	DATA 319
333	348	2.3354811E 00,	2.3354811E 00,	2.3354811E 00,	2.3354811E 00,	DATA 320
334	349	3.3141324E 00,	3.3141324E 00,	3.3141324E 00,	3.3141324E 00,	DATA 321
335		DATA (RAMOON(I), I= 37, 72, /				DATA 322
336	351	4.2654103E 00,	4.2654103E 00,	4.2654103E 00,	4.2654103E 00,	DATA 323
337	352	5.1769178E 00,	5.1769178E 00,	5.1769178E 00,	5.1769178E 00,	DATA 324
338	353	5.9760318E 00,	5.9760318E 00,	5.9760318E 00,	5.9760318E 00,	DATA 325
339	354	4.8453887E-01,	4.8453887E-01,	4.8453887E-01,	4.8453887E-01,	DATA 326
340	355	1.4269331E 00,	1.4269331E 00,	1.4269331E 00,	1.4269331E 00,	DATA 327
341	356	2.4693960E 00,	2.4693960E 00,	2.4693960E 00,	2.4693960E 00,	DATA 328
342	357	3.4413046E 00,	3.4413046E 00,	3.4413046E 00,	3.4413046E 00,	DATA 329
343	358	4.4409008E 00,	4.4409008E 00,	4.4409008E 00,	4.4409008E 00,	DATA 330
344	359	5.3345870E 00,	5.3345870E 00,	5.3345870E 00,	5.3345870E 00,	DATA 331
345		DATA (RAMOON(I), I= 73, 108, /				DATA 332
346	361	6.1202012E 00,	6.1202012E 00,	6.1202012E 00,	6.1202012E 00,	DATA 333
347	362	6.5008903E-01,	6.5008903E-01,	6.5008903E-01,	6.5008903E-01,	DATA 334
348	363	1.6042472E 00,	1.6042472E 00,	1.6042472E 00,	1.6042472E 00,	DATA 335

849	364	2,6092156E 00	2,8553334E 00	3,1013433E 00	3,3490300E 00	DATA 336
850	365	3,5995343E 00	3,8525080E 00	4,1060543E 00	4,3569736E 00	DATA 337
851	366	4,6016908E 00	4,873214E 00	5,0623835E 00	5,2769810E 00	DATA 338
852	367	5,4823618E 00	5,6808097E 00	5,8749633E 00	6,0677059E 00	DATA 339
853	368	6,2619626E 00	1,7737276E -01	3,8289436E -01	5,9722742E -01	DATA 340
854	369	8,2179029E -01	1,0557445E 00	1,2979793E 00	1,5452847E 00	DATA 341
855		DATA (RAMOQN1), I=109,144 /				DATA 342
856	371	1,7940956E 00	2,0413253E 00	2,2852182E 00	2,5274786E 00	DATA 343
857	372	2,7640686E 00	3,0026737E 00	3,2447113E 00	3,4900607E 00	DATA 344
858	373	3,7414793E 00	3,9700253E 00	4,2533833E 00	4,5061538E 00	DATA 345
859	374	4,7229597E 00	4,9488720E 00	5,2068741E 00	5,4177994E 00	DATA 346
860	375	5,6197579E 00	5,8156060E 00	6,0055946E 00	6,2019247E 00	DATA 347
861	376	1,1579707E -01	3,1957457E -01	5,3259536E -01	7,5648427E -01	DATA 348
862	377	9,9130160E -01	1,2354488E 00	1,4854552E 00	1,7369322E 00	DATA 349
863	378	1,9858424E 00	2,2296583E 00	2,4678612E 00	2,7017462E 00	DATA 350
864	379	2,9138357E 00	3,1671778E 00	3,4046258E 00	3,6480870E 00	DATA 351
865		DATA (RAMOQN1), I=145,180 /				DATA 352
866	381	3,8977843E 00	4,1517771E 00	4,4061416E 00	4,6560082E 00	DATA 353
867	382	4,8970640E 00	5,1267321E 00	5,3445352E 00	5,557686E 00	DATA 354
868	383	5,7509096E 00	5,9450923E 00	6,2377555E 00	6,4924079E 00	DATA 355
869	384	2,4939310E -01	4,5815979E -01	6,7801922E -01	9,1019034E -01	DATA 356
870	385	1,1540050E 00	1,4065739E 00	1,6632213E 00	1,9187935E 00	DATA 357
871	386	2,1692576E 00	2,4127348E 00	2,6496050E 00	2,8819476E 00	DATA 358
872	387	3,1127586E 00	3,3451966E 00	3,5818620E 00	3,8241192E 00	DATA 359
873	388	4,0715119E 00	4,3215668E 00	4,5702790E 00	4,8132854E 00	DATA 360
874	389	5,0470695E 00	5,2699838E 00	5,4821939E 00	5,6851954E 00	DATA 361
875		DATA (RAMOQN1), I=181,216 /				DATA 362
876	391	5,8816804E 00	6,0747199E 00	6,2676896E 00	1,8088864E -01	DATA 363
877	392	3,8400833E -01	5,9695358E -01	8,2193475E -01	1,6597461E 00	DATA 364
878	393	1,3091142E 00	1,5665149E 00	1,8268812E 00	2,0851210E 00	DATA 365
879	394	2,3376702E 00	2,5832639E 00	2,8227611E 00	3,0584270E 00	DATA 366
880	395	3,2930879E 00	3,5293663E 00	3,7690119E 00	4,0123586E 00	DATA 367
881	396	4,2580538E 00	4,5032687E 00	4,7444560E 00	4,9783908E 00	DATA 368
882	397	5,2030236E 00	5,4178260E 00	5,6236623E 00	5,8224251E 00	DATA 369
883	398	6,0166606E 00	6,2092850E 00	1,2021080E -01	3,1894033E -01	DATA 370
884	399	5,2527346E -01	7,4175692E -01	9,7004645E -01	1,2103439E 00	DATA 371
885		DATA (RAMOQN1), I=217,252 /				DATA 372
886	401	1,4609572E 00	1,7183703E 00	1,9750817E 00	2,2359587E 00	DATA 373
887	402	2,4894108E 00	2,7378222E 00	2,9822294E 00	3,2245922E 00	DATA 374
888	403	3,4669852E 00	3,7108738E 00	3,9565837E 00	4,2030351E 00	DATA 375
889	404	4,4479452E 00	4,6884381E 00	4,9218795E 00	5,1465676E 00	DATA 376
890	405	5,3620386E 00	5,5689969E 00	5,8690396E 00	5,9643486E 00	DATA 377
891	406	6,1574415E 00	6,7810534E -02	2,8492990E -01	4,6700329E -01	DATA 378
892	407	6,7750651E -01	8,7770930E -01	1,1283047E 00	1,3686736E 00	DATA 379
893	408	1,6168028E 00	1,8696636E 00	2,1240363E 00	2,3774465E 00	DATA 380
894	409	2,6287695E 00	2,8782727E 00	3,1271729E 00	3,3769898E 00	DATA 381
895		DATA (RAMOQN1), I=253,288 /				DATA 382
896	411	3,6284925E 00	3,8816886E 00	4,1349616E 00	4,3856207E 00	DATA 383
897	412	4,6305670E 00	4,8671858E 00	5,0939944E 00	5,3108391E 00	DATA 384
898	413	5,5187172E 00	5,7194355E 00	5,9192768E 00	6,1087496E 00	DATA 385
899	414	1,9232509E -02	2,1558629E -01	4,1691134E -01	6,2511779E -01	DATA 386
900	415	8,4151425E -01	1,0665560E 00	1,2996602E 00	1,5392314E 00	DATA 387
901	416	1,7830050E 00	2,0286698E 00	2,2745434E 00	2,5200849E 00	DATA 388
902	417	2,7656641E 00	3,0128545E 00	3,2632434E 00	3,5179733E 00	DATA 389
903	418	3,7869143E 00	4,0381730E 00	4,2982252E 00	4,5527999E 00	DATA 390
904	419	4,7981485E 00	5,0320759E 00	5,2540455E 00	5,4653019E 00	DATA 391
905		DATA (RAMOQN1), I=289,324 /				DATA 392
906	421	5,6679448E 00	5,8646542E 00	6,0593106E 00	6,2517837E 00	DATA 393
907	422	1,6460159E -01	3,6554834E -01	5,8336280E -01	7,8923392E -01	DATA 394
908	423	1,0433572E 00	1,2447833E 00	1,4815314E 00	1,7210848E 00	DATA 395
909	424	1,9609565E 00	2,1996869E 00	2,4369325E 00	2,6737390E 00	DATA 396
910	425	2,9120125E 00	3,1911983E 00	3,4024809E 00	3,6579595E 00	DATA 397
911	426	3,9198167E 00	4,1849040E 00	4,4482333E 00	4,7044100E 00	DATA 398
912	427	4,9492939E 00	5,1809713E 00	5,4997505E 00	5,6075584E 00	DATA 399
913	428	5,8072428E 00	6,0023465E 00	6,1992863E 00	1,8097414E -01	DATA 400
914	429	3,0640166E -01	5,1282737E -01	7,2792815E -01	9,522588E -01	DATA 401
915		DATA (RAMOQN1), I=329,360 /				DATA 402
916	431	1,1849607E 00	1,4237569E 00	1,6654247E 00	1,9066848E 00	DATA 403
917	432	2,1451539E 00	2,3799506E 00	2,6117915E 00	2,8426900E 00	DATA 404
918	433	3,0754445E 00	3,3130223E 00	3,5578254E 00	3,8108374E 00	DATA 405
919	434	4,0708323E 00	4,3341029E 00	4,5951972E 00	4,8485842E 00	DATA 406
920	435	5,0902387E 00	5,3186651E 00	5,5345217E 00	5,7400327E 00	DATA 407
921	436	5,9382661E 00	6,1326395E 00	6,3441155E -02	2,4038768E -01	DATA 408



422	437	4,4333202E-01,	6,5474475E-01,	8,7614692E-01,	1,2076629E 00,	DATA 409
423	438	1,3477123E 00,	1,5931450E 00,	1,8399974E 00,	2,8446534E 00,	DATA 410
424	439	2,3248630E 00,	2,5602027E 00,	2,7215127E 00,	3,0224116E 00,	DATA 411
425	DATA (BCMOQN1), I=761,368/					DATA 412
426	441	3,2246405E 00,	3,4914295E 00,	3,7347663E 00,	3,9850620E 00,	DATA 413
427	442	4,2406086E 00,	4,4976382E 00,	4,7512387E 00,	4,9968311E 00,	DATA 414
428	DATA (BCMOQN1), I=1,361/					DATA 415
429	451	2,6304198E-01,	1,8219086E-01,	9,1301940E-02,	=3,2379848E-03,	DATA 416
430	452	=9,5717298E-02,	=1,8125230E-01,	=2,5571931E-01,	=3,1567498E-01,	DATA 417
431	453	=3,5819656E-01,	=3,8206750E-01,	=3,8601583E-01,	=3,7084153E-01,	DATA 418
432	454	=3,3830935E-01,	=2,9101699E-01,	=2,8197205E-01,	=1,6422812E-01,	DATA 419
433	455	=9,0664036E-02,	=1,3918313E-02,	6,3550130E-02,	1,2930931E-01,	DATA 420
434	456	2,1074598E-01,	2,7483249E-01,	3,2795834E-01,	3,6593829E-01,	DATA 421
435	457	3,8438516E-01,	3,7956036E-01,	3,4954349E-01,	2,9519818E-01,	DATA 422
436	458	2,2033722E-01,	1,3103383E-01,	3,4393592E-02,	=6,2557959E-02,	DATA 423
437	459	=1,5361635E-01,	=2,3371889E-01,	=2,9899280E-01,	=3,4671055E-01,	DATA 424
438	DATA (BCMOQN1), I=37,721/					DATA 425
439	461	=3,7926556E-01,	=3,8417864E-01,	=3,7406613E-01,	=3,4650160E-01,	DATA 426
440	462	=3,0376827E-01,	=2,4856665E-01,	=1,8375946E-01,	=1,1217591E-01,	DATA 427
441	463	=3,6568665E-02,	4,0428882E-02,	1,1622350E-01,	1,8816175E-01,	DATA 428
442	464	2,5340143E-01,	3,0879689E-01,	3,9086580E-01,	3,7593840E-01,	DATA 429
443	465	3,8058719E-01,	3,6234016E-01,	3,2049221E-01,	2,5667987E-01,	DATA 430
444	466	1,7494685E-01,	8,1266598E-02,	=1,7295263E-02,	=1,1352139E-01,	DATA 431
445	467	=2,0086526E-01,	=2,7402661E-01,	=3,2926098E-01,	=3,6447056E-01,	DATA 432
446	468	=3,7912335E-01,	=3,7402401E-01,	=3,5096880E-01,	=3,1235965E-01,	DATA 433
447	469	=2,6037037E-01,	=1,9922545E-01,	=1,3009875E-01,	=5,6104096E-02,	DATA 434
448	DATA (BCMOQN1), I=73,108/					DATA 435
449	471	2,0160245E-02,	9,4044034E-02,	1,8877525E-01,	2,3540400E-01,	DATA 436
450	472	2,9278124E-01,	3,3760885E-01,	3,8660816E-01,	3,7684287E-01,	DATA 437
451	473	3,6617566E-01,	3,3375221E-01,	2,8035914E-01,	2,8855802E-01,	DATA 438
452	474	1,2255136E-01,	2,7954499E-02,	=6,8713497E-02,	=1,8060734E-01,	DATA 439
453	475	=2,4128769E-01,	=3,0545791E-01,	=3,4955712E-01,	=3,7203468E-01,	DATA 440
454	476	=3,7335106E-01,	=3,5532309E-01,	=3,2069847E-01,	=2,7248868E-01,	DATA 441
455	477	=2,1362578E-01,	=1,4682129E-01,	=7,4590022E-02,	6,3594858E-04,	DATA 442
456	478	7,6362023E-02,	1,4989627E-01,	2,1825837E-01,	2,7816713E-01,	DATA 443
457	479	3,2614639E-01,	3,5878320E-01,	3,7313706E-01,	3,6721847E-01,	DATA 444
458	DATA (BCMOQN1), I=109,144/					DATA 445
459	481	3,4039000E-01,	2,9352224E-01,	2,2891618E-01,	1,5007086E-01,	DATA 446
460	482	6,1455870E-02,	=3,1669226E-02,	=1,2345114E-01,	=2,8777179E-01,	DATA 447
461	483	=2,7879285E-01,	=3,3168668E-01,	=3,8336683E-01,	=3,7291971E-01,	DATA 448
462	484	=3,6150484E-01,	=3,3176056E-01,	=2,8701703E-01,	=2,2064872E-01,	DATA 449
463	485	=1,6572331E-01,	=9,4926761E-02,	=2,6666623E-02,	5,4737581E-02,	DATA 450
464	486	1,2884133E-01,	1,9888673E-01,	2,9168846E-01,	3,1368046E-01,	DATA 451
465	487	3,5105641E-01,	3,7045677E-01,	3,8941908E-01,	3,4705769E-01,	DATA 452
466	488	3,0428464E-01,	2,4361825E-01,	1,8872563E-01,	8,3965917E-02,	DATA 453
467	489	=5,8981192E-03,	=9,5822897E-02,	=1,8055801E-01,	=2,5482462E-01,	DATA 454
468	DATA (BCMOQN1), I=149,180/					DATA 455
469	491	=3,1371765E-01,	=3,5333858E-01,	=3,7146301E-01,	=3,6795435E-01,	DATA 456
470	492	=3,4459633E-01,	=3,0447066E-01,	=2,9116829E-01,	=1,8817901E-01,	DATA 457
471	493	=1,1858989E-01,	=4,5053453E-02,	3,8075047E-02,	1,8451774E-01,	DATA 458
472	494	1,7583090E-01,	2,4118838E-01,	2,9725714E-01,	3,4026133E-01,	DATA 459
473	495	3,6634118E-01,	3,7223602E-01,	3,5611928E-01,	3,3821203E-01,	DATA 460
474	496	2,6084197E-01,	1,8795148E-01,	1,0433728E-01,	1,5248143E-02,	DATA 461
475	497	=7,4349862E-02,	=1,5948878E-01,	=2,3544027E-01,	=2,9780006E-01,	DATA 462
476	498	=3,4280151E-01,	=3,6780274E-01,	=3,9176484E-01,	=3,9544581E-01,	DATA 463
477	499	=3,2114970E-01,	=2,7213594E-01,	=2,1196877E-01,	=1,4404240E-01,	DATA 464
478	DATA (BCMOQN1), I=181,216/					DATA 465
479	501	=7,1361305E-02,	3,4636110E-03,	7,8079936E-02,	1,5018572E-01,	DATA 466
480	502	2,1729739E-01,	2,7654360E-01,	3,2559656E-01,	3,5759402E-01,	DATA 467
481	503	3,7194436E-01,	3,6473511E-01,	3,8481308E-01,	2,8313379E-01,	DATA 468
482	504	2,1370870E-01,	1,3096846E-01,	4,0906578E-02,	=5,8638686E-02,	DATA 469
483	505	=1,3821350E-01,	=2,1693376E-01,	=2,8256642E-01,	=3,3164842E-01,	DATA 470
484	506	=3,6171306E-01,	=3,7157210E-01,	=3,8149587E-01,	=3,3313803E-01,	DATA 471
485	507	=2,8918834E-01,	=2,3288769E-01,	=1,4758422E-01,	=9,6441075E-02,	DATA 472
486	508	=2,2315796E-02,	5,2221076E-02,	1,2477397E-01,	1,9295708E-01,	DATA 473
487	509	2,5421324E-01,	3,0568489E-01,	3,4407040E-01,	3,6598707E-01,	DATA 474
488	DATA (BCMOQN1), I=217,252/					DATA 475
489	511	3,6822688E-01,	3,4559743E-01,	3,0666780E-01,	2,4427792E-01,	DATA 476
490	512	1,6846927E-01,	7,5911966E-02,	=1,7927945E-02,	=1,8959044E-01,	DATA 477
491	513	=1,9321858E-01,	=2,6392126E-01,	=3,1797448E-01,	=3,5294884E-01,	DATA 478
492	514	=3,6779228E-01,	=3,6282016E-01,	=3,8935018E-01,	=3,8038833E-01,	DATA 479
493	515	=2,4825281E-01,	=1,8624104E-01,	=1,1740136E-01,	=4,4618239E-02,	DATA 480
494	516	2,9410835E-02,	1,0213458E-01,	1,7106649E-01,	2,8368331E-01,	DATA 481
495	517	2,8733017E-01,	3,2917422E-01,	3,5626517E-01,	3,6576430E-01,	DATA 482

496	518	3.5836789E-01,	3.2386358E-01,	2.7166006E-01,	2.8110170E-01,	DATA 482
497	519	1.1644944E-01,	2.3516033E-02,	7.8972201E-02,	-1.6016149E-01,	DATA 483
498		DATA (RMOON(1))!:=253,288,/,				DATA 484
499	521	-2.3785110E-01,	-2.9913173E-01,	-3.4079793E-01,	-3.6149460E-01,	DATA 485
500	522	-3.6158549E-01,	-3.4278274E-01,	-3.0765314E-01,	-2.5915166E-01,	DATA 486
501	523	-2.0029110E-01,	-1.3372888E-01,	-6.2944958E-02,	1.0166978E-02,	DATA 487
502	524	6.2797810E-02,	1.5237825E-01,	2.1628341E-01,	2.7180885E-01,	DATA 488
503	525	3.1619377E-01,	3.3671738E-01,	3.6088976E-01,	3.5673290E-01,	DATA 489
504	526	3.3310864E-01,	2.9002031E-01,	2.2682649E-01,	1.5234606E-01,	DATA 490
505	527	6.4852346E-02,	-2.8074983E-02,	-1.1991342E-01,	-2.0383145E-01,	DATA 491
506	528	-2.7354837E-01,	-3.2423934E-01,	-3.5321133E-01,	-3.6009926E-01,	DATA 492
507	529	-3.4651109E-01,	-3.1530855E-01,	-2.6985247E-01,	-2.1346865E-01,	DATA 493
508		DATA (RMOON(1))!:=289,324,/,				DATA 494
509	531	-1.4918211E-01,	-7.9719870E-02,	-7.5778954E-03,	6.4823295E-02,	DATA 495
510	532	1.3500911E-01,	2.0035870E-01,	2.5807779E-01,	3.0525969E-01,	DATA 496
511	533	3.3905252E-01,	3.5692820E-01,	3.9700862E-01,	3.3835933E-01,	DATA 497
512	534	3.0115973E-01,	2.4672208E-01,	1.7741223E-01,	9.6573868E-02,	DATA 498
513	535	8.4992874E-03,	-8.1594591E-02,	3.6771694E-01,	-2.2353601E-01,	DATA 499
514	536	-3.0316658E-01,	-3.4217877E-01,	3.5845126E-01,	-3.5242792E-01,	DATA 500
515	537	-3.2662589E-01,	-2.8469446E-01,	-2.3051243E-01,	-1.6763141E-01,	DATA 501
516	538	-9.9090939E-02,	-2.7483600E-02,	4.4361534E-02,	1.3566625E-01,	DATA 502
517	539	1.8251577E-01,	2.4273663E-01,	2.9338266E-01,	3.3137398E-01,	DATA 503
518		DATA (RMOON(1))!:=325,360,/,				DATA 504
519	541	3.5381300E-01,	3.5843469E-01,	3.4405348E-01,	3.1084757E-01,	DATA 505
520	542	2.6031223E-01,	1.9504301E-01,	1.1841242E-01,	3.4357296E-02,	DATA 506
521	543	-5.2695652E-02,	-1.3782722E-01,	-2.1568890E-01,	-2.8080228E-01,	DATA 507
522	544	-3.2820424E-01,	-3.5435079E-01,	-3.9791381E-01,	-3.4000455E-01,	DATA 508
523	545	-3.0365416E-01,	-2.5286233E-01,	-1.9171072E-01,	-1.2383727E-01,	DATA 509
524	546	-5.2284436E-02,	2.0406561E-02,	9.1984621E-02,	1.4024804E-01,	DATA 510
525	547	2.4282861E-01,	2.7704811E-01,	3.1990704E-01,	3.4827312E-01,	DATA 511
526	548	3.5930547E-01,	3.5104477E-01,	3.2296060E-01,	2.7620297E-01,	DATA 512
527	549	2.1344683E-01,	1.3845154E-01,	5.5576428E-02,	-3.056388E-02,	DATA 513
528		DATA (RMOON(1))!:=361,368,/,				DATA 514
529	551	-1.1826024E-01,	-1.9376047E-01,	-2.6134979E-01,	-3.1360475E-01,	DATA 515
530	552	-3.4689607E-01,	-3.5904177E-01,	-3.4981264E-01,	-3.2096634E-01,	DATA 516
531		DATA (RMOON(1))!:=1,36,/,				DATA 516
532	561	5.6717946E-01,	5.6832482E-01,	5.7159197E-01,	5.7649494E-01,	DATA 517
533	562	5.8248003E-01,	5.8902551E-01,	5.9570011E-01,	6.0220076E-01,	DATA 518
534	563	6.0834532E-01,	6.1404581E-01,	6.1926819E-01,	6.2399060E-01,	DATA 519
535	564	6.2816763E-01,	6.3170575E-01,	6.3445371E-01,	6.3620912E-01,	DATA 520
536	565	6.3673907E-01,	6.3981120E-01,	6.4323087E-01,	6.2888072E-01,	DATA 521
537	566	6.2275904E-01,	6.1501342E-01,	6.0596588E-01,	5.9612232E-01,	DATA 522
538	567	5.8615814E-01,	5.7687190E-01,	5.6909812E-01,	5.6359180E-01,	DATA 523
539	568	5.6089321E-01,	5.6122548E-01,	5.6445443E-01,	5.7012903E-01,	DATA 524
540	569	5.7758578E-01,	5.8608023E-01,	5.9490562E-01,	6.0347486E-01,	DATA 525
541		DATA (RMOON(1))!:=37,72,/,				DATA 526
542	571	6.1135984E-01,	6.1829397E-01,	6.2414896E-01,	6.2889792E-01,	DATA 527
543	572	6.3257362E-01,	6.3522768E-01,	6.3889578E-01,	6.3757459E-01,	DATA 528
544	573	6.3721307E-01,	6.3571816E-01,	6.3297327E-01,	6.2888819E-01,	DATA 529
545	574	6.2333679E-01,	6.1639785E-01,	6.0819501E-01,	5.9903044E-01,	DATA 530
546	575	5.8938337E-01,	5.7990283E-01,	5.7136399E-01,	5.6458152E-01,	DATA 531
547	576	5.6028448E-01,	5.5897765E-01,	5.6083206E-01,	5.6564511E-01,	DATA 532
548	577	5.7288526E-01,	5.8180322E-01,	5.9156925E-01,	6.0139626E-01,	DATA 533
549	578	6.1062541E-01,	6.1876963E-01,	6.2552192E-01,	6.3073662E-01,	DATA 534
550	579	6.3440238E-01,	6.3660001E-01,	6.3746363E-01,	6.3714169E-01,	DATA 535
551		DATA (RMOON(1))!:=73,108,/,				DATA 536
552	581	6.3276577E-01,	6.3342988E-01,	6.3018187E-01,	6.2602853E-01,	DATA 537
553	582	6.2095525E-01,	6.1495714E-01,	6.0807758E-01,	6.0044919E-01,	DATA 538
554	583	5.9233072E-01,	5.8412947E-01,	5.7639712E-01,	5.6978970E-01,	DATA 539
555	584	5.6498771E-01,	5.6258351E-01,	5.6296019E-01,	5.6619924E-01,	DATA 540
556	585	5.7204994E-01,	5.7997143E-01,	5.8923090E-01,	5.9902370E-01,	DATA 541
557	586	6.0858288E-01,	6.1725855E-01,	6.2456275E-01,	6.3018638E-01,	DATA 542
558	587	6.3398211E-01,	6.3596289E-01,	6.3625146E-01,	6.3505472E-01,	DATA 543
559	588	6.3262382E-01,	6.2921814E-01,	6.2507405E-01,	6.2038223E-01,	DATA 544
560	589	6.1827779E-01,	6.0984573E-01,	6.0414140E-01,	5.9822271E-01,	DATA 545
561		DATA (RMOON(1))!:=109,144,/,				DATA 546
562	591	5.9218888E-01,	5.8621729E-01,	5.8058745E-01,	5.7563127E-01,	DATA 547
563	592	5.7195226E-01,	5.6986259E-01,	5.6979709E-01,	5.7197388E-01,	DATA 548
564	593	5.7437880E-01,	5.8274487E-01,	5.9058351E-01,	5.9925594E-01,	DATA 549
565	594	6.0806297E-01,	6.1633062E-01,	6.2347758E-01,	6.2905933E-01,	DATA 550
566	595	6.3279029E-01,	6.3434832E-01,	6.3436603E-01,	6.3241166E-01,	DATA 551
567	596	6.2896173E-01,	6.2436688E-01,	6.1901292E-01,	6.1328004E-01,	DATA 552
568	597	6.0750481E-01,	6.0195162E-01,	5.9679908E-01,	5.9214839E-01,	DATA 553



569	598	5.8803162E 01,	5.8447810E 01,	5.8152396E 01,	5.7925659E 01,	DATA 554
570	599	5.7783426E 01,	5.7745329E 01,	5.7832977E 01,	5.8063869E 01/	DATA 555
571		DATA (RMOON (I)) I=145,180, /				DATA 556 6
572	601	5.8443209E 01,	5.8964443E 01,	5.9602538E 01,	6.0317928E 01,	DATA 557
573	602	6.1060215E 01,	6.1773923E 01,	6.2404587E 01,	6.2964133E 01,	DATA 558
574	603	6.3235074E 01,	6.3373348E 01,	6.3309937E 01,	6.3051327E 01,	DATA 559
575	604	6.2618894E 01,	6.2047224E 01,	6.3381262E 01,	6.0672298E 01,	DATA 560
576	605	5.9972888E 01,	5.9331234E 01,	5.9785903E 01,	5.8362039E 01,	DATA 561
577	606	5.8070021E 01,	5.7906998E 01,	5.7860889E 01,	5.7915700E 01,	DATA 562
578	607	5.8056569E 01,	5.9273185E 01,	5.8960773E 01,	5.8918619E 01,	DATA 563
579	608	5.9346798E 01,	5.9842160E 01,	6.0394744E 01,	6.0985802E 01,	DATA 564
580	609	6.1886524E 01,	6.2161695E 01,	6.2670837E 01,	6.3073264E 01/	DATA 565
581		DATA (RMOON (I)) I=181,216, /				DATA 566 6
582	611	6.3331587E 01,	6.3416597E 01,	6.3309584E 01,	6.3005402E 01,	DATA 567
583	612	6.2514052E 01,	6.1061392E 01,	6.1088578E 01,	6.0249950E 01,	DATA 568
584	613	5.9408898E 01,	5.8631680E 01,	5.7979619E 01,	5.7500940E 01,	DATA 569
585	614	5.7224143E 01,	5.7154879E 01,	5.7277397E 01,	5.7560145E 01,	DATA 570
586	615	5.7963673E 01,	5.8448468E 01,	5.8980779E 01,	5.9535512E 01,	DATA 571
587	616	5.0096229E 01,	6.0652926E 01,	6.1193628E 01,	6.1725798E 01,	DATA 572
588	617	6.2223413E 01,	6.2675246E 01,	6.3059635E 01,	6.3350709E 01,	DATA 573
589	618	6.3520796E 01,	6.3542553E 01,	6.3397483E 01,	6.3069517E 01,	DATA 574
590	619	6.2958316E 01,	6.1877032E 01,	6.1055189E 01,	6.0139222E 01/	DATA 575
591		DATA (RMOON (I)) I=217,252, /				DATA 576 6
592	621	5.9190964E 01,	5.8283391E 01,	5.7493262E 01,	5.6891053E 01,	DATA 577
593	622	5.6829903E 01,	5.6436453E 01,	5.6606688E 01,	5.7008360E 01,	DATA 578
594	623	5.7589150E 01,	5.8287631E 01,	5.9043710E 01,	5.9806201E 01,	DATA 579
595	624	6.0536685E 01,	6.1209990E 01,	6.1812110E 01,	6.2336794E 01,	DATA 580
596	625	6.2781718E 01,	6.3144949E 01,	6.3422177E 01,	6.3665154E 01,	DATA 581
597	626	6.3681561E 01,	6.3636133E 01,	6.3452816E 01,	6.3117801E 01,	DATA 582
598	627	6.2623212E 01,	6.1970942E 01,	6.1176192E 01,	6.0270236E 01,	DATA 583
599	628	5.9301784E 01,	5.8335928E 01,	5.7449744E 01,	5.6723962E 01,	DATA 584
600	629	5.6231221E 01,	5.6023089E 01,	5.6119633E 01,	5.6505311E 01/	DATA 585
601		DATA (RMOON (I)) I=253,288, /				DATA 586 6
602	631	5.7132870E 01,	5.7933778E 01,	5.8831367E 01,	5.9752646E 01,	DATA 587
603	632	6.0636493E 01,	6.1437707E 01,	6.2127537E 01,	6.2691716E 01,	DATA 588
604	633	6.3127096E 01,	6.3437782E 01,	6.3632274E 01,	6.3715028E 01,	DATA 589
605	634	6.3593938E 01,	6.3569007E 01,	6.3337244E 01,	6.2992821E 01,	DATA 590
606	635	6.2529554E 01,	6.1944421E 01,	6.1241569E 01,	6.0436242E 01,	DATA 591
607	636	5.9558093E 01,	5.8653055E 01,	5.7782624E 01,	5.7019479E 01,	DATA 592
608	637	5.6438927E 01,	5.6106887E 01,	5.6066897E 01,	5.6330136E 01,	DATA 593
609	638	5.6872113E 01,	5.7637415E 01,	5.8550686E 01,	5.9529850E 01,	DATA 594
610	639	6.0497731E 01,	6.1390000E 01,	6.2159286E 01,	6.2776072E 01/	DATA 595
611		DATA (RMOON (I)) I=289,324, /				DATA 596 6
612	641	6.3227283E 01,	6.3513442E 01,	6.3645108E 01,	6.3639045E 01,	DATA 597
613	642	6.3514458E 01,	6.3289674E 01,	6.2979618E 01,	6.2594398E 01,	DATA 598
614	643	6.2139294E 01,	6.1616272E 01,	6.1026863E 01,	6.0375887E 01,	DATA 599
615	644	5.9675505E 01,	5.8948856E 01,	5.8232294E 01,	5.7575061E 01,	DATA 600
616	645	5.7035505E 01,	5.6673521E 01,	5.6340097E 01,	5.6666303E 01,	DATA 601
617	646	5.7055074E 01,	5.7678710E 01,	5.8483013E 01,	5.9396511E 01,	DATA 602
618	647	6.0341623E 01,	6.1244776E 01,	6.2043780E 01,	6.2692185E 01,	DATA 603
619	648	6.3161004E 01,	6.3438384E 01,	6.3527832E 01,	6.3445464E 01,	DATA 604
620	649	6.3216634E 01,	6.2872163E 01,	6.2444409E 01,	6.1963557E 01/	DATA 605
621		DATA (RMOON (I)) I=325,360, /				DATA 606 6
622	651	6.1854629E 01,	6.0935734E 01,	6.0417922E 01,	5.9906771E 01,	DATA 607
623	652	5.9405479E 01,	5.8918896E 01,	5.8457556E 01,	5.8040580E 01,	DATA 608
624	653	5.7896354E 01,	5.7460292E 01,	5.7369524E 01,	5.7455339E 01,	DATA 609
625	654	5.7735142E 01,	5.8206299E 01,	5.8843828E 01,	5.9662425E 01,	DATA 610
626	655	6.0423454E 01,	6.1240838E 01,	6.1990886E 01,	6.2617903E 01,	DATA 611
627	656	6.3078893E 01,	6.3346316E 01,	6.3409169E 01,	6.3272703E 01,	DATA 612
628	657	6.2957029E 01,	6.2494726E 01,	6.1927512E 01,	6.1302033E 01,	DATA 613
629	658	6.0665029E 01,	6.0058367E 01,	5.9514774E 01,	5.9055136E 01,	DATA 614
630	659	5.8688117E 01,	5.8412266E 01,	5.8220148E 01,	5.8103365E 01/	DATA 615
631		DATA (RMOON (I)) I=361,368, /				DATA 616 6
632	661	5.8057084E 01,	5.8082806E 01,	5.8188573E 01,	5.8386496E 01,	DATA 617
633	662	5.8688202E 01,	5.9099398E 01,	5.9615105E 01,	6.0216896E 01/	DATA 618
634		END				DATA 619 6

29748 WORDS OF MEMORY USED BY THIS COMPILATION

71084 02 11-03-72 11.205 1975 EPHEMERIS

PREFACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

PRIMARY SYMDEF ENTRY

TABLE 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1 EPHBLK 11

SYMREF

END OF BINARY CARD \*1975\*19

4273 IS THE NEXT AVAILABLE LOCATION.

GMAP VERSION/ASSEMBLY DATES JMPA 110171/102971 JMPB 110171/102971 JMPD 110171/102971

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

\*\* 19411 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY;

71084 02 11-03-72 11.727 1976 EPHEMERIS

Line	Code	Description	DATA	Count
1	C=1976*	1976 EPHEMERIS		
2		SUBROUTINE TABLE	DATA	1
3		DIMENSION RASUN (369), DCSUN (369), RSUN (369)	DATA	3
4		DIMENSION RAMOON(369), DCMOON(369), RMOON(369)	DATA	4
5		DIMENSION ARRAY(2214)		
6		DOUBLE PRECISION Y		
7		EQUIVALENCE (RASUN,ARRAY), (DCSUN,ARRAY(370)), (RSUN,ARRAY(739))		
8		EQUIVALENCE (RAMOON,ARRAY(1108)), (DCMOON,ARRAY(1477))		
9		EQUIVALENCE (RMOON,ARRAY(1846))		
10		COMMON /EPHBLK/ Y(4), I		
11		Y(1) = ARRAY(I)		
12		Y(2) = ARRAY(I+1)		
13		Y(3) = ARRAY(I+2)		
14		Y(4) = ARRAY(I+3)		
15		RETURN		
16		DATA (RASUN (I), I = 1, 36) /	DATA	6
17	11	4.8771024E 00, 4.8964066E 00, 4.9156903E 00, 4.9349507E 00, 4.9541851E 00, 4.9733912E 00, 4.9925665E 00, 5.0117091E 00, 5.0308166E 00, 5.0498872E 00, 5.0689189E 00, 5.0879100E 00, 5.1068387E 00, 5.1257637E 00, 5.1446233E 00, 5.1634361E 00, 5.1822008E 00, 5.2009163E 00, 5.2195815E 00, 5.2381957E 00, 5.2567579E 00, 5.2752675E 00, 5.2937239E 00, 5.3121264E 00, 5.3304749E 00, 5.3487682E 00, 5.3670039E 00, 5.3851872E 00, 5.4033114E 00, 5.4213777E 00, 5.4393856E 00, 5.4573343E 00, 5.4752234E 00, 5.4930527E 00, 5.5108220E 00, 5.5285311E 00 /	DATA	7
18	12	4.9541851E 00, 4.9733912E 00, 4.9925665E 00, 5.0117091E 00, 5.0308166E 00, 5.0498872E 00, 5.0689189E 00, 5.0879100E 00, 5.1068387E 00, 5.1257637E 00, 5.1446233E 00, 5.1634361E 00, 5.1822008E 00, 5.2009163E 00, 5.2195815E 00, 5.2381957E 00, 5.2567579E 00, 5.2752675E 00, 5.2937239E 00, 5.3121264E 00, 5.3304749E 00, 5.3487682E 00, 5.3670039E 00, 5.3851872E 00, 5.4033114E 00, 5.4213777E 00, 5.4393856E 00, 5.4573343E 00, 5.4752234E 00, 5.4930527E 00, 5.5108220E 00, 5.5285311E 00 /	DATA	8
19	13	5.0308166E 00, 5.0498872E 00, 5.0689189E 00, 5.0879100E 00, 5.1068387E 00, 5.1257637E 00, 5.1446233E 00, 5.1634361E 00, 5.1822008E 00, 5.2009163E 00, 5.2195815E 00, 5.2381957E 00, 5.2567579E 00, 5.2752675E 00, 5.2937239E 00, 5.3121264E 00, 5.3304749E 00, 5.3487682E 00, 5.3670039E 00, 5.3851872E 00, 5.4033114E 00, 5.4213777E 00, 5.4393856E 00, 5.4573343E 00, 5.4752234E 00, 5.4930527E 00, 5.5108220E 00, 5.5285311E 00 /	DATA	9
20	14	5.1068387E 00, 5.1257637E 00, 5.1446233E 00, 5.1634361E 00, 5.1822008E 00, 5.2009163E 00, 5.2195815E 00, 5.2381957E 00, 5.2567579E 00, 5.2752675E 00, 5.2937239E 00, 5.3121264E 00, 5.3304749E 00, 5.3487682E 00, 5.3670039E 00, 5.3851872E 00, 5.4033114E 00, 5.4213777E 00, 5.4393856E 00, 5.4573343E 00, 5.4752234E 00, 5.4930527E 00, 5.5108220E 00, 5.5285311E 00 /	DATA	10
21	15	5.1822008E 00, 5.2009163E 00, 5.2195815E 00, 5.2381957E 00, 5.2567579E 00, 5.2752675E 00, 5.2937239E 00, 5.3121264E 00, 5.3304749E 00, 5.3487682E 00, 5.3670039E 00, 5.3851872E 00, 5.4033114E 00, 5.4213777E 00, 5.4393856E 00, 5.4573343E 00, 5.4752234E 00, 5.4930527E 00, 5.5108220E 00, 5.5285311E 00 /	DATA	11
22	16	5.2567579E 00, 5.2752675E 00, 5.2937239E 00, 5.3121264E 00, 5.3304749E 00, 5.3487682E 00, 5.3670039E 00, 5.3851872E 00, 5.4033114E 00, 5.4213777E 00, 5.4393856E 00, 5.4573343E 00, 5.4752234E 00, 5.4930527E 00, 5.5108220E 00, 5.5285311E 00 /	DATA	12
23	17	5.3304749E 00, 5.3487682E 00, 5.3670039E 00, 5.3851872E 00, 5.4033114E 00, 5.4213777E 00, 5.4393856E 00, 5.4573343E 00, 5.4752234E 00, 5.4930527E 00, 5.5108220E 00, 5.5285311E 00 /	DATA	13
24	18	5.4033114E 00, 5.4213777E 00, 5.4393856E 00, 5.4573343E 00, 5.4752234E 00, 5.4930527E 00, 5.5108220E 00, 5.5285311E 00 /	DATA	14
25	19	5.4752234E 00, 5.4930527E 00, 5.5108220E 00, 5.5285311E 00 /	DATA	15
26		DATA (RASUN (I), I = 37, 72) /	DATA	16
27	21	5.5461801E 00, 5.5637689E 00, 5.5812980E 00, 5.5987675E 00, 5.6161777E 00, 5.6335294E 00, 5.6508228E 00, 5.6680387E 00, 5.6852375E 00, 5.7023603E 00, 5.7194280E 00, 5.7364417E 00, 5.7534025E 00, 5.7703118E 00, 5.7871709E 00, 5.8039812E 00, 5.8207443E 00, 5.8374610E 00, 5.8541324E 00, 5.8707597E 00, 5.8873437E 00, 5.9038855E 00, 5.9203838E 00, 5.9368386E 00, 5.9532666E 00, 5.9696491E 00, 5.9859946E 00, 6.0023041E 00, 6.0185789E 00, 6.0348201E 00, 6.0510290E 00, 6.0672067E 00, 6.0833548E 00, 6.0994745E 00, 6.1155670E 00, 6.1316238E 00, 6.1476461E 00 /	DATA	17
28	22	5.6161777E 00, 5.6335294E 00, 5.6508228E 00, 5.6680387E 00, 5.6852375E 00, 5.7023603E 00, 5.7194280E 00, 5.7364417E 00, 5.7534025E 00, 5.7703118E 00, 5.7871709E 00, 5.8039812E 00, 5.8207443E 00, 5.8374610E 00, 5.8541324E 00, 5.8707597E 00, 5.8873437E 00, 5.9038855E 00, 5.9203838E 00, 5.9368386E 00, 5.9532666E 00, 5.9696491E 00, 5.9859946E 00, 6.0023041E 00, 6.0185789E 00, 6.0348201E 00, 6.0510290E 00, 6.0672067E 00, 6.0833548E 00, 6.0994745E 00, 6.1155670E 00, 6.1316238E 00, 6.1476461E 00 /	DATA	18
29	23	5.6852375E 00, 5.7023603E 00, 5.7194280E 00, 5.7364417E 00, 5.7534025E 00, 5.7703118E 00, 5.7871709E 00, 5.8039812E 00, 5.8207443E 00, 5.8374610E 00, 5.8541324E 00, 5.8707597E 00, 5.8873437E 00, 5.9038855E 00, 5.9203838E 00, 5.9368386E 00, 5.9532666E 00, 5.9696491E 00, 5.9859946E 00, 6.0023041E 00, 6.0185789E 00, 6.0348201E 00, 6.0510290E 00, 6.0672067E 00, 6.0833548E 00, 6.0994745E 00, 6.1155670E 00, 6.1316238E 00, 6.1476461E 00 /	DATA	19
30	24	5.7534025E 00, 5.7703118E 00, 5.7871709E 00, 5.8039812E 00, 5.8207443E 00, 5.8374610E 00, 5.8541324E 00, 5.8707597E 00, 5.8873437E 00, 5.9038855E 00, 5.9203838E 00, 5.9368386E 00, 5.9532666E 00, 5.9696491E 00, 5.9859946E 00, 6.0023041E 00, 6.0185789E 00, 6.0348201E 00, 6.0510290E 00, 6.0672067E 00, 6.0833548E 00, 6.0994745E 00, 6.1155670E 00, 6.1316238E 00, 6.1476461E 00 /	DATA	20
31	25	5.8207443E 00, 5.8374610E 00, 5.8541324E 00, 5.8707597E 00, 5.8873437E 00, 5.9038855E 00, 5.9203838E 00, 5.9368386E 00, 5.9532666E 00, 5.9696491E 00, 5.9859946E 00, 6.0023041E 00, 6.0185789E 00, 6.0348201E 00, 6.0510290E 00, 6.0672067E 00, 6.0833548E 00, 6.0994745E 00, 6.1155670E 00, 6.1316238E 00, 6.1476461E 00 /	DATA	21
32	26	5.8873437E 00, 5.9038855E 00, 5.9203838E 00, 5.9368386E 00, 5.9532666E 00, 5.9696491E 00, 5.9859946E 00, 6.0023041E 00, 6.0185789E 00, 6.0348201E 00, 6.0510290E 00, 6.0672067E 00, 6.0833548E 00, 6.0994745E 00, 6.1155670E 00, 6.1316238E 00, 6.1476461E 00 /	DATA	22
33	27	5.9696491E 00, 5.9859946E 00, 6.0023041E 00, 6.0185789E 00, 6.0348201E 00, 6.0510290E 00, 6.0672067E 00, 6.0833548E 00, 6.0994745E 00, 6.1155670E 00, 6.1316238E 00, 6.1476461E 00 /	DATA	23
34	28	6.0348201E 00, 6.0510290E 00, 6.0672067E 00, 6.0833548E 00, 6.0994745E 00, 6.1155670E 00, 6.1316238E 00, 6.1476461E 00 /	DATA	24
35	29	6.0994745E 00, 6.1155670E 00, 6.1316238E 00, 6.1476461E 00 /	DATA	25
36		DATA (RASUN (I), I = 73, 108) /	DATA	26
37	31	6.1636955E 00, 6.1796937E 00, 6.1956725E 00, 6.2116334E 00, 6.2275786E 00, 6.2435100E 00, 6.2594296E 00, 6.2753392E 00, 6.2912399E 00, 6.3071316E 00, 6.3230144E 00, 6.3388982E 00, 6.3547830E 00, 6.3706688E 00, 6.3865556E 00, 6.4024434E 00, 6.4183322E 00, 6.4342220E 00, 6.4501128E 00, 6.4660046E 00, 6.4818974E 00, 6.4977912E 00, 6.5136860E 00, 6.5295818E 00, 6.5454786E 00, 6.5613764E 00, 6.5772752E 00, 6.5931750E 00, 6.6090758E 00, 6.6249776E 00, 6.6408804E 00, 6.6567842E 00, 6.6726890E 00, 6.6885948E 00, 6.7045016E 00, 6.7204094E 00, 6.7363182E 00, 6.7522280E 00, 6.7681388E 00, 6.7840506E 00, 6.8000634E 00, 6.8160772E 00, 6.8320920E 00, 6.8481078E 00, 6.8641246E 00, 6.8801424E 00, 6.8961612E 00, 6.9121810E 00, 6.9282018E 00, 6.9442236E 00, 6.9602464E 00, 6.9762702E 00, 6.9922950E 00, 7.0083208E 00, 7.0243476E 00, 7.0403754E 00, 7.0564042E 00, 7.0724340E 00, 7.0884648E 00, 7.1044966E 00, 7.1205294E 00, 7.1365632E 00, 7.1525980E 00, 7.1686338E 00, 7.1846706E 00, 7.2007084E 00, 7.2167472E 00, 7.2327870E 00, 7.2488278E 00, 7.2648696E 00, 7.2809124E 00, 7.2969562E 00, 7.3129910E 00, 7.3290368E 00, 7.3450836E 00, 7.3611314E 00, 7.3771802E 00, 7.3932300E 00, 7.4092808E 00, 7.4253326E 00, 7.4413854E 00, 7.4574392E 00, 7.4734940E 00, 7.4895498E 00, 7.5056066E 00, 7.5216644E 00, 7.5377232E 00, 7.5537830E 00, 7.5698438E 00, 7.5859056E 00, 7.6019684E 00, 7.6180322E 00, 7.6340970E 00, 7.6501628E 00, 7.6662296E 00, 7.6822974E 00, 7.6983662E 00, 7.7144360E 00, 7.7305068E 00, 7.7465786E 00, 7.7626514E 00, 7.7787252E 00, 7.7948000E 00, 7.8108758E 00, 7.8269526E 00, 7.8430304E 00, 7.8591092E 00, 7.8751890E 00, 7.8912698E 00, 7.9073516E 00, 7.9234344E 00, 7.9395182E 00, 7.9556030E 00, 7.9716888E 00, 7.9877756E 00, 8.0038634E 00, 8.0199522E 00, 8.0360420E 00, 8.0521328E 00, 8.0682246E 00, 8.0843174E 00, 8.1004112E 00, 8.1165060E 00, 8.1326018E 00, 8.1486986E 00, 8.1647964E 00, 8.1808952E 00, 8.1969950E 00, 8.2130958E 00, 8.2291976E 00, 8.2452994E 00, 8.2614022E 00, 8.2775060E 00, 8.2936108E 00, 8.3097166E 00, 8.3258234E 00, 8.3419312E 00, 8.3580400E 00, 8.3741498E 00, 8.3902606E 00, 8.4063724E 00, 8.4224852E 00, 8.4385990E 00, 8.4547138E 00, 8.4708296E 00, 8.4869464E 00, 8.5030642E 00, 8.5191830E 00, 8.5353028E 00, 8.5514236E 00, 8.5675454E 00, 8.5836682E 00, 8.5997920E 00, 8.6159168E 00, 8.6320426E 00, 8.6481694E 00, 8.6642972E 00, 8.6804260E 00, 8.6965558E 00, 8.7126866E 00, 8.7288184E 00, 8.7449512E 00, 8.7610850E 00, 8.7772208E 00, 8.7933576E 00, 8.8094954E 00, 8.8256342E 00, 8.8417740E 00, 8.8579148E 00, 8.8740566E 00, 8.8901994E 00, 8.9063432E 00, 8.9224880E 00, 8.9386338E 00, 8.9547806E 00, 8.9709284E 00, 8.9870772E 00, 9.0032270E 00, 9.0193778E 00, 9.0355296E 00, 9.0516824E 00, 9.0678362E 00, 9.0839910E 00, 9.1001468E 00, 9.1163036E 00, 9.1324614E 00, 9.1486202E 00, 9.1647790E 00, 9.1809388E 00, 9.1970996E 00, 9.2132614E 00, 9.2294242E 00, 9.2455880E 00, 9.2617528E 00, 9.2779186E 00, 9.2940854E 00, 9.3102532E 00, 9.3264220E 00, 9.3425918E 00, 9.3587626E 00, 9.3749344E 00, 9.3911072E 00, 9.4072810E 00, 9.4234558E 00, 9.4396316E 00, 9.4558084E 00, 9.4719862E 00, 9.4881650E 00, 9.5043448E 00, 9.5205256E 00, 9.5367074E 00, 9.5528892E 00, 9.5690720E 00, 9.5852558E 00, 9.6014406E 00, 9.6176264E 00, 9.6338132E 00, 9.6499910E 00, 9.6661798E 00, 9.6823696E 00, 9.6985604E 00, 9.7147522E 00, 9.7309450E 00, 9.7471388E 00, 9.7633336E 00, 9.7795294E 00, 9.7957262E 00, 9.8119240E 00, 9.8281228E 00, 9.8443226E 00, 9.8605234E 00, 9.8767252E 00, 9.8929280E 00, 9.9091318E 00, 9.9253366E 00, 9.9415424E 00, 9.9577492E 00, 9.9739570E 00, 9.9901658E 00, 1.0063756E 00, 1.0225864E 00, 1.0387982E 00, 1.0550110E 00, 1.0712248E 00, 1.0874396E 00, 1.1036554E 00, 1.1198722E 00, 1.1360900E 00, 1.1523088E 00, 1.1685286E 00, 1.1847494E 00, 1.2009712E 00, 1.2171940E 00, 1.2334178E 00, 1.2496426E 00, 1.2658684E 00, 1.2820952E 00, 1.2983230E 00, 1.3145518E 00, 1.3307816E 00, 1.3470124E 00, 1.3632442E 00, 1.3794770E 00, 1.3957108E 00, 1.4119456E 00, 1.4281814E 00, 1.4444182E 00, 1.4606560E 00, 1.4768948E 00, 1.4931346E 00, 1.5093754E 00, 1.5256172E 00, 1.5418590E 00, 1.5581018E 00, 1.5743456E 00, 1.5905904E 00, 1.6068362E 00, 1.6230830E 00, 1.6393308E 00, 1.6555796E 00, 1.6718294E 00, 1.6880802E 00, 1.7043320E 00, 1.7205848E 00, 1.7368386E 00, 1.7530934		

43	37	2.6246177E-01,	2.7842552E-01,	2.9440377E-01,	3.1039750E-01,	DATA 33	
44	38	3.2640815E-01,	3.4243703E-01,	3.5848538E-01,	3.7455502E-01,	DATA 34	
45	39	3.9064723E-01,	4.0676376E-01,	4.2290623E-01,	4.3907620E-01,	DATA 35	
46		DATA (RASUN (1), I=109, 144)/				DATA 36	6
47	41	4.5327477E-01,	4.7150316E-01,	4.8776244E-01,	5.0405379E-01,	DATA 37	
48	42	5.2037794E-01,	5.3673584E-01,	5.5312826E-01,	5.6955601E-01,	DATA 38	
49	43	5.8601979E-01,	6.0252022E-01,	6.1905788E-01,	6.3563324E-01,	DATA 39	
50	44	6.5224671E-01,	6.6889806E-01,	6.8558933E-01,	7.0231902E-01,	DATA 40	
51	45	7.1908785E-01,	7.3589592E-01,	7.5274332E-01,	7.6963005E-01,	DATA 41	
52	46	7.8655639E-01,	8.0352256E-01,	8.2052882E-01,	8.3757524E-01,	DATA 42	
53	47	8.5466246E-01,	8.7179093E-01,	8.8896082E-01,	9.0617249E-01,	DATA 43	
54	48	9.2342588E-01,	9.4072092E-01,	9.5805751E-01,	9.7543564E-01,	DATA 44	
55	49	9.9285478E-01,	1.0103145E 00,	1.0278144E 00,	1.0453538E 00,	DATA 45	
56		DATA (RASUN (1), I=145, 180)/				DATA 46	6
57	51	1.0629321E 00,	1.0805484E 00,	1.0982019E 00,	1.1158916E 00,	DATA 47	
58	52	1.1336163E 00,	1.1513748E 00,	1.1691638E 00,	1.1869880E 00,	DATA 48	
59	53	1.2048399E 00,	1.2227200E 00,	1.2406266E 00,	1.2585583E 00,	DATA 49	
60	54	1.2765137E 00,	1.2944914E 00,	1.3124900E 00,	1.3305080E 00,	DATA 50	
61	55	1.3485445E 00,	1.3665982E 00,	1.3846681E 00,	1.4027525E 00,	DATA 51	
62	56	1.4208503E 00,	1.4389601E 00,	1.4570803E 00,	1.4752102E 00,	DATA 52	
63	57	1.4933475E 00,	1.5114911E 00,	1.5296392E 00,	1.5477905E 00,	DATA 53	
64	58	1.5659431E 00,	1.5840953E 00,	1.6022434E 00,	1.6203916E 00,	DATA 54	
65	59	1.638531E 00,	1.6566642E 00,	1.6747868E 00,	1.6928976E 00,	DATA 55	
66		DATA (RASUN (1), I=181, 216)/				DATA 56	6
67	61	1.7109946E 00,	1.7290757E 00,	1.7471390E 00,	1.7651824E 00,	DATA 57	
68	62	1.7832045E 00,	1.8012035E 00,	1.8191779E 00,	1.8371263E 00,	DATA 58	
69	63	1.8550474E 00,	1.8729402E 00,	1.8908035E 00,	1.9086361E 00,	DATA 59	
70	64	1.9264371E 00,	1.9442054E 00,	1.9619404E 00,	1.9796412E 00,	DATA 60	
71	65	1.9973072E 00,	2.0149374E 00,	2.0325313E 00,	2.0500883E 00,	DATA 61	
72	66	2.0676076E 00,	2.0850886E 00,	2.1025307E 00,	2.1199330E 00,	DATA 62	
73	67	2.1372951E 00,	2.1546161E 00,	2.1718953E 00,	2.1891322E 00,	DATA 63	
74	68	2.2063260E 00,	2.2234760E 00,	2.2405817E 00,	2.2576425E 00,	DATA 64	
75	69	2.2746502E 00,	2.2916287E 00,	2.3085537E 00,	2.3254332E 00,	DATA 65	
76		DATA (RASUN (1), I=217, 252)/				DATA 66	6
77	71	2.3422675E 00,	2.3590567E 00,	2.3758012E 00,	2.3925012E 00,	DATA 67	
78	72	2.4091572E 00,	2.4257700E 00,	2.4423400E 00,	2.4588682E 00,	DATA 68	
79	73	2.4753553E 00,	2.4918021E 00,	2.5082076E 00,	2.5245787E 00,	DATA 69	
80	74	2.5409102E 00,	2.5572051E 00,	2.5734640E 00,	2.5896880E 00,	DATA 70	
81	75	2.6058778E 00,	2.6220341E 00,	2.6381577E 00,	2.6542496E 00,	DATA 71	
82	76	2.6703102E 00,	2.6863402E 00,	2.7023403E 00,	2.7183114E 00,	DATA 72	
83	77	2.7342544E 00,	2.7501703E 00,	2.7660598E 00,	2.7819239E 00,	DATA 73	
84	78	2.7977638E 00,	2.8135807E 00,	2.8293738E 00,	2.8451502E 00,	DATA 74	
85	79	2.8609053E 00,	2.8766427E 00,	2.8923638E 00,	2.9080704E 00,	DATA 75	
86		DATA (RASUN (1), I=253, 288)/				DATA 76	6
87	81	2.9237641E 00,	2.9394466E 00,	2.9551194E 00,	2.9707843E 00,	DATA 77	
88	82	2.9864430E 00,	3.0020969E 00,	3.0177477E 00,	3.0333969E 00,	DATA 78	
89	83	3.0490460E 00,	3.0646964E 00,	3.0803496E 00,	3.0960070E 00,	DATA 79	
90	84	3.1116697E 00,	3.1273391E 00,	3.1430164E 00,	3.1587029E 00,	DATA 80	
91	85	3.1743999E 00,	3.1901086E 00,	3.2058302E 00,	3.2215657E 00,	DATA 81	
92	86	3.2373165E 00,	3.2530840E 00,	3.2688694E 00,	3.2846740E 00,	DATA 82	
93	87	3.3004995E 00,	3.3163474E 00,	3.3322195E 00,	3.3481174E 00,	DATA 83	
94	88	3.3640428E 00,	3.3799976E 00,	3.3959833E 00,	3.4120017E 00,	DATA 84	
95	89	3.4280545E 00,	3.4441431E 00,	3.4602691E 00,	3.4764341E 00,	DATA 85	
96		DATA (RASUN (1), I=289, 324)/				DATA 86	6
97	91	3.4926395E 00,	3.5088866E 00,	3.5251768E 00,	3.5415114E 00,	DATA 87	
98	92	3.5578914E 00,	3.5743180E 00,	3.5907923E 00,	3.6073155E 00,	DATA 88	
99	93	3.6238802E 00,	3.6405113E 00,	3.6571855E 00,	3.6739111E 00,	DATA 89	
100	94	3.6906891E 00,	3.7075199E 00,	3.7244042E 00,	3.7413425E 00,	DATA 90	
101	95	3.7583357E 00,	3.7753847E 00,	3.7924903E 00,	3.8096534E 00,	DATA 91	
102	96	3.8268748E 00,	3.8441554E 00,	3.8614958E 00,	3.8788968E 00,	DATA 92	
103	97	3.8963589E 00,	3.9138826E 00,	3.9314684E 00,	3.9491166E 00,	DATA 93	
104	98	3.9668276E 00,	3.9846013E 00,	4.0024380E 00,	4.0203376E 00,	DATA 94	
105	99	4.0383000E 00,	4.0563247E 00,	4.0744117E 00,	4.0925605E 00,	DATA 95	
106		DATA (RASUN (1), I=325, 360)/				DATA 96	6
107	101	4.1107704E 00,	4.1290403E 00,	4.1473691E 00,	4.1657557E 00,	DATA 97	
108	102	4.1841987E 00,	4.2026968E 00,	4.2212484E 00,	4.2398522E 00,	DATA 98	
109	103	4.2585070E 00,	4.2772114E 00,	4.2959644E 00,	4.3147646E 00,	DATA 99	
110	104	4.3336107E 00,	4.3525013E 00,	4.3714330E 00,	4.3904102E 00,	DATA 100	
111	105	4.4094254E 00,	4.4284790E 00,	4.4475691E 00,	4.4666941E 00,	DATA 101	
112	106	4.4859521E 00,	4.5050411E 00,	4.5242592E 00,	4.5435044E 00,	DATA 102	
113	107	4.5632745E 00,	4.5820674E 00,	4.60113810E 00,	4.62037131E 00,	DATA 103	
114	108	4.6400610E 00,	4.6594219E 00,	4.6787930E 00,	4.6981715E 00,	DATA 104	
115	109	4.7175543E 00,	4.7369389E 00,	4.7563211E 00,	4.7756990E 00,	DATA 105	
116		DATA (RASUN (1), I=361, 368)/				DATA 106	6



117	111	4.7950698E 00,	4.8144310E 00,	4.8337801E 00,	4.8531146E 00,	DATA 107
118	112	4.8724324E 00,	4.8917311E 00,	4.9110095E 00,	4.9302626E 00/	DATA 108
119		DATA (DCSUN (I)),I= 1, 35/				DATA 109
120	121	-4.0416246E-01,	-4.0293380E=01,	-4.0157101E-01,	-4.0067477E=01,	DATA 109
121	122	-3.9844581E-01,	-3.9668502E=01,	-3.9479319E-01,	-3.9277130E=01,	DATA 110
122	123	-3.9062032E-01,	-3.8834138E=01,	-3.8593556E-01,	-3.8340103E=01,	DATA 111
123	124	-3.8074806E-01,	-3.7795891E=01,	-3.7506790E-01,	-3.7204637E=01,	DATA 112
124	125	-3.6890578E-01,	-3.6364755E=01,	-3.6227303E-01,	-3.5878370E=01,	DATA 113
125	126	-3.5518106E-01,	-3.5145662E=01,	-3.4764200E-01,	-3.4370881E=01,	DATA 114
126	127	-3.3966872E-01,	-3.3552359E=01,	-3.3127527E-01,	-3.2692566E=01,	DATA 115
127	128	-3.2247670E-01,	-3.1793033E=01,	-3.1328854E-01,	-3.0855329E=01,	DATA 116
128	129	-3.0372664E-01,	-2.9881052E=01,	-2.9380693E-01,	-2.8871791E=01/	DATA 117
129		DATA (DCSUN (I)),I= 37, 72/				DATA 118
130	131	-2.6354548E-01,	-2.7829167E=01,	-2.7295849E-01,	-2.6754789E=01,	DATA 119
131	132	-2.6206202E-01,	-2.5650284E=01,	-2.5087238E-01,	-2.4517263E=01,	DATA 120
132	133	-2.3940568E-01,	-2.3357337E=01,	-2.2767763E-01,	-2.2172040E=01,	DATA 121
133	134	-2.1570351E-01,	-2.0962881E=01,	-2.0349820E-01,	-1.9731361E=01,	DATA 122
134	135	-1.9107681E-01,	-1.8478993E=01,	-1.7845502E-01,	-1.7207408E=01,	DATA 123
135	136	-1.6564918E-01,	-1.5918239E=01,	-1.5267574E-01,	-1.4615105E=01,	DATA 124
136	137	-1.3293701E-01,	-1.2629117E=01,	-1.1961550E-01,	-1.1291199E=01,	DATA 125
137	138	-1.0618257E-01,	-9.9429179E=02,	-9.8653743E-02,	-8.5858164E=02,	DATA 126
138	139	-7.9044326E-02,	-7.2214111E=02,	-6.5369374E-02,	-5.8512020E=02/	DATA 127
139		DATA (DCSUN (I)),I= 73, 108/				DATA 128
140	141	-5.1643759E-02,	-4.4766332E=02,	-3.7881439E-02,	-3.0990780E=02,	DATA 129
141	142	-2.4095958E-02,	-1.7198594E=02,	-1.0300320E=02,	-3.4027158E=03,	DATA 130
142	143	3.4923991E-03,	1.0383260E=02,	1.7268076E-02,	2.4145091E=02,	DATA 131
143	144	3.1012462E-02,	3.7968384E=02,	4.4711070E-02,	5.1538729E=02,	DATA 132
144	145	5.8349602E-02,	6.5141924E=02,	7.1913932E-02,	7.8663872E=02,	DATA 133
145	146	8.5389993E-02,	9.2090563E=02,	9.8763831E-02,	1.0540814E=01,	DATA 134
146	147	1.1202171E-01,	1.1860286E=01,	1.2514989E-01,	1.3166105E=01,	DATA 135
147	148	1.3813475E-01,	1.4456938E=01,	1.5096335E-01,	1.5731504E=01,	DATA 136
148	149	1.6362305E-01,	1.6988585E=01,	1.7610199E-01,	1.8226998E=01/	DATA 137
149		DATA (DCSUN (I)),I=109, 144/				DATA 138
150	151	1.8838820E-01,	1.9445505E=01,	2.0046893E-01,	2.0642822E=01,	DATA 139
151	152	2.1233124E-01,	2.1817633E=01,	2.2396186E-01,	2.2968620E=01,	DATA 140
152	153	2.3534775E-01,	2.4094489E=01,	2.4647601E-01,	2.5193948E=01,	DATA 141
153	154	2.5733375E-01,	2.6263722E=01,	2.6790829E-01,	2.7308547E=01,	DATA 142
154	155	2.7818711E-01,	2.8321169E=01,	2.8815766E-01,	2.9302350E=01,	DATA 143
155	156	2.9780769E-01,	3.0250875E=01,	3.0712531E-01,	3.1165592E=01,	DATA 144
156	157	3.1609288E-01,	3.2045411E=01,	3.2471912E-01,	3.2889301E=01,	DATA 145
157	158	3.3297450E-01,	3.3692231E=01,	3.4085493E-01,	3.4465136E=01,	DATA 146
158	159	3.4835008E-01,	3.5194991E=01,	3.5544936E-01,	3.5884787E=01/	DATA 147
159		DATA (DCSUN (I)),I=145, 180/				DATA 148
160	161	3.6214364E-01,	3.6533571E=01,	3.6842301E-01,	3.7140445E=01,	DATA 149
161	162	3.7427897E-01,	3.7704556E=01,	3.7970323E-01,	3.8225106E=01,	DATA 150
162	163	3.8468809E-01,	3.8701344E=01,	3.8922624E-01,	3.9132570E=01,	DATA 151
163	164	3.9331098E-01,	3.9518137E=01,	3.9693619E-01,	3.9857484E=01,	DATA 152
164	165	4.0009676E-01,	4.0150147E=01,	4.0278850E-01,	4.0395739E=01,	DATA 153
165	166	4.0500775E-01,	4.0593921E=01,	4.0675139E-01,	4.0744400E=01,	DATA 154
166	167	4.0801673E-01,	4.0846938E=01,	4.0880179E-01,	4.0901388E=01,	DATA 155
167	168	4.0910557E-01,	4.0907690E=01,	4.0892795E-01,	4.0865885E=01,	DATA 156
168	169	4.0826974E-01,	4.0776093E=01,	4.0713264E-01,	4.0638521E=01/	DATA 157
169		DATA (DCSUN (I)),I=181, 216/				DATA 158
170	171	4.0851905E-01,	4.0453448E=01,	4.0343202E-01,	4.0221216E=01,	DATA 159
171	172	4.0087536E-01,	3.9942215E=01,	3.9785322E-01,	3.9616916E=01,	DATA 160
172	173	3.9437074E-01,	3.9245864E=01,	3.9043362E-01,	3.8829650E=01,	DATA 161
173	174	3.8604810E-01,	3.8368920E=01,	3.8122066E-01,	3.7864332E=01,	DATA 162
174	175	3.7595807E-01,	3.7316592E=01,	3.7026782E-01,	3.6726483E=01,	DATA 163
175	176	3.6415802E-01,	3.6094853E=01,	3.5763756E-01,	3.5422627E=01,	DATA 164
176	177	3.5071596E-01,	3.4710789E=01,	3.4340338E-01,	3.3960378E=01,	DATA 165
177	178	3.3571045E-01,	3.3172478E=01,	3.2764813E-01,	3.2348199E=01,	DATA 166
178	179	3.1922762E-01,	3.1488651E=01,	3.1046000E-01,	3.0594966E=01/	DATA 167
179		DATA (DCSUN (I)),I=217, 252/				DATA 168
180	181	3.0135681E-01,	2.9668292E=01,	2.9192935E-01,	2.8709770E=01,	DATA 169
181	182	2.8218920E-01,	2.7720530E=01,	2.7214739E-01,	2.6701677E=01,	DATA 170
182	183	2.6181490E-01,	2.5654316E=01,	2.5120302E-01,	2.4579587E=01,	DATA 171
183	184	2.4032325E-01,	2.3478657E=01,	2.2918743E-01,	2.2352734E=01,	DATA 172
184	185	2.1780785E-01,	2.1203057E=01,	2.0619712E-01,	2.0030904E=01,	DATA 173
185	186	1.9436804E-01,	1.8837377E=01,	1.8233382E-01,	1.7624385E=01,	DATA 174
186	187	1.7010747E-01,	1.6392628E=01,	1.5770189E-01,	1.5143602E=01,	DATA 175
187	188	1.4513015E-01,	1.3878589E=01,	1.3240481E-01,	1.2598847E=01,	DATA 175
188	189	1.1953839E-01,	1.1305603E=01,	1.0654292E-01,	1.0000045E=01/	DATA 177
189		DATA (DCSUN (I)),I=253, 288/				DATA 178
190	191	9.3430127E-02,	8.6833426E=02,	8.0211850E-02,	7.3566879E=02,	DATA 179



191	192	6.6900062E=02,	6.0212947E=02,	5.8507100E=02,	4.6784097E=02,	DATA 180
192	193	4.0045565E=02,	3.3293148E=02,	2.4528500E=02,	1.9753262E=02,	DATA 181
193	194	1.2969207E=02,	6.1780630E=03,	6.1845110E=04,	7.4186466E=03,	DATA 182
194	195	-1.4220764E=02,	-2.1023067E=02,	-2.7823804E=02,	-3.4621136E=02,	DATA 183
195	196	-4.1413398E=02,	-4.8198852E=02,	-5.4975755E=02,	-6.1742341E=02,	DATA 184
196	197	-6.8496950E=02,	-7.5237912E=02,	-8.1963570E=02,	-8.8672278E=02,	DATA 185
197	198	-9.5362374E=02,	-1.0203218E=01,	-1.0868003E=01,	-1.4530422E=01,	DATA 186
198	199	-1.2190301E=01,	-1.2847468E=01,	-1.3501744E=01,	-1.4152953E=01/	DATA 187
199		DATA (BCSUN (I), I=289,324)/				DATA 188
200	201	-1.4800911E=01,	-1.5445436E=01,	-1.6086339E=01,	-1.6723434E=01,	DATA 189
201	202	-1.7356524E=01,	-1.7983416E=01,	-1.8609914E=01,	-1.9229832E=01,	DATA 190
202	203	-1.9844969E=01,	-2.0455122E=01,	-2.1060097E=01,	-2.1659689E=01,	DATA 191
203	204	-2.2253699E=01,	-2.2841927E=01,	-2.3424171E=01,	-2.4000227E=01,	DATA 192
204	205	-2.4569903E=01,	-2.5133004E=01,	-2.5689338E=01,	-2.6238710E=01,	DATA 193
205	206	-2.6780938E=01,	-2.7315828E=01,	-2.7843188E=01,	-2.8362833E=01,	DATA 194
206	207	-2.8874568E=01,	-2.9378203E=01,	-2.9873550E=01,	-3.0360414E=01,	DATA 195
207	208	-3.0838606E=01,	-3.1307900E=01,	-3.1768201E=01,	-3.2219217E=01,	DATA 196
208	209	-3.2660792E=01,	-3.3092737E=01,	-3.3514839E=01,	-3.3926985E=01/	DATA 197
209		DATA (BCSUN (I), I=325,360)/				DATA 198
210	211	-3.4328923E=01,	-3.4720497E=01,	-3.5101526E=01,	-3.5471840E=01,	DATA 199
211	212	-3.5831261E=01,	-3.6179617E=01,	-3.6516736E=01,	-3.6842454E=01,	DATA 200
212	213	-3.7156609E=01,	-3.7459051E=01,	-3.7749630E=01,	-3.8022204E=01,	DATA 201
213	214	-3.8294642E=01,	-3.8549804E=01,	-3.8790573E=01,	-3.9019824E=01,	DATA 202
214	215	-3.9236440E=01,	-3.9440308E=01,	-3.9631320E=01,	-3.9809379E=01,	DATA 203
215	216	-3.9974387E=01,	-4.0126247E=01,	-4.0264878E=01,	-4.0390198E=01,	DATA 204
216	217	-4.0502129E=01,	-4.060610E=01,	-4.0685578E=01,	-4.0756986E=01,	DATA 205
217	218	-4.0814798E=01,	-4.0858978E=01,	-4.0889503E=01,	-4.0906360E=01,	DATA 206
218	219	-4.0909531E=01,	-4.0899017E=01,	-4.0874809E=01,	-4.0836918E=01/	DATA 207
219		DATA (BCSUN (I), I=361,368)/				DATA 208
220	221	-4.0785358E=01,	-4.0720147E=01,	-4.0641317E=01,	-4.0548902E=01,	DATA 209
221	222	-4.0442950E=01,	-4.0323514E=01,	-4.0190355E=01,	-4.0044433E=01/	DATA 210
222		DATA (RSUN (I), I= 1, 36)/				DATA 210
223	231	9.8400871E=01,	9.8399358E=01,	9.8398222E=01,	9.8397464E=01,	DATA 211
224	232	9.8397081E=01,	9.8397094E=01,	9.8397519E=01,	9.8398376E=01,	DATA 212
225	233	9.8399688E=01,	9.8401473E=01,	9.8403756E=01,	9.8406559E=01,	DATA 213
226	234	9.8409899E=01,	9.8413804E=01,	9.8418297E=01,	9.8423397E=01,	DATA 214
227	235	9.8429127E=01,	9.8435488E=01,	9.8442486E=01,	9.8450118E=01,	DATA 215
228	236	9.8458398E=01,	9.8467284E=01,	9.8476750E=01,	9.8486761E=01,	DATA 216
229	237	9.8497286E=01,	9.8508292E=01,	9.8519741E=01,	9.8531601E=01,	DATA 217
230	238	9.8543826E=01,	9.8556411E=01,	9.8569338E=01,	9.8582594E=01,	DATA 218
231	239	9.8596162E=01,	9.8610049E=01,	9.8624261E=01,	9.8638804E=01/	DATA 219
232		DATA (RSUN (I), I= 37, 72)/				DATA 220
233	241	9.8653686E=01,	9.8668921E=01,	9.8684525E=01,	9.8700511E=01,	DATA 221
234	242	9.8716896E=01,	9.8733702E=01,	9.8750953E=01,	9.8768668E=01,	DATA 222
235	243	9.8786865E=01,	9.8803561E=01,	9.8824766E=01,	9.8844489E=01,	DATA 223
236	244	9.8864753E=01,	9.8883519E=01,	9.8906760E=01,	9.8928452E=01,	DATA 224
237	245	9.8950566E=01,	9.8973091E=01,	9.8995897E=01,	9.9019034E=01,	DATA 225
238	246	9.9042422E=01,	9.9066041E=01,	9.9089869E=01,	9.9138047E=01,	DATA 226
239	247	9.9162366E=01,	9.9186828E=01,	9.9211428E=01,	9.9236168E=01,	DATA 227
240	248	9.9261043E=01,	9.9286068E=01,	9.9311250E=01,	9.9336594E=01,	DATA 228
241	249	9.9362120E=01,	9.9387849E=01,	9.9413801E=01,	9.9439985E=01/	DATA 229
242		DATA (RSUN (I), I= 73, 108)/				DATA 230
243	251	9.9466427E=01,	9.9493150E=01,	9.9520168E=01,	9.9547512E=01,	DATA 231
244	252	9.9575156E=01,	9.9603082E=01,	9.9631273E=01,	9.9659719E=01,	DATA 232
245	253	9.9688370E=01,	9.9717186E=01,	9.9746124E=01,	9.9775133E=01,	DATA 233
246	254	9.9804190E=01,	9.9833261E=01,	9.9862318E=01,	9.9891324E=01,	DATA 234
247	255	9.9920268E=01,	9.9949130E=01,	9.9977899E=01,	1.0006656E 00,	DATA 235
248	256	1.00003512E 00,	1.0006356E 00,	1.0009190E 00,	1.0012013E 00,	DATA 236
249	257	1.0014827E 00,	1.0017633E 00,	1.0020433E 00,	1.0023228E 00,	DATA 237
250	258	1.0026021E 00,	1.0028814E 00,	1.0031610E 00,	1.0034413E 00,	DATA 238
251	259	1.0037220E 00,	1.0040033E 00,	1.0042850E 00,	1.0045672E 00/	DATA 239
252		DATA (RSUN (I), I=109, 144)/				DATA 240
253	261	1.0048495E 00,	1.0051315E 00,	1.0054128E 00,	1.0056929E 00,	DATA 241
254	262	1.0059716E 00,	1.0062486E 00,	1.0065234E 00,	1.0067957E 00,	DATA 242
255	263	1.0070653E 00,	1.0073321E 00,	1.0075957E 00,	1.0078560E 00,	DATA 243
256	264	1.0081130E 00,	1.0083635E 00,	1.0086164E 00,	1.0088629E 00,	DATA 244
257	265	1.0091059E 00,	1.0093456E 00,	1.0095821E 00,	1.0098155E 00,	DATA 245
258	266	1.0100461E 00,	1.0102742E 00,	1.0105002E 00,	1.0107242E 00,	DATA 246
259	267	1.0109464E 00,	1.0111669E 00,	1.0113858E 00,	1.0116033E 00,	DATA 247
260	268	1.0118191E 00,	1.0120329E 00,	1.0122444E 00,	1.0124534E 00,	DATA 248
261	269	1.0126594E 00,	1.0128622E 00,	1.0130614E 00,	1.0132567E 00/	DATA 249
262		DATA (RSUN (I), I=145, 180)/				DATA 250
263	271	1.0134478E 00,	1.0136345E 00,	1.0138166E 00,	1.0139938E 00,	DATA 251
264	272	1.0141659E 00,	1.0143330E 00,	1.0144949E 00,	1.0146513E 00,	DATA 252

265	273	1.0148025E 00,	1.0149485E 00,	1.0150895E 00,	1.0152255E 00,	DATA 253
266	274	1.0153568E 00,	1.0154837E 00,	1.0156066E 00,	1.0157256E 00,	DATA 254
267	275	1.0158411E 00,	1.0159334E 00,	1.0160625E 00,	1.0161689E 00,	DATA 255
268	276	1.0162723E 00,	1.0163726E 00,	1.0164597E 00,	1.0165635E 00,	DATA 256
269	277	1.0166335E 00,	1.0167397E 00,	1.0168217E 00,	1.0168990E 00,	DATA 257
270	278	1.0169717E 00,	1.0170393E 00,	1.0171017E 00,	1.0171886E 00,	DATA 258
271	279	1.0172098E 00,	1.0172551E 00,	1.0172945E 00,	1.0173278E 00,	DATA 259
272	DATA (RSUN (I), I=181, 216)/					DATA 260
273	281	1.0173549E 00,	1.0173760E 00,	1.0173911E 00,	1.0174002E 00,	DATA 261
274	282	1.0174037E 00,	1.0174019E 00,	1.0173951E 00,	1.0173835E 00,	DATA 262
275	283	1.0173676E 00,	1.0173476E 00,	1.0173239E 00,	1.0172968E 00,	DATA 263
276	284	1.0172663E 00,	1.0172324E 00,	1.0171951E 00,	1.0171544E 00,	DATA 264
277	285	1.0171103E 00,	1.0170623E 00,	1.0170105E 00,	1.0169545E 00,	DATA 265
278	286	1.0168941E 00,	1.0168291E 00,	1.0167593E 00,	1.0166845E 00,	DATA 266
279	287	1.0166044E 00,	1.0165189E 00,	1.0164278E 00,	1.0163308E 00,	DATA 267
280	288	1.0162281E 00,	1.0161195E 00,	1.0160051E 00,	1.0158847E 00,	DATA 268
281	289	1.0157588E 00,	1.0156277E 00,	1.0154916E 00,	1.0153509E 00,	DATA 269
282	DATA (RSUN (I), I=217, 252)/					DATA 270
283	291	1.0152060E 00,	1.0150572E 00,	1.0149048E 00,	1.0147495E 00,	DATA 271
284	292	1.0145911E 00,	1.0144299E 00,	1.0142660E 00,	1.0140997E 00,	DATA 272
285	293	1.0139307E 00,	1.0137590E 00,	1.0135846E 00,	1.0134073E 00,	DATA 273
286	294	1.0132269E 00,	1.0130434E 00,	1.0128565E 00,	1.0126660E 00,	DATA 274
287	295	1.0124718E 00,	1.0122736E 00,	1.0120713E 00,	1.0118646E 00,	DATA 275
288	296	1.0116534E 00,	1.0114377E 00,	1.0112174E 00,	1.0110922E 00,	DATA 276
289	297	1.0107626E 00,	1.0105289E 00,	1.0102912E 00,	1.0101499E 00,	DATA 277
290	298	1.0098054E 00,	1.0095581E 00,	1.0093084E 00,	1.0090563E 00,	DATA 278
291	299	1.0088035E 00,	1.0085487E 00,	1.0082927E 00,	1.0080357E 00,	DATA 279
292	DATA (RSUN (I), I=253, 288)/					DATA 280
293	301	1.0077799E 00,	1.0075191E 00,	1.0072594E 00,	1.0069959E 00,	DATA 281
294	302	1.0067374E 00,	1.0064749E 00,	1.0062111E 00,	1.0059462E 00,	DATA 282
295	303	1.0056798E 00,	1.0054118E 00,	1.0051420E 00,	1.0048702E 00,	DATA 283
296	304	1.0045962E 00,	1.0043198E 00,	1.0040409E 00,	1.0037593E 00,	DATA 284
297	305	1.0034751E 00,	1.0031887E 00,	1.0029001E 00,	1.0026095E 00,	DATA 285
298	306	1.0023175E 00,	1.0020244E 00,	1.0017306E 00,	1.0014367E 00,	DATA 286
299	307	1.0011429E 00,	1.0008495E 00,	1.0005569E 00,	1.0002633E 00,	DATA 287
300	308	9.9997491E-01,	9.9968587E-01,	9.9939825E-01,	9.9911218E-01,	DATA 288
301	309	9.9882764E-01,	9.9854462E-01,	9.9826308E-01,	9.9798301E-01,	DATA 289
302	DATA (RSUN (I), I=289, 324)/					DATA 290
303	311	9.9770421E-01,	9.9742654E-01,	9.9714985E-01,	9.9687404E-01,	DATA 291
304	312	9.9659882E-01,	9.9632394E-01,	9.9604920E-01,	9.9577428E-01,	DATA 292
305	313	9.9549933E-01,	9.9522439E-01,	9.9494953E-01,	9.9467468E-01,	DATA 293
306	314	9.9440034E-01,	9.9412692E-01,	9.9385480E-01,	9.9358445E-01,	DATA 294
307	315	9.9331616E-01,	9.9305028E-01,	9.9278713E-01,	9.9252713E-01,	DATA 295
308	316	9.9227043E-01,	9.9201725E-01,	9.9176774E-01,	9.9152210E-01,	DATA 296
309	317	9.9128037E-01,	9.9104261E-01,	9.9080886E-01,	9.9057913E-01,	DATA 297
310	318	9.9035329E-01,	9.9013123E-01,	9.8991282E-01,	9.8969800E-01,	DATA 298
311	319	9.8948643E-01,	9.8927782E-01,	9.8907197E-01,	9.8886853E-01,	DATA 299
312	DATA (RSUN (I), I=325, 360)/					DATA 300
313	321	9.8866748E-01,	9.8846846E-01,	9.8827204E-01,	9.8807731E-01,	DATA 301
314	322	9.8788495E-01,	9.8769521E-01,	9.8750839E-01,	9.8732484E-01,	DATA 302
315	323	9.8714487E-01,	9.8696879E-01,	9.8679696E-01,	9.8662978E-01,	DATA 303
316	324	9.8646744E-01,	9.8631015E-01,	9.8615616E-01,	9.8601165E-01,	DATA 304
317	325	9.8587074E-01,	9.8573554E-01,	9.8560611E-01,	9.8548255E-01,	DATA 305
318	326	9.8536475E-01,	9.8525263E-01,	9.8514608E-01,	9.8504504E-01,	DATA 306
319	327	9.8494917E-01,	9.8485819E-01,	9.8477183E-01,	9.8468979E-01,	DATA 307
320	328	9.8461182E-01,	9.8453770E-01,	9.8446717E-01,	9.8439988E-01,	DATA 308
321	329	9.8433610E-01,	9.8427591E-01,	9.8421946E-01,	9.8416688E-01,	DATA 309
322	DATA (RSUN (I), I=361, 368)/					DATA 310
323	331	9.8411845E-01,	9.8407447E-01,	9.8403522E-01,	9.8400104E-01,	DATA 311
324	332	9.8397212E-01,	9.8394869E-01,	9.8393098E-01,	9.8391918E-01,	DATA 312
325	DATA (RAMOQN(I), I=1, 36)/					DATA 312
326	341	4.4976382E 00,	4.7512387E 00,	4.9968311E 00,	5.2314402E 00,	DATA 313
327	342	5.4341825E 00,	5.6660106E 00,	5.8691312E 00,	6.0664484E 00,	DATA 314
328	343	6.2611741E 00,	1.7340172E 01,	3.7267324E 01,	5.7867444E 01,	DATA 315
329	344	7.9368982E-01,	1.0190137E 00,	1.73545095E 00,	1.4983881E 00,	DATA 316
330	345	1.7472915E 00,	1.9974276E 00,	2.2454167E 00,	2.4893496E 00,	DATA 317
331	346	2.7290604E 00,	2.9658575E 00,	3.2019421E 00,	3.4397317E 00,	DATA 318
332	347	3.6811824E 00,	3.9271554E 00,	4.1769437E 00,	4.4281858E 00,	DATA 319
333	348	4.6773587E 00,	4.9207568E 00,	5.1555236E 00,	5.3802837E 00,	DATA 320
334	349	5.5951865E 00,	5.8016114E 00,	6.0017336E 00,	6.1981651E 00,	DATA 321
335	DATA (RAMOQN(I), I=37, 72)/					DATA 322
336	351	1.1051635E-01,	3.0796254E-01,	5.0997832E-01,	7.1888613E-01,	DATA 323
337	352	9.3641502E-01,	1.1633521E 00,	1.3992678E 00,	1.6424316E 00,	DATA 324
338	353	1.8901419E 00,	2.1394527E 00,	2.3880269E 00,	2.6347300E 00,	DATA 325



339	354	2,8797432E 00,	3,1242367E 00,	3,3697805E 00,	3,6176682E 00,	DATA 326
340	355	3,8682958E 00,	4,1207569E 00,	4,8728391E 00,	4,6215142E 00,	DATA 327
341	356	4,8637673E 00,	5,0973972E 00,	5,8214568E 00,	5,7431223E 00,	DATA 328
342	357	5,9439907E 00,	6,1411631E 00,	6,8876061E 00,	2,5089332E 01,	DATA 329
343	358	4,5126591E 01,	6,5693371E 01,	8,6936776E 01,	1,0893738E 00,	DATA 330
344	359	1,3169257E 00,	1,5511248E 00,	1,7905841E 00,	2,8328534E 00,	DATA 331
345		DATA (RAMOQN(I), I=73,1081)/				DATA 332
346	361	2,2769680E 00,	2,5219102E 00,	2,7677997E 00,	3,0155458E 00,	DATA 333
347	362	3,2663974E 00,	3,5212923E 00,	3,7801590E 00,	4,0414252E 00,	DATA 334
348	363	4,3020390E 00,	4,5581450E 00,	4,8061653E 00,	5,0437396E 00,	DATA 335
349	364	5,2701191E 00,	5,4860119E 00,	5,6931517E 00,	5,6938473E 00,	DATA 336
350	365	6,0906390E 00,	2,8849626E 03,	1,9935141E 01,	3,9897665E 01,	DATA 337
351	366	6,0348107E 01,	8,1403319E 01,	1,0311058E 00,	1,2543978E 00,	DATA 338
352	367	1,4828997E 00,	1,7151546E 00,	1,9496831E 00,	2,1854497E 00,	DATA 339
353	368	2,4222133E 00,	2,6606523E 00,	2,9022324E 00,	3,1488257E 00,	DATA 340
354	369	3,4020940E 00,	3,6526813E 00,	3,9294107E 00,	4,1989111E 00,	DATA 341
355		DATA (RAMOQN(I), I=109,144)/				DATA 342
356	371	4,4661466E 00,	4,7258329E 00,	4,9740116E 00,	5,2089195E 00,	DATA 343
357	372	5,4309224E 00,	5,6419003E 00,	5,8445598E 00,	6,0419191E 00,	DATA 344
358	373	6,2369873E 00,	1,4938814E 01,	3,4795834E 01,	5,9148612E 01,	DATA 345
359	374	7,6127318E 01,	9,776783E 01,	1,2004608E 00,	1,4279667E 00,	DATA 346
360	375	1,6583610E 00,	1,8897231E 00,	2,1207116E 00,	2,3509746E 00,	DATA 347
361	376	2,5812877E 00,	2,8134310E 00,	3,0498600E 00,	3,2931904E 00,	DATA 348
362	377	3,5454661E 00,	3,8072241E 00,	4,0766084E 00,	4,3491130E 00,	DATA 349
363	378	4,6185179E 00,	4,8788111E 00,	5,1259891E 00,	5,3587617E 00,	DATA 350
364	379	5,5781602E 00,	5,7868863E 00,	5,9875388E 00,	6,1840982E 00,	DATA 351
365		DATA (RAMOQN(I), I=145,180)/				DATA 352
366	381	9,648986E 02,	2,9393846E 01,	4,9590139E 01,	7,8420004E 01,	DATA 353
367	382	9,1979532E 01,	1,1425308E 00,	1,3710819E 00,	1,6032127E 00,	DATA 354
368	383	1,8363612E 00,	2,0683798E 00,	2,2981462E 00,	2,5258459E 00,	DATA 355
369	384	2,7529138E 00,	2,9817389E 00,	3,2152213E 00,	3,4561872E 00,	DATA 356
370	385	3,7066140E 00,	3,9666994E 00,	4,2340868E 00,	4,5038550E 00,	DATA 357
371	386	4,7697158E 00,	5,0259930E 00,	5,2692279E 00,	5,4986276E 00,	DATA 358
372	387	5,7155458E 00,	5,9226393E 00,	6,1231585E 00,	3,7305373E 02,	DATA 359
373	388	2,3670964E 01,	4,3513254E 01,	6,4101747E 01,	8,5405832E 01,	DATA 360
374	389	1,0749181E 00,	1,3030041E 00,	1,5364935E 00,	1,7727237E 00,	DATA 361
375		DATA (RAMOQN(I), I=181,216)/				DATA 362
376	391	2,0089272E 00,	2,2430302E 00,	2,4742005E 00,	2,7029907E 00,	DATA 363
377	392	2,9311369E 00,	3,1611539E 00,	3,3958172E 00,	3,6375325E 00,	DATA 364
378	393	3,8875856E 00,	4,1453828E 00,	4,4080398E 00,	4,6707600E 00,	DATA 365
379	394	4,9282366E 00,	5,1760617E 00,	5,4119700E 00,	5,6358543E 00,	DATA 366
380	395	5,8492687E 00,	6,0547574E 00,	6,2553136E 00,	1,7084193E 01,	DATA 367
381	396	3,7067914E 01,	5,7428207E 01,	7,8380653E 01,	1,8006308E 00,	DATA 368
382	397	1,2251124E 00,	1,4564236E 00,	1,6922654E 00,	1,9312678E 00,	DATA 369
383	398	2,1698179E 00,	2,4066454E 00,	2,6412900E 00,	2,8745136E 00,	DATA 370
384	399	3,1000173E 00,	3,3439743E 00,	3,5844575E 00,	3,8308049E 00,	DATA 371
385		DATA (RAMOQN(I), I=217,252)/				DATA 372
386	401	4,0830005E 00,	4,3392926E 00,	4,5963294E 00,	4,8499568E 00,	DATA 373
387	402	5,0963652E 00,	5,3331568E 00,	5,5595151E 00,	5,7762113E 00,	DATA 374
388	403	5,9850426E 00,	6,1883896E 00,	1,0367935E 01,	3,0589129E 01,	DATA 375
389	404	5,0827090E 01,	7,1491343E 01,	9,2739737E 01,	1,3465892E 00,	DATA 376
390	405	1,3724804E 00,	1,6041606E 00,	1,8400150E 00,	2,0781607E 00,	DATA 377
391	406	2,3169987E 00,	2,5556750E 00,	2,7942862E 00,	3,0337795E 00,	DATA 378
392	407	3,2756019E 00,	3,5211805E 00,	3,7713235E 00,	4,0256763E 00,	DATA 379
393	408	4,2824392E 00,	4,5389710E 00,	4,7905109E 00,	5,0351369E 00,	DATA 380
394	409	5,2705103E 00,	5,4961331E 00,	5,7127687E 00,	5,9220554E 00,	DATA 381
395		DATA (RAMOQN(I), I=253,288)/				DATA 382
396	411	6,1261165E 00,	4,4069197E 02,	2,4455507E 01,	4,4647425E 01,	DATA 383
397	412	6,5159865E 01,	8,6126194E 01,	1,0762427E 00,	1,2966868E 00,	DATA 384
398	413	1,5221218E 00,	1,7516080E 00,	1,9840309E 00,	2,2184673E 00,	DATA 385
399	414	2,4545133E 00,	2,6924602E 00,	2,9332577E 00,	3,1782449E 00,	DATA 386
400	415	3,4286693E 00,	3,6850542E 00,	3,9465713E 00,	4,2107252E 00,	DATA 387
401	416	4,4736570E 00,	4,7311029E 00,	4,9795748E 00,	5,2171577E 00,	DATA 388
402	417	5,4436613E 00,	5,6602625E 00,	5,8689904E 00,	6,0722688E 00,	DATA 389
403	418	6,2725906E 00,	1,6911678E 01,	3,9027792E 01,	5,9451827E 01,	DATA 390
404	419	8,0294416E 01,	1,0160427E 00,	1,2336641E 00,	1,4551159E 00,	DATA 391
405		DATA (RAMOQN(I), I=289,324)/				DATA 392
406	421	1,6793917E 00,	1,9055038E 00,	2,1328339E 00,	2,3614058E 00,	DATA 393
407	422	2,5920083E 00,	2,8261422E 00,	3,0657850E 00,	3,3129455E 00,	DATA 394
408	423	3,5689894E 00,	3,8337922E 00,	4,1050137E 00,	4,3780752E 00,	DATA 395
409	424	4,6471311E 00,	4,9068651E 00,	5,1539361E 00,	5,3874527E 00,	DATA 396
410	425	5,6085417E 00,	5,8195753E 00,	6,0234823E 00,	6,2232849E 00,	DATA 397
411	426	1,3863535E 01,	3,3837938E 01,	5,4129910E 01,	7,4871038E 01,	DATA 398
412	427	9,6115013E 01,	1,1783219E 00,	1,8991898E 00,	1,6222652E 00,	DATA 399

413	428	1.8660451E 00,	2.0694612E 00,	2.2923345E 00,	2.5153353E 00,	DATA 400
414	429	2.7601474E 00,	2.9691732E 00,	3.2052068E 00,	3.4508858E 00,	DATA 401
415		DATA (BMOON(I), I=329, 360)/				DATA 402 6
416	431	3.7078709E 00,	3.9758116E 00,	4.2515137E 00,	4.5290681E 00,	DATA 403
417	432	4.8013997E 00,	5.0625300E 00,	5.3409223E 00,	5.6111507E 00,	DATA 404
418	433	5.7601268E 00,	5.9691276E 00,	6.1715399E 00,	6.4752471E 02,	DATA 405
419	434	2.8650274E-01,	4.8786760E-01,	6.9355904E-01,	9.8469661E-01,	DATA 406
420	435	1.1214263E 00,	1.3428898E 00,	1.5674179E 00,	1.7929743E 00,	DATA 407
421	436	2.0177440E 00,	2.2406670E 00,	2.4617524E 00,	2.6821308E 00,	DATA 408
422	437	2.9039035E 00,	3.1298595E 00,	3.3630717E 00,	3.6063074E 00,	DATA 409
423	438	3.8611822E 00,	4.1271425E 00,	4.4007336E 00,	4.6759031E 00,	DATA 410
424	439	4.9456716E 00,	5.2043709E 00,	5.4490815E 00,	5.6797009E 00,	DATA 411
425		DATA (BMOON(I), I=361, 398)/				DATA 412 6
426	441	5.8981376E 00,	6.1073686E 00,	2.8554449E-02,	2.2835802E-01,	DATA 413
427	442	4.2958504E-01,	6.3374125E-01,	8.4266123E-01,	1.8573101E 00,	DATA 414
428		DATA (BMOON(I), I= 1, 36)/				DATA 414 6
429	451	-3.504177E-01,	-3.4981264E-01,	-3.2096634E-01,	-2.7574319E-01,	DATA 415
430	452	-2.1808736E-01,	-1.5194868E-01,	-8.0866206E-02,	-7.8415895E-03,	DATA 416
431	453	6.4585507E-02,	1.3415607E-01,	1.9867473E-01,	2.9580821E-01,	DATA 417
432	454	3.0295043E-01,	3.3721929E-01,	3.5565964E-01,	3.5569076E-01,	DATA 418
433	455	3.3572626E-01,	2.9575190E-01,	2.8759587E-01,	1.6476751E-01,	DATA 419
434	456	8.1964098E-02,	-5.3244849E-03,	-9.2316581E-02,	-1.7326909E-01,	DATA 420
435	457	-2.4367787E-01,	-2.9945253E-01,	-3.3736300E-01,	-3.5537043E-01,	DATA 421
436	458	3.5293023E-01,	-3.3108360E-01,	-2.9223216E-01,	-2.3966508E-01,	DATA 422
437	459	-1.7702647E-01,	-1.0789175E-01,	-3.9524304E-02,	3.7198971E-02,	DATA 423
438		DATA (BMOON(I), I= 37, 72)/				DATA 424 6
439	461	1.0773995E-01,	1.7377953E-01,	2.8330686E-01,	2.8328986E-01,	DATA 425
440	462	3.2197654E-01,	3.4654425E-01,	3.5449106E-01,	3.4378598E-01,	DATA 426
441	463	3.1338485E-01,	2.6371989E-01,	1.9697884E-01,	1.2705673E-01,	DATA 427
442	464	2.9202159E-02,	-6.0578090E-02,	-1.4614293E-01,	-2.2161451E-01,	DATA 428
443	465	-2.8285926E-01,	-3.2581789E-01,	-3.4875382E-01,	-3.5131875E-01,	DATA 429
444	466	-3.3461605E-01,	-3.0089648E-01,	-2.5311276E-01,	-1.2842491E-01,	DATA 430
445	467	-5.7930323E-02,	1.4044920E-02,	8.4809954E-02,	1.5165374E-01,	DATA 431
446	468	2.1278601E-01,	2.6527676E-01,	3.0701772E-01,	3.3573490E-01,	DATA 432
447	469	3.4928308E-01,	3.4584004E-01,	3.2419069E-01,	2.8409574E-01,	DATA 433
448		DATA (BMOON(I), I= 73, 108)/				DATA 434 6
449	471	2.2639821E-01,	1.5364064E-01,	6.9734697E-02,	-1.9978588E-02,	DATA 435
450	472	-1.0917108E-01,	-1.9119447E-01,	-2.5991939E-01,	-3.1056851E-01,	DATA 436
451	473	-3.1032229E-01,	-3.4852351E-01,	-3.8641916E-01,	-3.8657408E-01,	DATA 437
452	474	-2.6220855E-01,	-2.0668045E-01,	-1.4319651E-01,	-7.4719013E-02,	DATA 438
453	475	3.9887602E-03,	6.6405879E-02,	1.3395865E-01,	1.9619737E-01,	DATA 439
454	476	2.5067031E-01,	2.9497663E-01,	3.2384213E-01,	3.4424893E-01,	DATA 440
455	477	3.4559993E-01,	3.2989593E-01,	2.9689332E-01,	2.4722946E-01,	DATA 441
456	478	1.8252949E-01,	1.0551860E-01,	2.0130876E-02,	-6.8462836E-02,	DATA 442
457	479	-1.5405023E-01,	-2.2993773E-01,	-2.8989670E-01,	-3.2928625E-01,	DATA 443
458		DATA (BMOON(I), I=109, 147)/				DATA 444 6
459	481	-3.4392340E-01,	-3.4027692E-01,	-3.1490499E-01,	-2.7348794E-01,	DATA 445
460	482	-2.1994179E-01,	-1.5788678E-01,	-9.0472493E-02,	-2.0429779E-02,	DATA 446
461	483	4.9780235E-02,	1.1780615E-01,	1.0128266E-01,	2.3776992E-01,	DATA 447
462	484	2.8477428E-01,	3.1986056E-01,	3.4084759E-01,	3.4605087E-01,	DATA 448
463	485	3.3450632E-01,	3.0610732E-01,	2.6162656E-01,	2.0265960E-01,	DATA 449
464	486	1.3156886E-01,	5.1496975E-02,	-3.8544606E-02,	-1.3859063E-01,	DATA 450
465	487	-1.9780325E-01,	-2.6491584E-01,	-3.1414328E-01,	-3.4138386E-01,	DATA 451
466	488	-3.4318926E-01,	-3.2692951E-01,	-2.9005193E-01,	-2.3892176E-01,	DATA 452
467	489	-1.7785324E-01,	-1.1060465E-01,	-4.0282830E-02,	3.0521659E-02,	DATA 453
468		DATA (BMOON(I), I=145, 180)/				DATA 454 6
469	491	9.9517403E-02,	1.6450003E-01,	2.2320013E-01,	2.7320675E-01,	DATA 455
470	492	3.1202367E-01,	3.3724743E-01,	3.4686621E-01,	3.3959763E-01,	DATA 456
471	493	3.1514881E-01,	2.7430001E-01,	2.1880300E-01,	1.5118238E-01,	DATA 457
472	494	7.4561046E-02,	-7.4103815E-03,	-9.0520516E-02,	-1.6994493E-01,	DATA 458
473	495	-2.4032850E-01,	-2.9618563E-01,	-3.3271574E-01,	-3.4686447E-01,	DATA 459
474	496	-3.3813104E-01,	-3.0860301E-01,	-2.6217386E-01,	-2.0343171E-01,	DATA 460
475	497	-1.3676956E-01,	-6.5945105E-02,	5.9787611E-03,	7.6479341E-02,	DATA 461
476	498	1.4334350E-01,	2.0444467E-01,	2.5757814E-01,	3.0039474E-01,	DATA 462
477	499	3.3047020E-01,	3.4553361E-01,	3.4382882E-01,	3.2450833E-01,	DATA 463
478		DATA (BMOON(I), I=181, 216)/				DATA 464 6
479	501	2.8791026E-01,	2.3560588E-01,	1.7022249E-01,	9.5154223E-02,	DATA 465
480	502	1.4295785E-02,	-6.8120574E-02,	-1.4759043E-01,	-2.1938676E-01,	DATA 466
481	503	-2.7872588E-01,	-3.2118061E-01,	-3.4336431E-01,	-3.4368549E-01,	DATA 467
482	504	-3.2278097E-01,	-2.8332749E-01,	-2.2931269E-01,	-1.6515347E-01,	DATA 468
483	505	-9.5023995E-02,	-2.2524855E-02,	4.9306657E-02,	1.3814012E-01,	DATA 469
484	506	1.8161708E-01,	2.3769783E-01,	2.8424810E-01,	3.1904392E-01,	DATA 470
485	507	3.3985907E-01,	3.4468359E-01,	3.3212802E-01,	3.0177477E-01,	DATA 471
486	508	2.5447574E-01,	1.9240597E-01,	1.3888943E-01,	3.8112095E-02,	DATA 472



487	509	=4.5268162E=02,	=1.2636594E=01,	=2.0032396E=01,	=2.6253565E=01/	DATA 473
488		DATA (BCMOQN(I)), I=217, 252/				DATA 474
489	511	=3.0893635E=01,	=3.3641815E=01,	=3.4329552E=01,	=3.2963094E=01,	DATA 475
490	512	=2.9721813E=01,	=2.4918571E=01,	=1.8939122E=01,	=1.2184167E=01,	DATA 476
491	513	=5.0293401E=02,	2.1938856E=02,	9.2005738E=02,	1.5744324E=01,	DATA 477
492	514	2.1404570E=01,	2.6573784E=01,	3.0448588E=01,	3.3028416E=01,	DATA 478
493	515	3.4124755E=01,	3.3582069E=01,	3.3307739E=01,	2.7304259E=01,	DATA 479
494	516	2.1694445E=01,	1.4732306E=01,	6.7959293E=02,	=1.6367139E=02,	DATA 480
495	517	=1.0025486E=01,	=1.7814080E=01,	=2.4479156E=01,	=2.9578882E=01,	DATA 481
496	518	=3.2797210E=01,	=3.3976921E=01,	=3.8131040E=01,	=3.8425745E=01,	DATA 482
497	519	=2.6139604E=01,	=2.0614073E=01,	=1.4210513E=01,	=7.2810347E=02/	DATA 483
498		DATA (BCMOQN(I)), I=253, 288/				DATA 484
499	521	=1.5301124E=03,	6.8763989E=02,	1.8539571E=01,	1.9594518E=01,	DATA 485
500	522	2.4820000E=01,	2.9011611E=01,	3.1980846E=01,	3.8558988E=01,	DATA 486
501	523	3.3606740E=01,	3.2029201E=01,	2.8794519E=01,	2.8953849E=01,	DATA 487
502	524	1.7660401E=01,	1.0184849E=01,	1.9224137E=02,	=6.6159496E=02,	DATA 488
503	525	=1.4836436E=01,	=2.2122541E=01,	=2.7916018E=01,	=3.1800406E=01,	DATA 489
504	526	=3.3561595E=01,	=3.3203035E=01,	=3.0911029E=01,	=2.6989017E=01,	DATA 490
505	527	=2.1790470E=01,	=1.5671220E=01,	=8.9657928E=02,	=1.9814183E=02,	DATA 491
506	528	4.9989343E=02,	1.1711128E=01,	1.7905745E=01,	2.8346929E=01,	DATA 492
507	529	2.7814746E=01,	3.1110939E=01,	3.3067380E=01,	3.8555861E=01/	DATA 493
508		DATA (BCMOQN(I)), I=289, 324/				DATA 494
509	531	3.2497394E=01,	2.9869535E=01,	2.5711974E=01,	2.0132779E=01,	DATA 495
510	532	1.3318657E=01,	5.5506286E=02,	=2.7787193E=02,	=1.1157809E=01,	DATA 496
511	533	=1.8975984E=01,	=2.5586670E=01,	=3.0413592E=01,	=3.3070230E=01,	DATA 497
512	534	=3.3438823E=01,	=3.1666411E=01,	=2.8084765E=01,	=2.3104577E=01,	DATA 498
513	535	=1.7133250E=01,	=1.0534315E=01,	=3.6203487E=02,	3.3364578E=02,	DATA 499
514	536	1.0088657E=01,	1.6400203E=01,	2.2039108E=01,	2.6777709E=01,	DATA 500
515	537	3.0400859E=01,	3.2720672E=01,	3.3594293E=01,	3.2939414E=01,	DATA 501
516	538	3.0742593E=01,	2.7058656E=01,	2.2004229E=01,	1.5751979E=01,	DATA 502
517	539	8.5320429E=02,	6.4379895E=03,	=7.5251199E=02,	=1.5483749E=01/	DATA 503
518		DATA (BCMOQN(I)), I=325, 360/				DATA 504
519	541	=2.2646593E=01,	=2.8389494E=01,	=3.2161365E=01,	=3.3621324E=01,	DATA 505
520	542	=3.2730348E=01,	=2.9737677E=01,	=2.5073809E=01,	=1.9221290E=01,	DATA 506
521	543	=1.2424814E=01,	=5.6556083E=02,	1.958032E=02,	8.2494835E=02,	DATA 507
522	544	1.4712928E=01,	2.0562548E=01,	2.9583574E=01,	2.9560550E=01,	DATA 508
523	545	3.2289137E=01,	3.3597425E=01,	3.8371116E=01,	3.573907E=01,	DATA 509
524	546	2.8255310E=01,	2.3544210E=01,	1.7633614E=01,	1.0765845E=01,	DATA 510
525	547	3.2261626E=02,	=4.6521802E=02,	=1.2474621E=01,	=1.9773968E=01,	DATA 511
526	548	=2.6018808E=01,	=3.0662931E=01,	=3.8244927E=01,	=3.3511016E=01,	DATA 512
527	549	=3.1495454E=01,	=2.7502482E=01,	=2.2001056E=01,	=1.5499385E=01/	DATA 513
528		DATA (BCMOQN(I)), I=361, 368/				DATA 514
529	551	=8.4875102E=02,	=1.2528067E=02,	5.8163216E=02,	1.2508884E=01,	DATA 515
530	552	1.8616284E=01,	2.3941814E=01,	2.8288932E=01,	3.3461320E=01/	DATA 516
531		DATA (RMOON(I)), I=1, 36/				DATA 516
532	561	5.9099398E 01,	5.9615105E 01,	6.0216896E 01,	6.8872860E 01,	DATA 517
533	562	6.1340197E 01,	6.2169731E 01,	6.2711267E 01,	6.8118868E 01,	DATA 518
534	563	6.3355391E 01,	6.3396008E 01,	6.3230635E 01,	6.2865290E 01,	DATA 519
535	564	6.2322363E 01,	6.1639649E 01,	6.0467949E 01,	6.8067029E 01,	DATA 520
536	565	5.9299847E 01,	5.8625445E 01,	5.8091560E 01,	5.7728540E 01,	DATA 521
537	566	5.7546307E 01,	5.7535336E 01,	5.7671435E 01,	5.7922857E 01,	DATA 522
538	567	5.8257626E 01,	5.8649204E 01,	5.9079391E 01,	5.9538285E 01,	DATA 523
539	568	6.0021799E 01,	6.0527708E 01,	6.1051414E 01,	6.1582510E 01,	DATA 524
540	569	6.2102891E 01,	6.2586689E 01,	6.3001944E 01,	6.3313897E 01/	DATA 525
541		DATA (RMOON(I)), I=37, 72/				DATA 526
542	571	6.3487788E 01,	6.3494959E 01,	6.3314712E 01,	6.2938708E 01,	DATA 527
543	572	6.2373525E 01,	6.1642518E 01,	6.0786410E 01,	5.9862084E 01,	DATA 528
544	573	5.8939026E 01,	5.8093012E 01,	5.7397111E 01,	5.6911129E 01,	DATA 529
545	574	5.6671930E 01,	5.6687778E 01,	5.6938361E 01,	5.7381161E 01,	DATA 530
546	575	5.7961290E 01,	5.8622023E 01,	5.9313213E 01,	5.996254E 01,	DATA 531
547	576	6.0645442E 01,	6.1246445E 01,	6.1792935E 01,	6.2712738E 01,	DATA 532
548	577	6.3078056E 01,	6.3367861E 01,	6.3566229E 01,	6.3653142E 01,	DATA 533
549	578	6.3606938E 01,	6.3407603E 01,	6.3040529E 01,	6.2500392E 01,	DATA 534
550	579	6.1794801E 01,	6.0947343E 01,	5.9999443E 01,	5.9010187E 01/	DATA 535
551		DATA (RMOON(I)), I=73, 108/				DATA 536
552	581	5.8053329E 01,	5.7210928E 01,	5.6562014E 01,	5.6171759E 01,	DATA 537
553	582	5.6077340E 01,	5.6281630E 01,	5.6753275E 01,	5.7434422E 01,	DATA 538
554	583	5.8252946E 01,	5.9135142E 01,	6.0015723E 01,	6.0843724E 01,	DATA 539
555	584	6.1384424E 01,	6.2218227E 01,	6.2737653E 01,	6.3143464E 01,	DATA 540
556	585	6.3440937E 01,	6.3634049E 01,	6.3726552E 01,	6.3716409E 01,	DATA 541
557	586	6.3597638E 01,	6.3361033E 01,	6.2996524E 01,	6.2496506E 01,	DATA 542
558	587	6.1859732E 01,	6.1095322E 01,	6.0226413E 01,	5.9292744E 01,	DATA 543
559	588	5.8351110E 01,	5.7472653E 01,	5.6736166E 01,	5.6217335E 01,	DATA 544
560	589	5.5975377E 01,	5.6040833E 01,	5.6408478E 01,	5.7038358E 01/	DATA 545

561		DATA (RMOON (1), I=109, 144)/					DATA 546	6
562	591	5.7864204E 01,	5.8806589E 01,	5.9795015E 01,	6.0728693E 01,		DATA 547	
563	592	6.1582108E 01,	6.2307301E 01,	6.2883209E 01,	6.3303223E 01,		DATA 548	
564	593	6.3571741E 01,	6.3700226E 01,	6.3703248E 01,	6.3595081E 01,		DATA 549	
565	594	6.3387230E 01,	6.3087102E 01,	6.2697985E 01,	6.2219923E 01,		DATA 550	
566	595	6.1652838E 01,	6.0999751E 01,	6.0270780E 01,	5.9486941E 01,		DATA 551	
567	596	5.8682936E 01,	5.7907761E 01,	5.7222107E 01,	5.6691949E 01,		DATA 552	
568	597	5.6378604E 01,	5.6327018E 01,	5.6555511E 01,	5.7050519E 01,		DATA 553	
569	598	5.7768240E 01,	5.8642511E 01,	5.9596033E 01,	6.0551582E 01,		DATA 554	
570	599	6.1440838E 01,	6.2209950E 01,	6.2822026E 01,	6.3257208E 01,		DATA 555	
571		DATA (RMOON (1), I=145, 180)/					DATA 556	6
572	601	6.3511068E 01,	6.3591953E 01,	6.3517631E 01,	6.3311609E 01,		DATA 557	
573	602	6.2999513E 01,	6.2605880E 01,	6.2151559E 01,	6.1652301E 01,		DATA 558	
574	603	6.1110694E 01,	6.0557652E 01,	5.9975211E 01,	5.9380131E 01,		DATA 559	
575	604	5.8787600E 01,	5.8222023E 01,	5.7717836E 01,	5.7317462E 01,		DATA 560	
576	605	5.7066126E 01,	5.7004045E 01,	5.7157651E 01,	5.7532314E 01,		DATA 561	
577	606	5.8108933E 01,	5.8849493E 01,	5.9683004E 01,	6.0553882E 01,		DATA 562	
578	607	6.1390561E 01,	6.2132683E 01,	6.2732135E 01,	6.3159879E 01,		DATA 563	
579	608	6.3386925E 01,	6.3423877E 01,	6.3279372E 01,	6.2977644E 01,		DATA 564	
580	609	6.2551361E 01,	6.2037920E 01,	6.1475458E 01,	6.0898993E 01,		DATA 565	
581		DATA (RMOON (1), I=181, 216)/					DATA 566	6
582	611	6.0337248E 01,	5.9810800E 01,	5.9331986E 01,	5.8906674E 01,		DATA 567	
583	612	5.8537497E 01,	5.8227714E 01,	5.7984610E 01,	5.7821343E 01,		DATA 568	
584	613	5.7756448E 01,	5.7810779E 01,	5.8002490E 01,	5.8341030E 01,		DATA 569	
585	614	5.8822649E 01,	5.9427481E 01,	6.0120290E 01,	6.0853843E 01,		DATA 570	
586	615	6.1574213E 01,	6.2226764E 01,	6.2761720E 01,	6.3138674E 01,		DATA 571	
587	616	6.3329803E 01,	6.3321811E 01,	6.3116735E 01,	6.2731668E 01,		DATA 572	
588	617	6.2197430E 01,	6.1556099E 01,	6.0837373E 01,	6.0153789E 01,		DATA 573	
589	618	5.9495190E 01,	5.8923256E 01,	5.8467142E 01,	5.8141343E 01,		DATA 574	
590	619	5.7946384E 01,	5.7872180E 01,	5.7903105E 01,	5.8023291E 01,		DATA 575	
591		DATA (RMOON (1), I=217, 252)/					DATA 576	6
592	621	5.8220648E 01,	5.8488632E 01,	5.8825501E 01,	5.9231505E 01,		DATA 577	
593	622	5.9704994E 01,	6.0238589E 01,	6.0816473E 01,	6.1413475E 01,		DATA 578	
594	623	6.1996105E 01,	6.2525274E 01,	6.2960064E 01,	6.3261920E 01,		DATA 579	
595	624	6.3398665E 01,	6.3348032E 01,	6.3100492E 01,	6.2661284E 01,		DATA 580	
596	625	6.2051493E 01,	6.1307957E 01,	6.0481667E 01,	5.9634251E 01,		DATA 581	
597	626	5.8832323E 01,	5.8139964E 01,	5.7610356E 01,	5.7278349E 01,		DATA 582	
598	627	5.7156061E 01,	5.7232946E 01,	5.7480406E 01,	5.7859428E 01,		DATA 583	
599	628	5.8328868E 01,	5.8852182E 01,	5.9401336E 01,	5.9957663E 01,		DATA 584	
600	629	6.0510173E 01,	6.1052281E 01,	6.1578023E 01,	6.2078718E 01,		DATA 585	
601		DATA (RMOON (1), I=253, 288)/					DATA 586	6
602	631	6.2540707E 01,	6.2944529E 01,	6.3265637E 01,	6.3476566E 01,		DATA 587	
603	632	6.3549716E 01,	6.3461058E 01,	6.3193703E 01,	6.2741467E 01,		DATA 588	
604	633	6.2111980E 01,	6.1329023E 01,	6.0433661E 01,	5.9483528E 01,		DATA 589	
605	634	5.8549503E 01,	5.7709268E 01,	5.7037786E 01,	5.6599986E 01,		DATA 590	
606	635	5.6420307E 01,	5.6516419E 01,	5.6859468E 01,	5.7400856E 01,		DATA 591	
607	636	5.8079064E 01,	5.8830992E 01,	5.9600872E 01,	6.0345475E 01,		DATA 592	
608	637	6.1035637E 01,	6.1654830E 01,	6.2195895E 01,	6.2657080E 01,		DATA 593	
609	638	6.3038173E 01,	6.3337251E 01,	6.3548501E 01,	6.3661454E 01,		DATA 594	
610	639	6.3661626E 01,	6.3532382E 01,	6.3257781E 01,	6.2826215E 01,		DATA 595	
611		DATA (RMOON (1), I=289, 324)/					DATA 596	6
612	641	6.2234412E 01,	6.1491286E 01,	6.0621207E 01,	5.9666119E 01,		DATA 597	
613	642	5.8685623E 01,	5.7753970E 01,	5.6953142E 01,	5.6361963E 01,		DATA 598	
614	643	5.6042791E 01,	5.6029189E 01,	5.6318791E 01,	5.6874207E 01,		DATA 599	
615	644	5.7631631E 01,	5.8513937E 01,	5.9443816E 01,	6.0353730E 01,		DATA 600	
616	645	6.1191585E 01,	6.1922517E 01,	6.2527704E 01,	6.3001321E 01,		DATA 601	
617	646	6.3346631E 01,	6.3571893E 01,	6.3868516E 01,	6.3697942E 01,		DATA 602	
618	647	6.3809667E 01,	6.3420551E 01,	6.3125439E 01,	6.2717285E 01,		DATA 603	
619	648	6.2190206E 01,	6.1543656E 01,	6.0786492E 01,	5.9940803E 01,		DATA 604	
620	649	5.9044704E 01,	5.8153012E 01,	5.7334631E 01,	5.6665777E 01,		DATA 605	
621		DATA (RMOON (1), I=325, 360)/					DATA 606	6
622	651	5.6219077E 01,	5.6050263E 01,	5.6186034E 01,	5.6617412E 01,		DATA 607	
623	652	5.7300808E 01,	5.8167031E 01,	5.9134171E 01,	6.0120541E 01,		DATA 608	
624	653	6.1054523E 01,	6.1880415E 01,	6.2560705E 01,	6.3075605E 01,		DATA 609	
625	654	6.3420732E 01,	6.3603733E 01,	6.3640417E 01,	6.3550786E 01,		DATA 610	
626	655	6.3355349E 01,	6.3072065E 01,	6.2714274E 01,	6.2289911E 01,		DATA 611	
627	656	6.1902265E 01,	6.1252258E 01,	6.0641839E 01,	5.9978054E 01,		DATA 612	
628	657	5.9277126E 01,	5.8567651E 01,	5.7891735E 01,	5.7303039E 01,		DATA 613	
629	658	5.6861081E 01,	5.6622031E 01,	5.6627610E 01,	5.6899102E 01,		DATA 614	
630	659	5.7411800E 01,	5.8135897E 01,	5.9003399E 01,	5.9938620E 01,		DATA 615	
631		DATA (RMOON (1), I=361, 366)/					DATA 616	6
632	661	6.0865017E 01,	6.1714042E 01,	6.2431035E 01,	6.2978276E 01,		DATA 617	
633	662	6.3335635E 01,	6.3489538E 01,	6.3480696E 01,	6.3301058E 01,		DATA 618	
634		END					DATA 619	6



71034 02 11-03-72 11.742 1976 EPHENERIS

PREFACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

PRIMARY SYMDEF ENTRY

YABLE 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1 EPHBLK 11

SYMREF

END OF BINARY CARD \*1976\*19  
4273 IS THE NEXT AVAILABLE LOCATION.  
GMAP VERSION/ASSEMBLY DATES JMRA 110171/102971 JMPB 110171/102971 JMPC 110171/102971  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19411 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY,

71034 02 11-03-72 11.761 1977 EPHENERIS

Line	Code	Description	DATA
1	C*1977*	1977 EPHENERIS	1
2		SUBROUTINE TABLE	2
3		DIMENSION RASUN (369), DCSUN (369), RSUN (369)	3
4		DIMENSION RAMOON(369), DCMOON(369), RMOON(369)	4
5		DIMENSION ARRAY(2214)	
6		DOUBLE PRECISION V	
7		EQUIVALENCE (RASUN,ARRAY), (DCSUN,ARRAY(370)), (RSUN,ARRAY(739))	
8		EQUIVALENCE (RAMOON,ARRAY(1108)), (DCMOON,ARRAY(1477))	
9		EQUIVALENCE (RMOON,ARRAY(1846))	
10		COMMON /EPHBLK/, V(4), I	
11		Y(1) = ARRAY(I)	
12		Y(2) = ARRAY(I+1)	
13		Y(3) = ARRAY(I+2)	
14		Y(4) = ARRAY(I+3)	
15		RETURN	
16		DATA (RASUN (1), I = 1, 36) /	6
17	11	4.8917311E 00, 4.9110085E 00, 4.9302626E 00, 4.9494911E 00	7
18	12	4.9686922E 00, 4.9878638E 00, 4.9070040E 00, 5.0261110E 00	8
19	13	5.0451831E 00, 5.0642187E 00, 5.0832162E 00, 5.1021742E 00	9
20	14	5.1210911E 00, 5.1399656E 00, 5.1587969E 00, 5.1775820E 00	10
21	15	5.1963208E 00, 5.2150111E 00, 5.2336515E 00, 5.2522402E 00	11
22	16	5.2707759E 00, 5.2892970E 00, 5.3076822E 00, 5.3260508E 00	12
23	17	5.3443616E 00, 5.3626141E 00, 5.3808076E 00, 5.3989415E 00	13
24	18	5.4170156E 00, 5.4350294E 00, 5.4529830E 00, 5.4708760E 00	14
25	19	5.4887087E 00, 5.5064810E 00, 5.5241930E 00, 5.5418453E 00	15
26		DATA (RASUN (1), I = 37, 72) /	16
27	21	5.5594382E 00, 5.5769723E 00, 5.5944484E 00, 5.6118671E 00	17
28	22	5.6292292E 00, 5.6465356E 00, 5.6637872E 00, 5.6809845E 00	18
29	23	5.6981281E 00, 5.7152184E 00, 5.7322563E 00, 5.7492421E 00	19
30	24	5.7661762E 00, 5.7830592E 00, 5.7998920E 00, 5.8166752E 00	20
31	25	5.8334098E 00, 5.8500966E 00, 5.8667366E 00, 5.8833308E 00	21
32	26	5.8998803E 00, 5.9163864E 00, 5.9328500E 00, 5.9492725E 00	22
33	27	5.9656552E 00, 5.9819993E 00, 5.9983063E 00, 6.0145776E 00	23
34	28	6.0308149E 00, 6.0470200E 00, 6.0631943E 00, 6.0793402E 00	24
35	29	6.0954590E 00, 6.1115528E 00, 6.1276233E 00, 6.1436719E 00	25
36		DATA (RASUN (1), I = 73, 108) /	26
37	31	6.1597001E 00, 6.1757092E 00, 6.1917006E 00, 6.2076756E 00	27
38	32	6.2236354E 00, 6.2395812E 00, 6.2555144E 00, 6.2714362E 00	28
39	33	4.1227033E-03, 2.0069742E-02, 3.9961236E-02, 5.1850546E-02	29
40	34	6.7734976E-02, 8.3615831E-02, 9.9494429E-02, 1.1537210E-01	30
41	35	1.3125021E-01, 1.4713013E-01, 1.6301316E-01, 1.7890098E-01	31
42	36	1.9479514E-01, 2.1069741E-01, 2.2660930E-01, 2.4253276E-01	32
43	37	2.5846958E-01, 2.7442142E-01, 2.9039013E-01, 3.0637690E-01	33

44	38	3.2238305E-01,	3.3940983E-01,	3.9445861E-01,	3.7053034E-01,	DATA 34	
45	39	3.6662611E-01,	4.0274696E-01,	4.2889397E-01,	4.3506780E-01/	DATA 35	
46		DATA (RASUN (I)), I=109, 144)/				DATA 36	6
47	41	4.5126967E-01,	4.6750029E-01,	4.8376041E-01,	5.0006907E-01,	DATA 37	
48	42	5.1637216E-01,	5.3272523E-01,	5.4911062E-01,	5.6552901E-01,	DATA 38	
49	43	5.8198100E-01,	5.9846723E-01,	6.1498823E-01,	6.3154484E-01,	DATA 39	
50	44	6.4813787E-01,	6.6476874E-01,	6.8143626E-01,	6.9814339E-01,	DATA 40	
51	45	7.1489041E-01,	7.3167814E-01,	7.4859073E-01,	7.6537827E-01,	DATA 41	
52	46	7.8229150E-01,	7.9924725E-01,	8.1624600E-01,	8.3328769E-01,	DATA 42	
53	47	8.5037234E-01,	8.6749994E-01,	8.8467037E-01,	9.0188337E-01,	DATA 43	
54	48	9.1913862E-01,	9.3643564E-01,	9.5377385E-01,	9.7119268E-01,	DATA 44	
55	49	9.8657143E-01,	1.0060293E 00,	1.0235236E 00,	1.0410993E 00/	DATA 45	
56		DATA (RASUN (I)), I=145, 180)/				DATA 46	6
57	51	1.0586276E 00,	1.0762356E 00,	1.0938763E 00,	1.1115509E 00,	DATA 47	
58	52	1.1292386E 00,	1.1469986E 00,	1.1647699E 00,	1.1825720E 00,	DATA 48	
59	53	1.2004042E 00,	1.2182657E 00,	1.2361556E 00,	1.2540728E 00,	DATA 49	
60	54	1.2720162E 00,	1.2899848E 00,	1.3079777E 00,	1.3259933E 00,	DATA 50	
61	55	1.3440302E 00,	1.3620870E 00,	1.3801624E 00,	1.3982843E 00,	DATA 51	
62	56	1.4163618E 00,	1.4344822E 00,	1.4526141E 00,	1.4707554E 00,	DATA 52	
63	57	1.4889042E 00,	1.5070584E 00,	1.5252161E 00,	1.5433753E 00,	DATA 53	
64	58	1.5615339E 00,	1.5796899E 00,	1.5978413E 00,	1.6159865E 00,	DATA 54	
65	59	1.6341236E 00,	1.6522511E 00,	1.6703671E 00,	1.6884704E 00/	DATA 55	
66		DATA (RASUN (I)), I=181, 216)/				DATA 56	6
67	61	1.7065596E 00,	1.7246334E 00,	1.7426901E 00,	1.7607285E 00,	DATA 57	
68	62	1.7787475E 00,	1.7967456E 00,	1.8147221E 00,	1.8326755E 00,	DATA 58	
69	63	1.8506045E 00,	1.8685080E 00,	1.8863848E 00,	1.9042337E 00,	DATA 59	
70	64	1.9220531E 00,	1.9398419E 00,	1.9575987E 00,	1.9753222E 00,	DATA 60	
71	65	1.9930110E 00,	2.0106640E 00,	2.0282799E 00,	2.0458573E 00,	DATA 61	
72	66	2.0633954E 00,	2.0808930E 00,	2.0983492E 00,	2.1157633E 00,	DATA 62	
73	67	2.1331345E 00,	2.1504623E 00,	2.1677461E 00,	2.1849837E 00,	DATA 63	
74	68	2.2021810E 00,	2.2193316E 00,	2.2364375E 00,	2.2534987E 00,	DATA 64	
75	69	2.2705153E 00,	2.2874878E 00,	2.3044166E 00,	2.3213019E 00/	DATA 65	
76		DATA (RASUN (I)), I=217, 252)/				DATA 66	6
77	71	2.3381441E 00,	2.3549436E 00,	2.3717010E 00,	2.3884163E 00,	DATA 67	
78	72	2.4050900E 00,	2.4217224E 00,	2.4383137E 00,	2.4548643E 00,	DATA 68	
79	73	2.4713743E 00,	2.4878443E 00,	2.5042744E 00,	2.5206651E 00,	DATA 69	
80	74	2.5370167E 00,	2.5533297E 00,	2.5696046E 00,	2.5858420E 00,	DATA 70	
81	75	2.6020426E 00,	2.6182072E 00,	2.6343364E 00,	2.6504313E 00,	DATA 71	
82	76	2.6664923E 00,	2.6825219E 00,	2.6985196E 00,	2.7144872E 00,	DATA 72	
83	77	2.7304260E 00,	2.7463376E 00,	2.7622235E 00,	2.7780851E 00,	DATA 73	
84	78	2.7939240E 00,	2.8097416E 00,	2.8255396E 00,	2.8413192E 00,	DATA 74	
85	79	2.8570816E 00,	2.8728285E 00,	2.8885608E 00,	2.9042800E 00/	DATA 75	
86		DATA (RASUN (I)), I=253, 288)/				DATA 76	6
87	81	2.9199873E 00,	2.9356837E 00,	2.9513707E 00,	2.9670493E 00,	DATA 77	
88	82	2.9827206E 00,	2.9983859E 00,	3.0140463E 00,	3.0297032E 00,	DATA 78	
89	83	3.0453577E 00,	3.0610110E 00,	3.0766643E 00,	3.0923190E 00,	DATA 79	
90	84	3.1079763E 00,	3.1236378E 00,	3.1393048E 00,	3.1549789E 00,	DATA 80	
91	85	3.1706619E 00,	3.1863557E 00,	3.2020620E 00,	3.2177828E 00,	DATA 81	
92	86	3.2335197E 00,	3.2492746E 00,	3.2650492E 00,	3.2808453E 00,	DATA 82	
93	87	3.2966643E 00,	3.3125079E 00,	3.3283775E 00,	3.3442748E 00,	DATA 83	
94	88	3.3602009E 00,	3.3761573E 00,	3.3921454E 00,	3.4081665E 00,	DATA 84	
95	89	3.4242217E 00,	3.4403123E 00,	3.4564396E 00,	3.4726045E 00/	DATA 85	
96		DATA (RASUN (I)), I=289, 324)/				DATA 86	6
97	91	3.4888082E 00,	3.5050515E 00,	3.5213353E 00,	3.5376607E 00,	DATA 87	
98	92	3.5540286E 00,	3.5704402E 00,	3.5868954E 00,	3.6033987E 00,	DATA 88	
99	93	3.6199482E 00,	3.6365464E 00,	3.6531946E 00,	3.6698942E 00,	DATA 89	
100	94	3.6866465E 00,	3.7034526E 00,	3.7203138E 00,	3.7372311E 00,	DATA 90	
101	95	3.7542055E 00,	3.7712379E 00,	3.7883292E 00,	3.8054800E 00,	DATA 91	
102	96	3.8226911E 00,	3.8399629E 00,	3.8572963E 00,	3.8746913E 00,	DATA 92	
103	97	3.8921485E 00,	3.9096679E 00,	3.9272499E 00,	3.9448943E 00,	DATA 93	
104	98	3.9626008E 00,	3.9803689E 00,	3.9981982E 00,	4.0160881E 00,	DATA 94	
105	99	4.0340381E 00,	4.0520476E 00,	4.0701160E 00,	4.0882432E 00/	DATA 95	
106		DATA (RASUN (I)), I=325, 360)/				DATA 96	6
107	101	4.1064287E 00,	4.1246721E 00,	4.1429731E 00,	4.1613312E 00,	DATA 97	
108	102	4.1797498E 00,	4.1982163E 00,	4.2167418E 00,	4.2353215E 00,	DATA 98	
109	103	4.2539545E 00,	4.2726398E 00,	4.2913761E 00,	4.3101622E 00,	DATA 99	
110	104	4.3289969E 00,	4.3478786E 00,	4.3668060E 00,	4.3857772E 00,	DATA 100	
111	105	4.4047908E 00,	4.4238446E 00,	4.4429373E 00,	4.4620662E 00,	DATA 101	
112	106	4.4812289E 00,	4.5004228E 00,	4.5196453E 00,	4.5388938E 00,	DATA 102	
113	107	4.5581654E 00,	4.5774575E 00,	4.5967672E 00,	4.6160924E 00,	DATA 103	
114	108	4.6354307E 00,	4.6547799E 00,	4.6741375E 00,	4.6935015E 00,	DATA 104	
115	109	4.7128693E 00,	4.7322389E 00,	4.7516078E 00,	4.7709737E 00/	DATA 105	
116		DATA (RASUN (I)), I=361, 368)/				DATA 106	6



117	111	4.7903345E 00,	4.8096677E 00,	4.8290312E 00,	4.8483628E 00,	DATA 107
118	112	4.8676803E 00,	4.8869814E 00,	4.9062641E 00,	4.9255262E 00,	DATA 108
119		DATA (BCSUN (I), I= 1, 36)/				DATA 108
120	121	-4.0323314E-01,	-4.0190635E-01,	-4.0044433E-01,	-3.9884920E-01,	DATA 109
121	122	-3.9712198E-01,	-3.9526349E-01,	-3.9327455E-01,	-3.9113615E-01,	DATA 110
122	123	-3.8890925E-01,	-3.8653490E-01,	-3.8403411E-01,	-3.8140811E-01,	DATA 111
123	124	-3.7865806E-01,	-3.7578528E-01,	-3.7279109E-01,	-3.6967904E-01,	DATA 112
124	125	-3.6644460E-01,	-3.6309336E-01,	-3.5963076E-01,	-3.5603309E-01,	DATA 113
125	126	-3.5236342E-01,	-3.4856368E-01,	-3.4465563E-01,	-3.4064101E-01,	DATA 114
126	127	-3.3652155E-01,	-3.3229908E-01,	-3.2797546E-01,	-3.235253E-01,	DATA 115
127	128	-3.1903215E-01,	-3.1441621E-01,	-3.0970666E-01,	-3.0490537E-01,	DATA 116
128	129	-3.0001421E-01,	-2.9503520E-01,	-2.8997017E-01,	-2.8482112E-01,	DATA 117
129		DATA (BCSUN (I), I= 37, 72)/				DATA 118
130	131	-2.7958983E-01,	-2.7427824E-01,	-2.6888824E-01,	-2.6342374E-01,	DATA 119
131	132	-2.5788066E-01,	-2.5226694E-01,	-2.4658237E-01,	-2.4062963E-01,	DATA 120
132	133	-2.3501018E-01,	-2.2912637E-01,	-2.2318023E-01,	-2.1717392E-01,	DATA 121
133	134	-2.1110955E-01,	-2.0498922E-01,	-1.9881502E-01,	-1.9258895E-01,	DATA 122
134	135	-1.8631307E-01,	-1.7998943E-01,	-1.7362007E-01,	-1.6720498E-01,	DATA 123
135	136	-1.6075216E-01,	-1.5425758E-01,	-1.4772521E-01,	-1.4115700E-01,	DATA 124
136	137	-1.3455486E-01,	-1.2792072E-01,	-1.2125630E-01,	-1.1456398E-01,	DATA 125
137	138	-1.0784497E-01,	-1.0110125E-01,	-9.6334570E-02,	-8.7546673E-02,	DATA 126
138	139	-8.0739297E-02,	-7.3914197E-02,	-6.7073090E-02,	-6.0217883E-02,	DATA 127
139		DATA (BCSUN (I), I= 73, 108)/				DATA 128
140	141	-5.3350442E-02,	-4.6472642E-02,	-3.9586323E-02,	-3.2693410E-02,	DATA 129
141	142	-2.5795778E-02,	-1.8895288E-02,	-1.1993797E-02,	-5.8931252E-03,	DATA 130
142	143	1.8049071E-03,	8.6984821E-03,	1.9585766E-02,	2.2464985E-02,	DATA 131
143	144	2.9834362E-02,	3.6192120E-02,	4.3036503E-02,	4.9865763E-02,	DATA 132
144	145	5.6678171E-02,	6.3472006E-02,	7.0245532E-02,	7.6997137E-02,	DATA 133
145	146	8.3725197E-02,	9.0428124E-02,	9.7104298E-02,	1.0375224E-01,	DATA 134
146	147	1.1037040E-01,	1.1695723E-01,	1.2351123E-01,	1.3003069E-01,	DATA 135
147	148	1.3651395E-01,	1.4295935E-01,	1.4936523E-01,	1.5572986E-01,	DATA 136
148	149	1.6205153E-01,	1.6832858E-01,	1.7455931E-01,	1.8074209E-01,	DATA 137
149		DATA (BCSUN (I), I= 109, 144)/				DATA 138
150	151	1.8687523E-01,	1.9295705E-01,	1.9898588E-01,	2.0496006E-01,	DATA 139
151	152	2.1087795E-01,	2.1673793E-01,	2.2253832E-01,	2.2827752E-01,	DATA 140
152	153	2.3395388E-01,	2.3956580E-01,	2.4511166E-01,	2.5058990E-01,	DATA 141
153	154	2.5299902E-01,	2.6135750E-01,	2.6660380E-01,	2.7179460E-01,	DATA 142
154	155	2.7691444E-01,	2.8195598E-01,	2.8691972E-01,	2.9180427E-01,	DATA 143
155	156	2.9660811E-01,	3.0132977E-01,	3.0596785E-01,	3.1052082E-01,	DATA 144
156	157	3.1498722E-01,	3.1936563E-01,	3.2365465E-01,	3.2785289E-01,	DATA 145
157	158	3.3195899E-01,	3.3597162E-01,	3.3988937E-01,	3.4371100E-01,	DATA 146
158	159	3.4743516E-01,	3.5106059E-01,	3.5458605E-01,	3.5801030E-01,	DATA 147
159		DATA (BCSUN (I), I= 145, 180)/				DATA 148
160	161	3.6133211E-01,	3.6455037E-01,	3.6766387E-01,	3.7067154E-01,	DATA 149
161	162	3.7357227E-01,	3.7636510E-01,	3.7904901E-01,	3.8162318E-01,	DATA 150
162	163	3.8408673E-01,	3.8643884E-01,	3.8867870E-01,	3.9080553E-01,	DATA 151
163	164	3.9281856E-01,	3.9471700E-01,	3.9650023E-01,	3.9816748E-01,	DATA 152
164	165	3.9971815E-01,	4.0113169E-01,	4.0246762E-01,	4.0366546E-01,	DATA 153
165	166	4.0474481E-01,	4.0570527E-01,	4.0654658E-01,	4.0726841E-01,	DATA 154
166	167	4.0787053E-01,	4.0835276E-01,	4.0871496E-01,	4.0895705E-01,	DATA 155
167	168	4.0907896E-01,	4.0908064E-01,	4.0896215E-01,	4.0872354E-01,	DATA 156
168	169	4.0836496E-01,	4.0788655E-01,	4.0728863E-01,	4.0657147E-01,	DATA 157
169		DATA (BCSUN (I), I= 181, 216)/				DATA 158
170	171	4.0573536E-01,	4.0478077E-01,	4.0370803E-01,	4.0251760E-01,	DATA 159
171	172	4.0120998E-01,	3.9978562E-01,	3.9824504E-01,	3.9658885E-01,	DATA 160
172	173	3.9481767E-01,	3.9293222E-01,	3.9093329E-01,	3.8882164E-01,	DATA 161
173	174	3.8659820E-01,	3.8426384E-01,	3.8181951E-01,	3.7926621E-01,	DATA 162
174	175	3.7660492E-01,	3.7383672E-01,	3.7096263E-01,	3.6799382E-01,	DATA 163
175	176	3.6490136E-01,	3.6171645E-01,	3.5843022E-01,	3.5504388E-01,	DATA 164
176	177	3.5155859E-01,	3.4797560E-01,	3.4429623E-01,	3.4052168E-01,	DATA 165
177	178	3.3665327E-01,	3.3269231E-01,	3.2864007E-01,	3.2449783E-01,	DATA 166
178	179	3.2026688E-01,	3.1594848E-01,	3.1154386E-01,	3.0705439E-01,	DATA 167
179		DATA (BCSUN (I), I= 217, 252)/				DATA 168
180	181	3.0248143E-01,	2.9782637E-01,	2.9309059E-01,	2.8827556E-01,	DATA 169
181	182	2.8338280E-01,	2.7841378E-01,	2.7337002E-01,	2.6825308E-01,	DATA 170
182	183	2.6306451E-01,	2.5780584E-01,	2.5247862E-01,	2.4708446E-01,	DATA 171
183	184	2.4162496E-01,	2.3610167E-01,	2.3051619E-01,	2.2487003E-01,	DATA 172
184	185	2.1916479E-01,	2.1340203E-01,	2.0758340E-01,	2.0171037E-01,	DATA 173
185	186	1.9578455E-01,	1.8980746E-01,	1.8378063E-01,	1.7770554E-01,	DATA 174
186	187	1.7158366E-01,	1.6541639E-01,	1.5920514E-01,	1.5295141E-01,	DATA 175
187	188	1.4665665E-01,	1.4032235E-01,	1.3394998E-01,	1.2754112E-01,	DATA 176
188	189	1.2109733E-01,	1.1462019E-01,	1.0811129E-01,	1.0157226E-01,	DATA 177
189		DATA (BCSUN (I), I= 253, 288)/				DATA 178

190	191	9.5004722E-02,	8.8410510E-02,	8.1790640E-02,	7.9147416E-02,	DATA 179
191	192	6.8482300E-02,	6.1796996E-02,	5.9093034E-02,	4.8372205E-02,	DATA 180
192	193	4.1636141E-02,	3.4886527E-02,	2.9125109E-02,	2.2353491E-02,	DATA 181
193	194	1.4273370E-02,	7.7663449E-03,	9.9416237E-04,	5.8016893E-03,	DATA 182
194	195	-1.2500488E-02,	-1.9397829E-02,	-2.4195118E-02,	-3.2909779E-02,	DATA 183
195	196	-3.9780230E-02,	-4.6964880E-02,	-5.8342131E-02,	-6.8110298E-02,	DATA 184
196	197	-6.6867704E-02,	-7.3612633E-02,	-8.9034338E-02,	-8.7058173E-02,	DATA 185
197	198	-9.3755241E-02,	-1.0043279E-01,	-1.0708904E-01,	-1.1372211E-01,	DATA 186
198	199	-1.2033015E-01,	-1.2691132E-01,	-1.3346379E-01,	-1.3998865E-01,	DATA 187
199		DATA (BCSUN (1), I=289, 324) /				DATA 188 6
200	201	-1.4647499E-01,	-1.5292990E-01,	-1.5934841E-01,	-1.6572861E-01,	DATA 189
201	202	-1.7206859E-01,	-1.7936641E-01,	-1.8462006E-01,	-1.9082776E-01,	DATA 190
202	203	-1.9698762E-01,	-2.0309781E-01,	-2.0919646E-01,	-2.1516181E-01,	DATA 191
203	204	-2.2111194E-01,	-2.2700501E-01,	-2.3283918E-01,	-2.3861250E-01,	DATA 192
204	205	-2.4432309E-01,	-2.4996902E-01,	-2.5584833E-01,	-2.6189907E-01,	DATA 193
205	206	-2.6649927E-01,	-2.7186692E-01,	-2.7716011E-01,	-2.8237477E-01,	DATA 194
206	207	-2.8751495E-01,	-2.9257264E-01,	-2.9754797E-01,	-3.0243884E-01,	DATA 195
207	208	-3.0724336E-01,	-3.1195951E-01,	-3.1658528E-01,	-3.2111876E-01,	DATA 196
208	209	-3.2555795E-01,	-3.2990692E-01,	-3.3414568E-01,	-3.3829046E-01,	DATA 197
209		DATA (BCSUN (1), I=325, 360) /				DATA 198 6
210	211	-3.4233342E-01,	-3.4627283E-01,	-3.5010597E-01,	-3.5383414E-01,	DATA 199
211	212	-3.5745269E-01,	-3.6096100E-01,	-3.6435747E-01,	-3.6764052E-01,	DATA 200
212	213	-3.7080860E-01,	-3.7386017E-01,	-3.7679381E-01,	-3.7960800E-01,	DATA 201
213	214	-3.8230137E-01,	-3.8487251E-01,	-3.8732014E-01,	-3.8964294E-01,	DATA 202
214	215	-3.9183971E-01,	-3.9390932E-01,	-3.9585067E-01,	-3.9766278E-01,	DATA 203
215	216	-3.9934465E-01,	-4.0089539E-01,	-4.0231421E-01,	-4.0360020E-01,	DATA 204
216	217	-4.0475264E-01,	-4.0577084E-01,	-4.0665410E-01,	-4.0740192E-01,	DATA 205
217	218	-4.0801384E-01,	-4.0848948E-01,	-4.0882836E-01,	-4.0903089E-01,	DATA 206
218	219	-4.0909629E-01,	-4.092474E-01,	-4.0881619E-01,	-4.0847076E-01,	DATA 207
219		DATA (BCSUN (1), I=361, 368) /				DATA 208 6
220	221	-4.0798853E-01,	-4.0736969E-01,	-4.0666145E-01,	-4.0572339E-01,	DATA 209
221	222	-4.0469661E-01,	-4.0353467E-01,	-4.0223810E-01,	-4.0080747E-01,	DATA 210
222		DATA (RSUN (1), I=1, 36) /				DATA 210 6
223	231	9.8394869E-01,	9.8393098E-01,	9.8391919E-01,	9.8391347E-01,	DATA 211
224	232	9.8391397E-01,	9.8392080E-01,	9.8393408E-01,	9.8395376E-01,	DATA 212
225	233	9.8397978E-01,	9.8401205E-01,	9.8405038E-01,	9.8409499E-01,	DATA 213
226	234	9.8414499E-01,	9.8420027E-01,	9.8426038E-01,	9.8432553E-01,	DATA 214
227	235	9.8439477E-01,	9.8446801E-01,	9.8454479E-01,	9.8462510E-01,	DATA 215
228	236	9.8470896E-01,	9.8479632E-01,	9.8488705E-01,	9.8498141E-01,	DATA 216
229	237	9.8507955E-01,	9.8518167E-01,	9.8528802E-01,	9.8539874E-01,	DATA 217
230	238	9.8551404E-01,	9.8563413E-01,	9.8575917E-01,	9.8588937E-01,	DATA 218
231	239	9.8602488E-01,	9.8616584E-01,	9.8631242E-01,	9.8646460E-01,	DATA 219
232		DATA (RSUN (1), I=37, 72) /				DATA 220 6
233	241	9.8662241E-01,	9.8678578E-01,	9.8695483E-01,	9.8712714E-01,	DATA 221
234	242	9.8730845E-01,	9.8749245E-01,	9.8768086E-01,	9.8787326E-01,	DATA 222
235	243	9.8800922E-01,	9.8826840E-01,	9.8847028E-01,	9.8867474E-01,	DATA 223
236	244	9.8888158E-01,	9.8909065E-01,	9.8930165E-01,	9.8951473E-01,	DATA 224
237	245	9.8972992E-01,	9.8994728E-01,	9.9016695E-01,	9.9038901E-01,	DATA 225
238	246	9.9061362E-01,	9.9084095E-01,	9.9107112E-01,	9.9130434E-01,	DATA 226
239	247	9.9154077E-01,	9.9178060E-01,	9.9202394E-01,	9.9227092E-01,	DATA 227
240	248	9.9252161E-01,	9.9277607E-01,	9.9303430E-01,	9.9329650E-01,	DATA 228
241	249	9.9356188E-01,	9.9383033E-01,	9.9410171E-01,	9.9437548E-01,	DATA 229
242		DATA (RSUN (1), I=73, 108) /				DATA 230 6
243	251	9.9465124E-01,	9.9492855E-01,	9.9520691E-01,	9.9548610E-01,	DATA 231
244	252	9.9576583E-01,	9.9604581E-01,	9.9632572E-01,	9.9660555E-01,	DATA 232
245	253	9.9688523E-01,	9.9716472E-01,	9.9744400E-01,	9.9772313E-01,	DATA 233
246	254	9.9800222E-01,	9.9828133E-01,	9.9856058E-01,	9.9884015E-01,	DATA 234
247	255	9.9912018E-01,	9.9940088E-01,	9.9968232E-01,	9.9996477E-01,	DATA 235
248	256	1.0002484E 00,	1.0009533E 00,	1.0008198E 00,	1.0011076E 00,	DATA 236
249	257	1.0013967E 00,	1.0016867E 00,	1.0019777E 00,	1.0022692E 00,	DATA 237
250	258	1.0025607E 00,	1.0028519E 00,	1.0031422E 00,	1.0034313E 00,	DATA 238
251	259	1.0037189E 00,	1.0040047E 00,	1.0042853E 00,	1.0045696E 00,	DATA 239
252		DATA (RSUN (1), I=109, 144) /				DATA 240 6
253	261	1.0048485E 00,	1.0051248E 00,	1.0053985E 00,	1.0056695E 00,	DATA 241
254	262	1.0059379E 00,	1.0062037E 00,	1.0064670E 00,	1.0067279E 00,	DATA 242
255	263	1.0069869E 00,	1.0072431E 00,	1.0074977E 00,	1.0077507E 00,	DATA 243
256	264	1.0080022E 00,	1.0082525E 00,	1.0085019E 00,	1.0087503E 00,	DATA 244
257	265	1.0089978E 00,	1.0092443E 00,	1.0094900E 00,	1.0097343E 00,	DATA 245
258	266	1.0099769E 00,	1.0102174E 00,	1.0104535E 00,	1.0106907E 00,	DATA 246
259	267	1.0109228E 00,	1.0111514E 00,	1.0113761E 00,	1.0115967E 00,	DATA 247
260	268	1.0118131E 00,	1.0120251E 00,	1.0122325E 00,	1.0124353E 00,	DATA 248
261	269	1.0126335E 00,	1.0128270E 00,	1.0130159E 00,	1.0132003E 00,	DATA 249
262		DATA (RSUN (1), I=145, 180) /				DATA 250 6



263	271	1.0133802E 00,	1.0133560E 00,	1.0137275E 00,	1.0138953E 00,	DATA 251	
264	272	1.0140595E 00,	1.0142205E 00,	1.0143784E 00,	1.0145336E 00,	DATA 252	
265	273	1.0146860E 00,	1.0148359E 00,	1.0149836E 00,	1.0151286E 00,	DATA 253	
266	274	1.0152707E 00,	1.0154097E 00,	1.0155452E 00,	1.0156770E 00,	DATA 254	
267	275	1.0158046E 00,	1.0159279E 00,	1.0160462E 00,	1.0161596E 00,	DATA 255	
268	276	1.0162678E 00,	1.0163705E 00,	1.0164677E 00,	1.0165592E 00,	DATA 256	
269	277	1.0166449E 00,	1.0167247E 00,	1.0167987E 00,	1.0168670E 00,	DATA 257	
270	278	1.0169296E 00,	1.0169867E 00,	1.0170383E 00,	1.0170847E 00,	DATA 258	
271	279	1.0171264E 00,	1.0171636E 00,	1.0171965E 00,	1.0172254E 00,	DATA 259	
272	DATA (RSUN (I), I=181, 216)/					DATA 260	6
273	281	1.0172507E 00,	1.0172725E 00,	1.0172914E 00,	1.0173070E 00,	DATA 261	
274	282	1.0173195E 00,	1.0173282E 00,	1.0173339E 00,	1.0173349E 00,	DATA 262	
275	283	1.0173322E 00,	1.0173231E 00,	1.0173132E 00,	1.0172963E 00,	DATA 263	
276	284	1.0172743E 00,	1.0172469E 00,	1.0172139E 00,	1.0171751E 00,	DATA 264	
277	285	1.0171305E 00,	1.0170801E 00,	1.0170235E 00,	1.0169611E 00,	DATA 265	
278	286	1.0168928E 00,	1.0168186E 00,	1.0167358E 00,	1.0166535E 00,	DATA 266	
279	287	1.0165631E 00,	1.0164680E 00,	1.0163683E 00,	1.0162649E 00,	DATA 267	
280	288	1.0161569E 00,	1.0160459E 00,	1.0159319E 00,	1.0158149E 00,	DATA 268	
281	289	1.0156950E 00,	1.0155722E 00,	1.0154466E 00,	1.0153179E 00,	DATA 269	
282	DATA (RSUN (I), I=217, 252)/					DATA 270	6
283	291	1.0151859E 00,	1.0150505E 00,	1.0149114E 00,	1.0147684E 00,	DATA 271	
284	292	1.0146212E 00,	1.0144698E 00,	1.0143139E 00,	1.0141533E 00,	DATA 272	
285	293	1.0139878E 00,	1.0138173E 00,	1.0136421E 00,	1.0134617E 00,	DATA 273	
286	294	1.0132762E 00,	1.0130857E 00,	1.0128902E 00,	1.0126901E 00,	DATA 274	
287	295	1.0124856E 00,	1.0122770E 00,	1.0120645E 00,	1.0118487E 00,	DATA 275	
288	296	1.0116300E 00,	1.0114086E 00,	1.0111852E 00,	1.0109598E 00,	DATA 276	
289	297	1.0107327E 00,	1.0105039E 00,	1.0102738E 00,	1.0100423E 00,	DATA 277	
290	298	1.0098091E 00,	1.0095743E 00,	1.0093376E 00,	1.0090990E 00,	DATA 278	
291	299	1.0088582E 00,	1.0086152E 00,	1.0083696E 00,	1.0081215E 00,	DATA 279	
292	DATA (RSUN (I), I=253, 288)/					DATA 280	6
293	301	1.0078705E 00,	1.0076165E 00,	1.0073595E 00,	1.0070993E 00,	DATA 281	
294	302	1.0068358E 00,	1.0065691E 00,	1.0062989E 00,	1.0060258E 00,	DATA 282	
295	303	1.0057498E 00,	1.0054713E 00,	1.0051904E 00,	1.0049077E 00,	DATA 283	
296	304	1.0046235E 00,	1.0043384E 00,	1.0040527E 00,	1.0037668E 00,	DATA 284	
297	305	1.0034809E 00,	1.0031953E 00,	1.0029103E 00,	1.0026259E 00,	DATA 285	
298	306	1.0023422E 00,	1.0020591E 00,	1.0017766E 00,	1.0014946E 00,	DATA 286	
299	307	1.0012130E 00,	1.0009318E 00,	1.0006507E 00,	1.0003697E 00,	DATA 287	
300	308	1.0000884E 00,	9.9980687E-01,	9.9952486E-01,	9.9924222E-01,	DATA 288	
301	309	9.9895880E-01,	9.9867449E-01,	9.9838908E-01,	9.9810283E-01,	DATA 289	
302	DATA (RSUN (I), I=289, 324)/					DATA 290	6
303	311	9.9781586E-01,	9.9752840E-01,	9.9724048E-01,	9.9695267E-01,	DATA 291	
304	312	9.9666534E-01,	9.9637894E-01,	9.9609399E-01,	9.9581074E-01,	DATA 292	
305	313	9.9552953E-01,	9.9525069E-01,	9.9497463E-01,	9.9470139E-01,	DATA 293	
306	314	9.9443110E-01,	9.9416386E-01,	9.9389766E-01,	9.9363878E-01,	DATA 294	
307	315	9.9338084E-01,	9.9312590E-01,	9.9287389E-01,	9.9262463E-01,	DATA 295	
308	316	9.9237800E-01,	9.9213383E-01,	9.9189203E-01,	9.9165231E-01,	DATA 296	
309	317	9.9141444E-01,	9.9117826E-01,	9.9094348E-01,	9.9071021E-01,	DATA 297	
310	318	9.9047843E-01,	9.9024820E-01,	9.9001942E-01,	9.8979261E-01,	DATA 298	
311	319	9.8956811E-01,	9.8934630E-01,	9.8912764E-01,	9.8891243E-01,	DATA 299	
312	DATA (RSUN (I), I=325, 360)/					DATA 300	6
313	321	9.8870100E-01,	9.8849371E-01,	9.8829099E-01,	9.8809293E-01,	DATA 301	
314	322	9.8789973E-01,	9.8771154E-01,	9.8752852E-01,	9.8735067E-01,	DATA 302	
315	323	9.8717802E-01,	9.8701055E-01,	9.8684821E-01,	9.8669089E-01,	DATA 303	
316	324	9.8653847E-01,	9.8639079E-01,	9.8624777E-01,	9.8610909E-01,	DATA 304	
317	325	9.8597445E-01,	9.8584363E-01,	9.8571635E-01,	9.8559248E-01,	DATA 305	
318	326	9.8547184E-01,	9.8535437E-01,	9.8523971E-01,	9.8512830E-01,	DATA 306	
319	327	9.8502037E-01,	9.8491621E-01,	9.8481610E-01,	9.8472034E-01,	DATA 307	
320	328	9.8462930E-01,	9.8454326E-01,	9.8446269E-01,	9.8438767E-01,	DATA 308	
321	329	9.8431846E-01,	9.8425519E-01,	9.8419808E-01,	9.8414715E-01,	DATA 309	
322	DATA (RSUN (I), I=361, 368)/					DATA 310	6
323	331	9.8410247E-01,	9.8406488E-01,	9.8403196E-01,	9.8400604E-01,	DATA 311	
324	332	9.8398619E-01,	9.8397227E-01,	9.8396423E-01,	9.8396168E-01,	DATA 312	
325	DATA (RAMOQN(I), I= 1, 36)/					DATA 312	6
326	341	6.3374125E-01,	8.4266103E-01,	1.0373101E 00,	1.2776293E 00,	DATA 313	
327	342	1.5025335E 00,	1.7301607E 00,	1.9583767E 00,	2.1853922E 00,	DATA 314	
328	343	2.4102743E 00,	2.6331979E 00,	2.8554234E 00,	3.0790767E 00,	DATA 315	
329	344	3.3068056E 00,	3.5413238E 00,	3.7848039E 00,	4.0381108E 00,	DATA 316	
330	345	4.3000468E 00,	4.5670412E 00,	4.8337620E 00,	5.0946236E 00,	DATA 317	
331	346	5.3454223E 00,	5.5842181E 00,	5.8112465E 00,	6.0282778E 00,	DATA 318	
332	347	6.2379101E 00,	1.5983000E-01,	3.6331132E-01,	5.6768122E-01,	DATA 319	
333	348	7.7508259E-01,	9.8701718E-01,	1.2042013E 00,	1.4264667E 00,	DATA 320	
334	349	1.6228112E 00,	1.8816626E 00,	2.1113293E 00,	2.3469038E 00,	DATA 321	
335	DATA (RAMOQN(I), I= 37, 72)/					DATA 322	6

336	351	2.5686498E 00,	2.7961612E 00,	3.0242845E 00,	3.2548595E 00,	DATA 323
337	352	3.4899248E 00,	3.7312178E 00,	3.9795706E 00,	4.2344011E 00,	DATA 324
338	353	4.4934071E 00,	4.7328878E 00,	5.0086501E 00,	5.2571480E 00,	DATA 325
339	354	5.4962966E 00,	5.7256691E 00,	5.9462007E 00,	6.1596994E 00,	DATA 326
340	355	8.5209649E-02,	2.9141834E-01,	4.9731596E-01,	7.8477249E-01,	DATA 327
341	356	9.1922177E-01,	1.1295304E 00,	1.3480312E 00,	1.5763409E 00,	DATA 328
342	357	1.7956982E 00,	2.0231266E 00,	2.2517859E 00,	2.4812767E 00,	DATA 329
343	358	2.7118250E 00,	2.9442948E 00,	3.1800166E 00,	3.4204512E 00,	DATA 330
344	359	3.6667152E 00,	3.9190390E 00,	4.1763163E 00,	4.4359956E 00,	DATA 331
345		DATA (RAMOON(I), I=73,108)/				DATA 332
346	361	4.6945062E 00,	4.9481499E 00,	5.1940535E 00,	5.4307455E 00,	DATA 333
347	362	5.6582090E 00,	5.8775403E 00,	6.0905471E 00,	1.6129730E-02,	DATA 334
348	363	2.2274916E-01,	4.2910893E-01,	6.3675382E-01,	8.4678347E-01,	DATA 335
349	364	1.0597936E 00,	1.2758763E 00,	1.4947022E 00,	1.7156922E 00,	DATA 336
350	365	1.9382564E 00,	2.1620501E 00,	2.3871838E 00,	2.6143371E 00,	DATA 337
351	366	2.8447465E 00,	3.0800485E 00,	3.8219573E 00,	3.5717572E 00,	DATA 338
352	367	3.8296520E 00,	4.0941574E 00,	4.8619054E 00,	4.6282270E 00,	DATA 339
353	368	4.8883662E 00,	5.1388109E 00,	5.8779721E 00,	5.6061133E 00,	DATA 340
354	369	5.8248218E 00,	6.0364007E 00,	6.2433850E 00,	1.6502686E-01,	DATA 341
355		DATA (RAMOON(I), I=109,144)/				DATA 342
356	371	3.6982074E-01,	5.7623813E-01,	7.8535640E-01,	9.9760924E-01,	DATA 343
357	372	1.2128036E 00,	1.4302503E 00,	1.6490134E 00,	1.8682349E 00,	DATA 344
358	373	2.0874513E 00,	2.3068260E 00,	2.5272554E 00,	2.7503468E 00,	DATA 345
359	374	2.9782756E 00,	3.2135084E 00,	3.4583350E 00,	3.7141522E 00,	DATA 346
360	375	3.9805620E 00,	4.2546435E 00,	4.5310402E 00,	4.8032643E 00,	DATA 347
361	376	5.0656927E 00,	5.3150668E 00,	5.5307937E 00,	5.7743350E 00,	DATA 348
362	377	5.9882995E 00,	6.1957368E 00,	1.1647053E-01,	3.1956012E-01,	DATA 349
363	378	5.2399828E-01,	7.3130791E-01,	9.4223961E-01,	1.1567261E 00,	DATA 350
364	379	1.3739654E 00,	1.5926728E 00,	1.8114728E 00,	2.0293315E 00,	DATA 351
365		DATA (RAMOON(I), I=145,180)/				DATA 352
366	381	2.2459050E 00,	2.4617239E 00,	2.6782119E 00,	2.8975759E 00,	DATA 353
367	382	3.1225943E 00,	3.3362765E 00,	3.6013079E 00,	3.8591935E 00,	DATA 354
368	383	4.1291890E 00,	4.4075151E 00,	4.6876837E 00,	4.9623026E 00,	DATA 355
369	384	5.2254637E 00,	5.4742199E 00,	5.7085738E 00,	5.9305639E 00,	DATA 356
370	385	6.1432440E 00,	6.6759186E-02,	2.7064470E-01,	4.7445879E-01,	DATA 357
371	386	6.8032835E-01,	8.8963992E-01,	1.1026919E 00,	1.3196847E 00,	DATA 358
372	387	1.5388595E 00,	1.7583345E 00,	1.9780767E 00,	2.1955879E 00,	DATA 359
373	388	2.4111311E 00,	2.6255556E 00,	2.8405487E 00,	3.0585698E 00,	DATA 360
374	389	3.2825746E 00,	3.5156325E 00,	3.7603255E 00,	4.0178445E 00,	DATA 361
375		DATA (RAMOON(I), I=181,216)/				DATA 362
376	391	4.2870731E 00,	4.5637922E 00,	4.8414705E 00,	5.1130806E 00,	DATA 363
377	392	5.3733276E 00,	5.6198190E 00,	5.9528731E 00,	6.0746053E 00,	DATA 364
378	393	4.8065819E-03,	2.1302172E-01,	4.1903983E-01,	6.2539311E-01,	DATA 365
379	394	8.3399497E-01,	1.0459930E 00,	1.2613723E 00,	1.4804696E 00,	DATA 366
380	395	1.7011599E 00,	1.9222214E 00,	2.1422963E 00,	2.3606085E 00,	DATA 367
381	396	2.5772239E 00,	2.7931163E 00,	3.0100736E 00,	3.2304952E 00,	DATA 368
382	397	3.4370927E 00,	3.6924379E 00,	3.9384433E 00,	4.1953756E 00,	DATA 369
383	398	4.4613445E 00,	4.7320786E 00,	5.0018338E 00,	5.2650706E 00,	DATA 370
384	399	5.5179982E 00,	5.7591947E 00,	5.9892931E 00,	6.2102552E 00,	DATA 371
385		DATA (RAMOON(I), I=217,252)/				DATA 372
386	401	1.4145909E-01,	3.5195345E-01,	5.6101435E-01,	7.7068027E-01,	DATA 373
387	402	9.8241682E-01,	1.1570102E 00,	1.4145291E 00,	1.6343973E 00,	DATA 374
388	403	1.3856075E 00,	2.0770497E 00,	2.2978761E 00,	2.5177972E 00,	DATA 375
389	404	2.7372397E 00,	2.9573479E 00,	3.1798510E 00,	3.4068188E 00,	DATA 376
390	405	3.6403061E 00,	3.8818736E 00,	4.1320140E 00,	4.3896322E 00,	DATA 377
391	406	4.6318757E 00,	4.9146001E 00,	5.1734290E 00,	5.4249203E 00,	DATA 378
392	407	5.6672691E 00,	5.9003450E 00,	6.1252781E 00,	6.8731572E-02,	DATA 379
393	408	2.7518034E-01,	4.8746873E-01,	6.9933536E-01,	9.1269045E-01,	DATA 380
394	409	1.1265348E 00,	1.3429450E 00,	1.5611345E 00,	1.7806022E 00,	DATA 381
395		DATA (RAMOON(I), I=253,288)/				DATA 382
396	411	2.0007543E 00,	2.2211536E 00,	2.4417374E 00,	2.6629525E 00,	DATA 383
397	412	2.8857807E 00,	3.1116483E 00,	3.3422177E 00,	3.5790572E 00,	DATA 384
398	413	3.8231962E 00,	4.0746272E 00,	4.3319216E 00,	4.5922185E 00,	DATA 385
399	414	4.8317566E 00,	5.1068221E 00,	5.3546747E 00,	5.5940373E 00,	DATA 386
400	415	5.8250539E 00,	6.0489103E 00,	6.2673643E 00,	1.9915400E-01,	DATA 387
401	416	4.1243865E-01,	6.2548453E-01,	8.328314E-01,	1.0543183E 00,	DATA 388
402	417	1.2706009E 00,	1.4877863E 00,	1.7053730E 00,	1.9229300E 00,	DATA 389
403	418	2.1403171E 00,	2.3578440E 00,	2.5763468E 00,	2.7971735E 00,	DATA 390
404	419	3.0220784E 00,	3.2530096E 00,	3.4917600E 00,	3.7394872E 00,	DATA 391
405		DATA (RAMOON(I), I=289,324)/				DATA 392
406	421	3.9959512E 00,	4.2593170E 00,	4.5258489E 00,	4.7908046E 00,	DATA 393
407	422	5.0496915E 00,	5.2994349E 00,	5.5388778E 00,	5.2685787E 00,	DATA 394
408	423	5.9902459E 00,	6.2061456E 00,	1.3545033E-01,	3.4665461E-01,	DATA 395



409	424	5.5824044E=01,	7.7127059E=01,	9.8613232E=01,	1.2025692E 00,	DATA 396
410	425	1.4198388E 00,	1.6369856E 00,	1.8531717E 00,	2.8679810E 00,	DATA 397
411	426	2.2816249E 00,	2.4950242E 00,	2.7097840E 00,	2.9280846E 00,	DATA 398
412	427	3.1824917E 00,	3.3856446E 00,	3.6297478E 00,	3.8858156E 00,	DATA 399
413	428	4.1527960E 00,	4.4270252E 00,	4.7026540E 00,	4.9732352E 00,	DATA 400
414	429	5.2336886E 00,	5.4814894E 00,	5.7166604E 00,	5.9410172E 00,	DATA 401
415		DATA (RAMOON(I), I=325, 360)/				DATA 402
416	431	6.1572918E 00,	8.5274609E=02,	2.9411948E=01,	5.8295420E=01,	DATA 403
417	432	7.1342885E=01,	9.2639601E=01,	1.1418599E 00,	1.3590612E 00,	DATA 404
418	433	1.5767315E 00,	1.7934849E 00,	2.0082473E 00,	2.2205998E 00,	DATA 405
419	434	2.4309618E 00,	2.6406166E 00,	2.8711260E 00,	3.0666785E 00,	DATA 406
420	435	3.2888682E 00,	3.5213418E 00,	3.7607007E 00,	4.0260804E 00,	DATA 407
421	436	4.2980682E 00,	4.5780817E 00,	4.8590544E 00,	5.1335973E 00,	DATA 408
422	437	5.3961605E 00,	5.6443866E 00,	5.8793894E 00,	6.1029173E 00,	DATA 409
423	438	3.5121412E=02,	2.4560557E=01,	4.5410031E=01,	6.6295116E=01,	DATA 410
424	439	6.7375600E=01,	1.0872429E 00,	1.3032396E 00,	1.5267946E 00,	DATA 411
425		DATA (RAMOON(I), I=361, 368)/				DATA 412
426	441	1.7384779E 00,	1.9368151E 00,	2.1687339E 00,	2.3798948E 00,	DATA 413
427	442	2.5888444E 00,	2.7970054E 00,	3.0065657E 00,	3.2253079E 00,	DATA 414
428		DATA (BCMOON(I), I= 1, 36)/				DATA 414
429	451	2.3941814E=01,	2.8288982E=01,	3.1461320E=01,	3.3274873E=01,	DATA 415
430	452	3.3581675E=01,	3.2298052E=01,	2.9427960E=01,	2.5072373E=01,	DATA 416
431	453	1.9422226E=01,	1.2740117E=01,	5.3401637E=02,	=2.4261065E=02,	DATA 417
432	454	=1.0174763E=01,	=1.7488377E=01,	=2.8917832E=01,	=2.9000868E=01,	DATA 418
433	455	=3.2310575E=01,	=3.3534154E=01,	=3.2555883E=01,	=2.9498773E=01,	DATA 419
434	456	=2.4695083E=01,	=1.8600813E=01,	=1.1699759E=01,	=4.4346984E=02,	DATA 420
435	457	2.8233433E=02,	9.7759636E=02,	1.6191987E=01,	2.1837133E=01,	DATA 421
436	458	2.6556152E=01,	3.0162054E=01,	3.2485322E=01,	3.3374348E=01,	DATA 422
437	459	3.2715802E=01,	3.0459979E=01,	2.8643454E=01,	2.1461615E=01,	DATA 423
438		DATA (BCMOON(I), I= 37, 72)/				DATA 424
439	461	1.4967559E=01,	7.6590162E=02,	=1.4160414E=03,	=8.0086512E=02,	DATA 425
440	462	=1.5493120E=01,	=2.2141873E=01,	=2.7521194E=01,	=3.2251115E=01,	DATA 426
441	463	=3.3052260E=01,	=3.2795028E=01,	=3.0530008E=01,	=2.6481008E=01,	DATA 427
442	464	=2.1000927E=01,	=1.4509277E=01,	=7.4340668E=02,	=1.7160722E=03,	DATA 428
443	465	6.9332831E=02,	1.3590782E=01,	1.9559417E=01,	2.4635133E=01,	DATA 429
444	466	2.8640851E=01,	3.1420053E=01,	3.8836770E=01,	3.2782644E=01,	DATA 430
445	467	3.1190319E=01,	2.8050530E=01,	2.8429511E=01,	1.7483238E=01,	DATA 431
446	468	1.0465617E=01,	2.7279209E=02,	5.2930116E=02,	=1.3099543E=01,	DATA 432
447	469	=2.0171003E=01,	=2.6012252E=01,	=3.20208349E=01,	=3.2476687E=01,	DATA 433
448		DATA (BCMOON(I), I= 73, 108)/				DATA 434
449	471	=3.2703359E=01,	=3.0950446E=01,	=2.7430586E=01,	=2.2459723E=01,	DATA 435
450	472	=1.6406436E=01,	=9.6515535E=02,	=2.5622062E=02,	4.5221325E=02,	DATA 436
451	473	1.1295843E=01,	1.7488946E=01,	2.8666657E=01,	2.7228195E=01,	DATA 437
452	474	3.0406047E=01,	3.2266504E=01,	3.2711879E=01,	3.1684275E=01,	DATA 438
453	475	2.9170671E=01,	2.5209661E=01,	1.9900758E=01,	1.8417094E=01,	DATA 439
454	476	6.0205674E=02,	1.9250968E=02,	9.9523083E=02,	=1.7510080E=01,	DATA 440
455	477	=2.4015872E=01,	=2.8937273E=01,	=3.21884837E=01,	=3.2682406E=01,	DATA 441
456	478	=3.1383351E=01,	=2.8227244E=01,	=2.8563586E=01,	=1.7779276E=01,	DATA 442
457	479	=1.1251720E=01,	=4.3287947E=02,	=2.6737377E=02,	=9.4676729E=02,	DATA 443
458		DATA (BCMOON(I), I=109, 144)/				DATA 444
459	481	1.5787595E=01,	2.1389309E=01,	2.4052407E=01,	2.9586463E=01,	DATA 445
460	482	3.1839166E=01,	3.2704078E=01,	3.2125542E=01,	3.8099467E=01,	DATA 446
461	483	2.6670766E=01,	2.1930689E=01,	1.6018256E=01,	9.3293442E=02,	DATA 447
462	484	1.5340365E=02,	6.4021390E=02,	=1.4204425E=01,	=2.1300780E=01,	DATA 448
463	485	=2.7078837E=01,	=3.0992521E=01,	=3.2689126E=01,	=3.2095405E=01,	DATA 449
464	486	=2.9411615E=01,	=2.5021605E=01,	=1.9378016E=01,	=1.2917251E=01,	DATA 450
465	487	=6.0209260E=02,	9.8783205E=03,	7.8314264E=02,	1.4261658E=01,	DATA 451
466	488	2.0047843E=01,	2.4972461E=01,	2.8835095E=01,	3.1463314E=01,	DATA 452
467	489	3.2727263E=01,	3.2552980E=01,	3.0929080E=01,	2.7905184E=01,	DATA 453
468		DATA (BCMOON(I), I=145, 180)/				DATA 454
469	491	2.3583430E=01,	1.8108979E=01,	1.1665645E=01,	4.4811736E=02,	DATA 455
470	492	=3.1570829E=02,	=1.0880038E=01,	=1.8219702E=01,	=2.4616846E=01,	DATA 456
471	493	=2.9477657E=01,	=3.2288926E=01,	=3.2758748E=01,	=3.0906223E=01,	DATA 457
472	494	=2.7038850E=01,	=2.1635648E=01,	=1.5213576E=01,	=8.2390331E=02,	DATA 458
473	495	=1.0959719E=02,	5.9082126E=02,	1.2321289E=01,	1.8523888E=01,	DATA 459
474	496	2.3713703E=01,	2.7899447E=01,	3.0905220E=01,	3.2583766E=01,	DATA 460
475	497	3.2834364E=01,	3.1618887E=01,	2.8969595E=01,	2.4985973E=01,	DATA 461
476	498	1.9823353E=01,	1.3679824E=01,	6.7882678E=02,	=5.8220429E=03,	DATA 462
477	499	=8.1149588E=02,	=1.5429200E=01,	=2.2068730E=01,	=2.7514567E=01,	DATA 463
478		DATA (BCMOON(I), I=181, 216)/				DATA 464
479	501	=3.1242234E=01,	=3.2830476E=01,	=3.2086342E=01,	=2.9115861E=01,	DATA 465
480	502	=2.4289197E=01,	=1.8123457E=01,	=1.1155599E=01,	=3.8599662E=02,	DATA 466
481	503	3.3803960E=02,	1.0266320E=01,	1.6559978E=01,	2.2061455E=01,	DATA 467
482	504	2.6591915E=01,	2.9986722E=01,	3.2099329E=01,	3.2814234E=01,	DATA 468

483	505	3.2064688E=01,	2.9848696E=01,	2.6237212E=01,	2.8371877E=01,	DATA 469
484	506	1.5454553E=01,	8.7342532E=02,	1.4972156E=02,	5.9363275E=02,	DATA 470
485	507	-1.3208791E=01,	-1.9919928E=01,	-2.5629510E=01,	-2.9882326E=01,	DATA 471
486	508	-3.2267794E=01,	-3.2509413E=01,	-3.0550028E=01,	-2.6503283E=01,	DATA 472
487	509	-2.1007651E=01,	-1.4328767E=01,	-7.0603713E=02,	3.4118697E=03,	DATA 473
488	DATA (BCMOON(I), I=217, 252)/					DATA 474
489	511	7.5025371E=02,	1.4130146E=01,	1.9993326E=01,	2.4904889E=01,	DATA 475
490	512	2.8706442E=01,	3.1261674E=01,	3.2458629E=01,	3.2219485E=01,	DATA 476
491	513	3.0514495E=01,	2.7375272E=01,	2.2903222E=01,	1.7271018E=01,	DATA 477
492	514	1.0717646E=01,	3.5394302E=02,	3.9201530E=02,	-1.1280153E=01,	DATA 478
493	515	-1.8131744E=01,	-2.4051444E=01,	-2.0624577E=01,	-3.3485461E=01,	DATA 479
494	516	-3.2373584E=01,	-3.1190621E=01,	-2.8032295E=01,	-2.3175862E=01,	DATA 480
495	517	-1.7027199E=01,	-1.0050713E=01,	-2.7068982E=01,	4.5891636E=02,	DATA 481
496	518	1.1486891E=01,	1.7702266E=01,	2.8010078E=01,	2.7232992E=01,	DATA 482
497	519	3.0232119E=01,	3.1901847E=01,	3.2169726E=01,	3.1000722E=01,	DATA 483
498	DATA (BCMOON(I), I=253, 288)/					DATA 484
499	521	2.8404371E=01,	2.4443078E=01,	1.9240227E=01,	1.2987038E=01,	DATA 485
500	522	5.9469211E=02,	1.5446650E=02,	9.0874738E=02,	1.4232971E=01,	DATA 486
501	523	-2.2513532E=01,	-2.7482534E=01,	-3.0765666E=01,	-3.2113384E=01,	DATA 487
502	524	-3.1440562E=01,	-2.8836906E=01,	-2.4543659E=01,	-1.8907408E=01,	DATA 488
503	525	-1.2329150E=01,	-5.2220603E=02,	-2.0178008E=02,	9.8294413E=02,	DATA 489
504	526	1.5496839E=01,	2.1153490E=01,	2.5783554E=01,	2.9221019E=01,	DATA 490
505	527	3.1347830E=01,	3.2091567E=01,	3.1422926E=01,	2.9353420E=01,	DATA 491
506	528	2.5954340E=01,	2.1258632E=01,	1.5467226E=01,	8.7603095E=02,	DATA 492
507	529	1.4115891E=02,	6.2197011E=02,	6.1868783E=01,	2.0481256E=01,	DATA 493
508	DATA (BCMOON(I), I=289, 324)/					DATA 494
509	531	-2.6072167E=01,	-2.9993275E=01,	-3.1922429E=01,	-3.1743186E=01,	DATA 495
510	532	-2.9553200E=01,	-2.5619162E=01,	-2.0305560E=01,	-1.4010093E=01,	DATA 496
511	533	-7.1228997E=02,	-8.6891755E=05,	-6.9975595E=02,	-1.3590348E=01,	DATA 497
512	534	1.9494548E=01,	2.4469545E=01,	2.8316314E=01,	3.0885329E=01,	DATA 498
513	535	3.2082491E=01,	3.1870430E=01,	3.0264306E=01,	2.7323579E=01,	DATA 499
514	536	2.3143432E=01,	1.7850262E=01,	1.1604885E=01,	4.6150207E=02,	DATA 500
515	537	-2.8443261E=02,	-1.0408600E=01,	-1.7611913E=01,	-2.3904268E=01,	DATA 501
516	538	-2.8715460E=01,	-3.1565491E=01,	-3.2185111E=01,	-3.8583603E=01,	DATA 502
517	539	-2.7022816E=01,	-2.1919165E=01,	-1.5735213E=01,	-8.9069691E=02,	DATA 503
518	DATA (BCMOON(I), I=325, 360)/					DATA 504
519	541	-1.8152017E=02,	5.2137438E=02,	1.1895228E=01,	1.7973692E=01,	DATA 505
520	542	2.3216368E=01,	2.7415446E=01,	3.0397641E=01,	3.2037460E=01,	DATA 506
521	543	3.2268826E=01,	3.1089767E=01,	2.8557808E=01,	2.4778102E=01,	DATA 507
522	544	1.9889790E=01,	1.4056760E=01,	7.4673715E=02,	3.4510786E=03,	DATA 508
523	545	-7.0308548E=02,	-1.4300513E=01,	-2.1005645E=01,	-2.6601456E=01,	DATA 509
524	546	-3.0521986E=01,	-3.2304848E=01,	-3.1732607E=01,	-2.8907589E=01,	DATA 510
525	547	-2.4206868E=01,	-1.8152012E=01,	-1.1277186E=01,	-4.9507074E=02,	DATA 511
526	548	3.1482899E=02,	1.0016496E=01,	1.8305790E=01,	2.1801990E=01,	DATA 512
527	549	2.6313603E=01,	2.9671190E=01,	3.1736263E=01,	3.2415695E=01,	DATA 513
528	DATA (BCMOON(I), I=361, 369)/					DATA 514
529	551	3.1675394E=01,	2.9547041E=01,	2.6124607E=01,	2.1552427E=01,	DATA 515
530	552	1.6010400E=01,	9.7026602E=02,	2.8543608E=02,	4.2814964E=02,	DATA 516
531	DATA (RMOON(I), I=1, 36)/					DATA 516
532	561	6.3499538E 01,	6.3480696E 01,	6.3301038E 01,	6.2990232E 01,	DATA 517
533	562	6.2981582E 01,	6.2108271E 01,	6.1599696E 01,	6.1078864E 01,	DATA 518
534	563	6.0961218E 01,	6.0055205E 01,	5.9564569E 01,	5.9091988E 01,	DATA 519
535	564	5.8643298E 01,	5.8231192E 01,	5.7877270E 01,	5.7611501E 01,	DATA 520
536	565	5.7468061E 01,	5.7482038E 01,	5.7675651E 01,	5.8057074E 01,	DATA 521
537	566	5.8613058E 01,	5.9309309E 01,	6.0094426E 01,	6.8906693E 01,	DATA 522
538	567	6.1681877E 01,	6.2360396E 01,	6.2892889E 01,	6.3243926E 01,	DATA 523
539	568	6.3393982E 01,	6.3339955E 01,	6.8094476E 01,	6.2684176E 01,	DATA 524
540	569	6.2146968E 01,	6.1528345E 01,	6.0876816E 01,	6.9238816E 01,	DATA 525
541	DATA (RMOON(I), I=37, 72)/					DATA 526
542	571	5.9653768E 01,	5.9150217E 01,	5.8743931E 01,	5.8438536E 01,	DATA 527
543	572	5.8228568E 01,	5.8104201E 01,	5.8036297E 01,	5.8080406E 01,	DATA 528
544	573	5.8178585E 01,	5.8355565E 01,	5.8630455E 01,	5.9081876E 01,	DATA 529
545	574	5.9472901E 01,	6.0032231E 01,	6.0655642E 01,	6.1367066E 01,	DATA 530
546	575	6.1941910E 01,	6.2511781E 01,	6.2969631E 01,	6.3274673E 01,	DATA 531
547	576	6.3396196E 01,	6.3316810E 01,	6.3034346E 01,	6.2542853E 01,	DATA 532
548	577	6.1932413E 01,	6.1187613E 01,	6.0384460E 01,	5.9585494E 01,	DATA 533
549	578	5.8853309E 01,	5.8243045E 01,	5.7795231E 01,	5.7530902E 01,	DATA 534
550	579	5.7450090E 01,	5.7534892E 01,	5.7755535E 01,	5.8077979E 01,	DATA 535
551	DATA (RMOON(I), I=73, 108)/					DATA 536
552	581	5.8470738E 01,	5.8909400E 01,	5.9378184E 01,	5.9868747E 01,	DATA 537
553	582	6.0376990E 01,	6.0898995E 01,	6.1427193E 01,	6.1947487E 01,	DATA 538
554	583	6.2439213E 01,	6.2873848E 01,	6.3219259E 01,	6.3442028E 01,	DATA 539
555	584	6.3511521E 01,	6.3403807E 01,	6.3105273E 01,	6.2615722E 01,	DATA 540



556	585	6,1950709E	01,	6,1142830E	01,	6,0241451E	01,	5,9310359E	01,	DATA	541
557	586	5,8422831E	01,	5,7653920E	01,	5,9070472E	01,	5,6720724E	01,	DATA	542
558	587	5,6626385E	01,	5,6779939E	01,	5,7148174E	01,	5,7680674E	01,	DATA	543
559	588	5,8320364E	01,	5,9013069E	01,	5,9714090E	01,	6,8391171E	01,	DATA	544
560	589	6,1024223E	01,	6,1602755E	01,	6,2122138E	01,	6,2579670E	01/	DATA	545
561		DATA (RMOON (I), I=109,144)/								DATA	546
562	591	6,2971092E	01,	6,3288167E	01,	6,3517684E	01,	6,3641996E	01,	DATA	547
563	592	6,3640589E	01,	6,3494436E	01,	6,3186504E	01,	6,2708573E	01,	DATA	548
564	593	6,2063407E	01,	6,1268306E	01,	6,0357452E	01,	5,9382638E	01,	DATA	549
565	594	5,8611512E	01,	5,7522579E	01,	5,6796463E	01,	5,6304034E	01,	DATA	550
566	595	5,6093783E	01,	5,6182371E	01,	5,8551788E	01,	5,7154237E	01,	DATA	551
567	596	5,7922888E	01,	5,8784355E	01,	5,9669971E	01,	6,8523118E	01,	DATA	552
568	597	6,1302645E	01,	6,1982850E	01,	6,2551182E	01,	6,3004737E	01,	DATA	553
569	598	6,3346298E	01,	6,3580457E	01,	6,3710404E	01,	6,3735940E	01,	DATA	554
570	599	6,3652832E	01,	6,3453430E	01,	6,3128489E	01,	6,2670103E	01/	DATA	555
571		DATA (RMOON (I), I=145,180)/								DATA	556
572	601	6,2075389E	01,	6,1350383E	01,	6,0513714E	01,	5,9599519E	01,	DATA	557
573	602	5,8658680E	01,	5,7757299E	01,	5,6971463E	01,	5,6377943E	01,	DATA	558
574	603	5,6041736E	01,	5,6003287E	01,	5,6269531E	01,	5,6812100E	01,	DATA	559
575	604	5,7573393E	01,	5,8478077E	01,	5,9446047E	01,	6,8403379E	01,	DATA	560
576	605	6,1289539E	01,	6,2060754E	01,	6,2690239E	01,	6,3166306E	01,	DATA	561
577	606	6,3489280E	01,	6,3667784E	01,	6,3714876E	01,	6,3644519E	01,	DATA	562
578	607	6,3468893E	01,	6,3196704E	01,	6,2832632E	01,	6,2378094E	01,	DATA	563
579	608	6,1833417E	01,	6,1201069E	01,	6,0489429E	01,	5,9716553E	01,	DATA	564
580	609	5,8913227E	01,	5,8124286E	01,	5,7407063E	01,	5,6826209E	01/	DATA	565
581		DATA (RMOON (I), I=181,216)/								DATA	566
582	611	5,6444838E	01,	5,6313267E	01,	5,6458131E	01,	5,6875532E	01,	DATA	567
583	612	5,7530361E	01,	5,8362615E	01,	5,9297749E	01,	6,8258376E	01,	DATA	568
584	613	6,1172348E	01,	6,1982248E	01,	6,2645742E	01,	6,3137786E	01,	DATA	569
585	614	6,3449193E	01,	6,3584292E	01,	6,3557855E	01,	6,3391582E	01,	DATA	570
586	615	6,3110480E	01,	6,2739492E	01,	6,2300716E	01,	6,1811583E	01,	DATA	571
587	616	6,1284353E	01,	6,0727147E	01,	6,0146354E	01,	5,9549996E	01,	DATA	572
588	617	5,8951418E	01,	5,8372383E	01,	5,7844539E	01,	5,7408315E	01,	DATA	573
589	618	5,7108700E	01,	5,6988152E	01,	5,7077904E	01,	5,7390011E	01,	DATA	574
590	619	5,7912591E	01,	5,8609881E	01,	5,9427029E	01,	6,8297976E	01/	DATA	575
591		DATA (RMOON (I), I=217,252)/								DATA	576
592	621	6,1154203E	01,	6,1932454E	01,	6,2580432E	01,	6,3060290E	01,	DATA	577
593	622	6,3350118E	01,	6,3443898E	01,	6,3350259E	01,	6,3090348E	01,	DATA	578
594	623	6,2694894E	01,	6,2200618E	01,	6,1646245E	01,	6,1068474E	01,	DATA	579
595	624	6,0498476E	01,	5,9959527E	01,	5,9466322E	01,	5,9026181E	01,	DATA	580
596	625	5,8641932E	01,	5,8315766E	01,	5,8052999E	01,	5,7864596E	01,	DATA	581
597	626	5,7767539E	01,	5,7782579E	01,	5,7929674E	01,	5,8222141E	01,	DATA	582
598	627	5,8661188E	01,	5,9232397E	01,	5,9905208E	01,	6,8635473E	01,	DATA	583
599	628	6,1370321E	01,	6,2054126E	01,	6,2634383E	01,	6,3066695E	01,	DATA	584
600	629	6,3318472E	01,	6,3371352E	01,	6,3222406E	01,	6,2884258E	01/	DATA	585
601		DATA (RMOON (I), I=253,288)/								DATA	586
602	631	6,2384119E	01,	6,1761689E	01,	6,1065826E	01,	6,8349981E	01,	DATA	587
603	632	5,9666657E	01,	5,9061583E	01,	5,8568666E	01,	5,8206897E	01,	DATA	588
604	633	5,7980135E	01,	5,7879830E	01,	5,7889962E	01,	5,7992713E	01,	DATA	589
605	634	5,8173458E	01,	5,8423196E	01,	5,8738936E	01,	5,9121362E	01,	DATA	590
606	635	5,9370822E	01,	6,0083327E	01,	6,0647047E	01,	6,1240594E	01,	DATA	591
607	636	6,1833303E	01,	6,2387398E	01,	6,2861546E	01,	6,3215088E	01,	DATA	592
608	637	6,3412311E	01,	6,3426299E	01,	6,3242131E	01,	6,2859406E	01,	DATA	593
609	638	6,2293604E	01,	6,1376711E	01,	6,0756159E	01,	5,9892001E	01,	DATA	594
610	639	5,9051866E	01,	5,8303745E	01,	5,7707344E	01,	5,7305669E	01/	DATA	595
611		DATA (RMOON (I), I=289,324)/								DATA	596
612	641	5,7119028E	01,	5,7143389E	01,	5,7353733E	01,	5,7711313E	01,	DATA	597
613	642	5,8172482E	01,	5,8696559E	01,	5,9251047E	01,	5,9813622E	01,	DATA	598
614	643	6,0371203E	01,	6,0915952E	01,	6,1446316E	01,	6,1953224E	01,	DATA	599
615	644	6,2427167E	01,	6,2851660E	01,	6,3204276E	01,	6,3458232E	01,	DATA	600
616	645	6,3585135E	01,	6,3558449E	01,	6,3557258E	01,	6,2970018E	01,	DATA	601
617	646	6,2397985E	01,	6,1658056E	01,	6,0784610E	01,	5,9829750E	01,	DATA	602
618	647	5,8861176E	01,	5,7956951E	01,	5,7196855E	01,	5,6651065E	01,	DATA	603
619	648	5,6368394E	01,	5,6367506E	01,	5,6634276E	01,	5,7126344E	01,	DATA	604
620	649	5,7783216E	01,	5,8538379E	01,	5,9329871E	01,	6,0107297E	01/	DATA	605
621		DATA (RMOON (I), I=325,360)/								DATA	606
622	651	6,0834854E	01,	6,1490962E	01,	6,2065508E	01,	6,2555917E	01,	DATA	607
623	652	5,2962993E	01,	6,328194E	01,	6,3525788E	01,	6,3671317E	01,	DATA	608
624	653	6,3711573E	01,	6,3630924E	01,	6,3412773E	01,	6,3042928E	01,	DATA	609
625	654	6,2513538E	01,	6,1827133E	01,	6,1000358E	01,	6,8066876E	01,	DATA	610
626	655	5,9078683E	01,	5,8104720E	01,	5,7225822E	01,	5,6525378E	01,	DATA	611
627	656	5,6074432E	01,	5,5927947E	01,	5,6094487E	01,	5,6553199E	01,	DATA	612
628	657	5,7249300E	01,	5,8107957E	01,	5,9048260E	01,	5,9995206E	01,	DATA	613

629	658	6.0887559E 01,	6.1681421E 01,	6.2390293E 01,	6.2882745E 01,	DATA 614	
630	659	6.3278779E 01,	6.3543711E 01,	6.8694068E 01,	6.8733979E 01/	DATA 615	
631	DATA (RMOON (1), I, 361, 368)/					DATA 616	6
632	661	6.3672520E 01,	6.3812275E 01,	6.8251214E 01,	6.2863934E 01,	DATA 617	
633	662	6.2404260E 01,	6.1808866E 01,	6.1101402E 01,	6.8296631E 01/	DATA 618	
634	END					DATA 619	6

29748 WORDS OF MEMORY USED BY THIS COMPILATION

71034 02 11-03-72 11.778 1977 EPHEMERIS

PREFACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

PRIMARY SYMDEF ENTRY

TABLE 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1 EPHBLK 11

SYMPREF

END OF BINARY CARD \*1977\*19  
4273 IS THE NEXT AVAILABLE LOCATION.  
GMAP VERSION/ASSEMBLY DATES JMPA 110171/102971 JMPB 110171/102971 JMPC 110171/102971  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19411 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

71034 02 11-03-72 11.790 1978 EPHEMERIS

1	C*1978*	1978 EPHEMERIS				DATA	1
2	SUBROUTINE TABLE					DATA	2
3	DIMENSION RASUN (369), DCUN (369), RSUN (369)					DATA	3
4	DIMENSION RAMOON(369), DCMOON(369), RMOON(369)					DATA	4
5	DIMENSION ARRAY(2214)						
6	DOUBLE PRECISION Y						
7	EQUIVALENCE (RASUN,ARRAY), (DCUN,ARRAY(370)), (RSUN,ARRAY(739))						
8	EQUIVALENCE (RAMOON,ARRAY(1108)), (DCMOON,ARRAY(1477))						
9	EQUIVALENCE (RMOON,ARRAY(1846))						
10	COMMON /EPHBLK/ Y(4), I						
11	Y(1) = ARRAY(I)						
12	Y(2) = ARRAY(I+1)						2
13	Y(3) = ARRAY(I+2)						3
14	Y(4) = ARRAY(I+3)						4
15	RETURN						5
16	DATA (RASUN (1)), I = 1, 36)/					DATA	6
17	11	4.8869814E 00,	4.9062641E 00,	4.9255262E 00,	4.9447657E 00,	DATA	7
18	12	4.9639806E 00,	4.9831688E 00,	5.0023281E 00,	5.0214559E 00,	DATA	8
19	13	5.0405499E 00,	5.0596079E 00,	5.0786274E 00,	5.0976061E 00,	DATA	9
20	14	5.1165418E 00,	5.1354324E 00,	5.1542763E 00,	5.1730724E 00,	DATA	10
21	15	5.1918189E 00,	5.2105143E 00,	5.2291583E 00,	5.2477490E 00,	DATA	11
22	16	5.2662859E 00,	5.2847678E 00,	5.3031941E 00,	5.3215642E 00,	DATA	12
23	17	5.3396775E 00,	5.3581336E 00,	5.3763320E 00,	5.3944725E 00,	DATA	13
24	18	5.4125551E 00,	5.4305799E 00,	5.4485461E 00,	5.4664545E 00,	DATA	14
25	19	5.4843051E 00,	5.5020982E 00,	5.5198334E 00,	5.5375106E 00/	DATA	15
26	DATA (RASUN (1)), I = 37, 72)/					DATA	16
27	21	5.5851302E 00,	5.5726917E 00,	5.5901931E 00,	5.6076402E 00,	DATA	17
28	22	5.6250272E 00,	5.6423560E 00,	5.6596273E 00,	5.6768416E 00,	DATA	18
29	23	5.6939992E 00,	5.7111009E 00,	5.7281479E 00,	5.7451397E 00,	DATA	19
30	24	5.7620785E 00,	5.7789646E 00,	5.7957994E 00,	5.8125837E 00,	DATA	20
31	25	5.8293188E 00,	5.8460059E 00,	5.8626463E 00,	5.8792415E 00,	DATA	21
32	26	5.8957930E 00,	5.9123023E 00,	5.9287703E 00,	5.9452002E 00,	DATA	22
33	27	5.9615921E 00,	5.9779460E 00,	5.9942691E 00,	6.0105566E 00,	DATA	23
34	28	6.0268118E 00,	6.0430360E 00,	6.0592300E 00,	6.0753951E 00,	DATA	24

35	29	6.0915323E 00,	6.1076428E 00,	6.1237279E 00,	6.1397887E 00/	DATA	25
36		DATA (RASUN I), I=73,108)/				DATA	26
37	31	6.1558267E 00,	6.1718430E 00,	6.1878390E 00,	6.2038160E 00,	DATA	27
38	32	6.2197755E 00,	6.2357188E 00,	6.2516477E 00,	6.2675633E 00,	DATA	28
39	33	2.8210511E-04,	1.6176224E-02,	3.2062129E-02,	4.7941566E-02,	DATA	29
40	34	6.3816329E-02,	7.9688161E-02,	9.3558970E-02,	1.1143055E-01,	DATA	30
41	35	1.2730463E-01,	1.4318299E-01,	1.5906698E-01,	1.7493801E-01,	DATA	31
42	36	1.9085741E-01,	2.0676663E-01,	2.2268673E-01,	2.3861891E-01,	DATA	32
43	37	2.5456428E-01,	2.7052403E-01,	2.8649931E-01,	3.0249112E-01,	DATA	33
44	38	3.1850053E-01,	3.3452844E-01,	3.5057594E-01,	3.6664402E-01,	DATA	34
45	39	3.8273375E-01,	3.9884609E-01,	4.1498209E-01,	4.3114285E-01/	DATA	35
46		DATA (RASUN I), I=109,144)/				DATA	36
47	41	4.4732944E-01,	4.6354293E-01,	4.7978436E-01,	4.9605559E-01,	DATA	37
48	42	5.1235723E-01,	5.2869067E-01,	5.4505730E-01,	5.6145833E-01,	DATA	38
49	43	5.7789485E-01,	5.9436803E-01,	6.1087861E-01,	6.2742731E-01,	DATA	39
50	44	6.4401485E-01,	6.6064206E-01,	6.7730924E-01,	6.9401688E-01,	DATA	40
51	45	7.1076532E-01,	7.2755489E-01,	7.4438573E-01,	7.6125797E-01,	DATA	41
52	46	7.7817155E-01,	7.9512636E-01,	8.1212234E-01,	8.2915932E-01,	DATA	42
53	47	8.4623715E-01,	8.6335554E-01,	8.8051434E-01,	8.9771328E-01,	DATA	43
54	48	9.1495212E-01,	9.3223060E-01,	9.4954859E-01,	9.6690594E-01,	DATA	44
55	49	9.8430248E-01,	1.0017378E 00,	1.0192121E 00,	1.0367249E 00/	DATA	45
56		DATA (RASUN I), I=145,180)/				DATA	46
57	51	1.0542761E 00,	1.0718653E 00,	1.0894918E 00,	1.1071549E 00,	DATA	47
58	52	1.1248340E 00,	1.1425885E 00,	1.1603574E 00,	1.1781595E 00,	DATA	48
59	53	1.1959939E 00,	1.2138593E 00,	1.2317543E 00,	1.2496775E 00,	DATA	49
60	54	1.2676273E 00,	1.2856020E 00,	1.3035999E 00,	1.3216194E 00,	DATA	50
61	55	1.3396587E 00,	1.3577161E 00,	1.3757897E 00,	1.3938778E 00,	DATA	51
62	56	1.4119788E 00,	1.4300908E 00,	1.4482123E 00,	1.4663418E 00,	DATA	52
63	57	1.4844777E 00,	1.5026183E 00,	1.5207624E 00,	1.5389086E 00,	DATA	53
64	58	1.5570584E 00,	1.5752013E 00,	1.5933449E 00,	1.6114848E 00,	DATA	54
65	59	1.6296194E 00,	1.6477476E 00,	1.6658677E 00,	1.6839781E 00/	DATA	55
66		DATA (RASUN I), I=181,216)/				DATA	56
67	61	1.7020772E 00,	1.7201635E 00,	1.7382331E 00,	1.7562902E 00,	DATA	57
68	62	1.7743269E 00,	1.7923436E 00,	1.8103382E 00,	1.8283092E 00,	DATA	58
69	63	1.8462548E 00,	1.8641733E 00,	1.8820632E 00,	1.8999228E 00,	DATA	59
70	64	1.9177507E 00,	1.9355437E 00,	1.9533064E 00,	1.9710319E 00,	DATA	60
71	65	1.9887211E 00,	2.0063728E 00,	2.0239866E 00,	2.0415618E 00,	DATA	61
72	66	2.0590976E 00,	2.0765933E 00,	2.0940487E 00,	2.1114634E 00,	DATA	62
73	67	2.1288371E 00,	2.1461700E 00,	2.1634616E 00,	2.1807117E 00,	DATA	63
74	68	2.1979202E 00,	2.2150869E 00,	2.2322113E 00,	2.2492931E 00,	DATA	64
75	69	2.2663320E 00,	2.2833277E 00,	2.3002799E 00,	2.3171884E 00/	DATA	65
76		DATA (RASUN I), I=217,252)/				DATA	66
77	71	2.3340530E 00,	2.3508736E 00,	2.3676501E 00,	2.3843825E 00,	DATA	67
78	72	2.4010710E 00,	2.4177137E 00,	2.4343169E 00,	2.4508750E 00,	DATA	68
79	73	2.4673904E 00,	2.4839634E 00,	2.5002948E 00,	2.5166854E 00,	DATA	69
80	74	2.5330358E 00,	2.5493466E 00,	2.5656191E 00,	2.5818544E 00,	DATA	70
81	75	2.5980536E 00,	2.6142184E 00,	2.6303496E 00,	2.6464486E 00,	DATA	71
82	76	2.6625165E 00,	2.6785547E 00,	2.6945639E 00,	2.7105452E 00,	DATA	72
83	77	2.7264996E 00,	2.7424279E 00,	2.7583312E 00,	2.7742104E 00,	DATA	73
84	78	2.7900664E 00,	2.8059004E 00,	2.8217133E 00,	2.8375060E 00,	DATA	74
85	79	2.8532797E 00,	2.8690356E 00,	2.8847747E 00,	2.9004981E 00/	DATA	75
86		DATA (RASUN I), I=255,288)/				DATA	76
87	81	2.9162072E 00,	2.9319029E 00,	2.9475867E 00,	2.9632599E 00,	DATA	77
88	82	2.9789239E 00,	2.9945800E 00,	3.0102299E 00,	3.0258755E 00,	DATA	78
89	83	3.0415185E 00,	3.0571609E 00,	3.0728046E 00,	3.0884311E 00,	DATA	79
90	84	3.1041024E 00,	3.1197602E 00,	3.13534260E 00,	3.1511011E 00,	DATA	80
91	85	3.1667871E 00,	3.1824855E 00,	3.1981975E 00,	3.2139246E 00,	DATA	81
92	86	3.2296681E 00,	3.2454294E 00,	3.2612097E 00,	3.2770104E 00,	DATA	82
93	87	3.2928328E 00,	3.3086781E 00,	3.3245476E 00,	3.3404424E 00,	DATA	83
94	88	3.3563638E 00,	3.3723128E 00,	3.3882909E 00,	3.4042991E 00,	DATA	84
95	89	3.4203389E 00,	3.4364114E 00,	3.4525184E 00,	3.4686615E 00/	DATA	85
96		DATA (RASUN I), I=289,324)/				DATA	86
97	91	3.4848424E 00,	3.5010627E 00,	3.5173243E 00,	3.5336286E 00,	DATA	87
98	92	3.5499772E 00,	3.5663717E 00,	3.5828132E 00,	3.5993031E 00,	DATA	88
99	93	3.6158423E 00,	3.6324326E 00,	3.6490743E 00,	3.6657688E 00,	DATA	89
100	94	3.6825169E 00,	3.6993196E 00,	3.7161777E 00,	3.7330918E 00,	DATA	90
101	95	3.7500627E 00,	3.7670910E 00,	3.7841771E 00,	3.8013212E 00,	DATA	91
102	96	3.8185238E 00,	3.8357847E 00,	3.8531044E 00,	3.8704831E 00,	DATA	92
103	97	3.8879209E 00,	3.9054179E 00,	3.9229747E 00,	3.9405518E 00,	DATA	93
104	98	3.9582692E 00,	3.9760082E 00,	3.9938082E 00,	4.0116699E 00,	DATA	94
105	99	4.0295931E 00,	4.0475782E 00,	4.0656247E 00,	4.0837325E 00/	DATA	95
106		DATA (RASUN I), I=325,360)/				DATA	96
107	101	4.1019012E 00,	4.1201306E 00,	4.1384199E 00,	4.1567684E 00,	DATA	97



108	102	4.1751755E 00,	4.1936403E 00,	4.2121621E 00,	4.2307393E 00,	DATA 98	
109	103	4.2493709E 00,	4.2680537E 00,	4.2867919E 00,	4.3055778E 00,	DATA 99	
110	104	4.3244113E 00,	4.3432904E 00,	4.3622131E 00,	4.3811774E 00,	DATA 100	
111	105	4.4001813E 00,	4.4192226E 00,	4.4382996E 00,	4.4574106E 00,	DATA 101	
112	106	4.4765537E 00,	4.4957271E 00,	4.5149289E 00,	4.5341571E 00,	DATA 102	
113	107	4.5534098E 00,	4.5726849E 00,	4.5919803E 00,	4.6112939E 00,	DATA 103	
114	108	4.6306233E 00,	4.6499664E 00,	4.6693209E 00,	4.6886846E 00,	DATA 104	
115	109	4.7080550E 00,	4.7274299E 00,	4.7468067E 00,	4.7661832E 00,	DATA 105	
116		DATA (RASUN (I), I=361,368)/				DATA 106	6
117	111	4.7855567E 00,	4.8049251E 00,	4.8242853E 00,	4.8436344E 00,	DATA 107	
118	112	4.8629696E 00,	4.8822882E 00,	4.9015870E 00,	4.9208834E 00,	DATA 108	
119		DATA (BCSUN (I), I=1, 36)/				DATA 108	6
120	121	=4.0353467E-01,	=4.0223810E-01,	=4.0080747E-01,	=3.9924351E-01,	DATA 109	
121	122	=3.9754695E-01,	=3.9271863E-01,	=3.9372955E-01,	=3.9167072E-01,	DATA 110	
122	123	=3.8945321E-01,	=3.8710823E-01,	=3.8463690E-01,	=3.8204046E-01,	DATA 111	
123	124	=3.7932017E-01,	=3.7647737E-01,	=3.7351337E-01,	=3.7042953E-01,	DATA 112	
124	125	=3.6722736E-01,	=3.6390832E-01,	=3.6047401E-01,	=3.5692598E-01,	DATA 113	
125	126	=3.5326582E-01,	=3.4949524E-01,	=3.4561587E-01,	=3.4162938E-01,	DATA 114	
126	127	=3.3753753E-01,	=3.3334200E-01,	=3.2904439E-01,	=3.2464705E-01,	DATA 115	
127	128	=3.2015119E-01,	=3.155874E-01,	=3.1087163E-01,	=3.0609165E-01,	DATA 116	
128	129	=3.0122076E-01,	=2.9526085E-01,	=2.9121399E-01,	=2.8608219E-01,	DATA 117	
129		DATA (BCSUN (I), I=37, 72)/				DATA 118	6
130	131	=2.8086757E-01,	=2.7557213E-01,	=2.7019802E-01,	=2.6474728E-01,	DATA 119	
131	132	=2.5922205E-01,	=2.5362443E-01,	=2.4795638E-01,	=2.4221997E-01,	DATA 120	
132	133	=2.3641725E-01,	=2.3059028E-01,	=2.2462114E-01,	=2.1863175E-01,	DATA 121	
133	134	=2.1258424E-01,	=2.0648053E-01,	=2.0032267E-01,	=1.9411256E-01,	DATA 122	
134	135	=1.8785220E-01,	=1.8154354E-01,	=1.7518841E-01,	=1.6878877E-01,	DATA 123	
135	136	=1.6234645E-01,	=1.5586333E-01,	=1.4934125E-01,	=1.4278208E-01,	DATA 124	
136	137	=1.3618769E-01,	=1.2955993E-01,	=1.2290079E-01,	=1.1621222E-01,	DATA 125	
137	138	=1.0949620E-01,	=1.0275463E-01,	=9.5989550E-02,	=8.9202914E-02,	DATA 126	
138	139	=8.2396669E-02,	=7.5572761E-02,	=6.8733074E-02,	=6.1879493E-02,	DATA 127	
139		DATA (BCSUN (I), I=73, 108)/				DATA 128	6
140	141	=5.5013913E-02,	=4.8138255E-02,	=4.1254341E-02,	=3.4364010E-02,	DATA 129	
141	142	=2.7469089E-02,	=2.0371392E-02,	=1.3672695E-02,	=6.7747568E-03,	DATA 130	
142	143	1.2067726E-04,	7.0118638E-03,	1.3897149E-02,	2.0774874E-02,	DATA 131	
143	144	2.7643401E-02,	3.4501686E-02,	4.1346350E-02,	4.8177579E-02,	DATA 132	
144	145	5.4993153E-02,	6.1791467E-02,	6.8570793E-02,	7.5329394E-02,	DATA 133	
145	146	8.2065573E-02,	8.8777647E-02,	9.5463813E-02,	1.0212232E-01,	DATA 134	
146	147	1.0875145E-01,	1.1534948E-01,	1.2191458E-01,	1.2844536E-01,	DATA 135	
147	148	1.3493976E-01,	1.4139616E-01,	1.4781288E-01,	1.5418821E-01,	DATA 136	
148	149	1.6052046E-01,	1.6680799E-01,	1.7304903E-01,	1.7924204E-01,	DATA 137	
149		DATA (BCSUN (I), I=109, 144)/				DATA 138	6
150	151	1.8538534E-01,	1.9147735E-01,	1.9751644E-01,	2.0350106E-01,	DATA 139	
151	152	2.0942976E-01,	2.1530089E-01,	2.2111308E-01,	2.2686484E-01,	DATA 140	
152	153	2.3255467E-01,	2.3818105E-01,	2.4374245E-01,	2.4923732E-01,	DATA 141	
153	154	2.5466409E-01,	2.6002118E-01,	2.6537074E-01,	2.7052006E-01,	DATA 142	
154	155	2.7565870E-01,	2.8072141E-01,	2.8570670E-01,	2.9061301E-01,	DATA 143	
155	156	2.9543883E-01,	3.0018260E-01,	3.0484284E-01,	3.0941805E-01,	DATA 144	
156	157	3.1390679E-01,	3.1830797E-01,	3.2261894E-01,	3.2683954E-01,	DATA 145	
157	158	3.3096792E-01,	3.3500275E-01,	3.3894270E-01,	3.4278649E-01,	DATA 146	
158	159	3.4653292E-01,	3.5018071E-01,	3.5372877E-01,	3.5717598E-01,	DATA 147	
159		DATA (BCSUN (I), I=145, 180)/				DATA 148	6
160	161	3.6052122E-01,	3.6376340E-01,	3.6690144E-01,	3.6993422E-01,	DATA 149	
161	162	3.7286070E-01,	3.7567988E-01,	3.7839065E-01,	3.8099211E-01,	DATA 150	
162	163	3.8348331E-01,	3.8586337E-01,	3.8813148E-01,	3.9028477E-01,	DATA 151	
163	164	3.9232847E-01,	3.9425584E-01,	3.9606816E-01,	3.9776476E-01,	DATA 152	
164	165	3.9934498E-01,	4.0080826E-01,	4.0215399E-01,	4.0338175E-01,	DATA 153	
165	166	4.0449098E-01,	4.0548133E-01,	4.0635242E-01,	4.0710392E-01,	DATA 154	
166	167	4.0773559E-01,	4.0824725E-01,	4.0863882E-01,	4.0891016E-01,	DATA 155	
167	168	4.0906129E-01,	4.0909213E-01,	4.0900279E-01,	4.0879326E-01,	DATA 156	
168	169	4.0846366E-01,	4.0801410E-01,	4.0744450E-01,	4.0675599E-01,	DATA 157	
169		DATA (BCSUN (I), I=181, 216)/				DATA 158	6
170	171	4.0394804E-01,	4.0302731E-01,	4.0237762E-01,	4.0201335E-01,	DATA 159	
171	172	4.0153316E-01,	4.0013620E-01,	3.98862309E-01,	3.9699444E-01,	DATA 160	
172	173	3.9525100E-01,	3.9339341E-01,	3.9142244E-01,	3.8933894E-01,	DATA 161	
173	174	3.8714365E-01,	3.8483749E-01,	3.8242127E-01,	3.7989600E-01,	DATA 162	
174	175	3.7728257E-01,	3.7452208E-01,	3.7167551E-01,	3.6872394E-01,	DATA 163	
175	176	3.656845E-01,	3.6251010E-01,	3.5925000E-01,	3.5588927E-01,	DATA 164	
176	177	3.5242895E-01,	3.4887018E-01,	3.4521420E-01,	3.4146216E-01,	DATA 165	
177	178	3.3761543E-01,	3.3367530E-01,	3.2964300E-01,	3.2552020E-01,	DATA 166	
178	179	3.2130803E-01,	3.1700812E-01,	3.1262176E-01,	3.0815041E-01,	DATA 167	
179		DATA (BCSUN (I), I=217, 252)/				DATA 168	6
180	181	3.0359557E-01,	2.9895867E-01,	2.9424217E-01,	2.8944461E-01,	DATA 169	



181	182	2.8457046E=01,	2.7962017E=01,	2.7459527E=01,	2.6949727E=01,	DATA 170
182	183	2.6432767E=01,	2.5908801E=01,	2.5377981E=01,	2.4840456E=01,	DATA 171
183	184	2.4296376E=01,	2.3745893E=01,	2.3189152E=01,	2.2626293E=01,	DATA 172
184	185	2.2057454E=01,	2.1482771E=01,	2.0902397E=01,	2.0316476E=01,	DATA 173
185	186	1.9725157E=01,	1.9128593E=01,	1.8526940E=01,	1.7920358E=01,	DATA 174
186	187	1.7309006E=01,	1.6693044E=01,	1.6072633E=01,	1.5447933E=01,	DATA 175
187	188	1.4819107E=01,	1.4186313E=01,	1.3549716E=01,	1.2909478E=01,	DATA 176
188	189	1.2265762E=01,	1.1618729E=01,	1.0968540E=01,	1.0315359E=01,	DATA 177
189		DATA (BCSUN (I), I=253, 288) /				DATA 178
190	191	9.6593494E=02,	9.0006777E=02,	8.3395028E=02,	7.6759866E=02,	DATA 179
191	192	7.0102897E=02,	6.3425767E=02,	5.6729943E=02,	5.0016927E=02,	DATA 180
192	193	4.3288196E=02,	3.6545199E=02,	2.9789467E=02,	2.3022513E=02,	DATA 181
193	194	1.6245880E=02,	9.4610988E=03,	2.0698378E=03,	4.1262565E=03,	DATA 182
194	195	-1.0925516E=02,	-1.7726261E=02,	-2.4526794E=02,	-3.1325399E=02,	DATA 183
195	196	-3.8120353E=02,	-4.4909944E=02,	-5.1692390E=02,	-5.8465935E=02,	DATA 184
196	197	-6.5228802E=02,	-7.1979242E=02,	-7.8715439E=02,	-8.5435487E=02,	DATA 185
197	198	-9.2137855E=02,	-9.8820382E=02,	-1.0548136E=01,	-1.1211893E=01,	DATA 186
198	199	-1.1873131E=01,	-1.2531657E=01,	-1.3187302E=01,	-1.3839891E=01,	DATA 187
199		DATA (BCSUN (I), I=289, 324) /				DATA 188
200	201	-1.4489252E=01,	-1.5135211E=01,	-1.5777597E=01,	-1.6416234E=01,	DATA 189
201	202	-1.7050945E=01,	-1.7681557E=01,	-1.8307675E=01,	-1.8929720E=01,	DATA 190
202	203	-1.9546897E=01,	-2.0159220E=01,	-2.0766493E=01,	-2.1368521E=01,	DATA 191
203	204	-2.1965112E=01,	-2.2556072E=01,	-2.3141175E=01,	-2.3720286E=01,	DATA 192
204	205	-2.4293147E=01,	-2.4859582E=01,	-2.5419384E=01,	-2.5972352E=01,	DATA 193
205	206	-2.6518281E=01,	-2.7056965E=01,	-2.7588201E=01,	-2.8111783E=01,	DATA 194
206	207	-2.8627509E=01,	-2.9135172E=01,	-2.9634535E=01,	-3.0125555E=01,	DATA 195
207	208	-3.0607894E=01,	-3.1081415E=01,	-3.1545936E=01,	-3.2001277E=01,	DATA 196
208	209	-3.2447251E=01,	-3.2883684E=01,	-3.3310398E=01,	-3.3727187E=01,	DATA 197
209		DATA (BCSUN (I), I=325, 360) /				DATA 198
210	211	-3.4133898E=01,	-3.4530342E=01,	-3.4916343E=01,	-3.5291724E=01,	DATA 199
211	212	-3.5656316E=01,	-3.6009947E=01,	-3.6352450E=01,	-3.6683662E=01,	DATA 200
212	213	-3.7003426E=01,	-3.7311587E=01,	-3.7607995E=01,	-3.7892501E=01,	DATA 201
213	214	-3.8164957E=01,	-3.8425226E=01,	-3.8673164E=01,	-3.8908640E=01,	DATA 202
214	215	-3.9131523E=01,	-3.9341690E=01,	-3.9539029E=01,	-3.9723438E=01,	DATA 203
215	216	-3.9894815E=01,	-4.0053076E=01,	-4.0198134E=01,	-4.0329918E=01,	DATA 204
216	217	-4.0448353E=01,	-4.0553379E=01,	-4.0644935E=01,	-4.0722969E=01,	DATA 205
217	218	-4.0787432E=01,	-4.0838291E=01,	-4.0875501E=01,	-4.0899047E=01,	DATA 206
218	219	-4.0908902E=01,	-4.0905056E=01,	-4.0897503E=01,	-4.0856252E=01,	DATA 207
219		DATA (BCSUN (I), I=361, 368) /				DATA 208
220	221	-4.0811310E=01,	-4.0752703E=01,	-4.0680458E=01,	-4.0594615E=01,	DATA 209
221	222	-4.0495216E=01,	-4.0382315E=01,	-4.0255958E=01,	-4.0116213E=01,	DATA 210
222		DATA (RSUN (I), I=1, 36) /				DATA 210
223	231	9.8397228E=01,	9.8396422E=01,	9.8396168E=01,	9.8396435E=01,	DATA 211
224	232	9.8397195E=01,	9.8398425E=01,	9.8400089E=01,	9.8402158E=01,	DATA 212
225	233	9.8404606E=01,	9.8407387E=01,	9.8410527E=01,	9.8414032E=01,	DATA 213
226	234	9.8417910E=01,	9.8422169E=01,	9.8426839E=01,	9.8431948E=01,	DATA 214
227	235	9.8437522E=01,	9.8443603E=01,	9.8450199E=01,	9.8457333E=01,	DATA 215
228	236	9.8465022E=01,	9.8473287E=01,	9.8482134E=01,	9.8491576E=01,	DATA 216
229	237	9.8501614E=01,	9.8512256E=01,	9.8523495E=01,	9.8535321E=01,	DATA 217
230	238	9.8547724E=01,	9.8560698E=01,	9.8574208E=01,	9.8588227E=01,	DATA 218
231	239	9.8602720E=01,	9.8617666E=01,	9.8633018E=01,	9.8648738E=01,	DATA 219
232		DATA (RSUN (I), I=37, 72) /				DATA 220
233	241	9.8664792E=01,	9.8681127E=01,	9.8697745E=01,	9.8714635E=01,	DATA 221
234	242	9.8731788E=01,	9.8749187E=01,	9.8766859E=01,	9.8784821E=01,	DATA 222
235	243	9.8803092E=01,	9.8821699E=01,	9.8840656E=01,	9.8859978E=01,	DATA 223
236	244	9.8879688E=01,	9.8899803E=01,	9.8920333E=01,	9.8941292E=01,	DATA 224
237	245	9.8962688E=01,	9.8984531E=01,	9.9006818E=01,	9.9029548E=01,	DATA 225
238	246	9.9052714E=01,	9.9076318E=01,	9.9100325E=01,	9.9124706E=01,	DATA 226
239	247	9.9149435E=01,	9.9174487E=01,	9.9199814E=01,	9.9225371E=01,	DATA 227
240	248	9.9251119E=01,	9.9277008E=01,	9.9303019E=01,	9.9329128E=01,	DATA 228
241	249	9.9355313E=01,	9.9381540E=01,	9.9407827E=01,	9.9434178E=01,	DATA 229
242		DATA (RSUN (I), I=73, 108) /				DATA 230
243	251	9.9460602E=01,	9.9487112E=01,	9.9513720E=01,	9.9540442E=01,	DATA 231
244	252	9.9567293E=01,	9.9594291E=01,	9.9621451E=01,	9.9648787E=01,	DATA 232
245	253	9.9676314E=01,	9.9704041E=01,	9.9731977E=01,	9.9760128E=01,	DATA 233
246	254	9.9788494E=01,	9.9817088E=01,	9.9845878E=01,	9.9874847E=01,	DATA 234
247	255	9.9903966E=01,	9.9933223E=01,	9.9962565E=01,	9.9991997E=01,	DATA 235
248	256	1.0002133E 00,	1.0005067E 00,	1.0007993E 00,	1.0010908E 00,	DATA 236
249	257	1.0013809E 00,	1.0016692E 00,	1.0019558E 00,	1.0022405E 00,	DATA 237
250	258	1.0025235E 00,	1.0028047E 00,	1.0030841E 00,	1.0033619E 00,	DATA 238
251	259	1.0036387E 00,	1.0039133E 00,	1.0041872E 00,	1.0044600E 00,	DATA 239
252		DATA (RSUN (I), I=109, 144) /				DATA 240
253	261	1.0047320E 00,	1.0050033E 00,	1.0052740E 00,	1.0055444E 00,	DATA 241

254	262	1.0058145E 00,	1.0060843E 00,	1.0063542E 00,	1.8066237E 00,	DATA 242
255	263	1.0068926E 00,	1.0071610E 00,	1.0074283E 00,	1.8076943E 00,	DATA 243
256	264	1.0079384E 00,	1.0082202E 00,	1.0084794E 00,	1.8087356E 00,	DATA 244
257	265	1.0089886E 00,	1.0092379E 00,	1.0094834E 00,	1.8097250E 00,	DATA 245
258	266	1.0099627E 00,	1.0101963E 00,	1.0104258E 00,	1.0106514E 00,	DATA 246
259	267	1.0108732E 00,	1.0110912E 00,	1.0113036E 00,	1.0115165E 00,	DATA 247
260	268	1.0117242E 00,	1.0119288E 00,	1.0121303E 00,	1.0123295E 00,	DATA 248
261	269	1.0125262E 00,	1.0127207E 00,	1.0129130E 00,	1.0131031E 00,	DATA 249
262		DATA (RSUN (I), I=143, 180),				DATA 250
263	271	1.0132911E 00,	1.0134772E 00,	1.0136607E 00,	1.8138415E 00,	DATA 251
264	272	1.0140192E 00,	1.0141933E 00,	1.0143636E 00,	1.0145297E 00,	DATA 252
265	273	1.0146913E 00,	1.0148479E 00,	1.0149993E 00,	1.0151458E 00,	DATA 253
266	274	1.0152868E 00,	1.0154223E 00,	1.0155523E 00,	1.8156767E 00,	DATA 254
267	275	1.0157958E 00,	1.0159094E 00,	1.0160179E 00,	1.8161212E 00,	DATA 255
268	276	1.0162196E 00,	1.0163132E 00,	1.0164023E 00,	1.8164873E 00,	DATA 256
269	277	1.0165684E 00,	1.0166457E 00,	1.0167197E 00,	1.8167903E 00,	DATA 257
270	278	1.0168578E 00,	1.0169225E 00,	1.0169841E 00,	1.8170422E 00,	DATA 258
271	279	1.0170967E 00,	1.0171474E 00,	1.0171938E 00,	1.0172358E 00,	DATA 259
272		DATA (RSUN (I), I=181, 216),				DATA 260
273	281	1.0172728E 00,	1.0173046E 00,	1.0173310E 00,	1.0173518E 00,	DATA 261
274	282	1.0173668E 00,	1.0173759E 00,	1.0173790E 00,	1.8173761E 00,	DATA 262
275	283	1.0173673E 00,	1.0173524E 00,	1.0173317E 00,	1.8173053E 00,	DATA 263
276	284	1.0172733E 00,	1.0172358E 00,	1.0171933E 00,	1.8171459E 00,	DATA 264
277	285	1.0170940E 00,	1.0170378E 00,	1.0169777E 00,	1.0169140E 00,	DATA 265
278	286	1.0168470E 00,	1.0167771E 00,	1.0167042E 00,	1.8166281E 00,	DATA 266
279	287	1.0165487E 00,	1.0164661E 00,	1.0163798E 00,	1.8162897E 00,	DATA 267
280	288	1.0161954E 00,	1.0160964E 00,	1.0159929E 00,	1.8158843E 00,	DATA 268
281	289	1.0157707E 00,	1.0156519E 00,	1.0155277E 00,	1.8153980E 00,	DATA 269
282		DATA (RSUN (I), I=217, 252),				DATA 270
283	291	1.0152630E 00,	1.0151224E 00,	1.0149765E 00,	1.8148253E 00,	DATA 271
284	292	1.0146689E 00,	1.0145074E 00,	1.0143412E 00,	1.8141705E 00,	DATA 272
285	293	1.0139957E 00,	1.0138170E 00,	1.0136348E 00,	1.8134496E 00,	DATA 273
286	294	1.0132618E 00,	1.0130717E 00,	1.0128794E 00,	1.8126851E 00,	DATA 274
287	295	1.0124886E 00,	1.0122904E 00,	1.0120899E 00,	1.8118871E 00,	DATA 275
288	296	1.0116818E 00,	1.0114733E 00,	1.0112622E 00,	1.8110476E 00,	DATA 276
289	297	1.0108297E 00,	1.0106082E 00,	1.0103830E 00,	1.8101539E 00,	DATA 277
290	298	1.0099210E 00,	1.0096841E 00,	1.0094433E 00,	1.8091986E 00,	DATA 278
291	299	1.0089502E 00,	1.0086979E 00,	1.0084423E 00,	1.8081834E 00,	DATA 279
292		DATA (RSUN (I), I=253, 288),				DATA 280
293	301	1.0079218E 00,	1.0076574E 00,	1.0073909E 00,	1.8071227E 00,	DATA 281
294	302	1.0068531E 00,	1.0065828E 00,	1.0063113E 00,	1.8060404E 00,	DATA 282
295	303	1.0057687E 00,	1.0054973E 00,	1.0052257E 00,	1.8049539E 00,	DATA 283
296	304	1.0046818E 00,	1.0044093E 00,	1.0041361E 00,	1.8038622E 00,	DATA 284
297	305	1.0035873E 00,	1.0033112E 00,	1.0030339E 00,	1.8027552E 00,	DATA 285
298	306	1.0024749E 00,	1.0021929E 00,	1.0019094E 00,	1.8016241E 00,	DATA 286
299	307	1.0013371E 00,	1.0010484E 00,	1.0007582E 00,	1.8004667E 00,	DATA 287
300	308	1.0001743E 00,	9.9988106E-01,	9.9958749E-01,	9.9929404E-01,	DATA 288
301	309	9.9900112E-01,	9.9870922E-01,	9.9841861E-01,	9.9812961E-01,	DATA 289
302		DATA (RSUN (I), I=289, 324),				DATA 290
303	311	9.9784253E-01,	9.9755777E-01,	9.9727525E-01,	9.9699497E-01,	DATA 291
304	312	9.9671695E-01,	9.9644113E-01,	9.9616744E-01,	9.9589570E-01,	DATA 292
305	313	9.9562576E-01,	9.9535748E-01,	9.9509069E-01,	9.9482525E-01,	DATA 293
306	314	9.9456099E-01,	9.9429781E-01,	9.9403556E-01,	9.9377412E-01,	DATA 294
307	315	9.9351341E-01,	9.9325327E-01,	9.9299388E-01,	9.9273541E-01,	DATA 295
308	316	9.9247799E-01,	9.9222166E-01,	9.9196696E-01,	9.9171425E-01,	DATA 296
309	317	9.9146394E-01,	9.9121647E-01,	9.9097219E-01,	9.9073144E-01,	DATA 297
310	318	9.9049454E-01,	9.9026196E-01,	9.9003370E-01,	9.8980987E-01,	DATA 298
311	319	9.8959057E-01,	9.8937587E-01,	9.8916568E-01,	9.8895993E-01,	DATA 299
312		DATA (RSUN (I), I=325, 360),				DATA 300
313	321	9.8875850E-01,	9.8856127E-01,	9.8836806E-01,	9.8817875E-01,	DATA 301
314	322	9.8799314E-01,	9.8781113E-01,	9.8763243E-01,	9.8745687E-01,	DATA 302
315	323	9.8728425E-01,	9.8711436E-01,	9.8694722E-01,	9.8678283E-01,	DATA 303
316	324	9.8662119E-01,	9.8646216E-01,	9.8630623E-01,	9.8615371E-01,	DATA 304
317	325	9.8600493E-01,	9.8586026E-01,	9.8572004E-01,	9.8558462E-01,	DATA 305
318	326	9.8544333E-01,	9.8532962E-01,	9.8521055E-01,	9.8509732E-01,	DATA 306
319	327	9.8499003E-01,	9.8488884E-01,	9.8479371E-01,	9.8470457E-01,	DATA 307
320	328	9.8462139E-01,	9.8454409E-01,	9.8447210E-01,	9.8440647E-01,	DATA 308
321	329	9.8434582E-01,	9.8429039E-01,	9.8423991E-01,	9.8419408E-01,	DATA 309
322		DATA (RSUN (I), I=361, 368),				DATA 310
323	331	9.8415266E-01,	9.8411539E-01,	9.8408207E-01,	9.8405252E-01,	DATA 311
324	332	9.8402662E-01,	9.8400398E-01,	9.8398503E-01,	9.8396991E-01,	DATA 312
325		DATA (RAMOON(I), I=1, 36),				DATA 312
326	341	2.7970054E 00,	3.0065657E 00,	3.2203079E 00,	3.4413728E 00,	DATA 313



827	342	3.6728890E 00	3.9173602E 00	4.1727237E 00	4.2464878E 00	DATA 314
828	343	4.7249419E 00	5.0042507E 00	5.2773784E 00	5.5392865E 00	DATA 315
829	344	5.7879149E 00	6.0238238E 00	6.2492165E 00	6.5380985E 01	DATA 316
830	345	3.9695330E -01	6.0010705E -01	6.1238807E -01	6.3830779E 00	DATA 317
831	346	1.2468361E 00	1.4634126E 00	1.6809478E 00	1.8982389E 00	DATA 318
832	347	2.1141299E 00	2.3278736E 00	2.5933972E 00	2.8494030E 00	DATA 319
833	348	2.9593512E 00	3.1713207E 00	3.5078441E 00	3.8118327E 00	DATA 320
834	349	3.8451785E 00	4.0901636E 00	4.5046714E 00	4.8127600E 00	DATA 321
835		DATA (RAMOQN1) 1# 37; 72; /				DATA 322
836	351	4.8839913E 00	5.1947883E 00	5.4196423E 00	5.6758810E 00	DATA 323
837	352	5.9206859E 00	6.1557481E 00	6.9356494E -02	3.2018216E -01	DATA 324
838	353	5.7222160E -03	7.5252676E -01	9.6753422E -01	1.2831189E 00	DATA 325
839	354	1.3995494E 00	1.6163691E 00	1.8338752E 00	2.0498719E 00	DATA 326
840	355	2.2649443E 00	2.4736867E 00	2.6913383E 00	2.9048162E 00	DATA 327
841	356	3.1191518E 00	3.3373515E 00	3.5611747E 00	3.7925134E 00	DATA 328
842	357	4.0326588E 00	4.2817954E 00	4.5388853E 00	4.8001168E 00	DATA 329
843	358	5.0524332E 00	5.3215379E 00	5.5744063E 00	5.8195349E 00	DATA 330
844	359	6.0868983E 00	6.3424618E -03	2.2980669E -01	4.9177113E -01	DATA 331
845		DATA (RAMOQN1) 1# 73; 110; /				DATA 332
846	361	6.7168888E -01	8.9061733E -01	1.1091429E 00	1.3274022E 00	DATA 333
847	362	1.5651889E 00	1.7621278E 00	1.9778808E 00	2.1923402E 00	DATA 334
848	363	2.4057727E 00	2.6188942E 00	2.8328710E 00	3.0492544E 00	DATA 335
849	364	3.2698447E 00	3.4964708E 00	3.7306667E 00	3.9732453E 00	DATA 336
850	365	4.2238478E 00	4.4806591E 00	4.7405393E 00	4.9998830E 00	DATA 337
851	366	5.2545936E 00	5.5029118E 00	5.7437568E 00	5.9773660E 00	DATA 338
852	367	6.2056558E 00	1.4654726E -01	3.6829233E -01	5.8905900E -01	DATA 339
853	368	8.0968262E -01	1.0304083E 00	1.2509494E 00	1.4706440E 00	DATA 340
854	369	1.6887558E 00	1.9047154E 00	2.183705E 00	2.3301160E 00	DATA 341
855		DATA (RAMOQN1) 1# 109; 144; /				DATA 342
856	371	2.5409284E 00	2.7523217E 00	2.9662473E 00	3.1847398E 00	DATA 343
857	372	3.4106841E 00	3.6454549E 00	3.8903978E 00	4.1452163E 00	DATA 344
858	373	4.4077133E 00	4.6739819E 00	4.9387830E 00	5.1979166E 00	DATA 345
859	374	5.4483739E 00	5.6892442E 00	5.9213185E 00	6.1464626E 00	DATA 346
860	375	6.3807731E -02	3.0199999E -01	3.1973639E -01	7.3826829E -01	DATA 347
861	376	9.5805252E -01	1.1787943E 00	1.3955544E 00	1.6190865E 00	DATA 348
862	377	1.8362283E 00	2.0502665E 00	2.2611779E 00	2.4697140E 00	DATA 349
863	378	2.6773618E 00	2.8862322E 00	3.0989094E 00	3.3182483E 00	DATA 350
864	379	3.5470646E 00	3.7876285E 00	4.0409172E 00	4.3057662E 00	DATA 351
865		DATA (RAMOQN1) 1# 145; 180; /				DATA 352
866	381	4.5783913E 00	4.8529044E 00	5.1229479E 00	5.3836206E 00	DATA 353
867	382	5.6325809E 00	5.8699746E 00	6.0976617E 00	6.5155655E -02	DATA 354
868	383	2.5168565E -01	4.6662952E -01	6.8195082E -01	8.9880854E -01	DATA 355
869	384	1.1174525E 00	1.3372633E 00	1.5569799E 00	1.7750915E 00	DATA 356
870	385	1.9902985E 00	2.2019010E 00	2.4100203E 00	2.6156449E 00	DATA 357
871	386	2.8205537E 00	3.0271804E 00	3.2384491E 00	3.4575862E 00	DATA 358
872	387	3.6876186E 00	3.9310746E 00	4.1887870E 00	4.4590833E 00	DATA 359
873	388	4.7371587E 00	5.0162154E 00	5.2892544E 00	5.5513659E 00	DATA 360
874	389	5.8506341E 00	6.0377449E 00	6.2649884E 00	2.8212656E -01	DATA 361
875		DATA (RAMOQN1) 1# 181; 216; /				DATA 362
876	391	4.1846963E -03	6.3334865E -01	8.4859412E -01	1.0651870E 00	DATA 363
877	392	1.2832023E 00	1.5019026E 00	1.7200073E 00	1.9361005E 00	DATA 364
878	393	2.1490654E 00	2.3584241E 00	2.5645097E 00	2.7684807E 00	DATA 365
879	394	2.9722344E 00	3.1782726E 00	3.3895370E 00	3.6091788E 00	DATA 366
880	395	3.8401798E 00	4.0847234E 00	4.3433011E 00	4.6138238E 00	DATA 367
881	396	4.8913808E 00	5.1692654E 00	5.4410277E 00	5.8025497E 00	DATA 368
882	397	5.951747E 00	6.1899199E 00	1.7394082E -01	3.5881072E -01	DATA 369
883	398	5.7791526E -01	7.9536866E -01	1.0126138E 00	1.2303197E 00	DATA 370
884	399	1.4463950E 00	1.6661378E 00	1.8825163E 00	2.0965220E 00	DATA 371
885		DATA (RAMOQN1) 1# 217; 252; /				DATA 372
886	401	2.3075052E 00	2.5154088E 00	2.7208889E 00	2.9252012E 00	DATA 373
887	402	3.1303161E 00	3.3385897E 00	3.5526906E 00	3.7753224E 00	DATA 374
888	403	4.0688162E 00	4.2545303E 00	4.5121328E 00	4.7780814E 00	DATA 375
889	404	5.0509108E 00	5.3217334E 00	5.5870355E 00	5.8438862E 00	DATA 376
890	405	6.0908161E 00	4.6039676E -02	2.9745555E -01	5.8388029E -01	DATA 377
891	406	7.2713380E -01	9.4858350E -01	1.2690174E 00	1.3886379E 00	DATA 378
892	407	1.6071663E 00	1.8240411E 00	2.0386593E 00	2.2506736E 00	DATA 379
893	408	2.4600822E 00	2.6674298E 00	2.8737737E 00	3.0806434E 00	DATA 380
894	409	3.2899434E 00	3.5039808E 00	3.7243915E 00	3.9535604E 00	DATA 381
895		DATA (RAMOQN1) 1# 253; 288; /				DATA 382
896	411	4.1924725E 00	4.4410977E 00	4.6978631E 00	4.9596947E 00	DATA 383
897	412	5.2226363E 00	5.4828719E 00	5.7376647E 00	5.9857832E 00	DATA 384
898	413	6.2273579E 00	1.8021711E -01	4.1208940E -01	6.4105378E -01	DATA 385
899	414	8.6799932E -01	1.0933174E 00	1.8169255E 00	1.9384103E 00	DATA 386

600	415	1.7872460E 00,	1.9730323E 00,	2.1856790E 00,	3.3955310E 00,	DATA 387
601	416	2.6034015E 00,	2.8103448E 00,	3.0185846E 00,	3.2294065E 00,	DATA 388
602	417	3.4450079E 00,	3.6672821E 00,	3.8977124E 00,	4.1369958E 00,	DATA 389
603	418	4.3046082E 00,	4.6387084E 00,	4.8962461E 00,	5.1536858E 00,	DATA 390
604	419	5.4078978E 00,	5.6568763E 00,	5.8999814E 00,	6.1377718E 00,	DATA 391
605		DATA (RAMOON(1)), I#289, 324, /				DATA 392
606	421	8.8297947E -02,	3.1941133E -01,	5.4919.21E -01,	7.7838247E -01,	DATA 393
607	422	1.0070616E 00,	1.2346670E 00,	1.4602087E 00,	1.6826006E 00,	DATA 394
608	423	1.9010115E 00,	2.1151318E 00,	2.3253019E 00,	2.5325111E 00,	DATA 395
609	424	2.7383124E 00,	2.9446990E 00,	3.1539624E 00,	3.8685187E 00,	DATA 396
610	425	3.5906659E 00,	3.8222227E 00,	4.0640374E 00,	4.3154459E 00,	DATA 397
611	426	4.5740787E 00,	4.8359351E 00,	5.0965257E 00,	5.3520147E 00,	DATA 398
612	427	5.6001548E 00,	5.8405170E 00,	6.0741387E 00,	1.9738795E -02,	DATA 399
613	428	2.4806350E -01,	4.7126382E -01,	6.9736081E -01,	9.2460835E -01,	DATA 400
614	429	1.1926668E 00,	1.3801370E 00,	1.6055395E 00,	1.8272073E 00,	DATA 401
615		DATA (RAMOON(1)), I#325, 360, /				DATA 402
616	431	2.0440483E 00,	2.2557781E 00,	2.4630020E 00,	2.6671368E 00,	DATA 403
617	432	2.8702561E 00,	3.0749241E 00,	3.2840196E 00,	3.5005229E 00,	DATA 404
618	433	3.7271853E 00,	3.9660005E 00,	4.2174709E 00,	4.4798829E 00,	DATA 405
619	434	4.7490876E 00,	5.0192909E 00,	5.2847353E 00,	5.5413716E 00,	DATA 406
620	435	5.7876225E 00,	6.0241243E 00,	6.2529467E 00,	1.9359660E -01,	DATA 407
621	436	4.1812581E -01,	6.3658460E -01,	8.5933638E -01,	1.8838636E 00,	DATA 408
622	437	1.3095361E 00,	1.5348867E 00,	1.7580378E 00,	1.9772419E 00,	DATA 409
623	438	2.1913724E 00,	2.4002083E 00,	2.6044897E 00,	2.8058143E 00,	DATA 410
624	439	3.0664702E 00,	3.2092666E 00,	3.4173627E 00,	3.6340462E 00,	DATA 411
625		DATA (RAMOON(1)), I#361, 368, /				DATA 412
626	441	3.8623649E 00,	4.1045041E 00,	4.3609005E 00,	4.6293716E 00,	DATA 413
627	442	4.9649163E 00,	5.1807958E 00,	5.4506232E 00,	5.7162290E 00,	DATA 414
628		DATA (RAMOON(1)), I# 1, 36, /				DATA 414
629	451	9.7026602E -02,	2.8543608E -02,	4.2814964E -02,	1.1408890E -01,	DATA 415
630	452	-1.8166099E -01,	-2.4119184E -01,	-2.8769543E -01,	-3.2618492E -01,	DATA 416
631	453	-3.2281137E -01,	-3.0614660E -01,	-2.8784370E -01,	-2.1217908E -01,	DATA 417
632	454	-1.4478298E -01,	-7.1324022E -02,	3.8041765E -03,	7.5234709E -02,	DATA 418
633	455	1.4151885E -01,	1.9988262E -01,	2.4849628E -01,	2.8582840E -01,	DATA 419
634	456	3.1060596E -01,	3.2186908E -01,	3.1908353E -01,	3.8225717E -01,	DATA 420
635	457	2.7200812E -01,	2.2955449E -01,	1.7663399E -01,	1.4538990E -01,	DATA 421
636	458	4.8270277E -02,	-2.2023388E -02,	9.9252216E -02,	-1.5992193E -01,	DATA 422
637	459	-2.2051067E -01,	-2.7018697E -01,	-3.0470814E -01,	-3.2028428E -01,	DATA 423
638		DATA (RAMOON(1)), I# 37, 72, /				DATA 424
639	461	-3.1446918E -01,	-2.8701118E -01,	-2.4017651E -01,	-1.7830115E -01,	DATA 425
640	462	-1.0880716E -01,	3.1174711E -02,	4.8764427E -02,	1.1412261E -01,	DATA 426
641	463	1.7494316E -01,	2.3003354E -01,	2.9177193E -01,	3.8096050E -01,	DATA 427
642	464	3.1675462E -01,	3.1866277E -01,	3.0659350E -01,	2.8091758E -01,	DATA 428
643	465	2.4251622E -01,	1.9279933E -01,	1.8369178E -01,	6.7599810E -02,	DATA 429
644	466	-2.6887377E -03,	7.3866340E -02,	1.4249898E -01,	-2.8477504E -01,	DATA 430
645	467	-2.5678233E -01,	-2.9471476E -01,	-3.1227281E -01,	-3.1620489E -01,	DATA 431
646	468	-2.9684225E -01,	-2.5839554E -01,	-2.0383654E -01,	-1.8743780E -01,	DATA 432
647	469	6.4092183E -02,	1.1306454E -02,	1.4328573E -02,	1.5126686E -01,	DATA 433
648		DATA (RAMOON(1)), I# 73, 108, /				DATA 434
649	471	2.0921546E -01,	2.5603004E -01,	2.9023199E -01,	3.1090478E -01,	DATA 435
650	472	3.1760842E -01,	3.1032005E -01,	2.8939983E -01,	2.5558038E -01,	DATA 436
651	473	2.0998013E -01,	1.5414112E -01,	9.8086393E -02,	2.8381234E -02,	DATA 437
652	474	-5.1828280E -02,	-1.2283542E -01,	-1.8849063E -01,	-2.4449182E -01,	DATA 438
653	475	-2.8658382E -01,	-3.1147760E -01,	-3.1698439E -01,	-3.8259329E -01,	DATA 439
654	476	-2.6950170E -01,	-2.2036120E -01,	-1.9882828E -01,	-8.9092193E -02,	DATA 440
655	477	-1.5484304E -02,	5.7810888E -02,	1.2696585E -01,	1.8866810E -01,	DATA 441
656	478	2.4020533E -01,	2.7957648E -01,	3.8545783E -01,	3.1719460E -01,	DATA 442
657	479	3.1471913E -01,	2.9844530E -01,	2.6915992E -01,	2.2794186E -01,	DATA 443
658		DATA (RAMOON(1)), I#109, 144, /				DATA 444
659	481	1.7613663E -01,	1.1539973E -01,	4.7806412E -02,	-2.3997525E -02,	DATA 445
660	482	-9.6455400E -02,	-1.6605311E -01,	-2.2747204E -01,	-2.7603246E -01,	DATA 446
661	483	-3.0742636E -01,	-3.1876331E -01,	-3.0918866E -01,	-2.7997065E -01,	DATA 447
662	484	-2.3404159E -01,	-1.7528028E -01,	-1.0787331E -01,	-3.9920438E -02,	DATA 448
663	485	3.6737205E -02,	1.0656702E -01,	1.7036823E -01,	2.2532320E -01,	DATA 449
664	486	2.6808949E -01,	2.9991259E -01,	3.1671761E -01,	3.4913751E -01,	DATA 450
665	487	3.0745376E -01,	2.8247591E -01,	2.4336368E -01,	1.9751704E -01,	DATA 451
666	488	1.4050979E -03,	7.6130797E -02,	6.9176308E -03,	6.9639447E -02,	DATA 452
667	489	-1.3688206E -01,	-2.8286793E -01,	-2.9852312E -01,	-2.9863149E -01,	DATA 453
668		DATA (RAMOON(1)), I#145, 180, /				DATA 454
669	491	-3.1887006E -01,	-3.1695587E -01,	-2.9330005E -01,	-2.5076521E -01,	DATA 455
670	492	-1.9372233E -01,	-1.2699632E -01,	-5.9149327E -02,	-1.7810669E -02,	DATA 456
671	493	8.8435971E -02,	1.5373397E -01,	2.1107271E -01,	2.5813867E -01,	DATA 457
672	494	2.9309954E -01,	3.1452340E -01,	3.2169860E -01,	3.1459093E -01,	DATA 458



473	495	2.9382046E=01	2.6052708E=01	2.1619656E=01	1.6251323E=01	DATA 459
474	496	1.0128928E=01	3.4494885E=02	3.5609259E=01	1.8626072E=01	DATA 460
475	497	1.7396207E=01	2.3434347E=01	2.8231703E=01	3.1223805E=01	DATA 461
476	498	3.2159476E=01	3.0729960E=01	2.8131872E=01	2.1769319E=01	DATA 462
477	499	1.5179929E=01	7.9109685E=02	4.4460779E=03	6.8248772E=02	DATA 463
478		DATA (MCOON(I))	1.181.216/			DATA 464
479	501	1.3580630E=01	1.9366925E=01	2.4569923E=01	2.8412068E=01	DATA 465
480	502	3.0954556E=01	3.2106979E=01	3.1837825E=01	3.8179754E=01	DATA 466
481	503	2.7225889E=01	2.3117892E=01	1.8030388E=01	1.2187971E=01	DATA 467
482	504	5.7064522E=02	1.1011114E=02	8.0178712E=02	8.4751543E=01	DATA 468
483	505	2.0950132E=01	2.6189837E=01	2.9997320E=01	3.1917887E=01	DATA 469
484	506	3.1628681E=01	2.9057715E=01	2.1443059E=01	1.8218191E=01	DATA 470
485	507	1.0995989E=01	3.3509700E=02	4.8232532E=02	1.1334859E=01	DATA 471
486	508	1.7484563E=01	2.3049314E=01	2.9258112E=01	3.8183834E=01	DATA 472
487	509	3.1741134E=01	3.1891007E=01	3.8646697E=01	2.8076260E=01	DATA 473
488		DATA (MCOON(I))	1.217.252/			DATA 474
489	511	2.4299352E=01	1.9478740E=01	1.3809557E=01	7.3099055E=02	DATA 475
490	512	8.1530959E=03	6.0180007E=02	1.2711343E=01	1.8949863E=01	DATA 476
491	513	2.4173689E=01	2.8587120E=01	3.1185400E=01	3.1822778E=01	DATA 477
492	514	3.0304269E=01	2.6665647E=01	2.1194427E=01	1.4374670E=01	DATA 478
493	515	6.7842641E=02	1.8070806E=02	8.5059454E=02	1.5322783E=01	DATA 479
494	516	2.1169927E=01	2.5845602E=01	2.9216097E=01	3.1202826E=01	DATA 480
495	517	3.1773568E=01	3.0942670E=01	2.8767099E=01	2.5346759E=01	DATA 481
496	518	2.0821797E=01	1.5369207E=01	7.1992377E=02	2.5523633E=02	DATA 482
497	519	4.3026286E=02	1.1069387E=01	4.9426396E=01	2.3019481E=01	DATA 483
498		DATA (MCOON(I))	1.253.288/			DATA 484
499	521	2.7491291E=01	3.0484520E=01	3.1693827E=01	3.8921073E=01	DATA 485
500	522	2.8131327E=01	2.3483232E=01	1.7317330E=01	1.8105566E=01	DATA 486
501	523	2.3808904E=02	5.3313240E=02	1.2565117E=01	1.8943475E=01	DATA 487
502	524	2.4187671E=01	2.8112754E=01	3.0619871E=01	3.1662439E=01	DATA 488
503	525	3.1272791E=01	2.9510638E=01	2.6474178E=01	2.2290694E=01	DATA 489
504	526	1.7115063E=01	1.1131959E=01	4.5806497E=02	2.3395644E=02	DATA 490
505	527	9.2459008E=02	1.5873598E=01	2.1785620E=01	2.6613787E=01	DATA 491
506	528	2.9993153E=01	3.1627864E=01	3.1339429E=01	2.9101966E=01	DATA 492
507	529	2.5051833E=01	1.9468645E=01	1.2737976E=01	5.3089065E=02	DATA 493
508		DATA (MCOON(I))	1.289.324/			DATA 494
509	531	2.3483267E=02	9.7739230E=02	1.6553165E=01	2.2339293E=01	DATA 495
510	532	2.6871232E=01	2.9981608E=01	3.1594581E=01	3.1714354E=01	DATA 496
511	533	3.0407270E=01	2.7782194E=01	2.3975983E=01	1.9133827E=01	DATA 497
512	534	1.3427949E=01	7.0441874E=02	2.0440903E=03	6.8208682E=02	DATA 498
513	535	1.3701063E=01	2.8044820E=01	2.9418644E=01	2.9391113E=01	DATA 499
514	536	3.1599786E=01	3.1822827E=01	3.0026076E=01	2.6363681E=01	DATA 500
515	537	2.1135818E=01	1.4728946E=01	7.9644602E=02	6.8506120E=04	DATA 501
516	538	7.3547381E=02	1.4313460E=01	2.0459882E=01	2.5496305E=01	DATA 502
517	539	2.9195773E=01	3.1417889E=01	3.2114543E=01	3.1323697E=01	DATA 503
518		DATA (MCOON(I))	1.325.360/			DATA 504
519	541	2.9149242E=01	2.5737093E=01	2.1253329E=01	1.5871084E=01	DATA 505
520	542	9.7684067E=02	3.1366293E=02	3.8028877E=02	1.8777423E=01	DATA 506
521	543	1.7443552E=01	2.3380964E=01	2.8114913E=01	3.180177E=01	DATA 507
522	544	3.2220864E=01	3.1089116E=01	2.7888879E=01	2.2938936E=01	DATA 508
523	545	1.6682571E=01	9.5963879E=02	2.1322523E=02	5.3046796E=02	DATA 509
524	546	1.2355897E=01	1.8703146E=01	2.4066379E=01	2.8210714E=01	DATA 510
525	547	3.0961112E=01	3.2218648E=01	3.1969828E=01	3.8282657E=01	DATA 511
526	548	2.7289519E=01	2.3162983E=01	1.8093217E=01	1.2273856E=01	DATA 512
527	549	5.8976965E=02	8.3369481E=03	9.6952303E=02	1.4414669E=01	DATA 513
528		DATA (MCOON(I))	1.361.368/			DATA 514
529	551	2.0650593E=01	2.5982629E=01	2.9932990E=01	3.2037714E=01	DATA 515
530	552	3.1963737E=01	2.9625164E=01	2.5228047E=01	1.9211900E=01	DATA 516
531		DATA (MCOON(I))	1.361.368/			DATA 516
532	561	6.1808866E 01	6.1101402E 01	6.0296631E 01	5.9423984E 01	DATA 517
533	562	5.8825339E 01	5.7679222E 01	5.8934244E 01	5.8382106E 01	DATA 518
534	563	5.6084142E 01	5.5082237E 01	5.8384968E 01	5.6964789E 01	DATA 519
535	564	5.7763357E 01	5.8702874E 01	5.9694461E 01	6.8674790E 01	DATA 520
536	565	6.1564023E 01	6.2319873E 01	6.2913439E 01	6.8332761E 01	DATA 521
537	566	6.3879979E 01	6.3667728E 01	6.3615273E 01	6.2444601E 01	DATA 522
538	567	6.3176974E 01	6.2830192E 01	6.2416922E 01	6.1944465E 01	DATA 523
539	568	6.1416084E 01	6.0833718E 01	6.8201674E 01	5.9530783E 01	DATA 524
540	569	5.8842214E 01	5.8169846E 01	5.9560039E 01	5.8067985E 01	DATA 525
541		DATA (MCOON(I))	1.37.721/			DATA 526
542	571	5.6750383E 01	5.6659295E 01	5.6811531E 01	5.7220797E 01	DATA 527
543	572	5.7859330E 01	5.8661828E 01	5.9570153E 01	6.8503983E 01	DATA 528
544	573	6.1390624 01	6.2168383E 01	6.2780987E 01	6.3229471E 01	DATA 529
545	574	6.3472001E 01	6.3522323E 01	6.8397241E 01	6.8125424E 01	DATA 530

946	575	6.2733727E 01	6.2263223E 01	6.2745316E 01	6.2208399E 01	DATA	531
947	576	6.0673705E 01	6.0154732E 01	5.9658475E 01	5.9188281E 01	DATA	532
948	577	5.8747762E 01	5.8344873E 01	5.7994923E 01	5.7721531E 01	DATA	533
949	578	5.7854714E 01	5.7526134E 01	5.7662214E 01	5.7278830E 01	DATA	534
950	579	5.8463715E 01	5.9104300E 01	5.9849605E 01	6.0645210E 01	DATA	535
951	DATA (RMOON I) I#73,108/						DATA 536
952	581	6.1429894E 01	6.2142914E 01	6.2728194E 01	6.8147331E 01	DATA	537
953	582	6.3372683E 01	6.3393625E 01	6.3215538E 01	6.2858711E 01	DATA	538
954	583	6.2386227E 01	6.1750830E 01	6.2090816E 01	6.0425149E 01	DATA	539
955	584	5.9798297E 01	5.9245629E 01	5.8790307E 01	5.8442486E 01	DATA	540
956	585	5.8201079E 01	5.8057681E 01	5.8001581E 01	5.8024427E 01	DATA	541
957	586	5.8123228E 01	5.8300885E 01	5.8564150E 01	5.8919820E 01	DATA	542
958	587	5.9368944E 01	5.9704619E 01	6.0007544E 01	6.1140942E 01	DATA	543
959	588	6.1782610E 01	6.2368864E 01	6.2859316E 01	6.3211688E 01	DATA	544
960	589	6.3392041E 01	6.3378171E 01	6.3162038E 01	6.2751194E 01	DATA	545
961	DATA (RMOON I) I#109,144/						DATA 546
962	591	6.2169180E 01	6.1454685E 01	6.0639244E 01	5.9843220E 01	DATA	547
963	592	5.9070027E 01	5.8398987E 01	5.7877869E 01	5.7536746E 01	DATA	548
964	593	5.7384923E 01	5.7411933E 01	5.7592371E 01	5.7893024E 01	DATA	549
965	594	5.8280163E 01	5.8723121E 01	5.9207089E 01	5.9713111E 01	DATA	550
966	595	6.0235767E 01	6.0769596E 01	6.1307320E 01	6.1836834E 01	DATA	551
967	596	6.2339558E 01	6.2790484E 01	6.3159611E 01	6.3415034E 01	DATA	552
968	597	6.3826185E 01	6.3467767E 01	6.3223338E 01	6.2788610E 01	DATA	553
969	598	6.2173813E 01	6.1405581E 01	6.0327264E 01	5.9597486E 01	DATA	554
970	599	5.8686276E 01	5.7858423E 01	5.7214292E 01	5.6779447E 01	DATA	555
971	DATA (RMOON I) I#145,180/						DATA 556
972	601	5.6895620E 01	5.6665945E 01	5.6766171E 01	5.7451472E 01	DATA	557
973	602	5.9066417E 01	5.8755023E 01	5.9468433E 01	6.0169167E 01	DATA	558
974	603	6.0831964E 01	6.1442056E 01	6.1991890E 01	6.2477853E 01	DATA	559
975	604	6.2894213E 01	6.3235382E 01	6.3489453E 01	6.3640733E 01	DATA	560
976	605	6.3670595E 01	6.3559880E 01	6.3292083E 01	6.2856993E 01	DATA	561
977	606	6.2254381E 01	6.1497335E 01	6.0614893E 01	5.9653365E 01	DATA	562
978	607	5.8675492E 01	5.7756553E 01	5.6976853E 01	5.6410805E 01	DATA	563
979	608	5.6114398E 01	5.6114511E 01	5.6403792E 01	5.6943111E 01	DATA	564
980	609	5.7670615E 01	5.8514040E 01	5.9402487E 01	6.0275026E 01	DATA	565
981	DATA (RMOON I) I#181,216/						DATA 566
982	611	6.1089312E 01	6.1802574E 01	6.2409932E 01	6.2901355E 01	DATA	567
983	612	6.3277668E 01	6.3542910E 01	6.3700834E 01	6.3752559E 01	DATA	568
984	613	6.3695502E 01	6.3523553E 01	6.3228419E 01	6.2802143E 01	DATA	569
985	614	6.2240582E 01	6.1547287E 01	6.0737263E 01	5.9840132E 01	DATA	570
986	615	5.8901946E 01	5.7984584E 01	5.7161683E 01	5.6510820E 01	DATA	571
987	616	5.6100358E 01	5.5979477E 01	5.6164760E 01	5.6637572E 01	DATA	572
988	617	5.7347595E 01	5.8223120E 01	5.9184025E 01	6.0135581E 01	DATA	573
989	618	6.1066791E 01	6.1874813E 01	6.2546021E 01	6.3064604E 01	DATA	574
990	619	6.3427789E 01	6.3642507E 01	6.3720388E 01	6.3677084E 01	DATA	575
991	DATA (RMOON I) I#217,252/						DATA 576
992	621	6.3525226E 01	6.3275335E 01	6.2933643E 01	6.2502605E 01	DATA	577
993	622	6.1982653E 01	6.1375195E 01	6.0886319E 01	5.9930655E 01	DATA	578
994	623	5.9134757E 01	5.8339093E 01	5.7597507E 01	5.6973199E 01	DATA	579
995	624	5.6830885E 01	5.6325985E 01	5.6039320E 01	5.6737967E 01	DATA	580
996	625	5.7333796E 01	5.8126612E 01	5.9044352E 01	6.0088852E 01	DATA	581
997	626	6.0944765E 01	6.1790040E 01	6.2497180E 01	6.3038211E 01	DATA	582
998	627	6.3393739E 01	6.3570894E 01	6.3580434E 01	6.3443301E 01	DATA	583
999	628	6.3184915E 01	6.2831533E 01	6.2407191E 01	6.1931237E 01	DATA	584
000	629	6.1417530E 01	6.0874000E 01	6.0309167E 01	5.9726450E 01	DATA	585
001	DATA (RMOON I) I#253,281/						DATA 586
002	631	5.9136883E 01	5.8558200E 01	5.8018152E 01	5.7534114E 01	DATA	587
003	632	5.7210250E 01	5.7031062E 01	5.7052916E 01	5.7229377E 01	DATA	588
004	633	5.7754969E 01	5.8403458E 01	5.9191179E 01	6.0054445E 01	DATA	589
005	634	6.0923375E 01	6.1732225E 01	6.2423885E 01	6.2955173E 01	DATA	590
006	635	6.3298841E 01	6.3444051E 01	6.3395514E 01	6.3171602E 01	DATA	591
007	636	6.2801584E 01	6.2322104E 01	6.1773321E 01	6.1194240E 01	DATA	592
008	637	6.0619154E 01	6.0074443E 01	5.9577198E 01	5.9135791E 01	DATA	593
009	638	5.8752397E 01	5.8429878E 01	5.8161042E 01	5.7962011E 01	DATA	594
010	639	5.7843620E 01	5.7325202E 01	5.6927749E 01	5.6168266E 01	DATA	595
011	DATA (RMOON I) I#289,324/						DATA 596
012	641	5.8953786E 01	5.9076755E 01	5.9715192E 01	6.0423831E 01	DATA	597
013	642	6.1158603E 01	6.1861986E 01	6.2479303E 01	6.2962180E 01	DATA	598
014	643	6.3272868E 01	6.3387242E 01	6.3296575E 01	6.3008140E 01	DATA	599
015	644	6.2844717E 01	6.1942945E 01	6.1250405E 01	6.0521374E 01	DATA	600
016	645	5.9811362E 01	5.9170955E 01	5.8639953E 01	5.8245143E 01	DATA	601
017	646	5.7988799E 01	5.7870476E 01	5.7871589E 01	5.7971656E 01	DATA	602
018	647	5.8151054E 01	5.8396969E 01	5.8702725E 01	5.9067436E 01	DATA	603



619	648	5.9492428E 01,	5.9976871E 01,	6.0513770E 01,	6.1087178E 01,	DATA 604
620	649	6.1471446E 01,	6.2232461E 01,	6.2730608E 01,	6.3124756E 01,	DATA 605
621		DATA (RMOON (1),1,325,360)/				DATA 606
622	651	6.3276644E 01,	6.3455024E 01,	6.3339281E 01,	6.3022828E 01,	DATA 607
623	652	6.2812719E 01,	6.1835756E 01,	6.1033294E 01,	6.0161805E 01,	DATA 608
624	653	5.9288254E 01,	5.8483591E 01,	5.7814211E 01,	5.7332702E 01,	DATA 609
625	654	5.7070049E 01,	5.7031700E 01,	5.6198844E 01,	5.5534605E 01,	DATA 610
626	655	5.7993026E 01,	5.8528132E 01,	5.9100784E 01,	5.9688307E 01,	DATA 611
627	656	6.0258539E 01,	6.0809141E 01,	6.1340840E 01,	6.1846305E 01,	DATA 612
628	657	6.2319070E 01,	6.2747398E 01,	6.3113359E 01,	6.3393830E 01,	DATA 613
629	658	6.3361106E 01,	6.3589022E 01,	6.3843361E 01,	6.4138475E 01,	DATA 614
630	659	6.2638177E 01,	6.1961598E 01,	6.1136493E 01,	6.0200733E 01,	DATA 615
631		DATA (RMOON (1),1,361,368)/				DATA 616
632	661	5.9221506E 01,	5.8271678E 01,	5.7432717E 01,	5.6782223E 01,	DATA 617
633	662	5.6381376E 01,	5.6264833E 01,	5.6432617E 01,	5.6853314E 01,	DATA 618
634		END				DATA 619

29748 WORDS OF MEMORY USED BY THIS COMPILATION

71084 02 11-03-72 11.801 1978 EPHEMERIS

PREFACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

PRIMARY SYMDEF ENTRY

TABLE 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1 EPHBLK 11

SYMREF

END OF BINARY CARD \*1978\*19  
4273 IS THE NEXT AVAILABLE LOCATION.  
GMAP VERSION/ASSEMBLY DATES JMAP 110171/102971 JMPB 110171/102971 JMPC 110171/102971  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19411 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

71084 03 11-03-72 11.813 1979 EPHEMERIS

1	C*1979*	1979 EPHEMERIS				DATA 1
2		SUBROUTINE TABLE				DATA 2
3		DIMENSION CASUN (369), DCSUN (369), RSUN (369)				DATA 3
4		DIMENSION RMOON(369), DCMOON(369), RMOON(369)				DATA 4
5		DIMENSION ARRAY(2214)				
6		DOUBLE PRECISION V				
7		EQUIVALENCE (RASUN,ARRAY), (DCSUN,ARRAY(370)), (RSUN,ARRAY(739))				
8		EQUIVALENCE (RAMOON,ARRAY(1108)), (DCMOON,ARRAY(1477))				
9		EQUIVALENCE (RMOON,ARRAY(1846))				
10		COMMON EPHBLK, V(4), I				
11		Y(1) = ARRAY(I)				
12		Y(2) = ARRAY(I+1)				
13		Y(3) = ARRAY(I+2)				
14		Y(4) = ARRAY(I+3)				
15		RETURN				
16		DATA (RASUN (1),1, 1, 36)/				DATA 6
17	11	4.8822881E 00,	4.9015869E 00,	4.9208834E 00,	4.9401150E 00,	DATA 7
18	12	4.9593388E 00,	4.9789330E 00,	4.9976959E 00,	5.0168245E 00,	DATA 8
19	13	5.0359179E 00,	5.0549741E 00,	5.0739913E 00,	5.0929679E 00,	DATA 9
20	14	5.1119024E 00,	5.1307933E 00,	5.1496392E 00,	5.1684390E 00,	DATA 10
21	15	5.1871912E 00,	5.2058949E 00,	5.2245491E 00,	5.2431827E 00,	DATA 11
22	16	5.2617049E 00,	5.2802048E 00,	5.2986516E 00,	5.3170447E 00,	DATA 12
23	17	5.3353834E 00,	5.3536667E 00,	5.3718937E 00,	5.3900639E 00,	DATA 13

24	18	5.4081793E 00	5.4262292E 00	5.4442214E 00	5.4621544E 00	DATA	14	
25	19	5.4800267E 00	5.4978302E 00	5.5155889E 00	5.5332791E 00	DATA	15	
26		DATA (RASUN (I)) I: 37, 72) /					DATA	16
27	21	5.5909085E 00	5.5684777E 00	5.5859871E 00	5.6034371E 00	DATA	17	
28	22	5.6208282E 00	5.6381610E 00	5.6554354E 00	5.6726552E 00	DATA	18	
29	23	5.6898181E 00	5.7069262E 00	5.7239806E 00	5.7409822E 00	DATA	19	
30	24	5.7279322E 00	5.7748318E 00	5.7916820E 00	5.8084841E 00	DATA	20	
31	25	5.8252393E 00	5.8419464E 00	5.8586124E 00	5.8752320E 00	DATA	21	
32	26	5.8918083E 00	5.9083421E 00	5.9248340E 00	5.9412851E 00	DATA	22	
33	27	5.9876962E 00	5.9740665E 00	5.9904034E 00	6.0067016E 00	DATA	23	
34	28	6.0229650E 00	6.0391943E 00	6.0553911E 00	6.0715568E 00	DATA	24	
35	29	6.0876930E 00	6.1038010E 00	6.1198826E 00	6.1359394E 00	DATA	25	
36		DATA (RASUN (I)) I: 73, 108) /					DATA	26
37	31	6.1519729E 00	6.1679850E 00	6.1839775E 00	6.1999519E 00	DATA	27	
38	32	6.2159103E 00	6.2318543E 00	6.2477856E 00	6.2637060E 00	DATA	28	
39	33	6.2796172E 00	1.2335213E-02	2.8232037E-02	4.4123732E-02	DATA	29	
40	34	6.0011829E-02	7.5897319E-02	9.1781423E-02	1.0766835E-01	DATA	30	
41	35	1.2355029E-01	1.3943751E-01	1.5532820E-01	1.7122354E-01	DATA	31	
42	36	1.8712451E-01	2.0303247E-01	2.2894870E-01	2.4487149E-01	DATA	32	
43	37	2.5081110E-01	2.6675999E-01	2.8272259E-01	2.9870028E-01	DATA	33	
44	38	3.1469452E-01	3.3070688E-01	3.4673886E-01	3.6279200E-01	DATA	34	
45	39	3.7886769E-01	3.9496753E-01	4.1109289E-01	4.2724517E-01	DATA	35	
46		DATA (RASUN (I)) I: 109, 144) /					DATA	36
47	41	4.4342566E-01	4.5963542E-01	4.7587545E-01	4.9214674E-01	DATA	37	
48	42	5.0845045E-01	5.2478717E-01	5.4115763E-01	5.5756257E-01	DATA	38	
49	43	5.7400261E-01	5.9047830E-01	6.0699008E-01	6.2353832E-01	DATA	39	
50	44	6.4012319E-01	6.5674520E-01	6.7340467E-01	6.9010202E-01	DATA	40	
51	45	7.0683751E-01	7.2361165E-01	7.4042480E-01	7.5727742E-01	DATA	41	
52	46	7.7416984E-01	7.9110261E-01	8.0807612E-01	8.2509087E-01	DATA	42	
53	47	8.4214690E-01	8.5924488E-01	8.7638499E-01	8.9356738E-01	DATA	43	
54	48	9.1079219E-01	9.2805925E-01	9.4533683E-01	9.6271943E-01	DATA	44	
55	49	9.8011225E-01	9.9754620E-01	1.0150208E 00	1.0325352E 00	DATA	45	
56		DATA (RASUN (I)) I: 145, 180) /					DATA	46
57	51	1.0500890E 00	1.0676809E 00	1.0853101E 00	1.1029753E 00	DATA	47	
58	52	1.1206751E 00	1.1384085E 00	1.1561742E 00	1.1739709E 00	DATA	48	
59	53	1.1917973E 00	1.2096522E 00	1.2279344E 00	1.2454427E 00	DATA	49	
60	54	1.2633759E 00	1.2813327E 00	1.2993120E 00	1.3173127E 00	DATA	50	
61	55	1.3353334E 00	1.3533731E 00	1.3714304E 00	1.3895043E 00	DATA	51	
62	56	1.4075933E 00	1.4256959E 00	1.4438109E 00	1.4619367E 00	DATA	52	
63	57	1.4800722E 00	1.4982156E 00	1.5163652E 00	1.5345192E 00	DATA	53	
64	58	1.5526760E 00	1.5708334E 00	1.5889896E 00	1.6071423E 00	DATA	54	
65	59	1.6252894E 00	1.6434289E 00	1.6615589E 00	1.6796773E 00	DATA	55	
66		DATA (RASUN (I)) I: 181, 216) /					DATA	56
67	61	1.6977822E 00	1.7158719E 00	1.7339445E 00	1.7519985E 00	DATA	57	
68	62	1.7700321E 00	1.7880439E 00	1.8060326E 00	1.8239968E 00	DATA	58	
69	63	1.8419350E 00	1.8598462E 00	1.8777293E 00	1.8955833E 00	DATA	59	
70	64	1.9134070E 00	1.9311996E 00	1.9489602E 00	1.9666880E 00	DATA	60	
71	65	1.9843826E 00	2.0020430E 00	2.0196682E 00	2.0372575E 00	DATA	61	
72	66	2.0548101E 00	2.0723249E 00	2.0898008E 00	2.1072370E 00	DATA	62	
73	67	2.1246325E 00	2.1419863E 00	2.1592978E 00	2.1765662E 00	DATA	63	
74	68	2.1937909E 00	2.2109713E 00	2.2281071E 00	2.2451979E 00	DATA	64	
75	69	2.2622435E 00	2.2792438E 00	2.2961986E 00	2.3131082E 00	DATA	65	
76		DATA (RASUN (I)) I: 217, 252) /					DATA	66
77	71	2.3299724E 00	2.3467916E 00	2.3635662E 00	2.3802965E 00	DATA	67	
78	72	2.3969829E 00	2.4136261E 00	2.4302270E 00	2.4467862E 00	DATA	68	
79	73	2.4633051E 00	2.4797842E 00	2.4962242E 00	2.5126259E 00	DATA	69	
80	74	2.5289901E 00	2.5453173E 00	2.5616079E 00	2.5778624E 00	DATA	70	
81	75	2.5940817E 00	2.6102661E 00	2.6264162E 00	2.6425329E 00	DATA	71	
82	76	2.6586168E 00	2.6746687E 00	2.6906894E 00	2.7066799E 00	DATA	72	
83	77	2.7226411E 00	2.7385739E 00	2.7544795E 00	2.7703589E 00	DATA	73	
84	78	2.7862130E 00	2.8020433E 00	2.8178509E 00	2.8336371E 00	DATA	74	
85	79	2.8494032E 00	2.8651509E 00	2.8808819E 00	2.8965980E 00	DATA	75	
86		DATA (RASUN (I)) I: 253, 288) /					DATA	76
87	81	2.9123012E 00	2.9279930E 00	2.9436750E 00	2.9593488E 00	DATA	77	
88	82	2.9750161E 00	2.9906780E 00	2.9963357E 00	3.0219907E 00	DATA	78	
89	83	3.0376441E 00	3.0532973E 00	3.0689315E 00	3.0846080E 00	DATA	79	
90	84	3.1002682E 00	3.1159332E 00	3.1316043E 00	3.1472830E 00	DATA	80	
91	85	3.1629705E 00	3.1786680E 00	3.1943770E 00	3.2100988E 00	DATA	81	
92	86	3.2258345E 00	3.2415856E 00	3.2573936E 00	3.2731399E 00	DATA	82	
93	87	3.2889459E 00	3.3047732E 00	3.3206242E 00	3.3365004E 00	DATA	83	
94	88	3.3524040E 00	3.3683366E 00	3.3843000E 00	3.4002959E 00	DATA	84	
95	89	3.4163259E 00	3.4323913E 00	3.4484934E 00	3.4646236E 00	DATA	85	
96		DATA (RASUN (I)) I: 289, 324) /					DATA	86
97	91	3.4808131E 00	3.4970332E 00	3.5132950E 00	3.5295997E 00	DATA	87	



98	92	3.5459485E 00,	3.5623425E 00,	3.5787825E 00,	3.5952896E 00,	DATA 88
99	93	3.6118048E 00,	3.6203889E 00,	3.6450227E 00,	3.6617070E 00,	DATA 89
100	94	3.6784424E 00,	3.6952297E 00,	3.7120697E 00,	3.7289632E 00,	DATA 90
101	95	3.7459109E 00,	3.7629138E 00,	3.7799732E 00,	3.7970901E 00,	DATA 91
102	96	3.8142654E 00,	3.8315002E 00,	3.8487952E 00,	3.8661813E 00,	DATA 92
103	97	3.8835692E 00,	3.9010491E 00,	3.9185915E 00,	3.9361965E 00,	DATA 93
104	98	3.9538644E 00,	3.9715953E 00,	3.9893891E 00,	4.0072458E 00,	DATA 94
105	99	4.0251651E 00,	4.0431467E 00,	4.0611901E 00,	4.0792947E 00,	DATA 95
106		DATA (RASUN (1)), I=325,360, /				DATA 96
107	101	4.0974600E 00,	4.1156851E 00,	4.1339689E 00,	4.1523103E 00,	DATA 97
108	102	4.1707082E 00,	4.1891614E 00,	4.2076686E 00,	4.2262288E 00,	DATA 98
109	103	4.2448405E 00,	4.2635029E 00,	4.2822150E 00,	4.3009737E 00,	DATA 99
110	104	4.3197838E 00,	4.3386382E 00,	4.3575374E 00,	4.3764803E 00,	DATA 100
111	105	4.3954654E 00,	4.4144908E 00,	4.4335549E 00,	4.4526860E 00,	DATA 101
112	106	4.4717922E 00,	4.4909614E 00,	4.5101617E 00,	4.5293909E 00,	DATA 102
113	107	4.5486469E 00,	4.5679273E 00,	4.5872297E 00,	4.6065815E 00,	DATA 103
114	108	4.6258904E 00,	4.6452435E 00,	4.6646078E 00,	4.6839805E 00,	DATA 104
115	109	4.7033586E 00,	4.7227392E 00,	4.7421196E 00,	4.7614971E 00,	DATA 105
116		DATA (RASUN (1)), I=361,368, /				DATA 106
117	111	4.7808607E 00,	4.8002324E 00,	4.8195857E 00,	4.8389266E 00,	DATA 107
118	112	4.8682526E 00,	4.8775616E 00,	4.8968516E 00,	4.9161204E 00,	DATA 108
119		DATA (BCSUN (1)), I= 1, 36 /				DATA 109
120	121	-4.0382315E-01,	-4.0255998E-01,	-4.0116213E-01,	-3.9963135E-01,	DATA 109
121	122	-3.9796803E-01,	-3.9617297E-01,	-3.9424705E-01,	-3.9219116E-01,	DATA 110
122	123	-3.9600639E-01,	-3.8769379E-01,	-3.8525450E-01,	-3.8268972E-01,	DATA 111
123	124	-3.8600069E-01,	-3.7718866E-01,	-3.7425496E-01,	-3.7120091E-01,	DATA 112
124	125	-3.6802796E-01,	-3.6473753E-01,	-3.6133110E-01,	-3.5781019E-01,	DATA 113
125	126	-3.5617638E-01,	-3.5043127E-01,	-3.4657653E-01,	-3.4261383E-01,	DATA 114
126	127	-3.3854498E-01,	-3.3437179E-01,	-3.3009616E-01,	-3.2572002E-01,	DATA 115
127	128	-3.2124522E-01,	-3.1667375E-01,	-3.1200753E-01,	-3.0724848E-01,	DATA 116
128	129	-3.0239868E-01,	-2.9745993E-01,	-2.9243430E-01,	-2.8732372E-01,	DATA 117
129		DATA (BCSUN (1)), I= 37, 72 /				DATA 118
130	131	-2.8213026E-01,	-2.7685889E-01,	-2.7150264E-01,	-2.6607246E-01,	DATA 119
131	132	-2.6056737E-01,	-2.5498933E-01,	-2.4934035E-01,	-2.4362238E-01,	DATA 120
132	133	-2.3783736E-01,	-2.3198724E-01,	-2.2607400E-01,	-2.2009957E-01,	DATA 121
133	134	-2.1406506E-01,	-2.0797483E-01,	-2.0182846E-01,	-1.9562867E-01,	DATA 122
134	135	-1.8937748E-01,	-1.8307688E-01,	-1.7672895E-01,	-1.7033880E-01,	DATA 123
135	136	-1.6389933E-01,	-1.5742169E-01,	-1.5090491E-01,	-1.4435100E-01,	DATA 124
136	137	-1.3776203E-01,	-1.3113992E-01,	-1.2448663E-01,	-1.1780415E-01,	DATA 125
137	138	-1.1109448E-01,	-1.0435990E-01,	-9.7601149E-02,	-9.8821291E-02,	DATA 126
138	139	-8.4021795E-02,	-7.7204488E-02,	-7.0371182E-02,	-6.3523655E-02,	DATA 127
139		DATA (BCSUN (1)), I= 73, 108 /				DATA 128
140	141	-5.663693E-02,	-4.9793030E-02,	-4.2913393E-02,	-3.6026499E-02,	DATA 129
141	142	-2.9134062E-02,	-2.2237763E-02,	-1.5339302E-02,	-8.4403891E-03,	DATA 130
142	143	-1.5427264E-03,	3.3518971E-03,	1.2241696E-02,	1.9124885E-02,	DATA 131
143	144	2.5999748E-02,	3.2864399E-02,	3.9717035E-02,	4.6555863E-02,	DATA 132
144	145	5.3379099E-02,	6.0184982E-02,	6.6971731E-02,	7.3737568E-02,	DATA 133
145	146	8.0480657E-02,	8.7199301E-02,	9.3891767E-02,	1.0055633E-01,	DATA 134
146	147	1.0719130E-01,	1.1379500E-01,	1.2036579E-01,	1.2690205E-01,	DATA 135
147	148	1.3340215E-01,	1.3986451E-01,	1.4628758E-01,	1.5266979E-01,	DATA 136
148	149	1.5900958E-01,	1.6530543E-01,	1.7155582E-01,	1.7759225E-01,	DATA 137
149		DATA (BCSUN (1)), I=109, 144, /				DATA 138
150	151	1.8391401E-01,	1.9001865E-01,	1.9607151E-01,	2.0207093E-01,	DATA 139
151	152	2.0801537E-01,	2.1390311E-01,	2.1973253E-01,	2.2550197E-01,	DATA 140
152	153	2.3120984E-01,	2.3685445E-01,	2.4243424E-01,	2.4794750E-01,	DATA 141
153	154	2.5339257E-01,	2.5876789E-01,	2.6407180E-01,	2.6930874E-01,	DATA 142
154	155	2.7445909E-01,	2.7953936E-01,	2.8454202E-01,	2.8946855E-01,	DATA 143
155	156	2.9430851E-01,	2.9906944E-01,	3.0374694E-01,	3.0833966E-01,	DATA 144
156	157	3.1284619E-01,	3.1726525E-01,	3.2159554E-01,	3.2583873E-01,	DATA 145
157	158	3.2998451E-01,	3.3404060E-01,	3.3800264E-01,	3.4186935E-01,	DATA 146
158	159	3.4563948E-01,	3.4931171E-01,	3.5288478E-01,	3.5632749E-01,	DATA 147
159		DATA (BCSUN (1)), I=149, 180, /				DATA 148
160	161	3.5972869E-01,	3.6299717E-01,	3.6616179E-01,	3.6922138E-01,	DATA 149
161	162	3.7217486E-01,	3.7502112E-01,	3.7775911E-01,	3.8038783E-01,	DATA 150
162	163	3.8290626E-01,	3.8531352E-01,	3.8760865E-01,	3.8979089E-01,	DATA 151
163	164	3.9185939E-01,	3.9381341E-01,	3.9568230E-01,	3.9737842E-01,	DATA 152
164	165	3.998216E-01,	4.0147200E-01,	4.0284432E-01,	4.039921E-01,	DATA 153
165	166	4.0423566E-01,	4.0525346E-01,	4.0615228E-01,	4.0693174E-01,	DATA 154
166	167	4.0759161E-01,	4.0813163E-01,	4.0855163E-01,	4.0885152E-01,	DATA 155
167	168	4.0903124E-01,	4.0909077E-01,	4.0903019E-01,	4.0884934E-01,	DATA 156
168	169	4.0854892E-01,	4.0812851E-01,	4.0758852E-01,	4.0692915E-01,	DATA 157
169		DATA (BCSUN (1)), I=181, 216, /				DATA 158
170	171	4.0615072E-01,	4.0525353E-01,	4.0425778E-01,	4.0310448E-01,	DATA 159
171	172	4.0185356E-01,	4.0048567E-01,	3.9900145E-01,	3.9740147E-01,	DATA 160

172	173	3.9568646E=01,	3.9385712E=01,	3.9191424E=01,	3.8985856E=01,	DATA 161
173	174	3.9769085E=01,	3.8541191E=01,	3.8302267E=01,	3.8052387E=01,	DATA 162
174	175	3.7791647E=01,	3.7520140E=01,	3.7237969E=01,	3.6945242E=01,	DATA 163
175	176	3.6642065E=01,	3.6328599E=01,	3.6004842E=01,	3.5671029E=01,	DATA 164
176	177	3.5327249E=01,	3.4973623E=01,	3.4610277E=01,	3.4237335E=01,	DATA 165
177	178	3.3854933E=01,	3.3463199E=01,	3.3062261E=01,	3.2652264E=01,	DATA 166
178	179	3.2233337E=01,	3.1805617E=01,	3.1369250E=01,	3.0924869E=01,	DATA 167
179		DATA (BCSUN (I), I=217, 252)/				DATA 168
180	181	3.0471129E=01,	3.009665E=01,	2.9540124E=01,	2.9062642E=01,	DATA 169
181	182	2.8877370E=01,	2.8084440E=01,	2.7583990E=01,	2.7076156E=01,	DATA 170
182	183	2.6861069E=01,	2.6038878E=01,	2.5509730E=01,	2.4973773E=01,	DATA 171
183	184	2.4431159E=01,	2.3882042E=01,	2.3326387E=01,	2.2764945E=01,	DATA 172
184	185	2.2197277E=01,	2.1623741E=01,	2.1044493E=01,	2.0459693E=01,	DATA 173
185	186	1.9869499E=01,	1.9274068E=01,	1.8673564E=01,	1.8068141E=01,	DATA 174
186	187	1.7457961E=01,	1.6843179E=01,	1.6223959E=01,	1.5600458E=01,	DATA 175
187	188	1.4972842E=01,	1.4341265E=01,	1.3705886E=01,	1.3076860E=01,	DATA 176
188	189	1.2424349E=01,	1.1778492E=01,	1.1129435E=01,	1.0477320E=01,	DATA 177
189		DATA (BCSUN (I), I=253, 288)/				DATA 178
190	191	9.8222857E=02,	9.1644843E=02,	8.5040653E=02,	7.8411819E=02,	DATA 179
191	192	7.1759855E=02,	6.5086422E=02,	5.8393158E=02,	5.2681897E=02,	DATA 180
192	193	4.4953689E=02,	3.8210791E=02,	3.1494662E=02,	2.4686968E=02,	DATA 181
193	194	1.7909387E=02,	1.1123609E=02,	4.8313347E=03,	2.4657342E=03,	DATA 182
194	195	2.659043E=03,	1.8067451E=02,	2.2868643E=02,	2.9667743E=02,	DATA 183
195	196	3.6462982E=02,	4.3252638E=02,	5.0034962E=02,	5.6808219E=02,	DATA 184
196	197	6.3870624E=02,	7.0320607E=02,	7.7056548E=02,	8.3776847E=02,	DATA 185
197	198	9.0479908E=02,	9.7164092E=02,	1.0382776E=01,	1.1046923E=01,	DATA 186
198	199	1.1708684E=01,	1.2367874E=01,	1.3024313E=01,	1.3677817E=01,	DATA 187
199		DATA (BCSUN (I), I=289, 324)/				DATA 188
200	201	1.4328203E=01,	1.4975265E=01,	1.5618874E=01,	1.6258782E=01,	DATA 189
201	202	1.6694819E=01,	1.7526794E=01,	1.8194909E=01,	1.8777773E=01,	DATA 190
202	203	1.9396390E=01,	2.0010164E=01,	2.0618893E=01,	2.122379E=01,	DATA 191
203	204	2.1820417E=01,	2.2412810E=01,	2.2999351E=01,	2.3579844E=01,	DATA 192
204	205	2.4154081E=01,	2.4721876E=01,	2.5283036E=01,	2.5837382E=01,	DATA 193
205	206	2.6384722E=01,	2.6924871E=01,	2.7457647E=01,	2.7982663E=01,	DATA 194
206	207	2.8500334E=01,	2.9009866E=01,	2.9511260E=01,	3.0004324E=01,	DATA 195
207	208	3.0488867E=01,	3.0964692E=01,	3.1431606E=01,	3.1889416E=01,	DATA 196
208	209	3.2337933E=01,	3.276965E=01,	3.3206319E=01,	3.3625815E=01,	DATA 197
209		DATA (BCSUN (I), I=325, 360)/				DATA 198
210	211	3.4035264E=01,	3.4434481E=01,	3.4823283E=01,	3.5201487E=01,	DATA 199
211	212	3.5868918E=01,	3.5925392E=01,	3.6270739E=01,	3.6604790E=01,	DATA 200
212	213	3.6927374E=01,	3.7238339E=01,	3.7537538E=01,	3.7824830E=01,	DATA 201
213	214	3.8100074E=01,	3.8363144E=01,	3.8613911E=01,	3.8852260E=01,	DATA 202
214	215	3.9078066E=01,	3.9291218E=01,	3.9491601E=01,	3.9679109E=01,	DATA 203
215	216	3.9853647E=01,	4.0015114E=01,	4.0163420E=01,	4.0298487E=01,	DATA 204
216	217	4.0420233E=01,	4.0528595E=01,	4.0623505E=01,	4.0704911E=01,	DATA 205
217	218	4.072768E=01,	4.0827032E=01,	4.0867669E=01,	4.0894651E=01,	DATA 206
218	219	4.0907961E=01,	4.0907574E=01,	4.0893485E=01,	4.0865689E=01,	DATA 207
219		DATA (BCSUN (I), I=361, 368)/				DATA 208
220	221	4.0824195E=01,	4.0769013E=01,	4.0700176E=01,	4.0617713E=01,	DATA 209
221	222	4.0521666E=01,	4.0412086E=01,	4.0289032E=01,	4.0152563E=01,	DATA 210
222		DATA (RSUN (I), I=37, 72)/				DATA 210
223	231	9.8400398E=01,	9.8398503E=01,	9.8396990E=01,	9.8395886E=01,	DATA 211
224	232	9.8395209E=01,	9.8394992E=01,	9.8395269E=01,	9.8396070E=01,	DATA 212
225	233	9.8397440E=01,	9.8399385E=01,	9.8401924E=01,	9.8405075E=01,	DATA 213
226	234	9.8408852E=01,	9.8413255E=01,	9.8418286E=01,	9.8423941E=01,	DATA 214
227	235	9.8430218E=01,	9.8437101E=01,	9.8444577E=01,	9.8452626E=01,	DATA 215
228	236	9.8461238E=01,	9.8470375E=01,	9.8480010E=01,	9.8490112E=01,	DATA 216
229	237	9.8500659E=01,	9.8511608E=01,	9.8522929E=01,	9.8534593E=01,	DATA 217
230	238	9.8546550E=01,	9.8558822E=01,	9.8571408E=01,	9.8584314E=01,	DATA 218
231	239	9.8597535E=01,	9.8611110E=01,	9.8625062E=01,	9.8639418E=01,	DATA 219
232		DATA (RSUN (I), I=73, 108)/				DATA 220
233	241	9.8654219E=01,	9.8669472E=01,	9.8685195E=01,	9.8701406E=01,	DATA 221
234	242	9.8718125E=01,	9.8735351E=01,	9.8753092E=01,	9.8771347E=01,	DATA 222
235	243	9.8790120E=01,	9.8809395E=01,	9.8829164E=01,	9.8849413E=01,	DATA 223
236	244	9.8870128E=01,	9.8891276E=01,	9.8912829E=01,	9.8934756E=01,	DATA 224
237	245	9.8957034E=01,	9.8979612E=01,	9.9002451E=01,	9.9025512E=01,	DATA 225
238	246	9.9048745E=01,	9.9072144E=01,	9.9095695E=01,	9.9119384E=01,	DATA 226
239	247	9.9143185E=01,	9.9167131E=01,	9.9191238E=01,	9.9215528E=01,	DATA 227
240	248	9.9240027E=01,	9.9264749E=01,	9.9289710E=01,	9.9314929E=01,	DATA 228
241	249	9.9340428E=01,	9.9366210E=01,	9.9392287E=01,	9.9418664E=01,	DATA 229
242		DATA (RSUN (I), I=109, 144)/				DATA 230
243	251	9.9445347E=01,	9.9472328E=01,	9.9499605E=01,	9.9527167E=01,	DATA 231
244	252	9.9550098E=01,	9.9583102E=01,	9.9611419E=01,	9.9639934E=01,	DATA 232



245	253	9.9668623E-01,	9.9697436E-01,	9.9726331E-01,	9.9755286E-01,	DATA 233
246	254	9.9784193E-01,	9.9813089E-01,	9.9841925E-01,	9.9870877E-01,	DATA 234
247	255	9.9899302E-01,	9.9927825E-01,	9.9956251E-01,	9.9984592E-01,	DATA 235
248	256	1.0001284E 00,	1.0004107E 00,	1.0006924E 00,	1.0009739E 00,	DATA 236
249	257	1.0012555E 00,	1.0015371E 00,	1.0018189E 00,	1.0021012E 00,	DATA 237
250	258	1.0023838E 00,	1.0026670E 00,	1.0029507E 00,	1.0032350E 00,	DATA 238
251	259	1.0035198E 00,	1.0038049E 00,	1.0040902E 00,	1.0043754E 00,	DATA 239
252		DATA (RSUN (I)):#109,144)/				DATA 240
253	261	1.0046605E 00,	1.0049448E 00,	1.0052280E 00,	1.0055096E 00,	DATA 241
254	262	1.0057893E 00,	1.0060668E 00,	1.0063416E 00,	1.0066134E 00,	DATA 242
255	263	1.0068818E 00,	1.0071470E 00,	1.0074088E 00,	1.0076672E 00,	DATA 243
256	264	1.0079223E 00,	1.0081742E 00,	1.0084231E 00,	1.0086691E 00,	DATA 244
257	265	1.0089125E 00,	1.0091534E 00,	1.0093919E 00,	1.0096282E 00,	DATA 245
258	266	1.0098625E 00,	1.0100950E 00,	1.0103296E 00,	1.0105546E 00,	DATA 246
259	267	1.0107822E 00,	1.0110080E 00,	1.0112322E 00,	1.0114544E 00,	DATA 247
260	268	1.0116749E 00,	1.0118930E 00,	1.0121085E 00,	1.0123209E 00,	DATA 248
261	269	1.0125299E 00,	1.0127351E 00,	1.0129362E 00,	1.0131328E 00,	DATA 249
262		DATA (RSUN (I)):#149,180)/				DATA 250
263	271	1.0133244E 00,	1.0135111E 00,	1.0136928E 00,	1.0138693E 00,	DATA 251
264	272	1.0140406E 00,	1.0142068E 00,	1.0143680E 00,	1.0145243E 00,	DATA 252
265	273	1.0146760E 00,	1.0148232E 00,	1.0149660E 00,	1.0151047E 00,	DATA 253
266	274	1.0152395E 00,	1.0153705E 00,	1.0154981E 00,	1.0156224E 00,	DATA 254
267	275	1.0157436E 00,	1.0158617E 00,	1.0159769E 00,	1.0160891E 00,	DATA 255
268	276	1.0161984E 00,	1.0163046E 00,	1.0164072E 00,	1.0165060E 00,	DATA 256
269	277	1.0166007E 00,	1.0166909E 00,	1.0167763E 00,	1.0168565E 00,	DATA 257
270	278	1.0169311E 00,	1.0170001E 00,	1.0170632E 00,	1.0171204E 00,	DATA 258
271	279	1.0171715E 00,	1.0172166E 00,	1.0172557E 00,	1.0172890E 00,	DATA 259
272		DATA (RSUN (I)):#181,216)/				DATA 260
273	281	1.0173165E 00,	1.0173384E 00,	1.0173550E 00,	1.0173665E 00,	DATA 261
274	282	1.0173729E 00,	1.0173746E 00,	1.0173719E 00,	1.0173651E 00,	DATA 262
275	283	1.0173545E 00,	1.0173401E 00,	1.0173223E 00,	1.0173012E 00,	DATA 263
276	284	1.0172770E 00,	1.0172496E 00,	1.0172187E 00,	1.0171842E 00,	DATA 264
277	285	1.0171456E 00,	1.0171032E 00,	1.0170560E 00,	1.0170041E 00,	DATA 265
278	286	1.0169469E 00,	1.0168843E 00,	1.0168162E 00,	1.0167424E 00,	DATA 266
279	287	1.0166627E 00,	1.0165772E 00,	1.0164859E 00,	1.0163889E 00,	DATA 267
280	288	1.0162861E 00,	1.0161778E 00,	1.0160642E 00,	1.0159454E 00,	DATA 268
281	289	1.0158215E 00,	1.0156930E 00,	1.0155602E 00,	1.0154233E 00,	DATA 269
282		DATA (RSUN (I)):#217,252)/				DATA 270
283	291	1.0152825E 00,	1.0151384E 00,	1.0149911E 00,	1.0148410E 00,	DATA 271
284	292	1.0146886E 00,	1.0145336E 00,	1.0143760E 00,	1.0142158E 00,	DATA 272
285	293	1.0140531E 00,	1.0138873E 00,	1.0137184E 00,	1.0135459E 00,	DATA 273
286	294	1.0133695E 00,	1.0131891E 00,	1.0130045E 00,	1.0128155E 00,	DATA 274
287	295	1.0126219E 00,	1.0124238E 00,	1.0122211E 00,	1.0120138E 00,	DATA 275
288	296	1.0118018E 00,	1.0115855E 00,	1.0113648E 00,	1.0111400E 00,	DATA 276
289	297	1.0109111E 00,	1.0106786E 00,	1.0104428E 00,	1.0102036E 00,	DATA 277
290	298	1.0099618E 00,	1.0097176E 00,	1.0094714E 00,	1.0092236E 00,	DATA 278
291	299	1.0089747E 00,	1.0087248E 00,	1.0084739E 00,	1.0082222E 00,	DATA 279
292		DATA (RSUN (I)):#253,288)/				DATA 280
293	301	1.0079699E 00,	1.0077167E 00,	1.0074623E 00,	1.0072065E 00,	DATA 281
294	302	1.0069491E 00,	1.0066899E 00,	1.0064286E 00,	1.0061652E 00,	DATA 282
295	303	1.0058994E 00,	1.0056312E 00,	1.0053604E 00,	1.0050871E 00,	DATA 283
296	304	1.0048112E 00,	1.0045328E 00,	1.0042519E 00,	1.0039688E 00,	DATA 284
297	305	1.0036834E 00,	1.0033961E 00,	1.0031071E 00,	1.0028167E 00,	DATA 285
298	306	1.0025251E 00,	1.0022329E 00,	1.0019404E 00,	1.0016481E 00,	DATA 286
299	307	1.0013564E 00,	1.0010656E 00,	1.0007759E 00,	1.0004876E 00,	DATA 287
300	308	1.0002010E 00,	9.9991594E-01,	9.9983227E-01,	9.9974985E-01,	DATA 288
301	309	9.9906851E-01,	9.9878811E-01,	9.9850844E-01,	9.9822932E-01,	DATA 289
302		DATA (RSUN (I)):#289,324)/				DATA 290
303	311	9.9795052E-01,	9.9767193E-01,	9.9739347E-01,	9.9711903E-01,	DATA 291
304	312	9.9683653E-01,	9.9655795E-01,	9.9627931E-01,	9.9600065E-01,	DATA 292
305	313	9.9572194E-01,	9.9544346E-01,	9.9516536E-01,	9.9488793E-01,	DATA 293
306	314	9.9461126E-01,	9.9433588E-01,	9.9406220E-01,	9.9379059E-01,	DATA 294
307	315	9.9352148E-01,	9.9325521E-01,	9.9299215E-01,	9.9273258E-01,	DATA 295
308	316	9.9247701E-01,	9.9222528E-01,	9.9197740E-01,	9.9173338E-01,	DATA 296
309	317	9.9149311E-01,	9.9125649E-01,	9.9102333E-01,	9.9079344E-01,	DATA 297
310	318	9.9056658E-01,	9.9034265E-01,	9.9012147E-01,	9.8990229E-01,	DATA 298
311	319	9.8968679E-01,	9.8947304E-01,	9.8926157E-01,	9.8905227E-01,	DATA 299
312		DATA (RSUN (I)):#329,360)/				DATA 300
313	321	9.8884508E-01,	9.8864011E-01,	9.8843747E-01,	9.8823730E-01,	DATA 301
314	322	9.8803961E-01,	9.8784488E-01,	9.8765334E-01,	9.8746563E-01,	DATA 302
315	323	9.8728182E-01,	9.8710240E-01,	9.8692772E-01,	9.8675813E-01,	DATA 303
316	324	9.8659410E-01,	9.8643562E-01,	9.8628279E-01,	9.8613566E-01,	DATA 304
317	325	9.8599435E-01,	9.8585866E-01,	9.8572849E-01,	9.8560365E-01,	DATA 305



818	326	9.8848395E-01,	9.8536924E-01,	9.8525930E-01,	9.8518897E-01,	DATA 306
819	327	9.8805305E-01,	9.8495672E-01,	9.8486358E-01,	9.8477466E-01,	DATA 307
820	328	9.8468936E-01,	9.8460766E-01,	9.8452930E-01,	9.8445488E-01,	DATA 308
821	329	9.8438366E-01,	9.8431624E-01,	9.8425286E-01,	9.8417380E-01,	DATA 309
822		DATA (RSUN (1)), I=361,363, /				DATA 310 6
823	331	9.8413931E-01,	9.8406979E-01,	9.8404557E-01,	9.8400696E-01,	DATA 311
824	332	9.8397442E-01,	9.8394801E-01,	9.8392787E-01,	9.8391420E-01,	DATA 312
825		DATA (RAMOON1), I=1, 36, /				DATA 312 6
826	341	5.1807938E 00,	5.4506232E 00,	5.7102290E 00,	5.9582956E 00,	DATA 313
827	342	6.1958342E 00,	1.4202633E-01,	3.8608036E-01,	5.8749249E-01,	DATA 314
828	343	8.0837272E-01,	1.0299949E 00,	1.2526584E 00,	1.4757241E 00,	DATA 315
829	344	1.6978491E 00,	1.9174081E 00,	2.1329802E 00,	2.3437521E 00,	DATA 316
830	345	2.5497366E 00,	2.7518034E 00,	3.9515853E 00,	3.1513374E 00,	DATA 317
831	346	3.3937896E 00,	3.5619878E 00,	3.9790711E 00,	4.9078938E 00,	DATA 318
832	347	4.2804201E 00,	4.5068691E 00,	4.9749763E 00,	5.9499093E 00,	DATA 319
833	348	5.3253641E 00,	5.5934819E 00,	5.8564739E 00,	6.1071175E 00,	DATA 320
834	349	6.5260571E-02,	2.9856554E-01,	5.2709053E-01,	7.5246857E-01,	DATA 321
835		DATA (RAMOON1), I=37, 72, /				DATA 322 6
836	351	9.7434204E-01,	1.1995413E 00,	1.4220946E 00,	1.6433849E 00,	DATA 323
837	352	1.8624118E 00,	2.0781426E 00,	2.2898502E 00,	2.4973541E 00,	DATA 324
838	353	2.7011265E 00,	2.9022816E 00,	3.3024965E 00,	3.3039001E 00,	DATA 325
839	354	3.5089470E 00,	3.7202557E 00,	3.9403669E 00,	4.1713842E 00,	DATA 326
840	355	4.4143378E 00,	4.6687869E 00,	4.9322329E 00,	5.2005823E 00,	DATA 327
841	356	5.4689384E 00,	5.7331559E 00,	5.9907022E 00,	6.2408615E 00,	DATA 328
842	357	2.0109741E-01,	4.3912188E-01,	6.9318162E-01,	9.8438677E-01,	DATA 329
843	358	1.1333141E 00,	1.3999766E 00,	1.7837441E 00,	1.9045707E 00,	DATA 330
844	359	2.0312613E 00,	2.2337071E 00,	2.4420389E 00,	2.6468870E 00,	DATA 331
845		DATA (RAMOON1), I=73, 108, /				DATA 332 6
846	361	2.8493624E 00,	3.0509910E 00,	3.2530227E 00,	3.4593209E 00,	DATA 333
847	362	3.6702216E 00,	3.8883320E 00,	4.1152450E 00,	4.3517717E 00,	DATA 334
848	363	4.5975691E 00,	4.8509415E 00,	5.1090229E 00,	5.3684143E 00,	DATA 335
849	364	5.6260564E 00,	5.8799315E 00,	6.1293027E 00,	6.4383796E-02,	DATA 336
850	365	3.3319547E-01,	5.7272951E-01,	8.1047689E-01,	1.8464197E 00,	DATA 337
851	366	1.2799502E 00,	1.5100739E 00,	1.7357371E 00,	1.9561621E 00,	DATA 338
852	367	2.1710873E 00,	2.3808663E 00,	2.5864437E 00,	2.7892603E 00,	DATA 339
853	368	2.9911319E 00,	3.1941253E 00,	3.6004287E 00,	3.6121933E 00,	DATA 340
854	369	3.8313125E 00,	4.0591190E 00,	4.2960240E 00,	4.5412070E 00,	DATA 341
855		DATA (RAMOON1), I=109, 144, /				DATA 342 6
856	371	4.7825501E 00,	5.0469922E 00,	5.3012730E 00,	5.5527790E 00,	DATA 343
857	372	5.8001086E 00,	6.0431698E 00,	6.2828808E 00,	2.3748207E-01,	DATA 344
858	373	4.7673807E-01,	7.1235389E-01,	9.3039020E-01,	1.1879820E 00,	DATA 345
859	374	1.4235301E 00,	1.6551460E 00,	1.8811948E 00,	2.1007332E 00,	DATA 346
860	375	2.3137187E 00,	2.5205206E 00,	2.9241138E 00,	2.9251826E 00,	DATA 347
861	376	3.1266373E 00,	3.3311002E 00,	3.5411983E 00,	3.7593194E 00,	DATA 348
862	377	3.9872926E 00,	4.2257126E 00,	4.4738680E 00,	4.7291468E 00,	DATA 349
863	378	4.9876242E 00,	5.3450206E 00,	5.4978939E 00,	5.7444343E 00,	DATA 350
864	379	5.9845939E 00,	6.196833E 00,	1.6855720E-01,	3.9921321E-01,	DATA 351
865		DATA (RAMOON1), I=145, 180, /				DATA 352 6
866	381	6.3399434E-01,	8.6604548E-01,	1.1017787E 00,	1.8378717E 00,	DATA 353
867	382	1.5721861E 00,	1.8023668E 00,	2.0265079E 00,	2.2436337E 00,	DATA 354
868	383	2.4838717E 00,	2.6583625E 00,	2.8590415E 00,	3.0584045E 00,	DATA 355
869	384	3.2893091E 00,	3.4647964E 00,	3.6778784E 00,	3.9012100E 00,	DATA 356
870	385	4.1365780E 00,	4.3842301E 00,	4.6422849E 00,	4.9066835E 00,	DATA 357
871	386	5.120608E 00,	5.4333143E 00,	5.6870378E 00,	5.9321029E 00,	DATA 358
872	387	6.1693646E 00,	1.1774393E-01,	3.6620604E-01,	5.7401641E-01,	DATA 359
873	388	8.0299043E-01,	1.0339431E 00,	1.2664978E 00,	1.4991634E 00,	DATA 360
874	389	1.7297335E 00,	1.9559201E 00,	2.1759938E 00,	2.3892044E 00,	DATA 361
875		DATA (RAMOON1), I=304, 213, /				DATA 362 6
876	391	2.5958970E 00,	2.7973962E 00,	2.9957698E 00,	3.1957143E 00,	DATA 363
877	392	3.3941734E 00,	3.6003659E 00,	3.8154606E 00,	4.0422039E 00,	DATA 364
878	393	4.2823201E 00,	4.5357234E 00,	4.9998963E 00,	5.8699493E 00,	DATA 365
879	394	5.339938E 00,	5.6044025E 00,	5.8602833E 00,	6.1068821E 00,	DATA 366
880	395	6.2053240E-02,	2.9463005E-01,	5.2392040E-01,	7.5214984E-01,	DATA 367
881	396	9.8079624E-01,	1.2103320E 00,	1.4401656E 00,	1.6688362E 00,	DATA 368
882	397	1.8944819E 00,	2.1152469E 00,	2.8300685E 00,	2.8388811E 00,	DATA 369
883	398	2.7416937E 00,	2.9405531E 00,	3.1374491E 00,	3.8349196E 00,	DATA 370
884	399	3.5358472E 00,	3.7432895E 00,	3.9602974E 00,	4.1890775E 00,	DATA 371
885		DATA (RAMOON1), I=217, 252, /				DATA 372 6
886	401	4.4312761E 00,	4.6863528E 00,	4.9515420E 00,	5.2220407E 00,	DATA 373
887	402	5.4922424E 00,	5.7574242E 00,	6.0148947E 00,	6.2641667E 00,	DATA 374
888	403	2.2816161E-01,	4.6014927E-01,	6.9390685E-01,	9.2595055E-01,	DATA 375
889	404	1.1970541E 00,	1.3871077E 00,	1.6135079E 00,	1.8403753E 00,	DATA 376
890	405	2.0610084E 00,	2.2762637E 00,	2.4858214E 00,	2.6900618E 00,	DATA 377

891	406	2,8901245E 00,	3,1879937E 00,	3,2848786E 00,	3,6634694E 00,	DATA 378
892	407	3,6866901E 00,	3,6973228E 00,	4,2172925E 00,	4,3463750E 00,	DATA 379
893	408	4,5912883E 00,	4,8449573E 00,	5,3068999E 00,	5,3721516E 00,	DATA 380
894	409	5,4873948E 00,	5,8989114E 00,	6,3551302E 00,	1,2267050E-01,	DATA 381
895		DATA (BCHORN1), I#253, 2281/				DATA 382
896	411	3,6674379E-01,	6,1133459E-01,	8,5138616E-01,	1,0892717E 00,	DATA 383
897	412	1,3846936E 00,	1,5968107E 00,	1,7845334E 00,	2,0068794E 00,	DATA 384
898	413	2,2232761E 00,	2,4337286E 00,	2,6388907E 00,	2,8398033E 00,	DATA 385
899	414	3,0881763E 00,	3,2358834E 00,	3,4033031E 00,	3,6378270E 00,	DATA 386
900	415	3,8664264E 00,	4,0627388E 00,	4,2881499E 00,	4,5231873E 00,	DATA 387
901	416	4,7672335E 00,	5,0184492E 00,	5,2740812E 00,	5,5311347E 00,	DATA 388
902	417	5,7871939E 00,	6,0407472E 00,	6,4733471E-03,	2,5724734E-01,	DATA 389
903	418	5,0663357E-01,	7,5128696E-01,	9,9687757E-01,	1,2464736E 00,	DATA 390
904	419	1,4804903E 00,	1,7151792E 00,	1,9431261E 00,	2,1636159E 00,	DATA 391
905		DATA (BCHORN1), I#289, 324/				DATA 392
906	421	2,3767713E 00,	2,5834906E 00,	2,7852789E 00,	2,9840888E 00,	DATA 393
907	422	3,1223380E 00,	3,3814073E 00,	3,5845394E 00,	3,7935027E 00,	DATA 394
908	423	4,0100129E 00,	4,2351226E 00,	4,4689278E 00,	4,7103767E 00,	DATA 395
909	424	4,9873499E 00,	5,2071030E 00,	5,4569825E 00,	5,7051133E 00,	DATA 396
910	425	5,9897848E 00,	6,1944208E 00,	1,9403787E-01,	3,9744713E-01,	DATA 397
911	426	6,4254946E-01,	8,8954911E-01,	1,13374557E 00,	1,3841496E 00,	DATA 398
912	427	1,6268022E 00,	1,8630431E 00,	2,0990808E 00,	2,3097655E 00,	DATA 399
913	428	2,5203761E 00,	2,7242536E 00,	2,9235939E 00,	3,1209643E 00,	DATA 400
914	429	3,3191051E 00,	3,5207677E 00,	3,7289351E 00,	3,9445713E 00,	DATA 401
915		DATA (BCHORN1), I#325, 360/				DATA 402
916	431	4,1702678E 00,	4,4058268E 00,	4,6499459E 00,	4,8998845E 00,	DATA 403
917	432	5,1818947E 00,	5,4029143E 00,	5,6492357E 00,	5,8911681E 00,	DATA 404
918	433	6,1289594E 00,	6,1151106E-02,	3,1633385E-01,	5,9352309E-01,	DATA 405
919	434	7,9402141E-03,	1,0380169E 00,	1,2841619E 00,	1,5297730E 00,	DATA 406
920	435	1,7152084E 00,	2,0063215E 00,	2,2322659E 00,	2,4488472E 00,	DATA 407
921	436	2,6869286E 00,	2,8984012E 00,	3,0598232E 00,	3,2521384E 00,	DATA 408
922	437	3,4804723E 00,	3,6539565E 00,	3,8659052E 00,	4,0874643E 00,	DATA 409
923	438	4,3211004E 00,	4,5660167E 00,	4,8197923E 00,	5,0782503E 00,	DATA 410
924	439	5,3569168E 00,	5,5904703E 00,	5,8377517E 00,	6,0782424E 00,	DATA 411
925		DATA (BCHORN1), I#361, 368/				DATA 412
926	441	3,0058995E-02,	2,6198660E-01,	4,9352154E-01,	7,2690693E-01,	DATA 413
927	442	9,6852225E-01,	1,2034019E 00,	1,4450900E 00,	1,6859133E 00,	DATA 414
928		DATA (BCHORN1), I#373, 367/				DATA 415
929	451	-2,9629164E-01,	-2,5228047E-01,	-1,9211900E-01,	-1,2128985E-01,	DATA 416
930	452	-4,5285464E-02,	3,1049247E-02,	1,8373965E-01,	1,8997129E-01,	DATA 417
931	453	2,2893052E-03,	2,7069144E-01,	3,0220926E-01,	3,1937404E-01,	DATA 418
932	454	3,2179890E-01,	3,0964386E-01,	2,4002955E-01,	2,4636243E-01,	DATA 419
933	455	1,9861167E-01,	1,4281362E-01,	8,1082779E-02,	1,5548462E-02,	DATA 420
934	456	-5,1890707E-02,	-1,1793358E-01,	-1,5069269E-01,	-2,3651049E-01,	DATA 421
935	457	-2,8144185E-01,	-3,1110537E-01,	-8,2144373E-01,	-8,8977373E-01,	DATA 422
936	458	-2,7886970E-01,	-2,2237967E-01,	-1,5426436E-01,	-7,7592395E-02,	DATA 423
937	459	1,6867940E-03,	7,8346573E-02,	1,4843708E-01,	2,8891445E-01,	DATA 424
938		DATA (BCHORN1), I#371, 721/				DATA 425
939	461	2,5760080E-03,	2,9298460E-01,	3,3412867E-01,	3,2067063E-01,	DATA 426
940	462	3,1873436E-03,	2,9112911E-01,	2,5707993E-01,	2,1227805E-01,	DATA 427
941	463	1,5867232E-01,	9,8439974E-02,	3,8847450E-02,	8,2743645E-02,	DATA 428
942	464	-8,8852675E-02,	-1,6180402E-01,	-8,3863061E-01,	-8,6611156E-01,	DATA 429
943	465	-3,0033538E-03,	-3,1300390E-01,	-8,1604616E-01,	-2,9294630E-01,	DATA 430
944	466	-2,4936411E-03,	-1,8039400E-01,	-1,1491178E-01,	-8,9049329E-02,	DATA 431
945	467	4,7832472E-02,	1,2065925E-01,	1,8710051E-01,	2,4160984E-01,	DATA 432
946	468	2,8230771E-01,	3,0820328E-01,	3,1902851E-01,	3,1510420E-01,	DATA 433
947	469	2,9723510E-01,	2,6661889E-01,	2,8077303E-01,	1,7347771E-01,	DATA 434
948		DATA (BCHORN1), I#73, 106/				DATA 435
949	471	1,1473874E-01,	9,8768768E-02,	-1,8016806E-02,	-8,2993907E-02,	DATA 436
950	472	-1,4732021E-01,	-2,8593471E-01,	-8,9559182E-01,	-8,9297302E-01,	DATA 437
951	473	-3,1492612E-01,	-3,1885917E-01,	-8,0324164E-01,	-2,8867335E-01,	DATA 438
952	474	-2,1814039E-01,	-1,4794202E-01,	-9,1298955E-02,	-9,2493815E-03,	DATA 439
953	475	8,8113694E-02,	1,6025243E-01,	2,2159898E-01,	2,4927841E-01,	DATA 440
954	476	3,1891847E-01,	3,1809418E-01,	3,1888809E-01,	3,8506670E-01,	DATA 441
955	477	2,7794072E-01,	2,3911399E-01,	1,9032197E-01,	1,8349821E-01,	DATA 442
956	478	7,0467019E-02,	3,6531419E-03,	-6,4461713E-02,	-1,8098089E-01,	DATA 443
957	479	-1,9269162E-01,	-2,4995912E-01,	-8,8731682E-01,	-8,8345201E-01,	DATA 444
958		DATA (BCHORN1), I#189, 144/				DATA 445
959	481	-3,2181316E-03,	-8,1163160E-01,	-8,8120998E-01,	-2,5396728E-01,	DATA 446
960	482	-1,2292038E-01,	-1,0002947E-01,	-8,1810326E-02,	-5,7129927E-02,	DATA 447
961	483	1,3219847E-01,	1,9890976E-01,	2,9323477E-01,	2,9284747E-01,	DATA 448
962	484	3,1623302E-01,	3,2317290E-01,	3,2443109E-01,	2,9144151E-01,	DATA 449
963	485	2,5899100E-01,	2,1000074E-01,	1,5538134E-01,	9,4062372E-02,	DATA 450



864	486	2,8064217E-02,	4,0359473E-02,	0,0897023E-01,	0,7343173E-01,	DATA 480
865	487	02,3130260E-01,	02,7821347E-01,	03,3028460E-01,	03,2439197E-01,	DATA 481
866	488	03,1862571E-01,	02,9310602E-01,	02,4956991E-01,	01,9115801E-01,	DATA 482
867	489	01,2184366E-01,	04,5998579E-02,	3,3932601E-02,	1,8797104E-01,	DATA 483
868		DATA (BCHMOON1), I:145,180, /				DATA 484
869	491	1,7674957E-01,	2,3570362E-01,	2,8133200E-01,	3,1147787E-01,	DATA 485
870	492	3,2812820E-01,	3,2243369E-01,	3,0432038E-01,	2,7316179E-01,	DATA 486
871	493	2,3043430E-01,	1,7840094E-01,	1,1929115E-01,	9,4911880E-02,	DATA 487
872	494	01,2638966E-02,	08,1093644E-02,	-1,4775283E-01,	02,8932423E-01,	DATA 488
873	495	02,6189968E-01,	03,0120024E-01,	03,2318196E-01,	03,2492632E-01,	DATA 489
874	496	03,0947775E-01,	02,6618126E-01,	02,1033280E-01,	01,4239898E-01,	DATA 490
875	497	06,7172054E-02,	1,0690673E-02,	8,6787100E-02,	1,8736130E-01,	DATA 491
876	498	2,1891738E-01,	2,6848487E-01,	3,0873779E-01,	3,2320422E-01,	DATA 492
877	499	3,2642783E-01,	3,1397956E-01,	2,8728560E-01,	2,4832893E-01,	DATA 493
878		DATA (BCHMOON1), I:181,216, /				DATA 494
879	501	1,9933592E-01,	1,4234339E-01,	8,8092309E-02,	1,4041676E-02,	DATA 495
880	502	05,3314930E-02,	01,2026500E-01,	0,8346927E-01,	02,3978049E-01,	DATA 496
881	503	02,8824414E-01,	03,1554762E-01,	08,2677677E-01,	03,1643618E-01,	DATA 497
882	504	02,8637660E-01,	02,3309389E-01,	01,0698063E-01,	09,1533062E-02,	DATA 498
883	505	01,2287319E-02,	0,5857960E-02,	1,8872841E-01,	2,8288037E-01,	DATA 499
884	506	2,5852478E-01,	2,9450480E-01,	3,2835610E-01,	7,2641088E-01,	DATA 490
885	507	3,1886468E-01,	2,9673558E-01,	2,6170039E-01,	2,1505928E-01,	DATA 491
886	508	1,6147755E-01,	1,0085252E-01,	3,6195797E-02,	08,9328403E-02,	DATA 492
887	509	09,4808649E-02,	01,5993076E-01,	02,1780137E-01,	02,0681623E-01,	DATA 493
888		DATA (BCHMOON1), I:217,252, /				DATA 494
889	511	03,0818469E-01,	03,2295753E-01,	03,2275315E-01,	09,8075816E-01,	DATA 495
890	512	02,5757438E-01,	01,9640777E-01,	01,2244998E-01,	04,1794160E-02,	DATA 496
891	513	3,9898302E-02,	1,1659763E-01,	1,8495873E-01,	2,4171098E-01,	DATA 497
892	514	2,8664710E-01,	3,1242583E-01,	3,2447222E-01,	3,2098063E-01,	DATA 498
893	515	3,0278997E-01,	2,7134821E-01,	2,8528378E-01,	1,8647256E-01,	DATA 499
894	516	1,1749139E-01,	9,3770179E-02,	01,2267920E-02,	07,8341217E-02,	DATA 490
895	517	01,4204220E-01,	02,0077469E-01,	02,9169917E-01,	02,9189647E-01,	DATA 491
896	518	03,1688720E-01,	03,2460098E-01,	00,1222203E-01,	02,7892759E-01,	DATA 492
897	519	02,2608074E-01,	01,5731734E-01,	07,8036796E-02,	5,2087254E-03,	DATA 493
898		DATA (BCHMOON1), I:253,288, /				DATA 494
899	521	3,7128634E-02,	1,6150071E-01,	2,2448028E-01,	2,7323896E-01,	DATA 495
900	522	3,0619717E-01,	3,2258923E-01,	3,2314336E-01,	3,2550571E-01,	DATA 496
901	523	2,8824818E-01,	2,4017682E-01,	1,9030355E-01,	1,8277113E-01,	DATA 497
902	524	0,9814970E-02,	3,7559217E-03,	06,2986648E-02,	01,2786968E-01,	DATA 498
903	525	01,8819837E-01,	02,4111127E-01,	02,8360806E-01,	03,1266310E-01,	DATA 499
904	526	03,2847070E-01,	03,1983598E-01,	02,9465198E-01,	02,9035106E-01,	DATA 490
905	527	01,6911326E-01,	01,1483743E-01,	03,2762049E-02,	5,1135168E-02,	DATA 491
906	528	1,3089970E-01,	2,0109306E-01,	2,9771712E-01,	2,9888901E-01,	DATA 492
907	529	3,2105629E-01,	3,2679897E-01,	3,1630097E-01,	2,9188907E-01,	DATA 493
908		DATA (BCHMOON1), I:289,324, /				DATA 494
909	531	2,5602560E-01,	2,8631376E-01,	1,5038735E-01,	8,8274863E-02,	DATA 495
910	532	2,2851150E-02,	04,5381222E-02,	01,1206893E-01,	01,7499746E-01,	DATA 496
911	533	02,3110787E-01,	02,7719744E-01,	05,1012583E-01,	03,2712894E-01,	DATA 497
912	534	03,2618677E-01,	03,0640374E-01,	02,6819278E-01,	02,1334686E-01,	DATA 498
913	535	01,4191643E-01,	06,7012784E-02,	1,9444341E-02,	9,7055348E-02,	DATA 499
914	536	1,1237991E-01,	2,3647683E-01,	2,8245848E-01,	3,1691478E-01,	DATA 500
915	537	3,3066664E-01,	3,2559439E-01,	3,0522049E-01,	2,7121734E-01,	DATA 501
916	538	2,2600335E-01,	1,7190980E-01,	1,1111634E-01,	4,8713502E-02,	DATA 502
917	539	03,2170927E-02,	09,0210199E-02,	01,5574172E-01,	02,1569240E-01,	DATA 503
918		DATA (BCHMOON1), I:325,360, /				DATA 504
919	541	02,5668746E-01,	03,0497883E-01,	03,2747222E-01,	03,3168175E-01,	DATA 505
920	542	03,1853229E-01,	02,8254139E-01,	02,3171339E-01,	01,6719012E-01,	DATA 506
921	543	09,2887397E-02,	01,5051475E-02,	06,9820032E-02,	1,4442249E-01,	DATA 507
922	544	2,1270938E-01,	2,6827441E-01,	3,0781636E-01,	3,2938149E-01,	DATA 508
923	545	3,3288922E-01,	3,1851689E-01,	2,8927297E-01,	2,4747333E-01,	DATA 509
924	546	1,9879682E-01,	1,8673462E-01,	7,2934935E-02,	9,2822396E-03,	DATA 510
925	547	06,2920361E-02,	01,2977797E-01,	01,9258234E-01,	02,4811211E-01,	DATA 511
926	548	02,9267800E-01,	03,2245662E-01,	03,3410981E-01,	03,2588275E-01,	DATA 512
927	549	02,9672411E-01,	02,4940556E-01,	01,6709903E-01,	01,1418839E-01,	DATA 513
928		DATA (BCHMOON1), I:361,366, /				DATA 514
929	551	03,2843988E-02,	04,4825543E-02,	1,2193739E-01,	1,9186956E-01,	DATA 515
930	552	2,9884176E-01,	2,9561453E-01,	3,2380723E-01,	3,8422747E-01,	DATA 516
931		DATA (BCHMOON1), I:10,36, /				DATA 516
932	561	9,6864833E-01,	9,6432617E-01,	9,8853314E-01,	9,7471180E-01,	DATA 517
933	562	9,8818435E-01,	9,9027228E-01,	9,9838860E-01,	9,8688901E-01,	DATA 518
934	563	6,1807909E-01,	6,1920488E-01,	6,2441808E-01,	6,2891972E-01,	DATA 519
935	564	6,3213807E-01,	6,3468338E-01,	6,3832785E-01,	6,4689238E-01,	DATA 520
936	565	6,3655073E-01,	6,3689562E-01,	6,3178789E-01,	6,2714867E-01,	DATA 521

937	566	6.2099149E 01	6.1338119E 01	6.8455970E 01	5.9494915E 01	DATA	522
938	567	5.8815155E 01	5.7591827E 01	5.8807885E 01	5.8242773E 01	DATA	523
939	568	5.8928564E 01	5.5987173E 01	5.8323543E 01	5.6926823E 01	DATA	524
940	569	5.7729677E 01	5.8651764E 01	5.9613125E 01	6.8544825E 01	DATA	525
941	DATA (RMOON I) I=18 37, 72, /					DATA	526
942	571	6.1891799E 01	6.2120303E 01	6.2710979E 01	6.3158717E 01	DATA	527
943	572	6.2868270E 01	6.3650067E 01	6.3716249E 01	6.3677358E 01	DATA	528
944	573	6.3840191E 01	6.3306759E 01	6.2974786E 01	6.2539479E 01	DATA	529
945	574	6.1996605E 01	6.1346352E 01	6.0897496E 01	5.9771359E 01	DATA	530
946	575	5.9904716E 01	5.8050511E 01	5.7273249E 01	5.6652810E 01	DATA	531
947	576	5.6851228E 01	5.6124658E 01	5.5296666E 01	5.4756431E 01	DATA	532
948	577	5.7459744E 01	5.9337630E 01	5.9308857E 01	6.0292373E 01	DATA	533
949	578	6.1217041E 01	6.2027277E 01	6.2685555E 01	6.3172812E 01	DATA	534
950	579	6.3482568E 01	6.3625082E 01	6.3616509E 01	6.3478828E 01	DATA	535
951	DATA (RMOON I) I=18 73, 108, /					DATA	536
952	581	6.3233960E 01	6.2903622E 01	6.2504057E 01	6.2046473E 01	DATA	537
953	582	6.1537204E 01	6.0979653E 01	6.0377436E 01	5.9738258E 01	DATA	538
954	583	5.9077990E 01	5.8423303E 01	5.7813595E 01	5.7298099E 01	DATA	539
955	584	5.6930784E 01	5.6761613E 01	5.6282672E 01	5.5137261E 01	DATA	540
956	585	5.7679228E 01	5.8410174E 01	5.9268016E 01	6.0180205E 01	DATA	541
957	586	6.1073693E 01	6.1883136E 01	6.2558466E 01	6.3087817E 01	DATA	542
958	587	6.3368258E 01	6.3484922E 01	6.3419025E 01	6.3193050E 01	DATA	543
959	588	6.2837417E 01	6.2388621E 01	6.2875432E 01	6.2338267E 01	DATA	544
960	589	6.0791434E 01	6.0261763E 01	5.9756917E 01	5.9282488E 01	DATA	545
961	DATA (RMOON I) I=18 109, 144, /					DATA	546
962	591	5.8842062E 01	5.8441717E 01	5.8092874E 01	5.7814418E 01	DATA	547
963	592	5.7631967E 01	5.7374438E 01	5.7668205E 01	5.7930217E 01	DATA	548
964	593	5.8361995E 01	5.8946294E 01	5.9647471E 01	6.0415352E 01	DATA	549
965	594	6.1191446E 01	6.1915917E 01	6.2533968E 01	6.3000815E 01	DATA	550
966	595	6.3285025E 01	6.3370324E 01	6.3256124E 01	6.2986924E 01	DATA	551
967	596	6.2806690E 01	6.1926244E 01	6.1279644E 01	6.0609685E 01	DATA	552
968	597	5.9962882E 01	5.9378615E 01	5.8885361E 01	5.8498878E 01	DATA	553
969	598	5.8222851E 01	5.8051878E 01	5.7976009E 01	5.7984977E 01	DATA	554
970	599	5.674453E 01	5.6242356E 01	5.6493055E 01	5.6831638E 01	DATA	555
971	DATA (RMOON I) I=18 145, 180, /					DATA	556
972	603	5.9260123E 01	5.9773222E 01	6.0355400E 01	6.0980006E 01	DATA	557
973	602	6.1618648E 01	6.2204441E 01	6.2716342E 01	6.3103795E 01	DATA	558
974	603	6.3331014E 01	6.3372574E 01	6.3216104E 01	6.2864053E 01	DATA	559
975	604	6.2834486E 01	6.1660734E 01	6.0839716E 01	6.0078603E 01	DATA	560
976	605	5.9289730E 01	5.8583928E 01	5.8013143E 01	5.7613742E 01	DATA	561
977	606	5.7402264E 01	5.7374935E 01	5.7311164E 01	5.7775751E 01	DATA	562
978	607	5.9147198E 01	5.8981940E 01	5.9060137E 01	5.9568637E 01	DATA	563
979	608	6.0888672E 01	6.0622741E 01	6.1160925E 01	6.1692630E 01	DATA	564
980	609	6.2801375E 01	6.2664777E 01	6.2805458E 01	6.2340067E 01	DATA	565
981	DATA (RMOON I) I=18 181, 216, /					DATA	566
982	611	6.490716E 01	6.3479982E 01	6.3288915E 01	6.2909511E 01	DATA	567
983	612	6.2347509E 01	6.1624389E 01	6.0778231E 01	5.9842918E 01	DATA	568
984	613	5.8949676E 01	5.8098311E 01	5.7394773E 01	5.6895012E 01	DATA	569
985	614	5.6638342E 01	5.6636557E 01	5.6873236E 01	5.7363957E 01	DATA	570
986	615	5.7890557E 01	5.8561410E 01	5.9269906E 01	5.9972504E 01	DATA	571
987	616	6.0448260E 01	6.1271629E 01	6.1836120E 01	6.2337143E 01	DATA	572
988	617	6.2171024E 01	6.3131965E 01	6.3740159E 01	6.4591361E 01	DATA	573
989	618	6.3657831E 01	6.3590402E 01	6.3371382E 01	6.2988131E 01	DATA	574
990	619	6.243685E 01	6.1726164E 01	6.0880013E 01	5.9939468E 01	DATA	575
991	DATA (RMOON I) I=18 217, 252, /					DATA	576
992	621	5.8962598E 01	5.8021553E 01	5.7196115E 01	5.6563657E 01	DATA	577
993	622	5.6186794E 01	5.6101721E 01	5.6311093E 01	5.6786170E 01	DATA	578
994	623	5.7664224E 01	5.8280427E 01	5.9160220E 01	6.0039064E 01	DATA	579
995	624	6.0866247E 01	6.1606868E 01	6.2240812E 01	6.2789840E 01	DATA	580
996	625	6.3163840E 01	6.3456903E 01	6.3643702E 01	6.3726715E 01	DATA	581
997	626	6.3704663E 01	6.3572289E 01	6.3321321E 01	6.2942689E 01	DATA	582
998	627	6.2429846E 01	6.1782726E 01	6.1011709E 01	6.0141108E 01	DATA	583
999	628	5.9211548E 01	5.8280277E 01	5.7418278E 01	5.6703387E 01	DATA	584
000	629	5.6209472E 01	5.5993364E 01	5.6082999E 01	5.6470859E 01	DATA	585
001	DATA (RMOON I) I=18 253, 288, /					DATA	586
002	631	5.7115285E 01	5.7949208E 01	5.8892984E 01	5.9867110E 01	DATA	587
003	632	6.0801875E 01	6.1643023E 01	6.2333801E 01	6.2914839E 01	DATA	588
004	633	6.3318611E 01	6.3971961E 01	6.4686260E 01	6.5369590E 01	DATA	589
005	634	6.3857592E 01	6.4341242E 01	6.48305070E 01	6.5264259E 01	DATA	590
006	635	6.2162487E 01	6.1595499E 01	6.0944079E 01	6.0218872E 01	DATA	591
007	636	5.9439210E 01	5.8641806E 01	5.7875318E 01	5.7200641E 01	DATA	592
008	637	5.6483785E 01	5.6388757E 01	5.6350792E 01	5.6596124E 01	DATA	593
009	638	5.7106807E 01	5.7837541E 01	5.8720807E 01	5.9678849E 01	DATA	594



610	639	6.0632466E 01,	6.1514867E 01,	6.2271951E 01,	6.2867486E 01/	DATA 595
611		DATA (RMOON (1)), I=287, J=24,				DATA 596
612	641	6.3282590E 01,	6.3514114E 01,	6.3571894E 01,	6.3472399E 01,	DATA 597
613	642	6.3249997E 01,	6.2923163E 01,	6.2520961E 01,	6.2065230E 01,	DATA 598
614	643	6.1871968E 01,	6.1051214E 01,	6.0508989E 01,	5.9948212E 01,	DATA 599
615	644	5.9376522E 01,	5.8806416E 01,	5.8260046E 01,	5.7770237E 01,	DATA 600
616	645	5.7378547E 01,	5.7130267E 01,	5.6966608E 01,	5.7215896E 01,	DATA 601
617	646	5.7884874E 01,	5.8156747E 01,	5.8890322E 01,	5.9726748E 01,	DATA 602
618	647	6.0397746E 01,	6.1434546E 01,	6.2175145E 01,	6.2769852E 01,	DATA 603
619	648	6.3184325E 01,	6.3400845E 01,	6.3418046E 01,	6.3249649E 01,	DATA 604
620	649	6.2921691E 01,	6.2468237E 01,	6.1931574E 01,	6.1352705E 01/	DATA 605
621		DATA (RMOON (1)), I=329, J=360,				DATA 606
622	651	6.0769801E 01,	6.0213831E 01,	5.9706171E 01,	5.9258178E 01,	DATA 607
623	652	5.8872918E 01,	5.8948732E 01,	5.8283733E 01,	5.8079998E 01,	DATA 608
624	653	5.7946203E 01,	5.7897870E 01,	5.7994419E 01,	5.8136328E 01,	DATA 609
625	654	5.6455098E 01,	5.6911701E 01,	5.9491081E 01,	6.0162132E 01,	DATA 610
626	655	6.0880355E 01,	6.1592826E 01,	6.2244213E 01,	6.2782671E 01,	DATA 611
627	656	6.3164832E 01,	6.3329558E 01,	6.3350383E 01,	6.3136858E 01,	DATA 612
628	657	6.2734692E 01,	6.2174812E 01,	6.1501105E 01,	6.0746807E 01,	DATA 613
629	658	6.0029451E 01,	5.9344685E 01,	5.8759749E 01,	5.8387900E 01,	DATA 614
630	659	5.8605177E 01,	5.7850526E 01,	5.7829311E 01,	5.8219192E 01/	DATA 615
631		DATA (RMOON (1)), I=361, J=368,				DATA 616
632	661	5.8096675E 01,	5.8342409E 01,	5.8644217E 01,	5.8997801E 01,	DATA 617
633	662	5.9401387E 01,	5.9857723E 01,	6.0363628E 01,	6.0909892E 01/	DATA 618
634		END				DATA 619

29748 WORDS OF MEMORY USED BY THIS COMPILATION

71054 02 12-03-72 11.626 1979 EPHEMERIS

PRERACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

PRIMARY SYMDEF ENTRY

TABLE 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1 EPMBLK 11

SYNREF

END OF BINARY CARD \*1979\*19  
4273 IS THE NEXT AVAILABLE LOCATION.  
GMAP VERSION/ASSEMBLY DATES JMPA 110171/102971 JMPB 110171/102971 JMPC 110171/102971  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19431 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

71054 02 12-03-72 11.837 1980 EPHEMERIS

1	C*1980*	1980 EPHEMERIS	DATA	1
2		SUBROUTINE TABLE	DATA	2
3		DIMENSION RASUN(369), DCSUN(369), RSUN(369)	DATA	3
4		DIMENSION RAMOON(369), DCMOON(369), RMOON(369)	DATA	4
5		DIMENSION ARRAY(2214)		
6		DOUBLE PRECISION V		
7		EQUIVALENCE (RASUN,ARRAY), (DCSUN,ARRAY(370)), (RSUN,ARRAY(739))		
8		EQUIVALENCE (RAMOON,ARRAY(1106)), (DCMOON,ARRAY(1477))		
9		EQUIVALENCE (RMOON,ARRAY(1846))		
10		COMMON EPMBLK/ V(4), I		
11		V(1) = ARRAY(1)		
12		V(2) = ARRAY(1+1)		2
13		V(3) = ARRAY(1+2)		3
14		V(4) = ARRAY(1+3)		4





88	82	2,9868855E 00,	3,0025479E 00,	3,0182051E 00,	3,6338887E 00,	DATA	78
89	83	3,0499098E 00,	3,0651599E 00,	3,0808102E 00,	3,8964622E 00,	DATA	79
90	84	3,1421175E 00,	3,1277776E 00,	3,1434440E 00,	3,2591187E 00,	DATA	80
91	85	3,1748036E 00,	3,1909008E 00,	3,2062122E 00,	3,2219396E 00,	DATA	81
92	86	3,2876846E 00,	3,2534488E 00,	3,2692341E 00,	3,2850415E 00,	DATA	82
93	87	3,3008724E 00,	3,3167281E 00,	3,3326099E 00,	3,3488192E 00,	DATA	83
94	88	3,3644972E 00,	3,3804252E 00,	3,3964246E 00,	3,4124563E 00,	DATA	84
95	89	3,4285218E 00,	3,4446221E 00,	3,4607585E 00,	3,4769321E 00,	DATA	85
96		DATA (RASUN (I), I#289,324)/					DATA 86
97	91	3,4931441E 00,	3,5093955E 00,	3,5256874E 00,	3,5420216E 00,	DATA	87
98	92	3,5983974E 00,	3,5748179E 00,	3,5912535E 00,	3,6077959E 00,	DATA	88
99	93	3,6243568E 00,	3,6409675E 00,	3,6576297E 00,	3,6743446E 00,	DATA	89
100	94	3,6911135E 00,	3,7079374E 00,	3,7248177E 00,	3,7417549E 00,	DATA	90
101	95	3,7587498E 00,	3,7758032E 00,	3,7929157E 00,	3,8100878E 00,	DATA	91
102	96	3,8273201E 00,	3,8446130E 00,	3,8619669E 00,	3,8793819E 00,	DATA	92
103	97	3,8968583E 00,	3,9143960E 00,	3,9319952E 00,	3,9496856E 00,	DATA	93
104	98	3,9673771E 00,	3,9851594E 00,	4,0030021E 00,	4,0209050E 00,	DATA	94
105	99	4,0388675E 00,	4,0568893E 00,	4,0749703E 00,	4,0931101E 00,	DATA	95
106		DATA (RASUN (I), I#325,360)/					DATA 96
107	101	4,1113087E 00,	4,1295688E 00,	4,1478809E 00,	4,1662538E 00,	DATA	97
108	102	4,1846840E 00,	4,2031706E 00,	4,2217132E 00,	4,2403105E 00,	DATA	98
109	103	4,2580614E 00,	4,2776648E 00,	4,2964194E 00,	4,3152239E 00,	DATA	99
110	104	4,3340768E 00,	4,3529763E 00,	4,3719208E 00,	4,3909084E 00,	DATA	100
111	105	4,4099370E 00,	4,4290046E 00,	4,4481090E 00,	4,4672478E 00,	DATA	101
112	106	4,4864187E 00,	4,5056190E 00,	4,5248463E 00,	4,5440981E 00,	DATA	102
113	107	4,5633718E 00,	4,5826651E 00,	4,6019754E 00,	4,6213006E 00,	DATA	103
114	108	4,6406386E 00,	4,6599873E 00,	4,6793442E 00,	4,6987072E 00,	DATA	104
115	109	4,7187743E 00,	4,7374431E 00,	4,7568116E 00,	4,7761774E 00,	DATA	105
116		DATA (RASUN (I), I#361,368)/					DATA 106
117	111	4,7955381E 00,	4,8148916E 00,	4,8342357E 00,	4,8535680E 00,	DATA	107
118	112	4,8728862E 00,	4,8921880E 00,	4,9114709E 00,	4,9307328E 00,	DATA	108
119		DATA (RCSUN (I), I# 1, 36)/					DATA 108
120	121	-4,0412086E-01,	-4,0289032E-01,	-4,0152566E-01,	-4,0002749E-01,	DATA	109
121	122	-3,9839657E-01,	-3,9663367E-01,	-3,9473968E-01,	-3,9271546E-01,	DATA	110
122	123	-3,9056194E-01,	-3,8828018E-01,	-3,8587128E-01,	-3,8333636E-01,	DATA	111
123	124	-3,8067662E-01,	-3,7789338E-01,	-3,7498799E-01,	-3,7196182E-01,	DATA	112
124	125	-3,6881636E-01,	-3,6553312E-01,	-3,6217369E-01,	-3,5867963E-01,	DATA	113
125	126	-3,5587257E-01,	-3,5139416E-01,	-3,4675260E-01,	-3,4359001E-01,	DATA	114
126	127	-3,3954775E-01,	-3,3540101E-01,	-3,3115164E-01,	-3,2680155E-01,	DATA	115
127	128	-3,2232546E-01,	-3,1780652E-01,	-3,1316938E-01,	-3,0843095E-01,	DATA	116
128	129	-3,0360517E-01,	-2,9868988E-01,	-2,9368703E-01,	-2,8859847E-01,	DATA	117
129		DATA (RCSUN (I), I# 37, 72)/					DATA 118
130	131	-2,8342618E-01,	-2,7817203E-01,	-2,7233798E-01,	-2,6742601E-01,	DATA	119
131	132	-2,6193807E-01,	-2,5637614E-01,	-2,5074228E-01,	-2,4503843E-01,	DATA	120
132	133	-2,3926676E-01,	-2,3342932E-01,	-2,2752828E-01,	-2,215649E-01,	DATA	121
133	134	-2,1554323E-01,	-2,0946355E-01,	-2,0332848E-01,	-1,9714017E-01,	DATA	122
134	135	-1,9090056E-01,	-1,8461173E-01,	-1,7827572E-01,	-1,7189456E-01,	DATA	123
135	136	-1,6947027E-01,	-1,5900480E-01,	-1,5250011E-01,	-1,45938067E-01,	DATA	124
136	137	-1,3276969E-01,	-1,2612700E-01,	-1,1945444E-01,	-1,1275883E-01,	DATA	125
137	138	-1,0402698E-01,	-9,9279716E-02,	-9,7501825E-02,	-9,5767104E-02,	DATA	126
138	139	-7,8893362E-02,	-7,2062413E-02,	-6,5216061E-02,	-5,8356198E-02,	DATA	127
139		DATA (RCSUN (I), I# 73, 108)/					DATA 128
140	141	-5,1484697E-02,	-4,4803425E-02,	-3,8714170E-02,	-3,2818898E-02,	DATA	128
141	142	-2,3919479E-02,	-1,7017785E-02,	-1,0115693E-02,	-3,2180130E-03,	DATA	130
142	143	3,6924069E-03,	1,0374724E-02,	1,8460019E-02,	2,4336570E-02,	DATA	131
143	144	3,1202604E-02,	3,8056381E-02,	4,4896183E-02,	5,1720843E-02,	DATA	132
144	145	5,8827207E-02,	6,5315141E-02,	7,2082268E-02,	7,8827750E-02,	DATA	133
145	146	8,5849220E-02,	9,2245338E-02,	9,8914513E-02,	1,0585517E-01,	DATA	134
146	147	1,1216574E-01,	1,1874459E-01,	1,2529012E-01,	1,3180067E-01,	DATA	135
147	148	1,3827458E-01,	1,4471018E-01,	1,5110389E-01,	1,5748983E-01,	DATA	136
148	149	1,6377039E-01,	1,7003585E-01,	1,7625494E-01,	1,8242475E-01,	DATA	137
149		DATA (RCSUN (I), I#809,144)/					DATA 138
150	151	1,8854472E-01,	1,9461275E-01,	2,0062708E-01,	2,0658604E-01,	DATA	139
151	152	2,1248799E-01,	2,1833128E-01,	2,2411428E-01,	2,2983542E-01,	DATA	140
152	153	2,3849316E-01,	2,4408597E-01,	2,4966123E-01,	2,55207081E-01,	DATA	141
153	154	2,8745987E-01,	2,9277806E-01,	2,9802394E-01,	2,7319406E-01,	DATA	142
154	155	2,7829299E-01,	2,8331329E-01,	2,8825594E-01,	2,9318233E-01,	DATA	143
155	156	2,9789993E-01,	3,0259915E-01,	3,0721450E-01,	3,1194445E-01,	DATA	144
156	157	3,1618755E-01,	3,2054238E-01,	3,2480758E-01,	3,2898163E-01,	DATA	145
157	158	3,3806319E-01,	3,3709084E-01,	3,4094312E-01,	3,4473868E-01,	DATA	146
158	159	3,4843626E-01,	3,5203449E-01,	3,5533212E-01,	3,5892794E-01,	DATA	147
159		DATA (RCSUN (I), I#145, 180)/					DATA 148
160	161	3,6222088E-01,	3,6540968E-01,	3,6849340E-01,	3,7147095E-01,	DATA	149



161	162	3.7434137E=01,	3.7710368E=01,	3.7973696E=01,	3.8230037E=01,	DATA 150
162	163	3.8473302E=01,	3.8702420E=01,	3.8926300E=01,	3.9138889E=01,	DATA 151
163	164	3.9234040E=01,	3.9520757E=01,	3.9895941E=01,	3.9895932E=01,	DATA 152
164	165	4.0114468E=01,	4.0151692E=01,	4.0280161E=01,	4.0398830E=01,	DATA 153
165	166	4.0911648E=01,	4.0594278E=01,	4.0672588E=01,	4.0744641E=01,	DATA 154
166	167	4.011711E=01,	4.0846772E=01,	4.0879612E=01,	4.0900816E=01,	DATA 155
167	168	4.0909785E=01,	4.0906717E=01,	4.0891618E=01,	4.0864499E=01,	DATA 156
168	169	4.0625385E=01,	4.0774290E=01,	4.0721249E=01,	4.0636295E=01,	DATA 157
169		DATA (BCSUM (I)),I=181(216)/				DATA 158 6
170	171	4.0849459E=01,	4.0450786E=01,	4.0340313E=01,	4.0218090E=01,	DATA 159
171	172	4.0084160E=01,	3.9938581E=01,	3.9781403E=01,	3.9612690E=01,	DATA 160
172	173	3.9432511E=01,	3.9240943E=01,	3.9038064E=01,	3.8823298E=01,	DATA 161
173	174	3.8998710E=01,	3.8362416E=01,	3.8115166E=01,	3.7887053E=01,	DATA 162
174	175	3.7988179E=01,	3.7308631E=01,	3.7018530E=01,	3.6717973E=01,	DATA 163
175	176	3.6407077E=01,	3.6085953E=01,	3.5754715E=01,	3.543488E=01,	DATA 164
176	177	3.5062391E=01,	3.4701551E=01,	3.4331095E=01,	3.3951255E=01,	DATA 165
177	178	3.3861883E=01,	3.3163318E=01,	3.2755683E=01,	3.2339074E=01,	DATA 166
178	179	3.1915616E=01,	3.1479439E=01,	3.1036669E=01,	3.0583446E=01,	DATA 167
179		DATA (BCSUM (I)),I=217(252)/				DATA 168 6
180	181	3.0125909E=01,	2.9658202E=01,	2.9182472E=01,	2.8698870E=01,	DATA 169
181	182	2.8207546E=01,	2.7708655E=01,	2.7202349E=01,	2.6683777E=01,	DATA 170
182	183	2.6168098E=01,	2.5640458E=01,	2.5106018E=01,	2.4564929E=01,	DATA 171
183	184	2.4017345E=01,	2.3463423E=01,	2.2903315E=01,	2.2337184E=01,	DATA 172
184	185	2.1765181E=01,	2.1187466E=01,	2.0604196E=01,	2.0013525E=01,	DATA 173
185	186	1.9421609E=01,	1.8822597E=01,	1.8218642E=01,	1.7609884E=01,	DATA 174
186	187	1.6996465E=01,	1.6378527E=01,	1.5756207E=01,	1.5129657E=01,	DATA 175
187	188	1.4499028E=01,	1.3864473E=01,	1.3226144E=01,	1.2584207E=01,	DATA 176
188	189	1.1938825E=01,	1.1290160E=01,	1.0638374E=01,	9.9836312E=02,	DATA 177
189		DATA (BCSUM (I)),I=253(289)/				DATA 178 6
190	191	9.3260936E=02,	8.6659252E=02,	8.0032914E=02,	7.3383561E=02,	DATA 179
191	192	6.6712844E=02,	6.0223417E=02,	5.3313940E=02,	4.6289070E=02,	DATA 180
192	193	3.9849483E=02,	3.3096846E=02,	2.6332865E=02,	1.9559178E=02,	DATA 181
193	194	1.2777434E=02,	5.9892663E=03,	5.0364399E=04,	7.5993316E=03,	DATA 182
194	195	1.4397803E=02,	2.1196048E=02,	2.7993081E=02,	3.4787328E=02,	DATA 183
195	196	4.1377199E=02,	4.8361071E=02,	5.5137349E=02,	6.1904232E=02,	DATA 184
196	197	6.8459973E=02,	7.5402796E=02,	8.2130942E=02,	8.8842615E=02,	DATA 185
197	198	9.5836007E=02,	1.0220931E=01,	1.0886069E=01,	1.1548829E=01,	DATA 186
198	199	1.2209027E=01,	1.2866473E=01,	1.3592098E=01,	1.4172863E=01,	DATA 187
199		DATA (BCSUM (I)),I=289(324)/				DATA 188 6
200	201	1.4820425E=01,	1.5464977E=01,	1.6105824E=01,	1.6742776E=01,	DATA 189
201	202	1.7375636E=01,	1.8004219E=01,	1.8628320E=01,	1.9247772E=01,	DATA 190
202	203	1.9862393E=01,	2.0472003E=01,	2.1076433E=01,	2.1673496E=01,	DATA 191
203	204	2.2690144E=01,	2.2856801E=01,	2.3438681E=01,	2.4014443E=01,	DATA 192
204	205	2.4883999E=01,	2.5146846E=01,	2.5703906E=01,	2.6252428E=01,	DATA 193
205	206	2.6794662E=01,	2.732992E=01,	2.7870165E=01,	2.8374731E=01,	DATA 194
206	207	2.888942E=01,	2.9392246E=01,	2.9887636E=01,	3.0374518E=01,	DATA 195
207	208	3.0852686E=01,	3.1321946E=01,	3.1782096E=01,	3.2232940E=01,	DATA 196
208	209	3.2674279E=01,	3.3109921E=01,	3.3527675E=01,	3.3939366E=01,	DATA 197
209		DATA (BCSUM (I)),I=325(360)/				DATA 198 6
210	211	3.4840819E=01,	3.4731869E=01,	3.4112336E=01,	3.3482078E=01,	DATA 199
211	212	3.5840926E=01,	3.6188725E=01,	3.6325322E=01,	3.680551E=01,	DATA 200
212	213	3.7164255E=01,	3.7466286E=01,	3.7756496E=01,	3.8034731E=01,	DATA 201
213	214	3.8300857E=01,	3.8554736E=01,	3.8796239E=01,	3.9025236E=01,	DATA 202
214	215	3.9241607E=01,	3.9445236E=01,	3.9630014E=01,	3.9813836E=01,	DATA 203
215	216	3.9978997E=01,	4.0130210E=01,	4.0268581E=01,	4.0393832E=01,	DATA 204
216	217	4.0505281E=01,	4.0603465E=01,	4.0688119E=01,	4.0759197E=01,	DATA 205
217	218	4.0916658E=01,	4.0860474E=01,	4.0890622E=01,	4.0907085E=01,	DATA 206
218	219	4.0909865E=01,	4.0898949E=01,	4.0874344E=01,	4.0834059E=01,	DATA 207
219		DATA (BCSUM (I)),I=361(368)/				DATA 208 6
220	221	4.0784105E=01,	4.0718501E=01,	4.0639277E=01,	4.0546466E=01,	DATA 209
221	222	4.0440109E=01,	4.0320259E=01,	4.0186971E=01,	4.0040315E=01,	DATA 210
222		DATA (BCSUM (I)),I=369(369)/				DATA 210 6
223	231	9.8394801E=01,	9.8392766E=01,	9.8391410E=01,	9.8390690E=01,	DATA 211
224	232	9.8390613E=01,	9.8391167E=01,	9.8392344E=01,	9.8394127E=01,	DATA 212
225	233	9.8396498E=01,	9.8399436E=01,	9.8402921E=01,	9.8406930E=01,	DATA 213
226	234	9.8411433E=01,	9.8419404E=01,	9.8421816E=01,	9.8427645E=01,	DATA 214
227	235	9.8433863E=01,	9.8440485E=01,	9.8447405E=01,	9.8454675E=01,	DATA 215
228	236	9.8462299E=01,	9.8470286E=01,	9.8478652E=01,	9.8487408E=01,	DATA 216
229	237	9.849659E=01,	9.8506252E=01,	9.8516358E=01,	9.8527012E=01,	DATA 217
230	238	9.8538202E=01,	9.8549944E=01,	9.8562254E=01,	9.8575149E=01,	DATA 218
231	239	9.8586622E=01,	9.8602673E=01,	9.861722E=01,	9.8632653E=01,	DATA 219
232		DATA (BCSUM (I)),I=37(72)/				DATA 220 6
233	241	9.8648163E=01,	9.8664393E=01,	9.8681123E=01,	9.8698329E=01,	DATA 221

234	242	9.8715992E-01	9.8734048E-01	9.8752496E-01	9.8771305E-01	DATA	222
235	243	9.8790429E-01	9.8809836E-01	9.8829498E-01	9.8849366E-01	DATA	223
236	244	9.8869453E-01	9.8889755E-01	9.8910274E-01	9.8930998E-01	DATA	224
237	245	9.8951963E-01	9.8973195E-01	9.8994721E-01	9.9016574E-01	DATA	225
238	246	9.9038770E-01	9.9061321E-01	9.9084249E-01	9.9107375E-01	DATA	226
239	247	9.9155378E-01	9.9179870E-01	9.9204750E-01	9.9230080E-01	DATA	227
240	248	9.9255615E-01	9.9281566E-01	9.9307640E-01	9.9334408E-01	DATA	228
241	249	9.9361235E-01	9.9388293E-01	9.9415561E-01	9.9442985E-01	DATA	229
242		DATA (RSUN (I)) / (73.108) /				DATA	230
243	251	9.9470526E-01	9.9498145E-01	9.9525799E-01	9.9553471E-01	DATA	231
244	252	9.9581145E-01	9.9608806E-01	9.9636423E-01	9.9664029E-01	DATA	232
245	253	9.9691643E-01	9.9719284E-01	9.9746983E-01	9.9774750E-01	DATA	233
246	254	9.9802605E-01	9.9830568E-01	9.9858664E-01	9.9886893E-01	DATA	234
247	255	9.9915263E-01	9.9943778E-01	9.9972440E-01	1.0000224E 00	DATA	235
248	256	1.0003018E 00	1.0005924E 00	1.0008841E 00	1.0011766E 00	DATA	236
249	257	1.0014698E 00	1.0017632E 00	1.0020568E 00	1.0023501E 00	DATA	237
250	258	1.0026426E 00	1.0029339E 00	1.0032256E 00	1.0035114E 00	DATA	238
251	259	1.0037970E 00	1.0040802E 00	1.0043604E 00	1.0046380E 00	DATA	239
252		DATA (RSUN (I)) / (109.144) /				DATA	240
253	261	1.0049131E 00	1.0051857E 00	1.0054560E 00	1.0057242E 00	DATA	241
254	262	1.0059904E 00	1.0062550E 00	1.0065182E 00	1.0067801E 00	DATA	242
255	263	1.0070407E 00	1.0073003E 00	1.0075588E 00	1.0078164E 00	DATA	243
256	264	1.0080730E 00	1.0083286E 00	1.0085832E 00	1.0088367E 00	DATA	244
257	265	1.0090888E 00	1.0093394E 00	1.0095883E 00	1.0098350E 00	DATA	245
258	266	1.0100793E 00	1.0103207E 00	1.0105589E 00	1.0107935E 00	DATA	246
259	267	1.0110241E 00	1.0112504E 00	1.0114719E 00	1.0116887E 00	DATA	247
260	268	1.0119009E 00	1.0121084E 00	1.0123113E 00	1.0125090E 00	DATA	248
261	269	1.0127040E 00	1.0128943E 00	1.0130808E 00	1.0132637E 00	DATA	249
262		DATA (RSUN (I)) / (145.180) /				DATA	250
263	271	1.0134433E 00	1.0136196E 00	1.0137928E 00	1.0139631E 00	DATA	251
264	272	1.0141306E 00	1.0142994E 00	1.0144575E 00	1.0146169E 00	DATA	252
265	273	1.0147735E 00	1.0149273E 00	1.0150781E 00	1.0152257E 00	DATA	253
266	274	1.0153697E 00	1.0155097E 00	1.0156458E 00	1.0157768E 00	DATA	254
267	275	1.0159031E 00	1.0160240E 00	1.0161391E 00	1.0162485E 00	DATA	255
268	276	1.0163520E 00	1.0164495E 00	1.0165411E 00	1.0166268E 00	DATA	256
269	277	1.0167048E 00	1.0167814E 00	1.0168508E 00	1.0169151E 00	DATA	257
270	278	1.0169746E 00	1.0170296E 00	1.0170802E 00	1.0171266E 00	DATA	258
271	279	1.0171691E 00	1.0172079E 00	1.0172431E 00	1.0172748E 00	DATA	259
272		DATA (RSUN (I)) / (181.216) /				DATA	260
273	281	1.0173031E 00	1.0173280E 00	1.0173496E 00	1.0173676E 00	DATA	261
274	282	1.0173819E 00	1.0173920E 00	1.0173979E 00	1.0173990E 00	DATA	262
275	283	1.0173952E 00	1.0173860E 00	1.0173711E 00	1.0173503E 00	DATA	263
276	284	1.0173235E 00	1.0172906E 00	1.0172515E 00	1.0172062E 00	DATA	264
277	285	1.0171550E 00	1.0170980E 00	1.0170353E 00	1.0169671E 00	DATA	265
278	286	1.0168938E 00	1.0168155E 00	1.0167325E 00	1.0166451E 00	DATA	266
279	287	1.0165535E 00	1.0164580E 00	1.0163589E 00	1.0162564E 00	DATA	267
280	288	1.0161507E 00	1.0160420E 00	1.0159303E 00	1.0158160E 00	DATA	268
281	289	1.0156964E 00	1.0155775E 00	1.0154532E 00	1.0153253E 00	DATA	269
282		DATA (RSUN (I)) / (217.252) /				DATA	270
283	291	1.0151933E 00	1.0150569E 00	1.0149158E 00	1.0147699E 00	DATA	271
284	292	1.0146189E 00	1.0144628E 00	1.0143013E 00	1.0141345E 00	DATA	272
285	293	1.0139626E 00	1.0137854E 00	1.0136036E 00	1.0134169E 00	DATA	273
286	294	1.0132255E 00	1.0130299E 00	1.0128302E 00	1.0126267E 00	DATA	274
287	295	1.0124197E 00	1.0122096E 00	1.0119966E 00	1.0117821E 00	DATA	275
288	296	1.0115634E 00	1.0113438E 00	1.0111228E 00	1.0109001E 00	DATA	276
289	297	1.0106758E 00	1.0104499E 00	1.0102225E 00	1.0100993E 00	DATA	277
290	298	1.0097618E 00	1.0095279E 00	1.0092912E 00	1.0090516E 00	DATA	278
291	299	1.0088009E 00	1.0085630E 00	1.0083136E 00	1.0080607E 00	DATA	279
292		DATA (RSUN (I)) / (253.288) /				DATA	280
293	301	1.0078044E 00	1.0075447E 00	1.0072817E 00	1.0070155E 00	DATA	281
294	302	1.00667464E 00	1.0064744E 00	1.0061998E 00	1.0059230E 00	DATA	282
295	303	1.0056441E 00	1.0053637E 00	1.0050817E 00	1.0047980E 00	DATA	283
296	304	1.0045154E 00	1.0042318E 00	1.0039465E 00	1.0036654E 00	DATA	284
297	305	1.0033829E 00	1.0031010E 00	1.0028201E 00	1.0025394E 00	DATA	285
298	306	1.0022396E 00	1.0019796E 00	1.0016995E 00	1.0014191E 00	DATA	286
299	307	1.0011138E 00	1.0008566E 00	1.0005740E 00	1.0002905E 00	DATA	287
300	308	1.0000040E 00	9.9972054E-01	9.9943402E-01	9.9914657E-01	DATA	288
301	309	9.9889330E-01	9.9858934E-01	9.9827984E-01	9.9796900E-01	DATA	289
302		DATA (RSUN (I)) / (289.324) /				DATA	290
303	311	9.9770026E-01	9.9741074E-01	9.9712166E-01	9.9683356E-01	DATA	291
304	312	9.9684692E-01	9.9656183E-01	9.9627901E-01	9.9599864E-01	DATA	292
305	313	9.9584210E-01	9.9556335E-01	9.9528751E-01	9.9499702E-01	DATA	293
306	314	9.9484194E-01	9.9457973E-01	9.9432025E-01	9.9395326E-01	DATA	294



807	315	9.9330857E=01,	9.9305598E=01,	9.9281518E=01,	9.9255612E=01,	DATA 295
808	316	9.9230869E=01,	9.9206282E=01,	9.9181841E=01,	9.9157546E=01,	DATA 296
809	317	9.9133400E=01,	9.9109408E=01,	9.9085572E=01,	9.9061915E=01,	DATA 297
810	318	9.9038453E=01,	9.9015206E=01,	9.8992191E=01,	9.8969451E=01,	DATA 298
811	319	9.8947021E=01,	9.8924942E=01,	9.8903243E=01,	9.8881966E=01,	DATA 299
812		DATA (RSUN (I)) I=432, 360, /				DATA 300
813	321	9.8861146E=01,	9.8840816E=01,	9.8821025E=01,	9.8801757E=01,	DATA 301
814	322	9.8763012E=01,	9.8744784E=01,	9.8747072E=01,	9.8729855E=01,	DATA 302
815	323	9.8713107E=01,	9.8696807E=01,	9.8680922E=01,	9.8665443E=01,	DATA 303
816	324	9.8650351E=01,	9.8635630E=01,	9.8621263E=01,	9.8607241E=01,	DATA 304
817	325	9.8593555E=01,	9.8580196E=01,	9.8567161E=01,	9.8554455E=01,	DATA 305
818	326	9.8542086E=01,	9.8530067E=01,	9.8518396E=01,	9.8507113E=01,	DATA 306
819	327	9.8496268E=01,	9.8485629E=01,	9.8475882E=01,	9.8466451E=01,	DATA 307
820	328	9.8457570E=01,	9.8449272E=01,	9.8441608E=01,	9.8434570E=01,	DATA 308
821	329	9.8426171E=01,	9.8422412E=01,	9.8417319E=01,	9.8412833E=01,	DATA 309
822		DATA (RSUN (I)) I=361, 360, /				DATA 310
823	331	9.8408967E=01,	9.8405686E=01,	9.8402964E=01,	9.8400781E=01,	DATA 311
824	332	9.8399117E=01,	9.8397945E=01,	9.8397244E=01,	9.8396991E=01,	DATA 312
825		DATA (RAMOON(I)) I=31, 30, /				DATA 312
826	341	1.2034019E 00,	1.4450900E 00,	1.6859133E 00,	1.9226973E 00,	DATA 313
827	342	2.1826698E 00,	2.3741679E 00,	2.5869114E 00,	2.7918067E 00,	DATA 314
828	343	2.9910392E 00,	3.1869549E 00,	3.3826104E 00,	3.5811913E 00,	DATA 315
829	344	3.7859192E 00,	3.9998077E 00,	4.2252609E 00,	4.4634818E 00,	DATA 316
830	345	4.7132091E 00,	4.9733418E 00,	5.2373462E 00,	5.5062286E 00,	DATA 317
831	346	5.7886334E 00,	6.094737E 00,	6.4230233E 00,	6.7644638E 01,	DATA 318
832	347	4.4804302E=01,	6.7540625E=01,	9.0957569E=01,	1.1454140E 00,	DATA 319
833	348	1.3025647E 00,	1.6195010E 00,	1.8539283E 00,	2.0834303E 00,	DATA 320
834	349	2.3061439E 00,	2.5211913E 00,	2.7287944E 00,	2.9301423E 00,	DATA 321
835		DATA (RAMOON(I)) I=37, 72, /				DATA 322
836	351	3.1271577E 00,	3.3222669E 00,	3.5182181E 00,	3.7179327E 00,	DATA 323
837	352	3.9243406E 00,	4.1401308E 00,	4.3673569E 00,	4.6068924E 00,	DATA 324
838	353	4.8878799E 00,	5.1175082E 00,	5.3814833E 00,	5.6451994E 00,	DATA 325
839	354	5.9050665E 00,	6.1592894E 00,	6.4266844E=01,	6.6876634E=01,	DATA 326
840	355	6.1005447E=01,	8.4999383E=01,	1.0893730E 00,	1.3280631E 00,	DATA 327
841	356	1.5650430E 00,	1.7986977E 00,	2.0722887E 00,	2.4645822E 00,	DATA 328
842	357	2.6828301E 00,	2.9751641E 00,	3.2731470E 00,	3.2687749E 00,	DATA 329
843	358	3.4643271E 00,	3.6622390E 00,	3.8649752E 00,	4.0748594E 00,	DATA 330
844	359	4.2938255E 00,	4.5230758E 00,	4.7626932E 00,	5.0113927E 00,	DATA 331
845		DATA (RAMOON(I)) I=73, 108, /				DATA 332
846	361	5.2666133E 00,	5.5250941E 00,	5.7837616E 00,	6.0405191E 00,	DATA 333
847	362	1.1378558E=02,	2.6299560E=01,	5.1300663E=01,	7.6213831E=01,	DATA 334
848	363	1.0104988E 00,	1.2573450E 00,	1.5011662E 00,	1.7400872E 00,	DATA 335
849	364	1.9722816E 00,	2.1967168E 00,	2.4130907E 00,	2.6219781E 00,	DATA 336
850	365	2.8246453E 00,	3.0228475E 00,	3.2186447E 00,	3.4142854E 00,	DATA 337
851	366	3.6119387E 00,	3.8138749E 00,	4.0220179E 00,	4.2378944E 00,	DATA 338
852	367	4.4623585E 00,	4.6953561E 00,	4.9338176E 00,	5.1818092E 00,	DATA 339
853	368	5.4309906E 00,	5.6812506E 00,	5.9312620E 00,	6.1807835E 00,	DATA 340
854	369	1.4703169E=01,	3.9756894E=01,	6.4997207E=01,	9.0425859E=01,	DATA 341
855		DATA (RAMOON(I)) I=109, 144, /				DATA 342
856	371	1.1992419E 00,	1.4125588E 00,	1.6511992E 00,	1.9023893E 00,	DATA 343
857	372	2.1340874E 00,	2.3558420E 00,	2.5882347E 00,	2.8728823E 00,	DATA 344
858	373	2.9717923E 00,	3.1679802E 00,	3.3862771E 00,	3.5990049E 00,	DATA 345
859	374	3.7613519E 00,	3.9691443E 00,	4.1847501E 00,	4.4088093E 00,	DATA 346
860	375	4.6409063E 00,	4.8755294E 00,	5.1223465E 00,	5.3667982E 00,	DATA 347
861	376	5.6106137E 00,	5.8533567E 00,	6.0946100E 00,	6.2667036E 00,	DATA 348
862	377	2.9352313E=01,	5.4194961E=01,	7.9293516E=01,	1.0481476E 00,	DATA 349
863	378	1.3055230E 00,	1.5615172E 00,	1.8120213E 00,	2.0535591E 00,	DATA 350
864	379	2.2841600E 00,	2.5036047E 00,	2.7131301E 00,	2.9149801E 00,	DATA 351
865		DATA (RAMOON(I)) I=145, 180, /				DATA 352
866	381	3.1818138E 00,	3.3066947E 00,	3.5025882E 00,	3.7023538E 00,	DATA 353
867	382	3.9085337E 00,	4.1230927E 00,	4.3470728E 00,	4.5802388E 00,	DATA 354
868	383	4.809020E 00,	5.0661532E 00,	5.3125796E 00,	5.5972351E 00,	DATA 355
869	384	5.7684313E 00,	6.0360481E 00,	6.2713594E 00,	6.2337527E=01,	DATA 356
870	385	4.6097847E=01,	7.0314071E=01,	9.0956699E=01,	1.2038355E 00,	DATA 357
871	386	1.4892506E 00,	1.7131669E 00,	1.9611655E 00,	2.1997383E 00,	DATA 358
872	387	2.4271214E 00,	2.6434088E 00,	2.8901638E 00,	3.0498903E 00,	DATA 359
873	388	3.225929E 00,	3.4404813E 00,	3.6377759E 00,	3.8465335E 00,	DATA 360
874	389	4.0814120E 00,	4.2723144E 00,	4.5039246E 00,	4.7452793E 00,	DATA 361
875		DATA (RAMOON(I)) I=181, 216, /				DATA 362
876	391	4.9936730E 00,	5.2451789E 00,	5.4957262E 00,	5.7423014E 00,	DATA 363
877	392	5.9636373E 00,	6.2202597E 00,	6.9085464E=01,	4.8436910E=01,	DATA 364
878	393	6.4022870E=01,	8.8041467E=01,	1.1255462E 00,	1.3749198E 00,	DATA 365
879	394	1.6254857E 00,	1.0734650E 00,	2.3149610E 00,	2.3471818E 00,	DATA 366



880	395	2.5680750E 00	2.7806062E 00	2.9840749E 00	3.1818113E 00	DATA 367
881	396	3.3767845E 00	3.5721588E 00	3.7711184E 00	3.9766816E 00	DATA 368
882	397	4.1814279E 00	4.4170838E 00	4.6540076E 00	4.9007670E 00	DATA 369
883	398	5.1941554E 00	5.4099034E 00	5.6639146E 00	5.9134279E 00	DATA 370
884	399	5.1575569E 00	5.4394020E 01	5.6089558E 01	5.8759948E 01	DATA 371
885		DATA (RAMOON1) I#217252 /				DATA 372
886	401	8.2614824E 01	1.0677697E 00	1.3123658E 00	1.5583809E 00	DATA 373
887	402	1.8029492E 00	2.0429397E 00	2.2755649E 00	2.4992103E 00	DATA 374
888	403	2.7136348E 00	2.9198178E 00	3.2196315E 00	3.2155137E 00	DATA 375
889	404	3.5302179E 00	3.7066351E 00	3.9076419E 00	4.2159112E 00	DATA 376
890	405	4.3336279E 00	4.5620884E 00	4.8012944E 00	5.0494711E 00	DATA 377
891	406	5.3036381E 00	5.5599682E 00	5.8150808E 00	6.0668983E 00	DATA 378
892	407	3.1767712E 02	2.7691761E 01	3.2073021E 01	7.6478494E 01	DATA 379
893	408	1.0100500E 00	1.2564422E 00	1.5026869E 00	1.7465670E 00	DATA 380
894	409	1.9855176E 00	2.2173387E 00	2.4407231E 00	2.6554803E 00	DATA 381
895		DATA (RAMOON1) I#253,288 /				DATA 382
896	411	2.8624215E 00	3.0631237E 00	3.2596626E 00	3.4543986E 00	DATA 383
897	412	3.6498183E 00	3.8484063E 00	4.0525052E 00	4.2641856E 00	DATA 384
898	413	4.4846850E 00	4.7147037E 00	4.9535637E 00	5.1995004E 00	DATA 385
899	414	5.4499661E 00	5.7023214E 00	5.9545786E 00	6.2058885E 00	DATA 386
900	415	1.7320903E 01	4.23919.3E 01	6.75813.18E 01	9.2929073E 01	DATA 387
901	416	1.1836747E 00	1.4370926E 00	1.6868399E 00	1.9311064E 00	DATA 388
902	417	2.1447395E 00	2.3897145E 00	2.6052088E 00	2.8123851E 00	DATA 389
903	418	3.0130742E 00	3.2094842E 00	3.4039858E 00	3.5989624E 00	DATA 390
904	419	3.7966914E 00	3.9992202E 00	4.2082100E 00	4.4247431E 00	DATA 391
905		DATA (RAMOON1) I#2897324 /				DATA 392
906	421	4.6491288E 00	4.8007908E 00	5.1183435E 00	5.3599213E 00	DATA 393
907	422	5.6037051E 00	5.8484625E 00	6.0938889E 00	6.3439789E 00	DATA 394
908	423	3.0675981E 01	5.5999369E 01	8.3779092E 01	1.3794193E 02	DATA 395
909	424	1.3624215E 00	1.6029521E 00	1.8567964E 00	2.1065902E 00	DATA 396
910	425	2.3326142E 00	2.5529041E 00	2.7628735E 00	2.9647924E 00	DATA 397
911	426	3.1613471E 00	3.3893409E 00	3.5495095E 00	3.7463849E 00	DATA 398
912	427	3.9481563E 00	4.1564926E 00	4.3723276E 00	4.5958623E 00	DATA 399
913	428	4.8254936E 00	5.0599897E 00	5.2969525E 00	5.5344483E 00	DATA 400
914	429	5.7713776E 00	6.0077844E 00	6.2448392E 00	6.5135789E 01	DATA 401
915		DATA (RAMOON1) I#329,340 /				DATA 402
916	431	4.4602764E 01	6.9758309E 01	9.5668053E 01	1.2219066E 02	DATA 403
917	432	1.4895051E 00	1.7541022E 00	2.0103089E 00	2.2543340E 00	DATA 404
918	433	2.4447470E 00	2.7022762E 00	2.9091205E 00	3.1082556E 00	DATA 405
919	434	3.3029441E 00	3.4964454E 00	3.6918391E 00	3.8913709E 00	DATA 406
920	435	4.0987526E 00	4.3138880E 00	4.5375658E 00	4.7687850E 00	DATA 407
921	436	5.0051974E 00	5.2439252E 00	5.4820929E 00	5.7177959E 00	DATA 408
922	437	5.9505491E 00	6.1813245E 00	1.2907021E 01	3.6207045E 01	DATA 409
923	438	6.0272591E 01	8.5053887E 01	1.1070348E 02	1.3704709E 02	DATA 410
924	439	1.6365775E 00	1.8995069E 00	2.1536439E 00	2.3952482E 00	DATA 411
925		DATA (RAMOON1) I#361,368 /				DATA 412
926	441	2.6232069E 00	2.8384908E 00	3.0435872E 00	3.2416928E 00	DATA 413
927	442	3.4362612E 00	3.6307298E 00	3.8283423E 00	4.0319654E 00	DATA 414
928		DATA (RAMOON1) I# 1, 36 /				DATA 414
929	451	2.9561453E 01	3.2380723E 01	3.3422747E 01	3.2704121E 01	DATA 415
930	452	3.0366341E 01	2.6639482E 01	2.1795955E 01	1.6111394E 01	DATA 416
931	453	9.8418921E 02	3.2183734E 02	8.5458678E 02	8.8239141E 02	DATA 417
932	454	-1.6630999E 01	-2.2452109E 01	-2.7381255E 01	-3.1050301E 01	DATA 418
933	455	3.3679984E 01	3.3152093E 01	3.1101553E 01	2.6986930E 01	DATA 419
934	456	-2.1098330E 01	-1.3898027E 01	-8.9290614E 02	2.2684420E 02	DATA 420
935	457	1.0190491E 01	1.7417131E 01	2.8584270E 01	2.8399128E 01	DATA 421
936	458	3.1644928E 01	3.3195697E 01	3.8030066E 01	3.2233885E 01	DATA 422
937	459	2.7981742E 01	2.3513674E 01	1.80966031E 02	1.8997326E 01	DATA 423
938		DATA (RAMOON1) I# 37, 72 /				DATA 424
939	461	5.4716952E 02	-1.2452921E 02	-7.9310874E 02	-1.4343804E 01	DATA 425
940	462	-2.0306135E 01	-2.5489629E 01	-2.9605885E 01	-3.2314524E 01	DATA 426
941	463	-3.3279098E 01	-3.2234980E 01	-2.9074314E 01	-2.8913051E 01	DATA 427
942	464	-1.7096382E 01	-9.1547945E 02	-7.0147119E 03	7.6558104E 02	DATA 428
943	465	1.5378127E 01	2.2033776E 01	2.7300693E 01	3.8967038E 01	DATA 429
944	466	3.2925906E 01	3.3169814E 01	3.3781373E 01	2.4789062E 01	DATA 430
945	467	1.9637744E 01	1.3718277E 01	7.2649324E 02	5.8584837E 03	DATA 431
946	468	-6.1417454E 02	-1.2659440E 01	-1.8728297E 01	-2.4096094E 01	DATA 432
947	469	-2.8491532E 01	-3.1625244E 01	-3.3205334E 01	-3.2973142E 01	DATA 433
948		DATA (RAMOON1) I# 73, 108 /				DATA 434
949	471	-3.0758103E 01	-2.6538850E 01	-2.0488218E 01	-1.2981501E 01	DATA 435
950	472	-4.5603610E 02	4.1388646E 02	1.2472088E 01	1.9846689E 01	DATA 436
951	473	2.5876675E 01	3.0209119E 01	3.2729231E 01	3.8423090E 01	DATA 437
952	474	3.2408427E 01	2.9860682E 01	2.5001403E 01	2.3070843E 01	DATA 438

453	475	1.5311191E-01	8.9656836E-02	2.2734718E-02	64.5249810E-02	DATA	439
454	476	-1.1184911E-01	-1.7451660E-01	-2.8062942E-01	-2.2743820E-01	DATA	440
455	477	-3.1219334E-01	-3.3225226E-01	-8.3535283E-01	-8.1994108E-01	DATA	441
456	478	-2.8836094E-01	-2.3308986E-01	-1.6496138E-01	-8.5123563E-02	DATA	442
457	479	1.1671416E-03	8.7705264E-02	1.6839193E-01	2.8721511E-01	DATA	443
458		DATA (BCMOON(I), I) = 101897144 /				DATA	444
459	481	2.8978460E-01	3.2342091E-01	3.8703878E-01	3.8248189E-01	DATA	445
460	482	3.1080820E-03	2.7492812E-01	2.2756734E-01	1.7134384E-01	DATA	446
461	483	1.0869933E-01	4.1944621E-02	-2.6639882E-02	-9.4693611E-02	DATA	447
462	484	-1.5968748E-01	-2.1888333E-01	-2.8936538E-01	-3.8816740E-01	DATA	448
463	485	-3.3250682E-01	-3.4010509E-01	-3.2952793E-01	-3.8044883E-01	DATA	449
464	486	-2.5376579E-01	-1.9137479E-01	-1.1706825E-01	-3.4420894E-02	DATA	450
465	487	5.1345397E-02	1.3459515E-01	2.8950655E-01	2.7071986E-01	DATA	451
466	488	3.1609955E-01	3.3736300E-01	3.4030248E-01	3.2469101E-01	DATA	452
467	489	2.9263049E-01	2.4785261E-01	1.9321723E-01	1.8148082E-01	DATA	453
468		DATA (BCMOON(I), I) = 149180 /				DATA	454
469	491	6.5083017E-02	-3.7384405E-03	-7.2778611E-02	-1.3969418E-01	DATA	455
470	492	-2.0187122E-01	-2.5637502E-01	-3.8003178E-01	-3.2968230E-01	DATA	456
471	493	-3.4260333E-01	-3.3700110E-01	-8.3240272E-01	-2.6978572E-01	DATA	457
472	494	-2.1142205E-01	-1.4056519E-01	-6.1191888E-02	-2.2388034E-02	DATA	458
473	495	1.0523786E-01	1.8232220E-01	2.4838384E-01	2.9948363E-01	DATA	459
474	496	3.3166223E-01	3.4352918E-01	3.3547568E-01	3.8956822E-01	DATA	460
475	497	2.6888038E-01	2.1679009E-01	1.5649197E-01	9.8791336E-02	DATA	461
476	498	2.2119292E-02	-4.7322544E-02	-4.1536210E-01	-1.7965389E-01	DATA	462
477	499	-2.3751988E-01	-2.8589405E-01	-3.2144596E-01	-3.4094651E-01	DATA	463
478		DATA (BCMOON(I), I) = 181216 /				DATA	464
479	501	-3.4185436E-01	-3.2295128E-01	-2.8474936E-01	-2.2947155E-01	DATA	465
480	502	-1.6065252E-01	-8.2598754E-02	5.8986326E-05	8.2613407E-02	DATA	466
481	503	1.6041755E-01	2.2896150E-01	2.8408507E-01	3.2235179E-01	DATA	467
482	504	3.4153794E-01	3.4103238E-01	3.2190990E-01	2.8639849E-01	DATA	468
483	505	2.3827941E-01	1.8032265E-01	1.8587306E-01	4.7700016E-02	DATA	469
484	506	-2.1779161E-02	-9.0360178E-02	-1.8585928E-01	-2.1591368E-01	DATA	470
485	507	-2.6782637E-01	-3.0832145E-01	-2.8374023E-01	-3.6328503E-01	DATA	471
486	508	-3.3206964E-01	-3.0044303E-01	-2.4977987E-01	-1.8333516E-01	DATA	472
487	509	-1.0870293E-01	-2.2123013E-02	6.2101129E-02	1.4196487E-01	DATA	473
488		DATA (BCMOON(I), I) = 217252 /				DATA	474
489	511	2.1294565E-01	2.7112290E-01	3.3333954E-01	3.3744970E-01	DATA	475
490	512	3.4257494E-01	3.2922783E-01	2.9918578E-01	2.5513221E-01	DATA	476
491	513	2.0019973E-01	1.3757067E-01	7.0223604E-02	8.3717790E-04	DATA	477
492	514	-6.8180372E-02	-1.3457957E-01	-1.9611601E-01	-2.5039265E-01	DATA	478
493	515	-2.9474582E-01	-3.2624239E-01	-3.4186972E-01	-3.3897441E-01	DATA	479
494	516	-3.1390451E-01	-2.7265758E-01	-2.1125168E-01	-1.8563195E-01	DATA	480
495	517	-5.1147354E-02	3.6189849E-02	1.2042027E-01	1.9617836E-01	DATA	481
496	518	2.5903201E-01	3.0567951E-01	3.3407047E-01	3.4346638E-01	DATA	482
497	519	3.3439690E-01	3.0847697E-01	2.6810508E-01	2.1612164E-01	DATA	483
498		DATA (BCMOON(I), I) = 253288 /				DATA	484
499	521	1.5821277E-01	8.9206168E-02	1.9965439E-02	4.9533092E-02	DATA	485
500	522	-1.1716705E-01	-1.8029170E-01	-2.8664928E-01	-2.8378722E-01	DATA	486
501	523	-3.1912773E-01	-3.4003750E-01	-3.4404938E-01	-3.2924945E-01	DATA	487
502	524	-2.9477379E-01	-2.4178011E-01	-1.9123354E-01	-8.8886216E-02	DATA	488
503	525	6.3446784E-05	8.9128503E-02	1.8179449E-01	2.4230092E-01	DATA	489
504	526	2.9624553E-01	3.3094046E-01	3.4548419E-01	3.4056180E-01	DATA	490
505	527	3.1804396E-01	2.8051397E-01	2.3085585E-01	1.7198028E-01	DATA	491
506	528	1.0669181E-01	3.7658089E-02	-3.2564709E-02	-1.8148819E-01	DATA	492
507	529	-1.6662953E-01	-2.2550594E-01	-2.9559241E-01	-3.1436528E-01	DATA	493
508		DATA (BCMOON(I), I) = 289324 /				DATA	494
509	531	-3.3938902E-01	-3.4848351E-01	-3.3996460E-01	-3.1292672E-01	DATA	495
510	532	-2.6751737E-01	-8.0515908E-01	-1.2869338E-01	-4.2416071E-02	DATA	496
511	533	4.8061711E-02	1.3621482E-01	2.3530903E-01	2.7932552E-01	DATA	497
512	534	3.2387679E-01	3.4680948E-01	3.4826648E-01	3.8021015E-01	DATA	498
513	535	2.9866086E-01	2.4798173E-01	1.0415448E-01	1.2589772E-01	DATA	499
514	536	5.7065290E-02	-1.3638226E-02	-8.3831291E-02	-1.5108170E-01	DATA	500
515	537	-2.1263916E-01	-2.6643229E-01	-3.0914647E-01	-3.8839020E-01	DATA	501
516	538	-3.5193830E-01	-3.4820431E-01	-3.2647101E-01	-2.8701866E-01	DATA	502
517	539	-2.3114667E-01	-1.6114403E-01	-8.0280327E-02	7.3644436E-03	DATA	503
518		DATA (BCMOON(I), I) = 329360 /				DATA	504
519	541	9.5901945E-02	1.7981830E-01	2.5249282E-01	3.6809601E-01	DATA	505
520	542	3.4247005E-01	3.5394706E-01	3.4346442E-01	3.3391696E-01	DATA	506
521	543	2.6914469E-01	2.1305797E-01	1.4915227E-01	8.9387096E-02	DATA	507
522	544	9.2873630E-03	-6.1861670E-02	-1.3090894E-01	-1.9516717E-01	DATA	508
523	545	-2.5237255E-01	-2.9944769E-01	-3.8366511E-01	-3.9235956E-01	DATA	509
524	546	-3.3358541E-01	-8.3643894E-01	-8.0125069E-01	-2.4953606E-01	DATA	510
525	547	-1.8377669E-01	-1.0718173E-01	-2.3548424E-02	6.2759209E-02	DATA	511
526	548	1.4676416E-01	2.2300011E-01	2.8584116E-01	3.8027415E-01	DATA	512



927	549	3.5289063E-01,	3.5268826E-01,	3.3118914E-01,	2.9177683E-01/	DATA	513
928		DATA (RMOON (I)) I#361,368/				DATA	514
929	551	2.3866021E-01,	1.7398889E-01,	1.0738053E-01,	3.5622458E-02,	DATA	515
930	552	-3.6197419E-02,	-1.0646469E-01,	-1.9279997E-01,	-2.2285930E-01/	DATA	516
931		DATA (RMOON (I)) I# 1, 36/				DATA	516
932	561	5.9857723E 01,	6.0363628E 01,	6.0909292E 01,	6.1475633E 01,	DATA	517
933	562	6.2034286E 01,	6.2549537E 01,	6.2981698E 01,	6.3291279E 01,	DATA	518
934	563	6.3443316E 01,	6.3411363E 01,	6.3818091E 01,	6.2752204E 01,	DATA	519
935	564	6.2141516E 01,	6.1382844E 01,	6.0325987E 01,	5.963413E 01,	DATA	520
936	565	5.8178450E 01,	5.8030316E 01,	5.7451879E 01,	5.7086768E 01,	DATA	521
937	566	5.6953572E 01,	5.7044270E 01,	5.7328251E 01,	5.760563E 01,	DATA	522
938	567	5.8291661E 01,	5.8875920E 01,	5.9477169E 01,	6.0070873E 01,	DATA	523
939	568	6.0642902E 01,	6.1187041E 01,	6.1700007E 01,	6.2178246E 01,	DATA	524
940	569	6.2614312E 01,	6.2991051E 01,	6.3301276E 01,	6.3509021E 01/	DATA	525
941		DATA (RMOON (I)) I# 37, 22/				DATA	526
942	571	6.3392095E 01,	6.3525445E 01,	6.3288980E 01,	6.2871441E 01,	DATA	527
943	572	6.2274055E 01,	6.1513609E 01,	6.0624529E 01,	5.9659259E 01,	DATA	528
944	573	5.0686229E 01,	5.2784640E 01,	5.4035651E 01,	5.4510266E 01,	DATA	529
945	574	5.6258414E 01,	5.6296702E 01,	5.6609092E 01,	5.7149775E 01,	DATA	530
946	575	5.7854719E 01,	5.8653933E 01,	5.9482422E 01,	6.0287367E 01,	DATA	531
947	576	6.1031215E 01,	6.1691329E 01,	6.2257332E 01,	6.2403470E 01,	DATA	532
948	577	6.3388655E 01,	6.3582896E 01,	6.3681650E 01,	6.3675881E 01,	DATA	533
949	578	6.3852763E 01,	6.3298147E 01,	6.2899751E 01,	6.2351169E 01,	DATA	534
950	579	6.1655579E 01,	6.0829828E 01,	5.9907262E 01,	5.8939074E 01/	DATA	535
951		DATA (RMOON (I)) I# 73, 108/				DATA	536
952	581	5.7992906E 01,	5.7147822E 01,	5.6485037E 01,	5.6075086E 01,	DATA	537
953	582	5.5964246E 01,	5.6164595E 01,	5.6651451E 01,	5.7369134E 01,	DATA	538
954	583	5.8242736E 01,	5.9191684E 01,	6.0141348E 01,	6.1038894E 01,	DATA	539
955	584	6.1815781E 01,	6.2469887E 01,	6.2981355E 01,	6.3390204E 01,	DATA	540
956	585	6.3584161E 01,	6.3694613E 01,	6.3693005E 01,	6.3588215E 01,	DATA	541
957	586	6.3385084E 01,	6.3084176E 01,	6.2682863E 01,	6.2177750E 01,	DATA	542
958	587	6.1368056E 01,	6.0859530E 01,	6.0068399E 01,	5.9224729E 01,	DATA	543
959	588	5.8374106E 01,	5.7576521E 01,	5.68901499E 01,	5.6419212E 01,	DATA	544
960	589	5.6188503E 01,	5.6244653E 01,	5.6590835E 01,	5.7196448E 01/	DATA	545
961		DATA (RMOON (I)) I#189, 144/				DATA	546
962	591	5.8002849E 01,	5.8934273E 01,	5.9910201E 01,	6.0855987E 01,	DATA	547
963	592	6.1710112E 01,	6.2427876E 01,	6.2982127E 01,	6.3361910E 01,	DATA	548
964	593	6.3569836E 01,	6.3618697E 01,	6.3527757E 01,	6.3319083E 01,	DATA	549
965	594	6.3014310E 01,	6.2632078E 01,	6.2186466E 01,	6.1686749E 01,	DATA	550
966	595	6.1138642E 01,	6.0546843E 01,	5.9918483E 01,	5.9266933E 01,	DATA	551
967	596	5.8615135E 01,	5.7997380E 01,	5.7458471E 01,	5.7049604E 01,	DATA	552
968	597	5.6820993E 01,	5.6812301E 01,	5.6043487E 01,	5.5509604E 01,	DATA	553
969	598	5.8175008E 01,	5.8987997E 01,	5.9879281E 01,	6.0776681E 01,	DATA	554
970	599	6.1612805E 01,	6.2331412E 01,	6.2891185E 01,	6.3267200E 01/	DATA	555
971		DATA (RMOON (I)) I#149, 180/				DATA	556
972	601	6.3450652E 01,	6.3447349E 01,	6.3275308E 01,	6.2961689E 01,	DATA	557
973	602	6.2539259E 01,	6.2042648E 01,	6.1504697E 01,	6.0953411E 01,	DATA	558
974	603	6.0410031E 01,	5.9888639E 01,	5.9397478E 01,	5.8941717E 01,	DATA	559
975	604	5.8527074E 01,	5.8163342E 01,	5.7866755E 01,	5.7660216E 01,	DATA	560
976	605	5.7870859E 01,	5.7525096E 01,	5.7842156E 01,	5.8227865E 01,	DATA	561
977	606	5.8770476E 01,	5.9439927E 01,	6.0190573E 01,	6.0926649E 01,	DATA	562
978	607	6.1708940E 01,	6.2361290E 01,	6.2875948E 01,	6.3217371E 01,	DATA	563
979	608	6.3264482E 01,	6.3311622E 01,	6.3068351E 01,	6.2658221E 01,	DATA	564
980	609	6.2116538E 01,	6.1487122E 01,	6.0818134E 01,	6.0157235E 01/	DATA	565
981		DATA (RMOON (I)) I#181, 216/				DATA	566
982	611	5.9846626E 01,	5.9018839E 01,	5.8594172E 01,	5.8280451E 01,	DATA	567
983	612	5.8075241E 01,	5.7969913E 01,	5.7954423E 01,	5.8021422E 01,	DATA	568
984	613	5.8168509E 01,	5.8398055E 01,	5.8714705E 01,	5.9121380E 01,	DATA	569
985	614	5.9614943E 01,	6.0182817E 01,	6.0801460E 01,	6.1437078E 01,	DATA	570
986	615	6.2048340E 01,	6.2590442E 01,	6.3019688E 01,	6.3297907E 01,	DATA	571
987	616	6.3396202E 01,	6.3298237E 01,	6.3001725E 01,	6.2520136E 01,	DATA	572
988	617	6.1882433E 01,	6.1131871E 01,	6.0323204E 01,	5.9518105E 01,	DATA	573
989	618	5.8778894E 01,	5.8161181E 01,	5.7706724E 01,	5.8438246E 01,	DATA	574
990	619	5.7337735E 01,	5.7448836E 01,	5.7682632E 01,	5.8024982E 01/	DATA	575
991		DATA (RMOON (I)) I#217, 252/				DATA	576
992	621	5.8443336E 01,	5.8911370E 01,	5.9410784E 01,	5.9930418E 01,	DATA	577
993	622	6.0463429E 01,	6.1003588E 01,	6.1541749E 01,	6.2063335E 01,	DATA	578
994	623	6.2547303E 01,	6.2966765E 01,	6.3291031E 01,	6.3488676E 01,	DATA	579
995	624	6.3531112E 01,	6.3396301E 01,	6.3072286E 01,	6.2560249E 01,	DATA	580
996	625	6.1876825E 01,	6.1093379E 01,	6.0146781E 01,	5.9212079E 01,	DATA	581
997	626	5.8327528E 01,	5.7566752E 01,	5.6995755E 01,	5.6661641E 01,	DATA	582
998	627	5.6584905E 01,	5.6756886E 01,	5.7143425E 01,	5.7693397E 01,	DATA	583
999	628	5.8349263E 01,	5.9056548E 01,	5.9770321E 01,	6.0458095E 01,	DATA	584

600	629	6.1099913E 01,	6.1683737E 01,	6.2209716E 01,	6.2662307E 01/	DATA 585	
601		DATA (RMOON (1)) (1) 253,288, /				DATA 586	6
602	631	6.3048943E 01,	6.3357298E 01,	6.3574363E 01,	6.8682967E 01,	DATA 587	
603	632	6.3863561E 01,	6.3498952E 01,	6.3167770E 01,	6.2668835E 01,	DATA 588	
604	633	6.2002427E 01,	6.1188559E 01,	6.0262284E 01,	5.9276887E 01,	DATA 589	
605	634	5.8801523E 01,	5.7415908E 01,	5.8701200E 01,	5.6227826E 01,	DATA 590	
606	635	5.6042841E 01,	5.6160622E 01,	5.8560363E 01,	5.7191416E 01,	DATA 591	
607	636	5.7984459E 01,	5.8864535E 01,	5.9762193E 01,	6.0620803E 01,	DATA 592	
608	637	6.1399777E 01,	6.2074405E 01,	6.2633322E 01,	6.8074800E 01,	DATA 593	
609	638	6.3602705E 01,	6.3622659E 01,	6.8738832E 01,	6.8751846E 01,	DATA 594	
610	639	6.3657995E 01,	6.3449760E 01,	6.8117624E 01,	6.2653097E 01/	DATA 595	
611		DATA (RMOON (1)) (1) 289,324, /				DATA 596	6
612	641	6.2052590E 01,	6.1321527E 01,	6.0478184E 01,	5.9556723E 01,	DATA 597	
613	642	5.8403549E 01,	5.7700837E 01,	5.6911196E 01,	5.6318054E 01,	DATA 598	
614	643	5.5967798E 01,	5.5961590E 01,	5.8246036E 01,	5.6811249E 01,	DATA 599	
615	644	5.7897108E 01,	5.8525333E 01,	5.9513089E 01,	6.8484835E 01,	DATA 600	
616	645	6.1377205E 01,	6.2147427E 01,	6.2768560E 01,	6.8230011E 01,	DATA 601	
617	646	6.3933752E 01,	6.3690502E 01,	6.3715759E 01,	6.8626091E 01,	DATA 602	
618	647	6.3436067E 01,	6.3156174E 01,	6.2791972E 01,	6.2344743E 01,	DATA 603	
619	648	6.1813658E 01,	6.1199142E 01,	6.8906875E 01,	5.9751088E 01,	DATA 604	
620	649	5.8962048E 01,	5.8179858E 01,	5.8461413E 01,	5.6871816E 01/	DATA 605	
621		DATA (RMOON (1)) (1) 329,360, /				DATA 606	6
622	651	5.5475461E 01,	5.6326531E 01,	5.6455431E 01,	5.6861822E 01,	DATA 607	
623	652	5.7812944E 01,	5.8349189E 01,	5.9294594E 01,	6.8268783E 01,	DATA 608	
624	653	6.1197227E 01,	6.2018342E 01,	6.2687342E 01,	6.2177352E 01,	DATA 609	
625	654	6.3478518E 01,	6.3595744E 01,	5.3545596E 01,	6.8352692E 01,	DATA 610	
626	655	6.3045821E 01,	6.2654082E 01,	6.2203486E 01,	6.1714485E 01,	DATA 611	
627	656	6.1200932E 01,	6.0670698E 01,	6.0127899E 01,	5.9576412E 01,	DATA 612	
628	657	5.9024041E 01,	5.8486391E 01,	5.7989274E 01,	5.7568613E 01,	DATA 613	
629	658	5.7267157E 01,	5.7128029E 01,	5.9186144E 01,	5.8459545E 01,	DATA 614	
630	659	5.7943320E 01,	5.8608033E 01,	5.9403161E 01,	6.8264816E 01/	DATA 615	
631		DATA (RMOON (1)) (1) 361,368, /				DATA 616	6
632	661	6.1122043E 01,	6.1910136E 01,	6.2572109E 01,	6.8065495E 01,	DATA 617	
633	662	6.3364086E 01,	6.3458493E 01,	6.8355398E 01,	6.8075714E 01/	DATA 618	
634		END				DATA 619	6

29748 WORDS OF MEMORY USED BY THIS COMPILATION

71084 02 11-03-72 11.848 1980 EPHEMERIS

PREFACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

PRIMARY SYMDEF ENTRY

TABLE 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1 ERWBLK 11

SYNREF

END OF BINARY CARD \*1980\*19

4273 IS THE NEXT AVAILABLE LOCATION.

GMAP VERSION/ASSEMBLY DATES JMAP 110171/102971 JMPB 110171/802971 JMPC 110171/102971

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

\*\* 19411 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

