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October 8, 1968

APOLLO MISSION C' SPACECRAFT OPERATIONAL TRAJECTORY ALTERNATE 1, LUNAR ORBITAL MISSION

VOLUME II

TRAJECTORY PARAMETERS FOR A MISSION LAUNCHED DECEMBER 21, 1968

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Lunar Mission Analysis Branch

MISSION PLANNING AND ANALYSIS DIVISION

MANNED SPACECRAFT CENTER

HOUSTON, TEXAS

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MSC INTERNAL NOTE NO. 68-FM-253

PROJECT APOLLO

APOLLO MISSION C' SPACECRAFT OPERATIONAL TRAJECTORY ALTERNATE 1, LUNAR ORBITAL MISSION VOLUME II - TRAJECTORY PARAMETERS FOR A MISSION LAUNCHED DECEMBER 21, 1968

By Lunar Mission Design Section,
Lunar Mission Analysis Branch

October 8, 1968

MISSION PLANNING AND ANALYSIS DIVISION
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

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FOREWORD

Volume II of the spacecraft operational trajectory for Apollo Mission C', Alternate 1, presents a computer printout listing of significant trajectory parameters at selected times during each phase of a typical mission for the December 21, 1968 launch date (also described in Volume I). It also contains a tracking acquisition and loss table.

Note that the initial conditions for the earth orbit insertion (EOI) and translunar insertion (TLI) burns are only typical and that official data will be contained in the launch vehicle operational trajectory to be published by the Marshall Space Flight Center. The EOI and TLI burn parameters given were computed using burn polynomials.

Also note that the selenocentric osculating element block printed in the earth orbit phase is of no value and in updated documents will be printed only in the lunar phases.

In the lunar orbit phase, the selenographic altitude is relative to the mean lunar sphere radius of approximately 938.4 n. mi. The circular lunar orbit altitude was designed to be 60 n. mi. relative to the target site. For the December 21 launch, the target site is II-P-2, which is 0.82 n. mi. below the mean radius.

All CSM burns were computed using preferred REFSMMAT's which have zero SPS gimbal trim angles for each individual burn. This use of preferred alignments is incompatible with a recent decision to use one fixed REFSMMAT for all three nominal CSM thrusting maneuvers. The fixed REFSMMAT will be such that the gimbal angles would read approximately 0, 0, 0 for a horizontal, in-plane, posigrade, heads-up burn at the nominal lunar orbit circularization maneuver point; this would provide gimbal angles of approximately 0°, 180°, 0° (roll, pitch, yaw) for the actual lunar orbit circularization maneuver which is performed retrograde, heads-down.

Transearth injection (TEI) was targeted for a reentry path angle of -6.26° which is incompatible with a recent decision for a steeper target, i.e., -6.48°.

Both of the above discrepancies will be corrected in the first revision of the operational trajectory.

The reentry phase of the mission was computed and documented by the Reentry Studies Section of the Landing Analysis Branch.

The other volumes of the Mission C', Alternate 1 spacecraft operational trajectory are as follows:

1. Volume I - Profile for a Mission Launched December 21, 1968: Detailed mission description of the first launch opportunity, first injection opportunity on the second day of the December 1968 launch window. (MSC Internal Note 68-FM-252.)

2. Volume III - Mission Summaries for the December 1968 Launch Window: Mission summaries for (a) selected launch azimuths (72°, 81°, 90°, 99°, and 108°) for each daily window, and (b) selected parameters as a function of a range of launch azimuths (72° through 108°). (MSC Internal Note 68-FM-254.)

3. Volume IV - Mission Summaries for the January 1969 Launch Window: Mission summaries for (a) selected launch azimuths (72°, 81°, 90°, 99°, and 108°) for each daily window, and (b) selected parameters as a function of a range of launch azimuths (72° through 108°). (MSC Internal Note 68-FM-255.)

As significant changes in the mission plan occur, the spacecraft operational trajectory will be updated.

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SYMBOL DEFINITIONS AND COORDINATE SYSTEM DESCRIPTIONS

EARTH-CENTERED INERTIAL COORDINATE SYSTEM

The primary reference coordinate system in which all trajectory computations are made is a mean-of-epoch system. In this system the epoch is the beginning of a Besselian year nearest to the mission base time. The beginning of the Besselian (fictitious) solar year is when the right ascension of the fictitious mean sun, affected by aberration and measured from the mean equinox, is 18^h40^m. This instant always occurs near the beginning of the calendar year and is denoted by the notation .0 after the year; i.e., the beginning of the Besselian solar year 1960 is January 1^d. 345 E.T. = 1960.0. The crossover time for changing the reference epoch is 180 calendar days into the year (4320 hours from 0.0^h January 1). This change of epoch time corresponds to 24^h (midnight) June 29 in a common year and 24^h June 28 in a leap year.

After the reference epoch has been defined, the inertial geocentric coordinate system is described by the X-axis coincident with the intersection of the mean equatorial plane and the mean ecliptic plane of epoch. The intersection of these planes is known as the mean-of-epoch line of equinoxes. The X-Y plane is the mean equatorial plane of epoch and the Z-axis is coincident with the earth's mean axis of rotation.

PRINT FORMAT

The print block headings denote the coordinate system reference or other type of vehicle information which is printed immediately below it.

The following symbol definitions are referenced to the line number they are printed on under the particular print block heading in the example format. When it is desired to obtain the definition of a particular print symbol, attention should be focused on the print block heading for two reasons; first, the line numbers are not printed in the trajectory listing; second, print blocks which have no pertinence to current vehicle activities are deleted, i.e., the THRUST block is not printed if the vehicle is not thrusting. The lines of the heading print, which appear at the top of the trajectory print, are designated by alphabetical letters. The coordinate system definition relative to a given print block is footnoted on the page that the print block heading occurs.

PRINT FORMAT

VEHICLE CSM INERTIAL MEASUREMENT UNIT

XIMUX	YIMUX	ZIMUX
XIMUY	YIMUY	ZIMUY
XIMUZ	YIMUZ	ZIMUZ

VEHICLE CSM ATTITUDE MANEUVER ANGLES

ALPHA	BETA	GAMMA

VEHICLE CSM IMU MANEUVER ANGLES

ALPHA	BETA	GAMMA

a ****** CSM / MOON REF. /PHASE
b MEAN-OF-EPOCH (YEAR) (DATE) HRS., MINS., SECS. G.M.T.
c T HRS. FROM LAUNCH DAYS, HRS., MINS., SECS. G.E.T. RAGR
d PHASE ELAPSED TIME ____ SECS.

RESTART COORDINATES (ER AND ER/HR)

e RXYZ
f RDXYZ

g GD(N) THRUST **********
h ********** * ENGINE IGNITION * **********

1	THETA	BETA	FUEL	TM	VELG	TACC
2	BARC	DELV	MASS	MSFL	SPI	VEX
3	VRX	VRY	VRZ	VDX	VDY	VDZ
4	TGO	FC	GMLP	GMLY	PLCHNG	TDELV
	SELENOCENTRIC					
5	XL	YL	ZL	DXL	DYL	DZL
6	RL	DECL	RAL	VL	PTHL	AZL
	SELENOGRAPHIC					
7	XS	YS	ZS	DXS	DYS	DZS
8	ALTS	LATS	LONS	VRS	PTR	AZR
9	LTS	LNS	LTE	LNE	DSMP	RSMP
10	LIN	LAN	LAP	DR	VT	SOLSV
	GEOCENTRIC					
11	X	Y	Z	DX	DY	DZ
12	R	DEC	RA	V	PTH	AZ
	GEOGRAPHIC					
13	XG	YG	ZG	DXG	DYG	DZG
14	ALT	LAT	LON	VE	PTF	AZE
	EARTH-MOON PLANE					
15	XMP	YMP	ZMP	DXMP	DYMP	DZMP
16	RMP	DEMP	RAMP	VMP	PTMP	AZMP
17	XME	YME	ZME	DXME	DYME	DZME
18	DIA	LIA	DOA	LOA	DRP	LRP
	PLANETARY COORDINATES					
19	XM	YM	ZM	DXM	DYM	DZM
20	RM	DEM	RAM	LOM	VM	ARGM
21	XSUN	YSUN	ZSUN	RAS	LOS	DES
	GEOCENTRIC OSCULATING ELEMENTS					
22	SMA	ECC	INC	RAN	APF	RP
23	VH	RNMP	APMP	INMP	APO	TFP
24	TA	EA	MA	SLR	PER	MTA
	SELENOCENTRIC OSCULATING ELEMENTS					
25	SMAS	ECCS	INCS	RANS	APFS	RPS
26	VHS	RNMPS	APMPS	INMPS	APOS	TFPS
27	TAS	EAS	MAS	SLRS	PERS	MTAS
	SELENOCENTRIC UNIT VECTORS					
28	WX	WY	WZ	PX	PY	PZ
29	QX	QY	QZ	SXO	SYO	SZO
	BODY ATTITUDE AND FORCES					
30	RPAT	PRAT	YRAT	IGA	MGA	OGA
31	XIX	ETX	ZTX	ALO	ALLV	ALLI
32	XIY	ETY	ZTY	BTO	BTLV	BTLI
33	XIZ	ETZ	ZTZ	GMO	GMLV	GMLI
34	ALS	BTS	ALF	BTE	ALM	BTM
35	ALFI	BTFI				
	EARTH ENTRY [illegible] AND TOUCHDOWN					
36	[illegible]	ENTDT	LATTD	LONTD	AZTD	

Phase Initiation Print

Symbol	Definition
VEHICLE CSM INERTIAL MEASUREMENT UNIT[a]	
XIMUX XIMUY XIMUZ	Inertial components of a unit vector along the IMU X-axis, n.d.
YIMUX YIMUY YIMUZ	Inertial components of a unit vector along the IMU Y-axis, n.d.
ZIMUX ZIMUY ZIMUZ	Inertial components of a unit vector along the IMU Z-axis, n.d.
VEHICLE CSM IMU MANEUVER ANGLES	
ALPHA, BETA, GAMMA	Maneuver or torque angles of the IMU from its previous alignment performed in a Y, Z, X order of rotation, deg

[a]The inertial measurement unit (IMU) or stable member is aligned at the beginning of each thrusting phase. The IMU alignment matrix or REFSMMAT (reference stable member matrix) appears prior to the trajectory print which begins a thrusting phase. The coordinate system in which the IMU is aligned is always the earth centered inertial defined above or its parallel selenocentric coordinate system.

Heading Print

Line	Symbol	Definition
a	CSM/MOON REF./PHASE	Vehicle identification/reference body (earth or moon)/phase identification number
b	MEAN-OF-EPOCH (YEAR)	Year to which epoch is referenced
	(DATE)	Calender date of trajectory print
	__HRS__MINS__SECS G.M.T.	Greenwich mean time of day
	T__HRS FROM LAUNCH	Time in total hours from launch
	__HRS__MINS__SECS G.E.T.	Time from launch in hours, minutes, and seconds (ground elapsed time)
	RAGR	Right ascension of the Greenwich meridian, deg
d	PHASE ELAPSED TIME__SECS	The elapsed time in seconds from the beginning of a trajectory phase
	RESTART COORDINATES (ER AND ER/HR)	
e	RXYZ	Inertial position coordinates with respect to the reference body (earth or moon) in double precision, e.r.
f	RDXYZ	Inertial velocity coordinates with respect to the reference body in double precision, e.r./hr
g	GD(N) THRUST***	Guidance identification (N) used during a thrusting phase GD4 indicates external ΔV guidance
h	ENGINE IGNITION (or CUTOFF)	Thrust subtitle indicating the initiation or termination of a thrust

Main Body Print

Line	Symbol	Definition
1	THETA	Angle between the thrust acceleration vector and the local horizontal plane, deg
	BETA	Azimuth of the thrust acceleration vector with respect to the projection of the velocity vector into the local horizontal plane, deg
	FUEL	Propellant consumed, lb
	TM	Thrust magnitude, lbf
	VELG	Velocity to be gained to achieve the magnitude of the required velocity, fps
	TACC	Thrust acceleration, ft/sec^2
2	BARC	Range angle or burn arc, deg
	DELV ✓	Velocity gained during thrust period, fps
	MASS	Instantaneous mass of the vehicle, lb
	MSFL	Mass flow rate of propellant, lbm/sec
	SPI	Specific impulse, sec
	VEX	Exhaust velocity, fps
3	VRX, VRY, VRZ	Inertial components of the velocity required, fps
	VDX, VDY, VDZ	Inertial components of the velocity to be gained (VELG), fps
4	TGO	Time to go to thrust cutoff, sec
	FC	Commanded thrust, lbf

Line	Symbol	Definition
4	GMLP	Engine gimbal angle about Y-axis, deg
	GMLY	Engine gimbal angle about Z-axis, deg
	PLCHNG	Total orbital plane change since thrust initiation, deg
	TDELV	Total velocity increment applied since the beginning of the case, fps
	SELENOCENTRIC[a]	
5	XL, YL, ZL	Coordinates of vehicle position, n. mi.
	DXL, DYL, DZL	Coordinates of vehicle velocity, fps
6	RL, DECL, RAL	Radius, declination, right ascension, n. mi., deg
	VL, PTHL, AZL	Velocity, flight-path angle, azimuth, fps, deg
	SELENOGRAPHIC[b]	
7	XS, YS, ZS	Components of vehicle position, n. mi.

[a]The axes of the selenocentric coordinate system are directed parallel to those of the inertial geocentric system.

[b]The selenographic equatorial plane is perpendicular to the lunar axis of rotation. The X-axis of the system lies in the equatorial plane and is directed through the moon's prime meridian. The Z-axis is directed perpendicular to the equatorial plane along the lunar axis of rotation. The Y-axis completes the standard right-handed coordinate system. Altitude is the distance above the mean spherical moon. Longitude is positive eastward from the X-axis of the rotational selenographic reference frame. Latitude is the angle between the position vector and the lunar equator. The system is fixed in the moon and rotates with it.

Line	Symbol	Definition
	DXS, DYS, DZS	Components of vehicle velocity, fps
8	ALTS	Altitude, n. mi.
	LATS	Latitude, deg
	LONS	Longitude, deg
	VRS	Velocity vector magnitude, fps
	PTR	Flight-path angle, deg
	AZR	Azimuth, deg
9	LTS	Selenographic latitude of the sun, deg
	LNS	Selenographic longitude of the sun, deg
	LTE	Selenographic latitude of the earth, deg
	LNE	Selenographic longitude of the earth, deg
	DSMP	Declination of the sun with respect to the earth-moon plane, deg
	RSMP	Right ascension of sun with respect to the earth-moon coordinate system, deg
10	LIN	Selenographic inclination of the flight plane of the vehicle, deg
	LAN	Selenographic longitude of the ascending node, deg
	LAP	Selenographic argument of periapsis, deg
	DR	Radial component of velocity, fps

Line	Symbol	Definition
	VT	Tangential component of velocity, fps
	SOLSV	Sunlight incidence angle on selenographic subvehicle point, deg
	GEOCENTRIC[a]	
11	X, Y, Z	Inertial components of vehicle position, n. mi.
	DX, DY, DZ	Inertial components of vehicle velocity, fps
12	R	Radius magnitude, n. mi.
	DEC	Declination, angle between radius vector and the equatorial plane, positive northward, deg
	RA	Right ascension, angle between the vehicle meridian and vernal equinox (X-axis), deg
	V	Velocity magnitude, n. mi.
	PTH	Flight-path angle measured positive up from the local horizontal plane, deg
	AZ	Azimuth, the angle between the projections of the vehicle meridian and the velocity vector in the local horizontal plane, measured from the north toward east, deg

[a]The geocentric coordinate system is the basic earth centered inertial program coordinate system defined above.

Line	Symbol	Definition
	GEOGRAPHIC[a]	
14	ALT	Geodetic altitude, n. mi.
	LAT	Geodetic latitude, deg
	LON	Geographic longitude, deg
	VE	Rotational velocity, fps
	PTE	Rotational flight-path angle, deg
	AZE	Rotational azimuth, deg
	EARTH-MOON PLANE[b]	
15	XMP, YMP, ZMP	Position of vehicle with respect to current reference body, n. mi.
	DXMP, DYMP, DZMP	Velocity of vehicle with respect to current reference body, fps

[a]The geographic or earth fixed coordinate system is defined such that the Z-axis is directed along the earth's rotational axis, positive north, the X-axis passes through the Greenwich meridian and lies in the equatorial plane, and the Y-axis completes the standard right-handed system. The velocity components are referenced to a rotating earth, and the geodetic latitude and altitude are computed separately as a function of declination. The equatorial plane is the same as described for the geocentric inertial coordinate system.

[b]The earth-moon plane coordinate system is defined by the instantaneous radius and velocity vectors of the moon at the particular time in question. The X-axis lies along the earth-moon line, positive toward the earth from the moon. The Z-axis is normal to the earth-moon plane, parallel to the moon's angular momentum vector, positive in a northerly direction. The Y-axis completes the standard right-handed system. The right ascension is the angle measured in the earth-moon plane from the earth-moon line (X-axis) to the projection of the radius vector in the earth-moon plane. The declination is the angle between the radius vector and the earth-moon plane. This coordinate system is redefined at the beginning of each computational cycle and is centered in the current reference body.

Line	Symbol	Definition
16	RMP, DEMP, RAMP	Radius, declination, and right ascension with respect to current reference body, n. mi. and deg
	VMP, PTMP, AZMP	Velocity, flight-path angle, and azimuth, fps and deg
17	XME, YME, ZME	Position coordinates of vehicle with respect to the earth, n. mi.
	DXME, DYME, DZME	Velocity coordinates of vehicle with respect to the earth, fps
[a]18	DIA	Declination of incoming asymptote, deg
	LIA	Right ascension of incoming asymptote, deg
	DOA	Declination of outgoing asymptote, deg
	LOA	Right ascension of outgoing asymptote, deg
	DRP	Declination of the periapsis vector, deg
	LRP	Right ascension of the periapsis vector, deg
	PLANETARY COORDINATES[b]	
19	XM, YM, ZM	Inertial geocentric position coordinates of the moon, n. mi.
	DXM, DYM, DZM	Inertial geocentric velocity of the moon, fps

[a]Line 18 is printed only when trajectory is hyperbolic.

[b]The planetary coordinates are always referenced to the earth.

Line	Symbol	Definition
20	RM, DEM, RAM	Radius, declination, and right ascension of the moon
	LOM, VM, ARGM	Longitude, velocity, and argument of the moon
21	XSUN, YSUN, ZSUN	Position of the sun in inertial geocentric Cartesian coordinates, n. mi.
	RAS, LOS, DES	Right ascension, longitude, and declination of the sun
	GEOCENTRIC OSCULATING ELEMENTS	
22	SMA	Semimajor axis, n. mi.
	ECC	Eccentricity, n.d.
	INC	Inclination of vehicle flight plane to the earth equatorial plane, deg
	RAN	Right ascension of the ascending node, deg
	APF	Argument of perigee, deg
	RP	Radius at perigee, n. mi.
23	VH	Hyperbolic excess velocity for hyperbola or present escape velocity deficit for ellipse, fps
	RNMP	Right ascension of ascending node in earth-moon plane coordinates, deg
	APMP	Argument of periapsis vector in earth-moon plane coordinates, deg
	INMP	Inclination of vehicle flight plane to the earth-moon plane, deg

Line	Symbol	Definition
	APO	Apogee radius, n. mi.
	TFP	Time (G.E.T.) at which periapsis passage occurs, hr
24	TA	True anomaly, deg
	EA	Eccentric anomaly, deg
	MA	Mean anomaly, deg
	SLR	Semilatus rectum, n. mi.
	PER	Period, hr
	MTA	Maximum true anomaly (360° in ellipse, calculated value in hyperbola), deg
	SELENOCENTRIC OSCULATING ELEMENTS	
25	SMAS	
	ECCS	
	INCS	
	RANS	
	APFS	All symbols and their units are the same as the geocentric osculating elements except that the reference is selenocentric
	RPS	
	VHS	
	RNMPS	
	APMPS	
	INMPS	
	APOS	
	TFPS	

Line	Symbol	Definition
27	TAS	
	EAS	All symbols and their units are the same as the geocentric osculating elements except that the reference is selenocentric
	MAS	
	SLRS	
	PERS	
	MTAS	
	GEOCENTRIC (or SELENOCENTRIC) UNIT VECTORS	
28	WX, WY, WZ	Inertial components of unit angular momentum vector, n.d.
	PX, PY, PZ	Inertial components of unit periapsis vector, n.d.
29	QX, QY, QZ	Inertial components of the unit vector in orbit plane normal to the periapsis vector direction, n.d.
	SXO, SYO, SZO	Components of the unit vector of the outgoing asymptote, n.d. (set to zero if trajectory is not hyperbolic)
30	RRAT, PRAT, YRAT	Vehicle attitude roll, pitch, and yaw rates, deg/sec
	IGA, MGA, OGA	Vehicle IMU inner, middle, and outer gimbal angles, deg
[a]31	XIX	Inertial coordinates of a unit vector along the vehicle X-axis, n.d.
32	XIY	
33	XIZ	

[a]Lines 31, 32, and 33 should be read in column format instead of across.

Line	Symbol	Definition
[a]31	ETX	Inertial coordinates of a unit vector along the vehicle Y-axis, n.d.
32	ETY	
33	ETZ	
31	ZTX	Inertial coordinates of a unit vector along the vehicle Z-axis, n.d.
32	ZTY	
33	ZTZ	
31	ALO	Euler angles of vehicle orientation with respect to its attitude at phase initiation, taken in the order of pitch, yaw, and roll (Y, Z, X rotation), deg
32	BTO	
33	GMO	
31	ALLV	Pitch, yaw, and roll (Euler angles) of the vehicle with respect to the local horizontal coordinate system[b], deg
32	BTLV	
33	GMLV	
31	ALLI	Pitch, yaw, and roll of the vehicle with respect to the launch inertial coordinate system, deg
32	BTLI	
33	GMLI	

[a]Lines 31, 32, and 33 should be read in column format instead of across.

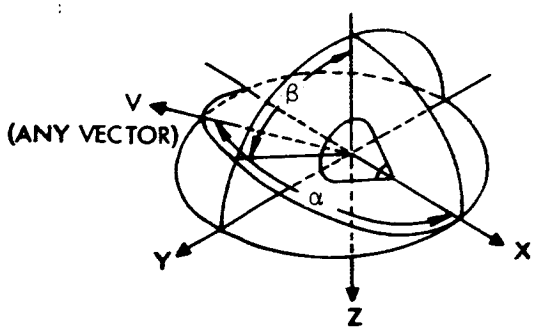
[b]The local horizontal (or local vertical) coordinate system is formed by the X-axis directed along the projection of the velocity vector in the local horizontal plane, the Z-axis is directed down along the negative radius vector and the Y-axis completes the right-handed system.

Line	Symbol	Definition
[a]34	ALS, BTS	Vehicle look angles α and β to the sun, deg
	ALE, BTE	Vehicle look angles α and β to the earth, deg
	ALM, BTM	Vehicle look angles α and β to the moon, deg
35	ALEI, BTEI	Look angles α and β to the earth in the IMU coordinate system, deg

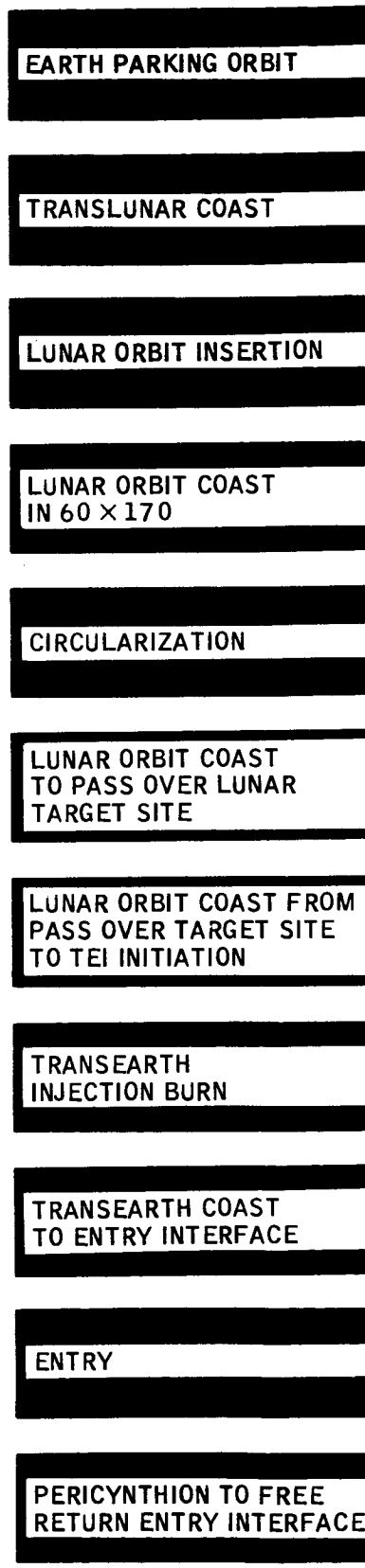
[a]Vehicle look angles or aspect angles of a line of sight or vehicle referenced vector are defined as illustrated:

α the angle between the vehicle X-axis and the vector, deg

β the angle between the -Z-axis and the projection of the vector in the Y-Z plane, measured positive toward +Y, deg



Line	Symbol	Definition
	EARTH ENTRY RANGE AND TOUCHDOWN	
36	ENTRG	Range of atmospheric reentry arc from 400 000-ft altitude to touchdown, n. mi.
	ENTDT	Duration of atmospheric reentry, i.e., time from 400 000-ft altitude to touchdown, hr
	LATTD	Geodetic latitude of touchdown, deg
	LONTD	Geographic longitude of touchdown, deg
	AZTD	Inertial azimuth at touchdown, deg


EARTH PARKING ORBIT
TRANSLUNAR COAST
LUNAR ORBIT INSERTION
LUNAR ORBIT COAST IN 60 × 170
CIRCULARIZATION
LUNAR ORBIT COAST TO PASS OVER LUNAR TARGET SITE
LUNAR ORBIT COAST FROM PASS OVER TARGET SITE TO TEI INITIATION
TRANSEARTH INJECTION BURN
TRANSEARTH COAST TO ENTRY INTERFACE
ENTRY
PERICYNTHION TO FREE RETURN ENTRY INTERFACE

EARTH PARKING ORBIT

TABLE I.- EARTH PARKING ORBIT

(a) Insertion to "TLI - 3.5 minutes"

EARTH PARKING ORBIT INSERTION RELATED TO A LIFT-OFF TIME OF:

MEAN-OF-EPOCH 1969 21 DEC. 1968 12 HRS. 50 MIN. 59.695 SEC G.M.T.

****** CSM / EARTH REF. /PHASE 2- 1

MEAN-OF-EPOCH 1969 21 DEC. 1968, 13 HRS., 2 MINS., 19.437 SECS. G.M.T.

T .188817068735758+000 HRS. FROM LAUNCH 0 DAYS, 0 HRS., 11 MINS., 19.741 SECS. G.E.T. RAGR .285742864182993+003

PHASE ELAPSED TIME .00000000 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	-.541408143937587 73+000	-.678325675427913 66+000	.552872240543365 47+000
RDXYZ	.349123269319534 30+001	-.267191767692565 91+001	.140631843358278 27+000

GEOCENTRIC

X	-1.8645737+03	Y	-2.3361085+03	Z	1.9040553+03	DX	2.0293505+04	DY	-1.5531069+04	DZ	8.1745141+02
R	3.5439334+03	DEC	3.2498104+01	RA	-1.2859524+02	V	2.5567727+04	PTH	-2.0041353-07	AZ	8.7827493+01

GEOGRAPHIC

XG	1.7425817+03	YG	-2.4284659+03	ZG	1.9040551+03	DXG	1.9378530+04	DYG	1.4546280+04	DZG	8.1745213+02
ALT	1.0334398+02	LAT	3.2667610+01	LON	3.0566189+02	VE	2.4244379+04	PTE	6.7762766-03	AZE	8.7708860+01

EARTH-MOON PLANE

XMP	-2.4432697+02	YMP	2.1956530+03	ZMP	2.7710786+03	DXMP	-2.0565955+04	DYMP	-1.2736493+04	DZMP	8.2784010+03
RMP	3.5439335+03	DEMP	5.1436865+01	RAMP	9.6349613+01	VMP	2.5567727+04	PTMP	-7.5449798-07	AZMP	5.8707833+01
XME	-2.4432697+02	YME	2.1956530+03	ZME	2.7710786+03	DXME	-2.0565955+04	DYME	-1.2736493+04	DZME	8.2784010+03

PLANETARY COORDINATES

XM	8.2201098+04	YM	-1.5497580+05	ZM	-8.4650720+04	DXM	3.3028152+03	DYM	1.2240727+03	DZM	6.3165226+02
RM	1.9478261+05	DEM	-2.5759254+01	RAM	-6.2057962+01	LOM	1.2199175+01	VM	3.5785370+03	ARGM	-6.5907773+01
XSUN	-3.4208261+05	YSUN	-7.2900111+07	ZSUN	-3.1612431+07	RAS	-9.0268858+01	LOS	3.4398827+02	DES	-2.3443269+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	3.5439333+03	ECC	5.2850784-08	INC	3.2562694+01	RAN	1.4544355+02	APF	-9.5144546+01	RP	3.5439331+03
VH	-1.0590500+04	RNMP	4.4209109+01	APMP	2.4644867+02	INMP	5.7812345+01	APO	3.5439334+03	TFP	9.1668166-01
TA	-1.7894246+02	EA	-1.7826099+02	MA	-1.7826099+02	SLR	3.5439331+03	PER	1.4699304+00	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-5.0065316+01	ECCS	2.0161854+03	INCS	1.1947509+02	RANS	1.3514777+02	APFS	8.9511858+01	RPS	1.0089090+05
VHS	2.3857073+04	RNMPS	-1.7850313+02	APMPS	5.9960648+01	INMPS	1.3617252+02	APOS	-1.0099103+05	TFPS	1.1956365+01
TAS	-5.8782196+01	EAS	-7.3017240+01	MAS	-1.9035544+05	SLRS	2.0351565+08	PERS	2.2254773-02	MTAS	9.0028416+01

GEOCENTRIC UNIT VECTORS

WX	3.0528925-01	WY	4.4326244-01	WZ	8.4280299-01	PX	5.4997539-01	PY	6.4044760-01	PZ	-5.3605403-01
QX	-7.7738377-01	QY	6.2717243-01	QZ	-4.8261659-02	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / EARTH REF. /PHASE 2- 2

MEAN-OF-EPOCH 1969 21 DEC. 1968, 13 HRS., 17 MINS., 19.437 SECS. G.M.T.

T .438817068735758+000 HRS. FROM LAUNCH 0 DAYS, 0 HRS., 26 MINS., 19.741 SECS. G.E.T. RAGR .289503130927585+003

PHASE ELAPSED TIME .90000000+03 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	.455239037201295 01+000	-.874532708356545 33+000	.294233332582508 91+000
RDXYZ	.370830308628786 05+001	.125594952538998 44+001	-.200908306299273 94+001

GEOCENTRIC

X	1.5678129+03	Y	-3.0118325+03	Z	1.0133200+03	DX	2.1555271+04	DY	7.3004639+03	DZ	-1.1678207+04
R	3.5434432+03	DEC	1.6616865+01	RA	-6.2500714+01	V	2.5579426+04	PTH	-1.7004918-02	AZ	1.1844763+02

GEOGRAPHIC

XG	3.3624507+03	YG	4.7233166+02	ZG	1.0133200+03	DXG	5.2409875+02	DYG	2.1265995+04	DZG	-1.1678206+04
ALT	1.0045802+02	LAT	1.6719592+01	LON	7.9961570+00	VE	2.4267215+04	PTE	-6.9504765-02	AZE	1.2013986+02

EARTH-MOON PLANE

XMP	-2.6189005+03	YMP	-4.8258108+02	ZMP	2.3376197+03	DXMP	-8.4177388+03	DYMP	-1.9984157+04	DZMP	-1.3567699+04
RMP	3.5434432+03	DEMP	4.1277213+01	RAMP	-1.6955930+02	VMP	2.5579426+04	PTMP	-1.7004918-02	AZMP	1.3487171+02
XME	-2.6189005+03	YME	-4.8258108+02	ZME	2.3376197+03	DXME	-8.4177388+03	DYME	-1.9984157+04	DZME	-1.3567699+04

PLANETARY COORDINATES

XM	8.2690024+04	YM	-1.5479396+05	ZM	-8.4556866+04	DXM	3.2989211+03	DYM	1.2312768+03	DZM	6.3559978+02
RM	1.9480419+05	DEM	-2.5725546+01	RAM	-6.1889127+01	LOM	8.6077424+00	VM	3.5781155+03	ARGM	-6.5751721+01
XSUN	-3.2736392+05	YSUN	-7.2900118+07	ZSUN	-3.1612433+07	RAS	-9.0257289+01	LOS	3.4023957+02	DES	-2.3443290+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	3.5461979+03	ECC	8.3155546-04	INC	3.2591331+01	RAN	1.4532625+02	APF	1.6886105+02	RP	3.5432490+03
VH	-1.0581303+04	RNMP	4.3971677+01	APMP	1.4971877+02	INMP	5.7818840+01	APO	3.5491467+03	TFP	5.2421162-01
TA	-2.0929135+01	EA	-2.0910915+01	MA	-2.0893910+01	SLR	3.5461953+03	PER	1.4713396+00	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-5.4644701+01	ECCS	3.2720471+03	INCS	1.4305847+02	RANS	-1.0327029+02	APFS	1.5377040+02	RPS	1.7874539+05
VHS	2.2835557+04	RNMPS	-9.9399825-01	APMPS	2.0046985+02	INMPS	1.4065518+02	APOS	-1.7885468+05	TFPS	5.6596367+00
TAS	-2.1569094+01	EAS	-2.2090447+01	MAS	-7.4063011+04	SLRS	5.8504207+08	PERS	2.5376973-02	MTAS	9.0017500+01

GEOCENTRIC UNIT VECTORS

WX	3.0643568-01	WY	4.4298290-01	WZ	8.4253388-01	PX	7.1431272-01	PY	-6.9204685-01	PZ	1.0405993-01
QX	6.2916968-01	QY	5.6994499-01	QZ	-5.2849617-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / EARTH REF. /PHASE 2- 3

MEAN-OF-EPOCH 1969 21 DEC. 1968, 13 HRS., 32 MINS., 19.437 SECS. G.M.T.

T .688817068735758+000 HRS. FROM LAUNCH 0 DAYS, 0 HRS., 41 MINS., 19.741 SECS. G.E.T. RAGR .293263397672177+003

PHASE ELAPSED TIME .18000000+04 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	.978708404627432 33+000	-.162657881344288 43+000	-.270609012957921 23+000
RDXYZ	.712199766110429 68-001	.388589874460262 84+001	-.206883682637939 66+001

GEOCENTRIC

X	3.3706067+03	Y	-5.6018293+02	Z	-9.3195945+02	DX	4.1398070+02	DY	2.2587582+04	DZ	-1.2025536+04
R	3.5416581+03	DEC	-1.5256587+01	RA	-9.4361080+00	V	2.5592651+04	PTH	-3.1921262-02	AZ	1.1915668+02

GEOGRAPHIC

XG	1.8458896+03	YG	2.8753234+03	ZG	-9.3195944+02	DXG	-1.9313690+04	DYG	8.4836125+03	DZG	-1.2025538+04

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 ALT    9.8527623+01  LAT   -1.5351816+01  LON    5.7300495+01  VE    2.4281760+04  FPE    1.5255726-02  AZE    1.2089737+02

EARTH-MOON PLANE
  XMP   -2.2876202+03  YMP   -2.6522197+03  ZMP   -5.2523056+02 DXMP   1.2535037+04 DYMP   -6.5700272+03 DZMP   -2.1323495+04
  RMP    3.5416581+03 DEMP   -8.5284654+00 RAMP   -1.3077877+02  VMP   2.5592652+04 PTMP   -3.1920411-02 AZMP    1.4741442+02
  XME   -2.2876202+03  YME   -2.6522197+03  ZME   -5.2523056+02 DXME   1.2535037+04 DYME   -6.5700272+03 DZME   -2.1323495+04

PLANETARY COORDINATES
   XM    8.3178376+04  YM    -1.5461104+05  ZM    -8.4462428+04  DXM   3.2950053+03  DYM    1.2384700+03  DZM    6.3954165+02
   RM    1.9482587+05 DEM    -2.5691651+01 RAM    -6.1720427+01  LOM   5.0161762+00  VM     3.5776921+03 ARGM   -6.5595706+01
 XSUN   -3.1264544+05 YSUN   -7.2900122+07 ZSUN   -3.1612435+07  RAS  -9.0245722+01  LOS    3.3649088+02  DES   -2.3443308+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    3.5462942+03  ECC    1.4210706-03  INC    3.2593507+01  RAN   1.4531183+02  APF   -1.2764412+02  RP     3.5412547+03
  VH    -1.0577189+04 RNMP    4.3806357+01 APMP   -1.4679389+02 INMP   5.7818468+01  APO    3.5513337+03  TFP    7.8302781-01
  TA    -2.3114592+01  EA    -2.3081993+01  MA    -2.3050072+01  SLR   3.5462870+03  PER    1.4713995+00  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -4.5651206+01 ECCS    3.6255654+03 INCS    1.0774057+02 RANS  -7.1473467+01 APFS   1.2214036+02  RPS    1.6546579+05
 VHS    2.4983858+04 RNMPS  -7.6849616-01 APMPS  -2.1060783+02 INMPS  9.7546717+01 APOS  -1.6555709+05 TFPS  -5.9635661+00
 TAS    3.0765477+01  EAS    3.2350869+01  MAS    1.2359008+05 SLRS   6.0007246+08 PERS   1.9377428-02 MTAS   9.0015801+01

GEOCENTRIC    UNIT VECTORS
   WX    3.0656538-01  WY    4.4293208-01  WZ    8.4251342-01  PX    8.8186413-01  PY    2.0095932-01  PZ   -4.2653368-01
   QX   -3.5823638-01  QY    8.7374281-01  QZ   -3.2899874-01 SXO    0.0000000     SYO   0.0000000     SZO   0.0000000

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****** CSM   / EARTH REF.  /PHASE   2-  4
                MEAN-OF-EPOCH  1969        21  DEC. 1968, 13 HRS., 47 MINS., 19.437 SECS. G.M.T.

T       .9388170687357580+000  HRS. FROM LAUNCH       0 DAYS,  0 HRS.,  56 MINS., 19.741 SECS. G.E.T.    RAGR  .2970236644167690+003

        PHASE ELAPSED TIME     .27000000+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      .4844369855590206 4+000      .7183438315720774 4+000      -.5532657073473028 2+000
        RDXYZ     -.3640297169181674 2+001     .2476645536117532 7+001      .2801415605155301 5-001

GEOCENTRIC
     X    1.6683687+03     Y    2.4739284+03     Z   -1.9054103+03  DX   -2.1159973+04  DY    1.4396010+04  DZ    1.6283802+02
     R    3.5403904+03  DEC    -3.2560652+01  RA    5.6005044+01  V    2.5593282+04  PTH   1.1288203-03  AZ    8.9566810+01

GEOGRAPHIC
    XG   -1.4457848+03    YG    2.6102647+03    ZG   -1.9054101+03  DXG  -2.1281897+04  DYG   -1.1668168+04  DZG   1.6282662+02
   ALT    9.9812436+01   LAT   -3.2730500+01   LON    1.1898138+02  VE    2.4271214+04  PTE   -1.6376037-04  AZE   8.9543176+01

EARTH-MOON PLANE
   XMP    4.1930716+02   YMP   -2.0726239+03   ZMP   -2.8395028+03 DXMP   2.0566043+04 DYMP    1.3589610+04 DZMP   -6.8830524+03
   RMP    3.5403904+03  DEMP   -5.3324487+01  RAMP   -7.8563003+01  VMP   2.5593282+04 PTMP    1.1285418-03 AZMP    1.1675946+02
   XME    4.1930716+02   YME   -2.0726239+03   ZME   -2.8395028+03 DXME   2.0566043+04 DYME    1.3589610+04 DZME   -6.8830524+03

PLANETARY COORDINATES
    XM    8.3666142+04    YM   -1.5442707+05   ZM    -8.4367408+04  DXM   3.2910678+03  DYM    1.2456521+03  DZM    6.4347772+02
    RM    1.9484764+05   DEM   -2.5657569+01  RAM    -6.1551865+01  LOM   1.4244701+00  VM     3.5772671+03 ARGM   -6.5439729+01
  XSUN   -2.9792674+05  YSUN   -7.2900124+07  ZSUN   -3.1612436+07  RAS  -9.0234154+01  LOS    3.3274218+02  DES   -2.3443326+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    3.5439278+03   ECC    9.9835412-04   INC    3.2563217+01  RAN   1.4520006+02  APF   -9.0453550+01  RP     3.5403897+03
    VH   -1.0583034+04 RNMP    4.3595174+01 APMP   -1.0966855+02 INMP   5.7770206+01  APO    3.5474659+03  TFP    9.3420418-01
    TA    1.1320565+00    EA    1.1308704+00    MA    1.1297414+00  SLR   3.5439242+03  PER    1.4699270+00  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -3.6971929+01  ECCS    3.5367563+03  INCS    4.0556089+01  RANS  -2.9431597+01  APFS   9.1513492+01  RPS    1.3072373+05
  VHS    2.7761926+04 RNMPS   -2.8064559+00 APMPS   -2.2563923+02 INMPS  2.0760530+01  APOS  -1.3079768+05 TFPS   -7.8812657+00
  TAS    4.7990043+01  EAS    5.4825952+01  MAS    2.2482740+05  SLRS   4.6246870+08  PERS   1.4122966-02 MTAS   9.0016107+01

GEOCENTRIC    UNIT VECTORS
   WX    3.0717460-01   WY    4.4196738-01   WZ    8.4279808-01  PX    4.8748054-01  PY    6.8752414-01  PZ   -5.3821209-01
   QX   -8.1731661-01   QY    5.7617302-01   QZ   -4.2605493-03 SXO    0.0000000     SYO   0.0000000     SZO   0.0000000

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****** CSM   / EARTH REF.  /PHASE   2-  5
                MEAN-OF-EPOCH  1969        21  DEC. 1968, 14 HRS.,  2 MINS., 19.437 SECS. G.M.T.

T       .1188817068735750+001  HRS. FROM LAUNCH       0 DAYS,  1 HRS.,  11 MINS., 19.741 SECS. G.E.T.    RAGR  .3007839311613610+003

        PHASE ELAPSED TIME     .36000000+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.5134759378936856 8+000     .8525333179056199 7+000      -.2591287959240530 4+000
        RDXYZ     -.3566358571240547 5+001     -.1508018722115889 3+001     .2095683015126739 9+001

GEOCENTRIC
     X   -1.7683770+03     Y    2.9360680+03     Z   -8.9242235+02  DX   -2.0730190+04  DY   -8.7656678+03  DZ    1.2181587+04
     R    3.5417608+03  DEC    -1.4594197+01  RA    1.2106031+02  V    2.4592357+04  PTH   3.2283867-02  AZ    6.0527746+01

GEOGRAPHIC
    XG   -3.4274449+03    YG   -1.6533559+01    ZG   -8.9242226+02  DXG  -3.0864605+03  DYG   -2.0777040+04  DZG   1.2181536+04
   ALT    9.8563649+01   LAT   -1.4685667+01   LON    1.8027638+02  VE    2.4281736+04  PTE   -1.3405519-02  AZE   5.8764403+01

EARTH-MOON PLANE
   XMP    2.7016740+03   YMP    6.4710353+02   ZMP   -2.1968808+03 DXMP   7.2820232+03 DYMP    1.9632044+04 DZMP   -1.4714746+04
   RMP    3.5417608+03  DEMP   -3.8336527+01  RAMP    1.3469696+01  VMP   2.5592358+04 PTMP    3.2284243-02 AZMP    4.2822333+01
   XME    2.7016740+03   YME    6.4710353+02   ZME   -2.1968808+03 DXME   7.2820232+03 DYME    1.9632044+04 DZME   -1.4714746+04

PLANETARY COORDINATES
    XM    8.4153321+04    YM   -1.5424203+05   ZM    -8.4271804+04  DXM   3.2871086+03  DYM    1.2528232+03  DZM    6.4740801+02
    RM    1.9486950+05   DEM   -2.5623302+01  RAM    -6.1383440+01  LOM   3.5783263+02  VM     3.5768402+03 ARGM   -6.5283790+01
  XSUN   -2.8320803+05  YSUN   -7.2900123+07  ZSUN   -3.1612435+07  RAS  -9.0222585+01  LOS    3.2899348+02  DES   -2.3443343+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    3.5464185+03   ECC    1.4299915-03   INC    3.2594500+01  RAN   1.4509857+02  APF   -5.1141531+01  RP     3.5413504+03
    VH   -1.0576959+04 RNMP    4.3361457+01 APMP   -7.0407745+01 INMP   5.7780433+01  APO    3.5514866+03  TFP    1.0940347+00
    TA    2.3254017+01    EA    2.3220945+01    MA    2.3188701+01  SLR   3.5464111+03  PER    1.4714769+00  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -3.5181412+01  ECCS    5.4270989+03  INCS    3.1446375+01  RANS  6.9095455+01  APFS   3.9036899+01  RPS    1.9089782+05
  VHS    2.8459614+04 RNMPS   -1.7881443+02 APMPS   -1.6133770+01 INMPS  3.2556736+01  APOS  -1.9096819+05 TFPS   -1.8335260+00
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 TAS    1.4949867+01  EAS    1.5119629+01  MAS    8.2996277+04 SLRS    1.0362122+09 PERS    1.3109546-02 MTAS    9.0010556+01

GEOCENTRIC    UNIT VECTORS
   WX    3.0828194-01  WY    4.4175684-01  WZ    8.4250409-01  PX   -1.3905472-01  PY    8.9705236-01  PZ   -4.1947684-01
   QX   -9.4107704-01  QY    1.2162965-02  QZ    3.3797341-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000
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****** CSM   / EARTH REF.  /PHASE   2-  6
                  MEAN-OF-EPOCH  1969       21  DEC. 1968, 14 HRS., 17 MINS., 19.437 SECS. G.M.T.

T        .143881706873575+001  HRS. FROM LAUNCH       0 DAYS,  1 HRS., 26 MINS., 19.741 SECS. G.E.T.    RAGR  .304544197905953+003

          PHASE ELAPSED TIME      .45000000+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ      -.97747230306234978+000       .10020863361120348+000       .30522770292967334+000
      RDXYZ       .21427988919808610+000      -.39246105571753990+001       .19787785758101202+001

GEOCENTRIC
    X  -3.3663496+03   Y    3.4511187+02   Z    1.0511839+03  DX    1.2455457+03  DY   -2.2812603+04  DZ    1.1502056+04
    R   3.5435010+03  DEC   1.7256579+01  RA   1.7414659+02  V     2.5578575+04  PTH   1.5761510-02  AZ    6.1914683+01

GEOGRAPHIC
   XG  -2.1931256+03  YG   -2.5771324+03  ZG    1.0511839+03  DXG   1.8354898+04  DYG  -1.0938031+04  DZG   1.1502055+04
  ALT   1.0058791+02  LAT   1.7362772+01  LON   2.2960240+02  VE    2.4266028+04  PTE   6.9312695-02  AZE   6.0247821+01

EARTH-MOON PLANE
  XMP   2.1887986+03  YMP   2.6886784+03  ZMP   7.3250850+02 DXMP  -1.3605763+04 DYMP   5.3685483+03 DZMP   2.0983933+04
  RMP   3.5435010+03 DEMP   1.1930137+01 RAMP   5.0851663+01  VMP   2.5578576+04 PTMP   1.5761980-02 AZMP   3.3025904+01
  XME   2.1887986+03  YME   2.6886784+03  ZME   7.3250850+02 DXME  -1.3605763+04 DYME   5.3685483+03 DZME   2.0983933+04

PLANETARY COORDINATES
   XM    8.4639920+04   YM   -1.5405593+05  ZM   -8.4175617+04  DXM   3.2831278+03  DYM   1.2599834+03  DZM   6.5133254+02
   RM    1.9489145+05  DEM   -2.5588850+01  RAM  -6.1215150+01  LOM   3.5424064+02  VM    3.5764116+03 ARGM  -6.5127888+01
 XSUN   -2.6848955+05 YSUN   -7.2900120+07 ZSUN   -3.1612433+07  RAS  -9.0211018+01  LOS   3.2524478+02  DES   -2.3443359+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    3.5460776+03  ECC    7.7691865-04  INC    3.2591321+01  RAN   1.4507598+02  APF   1.2664904+01  RP    3.5433225+03
   VH   -1.0581859+04 RNMP   4.3198233+01 APMP   -6.6094389+00 INMP   5.7774962+01  APO   3.5488325+03  TFP   1.3541326+00
   TA    2.0753455+01  EA    2.0736977+01  MA    2.0721215+01  SLR   3.5460753+03  PER   1.4712647+00  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -4.0644088+01 ECCS   4.1990854+03 INCS   5.7423222+01 RANS   1.0183926+02 APFS   6.0915018+01  RPS   1.7062735+05
  VHS    2.6478108+04 RNMPS -1.7931076+02 APMPS  3.0274242+01 INMPS  6.6548163+01 APOS  -1.7070864+05 TFPS  7.7273218+00
  TAS   -3.0042132+01  EAS   -3.1513695+01  MAS   -1.3907084+05 SLRS   7.1664944+08 PERS   1.6278479-02 MTAS   9.0013643+01

GEOCENTRIC    UNIT VECTORS
   WX    3.0836766-01  WY    4.4164003-01  WZ    8.4253397-01  PX   -9.0571550-01  PY    4.0710265-01  PZ    1.1809677-01
   QX   -2.9084155-01  QY   -7.9951329-01  QZ    5.2553751-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000
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****** CSM   / EARTH REF.  /PHASE   2-  7
                  MEAN-OF-EPOCH  1969       21  DEC. 1968, 14 HRS., 31 MINS., 23.187 SECS. G.M.T.

T        .167319206873575+001  HRS. FROM LAUNCH       0 DAYS,  1 HRS., 40 MINS., 23.491 SECS. G.E.T.    RAGR  .308069447979008+003

          PHASE ELAPSED TIME      .53437500+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ      -.48424257378982805+000      -.71953709802736027+000       .55379136298573953+000
      RDXYZ       .36354010695942705+001      -.24758807725935778+001      -.38066677299045928-001

GEOCENTRIC
    X  -1.6676992+03   Y   -2.4780379+03   Z    1.9072206+03  DX    2.1131513+04  DY   -1.4391564+04  DZ   -2.2127036+02
    R   3.5439219+03  DEC   3.2558919+01  RA   -1.2394023+02  V     2.5567693+04  PTH  -1.1256218-04  AZ    9.0588222+01

GEOGRAPHIC
   XG   9.2253967+02  YG   -2.8409176+03  ZG    1.9072205+03  DXG   2.3101244+04  DYG   7.3532513+03  DZG   -2.2127036+02
  ALT   1.0334367+02  LAT   3.2728592+01  LON   2.8799032+02  VE    2.4244314+04  PTE  -1.9557562-03  AZE   9.0620323+01

EARTH-MOON PLANE
  XMP  -4.0551308+02  YMP   2.0765047+03  ZMP   2.8430741+03 DXMP  -2.0683088+04 DYMP  -1.3389504+04 DZMP   6.8292014+03
  RMP   3.5439219+03 DEMP   5.3344492+01 RAMP   1.0105001+02  VMP   2.5567693+04 PTMP  -1.1317521-04 AZMP   6.3422415+01
  XME  -4.0551308+02  YME   2.0765047+03  ZME   2.8430741+03 DXME  -2.0683088+04 DYME  -1.3389504+04 DZME   6.8292014+03

PLANETARY COORDINATES
   XM    8.5095566+04   YM   -1.5388050+05  ZM   -8.4084916+04  DXM   3.2793762+03  DYM   1.2666859+03  DZM   6.5500647+02
   RM    1.9491212+05  DEM   -2.5556383+01  RAM  -6.1057504+01  LOM   3.5087304+02  VM    3.5760082+03 ARGM  -6.4981765+01
 XSUN   -2.5469070+05 YSUN   -7.2900115+07 ZSUN   -3.1612431+07  RAS  -9.0200174+01  LOS   3.2173037+02  DES   -2.3443372+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    3.5439009+03  ECC    6.2589400-06  INC    3.2563647+01  RAN   1.4496679+02  APF  -1.0739210+02  RP    3.5438787+03
   VH   -1.0590593+04 RNMP   4.2997516+01 APMP    2.3338201+02 INMP   5.7729523+01  APO   3.5439231+03  TFP   2.3333716+00
   TA   -1.6179711+02  EA   -1.6168660+02  MA   -1.6168649+02  SLR   3.5439008+03  PER   1.4699103+00  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -5.0491617+01 ECCS   1.9390243+03 INCS   1.2530894+02 RANS   1.4024343+02 APFS   9.2615585+01  RPS   9.7853986+04
  VHS    2.3756146+04 RNMPS -1.7826145+02 APMPS  6.1221847+01 INMPS  1.4338086+02 APOS  -9.7954969+04 TFPS  1.3616184+01
  TAS   -5.9817924+01  EAS   -7.5042197+01  MAS   -1.9075195+05 SLRS   1.4983912+08 PERS   2.2539623-02 MTAS   9.0029547+01

GEOCENTRIC    UNIT VECTORS
   WX    3.0897508-01  WY    4.4071830-01  WZ    8.4279404-01  PX   7.0644058-01  PY    4.8695693-01  PZ   -5.1362889-01
   QX   -6.3677004-01  QY    7.5408243-01  QZ   -1.6088373-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000
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****** CSM   / EARTH REF.  /PHASE   2-  8
                  MEAN-OF-EPOCH  1969       21  DEC. 1968, 14 HRS., 46 MINS., 23.187 SECS. G.M.T.

T        .192319206873575+001  HRS. FROM LAUNCH       0 DAYS,  1 HRS., 55 MINS., 23.491 SECS. G.E.T.    RAGR  .311829714723600+003

          PHASE ELAPSED TIME      .62437500+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ       .51233044046608548+000      -.85412780035986331+000       .25802880623921424+000
      RDXYZ       .35634054370678757+001       .15051777942433481+001      -.20984788046783308+001

GEOCENTRIC
    X   1.7644320+03   Y   -2.9415593+03   Z    8.8863406+02  DX    2.0713024+04  DY    8.7491543+03  DZ   -1.2197838+04
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   R     3.5433969+03  DEC    1.4524022+01   RA   -5.9043467+01    V    2.5580546+04  PTH   -1.8235590-02   AZ    1.1950501+02

GEOGRAPHIC
  XG     3.3685779+03  YG    -6.4705005+02   ZG    8.8863394+02   DXG   7.0079550+03  DYG    1.9776336+04  DZG   -1.2197837+04
  ALT    1.0019276+02  LAT    1.4615049+01   LON   3.4912682+02   VE    2.4269367+04  PTE   -6.6472539-02  AZE   1.2127234+02

EARTH-MOON PLANE
  XMP   -2.7109795+03  YMP   -6.1910036+02   ZMP   2.1961254+03 DXMP  -7.4508745+03 DYMP  -1.9548061+04 DZMP  -1.4721485+04
  RMP    3.5433969+03 DEMP    3.8300045+01 RAMP  -1.6713609+02  VMP   2.5580546+04 PTMP  -1.8235306-02 AZMP   1.3714465+02
  XME   -2.7109795+03  YME   -6.1910036+02   ZME   2.1961254+03 DXME  -7.4508745+03 DYME  -1.9548061+04 DZME  -1.4721485+04

PLANETARY COORDINATES
  XM     8.5581010+04   YM   -1.5369234+05   ZM   -8.3987606+04  DXM   3.2753537+03  DYM    1.2738243+03  DZM   6.5891963+02
  RM     1.9493426+05  DEM   -2.5521574+01  RAM   -6.0889483+01  LOM   3.4728079+02   VM    3.5755762+03 ARGM  -6.4825938+01
 XSUN   -2.3997200+05 YSUN   -7.2900106+07 ZSUN   -3.1612428+07  RAS  -9.0188605+01  LOS    3.1798168+02  DES   -2.3443866+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    3.5464162+03  ECC    9.0891199-04   INC   3.2594967+01  RAN   1.4485813+02  APF    1.7277052+02  RP    3.5431928+03
  VH    -1.0580419+04 RNMP    4.2764335+01 APMP   1.5338405+02 INMP   5.7739794+01  APO    3.5496397+03  TFP   2.0068999+00
  TA    -2.0516554+01   EA   -2.0497580+01   MA  -2.0479344+01  SLR   3.5464132+03  PER    1.4714755+00  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -5.4281411+01 ECCS    3.3518263+03 INCS   1.4134350+02 RANS  -9.8890633+01 APFS   1.5391159+02  RPS   1.8188758+05
 VHS    2.2911846+04 RNMPS  -8.9992259-01 APMPS  1.9791925+02 INMPS  1.3754018+02 APOS  -1.8199614+05 TFPS  6.5063134+00
 TAS   -1.8888900+01  EAS   -1.9234809+01  MAS  -6.5670361+04 SLRS   6.0983746+08 PERS   2.5124327-02 MTAS  9.0017002+01

GEOCENTRIC    UNIT VECTORS
  WX     3.1007547-01   WY    4.4050819-01   WZ   8.4249970-01   PX   7.5020123-01   PY   -6.5772519-01   PZ   6.7791518-02
  QX     5.8399598-01   QY    6.1102384-01   QZ  -5.3441423-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000

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****** CSM   / EARTH REF.  /PHASE   2- 9
                  MEAN-OF-EPOCH  1969        21  DEC. 1968, 15 HRS.,  1 MINS.,  23.187 SECS. G.M.T.

T        .2173192068735 75+001  HRS. FROM LAUNCH       0 DAYS,  2 HRS.,  10 MINS.,  23.491 SECS. G.E.T.     RAGR  .3155899814681 92+003

          PHASE ELAPSED TIME      .7143750 0+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .9763919630103 5775+000       -.1017296046723 0970+000       -.3062661242971 8316+000
        RDXYZ      -.2128348746818 1767+000        .3929120002228 1087+001       -.1975408278577 5521+001

GEOCENTRIC
     X     3.3626290+03    Y   -3.5034999+02    Z   -1.0547601+03   DX   -1.2371463+03  DY    2.2838815+04  DZ   -1.1482465+04
     R     3.5415445+03  DEC   -1.7327008+01   RA   -5.9481464+00    V    2.5592753+04  PTH  -3.1857198-02   AZ    1.1804402+02

GEOGRAPHIC
   XG      2.6472657+03  YG     2.1028557+03   ZG   -1.0547601+03  DXG   -1.5934363+04  DYG    1.4276230+04  DZG   -1.1482465+04
   ALT     9.8639549+01  LAT   -1.7433640+01   LON   3.8461874+01   VE    2.4280892+04  PTE    1.9264350-02  AZE   1.1970698+02

EARTH-MOON PLANE
  XMP    -2.2141910+03  YMP   -2.6650130+03   ZMP  -7.3321352+02 DXMP   1.3587879+04 DYMP   -5.4984955+03 DZMP  -2.0979159+04
  RMP     3.5415445+03 DEMP   -1.1948484+01 RAMP   -1.2972105+02  VMP   2.5592753+04 PTMP   -3.1856820-02 AZMP   1.4692970+02
  XME    -2.2141910+03  YME   -2.6650130+03   ZME  -7.3321352+02 DXME   1.3587879+04 DYME   -5.4984955+03 DZME  -2.0979159+04

PLANETARY COORDINATES
   XM     8.6065857+04   YM   -1.5350314+05   ZM   -8.3889717+04  DXM   3.2713097+03  DYM    1.2809516+03  DZM   6.6286690+02
   RM     1.9495648+05  DEM   -2.5486582+01  RAM   -6.0721602+01  LOM   3.4368841+02   VM    3.5751424+03 ARGM  -6.4670151+01
 XSUN    -2.2525351+05 YSUN   -7.2900095+07 ZSUN   -3.1612422+07  RAS  -9.0177036+01  LOS    3.1423298+02  DES   -2.3443401+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    3.5460945+03  ECC    1.3983978-03   INC   3.2591850+01  RAN   1.4484353+02  APF   -1.2297272+02  RP    3.5411357+03
   VH    -1.0577668+04 RNMP    4.2601208+01 APMP  -1.4236642+02 INMP   5.7734365+01  APO    3.5510533+03  TFP   2.2688116+00
   TA    -2.3461216+01   EA   -2.3428594+01   MA  -2.3396736+01  SLR   3.5460874+03  PER    1.4712753+00  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    -4.5067322+01 ECCS    3.5718636+03 INCS   1.0565744+02 RANS  -6.9296310+01 APFS   1.2009068+02  RPS   1.6092926+05
  VHS     2.5145181+04 RNMPS  -7.7408444-01 APMPS  -2.1318492+02 INMPS  9.4743229+01 APOS  -1.6101940+05 TFPS  -4.9481174+00
  TAS     3.3403606+01  EAS    3.5463888+01  MAS   1.3488137+05 SLRS   5.7497828+08 PERS   1.9006860-02 MTAS   9.0016039+01

GEOCENTRIC    UNIT VECTORS
   WX     3.1016126-01   WY    4.4039171-01   WZ   8.4252901-01   PX   8.5195738-01   PY   2.6450662-01   PZ   -4.5189032-01
   QX    -4.2186325-01   QY    8.5795767-01   QZ  -2.9315526-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000

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****** CSM   / EARTH REF.  /PHASE   2- 10
                  MEAN-OF-EPOCH  1969        21  DEC. 1968, 15 HRS.,  16 MINS.,  23.187 SECS. G.M.T.

T        .2423192068735 75+001  HRS. FROM LAUNCH       0 DAYS,  2 HRS.,  25 MINS.,  23.491 SECS. G.E.T.     RAGR  .3193502482127 84+003

          PHASE ELAPSED TIME      .8043750 0+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .4251369678255 088+000       .7564557515339 7355+000       -.5512100555785 2596+000
        RDXYZ      -.3767837618295 3984+001       .2268690700557 44572+001      .2068483058761 9256+000

GEOCENTRIC
     X     1.4641434+03    Y    2.6051833+03    Z   -1.8983307+03   DX   -2.1901328+04  DY    1.3187229+04  DZ   1.2023481+03
     R     3.5403892+03  DEC   -3.2424831+01   RA    6.0663503+01    V    2.5593296+04  PTH   3.7998459-03   AZ   8.6807083+01

GEOGRAPHIC
   XG     -5.8624884+02  YG     2.9303597+03   ZG   -1.8983307+03  DXG   -2.3908891+04  DYG   -4.0022677+03  DZG   1.2023541+03
   ALT     9.9786367+01  LAT   -3.2594306+01   LON   1.0131326+02   VE    2.4271359+04  PTE   -5.9463257-03  AZE   8.6632976+01

EARTH-MOON PLANE
  XMP     5.8274471+02  YMP   -1.9492207+03   ZMP  -2.8974649+03 DXMP   2.0607782+04 DYMP   1.4183899+04 DZMP  -5.3993690+03
  RMP     3.5403892+03 DEMP   -5.4925239+01 RAMP   -7.3355284+01  VMP   2.5593296+04 PTMP   3.7991842-03 AZMP   1.1153277+02
  XME     5.8274471+02  YME   -1.9492207+03   ZME  -2.8974649+03 DXME   2.0607782+04 DYME   1.4183899+04 DZME  -5.3993690+03

PLANETARY COORDINATES
   XM     8.6550110+04   YM   -1.5331287+05   ZM   -8.3791249+04  DXM   3.2672442+03  DYM    1.2880676+03  DZM   6.6672830+02
   RM     1.9497880+05  DEM   -2.5451405+01  RAM   -6.0553856+01  LOM   3.4009589+02   VM    3.5747069+03 ARGM  -6.4514309+01
 XSUN    -2.1053461+05 YSUN   -7.2900083+07 ZSUN   -3.1612416+07  RAS  -9.0165470+01  LOS    3.1048428+02  DES   -2.3443412+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    3.5439295+03  ECC    1.0011848-03   INC   3.2564579+01  RAN   1.4472389+02  APF   -8.8791154+01  RP    3.5403814+03
   VH    -1.0583026+04 RNMP    4.2384526+01 APMP  -1.0825379+02 INMP   5.7687342+01  APO    3.5474776+03  TFP   2.4076983+00
   TA     3.8023352+00   EA    3.7983613+00   MA   3.7945613+00  SLR   3.5439258+03  PER    1.4699281+00  MTA   3.5999999+02
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SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-3.6765942+01	ECCS	3.5676603+03	INCS	3.7119062+01	RANS	-2.3847077+01	APFS	8.8161455+01	RPS	1.3113163+05
VHS	2.7839587+04	RNMPS	-3.5611548+00	APMPS	-2.2479858+02	INMPS	1.5855595+01	APOS	-1.3120516+05	TFPS	-6.3740010+00
TAS	4.7906711+01	EAS	5.4701746+01	MAS	2.2613111+05	SLRS	4.6796422+08	PERS	1.4005103-02	MTAS	9.0016057+01

GEOCENTRIC UNIT VECTORS

WX	3.1084857-01	WY	4.3941567-01	WZ	8.4278530-01	PX	4.6939171-01	PY	7.0006242-01	PZ	-5.3813010-01
QX	-8.2646511-01	QY	5.6287340-01	QZ	1.1355327-02	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / EARTH REF. /PHASE 2- 11
MEAN-OF-EPOCH 1969 21 DEC. 1968, 15 HRS., 31 MINS., 23.187 SECS. G.M.T.

T .2673192068735 75+001 HRS. FROM LAUNCH 0 DAYS, 2 HRS., 40 MINS., 23.491 SECS. G.E.T. RAGR .3231105149573 76+003

PHASE ELAPSED TIME .8943750 0+04 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ -.5680921731369304 8+000 .8281841137051094 8+000 -.2215019800771121 1+000
RDXYZ -.3404921561891279 9+001 -.1751179257276481 3+001 .2173639592217285 9+001

GEOCENTRIC

X	-1.9564717+03	Y	2.8522110+03	Z	-7.6283810+02	DX	-1.9791804+04	DY	-1.0179088+04	DZ	1.2634725+04
R	3.5418654+03	DEC	-1.2437674+01	RA	1.2444814+02	V	2.5592296+04	PTH	3.2202949-02	AZ	5.9623393+01

GEOGRAPHIC

XG	-3.2768825+03	YG	1.1067655+03	ZG	-7.6283801+02	DXG	-9.2287623+03	DYG	-1.8569764+04	DZG	1.2634725+04
ALT	9.8469941+01	LAT	-1.2516581+01	LON	1.6133762+02	VE	2.4282555+04	PTE	-8.1136450-03	AZE	5.7794534+01

EARTH-MOON PLANE

XMP	2.7854723+03	YMP	7.7834184+02	ZMP	-2.0445388+03	DXMP	6.2632695+03	DYMP	1.9138569+04	DZMP	1.5794059+04
RMP	3.5418654+03	DEMP	-3.5257292+01	RAMP	1.5611905+01	VMP	2.5592296+04	PTMP	3.2203421-02	AZMP	4.0872143+01
XME	2.7854723+03	YME	7.7834184+02	ZME	-2.0445388+03	DXME	6.2632695+03	DYME	1.9138569+04	DZME	1.5794059+04

PLANETARY COORDINATES

XM	8.7033752+04	YM	-1.5312156+05	ZM	-8.3692203+04	DXM	3.2631575+03	DYM	1.2951723+03	DZM	6.7062371+02
RM	1.9500121+05	DEM	-2.5416047+01	RAM	-6.0386252+01	LOM	3.3650323+02	VM	3.5742697+03	ARGM	-6.4358686+01
XSUN	-1.9581612+05	YSUN	-7.2900068+07	ZSUN	-3.1612410+07	RAS	-9.0153901+01	LOS	3.0673558+02	DES	-2.3443424+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	3.5466111+03	ECC	1.4513492-03	INC	3.2597816+01	RAN	1.4462378+02	APF	-4.6380839+01	RP	3.5414638+03
VH	-1.0576486+04	RNMP	4.2155769+01	APMP	-6.5889080+01	INMP	5.7700813+01	APO	3.5517585+03	TFP	2.5801874+00
TA	2.2817045+01	EA	2.2784127+01	MA	2.2751924+01	SLR	3.5466035+03	PER	1.4715968+00	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-3.5351990+01	ECCS	5.4548316+03	INCS	3.2507658+01	RANS	7.3264317+01	APFS	3.8369358+01	RPS	1.9280380+05
VHS	2.8390870+04	RNMPS	-1.7892755+02	APMPS	-1.3938268+01	INMPS	3.4965029+01	APOS	-1.9287451+05	TFPS	4.7526795-02
TAS	1.2904780+01	EAS	1.3012886+01	MAS	7.1581914+04	SLRS	1.0519050+09	PERS	1.3205004-02	MTAS	9.0010501+01

GEOCENTRIC UNIT VECTORS

WX	3.1189890-01	WY	4.3927038-01	WZ	8.4247292-01	PX	-2.0939349-01	PY	8.9668418-01	PZ	-3.9001514-01
QX	-9.2675423-01	QY	-5.4763050-02	QZ	3.7165517-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / EARTH REF. /PHASE 2- 12
MEAN-OF-EPOCH 1969 21 DEC. 1968, 15 HRS., 38 MINS., .894 SECS. G.M.T.

T .2783666316668 19+001 HRS. FROM LAUNCH 0 DAYS, 2 HRS., 47 MINS., 1.199 SECS. G.E.T. RAGR .3247721655199 12+003

PHASE ELAPSED TIME .9341457 3+04 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ -.8680371142154666 0+000 .5509621422351329 3+000 .3413487821218096 1-001
RDXYZ -.1923745471717984 5+001 -.3173611044001928 5+001 .2367505761794007 4+001

GEOCENTRIC

X	-2.9894621+03	Y	1.8974769+03	Z	1.1755825+02	DX	-1.1182165+04	DY	-1.8447264+04	DZ	1.3761612+04
R	3.5427563+03	DEC	1.9015782+00	RA	1.4759581+02	V	2.5587581+04	PTH	2.7297981-02	AZ	5.7445305+01

GEOGRAPHIC

XG	-3.5365063+03	YG	-1.7442707+02	ZG	1.1755825+02	DXG	1.4293203+03	DYG	-1.9952173+04	DZG	1.3761612+04
ALT	9.8835483+01	LAT	1.9140230+00	LON	1.8282364+02	VE	2.4279913+04	PTE	3.5825606-02	AZE	5.5452751+01

EARTH-MOON PLANE

XMP	2.8769616+03	YMP	1.8959704+03	ZMP	-8.2432450+02	DXMP	-3.5708727+03	DYMP	1.4480837+04	DZMP	2.0791309+04
RMP	3.5427563+03	DEMP	-1.3454839+01	RAMP	3.3385613+01	VMP	2.5587581+04	PTMP	2.7298345-02	AZMP	3.3321650+01
XME	2.8769616+03	YME	1.8959704+03	ZME	-8.2432450+02	DXME	-3.5708727+03	DYME	1.4480837+04	DZME	2.0791309+04

PLANETARY COORDINATES

XM	8.7247277+04	YM	-1.5303668+05	ZM	-8.3648253+04	DXM	3.2613448+03	DYM	1.2983081+03	DZM	6.7234316+02
RM	1.9501114+05	DEM	-2.5400365+01	RAM	-6.0312235+01	LOM	3.3491559+02	VM	3.5740759+03	ARGM	-6.4289891+01
XSUN	-1.8931209+05	YSUN	-7.2900060+07	ZSUN	-3.1612407+07	RAS	-9.0148788+01	LOS	3.0507904+02	DES	-2.3443429+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	3.5470872+03	ECC	1.3106335-03	INC	3.2604082+01	RAN	1.4462043+02	APF	-1.7812824+01	RP	3.5424383+03
VH	-1.0576653+04	RNMP	4.2082579+01	APMP	-3.7321310+01	INMP	5.7706172+01	APO	3.5517361+03	TFP	2.6966248+00
TA	2.1344066+01	EA	2.1316177+01	MA	2.1288879+01	SLR	3.5470810+03	PER	1.4718931+00	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-3.7028665+01	ECCS	5.3067817+03	INCS	4.2490965+01	RANS	8.9552791+01	APFS	4.5701915+01	RPS	1.9646601+05
VHS	2.7740648+04	RNMPS	-1.7924335+02	APMPS	6.5832184+00	INMPS	4.8966029+01	APOS	-1.9654007+05	TFPS	4.2298396+00
TAS	-6.8996088+00	EAS	-6.9150384+00	MAS	-3.6778839+04	SLRS	1.0427987+09	PERS	1.4155487-02	MTAS	9.0010794+01

GEOCENTRIC UNIT VECTORS

WX	3.1197790-01	WY	4.3932729-01	WZ	8.4241399-01	PX	-6.2704126-01	PY	7.6134706-01	PZ	-1.6483288-01
QX	-7.1378499-01	QY	-4.7680411-01	QZ	5.1299979-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

TMAX TERMINATION

TABLE I.- EARTH PARKING ORBIT - Concluded

(b) "TLI - 3.5 minutes" to TLI initiation

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****** CSM   / EARTH REF.  /PHASE   3-  1
                MEAN-OF-EPOCH  1969       21  DEC. 1968, 15 HRS., 38 MINS.,   .894 SECS. G.M.T.

T        .27836663166681 9+001  HRS. FROM LAUNCH       0 DAYS,  2 HRS.,  47 MINS.,  1.199 SECS. G.E.T.    RAGR  .3247721655199 12+003

          PHASE ELAPSED TIME      .00000000    SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.8803711421546660+000      .5509621422351329 3+000      .3413487821218096 1-001
        RDXYZ     -.1923745471717984 5+001    -.3173611044001928 5+001     .2367505761794007 4+001

GEOCENTRIC
   X    -2.9894621+03   Y     1.8974769+0?   Z     1.1755825+02   DX   -1.1182165+04   DY   -1.8447264+04   DZ    1.3761612+04
   R     3.5427563+03  DEC    1.9015782+0?   RA    1.4759581+02   V     2.5587581+04   PTH   2.7297981-02   AZ    5.7445305+01

GEOGRAPHIC
  XG    -3.5365063+03  YG    -1.7442707+02  ZG    1.1755825+02   DXG   1.4293203+03   DYG  -1.9952173+04   DZG   1.3761612+04
  ALT    9.8835483+01  LAT    1.9140230+00  LON   1.8282364+02   VE    2.4279913+04   PTE   3.5825606-02   AZE   5.5452751+01

EARTH-MOON PLANE
  XMP    2.8769616+03  YMP    1.8959704+03  ZMP  -8.2432450+02  DXMP  -3.5708727+03  DYMP   1.4480837+04  DZMP  2.0791309+04
  RMP    3.5427563+03 DEMP   -1.3454839+01  RAMP  3.3385613+01   VMP   2.5587581+04  PTMP   2.7298345-02  AZMP  3.3321650+01
  XMF    2.8769616+03  YME    1.8959704+03  ZME  -8.2432450+02  DXME  -3.5708727+03  DYME   1.4480837+04  DZME  2.0791309+04

PLANETARY COORDINATES
  XM     8.7247277+04   YM   -1.5303668+05   ZM  -8.3648253+04   DXM   3.2613448+03   DYM   1.2983081+03   DZM   6.7234316+02
  RM     1.9501114+05  DEM   -2.5400365+01  RAM  -6.0312235+01   LOM   3.3491559+02   VM    3.5740759+03  ARGM  -6.4289801+01
 XSUN   -1.8931209+05 YSUN   -7.2900060+07 ZSUN  -3.1612407+07   RAS  -9.0148788+01   LOS   3.0507904+02   DES   -2.3443429+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    3.5470872+03  ECC    1.3106335-03  INC   3.2604082+01   RAN   1.4462043+02   APF  -1.7812824+01   RP    3.5424383+03
   VH   -1.0576653+04 RNMP   4.2082579+01 APMP  -3.7321310+01  INMP   5.7706172+01   APO   3.5517361+03   TFP   2.6966248+00
   TA    2.1344066+01   EA    2.1316177+01   MA   2.1288879+01   SLR   3.5470810+03   PER   1.4718931+00   MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -3.7028665+01 ECCS   5.3067817+03 INCS   4.2490965+01  RANS   8.9552791+01  APFS   4.5701915+01  RPS   1.9646601+05
  VHS    2.7740648+04 RNMPS -1.7924335+02 APMPS  6.5832184+00  INMPS  4.8966029+01  APOS  -1.9654007+05  TFPS  4.2298396+00
  TAS   -6.8996088+00  EAS   -6.9150384+00  MAS  -3.6778839+04  SLRS   1.0427987+09  PERS   1.4155487-02  MTAS  9.0010794+01

GEOCENTRIC    UNIT VECTORS
  WX     3.1197790-01   WY    4.3932729-01   WZ   8.4241399-01   PX   -6.2704126-01   PY   7.6134706-01   PZ   -1.6483288-01
  QX    -7.1378499-01   QY   -4.7680411-01   QZ   5.1299979-01   SXO   0.0000000      SYO   0.0000000      SZO   0.0000000

****** CSM   / EARTH REF.  /PHASE   3-  2
                MEAN-OF-EPOCH  1969       21  DEC. 1968, 15 HRS., 41 MINS., 30.894 SECS. G.M.T.

T        .28419996500015 2+001  HRS. FROM LAUNCH       0 DAYS,  2 HRS.,  50 MINS.,  31.199 SECS. G.E.T.    RAGR  .3256495610936 50+003

          PHASE ELAPSED TIME      .20999999+03 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.9921855710917681 9+000     .3506726810399638 5+000      .1697436447609801 8+000
        RDXYZ     -.9464340669776871 4+000    -.3657715762893568 5+001     .2257703972796846 9+001

GEOCENTRIC
   X    -3.2792637+03   Y     1.2076934+03   Z     5.8458583+02   DX   -5.5013420+03   DY   -2.1261222+04   DZ    1.3123367+04
   R     3.5431391+03  DEC    9.4967077+00   RA    1.5978216+02   V     2.5583727+04   PTH   2.2152975-02   AZ    5.8666362+01

GEOGRAPHIC
  XG    -3.3888109+03  YG    -8.5326093+02  ZG    5.8458582+02   DXG   7.0767321+03   DYG  -1.9155947+04   DZG   1.3123366+04
  ALT    9.9521305+01  LAT    9.5577490+00  LON   1.9413260+02   VE    2.4274539+04   PTE   5.6802253-02   AZE   5.6765552+01

EARTH-MOON PLANE
  XMP    2.6671074+03  YMP    2.3308132+03  ZMP  -8.7653594+01  DXMP  -8.5877566+03  DYMP   1.0654754+04  DZMP  2.1616053+04
  RMP    3.5431391+03 DEMP   -1.4175829+00  RAMP  4.1150550+01   VMP   2.5583727+04  PTMP   2.2153753-02  AZMP  3.2308509+01
  XMF    2.6671074+03  YME    2.3308132+03  ZME  -8.7653594+01  DXME  -8.5877566+03  DYME   1.0654754+04  DZME  2.1616053+04

PLANETARY COORDINATES
  XM     8.7360010+04   YM   -1.5299177+05   ZM  -8.3624993+04   DXM   3.2603856+03   DYM   1.2999636+03   DZM   6.7325088+02
  RM     1.9501638+05  DEM   -2.5392067+01  RAM  -6.0273150+01   LOM   3.3407728+02   VM    3.5739735+03  ARGM  -6.4253557+01
 XSUN   -1.8587676+05 YSUN   -7.2900055+07 ZSUN  -3.1612404+07   RAS  -9.0146089+01   LOS   3.0420434+02   DES   -2.3443431+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    3.5467834+03  ECC    1.0978203-03  INC   3.2600510+01   RAN   1.4461899+02   APF  -2.8113029+00   RP    3.5428897+03
   VH   -1.0578554+04 RNMP   4.2046838+01 APMP  -2.2321484+01  INMP   5.7702576+01   APO   3.5506771+03   TFP   2.7577884+00
   TA    2.0644370+01   EA    2.0621412+01   MA   2.0599258+01   SLR   3.5467789+03   PER   1.4717040+00   MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -3.8481399+01 ECCS   4.8951025+03 INCS   4.8508307+01  RANS   9.5839494+01  APFS   5.2364609+01  RPS   1.8833121+05
  VHS    2.7211984+04 RNMPS -1.7930764+02 APMPS  1.7677683+01  INMPS  5.6466928+01  APOS  -1.8840887+05  TFPS  6.5709807+00
  TAS   -1.7708158+01  EAS   -1.7993267+01  MAS  -8.9515802+04  SLRS   9.2209231+08  PERS   1.4996642-02  MTAS  9.0011703+01

GEOCENTRIC    UNIT VECTORS
  WX     3.1195855-01   WY    4.3927663-01   WZ   8.4244758-01   PX   -7.9041415-01   PY   6.1200259-01   PZ   -2.6425356-02
  QX    -5.2718813-01   QY   -6.5763887-01   QZ   5.3812990-01   SXO   0.0000000      SYO   0.0000000      SZO   0.0000000

 TMAX   TERMINATION
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TRANSLUNAR COAST

TABLE II.- TRANSLUNAR COAST

(a) TLI cutoff to "TLI cutoff + 2 hours"

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****** CSM   / EARTH REF.  /PHASE   4-  1
                  MEAN-OF-EPOCH  1969        21  DEC. 1968, 15 HRS., 46 MINS., 42.357 SECS. G.M.T.

T        .2928516978397 96+001   HRS. FROM LAUNCH        0 DAYS,  2 HRS.,  55 MINS.,  42.661 SECS. G.E.T.     RAGR  .3269508740248 51+003

          PHASE ELAPSED TIME      .00000000    SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.9792587980628 0136+000      -.4240038571879 2676-001      .3764612525701 5228+000
        RDXYZ      .3292874060571 1936+000      -.5594525933265 6860+001      .2462534129619 5983+001

GEOCENTRIC
   X   -3.3725022+03    Y   -1.4602411+03    Z    1.2965075+03   DX    1.9140505+03   DY   -3.2519329+04   DZ    1.4313984+04
   R    3.6160788+03  DEC    2.1010534+01   RA   -1.7752073+02    V    3.5581743+04  PTH    7.5257464+00   AZ    6.7422064+01

GEOGRAPHIC
  XG   -2.7472069+03   YG   -1.9616186+03   ZG    1.2965074+03  DXG    1.8469886+04  DYG   -2.4996739+04  DZG    1.4313984+04
  ALT   1.7363543+02  LAT    2.1133418+01  LON    2.1552838+02   VE    3.4217888+04  PTE    7.8766298+00  AZE    6.6466963+01

EARTH-MOON PLANE
  XMP    1.9547834+03  YMP    2.8031527+03  ZMP    1.1820249+03 DXMP   -2.0223338+04 DYMP    8.2726099+03 DZMP    2.8082751+04
  RMP    3.6160788+03 DEMP    1.9079529+01 RAMP    5.5109940+01  VMP    3.5581743+04 PTMP    7.5257467+00 AZMP    3.7185310+01
  XME    1.9547834+03 YME     2.8031527+03 ZME     1.1820249+03 DXME   -2.0223338+04 DYME    8.2726099+03 DZME    2.8082751+04

PLANETARY COORDINATES
   XM    8.7527040+04   YM   -1.5292510+05   ZM   -8.3590461+04  DXM    3.2589619+03  DYM    1.3024160+03  DZM    6.7459568+02
   RM    1.9502418+05  DEM   -2.5379751+01  RAM   -6.0215233+01  LOM    3.3283389+02   VM    3.5738214+03 ARGM   -6.4199707+01
 XSUN   -1.8078486+05 YSUN   -7.2900049+07 ZSUN   -3.1612401+07  RAS   -9.0142088+01  LOS    3.0290703+02  DES   -2.3443436+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.5169222+05  ECC    9.7657555-01  INC    3.0461697+01  RAN    1.4170898+02  APF    2.9777003+01   RP    3.5533063+03
   VH   -2.1396624+02 RNMP    4.1182483+01 APMP    8.2350011+00 INMP    5.5166546+01  APO    2.9983114+05  TFP    2.8835768+00
   TA    1.5233090+01   EA    1.6680309+00   MA    3.9302782-02  SLR    7.0233776+03  PER    4.1163607+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -2.1401403+01 ECCS    7.7443534+03 INCS    5.7157679+01 RANS    1.0279931+02 APFS    6.3589970+01  RPS    1.6571863+05
  VHS    3.6489215+04 RNMPS  -1.7933252+02 APMPS   3.3109248+01 INMPS   6.6731233+01 APOS   -1.6576143+05 TFPS   7.8554671+00
  TAS   -3.2735030+01  EAS   -3.4671889+01  MAS   -2.8516719+05 SLRS    1.2835493+09 PERS    6.2198671-03 MTAS   9.0007396+01

GEOCENTRIC    UNIT VECTORS
   WX    3.1414216-01   WY    3.9790132-01   WZ    8.6196824-01   PX   -9.4650222-01   PY    2.0185433-01   PZ    2.5177047-01
   QX   -7.3812228-02   QY   -8.9494657-01   QZ    4.4002543-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE   4-  2
                  MEAN-OF-EPOCH  1969        21  DEC. 1968, 15 HRS., 54 MINS., 12.357 SECS. G.M.T.

T        .3053516978397 96+001   HRS. FROM LAUNCH        0 DAYS,  3 HRS.,   3 MINS.,  12.661 SECS. G.E.T.     RAGR  .3288310073971 47+003

          PHASE ELAPSED TIME      .45000000+03 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.8270829221033 1055+000      -.7120880453450 7713+000      .6299998237998 7753+000
        RDXYZ      .1918353978160 9444+001      -.4989107346365 1119+001      .1601835209100 3583+001

GEOCENTRIC
   X   -2.8484186+03    Y   -2.4523839+03    Z    2.1696775+03   DX    1.1150825+04   DY   -2.9000209+04   DZ    9.3109953+03
   R    4.3399511+03  DEC    2.9995455+01   RA   -1.3927276+02    V    3.2435284+04  PTH    2.5030698+01   AZ    8.4475917+01

GEOGRAPHIC
  XG   -1.1679679+03   YG   -3.5726076+03   ZG    2.1696774+03  DXG    2.2967665+04  DYG   -1.8525100+04  DZG    9.3109941+03
  ALT   8.9891087+02  LAT    3.0127682+01  LON    2.5189622+02   VE    3.0941682+04  PTE    2.6342591+01  AZE    8.4209801+01

EARTH-MOON PLANE
  XMP    2.8949885+02  YMP    3.0718882+03  ZMP    3.0520270+03 DXMP   -2.3754158+04 DYMP   -3.1378765+02 DZMP    2.2083686+04
  RMP    4.3399511+03 DEMP    4.4687525+01 RAMP    8.4616268+01  VMP    3.2435284+04 PTMP    2.5030698+01 AZMP    5.3484853+01
  XME    2.8949885+02 YME     3.0718882+03 ZME     3.0520270+03 DXME   -2.3754158+04 DYME   -3.1378765+02 DZME    2.2083686+04

PLANETARY COORDINATES
   XM    8.7768327+04   YM   -1.5282851+05   ZM   -8.3540427+04  DXM    3.2568996+03  DYM    1.3059583+03  DZM    6.7653811+02
   RM    1.9503547+05  DEM   -2.5361910+01  RAM   -6.0131554+01  LOM    3.3103743+02   VM    3.5736013+03 ARGM   -6.4121885+01
 XSUN   -1.7342551+05 YSUN   -7.2900039+07 ZSUN   -3.1612397+07  RAS   -9.0136303+01  LOS    3.0103268+02  DES   -2.3443441+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4881013+05  ECC    9.7612059-01  INC    3.0453259+01  RAN    1.4167605+02  APF    2.9814511+01   RP    3.5534980+03
   VH   -2.3910707+02 RNMP    4.1089617+01 APMP    8.2528304+00 INMP    5.5152626+01  APO    2.9406677+05  TFP    2.8835805+00
   TA    5.0717688+01   EA    5.9648870+00   MA    1.5294974-01  SLR    7.0221400+03  PER    3.9996061+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -2.7008618+01 ECCS    5.0642847+03 INCS    6.9454647+01 RANS    1.1053064+02 APFS    7.3518242+01  RPS    1.3675232+05
  VHS    3.2481379+04 RNMPS  -1.7924359+02 APMPS   4.6488031+01 INMPS   8.0822579+01 APOS   -1.3680634+05 TFPS   1.0303305+01
  TAS   -4.5581339+01  EAS   -5.1313794+01  MAS   -2.9597601+05 SLRS    6.9268944+08 PERS    8.8180242-03 MTAS   9.0011312+01

GEOCENTRIC    UNIT VECTORS
   WX    3.1429213-01   WY    3.9762107-01   WZ    8.6204290-01   PX   -9.4645748-01   PY    2.0178344-01   PZ    2.5189534-01
   QX   -7.3747322-02   QY   -8.9508709-01   QZ    4.3975039-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE   4-  3
                  MEAN-OF-EPOCH  1969        21  DEC. 1968, 16 HRS.,  1 MINS., 42.357 SECS. G.M.T.

T        .3178516978397 96+001   HRS. FROM LAUNCH        0 DAYS,  3 HRS.,  10 MINS.,  42.661 SECS. G.E.T.     RAGR  .3307111407694 43+003

          PHASE ELAPSED TIME      .90000000+03 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.5408096378175 2948+000      -.1280572963214 9303+001      .7877692775391 0667+000
        RDXYZ      .2546429823343 0294+001      -.4126326247763 4307+001      .9738664950891 9778+000

GEOCENTRIC
   X   -1.8625124+03    Y   -4.4102081+03    Z    2.7130250+03   DX    1.4801645+04   DY   -2.3985116+04   DZ    5.6607985+03
   R    5.5026714+03  DEC    2.9540443+01   RA   -1.1289523+02    V    2.8747506+04  PTH    3.6263858+01   AZ    9.7760167+01

GEOGRAPHIC
  XG    5.3311367+02   YG   -4.7575915+03   ZG    2.7130249+03  DXG    2.2535314+04  DYG   -1.3914019+04  DZG    5.6607971+03
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 ALT    2.0615496+03  LAT    2.9643705+01  LON    2.7639362+02   VE    2.7082928+04  PTE    3.8877001+01  AZE    9.8621040+01

EARTH-MOON PLANE
  XMP   -1.4516956+03  YMP    2.8622207+03  ZMP    4.4698619+03 DXMP   -2.3037294+04 DYMP   -4.7865430+03 DZMP   1.6516394+04
  RMP    5.5026715+03 DEMP    5.4322007+01 RAMP    1.1689376+02  VMP    2.8747507+04 PTMP    3.6263856+01 AZMP   7.8463335+01
  XME   -1.4516956+03  YME    2.8622207+03  ZME    4.4698619+03 DXME   -2.3037294+04 DYME   -4.7865430+03 DZMF   1.6516394+04

PLANETARY COORDINATES
   XM    8.8009459+04   YM   -1.5273165+05   ZM   -8.3490250+04  DXM    3.2548320+03  DYM    1.3094977+03  DZM   6.7847903+02
   RM    1.9504678+05  DEM   -2.5344025+01  RAM   -6.0047910+01  LOM    3.2924095+02   VM    3.5733806+03 ARGM  -6.4044072+01
 XSUN   -1.6606616+05 YSUN   -7.2900028+07 ZSUN   -3.1612393+07  RAS   -9.0130520+01  LOS    2.9915833+02  DES   -2.3443445+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4842757+05  ECC    9.7605811-01  INC    3.0453550+01  RAN    1.4165406+02  APF    2.9836089+01   RP   3.5536364+03
   VH   -2.7020223+02 RNMP    4.0999141+01 APMP    8.2628093+00 INMP    5.5148862+01  APO    2.9330150+05  TFP   2.8835890+00
   TA    7.3565692+01   EA    9.4089340+00   MA    2.6648822-01  SLR    7.0221915+03  PER    3.9841926+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -3.5722755+01 ECCS    3.2753528+03 INCS    8.0232264+01 RANS    1.1630403+02 APFS    7.9704170+01  RPS   1.1696890+05
  VHS    2.8243153+04 RNMPS  -1.7904483+02 APMPS   5.4178434+01 INMPS   9.2948718+01 APOS   -1.1704035+05 TFPS  1.2401507+01
  TAS   -5.2854174+01  EAS   -6.2464347+01  MAS   -2.4753640+05 SLRS    3.8323138+08 PERS    1.3413285-02 MTAS  9.0017492+01

GEOCENTRIC    UNIT VECTORS
   WX    3.1444745-01   WY    3.9750384-01   WZ    8.6204032-01   PX   -9.4640701-01   PY    2.0181058-01   PZ   2.5216312-01
   QX   -7.3733050-02   QY   -8.9513303-01   QZ    4.3965924-01  SXO    0.0000000     SYO    0.0000000     SZO   0.0000000
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****** CSM   / EARTH REF.  /PHASE   4-  4
                MEAN-OF-EPOCH  1969        21  DEC.  1968, 16 HRS.,  9 MINS.,  12.357 SECS. G.M.T.

T        .3303516978396796+001  HRS. FROM LAUNCH       0 DAYS,  3 HRS.,  18 MINS.,  12.661 SECS. G.E.T.     RAGR  .3325912741417394+003

          PHASE ELAPSED TIME     .1350000+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.2087904478265413 6+000      -.1752176837526028 4+001       .8840959667770526 9+000
        RDXYZ      .2722909603831416 9+001      -.3455287865827413 4+001       .5996745229070852 0+000

GEOCENTRIC
     X   -7.1906042+02    Y   -6.0343805+03    Z    3.0447677+03   DX    1.5827470+04   DY   -2.0084568+04   DZ   3.4857310+03
     R    8.7971616+03  DEC    2.6612037+01   RA   -9.6795359+01    V    2.5807925+04  PTH    4.3355478+01   AZ   1.0538437+02

GEOGRAPHIC
    XG    2.1394940+03   YG   -5.6880014+03   ZG    3.0447677+03  DXG    2.0776167+04  DYG   -1.1492003+04  DZG   3.4857310+03
   ALT    3.3555478+03  LAT    2.6690067+01  LON    2.9061336+02   VE    2.3997200+04  PTE    4.7564854+01  AZE   1.0799523+02

EARTH-MOON PLANE
   XMP   -3.0941669+03  YMP    2.4270774+03  ZMP    5.5440810+03 DXMP   -2.1386094+04 DYMP   -6.7812300+03 DZMP   1.2755350+04
   RMP    6.7971616+03 DEMP    5.4651333+01 RAMP    1.4188921+02  VMP    2.5807925+04 PTMP    4.3355479+01 AZMP   9.8987754+01
   XME   -3.0941669+03  YME    2.4270774+03  ZME    5.5440810+03 DXME   -2.1386094+04 DYME   -6.7812300+03 DZMF   1.2755350+04

PLANETARY COORDINATES
    XM    8.8250433+04   YM   -1.5263454+05   ZM   -8.3439931+04  DXM    3.2527592+03  DYM    1.3130341+03  DZM   6.8041839+02
    RM    1.9505810+05  DEM   -2.5326097+01  RAM   -5.9964303+01  LOM    3.2744442+02   VM    3.5731596+03 ARGM  -6.3966272+01
  XSUN   -1.5870681+05 YSUN   -7.2900017+07 ZSUN   -3.1612388+07  RAS   -9.0124735+01  LOS    2.9728398+02  DES   -2.3443450+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.4833605+05  ECC    9.7604220-01  INC    3.0455393+01  RAN    1.4164421+02  APF    2.9847417+01   RP   3.5538059+03
    VH   -3.0082656+02 RNMP    4.0914959+01 APMP    8.2694218+00 INMP    5.5148804+01  APO    2.9311828+05  TFP   2.8835884+00
    TA    8.8053818+01   EA    1.2150424+01   MA    3.7978633-01  SLR    7.0224678+03  PER    3.9805081+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -4.5698016+01 ECCS    2.3031441+03 INCS    8.8685763+01 RANS    1.2059001+02 APFS    8.3570273+01  RPS   1.0520342+05
   VHS    2.4971059+04 RNMPS  -1.7891145+02 APMPS   5.8493371+01 INMPS   1.0241264+02 APOS   -1.0529482+05 TFPS  1.4162116+01
   TAS   -5.6799610+01  EAS   -6.9305386+01  MAS   -2.0142460+05 SLRS    2.4240384+08 PERS    1.9407239-02 MTAS  9.0024875+01

GEOCENTRIC    UNIT VECTORS
   WX    3.1453296-01   WY    3.9747155-01   WZ    8.6202401-01   PX   -9.4638185-01   PY    2.0180260-01   PZ   2.5226384-01
   QX   -7.3690977-02   QY   -8.9514917-01   QZ    4.3963344-01  SXO    0.0000000     SYO    0.0000000     SZO   0.0000000
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****** CSM   / EARTH REF.  /PHASE   4-  5
                MEAN-OF-EPOCH  1969        21  DEC.  1968, 16 HRS.,  16 MINS.,  42.357 SECS. G.M.T.

T        .3428516978396796+001  HRS. FROM LAUNCH       0 DAYS,  3 HRS.,  25 MINS.,  42.661 SECS. G.E.T.     RAGR  .3344714075140354+003

          PHASE ELAPSED TIME     .1800000+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .1333500277458411 3+000      -.2152224962483549 6+001       .9437038679982865 7+000
        RDXYZ      .2736100824387226 7+001      -.2971513492112371 2+001       .3716365131569822 7+000

GEOCENTRIC
     X    4.5924863+02    Y   -7.4121197+03    Z    3.2500534+03   DX    1.5904147+04   DY   -1.7272530+04   DZ   2.1602134+03
     R    8.1063724+03  DEC    2.3636063+01   RA   -8.6454532+01    V    2.3578565+04  PTH    4.8138451+01   AZ   1.0978884+02

GEOGRAPHIC
    XG    3.6087504+03   YG   -6.4905581+03   ZG    3.2500533+03  DXG    1.8919405+04  DYG   -1.0331100+04  DZG   2.1602136+03
   ALT    4.6642963+03  LAT    2.3696054+01  LON    2.9907405+02   VE    2.1664304+04  PTE    5.4126104+01  AZE   1.1490128+02

EARTH-MOON PLANE
   XMP   -4.6149870+03  YMP    1.8926496+03  ZMP    6.3900740+03 DXMP   -1.9797778+04 DYMP   -7.6745115+03 DZMP   1.0251760+04
   RMP    8.1063724+03 DEMP    5.2024866+01 RAMP    1.5770100+02  VMP    2.3578565+04 PTMP    4.8138449+01 AZMP   1.1176902+02
   XME   -4.6149870+03  YME    1.8926496+03  ZME    6.3900740+03 DXME   -1.9797778+04 DYME   -7.6745115+03 DZMF   1.0251760+04

PLANETARY COORDINATES
    XM    8.8491258+04   YM   -1.5253717+05   ZM   -8.3389467+04  DXM    3.2506810+03  DYM    1.3165678+03  DZM   6.8235629+02
    RM    1.9506945+05  DEM   -2.5308122+01  RAM   -5.9880729+01  LOM    3.2564786+02   VM    3.5729382+03 ARGM  -6.3888470+01
  XSUN   -1.5134747+05 YSUN   -7.2900006+07 ZSUN   -3.1612383+07  RAS   -9.0118951+01  LOS    2.9540964+02  DES   -2.3443454+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.4825607+05  ECC    9.7602839-01  INC    3.0456837+01  RAN    1.4163976+02  APF    2.9852920+01   RP   3.5539400+03
    VH   -3.2907136+02 RNMP    4.0834063+01 APMP    8.2729846+00 INMP    5.5149579+01  APO    2.9295821+05  TFP   2.8835830+00
    TA    9.7872375+01   EA    1.4410107+01   MA    4.9324015-01  SLR    7.0226831+03  PER    3.9772894+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -5.6142613+01 ECCS    1.7455900+03 INCS    9.5194627+01 RANS    1.2390050+02 APFS    8.6252518+01  RPS   9.7945845+04
   VHS    2.2528866+04 RNMPS  -1.7874198+02 APMPS   6.1131832+01 INMPS   1.0970957+02 APOS   -9.8058131+04 TFPS  1.5672627+01
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 TAS   -5.9090646+01  EAS   -7.3607103+01  MAS   -1.6679116+05 SLRS    1.7107122+08 PERS    2.6427536-02 MTAS    9.0032823+01

GEOCENTRIC    UNIT VECTORS
   WX    3.1457729-01   WY    3.9746414-01   WZ    8.6201124-01   PX   -9.4636934-01   PY    2.0179512-01   PZ    2.5231688-01
   QX   -7.3662747-02   QY   -8.9515416-01   QZ    4.3962803-01   SXO   0.0000000     SYO   0.0000000     SZO   0.0000000
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****** CSM   / EARTH REF.  /PHASE   4=  6
                  MEAN-OF-EPOCH  1969       21  DEC. 1968, 16 HRS., 24 MINS., 12.357 SECS. G.M.T.

T        .355351697839796+001  HRS. FROM LAUNCH      0 DAYS, 3 HRS., 33 MINS., 12.661 SECS. G.E.T.     RAGR  .336351540886331+003

          PHASE ELAPSED TIME     .22499999+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .47290678717516550+000      -.25003817126781177+001       .98031409075781117+000
        RDXYZ      .26914685427058574+001      -.26162526637182780+001       .22404168455441697+000

GEOCENTRIC
    X   1.6286595+03    Y   -8.6111484+03    Z    3.3761366+03   DX    1.5644712+04   DY   -1.5207505+04   DZ    1.3022882+03
    R   9.3916295+03  DEC    2.1068483+01   RA   -7.9289938+01   V     2.1856833+04   PTH   5.1582444+01   AZ    1.1251874+02

GEOGRAPHIC
   XG   4.9460287+03   YG   -7.2347221+03   ZG    3.3761365+03   DXG   1.7225481+04   DYG  -9.8464402+03   DZG   1.3022884+03
  ALT   5.9491889+03  LAT    2.1115765+01  LON    3.0435852+02   VE    1.9883801+04   PTE   5.9432706+01   AZE   1.2105065+02

EARTH-MOON PLANE
  XMP  -6.0273998+03  YMP    1.3148034+03  ZMP    7.0812747+03 DXMP  -1.8443017+04 DYMP  -8.0696198+03 DZMP   8.5121986+03
  RMP   9.3916296+03 DEMP    4.8937936+01 RAMP    1.6769440+02  VMP   2.1856833+04  PTMP   5.1582444+01 AZMP   1.1955045+02
  XME  -6.0273998+03  YME    1.3148034+03  ZME    7.0812747+03 DXME  -1.8443017+04 DYME  -8.0696198+03 DZME   8.5121986+03

PLANETARY COORDINATES
   XM   8.8731930+04   YM   -1.5243953+05   ZM   -8.3338859+04  DXM   3.2485975+03  DYM   1.3200986+03  DZM   6.8429269+02
   RM   1.9508082+05  DEM   -2.5290102+01  RAM   -5.9797190+01  LOM   3.2385127+02  VM    3.5727163+03 ARGM  -6.3810695+01
 XSUN  -1.4398791+05 YSUN   -7.2899993+07 ZSUN   -3.1612377+07  RAS  -9.0113167+01  LOS   2.9353528+02  DES  -2.3443457+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   1.4819219+05  ECC    9.7601741-01  INC    3.0457811+01  RAN   1.4163756+02  APF   2.9855692+01  RP    3.5540340+03
   VH   -3.5474557+02 RNMP    4.0754675+01 APMP    8.2748970+00 INMP  5.5149937+01  APO   2.9283036+05  TFP   2.8835779+00
   TA    1.0497647+02   EA    1.6333710+01   MA    6.0678010-01  SLR   7.0228288+03  PER   3.9747193+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS  -6.6748115+01 ECCS    1.3963814+03 INCS    1.0026883+02 RANS   1.2656031+02 APFS   8.8294429+01 RPS   9.3139081+04
  VHS    2.0661704+04 RNMPS  -1.7858141+02 APMPS   6.2907023+01 INMPS  1.1542287+02 APOS  -9.3272578+04 TFPS  1.7001446+01
  TAS   -6.0531866+01  EAS   -7.6455959+01  MAS   -1.4131285+05 SLRS   1.3015082+08 PERS   3.4259123-02 MTAS  9.0041031+01

GEOCENTRIC    UNIT VECTORS
   WX    3.1460168-01   WY    3.9746355-01   WZ    8.6200263-01   PX   -9.4636247-01   PY    2.0179154-01   PZ    2.5234546-01
   QX   -7.3646717-02   QY   -8.9515522-01   QZ    4.3962853-01   SXO   0.0000000     SYO   0.0000000     SZO   0.0000000
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****** CSM   / EARTH REF.  /PHASE   4=  7
                  MEAN-OF-EPOCH  1969       21  DEC. 1968, 16 HRS., 31 MINS., 42.357 SECS. G.M.T.

T        .367851697839796+001  HRS. FROM LAUNCH      0 DAYS, 3 HRS., 40 MINS., 42.661 SECS. G.E.T.     RAGR  .338231674258627+003

          PHASE ELAPSED TIME     .27000000+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .80543418628558998+000      -.28098298629080768+001       .10016341131409656+001
        RDXYZ      .26273514262750477+001      -.23465000645096631+001       .12302117558638136+000

GEOCENTRIC
    X   2.7738617+03    Y   -9.6768638+03    Z    3.4495613+03   DX    1.5272018+04   DY   -1.3639512+04   DZ    7.1508570+02
    R   1.0641216+04  DEC    1.8915287+01   RA   -7.4005111+01   V     2.0488586+04   PTH   5.4193686+01   AZ    1.1432791+02

GEOGRAPHIC
   XG   6.1647689+03   YG   -7.9581168+03   ZG    3.4495611+03   DXG   1.5715199+04   DYG  -9.7346636+03   DZG   7.1508525+02
  ALT   7.1984959+03  LAT    1.8953428+01  LON    3.0776321+02   VE    1.8499798+04   PTE   6.3897265+01   AZE   1.2744796+02

EARTH-MOON PLANE
  XMP  -7.3487245+03  YMP    7.1949241+02  ZMP    7.6625095+03 DXMP  -1.7310255+04 DYMP  -8.2235833+03 DZMP   7.2463744+03
  RMP   1.0641216+04 DEMP    4.6060951+01 RAMP    1.7440815+02  VMP   2.0488586+04  PTMP   5.4193687+01 AZMP   1.2456276+02
  XME  -7.3487245+03  YME    7.1949241+02  ZME    7.6625095+03 DXME  -1.7310255+04 DYME  -8.2235833+03 DZME   7.2463744+03

PLANETARY COORDINATES
   XM   8.8972442+04   YM   -1.5234163+05   ZM   -8.3288109+04  DXM   3.2465088+03  DYM   1.3236263+03  DZM   6.8622751+02
   RM   1.9509222+05  DEM   -2.5272037+01  RAM   -5.9713689+01  LOM   3.2205463+02  VM    3.5724941+03 ARGM  -6.3732924+01
 XSUN  -1.3662877+05 YSUN   -7.2899980+07 ZSUN   -3.1612372+07  RAS  -9.0107384+01  LOS   2.9166093+02  DES  -2.3443463+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   1.4814543+05  ECC    9.7600941-01  INC    3.0458473+01  RAN   1.4163636+02  APF   2.9857189+01  RP    3.5540980+03
   VH   -3.7813797+02 RNMP    4.0676019+01 APMP    8.2759865+00 INMP  5.5150392+01  APO   2.9273677+05  TFP   2.8835719+00
   TA    1.1038849+02   EA    1.8013223+01   MA    7.2034198-01  SLR   7.0229277+03  PER   3.9728381+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS  -7.7389225+01 ECCS    1.1604537+03 INCS    1.0430580+02 RANS   1.2876602+02 APFS   8.9954483+01 RPS   8.9729234+04
  VHS    1.9188692+04 RNMPS  -1.7843050+02 APMPS   6.4203676+01 INMPS  1.1999448+02 APOS  -8.9884003+04 TFPS  1.8194540+01
  TAS   -6.1504880+01  EAS   -7.8445993+01  MAS   -1.2218325+05 SLRS   1.0421633+08 PERS   4.2769924-02 MTAS  9.0049371+01

GEOCENTRIC    UNIT VECTORS
   WX    3.1461617-01   WY    3.9746477-01   WZ    8.6199677-01   PX   -9.4635835-01   PY    2.0179026-01   PZ    2.5236188-01
   QX   -7.3637591-02   QY   -8.9515497-01   QZ    4.3963058-01   SXO   0.0000000     SYO   0.0000000     SZO   0.0000000
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****** CSM   / EARTH REF.  /PHASE   4=  8
                  MEAN-OF-EPOCH  1969       21  DEC. 1968, 16 HRS., 39 MINS., 12.357 SECS. G.M.T.

T        .380351697839796+001  HRS. FROM LAUNCH      0 DAYS, 3 HRS., 48 MINS., 12.661 SECS. G.E.T.     RAGR  .340111807630923+003

          PHASE ELAPSED TIME     .31500000+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .11295562273275541+001      -.30894227861166687+001       .10122528766773597+001
        RDXYZ      .25584472959867208+001      -.21350578713892580+001       .50651378361870740-001

GEOCENTRIC
    X   3.8901165+03    Y   -1.0639767+04    Z    3.4861316+03   DX    1.4871499+04   DY   -1.2410461+04   DZ    2.9442151+02
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   R    1.1852880+04  DEC    1.7104587+01   RA   -6.9916552+01    V    1.9371828+04  PTH    5.6253284+01   AZ    1.1559325+02

GEOGRAPHIC
  XG    7.2776003+03  YG    -8.6818296+03  ZG    3.4861315+03  DXG   1.4359676+04  DYG   -9.8357466+03  DZG   2.9442165+02
  ALT   8.4099448+03  LAT    1.7135970+01  LON   3.0997164+02  VE    1.7407726+04  PTE    6.7694423+01  AZE   1.3482469+02

EARTH-MOON PLANE
  XMP  -8.5939313+03  YMP    1.1959057+02  ZMP   8.1621563+03 DXMP  -1.6358654+04 DYMP   -8.2535920+03 DZMP  6.2881143+03
  RMP   1.1852880+04  DEMP   4.3521143+01  RAMP  1.7920274+02  VMP   1.9371828+04  PTMP   5.6253286+01  AZMP  1.2799788+02
  XME  -8.5939313+03  YME    1.1959057+02  ZME   8.1621563+03 DXME  -1.6358654+04 DYME   -8.2535920+03 DZME  6.2881143+03

PLANETARY COORDINATES
  XM    8.9212803+04   YM   -1.5224347+05   ZM   -8.3237214+04  DXM   3.2444147+03  DYM    1.3271513+03  DZM   6.8816086+02
  RM    1.9510365+05  DEM   -2.5253927+01  RAM   -5.9630221+01  LOM   3.2025796+02  VM     3.5722714+03  ARGM  -6.3655160+01
 XSUN  -1.2926964+05 YSUN   -7.2899967+07 ZSUN   -3.1612365+07  RAS  -9.0101598+01  LOS    2.8978658+02  DES   -2.3443466+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   1.4811201+05  ECC    9.7600368-01  INC   3.0458939+01  RAN   1.4163566+02  APF    2.9858054+01  RP    3.5541437+03
  VH   -3.9959727+02 RNMP   4.0597739+01 APMP   8.2766575+00 INMP   5.5150755+01 APO    2.9266988+05  TFP   2.8835666+00
  TA    1.1467714+02  EA     1.9508445+01  MA    8.3389811-01  SLR   7.0229971+03  PER    3.9714937+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS  -8.8013025+01 ECCS   9.9134539+02 INCS   1.0758486+02 RANS   1.3064079+02 APFS   9.1365831+01  RPS   8.7163293+04
 VHS    1.7993356+04 RNMPS -1.7828878+02 APMPS  6.5215586+01 INMPS  1.2373167+02 APOS  -8.7339320+04  TFPS  1.9282827+01
 TAS   -6.2202085+01  EAS   -7.9905415+01  MAS  -1.0742762+05 SLRS   8.6496090+07 PERS   5.1872617-02 MTAS  9.0057795+01

GEOCENTRIC    UNIT VECTORS
  WX    3.1462543-01  WY     3.9746636-01  WZ    8.6199265-01  PX   -9.4635570-01  PY    2.0179006-01  PZ    2.5237200-01
  QX   -7.3632167-02  QY    -8.9515430-01  QZ    4.3963284-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000
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****** CSM   / EARTH REF.  /PHASE   4-  9
                    MEAN-OF-EPOCH  1969        21  DEC. 1968, 16 HRS., 46 MINS., 42.357 SECS. G.M.T.

T          .3928516978397960+001  HRS. FROM LAUNCH       0 DAYS,  3 HRS., 55 MINS., 42.661 SECS. G.E.T.    RAGR  .3419919410032190+003

          PHASE ELAPSED TIME      .3600000000+04 SECS.

RESTART COORDINATES ( ER AND FR/HR )

        RXYZ        .1445093446367876O+001      -.3345299426416988?+001       .1015066678290913?+001
       RDXYZ        .2490573534029441O+001      -.1964756142741859?+001      -.3116014446394065?-002

GEOCENTRIC
     X    4.9768057+03    Y    -1.1520989+04    Z    3.4958221+03   DX    1.4476969+04   DY   -1.1420548+04   DZ   -1.8112472+01
     R    1.3027761+04  DEC    1.5565294+01   RA   -6.6636749+01    V    1.8439410+04  PTH    5.7928079+01   AZ    1.1651642+02

GEOGRAPHIC
   XG     8.2947298+03   YG   -9.4180267+03   ZG    3.4958217+03  DXG   1.3125542+04  DYG   -1.0060730+04  DZG   -1.8112412+01
   ALT    9.5846584+03  LAT    1.5591547+01  LON   3.1137130+02   VE    1.6537789+04  PTE    7.0856192+01  AZE   1.4383449+02

EARTH-MOON PLANE
  XMP   -9.7749879+03  YMP   -4.7818583+02  ZMP   8.5990407+03 DXMP  -1.5550283+04 DYMP   -8.2171755+03 DZMP  5.5388243+03
  RMP    1.3027761+04 DEMP    4.1304078+01 RAMP   1.7719936+02  VMP   1.8439410+04 PTMP    5.7928077+01 AZMP  1.3047828+02
  XME   -9.7749879+03  YME   -4.7818583+02  ZME   8.5990407+03 DXME  -1.5550283+04 DYME   -8.2171755+03 DZME  5.5388243+03

PLANETARY COORDINATES
   XM    8.9453010+04   YM   -1.5214505+05   ZM   -8.3186177+04  DXM   3.2423154+03  DYM    1.3306734+03  DZM   6.9009268+02
   RM    1.9511509+05  DEM   -2.5235772+01  RAM   -5.9546789+01  LOM   3.1846127+02  VM     3.5720482+03  ARGM  -6.3577406+01
 XSUN   -1.2191008+05 YSUN   -7.2899953+07 ZSUN   -3.1612359+07  RAS  -9.0095815+01  LOS    2.8791223+02  DES   -2.3443469+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   1.4808811+05  ECC    9.7599959-01  INC   3.0459279+01  RAN   1.4163520+02  APF    2.9858591+01  RP    3.5541769+03
   VH   -4.1943166+02 RNMP   4.0519673+01 APMP   8.2771067+00 INMP   5.5151052+01 APO    2.9262204+05  TFP   2.8835618+00
   TA    1.1818051+02  EA     2.0859847+01  MA    9.4743928-01  SLR   7.0230479+03  PER    3.9705323+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS  -9.8597344+01 ECCS   8.6446539+02 INCS   1.1029921+02 RANS   1.3226537+02 APFS   9.2603286+01  RPS   8.5135303+04
  VHS    1.7000160+04 RNMPS -1.7815544+02 APMPS  6.6047429+01 INMPS  1.2684601+02 APOS  -8.5332588+04  TFPS  2.0287743+01
  TAS   -6.2727321+01  EAS   -8.1022707+01  MAS  -9.5752405+04 SLRS   7.3681734+07 PERS   6.1505727-02 MTAS  9.0066276+01

GEOCENTRIC    UNIT VECTORS
   WX    3.1463175-01  WY     3.9746793-01  WZ    8.6198963-01  PX   -9.4635387-01  PY    2.0179029-01  PZ    2.5237869-01
   QX   -7.3628703-02  QY    -8.9515356-01  QZ    4.3963493-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000
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****** CSM   / EARTH REF.  /PHASE   4-  10
                    MEAN-OF-EPOCH  1969        21  DEC. 1968, 17 HRS., 22 MINS., 19.857 SECS. G.M.T.

T          .4522266978397960+001  HRS. FROM LAUNCH       0 DAYS,  4 HRS., 31 MINS., 20.161 SECS. G.E.T.    RAGR  .3509225745216250+003

          PHASE ELAPSED TIME      .5737500000+04 SECS.

RESTART COORDINATES ( ER AND FR/HR )

        RXYZ        .2838940150614054O+001      -.4344126613291954O+001       .9668572575761522O+000
       RDXYZ        .2219389934308824O+001      -.1461410526966146?+001      -.1362582250698280?+000

GEOCENTRIC
     X    9.7771212+03    Y    -1.4960883+04    Z    3.3297921+03   DX    1.2900659+04   DY   -8.4947482+03   DZ   -7.9202884+02
     R    1.8179869+04  DEC    1.0553769+01   RA   -5.6834889+01    V    1.5466578+04  PTH    6.3022183+01   AZ    1.1873962+02

GEOGRAPHIC
   XG     1.2015036+04   YG   -1.3230987+04   ZG    3.3297917+03  DXG   8.2169488+03  DYG   -1.1676625+04  DZG   -7.9202837+02
   ALT    1.4736322+04  LAT    1.0566868+01  LON   3.1224253+02   VE    1.4299970+04  PTE    7.4543248+01  AZE   1.5238095+02

EARTH-MOON PLANE
  XMP   -1.4749856+04  YMP   -3.2153178+03  ZMP   1.0129715+04 DXMP  -1.2926282+04 DYMP   -7.7592482+03 DZMP  3.4525841+03
  RMP    1.8179869+04 DEMP    3.3861966+01 RAMP   1.6770248+02  VMP   1.5466578+04 PTMP    6.3022178+01 AZMP  1.3651873+02
  XME   -1.4749856+04  YME   -3.2153178+03  ZME   1.0129715+04 DXME  -1.2926282+04 DYME   -7.7592482+03 DZME  3.4525841+03

PLANETARY COORDINATES
   XM    9.0591849+04   YM   -1.5167400+05   ZM   -8.2941800+04  DXM   3.2322718+03  DYM    1.3473632+03  DZM   6.9924777+02
   RM    1.9516974+05  DEM   -2.5148930+01  RAM   -5.9150971+01  LOM   3.0992645+02  VM     3.5709825+03  ARGM  -6.3208215+01
 XSUN   -8.6953437+04 YSUN   -7.2899876+07 ZSUN   -3.1612325+07  RAS  -9.0068341+01  LOS    2.7900908+02  DES   -2.3443484+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   1.4803864+05  ECC    9.7599103-01  INC   3.0460228+01  RAN   1.4163426+02  APF    2.9859660+01  RP    3.5542559+03
   VH   -4.9789280+02 RNMP   4.0149987+01 APMP   8.2782268+00 INMP   5.5152054+01 APO    2.9252303+05  TFP   2.8835475+00
   TA    1.2896020+02  EA     2.6002654+01  MA    1.4865379+00  SLR   7.0231737+03  PER    3.9685430+02  MTA   3.5999999+02
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SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.4821671+02 ECCS    5.3361867+02 INCS    1.1868660+02 RANS    1.3788058+02 APFS    9.7132995+01 RPS     7.8942987+04
  VHS    1.3865549+04 RNMPS -1.7761294+02 APMPS   6.8850187+01 INMPS   1.3664037+02 APOS   -7.9239421+04 TFPS    2.4297427+01
  TAS   -6.4167678+01  EAS   -8.4152707+01  MAS   -6.2799909+04 SLRS    4.2204396+07 PERS    1.1336095-01 MTAS    9.0107370+01

GEOCENTRIC     UNIT VECTORS
   WX    3.1464712-01  WY    3.9747395-01  WZ    8.6198124-01  PX   -9.4634934-01  PY    2.0179236-01  PZ    2.5239399-01
   QX   -7.3621193-02  QY   -8.9515042-01  QZ    4.3964259-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000
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****** CSM   / EARTH REF.  /PHASE   4- 11
                    MEAN-OF-EPOCH  1969       21  DEC. 1968, 17 HRS., 46 MINS., 42.357 SECS. G.M.T.

T        .492851697839796+001  HRS. FROM LAUNCH      0 DAYS,  4 HRS., 55 MINS., 42.661 SECS. G.E.T.     RAGR  .357033007981587+003

           PHASE ELAPSED TIME      .72000000+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .371110680521444461+001      -.489502486081096l5+001       .902518132896603S1+000
        RDXYZ       .207946042677416?3+001      -.126284499441452l1+001      -.176751711060513S8+000

GEOCENTRIC
    X    1.2780805+04    Y   -1.6858140+04    Z    3.1082124+03   DX    1.2087290+04   DY   -7.3405685+03   DZ   -1.0274055+03
    R    2.1382396+04  DEC    8.3583090+00   RA   -5.2832832+01   V    1.4178931+04  PTH    6.5119337+01   AZ    1.1939802+02

GEOGRAPHIC
   XG    1.3636261+04   YG   -1.6173998+04   ZG    3.1082124+03  DXG   5.2847078+03  DYG   -1.2746999+04  DZG   -1.0274050+03
  ALT    1.7938706+04  LAT    8.3672023+00  LON    3.1013416+02   VE   1.3837258+04  PTE    6.8365346+01  AZE   -1.2505671+02

EARTH-MOON PLANE
  XMP   -1.7734702+04  YMP   -4.9692040+03  ZMP    1.0862513+04 DXMP  -1.1784529+04 DYMP   -7.4117144+03 DZMP    2.6895057+03
  RMP    2.1382396+04 DEMP    3.0531498+01 RAMP   -1.6434731+02  VMP   1.4178931+04 PTMP    6.5119336+01 AZMP    1.3844276+02
  XME   -1.7734702+04  YME   -4.9692040+03  ZME    1.0862513+04 DXME  -1.1784529+04 DYME   -7.4117144+03 DZME    2.6895057+03

PLANETARY COORDINATES
   XM    9.1369013+04   YM   -1.5134832+05   ZM   -8.2772741+04  DXM   3.2253318+03  DYM    1.3587444+03  DZM    7.0549174+02
   RM    1.9520742+05  DEM   -2.5088936+01  RAM   -5.8880612+01  LOM   3.0408637+02   VM    3.5702479+03 ARGM   -6.2955738+01
 XSUN   -6.3035714+04 YSUN   -7.2899816+07 ZSUN   -3.1612299+07  RAS  -9.0049542+01  LOS    2.7291744+02  DES   -2.3443491+01

GEOCENTRIC     OSCULATING ELEMENTS
  SMA    1.4802996+05  ECC    9.7598946-01  INC    3.0460718+01  RAN   1.4163394+02  APF    2.9860035+01  RP    3.5542791+03
   VH   -5.4154106+02 RNMP    3.9897423+01 APMP    8.2787579+00 INMP   5.5152652+01  APO    2.9250564+05  TFP   2.8835426+00
   TA    1.3347696+02   EA    2.8764945+01   MA    1.8552287+00  SLR   7.0232166+03  PER    3.9681941+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.8161951+02 ECCS    4.2001516+02 INCS    1.2213056+02 RANS   1.4055848+02 APFS    9.9516050+01 RPS     7.6101329+04
  VHS    1.2525769+04 RNMPS -1.7730616+02 APMPS   7.0297126+01 INMPS   1.4077047+02 APOS   -7.6464569+04 TFPS    2.6571137+01
  TAS   -6.4755903+01  EAS   -8.5450004+01  MAS   -5.0669991+04 SLRS    3.2039812+07 PERS    1.5376642-01 MTAS    9.0136413+01

GEOCENTRIC     UNIT VECTORS
   WX    3.1465397-01  WY    3.9747792-01  WZ    8.6197691-01  PX   -9.4634733-01  PY    2.0179365-01  PZ    2.5240052-01
   QX   -7.3617831-02  QY   -8.9514837-01  QZ    4.3964733-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000

TMAX   TERMINATION
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TABLE II.- TRANSLUNAR COAST - Concluded

(b) "TLI cutoff + 2 hrs" to pericynthion

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****** CSM   / EARTH REF.  /PHASE   5-  1
                MEAN-OF-EPOCH  1969        21  DEC. 1968, 17 HRS., 46 MINS., 42.357 SECS. G.M.T.

T        .4928516978397960+001  HRS. FROM LAUNCH       0 DAYS,  4 HRS., 55 MINS., 42.661 SECS. G.E.T.    RAGR  .3570330079815A7+003

          PHASE ELAPSED TIME      .72000000+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .3711106A052144461+001      -.4895024860A109615+001       .9025181328966035I+000
        RDXYZ       .2079460426774167 3+001     -.1262848994414521 +001      -.1767517110605135A+000

GEOCENTRIC
    X    1.2780805+04    Y   -1.6858140+04    Z    3.1082124+03   DX    1.2087290+04   DY   -7.3405685+03   DZ   -1.0274055+03
    R    2.1382396+04  DEC    8.3583090+00   RA   -5.2832832+01    V    1.4178931+04  PTH    6.5119337+01   AZ    1.1939802+02

GEOGRAPHIC
   XG    1.3636261+04   YG   -1.6173998+04   ZG    3.1082124+03   DXG   5.2847078+03   DYG   -1.2746999+04   DZG   -1.0274050+03
  ALT    1.7938706+04  LAT    8.3672023+00  LON    3.1013416+02   VE    1.3837258+04  PTE    6.8365346+01   AZE   -1.2505671+02

EARTH-MOON PLANE
  XMP   -1.7734702+04  YMP   -4.9692040+03  ZMP    1.0862513+04  DXMP  -1.1784529+04  DYMP   -7.4117144+03  DZMP    2.6895057+03
  RMP    2.1382396+04 DEMP    3.0531498+01 RAMP   -1.6434731+02   VMP   1.4178931+04 PTMP    6.5119336+01 AZMP    1.3844276+02
  XME   -1.7734702+04  YME   -4.9692040+03  ZME    1.0862513+04  DXME  -1.1784529+04  DYME   -7.4117144+03  DZME    2.6895057+03

PLANETARY COORDINATES
   XM    9.1369013+04   YM   -1.5134832+05   ZM   -8.2772741+04   DXM   3.2253318+03   DYM    1.3587444+03   DZM    7.0549174+02
   RM    1.9520742+05  DEM   -2.5088936+01  RAM   -5.8880612+01  LOM    3.0408637+02   VM    3.5702479+03 ARGM   -6.2955738+01
 XSUN   -6.3035714+04 YSUN   -7.2899816+07 ZSUN   -3.1612299+07  RAS   -9.0049542+01  LOS    2.7291744+02  DES   -2.3443491+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4802996+05  ECC    9.7598946-01  INC    3.0460718+01  RAN    1.4163394+02  APF    2.9860035+01   RP    3.5542701+03
   VH   -5.4154106+02 RNMP    3.9897423+01 APMP    8.2787579+00 INMP    5.5152652+01  APO    2.9250564+05  TFP    2.8835426+00
   TA    1.3347696+02   EA    2.8764945+01   MA    1.8552287+00  SLR    7.0232166+03  PER    3.9681941+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.8161951+02 ECCS    4.2001516+02 INCS    1.2213056+02 RANS    1.4055848+02 APFS    9.9516050+01  RPS    7.6101329+04
  VHS    1.2525769+04 RNMPS  -1.7730616+02 APMPS   7.0297126+01 INMPS   1.4077047+02 APOS   -7.6464569+04 TFPS    2.6571137+01
  TAS   -6.4755903+01  EAS   -8.5450004+01  MAS   -5.0669991+04 SLRS    3.2039812+07 PERS    1.5376642-01 MTAS    9.0136413+01

GEOCENTRIC    UNIT VECTORS
   WX    3.1465397-01   WY    3.9747792-01   WZ    8.6197691-01   PX   -9.4634733-01   PY    2.0179365-01   PZ    2.5240052-01
   QX   -7.3617831-02   QY   -8.9514837-01   QZ    4.3964733-01  SXO    0.0000000    SYO    0.0000000    SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE   5-  2
                MEAN-OF-EPOCH  1969        21  DEC. 1968, 17 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .4999999999999999+001  HRS. FROM LAUNCH       0 DAYS,  4 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .3581081A8897319+003

          PHASE ELAPSED TIME      .74573399+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .3858973588364264A+001      -.4994276412401621+001       .8A969713003590268+000
        RDXYZ       .2057785796181234A+001      -.1234559615068671 7+001      -.1A18846003734462+000

GEOCENTRIC
    X    1.3290048+04    Y   -1.7165516+04    Z    3.0640578+03   DX    1.1961301+04   DY   -7.1761307+03   DZ   -1.0572523+03
    R    2.1924160+04  DEC    8.0337931+00   RA   -5.2251907+01    V    1.3988830+04  PTH    6.5423398+01   AZ    1.1948033+02

GEOGRAPHIC
   XG    1.3849479+04   YG   -1.6717423+04   ZG    3.0640578+03   DXG   4.7845713+03   DYG   -1.2913737+04   DZG   -1.0572520+03
  ALT    1.8480451+04  LAT    8.0421387+00  LON    3.0963990+02   VE    1.3812116+04  PTE    6.7074317+01   AZE   -1.2217585+02

EARTH-MOON PLANE
  XMP   -1.8234178+04  YMP   -5.2679605+03  ZMP    1.0974157+04  DXMP  -1.1616416+04  DYMP   -7.3531947+03  DZMP    2.5839482+03
  RMP    2.1924160+04 DEMP    3.0036449+01 RAMP   -1.6388568+02   VMP   1.3988830+04 PTMP    6.5423397+01 AZMP    1.3869804+02
  XME   -1.8234178+04  YME   -5.2679605+03  ZME    1.0974157+04  DXME  -1.1616416+04  DYME   -7.3531947+03  DZME    2.5839482+03

PLANETARY COORDINATES
   XM    9.1505565+04   YM   -1.5129074+05   ZM   -8.2742844+04   DXM   3.2241051+03   DYM    1.3607435+03   DZM    7.0658854+02
   RM    1.9521408+05  DEM   -2.5078332+01  RAM   -5.8833086+01  LOM    3.0305871+02   VM    3.5701182+03 ARGM   -6.2911330+01
 XSUN   -5.8827909+04 YSUN   -7.2899805+07 ZSUN   -3.1612294+07  RAS   -9.0046237+01  LOS    2.7184557+02  DES   -2.3443493+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4802933+05  ECC    9.7598934-01  INC    3.0460008+01  RAN    1.4163388+02  APF    2.9860091+01   RP    3.5542817+03
   VH   -5.4862642+02 RNMP    3.9853003+01 APMP    8.2788483+00 INMP    5.5152763+01  APO    2.9250439+05  TFP    2.8835424+00
   TA    1.3413719+02   EA    2.9208362+01   MA    1.9200915+00  SLR    7.0232224+03  PER    3.9681688+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.8745997+02 ECCS    4.0458752+02 INCS    1.2262662+02 RANS    1.4096832+02 APFS    9.9897778+01  RPS    7.5656507+04
  VHS    1.2329100+04 RNMPS  -1.7725632+02 APMPS   7.0532633+01 INMPS   1.4137249+02 APOS   -7.6031427+04 TFPS    2.6943773+01
  TAS   -6.4845458+01  EAS   -8.5648156+01  MAS   -4.8992911+04 SLRS    3.0685335+07 PERS    1.6124288-01 MTAS    9.0141614+01

GEOCENTRIC    UNIT VECTORS
   WX    3.1465515-01   WY    3.9747868-01   WZ    8.6197612-01   PX   -9.4634698-01   PY    2.0179390-01   PZ    2.5240164-01
   QX   -7.3617251-02   QY   -8.9514797-01   QZ    4.3964824-01  SXO    0.0000000    SYO    0.0000000    SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE   5-  3
                MEAN-OF-EPOCH  1969        21  DEC. 1968, 22 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .1000000000000000+002  HRS. FROM LAUNCH       0 DAYS,  9 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .7331352378915994002

          PHASE ELAPSED TIME      .25457339+05 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .1198903764548003 5+002     -.8897752932262003 7+001      -.2739217464584978 1+000
        RDXYZ       .1357550357442972 8+001     -.5494959967639709 1+000      -.2423698231089514 0+000

GEOCENTRIC
    X    4.1289449+04    Y   -3.0643269+04    Z   -9.4336828+02   DX    7.8910396+03   DY   -3.1940580+03   DZ   -1.4088243+03
    R    5.1426826+04  DEC   -1.0510867+00   RA   -3.6581229+01    V    8.6287483+03  PTH    7.3295137+01   AZ    1.2046254+02

GEOGRAPHIC
   XG    -1.7497265+04  YG   -4.8349500+04   ZG   -9.4336826+02   DXG  -2.2216334+04  DYG   -7.2323209+02   DZG   -1.4088237+03
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  ALT    4.7982897+04  LAT   -1.0515579+00  LON    2.5010524+02   VE    2.2272705+04  PTE    2.1781278+01  AZE   -9.3485345+01

EARTH-MOON PLANE
  XMP   -4.4708771+04  YMP   -2.1147718+04  ZMP    1.4093199+04 DXMP   -7.0495252+03 DYMP   -4.9638681+03 DZMP    3.4569911+02
  RMP    5.1426826+04 DEMP    1.5905034+01 RAMP   -1.5468536+02  VMP    8.6287483+03 PTMP    7.3295141+01 AZMP    1.4356925+02
  XME   -4.4708771+04  YME   -2.1147718+04  ZME    1.4093199+04 DXME   -7.0495252+03 DYME   -4.9638681+03 DZME    3.4569911+02

PLANETARY COORDINATES
   XM    1.0092546+05   YM   -1.4705495+05   ZM   -8.0537264+04  DXM    3.1341276+03  DYM    1.4981254+03  DZM    7.8201785+02
   RM    1.9569710+05  DEM   -2.4301636+01  RAM   -5.5537754+01  LOM    2.3114872+02   VM    3.5607144+03 ARGM   -5.9812996+01
 XSUN    2.3554327+05 YSUN   -7.2898516+07 ZSUN   -3.1611732+07  RAS   -8.9814869+01  LOS    1.9687160+02  DES   -2.3443387+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4811093+05  ECC    9.7600449-01  INC    3.0478923+01  RAN    1.4163239+02  APF    2.9861552+01   RP    3.5539987+03
   VH   -8.6319315+02 RNMP    3.6749551+01 APMP    8.2865988+00 INMP    5.5171878+01  APO    2.9266787+05  TFP    2.8837463+00
   TA    1.5221103+02   EA    4.8023123+01   MA    6.4506692+00  SLR    7.0227132+03  PER    3.9714504+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -5.8067647+02 ECCS    9.5393546+01 INCS    1.3491014+02 RANS    1.5447085+02 APFS    1.1665988+02  RPS    5.4812111+04
  VHS    7.0051676+03 RNMPS  -1.7520208+02 APMPS   8.3238940+01 INMPS   1.5730704+02 APOS   -5.5973464+04 TFPS   4.4306736+01
  TAS   -6.9435804+01  EAS   -9.6226682+01  MAS   -1.4049563+04 SLRS    5.2835335+06 PERS    8.7906113-01 MTAS   9.0600634+01

GEOCENTRIC    UNIT VECTORS
   #X    3.1483471-01   WY    3.9768413-01   WZ    8.6181578-01   PX   -9.4629404-01   PY    2.0185844-01   PZ    2.5254853-01
   QX   -7.3530243-02   QY   -8.9504217-01   QZ    4.3987816-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

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****** CSM   / EARTH REF.  /PHASE   5-  4
                    MEAN-OF-EPOCH  1969       22  DEC.  1968,  3 HRS.,  50 MINS.,  59.695 SECS.  G.M.T.

T        .1500000000000000+002  HRS. FROM LAUNCH      0 DAYS,  14 HRS.,  59 MINS.,  59.999 SECS.  G.E.T.    RAGR  .1485188586810000+003

          PHASE ELAPSED TIME     .43457339+05 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .1806838824675890 4+002      -.1115247995094010 6+002      -.1455231261233246 1+001
       RDXYZ       .1101885250703048 8+001      -.3764590853986028 2+000      -.2291960181087654 1+000

GEOCENTRIC
    X    6.2226329+04    Y   -3.8408399+04    Z   -5.0117197+03   DX    6.4049338+03   DY   -2.1882455+03   DZ   -1.3322488+03
    R    7.3296919+04  DEC   -3.9206914+00   RA   -3.1684422+01    V    6.8982955+03  PTH    7.5392163+01   AZ    1.2030449+02

GEOGRAPHIC
   XG   -7.3124918+04   YG    2.5944132+03   ZG   -5.0117195+03  DXG   -6.4899916+03  DYG    3.0921382+04  DZG   -1.3322577+03
  ALT    6.9853041+04  LAT   -3.9219210+00  LON    1.7979672+02   VE    3.1623202+04  PTE    2.1186205+01  AZE   -9.1627172+01

EARTH-MOON PLANE
  XMP   -6.4779800+04  YMP   -3.1132337+04  ZMP    1.4380317+04 DXMP   -5.7115717+03 DYMP   -3.8676009+03 DZMP   -7.8061678+01
  RMP    7.3296918+04 DEMP    1.1314403+01 RAMP   -1.5433165+02  VMP    6.8982957+03 PTMP    7.5392170+01 AZMP    1.4443455+02
  XME   -6.4779800+04  YME   -3.1132337+04  ZME    1.4380317+04 DXME   -5.7115717+03 DYME   -3.8676009+03 DZME   -7.8061678+01

PLANETARY COORDINATES
   XM    1.1006695+05   YM   -1.4241965+05   ZM   -7.8112186+04  DXM    3.0362287+03  DYM    1.6303887+03  DZM    8.5474342+02
   RM    1.9621316+05  DEM   -2.3459367+01  RAM   -5.2301881+01  LOM    1.5917926+02   VM    3.5506954+03 ARGM   -5.6731715+01
 XSUN    5.2990480+05 YSUN   -7.2896237+07 ZSUN   -3.1610739+07  RAS   -8.9583506+01  LOS    1.2189764+02  DES   -2.3442940+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4824376+05  ECC    9.7603877-01  INC    3.0533136+01  RAN    1.4164288+02  APF    2.9848880+01   RP    3.5521031+03
   VH   -1.0524353+03 RNMP    3.3653753+01 APMP    8.2956045+00 INMP    5.5226848+01  APO    2.9293543+05  TFP    2.8848860+00
   TA    1.5788591+02   EA    5.8803398+01   MA    1.0967228+01  SLR    7.0190926+03  PER    3.9767943+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -9.4063602+02 ECCS    4.3567836+01 INCS    1.3804470+02 RANS    1.5995564+02 APFS    1.2743103+02  RPS    4.0040839+04
  VHS    5.5039546+03 RNMPS  -1.7418835+02 APMPS   9.3868504+01 INMPS   1.6200875+02 APOS   -4.1922112+04 TFPS   5.4474460+01
  TAS   -7.3823807+01  EAS   -1.0743635+02  MAS   -7.8409477+03 SLRS    1.7845334+06 PERS    1.8123837+00 MTAS   9.1315207+01

GEOCENTRIC    UNIT VECTORS
   #X    3.1526771-01   WY    3.9838109-01   WZ    8.6133546-01   PX   -9.4616640-01   PY    2.0207041-01   PZ    2.5285698-01
   QX   -7.3316967-02   QY   -8.9468431-01   QZ    4.4064108-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

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****** CSM   / EARTH REF.  /PHASE   5-  5
                    MEAN-OF-EPOCH  1969       22  DEC.  1968,  8 HRS.,  50 MINS.,  59.695 SECS.  G.M.T.

T        .2000000000000000+002  HRS. FROM LAUNCH      0 DAYS,  19 HRS.,  59 MINS.,  59.999 SECS.  G.E.T.    RAGR  .2237241935728400+003

          PHASE ELAPSED TIME     .61457339+05 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .2317543878096900 4+002      -.1279668140140098 8+002      -.2565403958115623 6+001
       RDXYZ       .9514446228813974 3+000      -.2890158950033021 0+000      -.2151484661645818 6+000

GEOCENTRIC
    X    7.9814671+04    Y   -4.4070920+04    Z   -8.8350806+03   DX    5.5304667+03   DY   -1.6799641+03   DZ   -1.2505945+03
    R    9.1600688+04  DEC   -5.5349041+00   RA   -2.8905971+01    V    5.9137406+03  PTH    7.6393312+01   AZ    1.2018333+02

GEOGRAPHIC
   XG   -2.7218822+04   YG    8.7015878+04   ZG   -8.8350804+03  DXG    3.5719201+04  DYG    1.7096701+04  DZG   -1.2506010+03
  ALT    8.8156863+04  LAT   -5.5362886+00  LON    1.0736983+02   VE    3.9619724+04  PTE    8.3415468+00  AZE   -9.1022200+01

EARTH-MOON PLANE
  XMP   -8.2398632+04  YMP   -3.7539626+04  ZMP    1.3853811+04 DXMP   -4.9950741+03 DYMP   -3.1553601+03 DZMP   -2.5547232+02
  RMP    9.1600688+04 DEMP    8.6988708+00 RAMP   -1.5550667+02  VMP    5.9137406+03 PTMP    7.6393312+01 AZMP    1.4487263+02
  XME   -8.2398632+04  YME   -3.7539626+04  ZME    1.3853811+04 DXME   -4.9950741+03 DYME   -3.1553601+03 DZME   -2.5547232+02

PLANETARY COORDINATES
   XM    1.1890723+05   YM   -1.3740055+05   ZM   -7.5475907+04  DXM    2.9308490+03  DYM    1.7571891+03  DZM    9.2457366+02
   RM    1.9675989+05  DEM   -2.2556480+01  RAM   -4.9126896+01  LOM    8.7148909+01   VM    3.5401165+03 ARGM   -5.3668419+01
 XSUN    8.2425497+05 YSUN   -7.2892969+07 ZSUN   -3.1609317+07  RAS   -8.9352140+01  LOS    4.6923665+01  DES   -2.3442153+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4840877+05  ECC    9.7609635-01  INC    3.0639502+01  RAN    1.4167822+02  APF    2.9809578+01   RP    3.5475118+03
   VH   -1.1984033+03 RNMP    3.0566864+01 APMP    8.3041798+00 INMP    5.5335005+01  APO    2.9327004+05  TFP    2.8879638+00
   TA    1.6109987+02   EA    6.6911334+01   MA    1.5464873+01  SLR    7.0102246+03  PER    3.9834359+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.2479810+03 ECCS    2.3841430+01 INCS    1.3964866+02 RANS    1.6354853+02 APFS    1.3643277+02  RPS    2.8505671+04
  VHS    4.7783907+03 RNMPS  -1.7338853+02 APMPS   1.0386183+02 INMPS   1.6464685+02 APOS   -3.1001633+04 TFPS   6.1017377+01
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 TAS   -7.8275953+01  EAS   -1.1988811+02  MAS   -5.3313928+03 SLRS    7.0812168+05 PERS    2.7696806+00 MTAS    9.2403906+01

GEOCENTRIC    UNIT VECTORS
   WX    3.1601290-01   WY    3.9982927-01   WZ    8.6039084-01   PX   -9.4594955-01   PY    2.0246889-01   PZ    2.5334913-01
   QX   -7.2905984-02   QY   -8.9394792-01   QZ    4.4220110-01  SXO    0.0000000      SYO    0.0000000      SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE   5-  6
                MEAN-OF-EPOCH  1969       22  DEC. 1968, 13 HRS., 50 MINS., 59.69, SECS. G.M.T.

T        .250000000000000+002  HRS. FROM LAUNCH       1 DAYS,  0 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .298929528464680+003

          PHASE ELAPSED TIME     .7945739+05 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .276572404701668491+002      -.140952645755746594+002      -.360997653571198666+001
        RDXYZ      .846637838035274A7+000       -.234039451048048507+000      -.203008329455229424+000

GEOCENTRIC
     X    9.5249699+04   Y   -4.8543154+04   Z   -1.2432519+04   DX    4.9212559+03   DY   -1.3604046+03   DZ   -1.1800275+03
     R    1.0762672+05  DEC   -6.6333406+00  RA   -2.7005257+01   V    5.2404127+03  PTH    7.6956835+01  AZ    1.2016432+02

GEOGRAPHIC
   XG     8.8561179+04  YG    5.9882049+04  ZG   -1.2432519+04  DXG   3.0103602+04  DYG   -3.5590364+04  DZG   -1.1800143+03
   ALT    1.0418294+05  LAT   -6.6347490+00  LON   3.4065216+01   VE    4.6629319+04  PTE    6.2856479+00  AZE   -9.0734535+01

EARTH-MOON PLANE
  XMP   -9.8556504+04  YMP   -4.1263170+04  ZMP   1.2941276+04 DXMP   -4.522247A+03 DYMP   -2.6245536+03 DZMP   -3.5059608+02
  RMP    1.0762672+05 DEMP    6.9060823+00 RAMP   -1.5728214+02  VMP    5.2404126+03 PTMP    7.6956841+01 AZMP    1.4522954+02
  XME   -9.8556504+04  YME   -4.1263170+04  ZME   1.2941276+04 DXME   -4.522247A+03 DYME   -2.6245536+03 DZME   -3.5059608+02

PLANETARY COORDINATES
   XV    1.2742482+05   YM   -1.3201429+05   ZM   -7.2637267+04  DXM    2.A18447A+03  DYM    1.8782164+03  DZM    9.9133544+02
   RV    1.9733482+05  DEM   -2.1597962+01  RAM   -4.6013453+01  LOM    1.5057019+01   VM    3.5290351+03 ARGM   -5.0623930+01
 XSUN    1.1185903+06 YSUN   -7.2888713+07 ZSUN   -3.1607465+07  RAS   -8.912077A+01  LOS    3.3194969+02  DES   -2.3441025+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.4861381+05  ECC    9.7618669-01  INC    3.0917876+01  RAN    1.4175316+02  APF    2.9729929+01   RP    3.5389863+03
    VH   -1.3208869+03 RNMP    2.7489762+01 APMP    8.3111329+00 INMP    5.5517644+01  APO    2.9368863+05  TFP    2.8944880+00
    TA    1.6330110+02   EA    7.3589106+01   MA    1.9936358+01  SLR    6.9936965+03  PER    3.9916937+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -1.4921465+03 ECCS    1.4169457+01 INCS    1.4070072+02 RANS    1.6639185+02 APFS    1.4467321+02  RPS    1.9650759+04
   VHS    4.3699846+03 RNMPS  -1.7242951+02 APMPS   1.1379209+02 INMPS   1.6650309+02 APOS   -2.2635052+04 TFPS   6.5085161+01
   TAS   -8.2846639+01  EAS   -1.3330755+02  MAS   -3.9852098+03 SLRS    2.9809134+05 PERS    3.6210534+00 MTAS    9.4046974+01

GEOCENTRIC    UNIT VECTORS
   WX    3.1714632-01   WY    4.0234391-01   WZ    8.5880008-01   PX   -9.4562455-01   PY    2.0309367-01   PZ    2.5406127-01
   QX   -7.2196854-02   QY   -8.9267703-01   QZ    4.4487669-01  SXO    0.0000000      SYO    0.0000000      SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE   5-  7
                MEAN-OF-EPOCH  1969       22  DEC. 1968, 18 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .300000000000000+002  HRS. FROM LAUNCH       1 DAYS,  5 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .141348633565211+002

          PHASE ELAPSED TIME     .9745740+05 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .316830282893024l4+002      -.151640918159751076+002      -.459854592389777D9+001
        RDXYZ      .766879057023526?8+000       -.195526754730346l3+000      -.192701190076846?0+000

GEOCENTRIC
     X    1.0911424+05   Y   -5.2224090+04   Z   -1.5937086+04   DX    4.4576416+03   DY   -1.1365393+03   DZ   -1.1201151+03
     R    1.2200035+05  DEC   -7.4587174+00  RA   -2.5576636+01   V    4.7346539+03  PTH    7.7294937+01  AZ    1.2027614+02

GEOGRAPHIC
   XG     9.3057264+04  YG   -7.7289186+04  ZG   -1.5837086+04  DXG   -3.0199952+04  DYG   -4.3422271+04  DZG   -1.1200978+03
   ALT    1.1855662+05  LAT   -7.4601111+00  LON   3.2028849+02   VE    5.2903550+04  PTE    5.0085787+00  AZE   -9.0570619+01

EARTH-MOON PLANE
  XMP   -1.1363795+05  YMP   -4.2790917+04  ZMP   1.1808567+04 DXMP   -4.1727809+03 DYMP   -2.1995729+03 DZMP   -4.0832198+02
  RMP    1.2200035+05 DEMP    5.5544260+00 RAMP   -1.5936589+02  VMP    4.7346540+03 PTMP    7.7294937+01 AZMP    1.4562101+02
  XME   -1.1363795+05  YME   -4.2790917+04  ZME   1.1808567+04 DXME   -4.1727809+03 DYME   -2.1995729+03 DZME   -4.0832198+02

PLANETARY COORDINATES
   XV    1.3559961+05   YM   -1.2627840+05   ZM   -6.9605588+04  DXM    2.6994968+03  DYM    1.9931956+03  DZM    1.0548744+03
   RV    1.9793540+05  DEM   -2.0588765+01  RAM   -4.2961489+01  LOM    3.0290364+02   VM    3.5175093+03 ARGM   -4.7598953+01
 XSUN    1.4129067+06 YSUN   -7.2883468+07 ZSUN   -3.1605186+07  RAS   -8.8889410+01  LOS    2.5697572+02  DES   -2.3439555+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.4887257+05  ECC    9.7632256-01  INC    3.1096533+01  RAN    1.4188710+02  APF    2.9592186+01   RP    3.5249210+03
    VH   -1.4280225+03 RNMP    2.4422830+01 APMP    8.3152447+00 INMP    5.5804866+01  APO    2.9422022+05  TFP    2.9068259+00
    TA    1.6496455+02   EA    7.9345725+01   MA    2.4370918+01  SLR    6.9663808+03  PER    4.0021235+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -1.6743447+03 ECCS    8.8077672+00 INCS    1.4150257+02 RANS    1.6894641+02 APFS    1.5279705+02  RPS    1.3072893+04
   VHS    4.1253728+03 RNMPS  -1.7093048+02 APMPS   1.2433673+02 INMPS   1.6799770+02 APOS   -1.6421583+04 TFPS   6.7440783+01
   TAS   -8.7749930+01  EAS   -1.4727324+02  MAS   -3.1315719+03 SLRS    1.2821589+05 PERS    4.3041267+00 MTAS    9.6519198+01

GEOCENTRIC    UNIT VECTORS
   WX    3.1877916-01   WY    4.0636566-01   WZ    8.5629832-01   PX   -9.4516291-01   PY    2.0400056-01   PZ    2.5505062-01
   QX   -7.1041528-02   QY   -8.9064623-01   QZ    4.4911297-01  SXO    0.0000000      SYO    0.0000000      SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE   5-  8
                MEAN-OF-EPOCH  1969       22  DEC. 1968, 23 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .349999999999999+002  HRS. FROM LAUNCH       1 DAYS, 10 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .A93401982483614+002

          PHASE ELAPSED TIME     .1154573A+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .353519351267104?6+002      -.160667526823706?2+002      -.553959385731427?5+001
        RDXYZ      .702795576580301?4+000       -.166847745948364?1+000      -.183961037701136l4+000

GEOCENTRIC
     X    1.2174972+05   Y   -5.5332829+04   Z   -1.9077992+04   DX    4.0851433+03   DY   -9.6983670+02   DZ   -1.0693112+03
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   R     1.3508768+05  DEC    -8.1188381+00   RA    -2.4440853+01    V     4.3327133+03  PTH    7.7503052+01   AZ    1.2056038+02

GEOGRAPHIC
  XG    -5.3927153+04  YG     -1.2237882+05  ZG    -1.9077992+04  DXG   -5.5146012+04  DYG    1.9797853+04  DZG   -1.0692720+03
  ALT    1.3164399+05  LAT    -8.1202053+00  LON    2.4621894+02  VE    5.8601888+04  PTE    4.1393930+00  AZE   -9.0467200+01

EARTH-MOON PLANE
  XMP   -1.2781439+05  YMP    -4.2439760+04  ZMP    1.0537261+04 DXMP   -3.8952629+03 DYMP   -1.8440017+03 DZMP   -4.4608251+02
  RMP    1.3508768+05  DEMP    4.4737941+00 RAMP   -1.6163166+02  VMP    4.3327133+03 PTMP    7.7503055+01 AZMP    1.4612608+02
  XME   -1.2781439+05  YME    -4.2439760+04  ZME    1.0537261+04 DXME   -3.8952629+03 DYME   -1.8440017+03 DZME   -4.4608251+02

PLANETARY COORDINATES
   XM    1.4341291+05   YM    -1.2021114+0   ZM    -6.6390622+04  DXM    2.5744794+03  DYM    2.1018872+03  DZM    1.1150555+03
   RM    1.9855905+05  DEM    -1.9533751+01  RAM   -3.9970308+01  LOM    2.3068949+02   VM    3.5055988+03 ARGM   -4.4594080+01
 XSUN    1.7071998+06 YSUN    -7.2877236+07 ZSUN   -3.1602477+07  RAS   -8.8658050+01  LOS    1.8200175+02  DES   -2.3437741+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4920655+05  ECC     9.7652224-01  INC    3.1519388+01  RAN    1.4210791+02  APF    2.9371139+01   RP    3.5030361+03
   VH   -1.5238389+03 RNMP     2.1365859+01 APMP    8.3149596+00 INMP    5.6243200+01  APO    2.9491007+05  TFP    2.9288194+00
   TA    1.6630157+02   EA     8.4439237+01   MA    2.8751938+01  SLR    6.9238282+03  PER    4.0155987+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.8030570+03 ECCS     5.6461845+00 INCS    1.4218364+02 RANS    1.7149164+02 APFS    1.6145398+02  RPS    8.3773352+03
  VHS    3.9754008+03 RNMPS   -1.6834263+02 APMPS   1.3647261+02 INMPS   1.6931722+02 APOS   -1.1983449+04 TFPS   6.8663740+01
  TAS   -9.3356209+01  EAS    -1.6108084+02  MAS   -2.5196078+03 SLRS    5.5677315+04 PERS    4.8098542+00 MTAS   1.0020151+02

GEOCENTRIC    UNIT VECTORS
   WX    3.2108336-01   WY     4.1256735-01   WZ    8.5246329-01   PX   -9.4451901-01   PY    2.0527638-01   PZ    2.5640870-01
   QX   -6.9204731-02   QY    -8.8749634-01   QZ    4.5558853-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000
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****** CSM   / EARTH REF.  /PHASE   5- 9
                MEAN-OF-EPOCH  1969       23  DEC. 196A,  4 HRS.,  50 MINS.,  59.695 SECS. G.M.T.

T        .3999999999999999+002  HRS. FROM LAUNCH       1 DAYS, 15 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .16454553314020l+003

          PHASE ELAPSED TIME      .13345733+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .3872869985416366l+002      -.16843507699869055+002      -.64404791773427829+001
        RDXYZ       .6494061869791829+000       -.14478691692421517+000      -.17661974365575415+000

GEOCENTRIC
    X     1.3337906+05    Y    -5.8007921+04    Z    -2.2180582+04   DX    3.7748065+03  DY   -8.4160362+02   DZ   -1.0266384+03
    R     1.4712876+05  DEC    -8.6707556+00   RA    -2.3504714+01    V    4.0014306+03  PTH    7.7636021+01   AZ    1.2109095+02

GEOGRAPHIC
   XG    -1.4401393+05   YG     2.0368645+04   ZG    -2.2180581+04  DXG    5.1622979+03  DYG    6.3614598+04  DZG   -1.0266157+03
  ALT     1.4368509+05  LAT    -8.6720935+00  LON    1.7194974+02   VE    6.3831972+04  PTE    3.5106003+00  AZE   -9.0397746+01

EARTH-MOON PLANE
  XMP    -1.4116473+05  YMP    -4.0438180+04  ZMP    9.1729943+03 DXMP   -3.6641083+03 DYMP   -1.5371484+03 DZMP   -4.7215651+02
  RMP     1.4712876+05 DEMP     3.5745217+00 RAMP   -1.6401505+02  VMP    4.0014306+03 PTMP    7.7636025+01 AZMP    1.4683702+02
  XME    -1.4116473+05  YME    -4.0438180+04  ZME    9.1729943+03 DXME   -3.6641083+03 DYME   -1.5371484+03 DZME   -4.7215651+02

PLANETARY COORDINATES
   XM    1.5084747+05   YM    -1.1383147+05   ZM    -6.3902497+04  DXM    2.4438842+03  DYM    2.2040851+03  DZM    1.1717618+03
   RM    1.9920310+05  DEM    -1.8437660+01  RAM   -3.7038679+01  LOM    1.5841579+02   VM    3.4933633+03 ARGM   -4.1609800+01
 XSUN    2.0014659+06 YSUN    -7.2870017+07 ZSUN   -3.1599339+07  RAS   -8.8426694+01  LOS    1.0702777+02  DES   -2.3435588+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4965089+05  ECC     9.7681376-01  INC    3.2160381+01  RAN    1.4245900+02  APF    2.9028210+01   RP    3.4698430+03
   VH   -1.6103556+03 RNMP     1.8317866+01 APMP    8.3080115+00 INMP    5.6910623+01  APO    2.9583193+05  TFP    2.9670541+00
   TA    1.6742435+02   EA     8.9011402+01   MA    3.3052427+01  SLR    6.8592289+03  PER    4.0335496+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.8894048+03 ECCS     3.7449444+00 INCS    1.4280272+02 RANS    1.7423414+02 APFS    1.7127180+02  RPS    5.1863113+03
  VHS    3.8834984+03 RNMPS   -1.6383759+02 APMPS   1.3648599+02 INMPS   1.7053051+02 APOS   -8.9651210+03 TFPS   6.9186402+01
  TAS   -1.0007294+02  EAS    -1.7346783+02  MAS   -2.0364752+03 SLRS    2.4608757+04 PERS    5.1594722+00 MTAS   1.0548741+02

GEOCENTRIC    UNIT VECTORS
   WX    3.2434038-01   WY     4.2206293-01   WZ    8.4656141-01   PX   -9.4361550-01   PY    2.0706647-01   PZ    2.5828903-01
   QX   -6.6280258-02   QY    -8.8260203-01   QZ    4.6542513-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000
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****** CSM   / EARTH REF.  /PHASE   5- 10
                MEAN-OF-EPOCH  1969       23  DEC. 196A,  9 HRS.,  50 MINS.,  59.695 SECS. G.M.T.

T        .4499999999999999+002  HRS. FROM LAUNCH       1 DAYS, 20 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .23975086803204l+003

          PHASE ELAPSED TIME      .15145734+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .4185891591684244l+002      -.17522895200524898+002      -.73080937665375436+001
        RDXYZ       .6038041748515l662+000      -.12772152719781937+000      -.17066773328209089+000

GEOCENTRIC
    X     1.4415932+05    Y    -6.0347687+04    Z    -2.5168589+04   DX    3.5097355+03  DY   -7.4240754+02   DZ   -9.9204117+02
    R     1.5829469+05  DEC    -9.1487592+00   RA    -2.2715061+01    V    3.7220367+03  PTH    7.7735431+01   AZ    1.2200825+02

GEOGRAPHIC
   XG    -2.0490905+04   YG     1.5493184+05   ZG    -2.5168589+04  DXG    6.7520040+04  DYG    1.2484929+04  DZG   -9.9193154+02
  ALT     1.5485106+05  LAT    -9.1500693+00  LON    9.7534072+01   VE    6.8671779+04  PTE    3.0360063+00  AZE   -9.0349996+01

EARTH-MOON PLANE
  XMP    -1.5372412+05  YMP    -3.6961465+04  ZMP    7.7430929+03 DXMP   -3.4657277+03 DYMP   -1.2653396+03 DZMP   -4.9112543+02
  RMP     1.5829469+05 DEMP     2.8037810+00 RAMP   -1.6648041+02  VMP    3.7220367+03 PTMP    7.7735435+01 AZMP    1.4790743+02
  XME    -1.5372412+05  YME    -3.6961465+04  ZME    7.7430929+03 DXME   -3.4657277+03 DYME   -1.2653396+03 DZME   -4.9112543+02

PLANETARY COORDINATES
   XM    1.5788750+05   YM    -1.0715488+05   ZM    -5.9451652+04  DXM    2.3082017+03  DYM    2.2996172+03  DZM    1.2248947+03
   RM    1.9986492+05  DEM    -1.7305057+01  RAM   -3.4164881+01  LOM    8.6084241+01   VM    3.4808622+03 ARGM   -3.8646478+01
 XSUN    2.2957005+06 YSUN    -7.2861809+07 ZSUN   -3.1595773+07  RAS   -8.8195343+01  LOS    3.2053790+01  DES   -2.3433094+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.5026758+05  ECC     9.7724302-01  INC    3.3155996+01  RAN    1.4301334+02  APF    2.8500044+01   RP    3.4196360+03
   VH   -1.6882057+03 RNMP     1.5276629+01 APMP    8.2907756+00 INMP    5.7950436+01  APO    2.9711552+05  TFP    3.0335361+00
   TA    1.6840076+02   EA     9.3133508+01   MA    3.7225323+01  SLR    6.7614510+03  PER    4.0585078+02  MTA    3.5999999+02
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SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.9441894+03 ECCS    2.6230414+00 INCS    1.4336591+02 RANS    1.7727235+02 APFS   -1.7755929+02  RPS    3.1555001+03
  VHS    3.8283915+03 RNMPS  -1.5648538+02 APMPS   1.7041380+02 INMPS   1.7157868+02 APOS   -7.0438790+03 TFPS   6.9322570+01
  TAS   -1.0794704+02  EAS   -1.8233817+02  MAS   -1.6258719+03 SLRS    1.1432508+04 PERS    5.3854950+00 MTAS   1.1241031+02

GEOCENTRIC    UNIT VECTORS
   WX    3.2904323-01  WY    4.3686672-01  WZ    8.3718459-01  PX   -9.4231043-01  PY    2.0963435-01  PZ   2.6096825-01
   QX   -6.1494302-02  QY   -8.7475760-01  QZ    4.8064283-01  SXO   0.0000000     SYO   0.0000000     SZO  0.0000000

****** CSM   / EARTH REF.  /PHASE   5- 11
                MEAN-OF-EPOCH  1969       23  DEC. 1968, 14 HRS.,  50 MINS.,  59.695 SECS. G.M.T.

T        .4999999999999999+002  HRS. FROM LAUNCH      2 DAYS,  1 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .3149562029238B2+003

          PHASE ELAPSED TIME     .1694573+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      .4477673340373967B+002      -.1912797324A08864A+002      -.814985228046157B5+001
        RDXYZ     .5642213606941410l+000      -.1150400116A84647A+000      -.166349607790152B4+000

GEOCENTRIC
    X    1.5420809+05   Y   -6.2431535+04   Z   -2.8067549+04   DX    3.2796522+03  DY   -6.6869363+02  DZ   -9.6694118+02
    R    1.6871757+05  DEC  -9.5761432+00   RA  -2.2040688+01   V     3.4839984+03  PTH   7.7846020+01  AZ    1.2360700+02

GEOGRAPHIC
   XG    1.5313769+05  YG    6.5012907+04   ZG  -2.8067549+04   DXG   3.1596218+04  DYG  -6.6003486+04  DZG  -9.6704771+02
  ALT    1.6527396+05  LAT  -9.5774277+00   LON  2.3003110+01   VE    7.3182761+04  PTE   2.6675007+00  AZE  -9.0318138+01

EARTH-MOON PLANE
  XMP   -1.6550817+05  YMP  -3.2146985+04   ZMP   6.2639576+03  DXMP  -3.2934863+03  DYMP  -1.0174183+03  DZMP  -5.0601678+02
  RMP    1.6871757+05  DEMP  2.1277027+00   RAMP -1.6900819+02   VMP   3.4839983+03  PTMP  7.7846024+01  AZMP   1.4963598+02
  XME   -1.6550817+05  YME  -3.2146985+04   ZME   6.2639576+03  DXME  -3.2934863+03  DYME  -1.0174183+03  DZMF  -5.0601678+02

PLANETARY COORDINATES
   XM    1.6451865+05  YM   -1.0021333+05   ZM   -5.5748805+04   DXM   2.1679226+03  DYM   2.3883431+03  DZM   1.2743728+03
   RM    2.0054183+05  DEM  -1.6140330+01   RAM  -3.1346866+01   LOM   1.3696930+01  VM    3.4681547+03  ARGM  -3.5704383+01
 XSUN    2.5898993+06 YSUN  -7.2852616+07  ZSUN  -3.1591778+07   RAS  -8.7964000+01  LOS   3.1707979+02  DES   -2.3430260+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.5117900+05  ECC   9.7789040-01   INC   3.4790066+01   RAN   1.4390566+02  APF   2.7674360+01   RP   3.3425070+03
   VH    -1.7564657+03 RNMP   1.2237849+01  APMP  8.2571641+00  INMP   5.9659122+01  APO   2.9901550+05  TFP   3.1521514+00
    TA    1.6927727+02  EA    9.6813323+01   MA    4.1180011+01  SLR    6.6111104+03  PER   4.0954882+02  MTA   3.5999990+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.9765555+03 ECCS    1.9986137+00 INCS    1.4382700+02 RANS   -1.7956454+02 APFS   -1.6604906+02  RPS    1.9738155+03
  VHS    3.7969172+03 RNMPS  -1.4652120+02 APMPS   1.9215497+02 INMPS   1.7226864+02 APOS   -5.9269266+03 TFPS   6.9291024+01
  TAS   -1.1601443+02  EAS   -1.8497898+02  MAS   -1.2579880+03 SLRS    5.9187099+03 PERS    5.5205365+00 MTAS   1.2002204+02

GEOCENTRIC    UNIT VECTORS
   WX    3.3613294-01  WY    4.6104901-01  WZ    8.2124812-01  PX   -9.4031254-01  PY    2.1351254-01  PZ   2.6499942-01
   QX   -5.3169051-02  QY   -8.6130493-01  QZ    5.0529876-01  SXO   0.0000000     SYO   0.0000000     SZO  0.0000000

****** CSM   / EARTH REF.  /PHASE   5- 12
                MEAN-OF-EPOCH  1969       23  DEC. 1968, 19 HRS.,  50 MINS.,  59.695 SECS. G.M.T.

T        .5499999999999999+002  HRS. FROM LAUNCH      4 DAYS,  6 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .3016153781572Z6+002

          PHASE ELAPSED TIME     .1874573+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      .4750944681981382B+002      -.1868135125618371Z+002      -.8975589631069338B+001
        RDXYZ     .5296526290802220l+000      -.1072652562901030A6+000      -.164479901821770A5+000

GEOCENTRIC
    X    1.6361938+05   Y   -6.4337333+04   Z   -3.0911334+04   DX    3.0787144+03  DY   -6.2350128+02  DZ   -9.5607313+02
    R    1.7851079+05  DEC  -9.9717312+00   RA  -2.1465416+01   V     3.2834908+03  PTH   7.8035417+01  AZ    1.2661431+02

GEOGRAPHIC
   XG    1.0914169+05  YG   -1.3783570+05   ZG   -3.0911333+04   DXG  -5.8723235+04  DYG  -5.0444186+04  DZG  -9.5590948+02
  ALT    1.7506720+05  LAT  -9.9729933+00   LON   3.0837304+02   VE    7.7420594+04  PTE   2.3778760+00  AZE  -9.0300667+01

EARTH-MOON PLANE
  XMP   -1.7652933+05  YMP  -2.6095871+04   ZMP   4.7437144+03  DXMP  -3.1468418+03  DYMP  -7.8020536+02  DZMP  -5.1959394+02
  RMP    1.7851079+05  DEMP  1.5227472+00   RAMP -1.7159101+02   VMP   3.2834907+03  PTMP  7.8035417+01  AZMP   1.5275390+02
  XME   -1.7652933+05  YME  -2.6095871+04   ZME   4.7437144+03  DXME  -3.1468418+03  DYME  -7.8020536+02  DZMF  -5.1959394+02

PLANETARY COORDINATES
   XM    1.7072803+05  YM   -9.3015162+04   ZM   -5.1904874+04   DXM   2.0235335+03  DYM   2.4701528+03  DZM   1.3201315+03
   RM    2.0123120+05  DEM  -1.4947657+01   RAM  -2.8582202+01   LOM   3.0125625+02  VM    3.4552988+03  ARGM  -3.2783676+01
 XSUN    2.8840586+06 YSUN  -7.2842436+07  ZSUN  -3.1587355+07   RAS  -8.7732664+01  LOS   2.4210580+02  DES   -2.3427083+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.5267017+05  ECC   9.7890498-01   INC   3.7763724+01   RAN   1.4541641+02  APF   2.6335226+01   RP   3.2205807+03
   VH    -1.8111981+03 RNMP   9.1929789+00  APMP  8.1977313+00  INMP   6.2764322+01  APO   3.0211976+05  TFP   3.3768144+00
    TA    1.7008959+02  EA    9.9956778+01   MA    4.4714413+01  SLR    6.3732191+03  PER   4.1562317+02  MTA   3.5999990+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.9936685+03 ECCS    1.6831574+00 INCS    1.4412328+02 RANS   -1.7683814+02 APFS   -1.5646292+02  RPS    1.3619894+03
  VHS    3.7805864+03 RNMPS  -1.3721959+02 APMPS   2.1164881+02 INMPS   1.7247906+02 APOS   -5.3493263+03 TFPS   6.9224434+01
  TAS   -1.2229091+02  EAS   -1.7901538+02  MAS   -9.1567293+02 SLRS    3.6544322+03 PERS    5.5923861+00 MTAS   1.2645003+02

GEOCENTRIC    UNIT VECTORS
   WX    3.4760688-01  WY    5.0419382-01  WZ    7.9054289-01  PX   -9.3691344-01  PY    2.1996509-01  PZ   2.7167725-01
   QX   -3.6913843-02  QY   -8.3510713-01  QZ    5.4884734-01  SXO   0.0000000     SYO   0.0000000     SZO  0.0000000

****** CSM   / MOON REF.  /PHASE   5- 13
                MEAN-OF-EPOCH  1969       24  DEC. 1968,  0 HRS.,  50 MINS.,  59.695 SECS. G.M.T.

T        .5999999999999999+002  HRS. FROM LAUNCH      2 DAYS, 11 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .1053668727075Z2+003

          PHASE ELAPSED TIME     .2054573+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.1169576477865529Z+001      .5637110531214879Z+001      .4114635756297217B+001
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      RDXYZ      .17722007788621764+000     -.54554650406626076+000     -.40209466426351343+000

SELENOCENTRIC
   XL   -4.0279436+03   YL    1.9413833+04   ZL    1.4170532+04  DXL    1.0301280+03  DYL   -3.1711008+03  DZL   -2.3372576+03
   RL    2.4370582+04 DECL    3.5553334+01  RAL    1.0172131+02   VL    4.0718322+03 PTHL   -8.4852426+01  AZL   -8.5986423+01

SELENOGRAPHIC
   XS    1.7054522+04   YS   -1.6378568+04   ZS    5.9000881+03  DXS   -3.3552671+03  DYS    2.1855658+03  DZS   -9.8537291+02
 ALTS    2.3432088+04 LATS    1.4010446+01 LONS   -4.3841743+01  VRS    4.1237695+03  PTR   -7.9553002+01  AZR   -9.0281422+01
  LTS   -1.5047119+00  LNS    1.2854262+02  LTE    3.6373024+00  LNE    7.5085826+00 DSMP    5.0238017+00 RSMP    1.2119733+02
  LIN    1.6597790+02  LAN    4.8540734+01  LAP    1.4849007+02   DR   -4.0554100+03   VT    7.4774607+02 SOLSV   -7.5402261+01

GEOCENTRIC
    X    1.7247624+05    Y   -6.6171148+04    Z   -3.3760425+04   DX    2.9056427+03   DY   -6.2613527+02   DZ   -9.7513570+02
    R    1.8779361+05  DEC   -1.0356601+01   RA   -2.0989496+01    V    3.1282094+03  PTH    7.8423468+01   AZ    1.3338809+02

GEOGRAPHIC
   XG   -1.0951142+05   YG   -1.4877473+05   ZG   -3.3760422+04  DXG   -6.7292460+04  DYG    4.5886179+04  DZG   -9.7507003+02
  ALT    1.8435004+05  LAT   -1.0357845+01  LON    2.3364363+02   VE    8.1454083+04  PTE    2.1561736+00  AZE   -9.0303501+01

EARTH-MOON PLANE
  XMP    1.5112576+04  YMP   -1.8852592+04  ZMP    3.1804196+03 DXMP   -2.7992192+03 DYMP    2.9079860+03 DZMP   -5.3647529+02
  RMP    2.4370582+04 DEMP    7.4986254+00 RAMP   -5.1283712+01  VMP    4.0718321+03 PTMP   -8.4852431+01 AZMP   -9.1144462+01
  XME   -1.8681783+05  YME   -1.8852595+04  ZME    3.1804199+03 DXME   -3.0366156+03 DYME   -5.2616945+02 DZME   -5.3647529+02
  DIA    7.5724300+00  LIA   -4.5894387+01  DOA   -8.0532134-01  LOA    5.3479052+01  DRP   -5.2213926+00  LRP   -1.7591526+02

PLANETARY COORDINATES
   XM    1.7650418+05   YM   -8.5584982+04   ZM   -4.7930957+04  DXM    1.8755146+03  DYM    2.5449655+03  DZM    1.3621219+03
   RM    2.0193041+05  DEM   -1.3730997+01  RAM   -2.5868247+01  LOM    2.2876488+02   VM    3.4423511+03 ARGM   -2.9884420+01
 XSUN    3.1781743+06 YSUN   -7.2831270+07 ZSUN   -3.1582505+07  RAS   -8.7501339+01  LOS    1.6713178+02  DES   -2.3423566+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.5561756+05  ECC    9.8053583-01  INC    4.4366823+01  RAN    1.4824231+02  APF    2.4049067+01   RP    3.0289681+03
   VH   -1.8389662+03 RNMP   -1.7387705+02 APMP    8.1160798+00 INMP    6.9622333+01  APO    3.0820614+05  TFP    3.8551485+00
   TA    1.7084873+02   EA    1.0217322+02   MA    4.7255904+01  SLR    5.9989762+03  PER    4.2771684+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -2.0008788+03 ECCS    1.5460591+00 INCS    1.4425052+02 RANS   -1.7515931+02 APFS   -1.5063538+02  RPS    1.0925980+03
  VHS    3.7737685+03 RNMPS   4.7419651+01 APMPS   2.2358631+02 INMPS   1.7241503+02 APOS   -5.0943557+03 TFPS    6.9178219+01
  TAS   -1.2495795+02  EAS   -1.6230035+02  MAS   -5.8764096+02 SLRS    2.7818190+03 PERS    5.6227519+00 MTAS    1.3030120+02

SELENOCENTRIC UNIT VECTORS
   WX   -4.9301528-02   WY    5.8215840-01   WZ   -8.1157930-01   PX    9.0199119-01   PY   -3.2300770-01   PZ   -2.8649229-01
   QX   -4.2893025-01   QY   -7.4616188-01   QZ   -5.0917698-01  SXO   -9.1053882-01  SYO   -3.6014061-01  SZO   -2.0302134-01
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****** CSM   / MOON  REF.  /PHASE   5- 14
                  MEAN-OF-EPOCH  1969       24  DEC. 1968, 5 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .65000000000000+002  HRS. FROM LAUNCH      2 DAYS, 16 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .18057220759940 3+003

         PHASE ELAPSED TIME     .22345734+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ      -.28108973124966105+000      .28326770715243327+001      .20473521013486000+001
      RDXYZ       .17942820750694517+000     -.58537733517748888+000     -.43136146663634542+000

SELENOCENTRIC
   XL   -9.6805435+02   YL    9.7555515+03   ZL    7.0509445+03  DXL    1.0429632+03  DYL   -3.4026256+03  DZL   -2.5073769+03
   RL    1.2075750+04 DECL    3.5724815+01  RAL    9.5666974+01   VL    4.3534552+03 PTHL   -8.0722182+01  AZL   -8.9867294+01

SELENOGRAPHIC
   XS    7.2724012+03   YS   -9.1942999+03   ZS    2.8984059+03  DXS   -3.2823732+03  DYS    2.7136108+03  DZS   -1.0567954+03
 ALTS    1.1137256+04 LATS    1.3887645+01 LONS   -5.1657114+01  VRS    4.3879919+03  PTR   -7.8279562+01  AZR   -9.1692286+01
  LTS   -1.5066908+00  LNS    1.2600612+02  LTE    3.3599327+00  LNE    7.6316612+00 DSMP    5.0259461+00 RSMP    1.1853063+02
  LIN    1.6595022+02  LAN    4.7230722+01  LAP    1.3759015+02   DR   -4.2965040+03   VT    8.9136155+02 SOLSV   -7.7405223+01

GEOCENTRIC
    X    1.8086898+05    Y   -6.8188067+04    Z   -3.6787333+04   DX    2.7673023+03   DY   -7.8989852+02   DZ   -1.1070671+03
    R    1.9676511+05  DEC   -1.0775463+01   RA   -2.0656570+01    V    3.0834233+03  PTH    7.8776401+01   AZ    1.5673071+02

GEOGRAPHIC
   XG   -1.8017898+05   YG    6.9990955+04   ZG   -3.6787330+04  DXG    2.8252140+04  DYG    8.0650713+04  DZG   -1.1071266+03
  ALT    1.9332158+05  LAT   -1.0776696+01  LON    1.5877122+02   VE    8.5463132+04  PTE    2.0280707+00  AZE   -9.0369832+01

EARTH-MOON PLANE
  XMP    6.1465232+03  YMP   -1.0279008+04  ZMP    1.5446632+03 DXMP   -2.7871596+03 DYMP    3.2943968+03 DZMP   -5.7555404+02
  RMP    1.2075750+04 DEMP    7.3490947+00 RAMP   -5.9121903+01  VMP    4.3534551+03 PTMP   -8.0722180+01 AZMP   -9.2137974+01
  XME   -1.9649037+05  YME   -1.0279008+04  ZME    1.5446634+03 DXME   -3.0265837+03 DYME   -1.2660179+02 DZME   -5.7555404+02
  DIA    7.6072438+00  LIA   -4.9097421+01  DOA   -5.3041341-02  LOA    4.7542829+01  DRP   -5.6697179+00  LRP    1.7950713+02

PLANETARY COORDINATES
   XM    1.8183704+05   YM   -7.7943619+04   ZM   -4.3838278+04  DXM    1.7243391+03  DYM    2.6127271+03  DZM    1.4003097+03
   RM    2.0263689+05  DEM   -1.2494100+01  RAM   -2.3202173+01  LOM    1.5622561+02   VM    3.4293666+03 ARGM   -2.7006593+01
 XSUN    3.4722418+06 YSUN   -7.2819117+07 ZSUN   -3.1577226+07  RAS   -8.7270025+01  LOS    9.2157767+01  DES   -2.3419707+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.6500271+05  ECC    9.8159040-01  INC    6.7164464+01  RAN    1.5474678+02  APF    2.0740365+01   RP    3.0376355+03
   VH   -1.7691920+03 RNMP   -1.7702919+02 APMP    8.5856724+00 INMP    9.3026209+01  APO    3.2696779+05  TFP    5.1212869+00
   TA    1.7096391+02   EA    1.0130936+02   MA    4.6160430+01  SLR    6.0193459+03  PER    4.6698733+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -2.0020258+03 ECCS    1.5030711+00 INCS    1.4427496+02 RANS   -1.7456058+02 APFS   -1.4842139+02  RPS    1.0071614+03
  VHS    3.7726872+03 RNMPS   4.7148035+01 APMPS   2.2786597+02 INMPS   1.7234787+02 APOS   -5.0112132+03 TFPS    6.9160146+01
  TAS   -1.2176335+02  EAS   -1.2745166+02  MAS   -2.6612696+02 SLRS    2.5209966+03 PERS    5.6275877+00 MTAS    1.3170569+02

SELENOCENTRIC UNIT VECTORS
   WX   -5.5349291-02   WY    5.8126665-01   WZ   -8.1182852-01   PX    8.8838550-01   PY   -3.4245771-01   PZ   -3.0576748-01
   QX   -4.5574937-01   QY   -7.3814069-01   QZ   -4.9743407-01  SXO   -9.3129664-01  SYO   -3.2323658-01  SZO   -1.6794191-01
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****** CSM   / MOON  REF.  /PHASE   5- 15
                  MEAN-OF-EPOCH  1969       24  DEC. 1968, 10 HRS., 0 MINS., 29.133 SECS. G.M.T.

T        .69158177044859 1+002  HRS. FROM LAUNCH      2 DAYS, 21 HRS., 9 MINS., 29.437 SECS. G.E.T.    RAGR  .24311562703904 1+003

         PHASE ELAPSED TIME     .23842677+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )
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RXYZ	.2571202838489842 1+000	-.1000005356785261 5+000	-.8930692377045211 7-001	
RDXYZ	-.6668213500280731 1+000	-.1070854856281287 6+001	-.7207417969940994 7+000	

SELENOCENTRIC											
XL	8.8550516+02	YL	-3.4439520+02	ZL	-3.0756710+02	DXL	-3.8760357+03	DYL	-6.2245632+03	DZL	-4.1894593+03
RL	9.9866159+02	DECL	-1.7937495+01	RAL	-2.1252307+01	VL	8.4451411+03	PTHL	-3.7997217-07	AZL	-1.2142783+02
SELENOGRAPHIC											
XS	-9.8196666+02	YS	-8.9590890+01	ZS	-1.5823996+02	DXS	-5.0687705+02	DYS	8.3013170+03	DZS	-1.5545119+03
ALTS	6.0168054+01	LATS	-9.1170585+00	LONS	-1.7478698+02	VRS	8.4608093+03	PTR	-8.3755133-07	AZR	-1.0072421+02
LTS	-1.5083657+00	LNS	1.2389686+02	LTE	3.1242815+00	LNE	7.7167727+00	DSMP	5.0275969+00	RSMP	1.1632912+02
LIN	1.6594357+02	LAN	4.5076317+01	LAP	1.5436129+02	DR	-1.2368035-04	VT	8.4608093+03	SOLSV	2.8549588+01
GEOCENTRIC											
X	1.8681367+05	Y	-7.1787334+04	Z	-4.0659866+04	DX	-2.2794928+03	DY	-3.5608744+03	DZ	-2.7603021+03
R	2.0422046+05	DEC	-1.1484211+01	RA	-2.1020389+01	V	5.0492753+03	PTH	-3.2233757+00	AZ	-1.2476187+02
GEOGRAPHIC											
XG	-2.0446932+04	YG	1.9908463+05	ZG	-4.0659862+04	DXG	9.2416672+04	DYG	8.6366408+03	DZG	-2.7603074+03
ALT	2.0077698+05	LAT	-1.1485473+01	LON	9.5863985+01	VE	9.2860393+04	PTE	-1.7513950-01	AZE	-9.1773798+01
EARTH-MOON PLANE											
XMP	-9.9226404+02	YMP	5.3308690+01	ZMP	-9.9474666+01	DXMP	5.2605320+02	DYMP	8.3954625+03	DZMP	-7.4825530+02
RMP	9.9866156+02	DEMP	-5.7165970+00	RAMP	1.7692477+02	VMP	8.4451409+03	PTMP	-7.9556677-07	AZMP	-9.5108660+01
XME	-2.0422043+05	YME	5.3307102+01	ZME	-9.9474760+01	DXME	2.8558078+02	DYME	4.9853525+03	DZME	-7.4825525+02
DIA	7.6111555+00	LIA	-5.1562788+01	DOA	2.3009840-02	LOA	4.4845203+01	DRP	-5.7165968+00	LRP	1.7692477+02
PLANETARY COORDINATES											
XM	1.8592817+05	YM	-7.1442939+04	ZM	-4.0352299+04	DXM	1.5965429+03	DYM	2.6636888+03	DZM	1.4291572+03
RM	2.0322816+05	DEM	-1.1452567+01	RAM	-2.1019281+01	LOM	9.5865092+01	VM	3.4185783+03	APGM	-2.4629505+01
XSUN	3.7167608+06	YSUN	-7.2808260+07	ZSUN	-3.1572510+07	RAS	-8.7077665+01	LOS	2.9806709+01	DES	-2.3416239+01
GEOCENTRIC OSCULATING ELEMENTS											
SMA	-8.2534329+05	ECC	1.2467321+00	INC	1.4361812+02	RAN	1.7498629+02	APF	-1.5457934+02	RP	2.0363864+05
VH	1.6753965+03	RNMP	-1.7982904+02	APMP	-1.7400365+02	INMP	1.7146267+02	APO	-1.8543252+06	TFP	7.6063108+01
TA	-5.8083481+00	EA	-1.9266503+00	MA	-4.7581872-01	SLR	4.5752146+05	PER	5.2242070+03	MTA	1.4333081+02
SELENOCENTRIC OSCULATING ELEMENTS											
SMAS	-1.9991438+03	ECCS	1.4995446+00	INCS	1.4427427+02	RANS	-1.7450418+02	APFS	-1.4816688+02	RPS	9.9866156+02
VHS	3.7754056+03	RNMPS	4.5016269+01	APMPS	-1.3165329+02	INMPS	1.7233898+02	APOS	-4.9969492+03	TFPS	6.9158176+01
TAS	-6.3730890-07	EAS	0.0000000	MAS	-4.2723425-07	SLRS	2.4961990+03	PERS	5.6154402+00	MTAS	1.3182587+02
SELENOCENTRIC UNIT VECTORS											
WX	-5.5922492-02	WY	5.8122162-01	WZ	-8.1182148-01	PX	8.8669191-01	PY	-3.4485676-01	PZ	-3.0797931-01
QX	-4.5896635-01	QY	-7.3705850-01	QZ	-4.9607926-01	SXO	-9.3331763-01	SYO	-3.1926313-01	SZO	-1.6428389-01

GAMMA TERMINATION

LUNAR ORBIT INSERTION

TABLE III.- LUNAR ORBIT INSERTION

LUNAR ORBIT INSERTION EXTERNAL ΔV TARGET PARAMETERS:

DRTX = -2977.1872 fps
DRTY = 232.4716 fps
DRTZ = 166.8016 fps

2990.90445

VEHICLE CSM INERTIAL MEASUREMENT UNIT

XIMUX	.43694293-00	YIMUX	-.31758223-01	ZIMUX	-.89892841-00
XIMUY	.69900505-00	YIMUY	.64095694-00	ZIMUY	.31712165-00
XIMUZ	.56610318-00	YIMUZ	-.76691958-00	ZIMUZ	.30226076-00

****** CSM / MOON REF. /PHASE 7- 1
MEAN-OF-EPOCH 1969 24 DEC. 1968, 9 HRS., 58 MINS., 28.862 SECS. G.M.T.

T .2912476843377754+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 7 MINS., 29.166 SECS. G.E.T. RAGR .2426131250821104+003

PHASE ELAPSED TIME .2383650+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .2779223818305480+000 -.6773356360452027-001 -.6477426799154[illegible]549-001
RDXYZ -.5777022358102005+000 -.1098149688534151 5+001 -.7464343052794734 2+000

G04 THRUST **********
****
* ENGINE IGNITION *
****

THETA	7.9056118+00	BETA	1.7549925+0[illegible]	FUEL	0.0000000	TM	2.0500000+04	VELG	2.9909045+03	TACC	1.0531[illegible]+01
BANK	0.0000000	DELV	0.0000000	MASS	6.2629882+04	MSFL	6.5265838+01	SPI	3.1410000+02	VFX	1.0105860+04
VRX	-2.0511580+03	VRY	-4.2925627+03	VRZ	-2.6456417+03	VDX	1.3068546+03	VDY	2.0906574+03	VDZ	1.6931605+03
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	0.0000000	TDELV	0.0000000

SELENOCENTRIC

XL	9.5714571+02	YL	-2.1949344+0[illegible]	ZL	-2.2307827+02	DXL	-3.3580126+03	DYL	-6.3832200+03	DZL	-4.3388022+03
RL	1.0070100+03	DECL	-1.2798642+01	RAL	-1.2915799+01	VL	8.4170631+03	PTHL	-5.7224116+00	AZL	-1.2364330+02

SELENOGRAPHIC

XS	-9.6642210+02	YS	-2.5309848+02	ZS	-1.2664375+02	DXS	-1.0600080+03	DYS	8.2046316+03	DZS	-1.6347016+03
ALTS	6.8516488+01	LATS	-7.2247718+0[illegible]	LONS	-1.6532427+02	VRS	8.4327838+03	PTR	-5.7117084+00	AZS	-1.0206707+02
LTS	-1.5083520+00	LNS	1.2391379+02	LTE	3.1261902+00	LNE	7.7161507+00	DSMP	5.0275840+00	RSMP	1.1634673+02
LIN	1.6594327+02	LAN	4.5093764+01	LAP	4.1102839+01	DR	-8.3925668+02	VT	8.3909171+03	SOLSV	1.9273340+01

GEOCENTRIC

X	1.8685372+05	Y	-7.1715119+04	Z	-4.0603645+04	DX	-1.7604368+03	DY	-3.7199209+03	DZ	-2.9098662+03
R	2.0422053+05	DEC	-1.1468113+01	RA	-2.0996977+01	V	5.0402649+03	PTH	3.1176636+00	AZ	-1.2537378+02

GEOGRAPHIC

XG	-2.2274698+04	YG	1.9889999+0[illegible]	ZG	-4.0603647+04	DXG	9.2240868+04	DYG	1.0017433+04	DZG	-2.9098787+03
ALT	2.0077705+05	LAT	-1.1469373+01	LON	9.6389896+01	VE	9.2828844+04	PTE	1.6923410-01	AZE	-9.1798598+01

EARTH-MOON PLANE

XMP	-9.9708475+02	YMP	-1.1319176+02	ZMP	-8.4135623+01	DXMP	-3.6081249+01	DYMP	8.3788854+03	DZMP	-7.9995602+02
RMP	1.0070100+03	DEMP	-4.7926459+0[illegible]	RAMP	-1.7352335+02	VMP	8.4170630+03	PTMP	-5.7224122+00	AZMP	-9.5984116+01
XME	-2.0422049+05	YME	-1.1319222+02	ZME	-8.4135422+01	DXME	-2.7654755+02	DYME	4.9688882+03	DZME	-7.9995605+02
DIA	7.6115108+00	LIA	-5.1540926+01	DOA	2.2469936-02	LOA	4.4866213+01	DRP	-5.7164118+00	LRP	1.7694634+02

PLANETARY COORDINATES

XS	1.8539658+05	YM	-7.1495626+0[illegible]	ZM	-4.0380567+04	DXM	1.5975757+03	DYM	2.0632991+03	DZM	1.4289361+03
RM	2.0322340+05	DEM	-1.1460969+01	RAM	-2.1036688+01	LOM	9.6350185+01	VM	3.4186648+03	ARGM	-2.4648535+01
XSUN	3.7147975+06	YSUN	-7.2808350+07	ZSUN	-3.1572549+07	RAS	-8.7079209+01	LOS	3.0307666+01	DES	-2.3416268+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-8.5296641+05	ECC	1.2387839+00	INC	1.4304557+02	RAN	1.7464749+02	APF	-1.8632142+02	RP	2.0367467+05
VH	1.6480445+03	RNMP	-1.7982160+02	APMP	-1.8548542+02	INMP	1.7085540+02	APO	-1.9096074+06	TFP	6.2414284+01
TA	5.6339436+00	EA	1.8416042+00	MA	4.4013912-01	SLR	4.6598358+05	PER	5.4886603+03	MTA	1.4382745+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-1.0991938+03	ECCS	1.4995332+00	INCS	1.4427304+02	RANS	-1.7450447+02	APFS	-1.4816955+02	RPS	9.9866367+02
VHS	3.7753584+03	RNMPS	4.5033254+01	APMPS	-1.3165772+02	INMPS	1.7233870+02	APOS	-4.9970512+03	TFPS	6.9158167+01
TAS	-9.5350125+00	EAS	-4.2744403+00	MAS	-2.1411721+00	SLRS	2.4961929+03	PERS	5.6156508+00	MTAS	1.3182627+02

SELENOCENTRIC UNIT VECTORS

WX	-5.5919929-02	WY	5.8122668-01	WZ	-8.1181803-01	PX	8.8671137-01	PY	-3.4482513-01	PZ	-3.0795867-01
UX	-4.5892905-01	UY	-7.3706931-01	UZ	-4.9409771-01	SXO	-9.3330523-01	SYO	-3.1928717-01	SZO	-1.6430758-01

BODY ATTITUDE AND FORCES

BRAT	0.0000000	PRAT	0.0000000	YRAT	0.0000000	IGA	0.0000000	MGA	0.0000000	OGA	0.0000000
XIX	4.3694293-01	ETX	-3.1758223-02	ZTX	-8.9892841-01	ALO	0.0000000	ALLV	1.7207024+02	ALLI	-1.3588123+02
XIY	6.9900505-01	ETY	6.4095694-01	ZTY	3.1712165-01	BTO	0.0000000	BTLV	4.4578797+00	BTLI	3.5590838+01
XIZ	5.8610318-01	ETZ	-7.6691958-01	ZTZ	3.0226076-01	GMO	0.0000000	GMLV	-1.7037979+02	GMLI	8.2071877+01
ALS	1.4780249+02	BTS	-3.2229736+01	ALE	9.2393669+01	BTE	1.7416021+02	ALM	9.7905609+01	BTM	-1.7999999+02
ALEI	9.2393669+01	BTEI	1.7416021+02								

****** CSM / MOON REF. /PHASE 7- 2
MEAN-OF-EPOCH 1969 24 DEC. 1968, 9 HRS., 58 MINS., 38.862 SECS. G.M.T.

T .2912754621154134+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 7 MINS., 39.166 SECS. G.E.T. RAGR .2426549066230864+003

PHASE ELAPSED TIME .2383651+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .2763180422902742 1+000 -.6676367127383790 0-001 -.6683092306884[illegible]000-001
RDXYZ -.5773025782296562 9+000 -.1083639915090940 50+001 -.7343288464806200 0+000

G04 THRUST **********
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THETA	7.1276490+00	BETA	1.7545037+02	FUEL	6.5266113+02	TM	2.0500000+04	VELG	2.9850404+03	TACC	1.0642[illegible]+01
BANK	7.8051834-01	DELV	1.0586456+02	MASS	6.1977220+04	MSFL	6.5265838+01	SPI	3.1410000+02	VFX	1.0105860+04
VRX	-2.0960915+03	VRY	-4.2822212+03	VRZ	-2.6352062+03	VDX	1.2605880+03	VDY	2.0166578+03	VDZ	1.6332306+03
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	5.6994959-02	TDELV	1.0586456+02

SELENOCENTRIC

XL	9.5162097+02	YL	-2.2992964+02	ZL	-2.3016126+02	DXL	-3.3556895+03	DYL	-6.2980790+03	DZL	-4.2684360+03
RL	1.0056959+03	DECL	-1.3229829+01	RAL	-1.3583408+01	VL	8.3160134+03	PTHL	-5.2317955+00	AZL	-1.2343606+02

SELENOGRAPHIC

XS	-9.6812317+02	YS	-2.3966987+02	ZS	-1.2930639+02	DXS	-1.0072085+03	DYS	8.1142015+03	DZS	-1.6009946+03
ALTS	6.7202398+01	LATS	-7.3871997+00	LONS	-1.6609533+02	VRS	8.3317301+03	PTR	-5.2218991+00	AZS	-1.0191220+02
LTS	-1.5083534+00	LNS	1.2391240+02	LTE	3.1260330+00	LNE	7.7162018+00	DSMP	5.0275846+00	RSMP	1.1634528+02
LIN	1.6599180+02	LAN	4.5215549+01	LAP	1.7654691+01	DR	-7.5829751+02	VT	8.2971507+03	SOLSV	2.0033779+01

GEOCENTRIC

X	1.8685079+05	Y	-7.1721222+04	Z	-4.0608403+04	DX	-1.7581987+03	DY	-3.6355478+03	DZ	-2.8394826+03
R	2.0422095+05	DEC	-1.1469451+01	RA	-2.0998909+01	V	4.9367125+03	PTH	2.7022848+00	AZ	-1.2530013+02

GEOGRAPHIC

XG	-2.2122882+04	YG	1.9891639+05	ZG	-4.0608403+04	DXG	9.2172265+04	DYG	9.9103990+03	DZG	-2.8394927+03
ALT	2.0077747+05	LAT	-1.1470712+01	LON	9.6346182+01	VE	9.2746998+04	PTE	1.4382187-01	AZE	-9.1760988+01

EARTH-MOON PLANE

XMP	-9.9711269+02	YMP	-9.9456193+01	ZMP	-8.5434360+01	DXMP	5.6732865+00	DYMP	8.2795154+03	DZMP	-7.7825035+02
RMP	1.0056959+03	DEMP	-4.8731778+00	RAMP	-1.7430391+02	VMP	8.3160133+03	PTMP	-5.2317953+00	AZMP	-9.5861487+01
XME	-2.0422091+05	YME	-9.9455053+01	ZME	-8.5434398+01	DXME	-2.3479348+02	DYME	4.8693254+03	DZME	-7.7825039+02
DIA	7.5919689+00	LIA	-4.9389907+01	DOA	3.7080493-01	LOA	4.2529628+01	DRP	-5.7173929+00	LRP	1.7683006+02

PLANETARY COORDINATES

XM	1.8589918+05	YM	-7.1491292+04	ZM	-4.0378242+04	DXM	1.5974908+03	DYM	2.6633312+03	DZM	1.4289543+03
RM	2.0322379+05	DEM	-1.1460279+01	RAM	-2.1035258+01	LOM	9.6309836+01	VM	3.4186576+03	ARGM	-2.4646968+01
XSUN	3.7149590+06	YSUN	-7.2808343+07	ZSUN	-3.1572545+07	RAS	-8.7079082+01	LOS	3.0266012+01	DES	-2.3416265+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-1.3765645+06	ECC	1.1480470+00	INC	1.4310715+02	RAN	1.7468344+02	APF	-1.6571230+02	RP	2.0379627+05
VH	1.2972886+03	RNMP	-1.7982210+02	APMP	-1.8490398+02	INMP	1.7092067+02	APO	-2.9569253+06	TFP	6.2976621+01
TA	5.0558843+00	EA	1.3282387+00	MA	1.9677937-01	SLR	4.3776396+05	PER	1.1252871+04	MTA	1.5058023+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-2.2817105+03	ECCS	1.4376564+00	INCS	1.4432652+02	RANS	-1.7446677+02	APFS	-1.4802526+02	RPS	9.9860526+02
VHS	3.5339090+03	RNMPS	4.5303454+01	APMPS	-1.3127469+02	INMPS	1.7238278+02	APOS	-5.5620263+03	TFPS	6.9158974+01
TAS	-8.8682953+00	EAS	-3.7665629+00	MAS	-1.6523606+00	SLRS	2.4342564+03	PERS	6.8471298+00	MTAS	1.3407317+02

SELENOCENTRIC UNIT VECTORS

WX	-5.6230479-02	WY	5.8044801-01	WZ	-8.1235352-01	PX	8.8580806-01	PY	-3.4637978-01	PZ	-3.0881242-01
QX	-4.6063238-01	QY	-7.3695396-01	QZ	-4.9468842-01	SXO	-9.4708952-01	SYO	-2.8853244-01	SZO	-1.4060724-01

BODY ATTITUDE AND FORCES

RRAT	-2.8367042-08	PRAT	-3.0050195-07	YRAT	-3.1719735-09	IGA	0.0000000	MGA	1.0672170-06	OGA	0.0000000
XIX	4.3694294-01	ETX	-3.1758165-02	ZTX	-8.9892840-01	ALO	0.0000000	ALLV	1.7285005+02	ALLI	-1.3588124+02
XIY	6.9900507-01	ETY	6.4095695-01	ZTY	3.1712169-01	BTO	1.0672170-06	BTLV	4.5143803+00	BTLI	3.5590838+01
XIZ	5.6610316-01	ETZ	-7.6691956-01	ZTZ	3.0226073-01	GMO	0.0000000	GMLV	-1.7937218+02	GMLI	8.2071894+01
ALS	1.4780239+02	BTS	-3.2229637+01	ALE	9.2391353+01	BTE	1.7416019+02	ALM	9.7127647+01	BTM	1.7993790+02
ALEI	9.2391352+01	BTEI	1.7416018+02								

****** CSM / MOON REF. /PHASE 7- 3
MEAN-OF-EPOCH 1969 24 DEC. 1968, 9 HRS., 58 MINS., 48.862 SECS. G.M.T.

T .69130323989249 3+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 7 MINS., 49.166 SECS. G.E.T. RAGR .24269668736406 3+003

PHASE ELAPSED TIME .23832650+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .27471509421881203+000 -.69753370773653617-001 -.68853713638837744-001
RDXYZ -.57680299127542712+000 -.10689063125160505+001 -.72205167391975308+000

GD4 THRUST **********
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THETA	6.3576561+00	BETA	1.7539865+02	FUEL	1.3053222+03	TM	2.0500000+04	VELG	2.7780556+03	TACC	1.0755364+01
BARC	1.5528676+00	DELV	2.1284973+02	MASS	6.1324559+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04
VRX	-2.1389337+03	VRY	-4.2713621+03	VRZ	-2.6244071+03	VDX	1.2138517+03	VDY	1.9418749+03	VDZ	1.5726661+03
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	1.1600087-01	TDELV	2.1284973+02

SELENOCENTRIC

XL	9.4610053+02	YL	-2.4022597+02	ZL	-2.3712761+02	DXL	-3.3527856+03	DYL	-6.2132369+03	DZL	-4.1970733+03
RL	1.0045119+03	DECL	-1.3654262+01	RAL	-1.4246988+01	VL	8.2134588+03	PTHL	-4.7572383+00	AZL	-1.2322278+02

SELENOGRAPHIC

XS	-9.6973720+02	YS	-2.2639088+02	ZS	-1.3191310+02	DXS	-9.5408598+02	DYS	8.0221161+03	DZS	-1.5667287+03
ALTS	6.6018375+01	LATS	-7.5459111+00	LONS	-1.6685931+02	VRS	8.2291715+03	PTR	-4.7481342+00	AZR	-1.0175426+02
LTS	-1.5083546+00	LNS	1.2391098+02	LTE	3.1258728+00	LNE	7.7162544+00	DSMP	5.0275856+00	RSMP	1.1634380+02
LIN	1.6604154+02	LAN	4.5345347+01	LAP	1.7290556+01	DR	-6.8117589+02	VT	8.2009305+03	SOLSV	2.0786465+01

GEOCENTRIC

X	1.8684793+05	Y	-7.1727085+04	Z	-4.0612991+04	DX	-1.7553816+03	DY	-3.5498729+03	DZ	-2.7681004+03
R	2.0422130+05	DEC	-1.1470743+01	RA	-2.1000770+01	V	4.8317017+03	PTH	2.2682670+00	AZ	-1.2523987+02

GEOGRAPHIC

XG	-2.1971301+04	YG	1.9893262+05	ZG	-4.0612987+04	DXG	9.2102111+04	DYG	9.8034923+03	DZG	-2.7681366+03
ALT	2.0077782+05	LAT	-1.1472004+01	LON	9.6302541+01	VE	9.2663748+04	PTE	1.1827976-01	AZE	-9.1722715+01

EARTH-MOON PLANE

XMP	-9.9707150+02	YMP	-8.5884967+01	ZMP	-8.6697158+01	DXMP	4.7552083+01	DYMP	8.1784280+03	DZMP	-7.5628240+02
RMP	1.0045119+03	DEMP	-4.9512296+00	RAMP	-1.7507685+02	VMP	8.2134588+03	PTMP	-4.7572387+00	AZMP	-9.5736426+01
XME	-2.0422126+05	YME	-8.5885592+01	ZME	-8.6697657+01	DXME	-1.9291522+02	DYME	4.7682452+03	DZME	-7.5628242+02
DIA	7.5649597+00	LIA	-4.6940921+01	DOA	7.5624628-01	LOA	3.9892638+01	DRP	-5.7188855+00	LRP	1.7671046+02

PLANETARY COORDINATES

XM	1.8590184+05	YM	-7.1486860+04	ZM	-4.0375864+04	DXM	1.5974039+03	DYM	2.6633640+03	DZM	1.4289729+03
RM	2.0322419+05	DEM	-1.1459573+01	RAM	-2.1033791+01	LOM	9.6269520+01	VM	3.4186503+03	ARGM	-2.4645367+01
XSUN	3.7151244+06	YSUN	-7.2808335+07	ZSUN	-3.1572543+07	RAS	-8.7078953+01	LOS	3.0224362+01	DES	-2.3416264+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-3.5250656+06	ECC	1.0578458+00	INC	1.4317120+02	RAN	1.7472096+02	APF	-1.6503660+02	RP	2.0391014+05
VH	8.1068346+02	RNMP	-1.7982253+02	APMP	-1.8425714+02	INMP	1.7098856+02	APO	-7.2540415+06	TFP	6.3643146+01
TA	4.4124396+00	EA	7.4016454-01	MA	4.2838305-02	SLR	4.1961561+05	PER	4.6112565+04	MTA	1.6096462+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-2.6565096+03	ECCS	1.3758864+00	INCS	1.4438062+02	RANS	-1.7442638+02	APFS	-1.4787533+02	RPS	9.9854581+02
VHS	3.2751405+03	RNMPS	4.5591169+01	APMPS	-1.3087080+02	INMPS	1.7242773+02	APOS	-6.3115649+03	TFPS	6.9159779+01
TAS	-8.2129430+00	EAS	-3.2732336+00	MAS	-1.2328128+00	SLRS	2.3724313+03	PERS	8.6017104+00	MTAS	1.3661914+02

SELENOCENTRIC UNIT VECTORS

WX	-5.6565151-02	WY	5.7964441-01	WZ	-8.1290390-01	PX	8.8487344-01	PY	-3.4797454-01	PZ	-3.0969773-01
QX	-4.6238442-01	QY	-7.3683516-01	QZ	-4.9322872-01	SXO	-9.6071601-01	SYO	-2.5318198-01	SZO	-1.1368192-01

BODY ATTITUDE AND FORCES

RRAT	-5.6503920-09	PRAT	-6.4525960-07	YRAT	1.3877086-07	IGA	0.0000000	MGA	-1.4941039-06	OGA	0.0000000
XIX	4.3694294-01	ETX	-3.1758105-02	ZTX	-8.9892841-01	ALO	0.0000000	ALLV	1.7362195+02	ALLI	-1.3588123+02
XIY	6.9900504-01	ETY	6.4095699-01	ZTY	3.1712171-01	BTO	-1.4941039-06	BTLV	4.5729814+00	BTLI	3.5590838+01
XIZ	5.6610320-01	ETZ	-7.6691954-01	ZTZ	3.0226070-01	GMO	0.0000000	GMLV	-1.7936521+02	GMLI	8.2071888+01
ALS	1.4780228+02	BTS	-3.2229540+01	ALE	9.2389116+01	BTE	1.7416017+02	ALM	9.6357654+01	BTM	1.7987586+02
ALEI	9.2389116+01	BTEI	1.7416016+02								

****** CSM / MOON REF. /PHASE 7- 4
MEAN-OF-EPOCH 1969 24 DEC. 1968, 9 HRS., 58 MINS., 58.862 SECS. G.M.T.

T .691331017669852+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 7 MINS., 59.166 SECS. G.E.T. RAGR .242738468105040+003

PHASE ELAPSED TIME .2383650+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	.273113678261419 41+000	-.72701830793290619-001	-.708421611651826 81-001
RDXYZ	-.576198663294636 62+000	-.105394721167170 34+001	-.709601666535023 76+000

GD4 THRUST **********

THETA	5.5959799+00	BETA	1.7534395+02	FUEL	1.9579834+03	TM	2.0500000+04	VELG	2.6699259+03	TACC	1.0871062+01
BARC	2.3170561+00	DELV	3.2097998+02	MASS	6.0671898+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04
VRX	-2.1826675+03	VRY	-4.2599923+03	VRZ	-2.6132514+03	VDX	1.1666053+03	VDY	1.8662918+03	VDZ	1.5114536+03
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	1.7713801-01	TDELV	3.2097998+02

SELENOCENTRIC

XL	9.4058535+02	YL	-2.5038027+02	ZL	-2.4397569+02	DXL	-3.3492728+03	DYL	-6.1262841+03	DZL	-4.1247050+03
RL	1.0034516+03	DECL	-1.4071731+01	RAL	-1.4906249+01	VL	8.1093881+03	PTHL	-4.2994219+00	AZL	-1.2300368+02

SELENOGRAPHIC

XS	-9.7126345+02	YS	-2.1326540+02	ZS	-1.3446314+02	DXS	-9.0066795+02	DYS	7.9283500+03	DZS	-1.5320815+03
ALTS	6.4958107+01	LATS	-7.7008345+00	LONS	-1.6761579+02	VRS	8.1250976+03	PTR	-4.2910934+00	AZR	-1.0159303+02
LTS	-1.5083554+00	LNS	1.2390958+02	LTE	3.1257156+00	LNE	7.7163059+00	DSMP	5.0275869+00	RSMP	1.1634235+02
LIN	1.6609257+02	LAN	4.5483761+01	LAP	4.5568752+01	DR	-6.0794997+02	VT	8.1023210+03	SOLSV	2.1531060+01

GEOCENTRIC

X	1.8684502+05	Y	-7.1732906+04	Z	-4.0617514+04	DX	-1.7519538+03	DY	-3.4628880+03	DZ	-2.6957139+03
R	2.0422158+05	DEC	-1.1472022+01	RA	-2.1002624+01	V	4.7252311+03	PTH	1.8143265+00	AZ	-1.2516876+02

GEOGRAPHIC

XG	-2.1819724+04	YG	1.9894866+05	ZG	-4.0617507+04	DXG	9.2030373+04	DYG	9.6966536+03	DZG	-2.6957220+03
ALT	2.0077810+05	LAT	-1.1473282+01	LON	9.6258907+01	VE	9.2579059+04	PTE	9.2624798-02	AZE	-9.1683805+01

EARTH-MOON PLANE

XMP	-9.9696087+02	YMP	-7.2482155+01	ZMP	-8.7923582+01	DXMP	8.9523938+01	DYMP	8.0756010+03	DZMP	-7.3405086+02
RMP	1.0034516+03	DEMP	-5.0267681+00	RAMP	-1.7584173+02	VMP	8.1093881+03	PTMP	-4.2994221+00	AZMP	-9.5608898+01
XME	-2.0422155+05	YME	-7.2482198+01	ZME	-8.7924377+01	DXME	-1.5094387+02	DYME	4.6654254+03	DZME	-7.3405085+02
DIA	7.5264384+00	LIA	-4.4114464+01	DOA	1.1868648+00	LOA	3.6876097+01	DRP	-5.7209142+00	LRP	1.7658724+02

PLANETARY COORDINATES

XM	1.8590444+05	YM	-7.1482527+04	ZM	-4.0373538+04	DXM	1.5973189+03	DYM	2.6633961+03	DZM	1.4289911+03
RM	2.0322458+05	DEM	-1.1458880+01	RAM	-2.1032360+01	LOM	9.6229172+01	VM	3.4186433+03	ARGM	-2.4643803+01
XSUN	3.7152858+06	YSUN	-7.2808328+07	ZSUN	-3.1572539+07	RAS	-8.7078825+01	LOS	3.0182707+01	DES	-2.3416261+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	6.4300207+06	ECC	9.6827171-01	INC	1.4323793+02	RAN	1.7476017+02	APF	-1.6427866+02	RP	2.0401361+05
VH	-3.7971958+01	RNMP	-1.7982286+02	APMP	-1.8352939+02	INMP	1.7105931+02	APO	1.2656028+07	TFP	6.4441592+01
TA	3.6881255+00	EA	4.6841843-01	MA	1.4867162-02	SLR	4.0155401+05	PER	1.1360227+05	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-3.1774747+03	ECCS	1.3142388+00	INCS	1.4443634+02	RANS	-1.7438312+02	APFS	-1.4771939+02	RPS	9.9848578+02
VHS	2.9946397+03	RNMPS	4.5897717+01	APMPS	-1.3044460+02	INMPS	1.7247356+02	APOS	-7.3534352+03	TFPS	6.9160588+01
TAS	-7.5695442+00	EAS	-2.7939196+00	MAS	-8.7941309-01	SLRS	2.3107344+03	PERS	1.1252290+01	MTAS	1.3954331+02

SELENOCENTRIC UNIT VECTORS

WX	-5.6925357-02	WY	5.7881449-01	WZ	-8.1346992-01	PX	8.8390521-01	PY	-3.4961236-01	PZ	-3.1061667-01
QX	-4.6418857-01	QY	-7.3671225-01	QZ	-4.9171533-01	SXO	-9.7376000-01	SYO	-2.1201376-01	SZO	-8.2713574-02

BODY ATTITUDE AND FORCES

RRAT	-3.6872538-08	PRAT	9.9394941-09	YRAT	-6.1187892-07	IGA	0.0000000	MGA	2.1344341-07	OGA	0.0000000
XIX	4.3694293-01	ETX	-3.1758052-02	ZTX	-8.9892841-01	ALO	0.0000000	ALLV	1.7438561+02	ALLI	-1.3588124+02
XIY	6.4900506-01	ETY	6.4095701-01	ZTY	3.1712173-01	BTO	2.1344341-07	RTLV	4.6337907+00	RTLI	3.5590838+01
XIZ	5.6610318-01	ETZ	-7.6691952-01	ZTZ	3.0226067-01	GMO	0.0000000	GMLV	-1.7935873+02	GMLI	8.2071885+01
ALS	1.4780217+02	BTS	-3.2229443+01	ALE	9.2386895+01	BTF	1.7416014+02	ALM	9.5595977+01	BTM	1.7981385+02

****** CSM / MOON REF. /PHASE 7- 5

MEAN-OF-EPOCH 1969 24 DEC. 1968, 9 HRS., 59 MINS., 8.862 SECS. G.M.T.

T .691358795447211+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 8 MINS., 9.166 SECS. G.E.T. RAGR .242780248846016+003

PHASE ELAPSED TIME .2383650+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	.271514091923974 24+000	-.75608422630736401-001	-.727957839706440 38-001
RDXYZ	-.575484889609659 67+000	-.103876094114389 76+001	-.696977681646119 35+000

GD4 THRUST **********

THETA	4.8429532+00	BETA	1.7528618+02	FUEL	2.6106445+03	TM	2.0500000+04	VELG	2.5606268+03	TACC	1.0989276+01
BARC	3.0725973+00	DELV	4.3027947+02	MASS	6.0019237+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04
VRX	-2.2262760+03	VRY	-4.2481196+03	VRZ	-2.6017465+03	VDX	1.1188477+03	VDY	1.7898910+03	VDZ	1.4495789+03
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	2.4053601-01	TDELV	4.3027947+02

SELENOCENTRIC

XL	9.3507649+02	YL	-2.6039038+02	ZL	-2.5070383+02	DXL	-3.3451238+03	DYL	-6.0380108+03	DZL	-4.0513255+03
RL	1.0025086+03	DECL	-1.4482038+01	RAL	-1.5560903+01	VL	8.0037907+03	PTHL	-3.8590477+00	AZL	-1.2277882+02

SELENOGRAPHIC

XS	-9.7270167+02	YS	-2.0029507+02	ZS	-1.3695580+02	DXS	-8.4696262+02	DYS	7.8328804+03	DZS	-1.4969905+03
ALTS	6.4015102+01	LATS	-7.8519072+00	LONS	-1.6836450+02	VRS	8.0194975+03	PTR	-3.8514783+00	AZR	-1.0142858+02
LTS	-1.5083568+00	LNS	1.2390816+02	LTE	3.1255554+00	LNE	7.7163580+00	DSMP	5.0275878+00	RSMP	1.1634087+02
LIN	1.6614493+02	LAN	4.5631313+01	LAP	1.2360832+02	DR	-5.3867257+02	VT	8.0013856+03	SOLSV	2.2267246+01

GEOCENTRIC

X	1.8664217+05	Y	-7.1734845+04	Z	-4.0621866+04	DX	-1.7478917+03	DY	-3.3745819+03	DZ	-2.6223158+03
R	2.0422179+05	DEC	-1.1473256+01	RA	-2.1004409+01	V	4.6173010+03	PTH	1.3387632+00	AZ	-1.2509455+02

GEOGRAPHIC

XG	-2.1668383+04	YG	1.9896453+05	ZG	-4.0621863+04	DXG	9.1957042+04	DYG	9.5899925+03	DZG	-2.6223020+03
ALT	2.0077831+05	LAT	-1.1474517+01	LON	9.6215343+01	VE	9.2492932+04	PTE	6.6861820-02	AZE	-9.1644214+01

EARTH-MOON PLANE

XMP	-9.3678079+02	YMP	-5.9249435+01	ZMP	-8.9113196+01	DXMP	1.3157837+02	DYMP	7.9710127+03	DZMP	-7.1155425+02
RMP	1.0025086+03	DEMP	-5.0997644+00	RAMP	-1.7659830+02	VMP	8.0037907+03	PTMP	-3.8590480+00	AZMP	-9.5478851+01

XME	-2.0422177+05	YME	-5.9251644+01	ZME	-8.9113738+01	DXME	-1.0888999+02	DYME	4.5608446+03	DZME	-7.1155425+02
DIA	7.4696801+00	LIA	-4.0791880+01	DOA	1.6741673+00	LOA	3.3361527+01	DRP	-5.7235076+00	LRP	1.7646006+02

PLANETARY COORDINATES

XM	1.8590709+05	YM	-7.1478096+04	ZM	-4.0371162+04	DXM	1.5972321+03	DYM	2.6634289+03	DZM	1.4290097+03
RM	2.0322498+05	DEM	-1.1458175+01	RAM	-2.1030896+01	LOM	9.6188856+01	VM	3.4186359+03	ARGM	-2.4642203+01
XSUN	3.7154506+06	YSUN	-7.2808320+07	ZSUN	-3.1572536+07	RAS	-8.7078695+01	LOS	3.0141054+01	DES	-2.3416258+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	1.6927387+06	ECC	8.7942458-01	INC	1.4330757+02	RAN	1.7480125+02	APF	-1.6341659+02	RP	2.0410269+05
VH	-1.4589950+02	RNMP	-1.7982311+02	APMP	-1.8269891+02	INMP	1.7113315+02	APO	3.1813747+06	TFP	6.5409974+01
TA	2.8611213+00	EA	7.2483248-01	MA	8.7413978-02	SLR	3.8359557+05	PER	1.5344522+04	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-3.9505662+03	ECCS	1.2527297+00	INCS	1.4449377+02	RANS	-1.7433682+02	APFS	-1.4755699+02	RPS	9.9842553+02
VHS	2.6856905+03	RNMPS	4.6224399+01	APMPS	-1.2999442+02	INMPS	1.7252029+02	APOS	-8.8995578+03	TFPS	6.9161399+01
TAS	-6.9387124+00	EAS	-2.3272520+00	MAS	-5.8896753-01	SLRS	2.2491828+03	PERS	1.5599359+01	MTAS	1.4296395+02

SELENOCENTRIC UNIT VECTORS

WX	-5.7312618-02	WY	5.7795674-01	WZ	-8.1405238-01	PX	8.8290076-01	PY	-3.5129667-01	PZ	-3.1157164-01
QX	-4.6604881-01	QY	-7.3658445-01	QZ	-4.9014471-01	SXO	-9.8549076-01	SYO	-1.6323259-01	SZO	-4.6508458-02

BODY ATTITUDE AND FORCES

RRAT	-1.9434642-08	PRAT	-5.6680191-07	YRAT	1.0577866-08	IGA	0.0000000	MGA	-6.4033023-07	OGA	-6.9941136-03
XIX	4.3694294-01	ETX	-3.1757987-02	ZTX	-8.9892841-01	ALO	0.0000000	ALLV	1.7514069+02	ALLI	-1.3588123+02
XIY	6.9900505-01	ETY	6.4095702-01	ZTY	3.1712177-01	BTO	-6.4033023-07	BTLV	4.6969415+00	BTLI	3.5590838+01
XIZ	5.6610319-01	ETZ	-7.6691950-01	ZTZ	3.0226064-01	GMO	-6.9941136-03	GMLV	-1.7935292+02	GMLI	8.2071880+01
ALS	1.4780206+02	BTS	-3.2229341+01	ALE	9.2384755+01	BTE	1.7416012+02	ALM	9.4842950+01	BTM	1.7975190+02
ALEI	9.2384753+01	BTEI	1.7416011+02								

****** CSM / MOON REF. /PHASE 7- 6
MEAN-OF-EPOCH 1969 24 DEC. 1968, 9 HRS., 59 MINS., 18.862 SECS. G.M.T.

T .69138657322457O+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 8 MINS., 19.166 SECS. G.E.T. RAGR .2428220295869 93+003

PHASE ELAPSED TIME .23835650+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	.2699166456322334 5+000	-.78472512916392766-001	-.74714097161721164-001
RDXYZ	-.57465707327030761+000	-.10233458097882373+001	-.68417854485660468+000

GD4 THRUST **********
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THETA	4.0988947+00	BETA	1.7522518+02	FUEL	3.2633056+03	TM	2.0500000+04	VELG	2.4501327+03	TACC	1.1110089+01
BARC	3.8191982+00	DELV	5.4077397+02	MASS	5.9366576+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04
VRX	-2.2697438+03	VRY	-4.2357520+03	VRZ	-2.5899000+03	VDX	1.0705681+03	VDY	1.7126551+03	VDZ	1.3870279+03
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	3.0633481-01	TDELV	5.4077397+02

SELENOCENTRIC

XL	9.2957498+02	YL	-2.7025412+02	ZL	-2.5731038+02	DXL	-3.3403119+03	DYL	-5.9484071+03	DZL	-3.9769279+03
RL	1.0016764+03	DECL	-1.4884997+01	RAL	-1.6210663+01	VL	7.8966567+03	PTHL	-3.4368405+00	AZL	-1.2254838+02

SELENOGRAPHIC

XS	-9.7405115+02	YS	-1.8748384+02	ZS	-1.3939033+02	DXS	-7.9299622+02	DYS	7.7356821+03	DZS	-1.4614531+03
ALTS	6.3182829+01	LATS	-7.9990719+00	LONS	-1.6910504+02	VRS	7.9123615+03	PTR	-3.4300110+00	AZR	-1.0126091+02
LTS	-1.5083577+00	LNS	1.2390677+02	LTE	3.1253981+00	LNE	7.7164093+00	DSMP	5.0275891+00	RSMP	1.1633942+02
LIN	1.6619869+02	LAN	4.5788705+01	LAP	-1.5642486+02	DR	-4.7339053+02	VT	7.8981875+03	SOLSV	2.2994709+01

GEOCENTRIC

X	1.8683927+05	Y	-7.1744016+04	Z	-4.0626147+04	DX	-1.7431648+03	DY	-3.2849462+03	DZ	-2.5479000+03
R	2.0422193+05	DEC	-1.1474473+01	RA	-2.1006183+01	V	4.5079142+03	PTH	8.3990818-01	AZ	-1.2501697+02

GEOGRAPHIC

XG	-2.1517046+04	YG	1.9898022+05	ZG	-4.0626142+04	DXG	9.1882087+04	DYG	9.4834273+03	DZG	-2.5479064+03
ALT	2.0077845+05	LAT	-1.1475735+01	LON	9.6171788+01	VE	9.2405334+04	PTE	4.1008106-02	AZE	-9.1603921+01

EARTH-MOON PLANE

XMP	-9.9653102+02	YMP	-4.6190894+01	ZMP	-9.0265571+01	DXMP	1.7368589+02	DYMP	7.8646415+03	DZMP	-6.8879117+02
RMP	1.0016763+03	DEMP	-5.1701947+00	RAMP	-1.7734614+02	VMP	7.8966565+03	PTMP	-3.4368407+00	AZMP	-9.5346230+01
XME	-2.0422190+05	YME	-4.6191879+01	ZME	-9.0265738+01	DXME	-6.6782958+01	DYME	4.4544805+03	DZME	-6.8879117+02
DIA	7.3826452+00	LIA	-3.6780258+01	DOA	2.2359186+00	LOA	2.9156554+01	DRP	-5.7266967+00	LRP	1.7632867+02

PLANETARY COORDINATES

XM	1.8590969+05	YM	-7.1473762+04	ZM	-4.0368836+04	DXM	1.5971471+03	DYM	2.6634609+03	DZM	1.4290278+03
RM	2.0322537+05	DEM	-1.1457483+01	RAM	-2.1029466+01	LOM	9.6148503+01	VM	3.4186289+03	ARGM	-2.4640638+01
XSUN	3.7156122+06	YSUN	-7.2808313+07	ZSUN	-3.1572533+07	RAS	-8.7078568+01	LOS	3.0099403+01	DES	-2.3416256+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	9.7884300+05	ECC	7.9141469-01	INC	1.4338040+02	RAN	1.7484435+02	APF	-1.6241997+02	RP	2.0417228+05
VH	-2.5528479+02	RNMP	-1.7982325+02	APMP	-1.8173547+02	INMP	1.7121039+02	APO	1.7535137+06	TFP	6.6601996+01
TA	1.9012049+00	EA	6.4879563-01	MA	1.3534020-01	SLR	3.6575719+05	PER	6.7474243+03	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-5.2167732+03	ECCS	1.1913761+00	INCS	1.4455298+02	RANS	-1.7428727+02	APFS	-1.4738765+02	RPS	9.9836559+02
VHS	2.3371396+03	RNMPS	4.6572779+01	APMPS	-1.2951843+02	INMPS	1.7256795+02	APOS	-1.1431912+04	TFPS	6.9162215+01
TAS	-6.3210946+00	EAS	-1.8700665+00	MAS	-3.5828117-01	SLRS	2.1877943+03	PERS	2.3671222+01	MTAS	1.4707318+02

SELENOCENTRIC UNIT VECTORS

WX	-5.7728585-02	WY	5.7706954-01	WZ	-8.1465218-01	PX	8.8185693-01	PY	-3.5303146-01	PZ	-3.1256536-01
QX	-4.6796979-01	QY	-7.3645061-01	QZ	-4.8851275-01	SXO	-9.9457341-01	SYO	-1.0398810-01	SZO	-3.1830184-03

BODY ATTITUDE AND FORCES

RRAT	-5.1882406-08	PRAT	-4.1316167-07	YRAT	1.0809904-07	IGA	0.0000000	MGA	-1.2806605-06	OGA	0.0000000
XIX	4.3694294-01	ETX	-3.1757988-02	ZTX	-8.9892841-01	ALO	0.0000000	ALLV	1.7588688+02	ALLI	-1.3588123+02
XIY	6.9900504-01	ETY	6.4095703-01	ZTY	3.1712177-01	BTO	-1.2806605-06	BTLV	4.7625666+00	BTLI	3.5590838+01
XIZ	5.6610319-01	ETZ	-7.6691951-01	ZTZ	3.0226064-01	GMO	0.0000000	GMLV	-1.7934784+02	GMLI	8.2071880+01
ALS	1.4780196+02	BTS	-3.2229243+01	ALE	9.2382631+01	BTE	1.7416008+02	ALM	9.4098892+01	BTM	1.7968996+02
ALEI	9.2382631+01	BTEI	1.7416007+02								

****** CSM / MOON REF. /PHASE 7- 7
MEAN-OF-EPOCH 1969 24 DEC. 1968, 9 HRS., 59 MINS., 28.862 SECS. G.M.T.

T .69141435100192 9+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 8 MINS., 29.166 SECS. G.E.T. RAGR .2428638103279 70+003

PHASE ELAPSED TIME .23836650+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

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        RXYZ      .26832166242962839+000     -.81293463541912956-001     -.76596612526431847-001
        RDXYZ     -.57371072658166948+000    -.10077000948159959+001     -.67120303950515131+000

GD4     THRUST **********
        **********
THETA    3.3641132+00 BETA    1.7516082+02 FUEL    3.9159667+03 TM      2.0500000+04 VELG    2.3384169+03 TACC    1.1233589+01
BARC     4.5565671+00 DELV    6.5248988+02 MASS    5.8713914+04 MSFL    6.5265838+01 SPI     3.1410000+02 VEX     1.0105868+04
VRX     -2.3130564+03 VRY    -4.2228980+03 VRZ    -2.5777199+03 VDX     1.0217548+03 VDY     1.6345652+03 VDZ     1.3237853+03
TGO      0.0000000    FC      0.0000000    GMLP     0.0000000    GMLY     0.0000000    PLCHNG   3.7468564-01 TDELV   6.5248988+02

SELENOCENTRIC
  XL     9.2408196+02  YL    -2.7996928+02  ZL    -2.6379364+02  DXL   -3.3348111+03  DYL   -5.8574633+03  DZL   -3.9015052+03
  RL     1.0009482+03 DECL    -1.5280439+01  RAL   -1.6855243+01  VL     7.7879767+03 PTHL    -3.0335560+00  AZL   -1.2231216+02

SELENOGRAPHIC
  XS    -9.7531173+02  YS    -1.7483345+02  ZS    -1.4176601+02  DXS   -7.3877586+02  DYS    7.6367322+03  DZS   -1.4254667+03
 ALTS     6.2454683+01 LATS    -8.1422780+00 LONS    -1.6983715+02  VRS    7.8036800+03  PTR    -3.0274458+00  AZR   -1.0109001+02
  LTS    -1.5083594+00  LNS     1.2390534+02  LTE    3.1252377+00  LNE    7.7164613+00 DSMP    5.0275900+00 RSMP    1.1633794+02
  LIN     1.6625392+02  LAN     4.5956571+01  LAP   -1.6473288+02  DR    -4.1214600+02  VT     7.7927888+03 SOLSV   2.3713163+01

GEOCENTRIC
    X     1.8683643+05    Y    -7.1749300+04    Z    -4.0630253+04   DX    -1.7377508+03   DY    -3.1939695+03   DZ    -2.4724587+03
    R     2.0422201+05  DEC    -1.1475645+01   RA    -2.1007887+01    V     4.3970753+03  PTH     3.1561654-01   AZ    -1.2493568+02

GEOGRAPHIC
   XG    -2.1365944+04   YG     1.9899575+05   ZG    -4.0630248+04  DXG    9.1805497+04  DYG    9.3770843+03  DZG   -2.4724887+03
  ALT     2.0077854+05  LAT    -1.1476906+01  LON     9.6128304+01   VE     9.2316263+04  PTE     1.5067171-02  AZE   -9.1562967+01

EARTH-MOON PLANE
  XMP    -9.9621160+02  YMP    -3.3308315+01  ZMP    -9.1380266+01 DXMP    2.1583705+02 DYMP    7.7564657+03 DZMP   -6.6575982+02
  RMP     1.0009482+03 DEMP    -5.2380370+00 RAMP    -1.7808502+02  VMP    7.7879767+03 PTMP    -3.0335563+00 AZMP   -9.5210948+01
  XME    -2.0422199+05  YME    -3.3309061+01  ZME    -9.1380379+01 DXME   -2.4632355+01 DYME    4.3463120+03 DZME   -6.6575989+02
  DIA     7.2410150+00  LIA    -3.1722087+01  DOA    2.9033419+00   LOA    2.3904097+01  DRP    -5.7305152+00  LRP    1.7619260+02

PLANETARY COORDINATES
   XM     1.8591235+05   YM    -7.1469332+04   ZM    -4.0366459+04  DXM    1.5970603+03  DYM    2.6634937+03  DZM    1.4290465+03
   RM     2.0322578+05  DEM    -1.1456777+01  RAM    -2.1028001+01  LOM    9.6108188+01   VM    3.4186216+03 ARGM    -2.4639036+01
 XSUN     3.7157772+06 YSUN    -7.2808306+07 ZSUN    -3.1572530+07  RAS   -8.7078439+01  LOS    3.0057749+01  DES   -2.3416253+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA     6.9077204+05  ECC     7.0436771-01  INC     1.4345670+02  RAN    1.7488969+02  APF   -1.6124402+02   RP    2.0421451+05
   VH    -3.6612272+02 RNMP    -1.7982328+02 APMP    -1.8059438+02 INMP    1.7129134+02  APO    1.1773295+06  TFP    6.8096594+01
   TA     7.6370414-01   EA     3.1807146-01   MA     9.4033343-02  SLR    3.4805661+05  PER    4.0000975+03  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    -7.6677658+03 ECCS     1.1301952+00 INCS     1.4461409+02 RANS   -1.7423428+02 APFS   -1.4721078+02  RPS    9.9830630+02
  VHS     1.9277522+03 RNMPS    4.6944427+01 APMPS   -1.2901462+02 INMPS   1.7261655+02 APOS   -1.6333838+04  TFPS   6.9163035+01
  TAS    -5.7173823+00  EAS    -1.4147115+00  MAS    -1.8435033-01 SLRS    2.1265873+03 PERS    4.2181400+01 MTAS   1.5222727+02

SELENOCENTRIC UNIT VECTORS
   WX    -5.8175035-02   WY     5.7615110-01   WZ    -8.1527025-01   PX    8.8077014-01   PY   -3.5482148-01   PZ   -3.1360106-01
   QX    -4.6995699-01   QY    -7.3630944-01   QZ    -4.8681492-01  SXO   -9.9829169-01  SYO   -2.9147681-02  SZO    5.0636198-02

BODY ATTITUDE AND FORCES
 RRAT    -2.3515332-08 PRAT    -1.1265971-07 YRAT     1.1127105-07  IGA    0.0000000     MGA   -6.4033023-07  OGA    0.0000000
  XIX     4.3694296-01  ETX    -3.1757989-02  ZTX    -8.9892840-01  ALO    0.0000000    ALLV    1.7662388+02 ALLI   -1.3588123+02
  XIY     6.9900504-01  ETY     6.4095705-01  ZTY     3.1712177-01  BTO   -6.4033023-07  BTLV    4.8308127+00 BTLI    3.5590838+01
  XIZ     5.6610318-01  ETZ    -7.6691949-01  ZTZ     3.0226066-01  GMO    0.0000000    GMLV   -1.7934331+02 GMLI    8.2071879+01
  ALS     1.4780185+02  BTS    -3.2229143+01  ALE     9.2380594+01  BTE    1.7416005+02  ALM    9.3364111+01  OTM    1.7962804+02
 ALEI     9.2380592+01 BTEI     1.7416004+02

****** CSM   / MOON  REF.  /PHASE   7- 8
                    MEAN-OF-EPOCH  1969        24  DEC.  1968,  9 HRS.,  59 MINS.,  38.862 SECS.  G.M.T.

T        .69144212877928B+002  HRS. FROM LAUNCH      2 DAYS, 21 HRS.,  8 MINS.,  39.166 SECS.  G.E.T.     RAGR  .242905591068947+003

          PHASE ELAPSED TIME      .23837651+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      .26672947767265865+000     -.84070631552540185-001     -.78442838402936783-001
        RDXYZ     -.57264147221652420+000    -.99182202727809362+000     -.65A049A9635412673+000

GD4     THRUST **********
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THETA    2.6388998+00 BETA    1.7509294+02 FUEL    4.5686279+03  TM     2.0500000+04 VELG    2.2254525+03 TACC    1.1359864+01
BARC     5.2844119+00 DELV    7.6545471+02 MASS    5.8061253+04 MSFL    6.5265838+01 SPI     3.1410000+02 VEX     1.0105868+04
VRX     -2.3562001+03 VRY    -4.2095661+03 VRZ    -2.5652140+03 VDX     9.7239577+02 VDY     1.5556026+03 VDZ     1.2598357+03
TGO      0.0000000    FC      0.0000000    GMLP     0.0000000    GMLY     0.0000000    PLCHNG   4.4575223-01 TDELV   7.6545471+02

SELENOCENTRIC
  XL     9.1859858+02  YL    -2.8953367+02  ZL    -2.7015192+02  DXL   -3.3285958+03  DYL   -5.7651687+03  DZL   -3.8250498+03
  RL     1.0003175+03 DECL    -1.5668204+01  RAL   -1.7494362+01  VL     7.6777423+03 PTHL    -2.6499800+00  AZL   -1.2207051+02

SELENOGRAPHIC
  XS    -9.7648276+02  YS    -1.6234794+02  ZS    -1.4408210+02  DXS   -6.8432607+02  DYS    7.5360063+03  DZS   -1.3890280+03
 ALTS     6.1823989+01 LATS    -8.2814813+00 LONS    -1.7056046+02  VRS    7.6934447+03  PTR    -2.6445678+00  AZR   -1.0091584+02
  LTS    -1.5083599+00  LNS     1.2390395+02  LTE    3.1250805+00  LNE    7.7165123+00 DSMP    5.0275911+00 RSMP    1.1633640+02
  LIN     1.6631070+02  LAN     4.6135738+01  LAP   -1.5735221+02  DR    -3.5497575+02  VT     7.6852509+03 SOLSV   2.4422319+01

GEOCENTRIC
    X     1.8683355+05    Y    -7.1754531+04    Z    -4.0634286+04   DX    -1.7316205+03   DY    -3.1016430+03   DZ    -2.3959851+03
    R     2.0422201+05  DEC    -1.1476799+01   RA    -2.1009581+01    V     4.2847922+03  PTH    -2.3628961-01   AZ    -1.2485031+02

GEOGRAPHIC
   XG    -2.1214859+04   YG     1.9901109+05   ZG    -4.0634281+04  DXG    9.1727240+04  DYG    9.2709083+03  DZG   -2.3959626+03
  ALT     2.0077854+05  LAT    -1.1478060+01  LON     9.6084829+01   VE     9.2225688+04  PTE    -1.0944638-02  AZE   -9.1521313+01

EARTH-MOON PLANE
  XMP    -9.9582241+02  YMP    -2.0605885+01  ZMP    -9.2456828+01 DXMP    2.5800388+02 DYMP    7.6464638+03 DZMP   -6.4245855+02
  RMP     1.0003175+03 DEMP    -5.3032737+00 RAMP    -1.7881458+02  VMP    7.6777422+03 PTMP    -2.6499807+00 AZMP   -9.5072946+01
  XME    -2.0422199+05  YME    -2.0607090+01  ZME    -9.2457659+01 DXME    1.7534006+01 DYME    4.2363172+03 DZME   -6.4245855+02
  DIA     6.9828559+00  LIA    -2.4768387+01  DOA    3.7467802+00   LOA    1.6756072+01  DRP    -5.7350012+00  LRP    1.7605146+02

PLANETARY COORDINATES
   XM     1.8591494+05   YM    -7.1464998+04   ZM    -4.0364134+04  DXM    1.5969753+03  DYM    2.6635257+03  DZM    1.4290646+03
   RM     2.0322616+05  DEM    -1.1456085+01  RAM    -2.1026568+01  LOM    9.6067842+01   VM    3.4186145+03 ARGM    -2.4637472+01
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XSUN    3.7159387+06 YSUN   -7.2808298+07 ZSUN   -3.1572526+07  RAS   -8.7078311+01  LOS    3.0016099+01  DES   -2.3416251+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    5.3520630+05  ECC    6.1843224-01  INC    1.4353684+02  RAN    1.7493750+02  APF   -1.5982150+02  RP    2.0421746+05
   VH   -4.7840589+02 RNMP   -1.7982318+02 APMP   -1.7920863+02 INMP   1.7137637+02  APO    8.6619514+05  TFP   7.0012398+01
   TA   -6.1837006-01   EA   -3.0025497-01   MA   -1.1456846-01  SLR    3.3051211+05  PER    2.7280372+03  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.4424473+04 ECCS    1.0692052+00 INCS    1.4467720+02 RANS   -1.7417759+02 APFS   -1.4702576+02  RPS   9.9824824+02
  VHS    1.4055155+03 RNMPS   4.7341202+01 APMPS  -1.2848077+02 INMPS   1.7266610+02 APOS   -2.9847194+04  TFPS  6.9163861+01
  TAS   -5.1283281+00  EAS   -9.3851963-01  MAS   -6.4994717-02 SLRS   2.0655806+03 PERS    1.0883477+02 MTAS  1.5927248+02

SELENOCENTRIC UNIT VECTORS
   WX   -5.8653888-02   WY    5.7519953-01   WZ   -8.1590761-01   PX    8.7963611-01   PY   -3.5667238-01   PZ   -3.1468252-01
   QX   -4.7201695-01   QY   -7.3615915-01   QZ   -4.8504606-01  SXO   -9.8975906-01  SYO    7.3042080-02  SZO   1.2264500-01

BODY ATTITUDE AND FORCES
 RRAT   -2.8339500-08 PRAT   -4.8506907-07 YRAT   -4.7152212-07 IGA    0.0000000   MGA    0.0000000   OGA   0.0000000
  XIX    4.3694293-01 ETX    -3.1757966-02 ZTX    -8.9892841-01 ALO    0.0000000   ALLV   1.7735141+02 ALLI  -1.3588123+02
  XIY    6.9900505-01 ETY     6.4095704-01 ZTY     3.1712177-01 BTO    0.0000000   BTLV   4.9018396+00 BTLI   3.5590838+01
  XIZ    5.6610318-01 ETZ    -7.6691949-01 ZTZ     3.0226062-01 GMO    0.0000000   GMLV  -1.7933957+02 GMLI   8.2071878+01
  ALS    1.4780174+02 BTS    -3.2229044+01 ALE     9.2378570+01 BTE    1.7416001+02 ALM    9.2638898+01 BTM    1.7956613+02
 ALEI    9.2378570+01 BTEI    1.7416000+02

****** CSM    / MOON  REF.  /PHASE   7- 9
                    MEAN-OF-EPOCH  1969        24  DEC. 1968,  9 HRS.,  59 MINS.,  48.862 SECS. G.M.T.

T          .6914699065566470+002  HRS. FROM LAUNCH       2 DAYS,  21 HRS.,   8 MINS.,  49.166 SECS. G.E.T.     RAGR  .2429473718099230+003

          PHASE ELAPSED TIME      .23838650+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ        .2651404387233532O+000      -.8680336900160456З-001      -.8025227951703925Z-001
         RDXYZ       -.5714450428514429l+000     -.9757097796676733Б+000      -.6447177821762973Б+000

GD4     THRUST **********
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THETA     1.9235409+00 BETA     1.7502137+02 FUFL     5.2212890+03  TM     2.0500000+04 VELG     2.1112110+03 TACC     1.1489011+01
 BARC     6.0024229+00 DELV     8.7969652+02 MASS     5.7408592+04 MSFL    6.5265838+01 SPI      3.1410000+02 VEX      1.0105868+04
 VRX     -2.3991626+03 VRY     -4.1957657+03 VRZ    -2.5523908+03 VDX     9.2247877+02 VDY      1.4757472+03 VDZ      1.1951633+03
 TGO      0.0000000    FC       0.0000000    GMLP     0.0000000    GMLY    0.0000000    PLCHNG   5.1971211-01 TDELV    8.7969652+02

SELENOCENTRIC
   XL     9.1312604+02   YL    -2.9894502+02   ZL    -2.7638351+02  DXL   -3.3216414+03  DYL   -5.6715130+03  DZL   -3.7475542+03
   RL     9.9977754+02 DECL    -1.6048145+01  RAL    -1.8127742+01  VL    7.5659449+03  PTHL   -2.2869392+00  AZL   -1.2182339+02

SELENOGRAPHIC
   XS    -9.7756410+02   YS    -1.5002912+02   ZS    -1.4633784+02  DXS   -6.2965258+02  DYS    7.4334813+03  DZS   -1.3521341+03
 ALTS     6.1283989+01 LATS    -8.4166446+00 LONS    -1.7127475+02  VRS    7.5816470+03  PTR    -2.2822008+00  AZR   -1.0073837+02
  LTS    -1.5083611+00  LNS     1.2390253+02  LTE     3.1249204+00  LNE    7.7165647+00  DSMP   5.0275926+00  RSMP   1.1633501+02
  LIN     1.6636908+02  LAN     4.6326979+01  LAP    -4.2462693+01  DR    -3.0191170+02  VT     7.5756334+03  SOLSV  2.5121915+01

GEOCENTRIC
    X     1.8683073+05    Y    -7.1759510+04    Z    -4.0638140+04  DX    -1.7247529+03  DY    -3.0079545+03  DZ    -2.3184709+03
    R     2.0422195+05  DEC    -1.1477907+01   RA    -2.1011202+01   V     4.1710754+03  PTH    -8.1855439-01  AZ    -1.2476046+02

GEOGRAPHIC
   XG    -2.1064010+04   YG     1.9902626+05   ZG    -4.0638138+04  DXG   9.1647308+04  DYG    9.1649821+03  DZG   -2.3184777+03
  ALT     2.0077848+05  LAT    -1.1479168+01  LON     9.6041426+01  VE    9.2133608+04  PTE    -3.7023632-02  AZE   -9.1478918+01

EARTH-MOON PLANE
  XMP    -9.9536349+02   YMP   -8.0854120+00   ZMP   -9.3494811+01 DXMP    3.0017833+02 DYMP   7.5346132+03 DZMP   -6.1888530+02
  RMP     9.9977753+02 DEMP    -5.3658904+00 RAMP    -1.7953458+02  VMP   7.5659447+03 PTMP   -2.2869390+00 AZMP   -9.4932110+01
  XME    -2.0422193+05  YME   -8.0855548+00  ZME   -9.3495115+01 DXME    5.9707948+01 DYME   4.1244740+03 DZME   -6.1888532+02
  DIA     6.2709869+00  LIA    -1.1528564+01 DOA     5.1137603+00  LOA   3.3227883+00  DRP    -5.7401972+00  LRP   1.7590462+02

PLANETARY COORDINATES
   XM     1.8591760+05   YM    -7.1460566+04   ZM    -4.0361757+04  DXM   1.5968885+03  DYM    2.6635585+03  DZM   1.4290832+03
   RM     2.0322657+05  DEM    -1.1455378+01  RAM    -2.1025105+01  LOM   9.6027524+01  VM     3.4186072+03 ARGM   -2.4635871+01
 XSUN     3.7161041+06 YSUN    -7.2808291+07 ZSUN    -3.1572523+07  RAS  -8.7078181+01  LOS    2.9974445+01  DES   -2.3416249+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    4.3792368+05  ECC    5.3379530-01  INC    1.4362119+02  RAN    1.7498805+02  APF   -1.5804511+02  RP    2.0416208+05
   VH   -5.9212332+02 RNMP   -1.7982293+02 APMP   -1.7747109+02 INMP   1.7146590+02  APO    6.7168528+05  TFP   7.2538508+01
   TA   -2.3521468+00   EA   -1.2969148+00   MA   -6.0468686-01  SLR    3.1314281+05  PER    2.0191384+03  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.1848335+05 ECCS    1.0084247+00 INCS    1.4474243+02 RANS   -1.7411696+02 APFS   -1.4683182+02  RPS   9.9819189+02
  VHS    4.9040736+02 RNMPS   4.7765008+01 APMPS  -1.2791435+02 INMPS   1.7271664+02 APOS   -2.3796489+05 TFPS  6.9164697+01
  TAS   -4.5547620+00  EAS   -2.9515211-01  MAS   -2.4880183-03 SLRS   2.0047938+03 PERS    2.5621451+03 MTAS  1.7258865+02

SELENOCENTRIC UNIT VECTORS
   WX   -5.9167236-02   WY    5.7421277-01   WZ   -8.1656534-01   PX    8.7844970-01   PY   -3.5859095-01   PZ   -3.1581421-01
   QX   -4.7415749-01   QY   -7.3599742-01   QZ   -4.8320020-01  SXO   -9.3227331-01  SYO    2.6065741-01  SZO   2.5084685-01

BODY ATTITUDE AND FORCES
 RRAT   -8.8771633-09 PRAT   -1.0283425-07 YRAT   -9.5045011-07 IGA    0.0000000   MGA    2.1344341-06 OGA   0.0000000
  XIX    4.3694296-01 ETX    -3.1757923-02 ZTX    -8.9892840-01 ALO    0.0000000   ALLV   1.7806915+02 ALLI  -1.3588124+02
  XIY    6.9900507-01 ETY     6.4095703-01 ZTY     3.1712182-01 BTO    2.1344341-06 BTLV   4.9758174+00 BTLI   3.5590840+01
  XIZ    5.6610314-01 ETZ    -7.6691951-01 ZTZ     3.0226061-01 GMO    0.0000000   GMLV  -1.7933661+02 GMLI   8.2071874+01
  ALS    1.4780163+02 BTS    -3.2228938+01 ALE     9.2376637+01 BTE    1.7415998+02 ALM    9.1923538+01 BTM    1.7950422+02
 ALEI    9.2376635+01 BTEI    1.7415997+02

****** CSM    / MOON  REF.  /PHASE   7- 10
                    MEAN-OF-EPOCH  1969        24  DEC. 1968,  9 HRS.,  58.862 SECS. G.M.T.

T          .6914976843340060+002  HRS. FROM LAUNCH       2 DAYS,  21 HRS.,   8 MINS.,  59.166 SECS. G.E.T.     RAGR  .2429891525500000+003

          PHASE ELAPSED TIME      .23839650+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ        .2635549046458058З+000      -.8949102276740596З-001      -.8202443679037259Б-001
         RDXYZ       -.5701172805599882Б+000     -.9593614512853546б+000      -.6312052890632911б+000

GD4     THRUST **********
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THETA	1.2183000+00	BETA	1.7494591+02	FUEL	5.8739502+03	TM	2.0500000+04	VELG	1.9956633+03	TACC	1.1621128+01
BARC	6.7103518+00	DELV	9.9524456+02	MASS	5.6755931+04	MSFL	6.5265838+01	SPI	3.1410000+02	VFX	1.0105868+04
VRX	-2.4419326+03	VRY	-4.1815063+03	VRZ	-2.5392587+03	VDX	8.7199096+02	VDY	1.3949787+03	VDZ	1.1297513+03
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	5.9675810-01	TDELV	9.9524456+02

SELENOCENTRIC

XL	9.0766558+02	YL	-3.0820113+02	ZL	-2.6248671+02	DXL	-3.3139235+03	DYL	-5.5764850+03	DZL	-3.6690100+03
RL	9.9932151+02	DECL	-1.6420130+01	RAL	-1.8755103+01	VL	7.4525772+03	PTHL	-1.9452992+00	AZL	-1.2157085+02

SELENOGRAPHIC

XS	-9.7855523+02	YS	-1.3788109+02	ZS	-1.4853249+02	DXS	-5.7477827+02	DYS	7.3291323+03	DZS	-1.3147815+03
ALTS	6.0827973+01	LATS	-8.5477348+00	LONS	-1.7197967+02	VRS	7.4682796+03	PTR	-1.9412078+00	AZR	-1.0055753+02
LTS	-1.5083625+00	LNS	1.2390113+02	LTE	3.1247631+00	LNE	7.7166164+00	PSMP	5.0275932+00	RSMP	1.1633356+02
LIN	1.6642915+02	LAN	4.6531274+01	LAP	-5.9775980+01	DR	-2.5298040+02	VT	7.4639936+03	SOLSV	2.5811686+01

GEOCENTRIC

X	1.8682787+05	Y	-7.1764432+04	Z	-4.0641917+04	DX	-1.7171200+03	DY	-2.9128944+03	DZ	-2.2399086+03
R	2.0422181+05	DEC	-1.1479995+01	RA	-2.1012810+01	V	4.0559395+03	PTH	-1.4340448+00	AZ	-1.2466561+02

GEOGRAPHIC

XG	-2.0913192+04	YG	1.9904125+05	ZG	-4.0641912+04	DXG	9.1565672+04	DYG	9.0592632+03	DZG	-2.2399000+03
ALT	2.0077834+05	LAT	-1.1480256+01	LON	9.5998030+01	VE	9.2039990+04	PTE	-6.3156156-02	AZE	-9.1435818+01

EARTH-MOON PLANE

XMP	-9.9483483+02	YMP	4.2488184+00	ZMP	-9.4493782+01	DXMP	3.4233439+02	DYMP	7.4208923+03	DZMP	-5.9503808+02
RMP	9.9932149+02	DEMP	-5.4258773+00	RAMP	1.7975529+02	VMP	7.4525771+03	PTMP	-1.9452995+00	AZMP	-9.4788335+01
XME	-2.0422179+05	YME	4.2481545+00	ZME	-9.4493981+01	DXME	1.0186350+02	DYME	4.0107603+03	DZME	-5.9503808+02

PLANETARY COORDINATES

XM	1.8592020+05	YM	-7.1456232+04	ZM	-4.0359431+04	DXM	1.5968034+03	DYM	2.6635905+03	DZM	1.4291015+03
RM	2.0322696+05	DEM	-1.1454686+01	RAM	-2.1023673+01	LOM	9.5987175+01	VM	3.4186001+03	ARGM	-2.4634304+01
XSUN	3.7162656+06	YSUN	-7.2808283+07	ZSUN	-3.1572520+07	RAS	-8.7078054+01	LOS	2.9932795+01	DES	-2.3416246+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	3.7141893+05	ECC	4.5071210-01	INC	1.4371023+02	RAN	1.7504162+02	APF	-1.5573511+02	RP	2.0401593+05
VH	-7.0726078+02	RNMP	-1.7982251+02	APMP	-1.7520228+02	INMP	1.7156043+02	APO	5.3882194+05	TFP	7.5990948+01
TA	-4.6170812+00	EA	-2.8419923+00	MA	-1.5615972+00	SLR	2.9596835+05	PER	1.5771192+03	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	1.9148315+04	ECCS	9.4787330-01	INCS	1.4480991+02	RANS	-1.7405212+02	APFS	-1.4662804+02	RPS	9.9813860+02
VHS	-9.9180058+01	RNMPS	4.8218086+01	APMPS	-1.2731257+02	INMPS	1.7276814+02	APOS	3.7298492+04	TFPS	6.9165542+01
TAS	-3.9976212+00	EAS	-6.5421855-01	MAS	-3.4115723-02	SLRS	1.9442469+03	PERS	1.6646142+02	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-5.9717344-02	WY	5.7318855-01	WZ	-8.1724460-01	PX	8.7720469-01	PY	-3.6058553-01	PZ	-3.1700157-01
UX	-4.7638825-01	UY	-7.3582128-01	UZ	-4.8127047-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

BODY ATTITUDE AND FORCES

RRAT	-3.1648983-08	PRAT	6.1105759-07	YRAT	-1.5569263-07	IGA	0.0000000	MGA	8.5377364-07	OGA	0.0000000
XIX	4.3694295-01	ETX	-3.1757887-02	ZTX	-8.9692641-01	ALO	0.0000000	ALLV	1.7877697+02	ALLI	-1.3588134+02
XIY	6.9900506-01	ETY	6.4095702-01	ZTY	3.1712183-01	BTO	8.5377364-07	BTLV	5.0529373+00	BTLI	3.5590836+01
XIZ	5.6610316-01	ETZ	-7.6691952-01	ZTZ	3.0226057-01	GMO	0.0000000	GMLV	-1.7933447+02	GMLI	8.2071874+01
ALS	1.4780153+02	BTS	-3.2228836+01	ALE	9.2374720+01	BTE	1.7415994+02	ALM	9.1218296+01	BTM	1.7944230+02
ALEI	9.2374720+01	BTEI	1.7415992+02								

****** CSM / MOON REF. /PHASE 7- 11

MEAN-OF-EPOCH 1969 24 DEC. 1968, 10 HRS., 0 MINS., 8.862 SECS. G.M.T.

T .891525462111365+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 9 MINS., 9.166 SECS. G.E.T. RAGR .243030933291877+003

PHASE ELAPSED TIME .2384065D+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .251973245904985 70+000 -.9213203433045053 4-001 -.8375880711858n602-001

RDXYZ -.5686541338490461 7+000 -.9427750538120003 0+000 -.6175109248818525 7+000

GD4 THRUST **********

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THETA	5.2343751-01	BETA	1.7486638+02	FUEL	6.5266113+03	TM	2.0500000+04	VELG	1.8787792+03	TACC	1.1756320+01
BARC	7.4079692+00	DELV	1.1121291+03	MASS	5.6103271+04	MSFL	6.5265838+01	SPI	3.1410000+02	VFX	1.0105868+04
VRX	-2.4844993+03	VRY	-4.1667970+03	VRZ	-2.5258258+03	VDX	8.2091928+02	VDY	1.3132761+03	VDZ	1.0635800+03
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	6.7709994-01	TDELV	1.1121201+03

SELENOCENTRIC

XL	9.0221845+02	YL	-3.1729970+02	ZL	-2.8845976+02	DXL	-3.3054186+03	DYL	-5.4800732+03	DZL	-3.5894088+03
RL	9.9894257+02	DECL	-1.6784039+01	RAL	-1.9376177+01	VL	7.3376323+03	PTHL	-1.6259774+00	AZL	-1.2131202+02

SELENOGRAPHIC

XS	-9.7945593+02	YS	-1.2590574+02	ZS	-1.5066528+02	DXS	-5.1970744+02	DYS	7.2229360+03	DZS	-1.2769665+03
ALTS	6.0444023+01	LATS	-8.6747260+00	LONS	-1.7967409+02	VRS	7.3533355+03	PTR	-1.6225046+00	AZR	-1.0037324+02
LTS	-1.5043631+00	LNS	1.2389971+02	LTE	3.1246027+00	LNE	7.7166681+00	PSMP	5.0275939+00	RSMP	1.1633207+02
LIN	1.6649102+02	LAN	4.6749571+01	LAP	2.0345613+01	DR	-2.0820426+02	VT	7.3503873+03	SOLSV	2.6491401+01

GEOCENTRIC

X	1.8682507+05	Y	-7.1769100+04	Z	-4.0645513+04	DX	-1.7087020+03	DY	-2.8164499+03	DZ	-2.2602887+03
R	2.0422162+05	DEC	-1.1480037+01	RA	-2.1014345+01	V	3.9394034+03	PTH	-2.0863162+00	AZ	-1.2456522+02

GEOGRAPHIC

XG	-2.0762609+04	YG	1.9905608+05	ZG	-4.0645514+04	DXG	9.1482315+04	DYG	8.9538374+03	DZG	-2.2603239+03
ALT	2.0077814+05	LAT	-1.1481299+01	LON	9.5954721+01	VE	9.1944835+04	PTE	-8.9338486-02	AZE	-9.1391964+01

EARTH-MOON PLANE

XMP	-9.9423644+02	YMP	1.6394921+01	ZMP	-9.5453279+01	DXMP	3.8446508+02	DYMP	7.3052783+03	DZMP	-5.7091451+02
RMP	9.9894254+02	DEMP	-5.4832254+00	RAMP	1.7905527+02	VMP	7.3376323+03	PTMP	-1.6259775+00	AZMP	-9.4641469+01
XME	-2.0422160+05	YME	1.6394858+01	ZME	-9.5453434+01	DXME	1.4399372+02	DYME	3.8951536+03	DZME	-5.7091454+02

PLANETARY COORDINATES

XM	1.8592285+05	YM	-7.1451801+04	ZM	-4.0357053+04	DXM	1.5967166+03	DYM	2.6636233+03	DZM	1.4291200+03
RM	2.0322736+05	DEM	-1.1453979+01	RAM	-2.1022209+01	LOM	9.5946859+01	VM	3.4185928+03	ARGM	-2.4632706+01
XSUN	3.7164304+06	YSUN	-7.2808275+07	ZSUN	-3.1572516+07	RAS	-8.7077925+01	LOS	2.9891141+01	DES	-2.3416245+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	3.2314628+05	ECC	3.6957459-01	INC	1.4380447+02	RAN	1.7509861+02	APF	-1.5256497+02	RP	2.0371963+05
VH	-8.2379913+02	RNMP	-1.7982191+02	APMP	-1.7207593+02	INMP	1.7166052+02	APO	4.4257294+05	TFP	8.0940650+01
TA	-7.7394214+00	EA	-5.2551954+00	MA	-3.3157307+00	SLR	2.7900021+05	PER	1.2798739+03	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	8.8774937+03	ECCS	8.8757104-01	INCS	1.4487977+02	RANS	-1.7398276+02	APFS	-1.4641335+02	RPS	9.9808742+02
VHS	-2.1555704+02	RNMPS	4.8702760+01	APMPS	-1.2667213+02	INMPS	1.7282064+02	APOS	1.6756900+04	TFPS	6.9166403+01
TAS	-3.4579851+00	EAS	-8.4417894-01	MAS	-9.4937259-02	SLRS	1.8839607+03	PERS	5.2547651+01	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-6.0306671-02	WY	5.7212443-01	WZ	-8.1794666-01	PX	8.7589340-01	PY	-3.6266637-01	PZ	-3.1825120-01
QX	-4.7872103-01	QY	-7.3562675-01	QZ	-4.7924881-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

BODY ATTITUDE AND FORCES

RRAT	4.2178895-08	PRAT	3.7477196-08	YRAT	-3.3698515-07	IGA	9.8911705-03	MGA	4.2688682-07	OGA	0.0000000
XIX	4.3694294-01	ETX	-3.1757841-02	ZTX	-8.9892840-01	ALO	9.8911705-03	ALLV	1.7947450+02	ALLI	-1.3588124+02
XIY	6.9900505-01	ETY	6.4095709-01	ZTY	3.1712183-01	BTO	4.2688682-07	BTLV	5.1333994+00	BTLI	3.5590838+01
XIZ	5.6610317-01	ETZ	-7.6691945-01	ZTZ	3.0226056-01	GMO	0.0000000	GMLV	-1.7933322+02	GMLI	8.2071868+01
ALS	1.4780141+02	BTS	-3.2228745+01	ALE	9.2372891+01	BTE	1.7415990+02	ALM	9.0523434+01	BTM	1.7938036+02
ALEI	9.2372891+01	BTEI	1.7415988+02								

****** CSM / MOON REF. /PHASE 7- 12
MEAN-OF-EPOCH 1969 24 DEC. 1968, 10 HRS., 0 MINS., 18.862 SECS. G.M.T.

T .691553239888724+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 9 MINS., 19.166 SECS. G.E.T. RAGR .2430727140328S3+003

PHASE ELAPSED TIME .23841650+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .2603958440751674 9+000 -.9472843951141208 4-001 -.8545488312062994 3-001
RDXYZ -.5670516551163996 9+000 -.9259484982389702 0+000 -.6036331004889867 8+000

GD4 THRUST **********
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THETA	-1.6080228-01	BETA	1.7478254+02	FUEL	7.1792725+03	TM	2.0500000+04	VELG	1.7605273+03	TACC	1.1894693+01
BARC	8.0949892+00	DELV	1.2303815+03	MASS	5.5450609+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04
VRX	-2.5268539+03	VRY	-4.1516478+03	VRZ	-2.5121009+03	VDX	7.6924998+02	VDY	1.2306175+03	VDZ	9.9664017+02
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	7.6096626-01	TDELV	1.2303815+03

SELENOCENTRIC

XL	8.9678598+02	YL	-3.2623845+02	ZL	-2.9430094+02	DXL	-3.2961039+03	DYL	-5.3822654+03	DZL	-3.5087410+03
RL	9.9863388+02	DECL	-1.7139759+01	RAL	-1.9990693+01	VL	7.2211041+03	PTHL	-1.3299482+00	AZL	-1.2104962+02

SELENOGRAPHIC

XS	-9.8026579+02	YS	-1.1410730+02	ZS	-1.5273545+02	DXS	-4.6446078+02	DYS	7.1148673+03	DZS	-1.2386851+03
ALTS	6.0140342+01	LATS	-8.7975973+00	LONS	-1.7336039+02	VRS	7.2368086+03	PTR	-1.3270621+00	AZR	-1.0018540+02
LTS	-1.5083645+00	LNS	1.2389832+02	LTE	3.1244455+00	LNE	7.7167193+00	DSMP	5.0275949+00	RSMP	1.1633063+02
LIN	1.6655474+02	LAN	4.6983052+01	LAP	1.5371467+01	DR	-1.6760110+02	VT	7.2348675+03	SOLSV	2.7160822+01

GEOCENTRIC

X	1.8682224+05	Y	-7.1773706+04	Z	-4.0649029+04	DX	-1.6994722+03	DY	-2.7186100+03	DZ	-2.0796029+03
R	2.0422135+05	DEC	-1.1481059+01	RA	-2.1015866+01	V	3.8214911+03	PTH	-2.7791870+00	AZ	-1.2445863+02

GEOGRAPHIC

XG	-2.0612068+04	YG	1.9907073+05	ZG	-4.0649028+04	DXG	9.1397210+04	DYG	8.8486670+03	DZG	-2.0796154+03
ALT	2.0077787+05	LAT	-1.1482321+01	LON	9.5911421+01	VE	9.1848104+04	PTE	-1.1555766-01	AZE	-9.1347376+01

EARTH-MOON PLANE

XMP	-9.9356845+02	YMP	2.8348548+01	ZMP	-9.6372841+01	DXMP	4.2654660+02	DYMP	7.1877485+03	DZMP	-5.4651200+02
RMP	9.9863387+02	DEMP	-5.5379296+00	RAMP	1.7836567+02	VMP	7.2211041+03	PTMP	-1.3299483+00	AZMP	-9.4491374+01
XME	-2.0422132+05	YME	2.8347988+01	ZME	-9.6373474+01	DXME	1.8607476+02	DYME	3.7776309+03	DZME	-5.4651202+02

PLANETARY COORDINATES

XM	1.8592545+05	YM	-7.1447467+04	ZM	-4.0354728+04	DXM	1.5966316+03	DYM	2.6636554+03	DZM	1.4291382+03
RM	2.0322775+05	DEM	-1.1453289+01	RAM	-2.1020778+01	LOM	9.5906506+01	VM	3.4185857+03	ARGM	-2.4631140+01
XSUN	3.7165920+06	YSUN	-7.2808268+07	ZSUN	-3.1572513+07	RAS	-8.7077796+01	LOS	2.9849490+01	DES	-2.3416242+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	2.8656656+05	ECC	2.9107990-01	INC	1.4390453+02	RAN	1.7515942+02	APF	-1.4788549+02	RP	2.0315279+05
VH	-9.4171472+02	RNMP	-1.7982108+02	APMP	-1.6744319+02	INMP	1.7176681+02	APO	3.6998032+05	TFP	8.8512612+01
TA	-1.2367992+01	EA	-9.1808223+00	MA	-6.5198904+00	SLR	2.6228648+05	PER	1.0688253+03	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	5.7870436+03	ECCS	8.2753890-01	INCS	1.4495216+02	RANS	-1.7390855+02	APFS	-1.4618644+02	RPS	9.9803993+02
VHS	-3.3325249+02	RNMPS	4.9221735+01	APMPS	-1.2598948+02	INMPS	1.7287412+02	APOS	1.0576047+04	TFPS	6.9167282+01
TAS	-2.9371277+00	EAS	-9.0244594-01	MAS	-1.5566768-01	SLRS	1.8239566+03	PERS	2.7656859+01	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-6.0937915-02	WY	5.7101773-01	WZ	-8.1867291-01	PX	8.7450630-01	PY	-3.6486641-01	PZ	-3.1957129-01
QX	-4.8117074-01	QY	-7.3540863-01	QZ	-4.7712562-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

BODY ATTITUDE AND FORCES

RRAT	-5.3063706-09	PRAT	-4.7416755-08	YRAT	9.4886407-07	IGA	0.0000000	MGA	-8.5377364-07	OGA	0.0000000
XIX	4.3694295-01	ETX	-3.1757850-02	ZTX	-8.9892841-01	ALO	0.0000000	ALLV	-1.7983837+02	ALLI	-1.3588123+02
XIY	6.9900504-01	ETY	6.4095709-01	ZTY	3.1712183-01	BTO	-8.5377364-07	BTLV	5.2174256+00	BTLI	3.5590838+01
XIZ	5.6610319-01	ETZ	-7.6691945-01	ZTZ	3.0226058-01	GMO	0.0000000	GMLV	-1.7933290+02	GMLI	8.2071868+01
ALS	1.4780131+02	BTS	-3.2228646+01	ALE	9.2371084+01	BTE	1.7415985+02	ALM	8.9839195+01	BTM	1.7931839+02
ALEI	9.2371084+01	BTEI	1.7415984+02								

****** CSM / MOON REF. /PHASE 7- 13
MEAN-OF-EPOCH 1969 24 DEC. 1968, 10 HRS., 0 MINS., 28.862 SECS. G.M.T.

T .691581017666083+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 9 MINS., 29.166 SECS. G.E.T. RAGR .2431144947738S0+003

PHASE ELAPSED TIME .23842651+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .2588230915557437 8+000 -.9727686816878150 2-001 -.8711215285725440 0-001
RDXYZ -.5653059971341360 5+000 -.9088795782922326 7+000 -.5895701214007047 7+000

GD4 THRUST **********
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THETA	-8.3418892-01	BETA	1.7469417+02	FUEL	7.8319336+03	TM	2.0500000+04	VELG	1.6408755+03	TACC	1.2036363+01
BARC	8.7712027+00	DELV	1.3500337+03	MASS	5.4797948+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04
VRX	-2.5689879+03	VRY	-4.1360685+03	VRZ	-2.4980923+03	VDX	7.1696897+02	VDY	1.1469802+03	VDZ	9.2890485+02
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	8.4860657-01	TDELV	1.3500337+03

SELENOCENTRIC

XL	8.9136952+02	YL	-3.3501507+02	ZL	-3.0000846+02	DXL	-3.2859569+03	DYL	-5.2830488+03	DZL	-3.4269971+03
RL	9.9838858+02	DECL	-1.7487197+01	RAL	-2.0598383+01	VL	7.1029871+03	PTHL	-1.0582486+00	AZL	-1.2078093+02

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SELENOGRAPHIC
   XS    -9.8098464+02   YS    -1.0248768+02   ZS    -1.5474223+02   DXS   -4.0904111+02   DYS    7.0049015+03   DZS   -1.1999329+03
 ALTS     5.9895065+01 LATS    -8.9163317+00 LONS    -1.7403570+02   VRS    7.1186935+03   PTR   -1.0559132+00   AZR   -9.9993900+01
  LTS    -1.5083656+00   LNS    1.2389689+02   LTE    3.1242850+00   LNE    7.7167711+00 DSMP    5.0275967+00 RSMP    1.1632915+02
  LIN     1.6662043+02   LAN    4.7232880+01   LAP    3.8755224+01   DR    -1.3118412+02   VT    7.1174847+03 SOLSV   2.7819735+01

GEOCENTRIC
    X     1.8681948+05    Y    -7.1778051+04    Z    -4.0652359+04   DX    -1.6894121+03   DY   -2.6193607+03   DZ   -1.9978403+03
    R     2.0422100+05  DEC    -1.1482031+01   RA    -2.1017312+01    V     3.7022330+03  PTH   -3.5173383+00   AZ   -1.2434508+02

GEOGRAPHIC
   XG    -2.0461764+04   YG     1.9908521+05   ZG    -4.0652356+04   DXG   9.1310348+04   DYG    8.7438361+03   DZG   -1.9978407+03
  ALT     2.0077753+05  LAT    -1.1483293+01  LON     9.5868193+01   VE    9.1749802+04   PTE   -1.4181167-01   AZE   -9.1302032+01

EARTH-MOON PLANE
  XMP    -9.9283090+02   YMP    4.0107737+01   ZMP   -9.7252006+01 DXMP    4.6857347+02 DYMP    7.0682785+03 DZMP   -5.2182789+02
  RMP     9.9838858+02  DEMP   -5.5899870+00 RAMP    1.7768665+02   VMP   7.1029869+03 PTMP   -1.0582485+00 AZMP   -9.4337853+01
  XME    -2.0422098+05   YME    4.0106724+01   ZME   -9.7252458+01 DXME    2.2810113+02 DYME    3.6581683+03 DZME   -5.2182794+02

PLANETARY COORDINATES
   XM     1.8592811+05    YM   -7.1443036+04    ZM    -4.0352351+04   DXM   1.5965448+03   DYM    2.6636881+03   DZM    1.4291568+03
   RM     2.0322815+05   DEM   -1.1452582+01   RAM    -2.1019314+01   LOM   9.5866191+01    VM    3.4185784+03  ARGM   -2.4629541+01
 XSUN     3.7167570+06  YSUN   -7.2808260+07  ZSUN    -3.1572510+07   RAS  -8.7077667+01   LOS    2.9807836+01   DES   -2.3416239+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA     2.5793739+05   ECC    2.1672610-01   INC    1.4401110+02   RAN   1.7522454+02   APF   -1.4023772+02   RP    2.0203563+05
   VH    -1.0609767+03 RNMP   -1.7982001+02 APMP   -1.5984543+02 INMP   1.7188007+02   APO    3.1383916+05  TFP    1.0119364+02
   TA    -1.9961390+01   EA   -1.6073624+01   MA   -1.2635565+01   SLR   2.4582201+05   PER    9.1272493+02   MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS     4.2979790+03 ECCS    7.6779865-01 INCS    1.4502725+02 RANS   -1.7382914+02 APFS   -1.4594569+02  RPS    9.9799655+02
  VHS    -4.5229751+02 RNMPS   4.9777859+01 APMPS   -1.2526033+02 INMPS   1.7292856+02 APOS    7.5979615+03 TFPS   6.9168186+01
  TAS    -2.4365927+00  EAS   -8.8319323-01  MAS    -2.0510551-01 SLRS    1.7642569+03 PERS    1.7701668+01 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   UX    -6.1613993-02   WY    5.6986552-01   WZ    -8.1942480-01    PX   8.7303121-01    PY   -3.6714210-01    PZ   -3.2097218-01
   QX    -4.8375633-01   QY   -7.3515979-01   QZ    -4.7488929-01   SXO   0.0000000       SYO   0.0000000       SZO   0.0000000

BODY ATTITUDE AND FORCES
 RRAT    -5.0711905-08 PRAT    4.5753142-07 YRAT    1.9662839-07   IGA   0.0000000     MGA   -6.4033023-07  OGA   0.0000000
  XIX     4.3694291-01  ETX   -3.1757855-02  ZTX   -8.9892843-01   ALO   0.0000000    ALLV   -1.7916225+02 ALLI   -1.3588123+02
  XIY     6.9900505-01  ETY    6.4095711-01  ZTY    3.1712179-01   BTO  -6.4033023-07  BTLV    5.3052551+00  BTLI   3.5590836+01
  XIZ     5.8610320-01  ETZ   -7.6691944-01  ZTZ    3.0226056-01   GMO   0.0000000     GMLV   -1.7933374+02  GMLI   8.2071870+01
  ALS     1.4780120+02  BTS   -3.2228548+01  ALF    9.2369366+01   BTE   1.7415981+02  ALM    8.9165809+01  BTM    1.7925638+02
 ALEI     9.2369366+01 BTEI    1.7415980+02

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****** CSM   / MOON  REF.  /PHASE   7- 14
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS.,  0 MINS.,  38.862 SECS. G.M.T.

T        .6916087954434420+002  HRS. FROM LAUNCH       2 DAYS, 21 HRS.,  9 MINS.,  39.166 SECS. G.E.T.     RAGR  .2431562755148070+003

          PHASE ELAPSED TIME      .2384365I+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ        .2572553913016318O+000       -.9977754385866433I-001       -.8873009952109857O-001
         RDXYZ      -.5634134059806374 3+000       -.8915659587864112 +000       -.5753201753442714 +000

GDH     THRUST **********
        **********
 THETA    -1.4964919+00 BETA    1.7460100+02 FUEL    8.4845947+03   TM    2.0500000+04 VELG    1.5197898+03 TACC    1.2181447+01
  BARC     9.4363841+00 DELV    1.4711198+03 MASS    5.4145287+04 MSFL    6.5265838+01 SPI     3.1410000+02 VEX     1.0105868+04
   VRX    -2.6108944+03 VRY   -4.1200689+03 VRZ    -2.4838085+03   VDX   6.6406146+02  VDY    1.0623408+03  VDZ    8.6035790+02
   TGO     0.0000000     FC    0.0000000   GMLP    0.0000000   GMLY    0.0000000   PLCHNG   9.4029386-01  TDELV   1.4711198+03

SELENOCENTRIC
    XL     8.8597047+02   YL   -3.4362722+02   ZL    -3.0558056+02   DXL   -3.2749558+03   DYL   -5.1824098+03   DZL   -3.3441664+03
    RL     9.6819978+02 DECL   -1.7826260+01  RAL    -2.1198984+01    VL    6.9832768+03 PTHL   -8.1199002-01   AZL   -1.2050684+02

SELENOGRAPHIC
    XS    -9.8151210+02   YS   -9.1051206+01   ZS    -1.5668485+02   DXS   -3.5346680+02   DYS    6.8930130+03   DZS   -1.1607055+03
  ALTS     5.9706263+01 LATS   -9.0309184+00 LONS    -1.7470059+02   VRS    6.9989858+03   PTR   -8.1016798-01   AZR   -9.9798577+01
   LTS    -1.5043674+00   LNS    1.2389550+02   LTE    3.1241284+00   LNE    7.7168227+00 DSMP    5.0275976+00 RSMP    1.1632770+02
   LIN     1.6668817+02   LAN    4.7500490+01   LAP    1.5402751+02   DR    -9.8963051+01   VT    6.9982861+03 SOLSV   2.8467927+01

GEOCENTRIC
     X     1.8681668+05    Y   -7.1782328+04    Z    -4.0655606+04   DX    -1.6784960+03   DY   -2.5186896+03   DZ   -1.9149914+03
     R     2.0422059+05  DEC   -1.1482984+01   RA    -2.1018742+01    V     3.5816669+03  PTH   -4.3059155+00   AZ   -1.2423684+02

GEOGRAPHIC
    XG    -2.0311503+04   YG    1.9909951+05   ZG    -4.0655603+04   DXG   9.1221697+04   DYG    8.6392711+03   DZG   -1.9150320+03
   ALT     2.0077712+05  LAT   -1.1484246+01  LON     9.5824981+01   VE    9.1649892+04   PTE   -1.6808859-01   AZE   -9.1255908+01

EARTH-MOON PLANE
   XMP    -9.9202394+02   YMP    5.1668070+01   ZMP   -9.8090315+01 DXMP    5.1052398+02 DYMP    6.9468448+03 DZMP   -4.9685930+02
   RMP     9.9819979+02  DEMP   -5.6393979+00 RAMP    1.7701852+02   VMP   6.9832768+03 PTMP   -8.1199027-01 AZMP   -9.4180717+01
   XME    -2.0422056+05   YME    5.1667780+01   ZME   -9.8090389+01 DXME    2.7005109+02 DYME    3.5367417+03 DZME   -4.9685930+02

PLANETARY COORDINATES
    XM     1.8593071+05    YM   -7.1438701+04    ZM    -4.0350025+04   DXM   1.5964598+03   DYM    2.6637202+03   DZM    1.4291750+03
    RM     2.0322854+05   DEM   -1.1451891+01   RAM    -2.1017881+01   LOM   9.5825441+01    VM    3.4185714+03  ARGM   -2.4627976+01
 XSUN     3.7169185+06  YSUN   -7.2808253+07  ZSUN    -3.1572507+07   RAS  -8.7077540+01   LOS    2.9766183+01   DES   -2.3416230+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA     2.5796244+05   ECC    1.5052956-01   INC    1.4412504+02   RAN   1.7529456+02   APF   -1.2591525+02   RP    1.9959365+05
   VH    -1.1815476+03 RNMP   -1.7981865+02 APMP   -1.4557675+02 INMP   1.7200118+02   APO    2.7033123+05  TFP    1.2508667+02
   TA    -3.4225482+01   EA   -2.9636520+01   MA   -2.5371636+01   SLR   2.2963838+05   PER    7.9353508+02   MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS     3.4220346+03 ECCS    7.0837289-01 INCS    1.4510521+02 RANS   -1.7374410+02 APFS   -1.4564906+02  RPS    9.9795807+02
  VHS    -5.7272232+02 RNMPS   5.0374428+01 APMPS   -1.2447981+02 INMPS   1.7298396+02 APOS    5.8461112+03 TFPS   6.9169123+01
  TAS    -1.9583025+00  EAS   -8.0916558-01  MAS    -2.3599366-01 SLRS    1.7048844+03 PERS    1.2576053+01 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   UX    -6.2338126-02   WY    5.6866462-01   WZ    -8.2020395-01    PX   8.7145239-01    PY   -3.6957490-01    PZ   -3.2246722-01
   QX    -4.8650249-01   QY   -7.3487069-01   QZ    -4.7252553-01   SXO   0.0000000       SYO   0.0000000       SZO   0.0000000

BODY ATTITUDE AND FORCES
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RRAT   -4.2096112-08 PRAT   -5.9117848-07 YRAT   -1.0680652-06 IGA     0.0000000    MGA    -1.4941039-06 OGA     0.0000000
XIX     4.3694294-01 ETX    -3.1757849-02 ZTX    -8.9892840-01 ALO     0.0000000    ALLV   -1.7849682+02 ALLI   -1.3588123+02
XIY     6.9900503-01 ETY     6.4095712-01 ZTY     3.1712181-01 BTO    -1.4941039-06 BTLV    5.3971531+00 BTLI    3.5590838+01
XIZ     5.6610319-01 ETZ    -7.6691943-01 ZTZ     3.0226058-01 GMO     0.0000000    GMLV   -1.7933557+02 GMLI    8.2071868+01
ALS     1.4780109+02 BTS    -3.2228449+01 ALE     9.2367673+01 BTE     1.7415976+02 ALM     8.8503505+01 RTM     1.7919432+02
ALEI    9.2367671+01 BTEI    1.7415974+02
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****** CSM   / MOON  REF.  /PHASE   7- 15
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS.,  0 MINS.,  48.862 SECS. G.M.T.

T         .6916365732208O1+002  HRS. FROM LAUNCH       2 DAYS, 21 HRS.,  9 MINS.,  49.166 SECS. G.E.T.    RAGR  .243198056255783+003

          PHASE ELAPSED TIME      .23844650+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .25569315656849555+000      -.10222978344460730+000      -.90308201093801767-001
        RDXYZ       -.56137021847152006+000      -.87400515959054373+000      -.56088132062108126+000

GD4     THRUST **********
        **********
THETA   -2.1475079+00 BETA     1.7450272+02 FUEL     9.1372558+03  TM      2.0500000+04 VELG     1.3972359+03 TACC     1.2330073+01
 BARC    1.0090314+01 DELV     1.5936743+03 MASS     5.3492626+04 MSFL    6.5265838+01 SPI      3.1410000+02 VEX      1.0105868+04
 VRX    -2.6525670+03 VRY     -4.1036590+03 VRZ    -2.4692578+03 VDX     6.1051238+02 VDY      9.7667500+02 VDZ      7.9097974+02
 TGO     0.0000000    FC       0.0000000    GMLP     0.0000000    GMLY    0.0000000    PLCHNG   1.0363274+00 TDELV    1.5936743+03

SELENOCENTRIC
   XL    8.8059024+02   YL    -3.5207257+02   ZL    -3.1101544+02  DXL   -3.2630794+03  DYL   -5.0803340+03  DZL   -3.2602376+03
   RL    9.9806055+02 DECL    -1.8156874+01   RAL   -2.1792237+01  VL     6.8619698+03 PTHL   -5.9236660-01  AZL   -1.2022729+02

SELENOGRAPHIC
   XS   -9.8214801+02   YS    -7.9799885+01   ZS    -1.5856250+02  DXS   -2.9773913+02  DYS    6.7791759+03  DZS   -1.1209975+03
 ALTS    5.9567010+01 LATS    -9.1413498+00 LONS    -1.7535490+02  VRS    6.8776819+03  PTR   -5.9101380-01  AZR   -9.9599265+01
  LTS   -1.5083683+00  LNS     1.2389407+02  LTE     3.1239677+00  LNE    7.7168751+00 DSMP    5.0275985+00 RSMP    1.1632621+02
  LIN    1.6675809+02  LAN     4.7787329+01  LAP     1.3875055+02  DR    -7.0942971+01  VT     6.8773159+03 SOLSV    2.9105211+01

GEOCENTRIC
    X    1.8681396+05    Y    -7.1786341+04    Z    -4.0658663+04  DX    -1.6667064+03  DY    -2.4165811+03  DZ    -1.8310440+03
    R    2.0422012+05  DEC    -1.1483886+01   RA    -2.1020094+01  V      3.4598406+03  PTH   -5.1511896+00  AZ    -1.2409339+02

GEOGRAPHIC
   XG   -2.0161503+04   YG     1.9911364+05   ZG    -4.0658659+04  DXG    9.1131242+04  DYG    8.5351098+03  DZG   -1.8310320+03
  ALT    2.0077664+05  LAT    -1.1485148+01   LON    9.5781849+01  VE     9.1548373+04  PTE   -1.9438774-01  AZE   -9.1208979+01

EARTH-MOON PLANE
  XMP   -9.9114767+02  YMP     6.3027512+01   ZMP   -9.8887297+01 DXMP    5.5239416+02 DYMP    6.8234215+03 DZMP   -4.7160290+02
  RMP    9.9806054+02 DEMP    -5.6861640+00 RAMP     1.7636143+02  VMP    6.8619697+03 PTMP   -5.9236696-01 AZMP   -9.4019733+01
  XME   -2.0422009+05  YME     6.3027462+01   ZME   -9.8887675+01 DXME    3.1192070+02 DYME    3.4133258+03 DZME   -4.7160295+02

PLANETARY COORDINATES
   XM    1.8593337+05   YM    -7.1434269+04   ZM    -4.0347648+04  DXM    1.5963729+03  DYM    2.6637529+03  DZM    1.4291935+03
   RM    2.0322894+05  DEM    -1.1451184+01   RAM   -2.1016417+01  LOM    9.5785527+01  VM     3.4185641+03 ARGM    -2.4626375+01
 XSUN    3.7170839+06 YSUN    -7.2808245+07 ZSUN    -3.1572504+07  RAS   -8.7077411+01  LOS    2.9724532+01  DES    -2.3416235+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    2.1615509+05   ECC     1.0528672-01   INC    1.4424731+02  RAN    1.7537016+02  APF   -9.6413648+01   RP    1.9339683+05
   VH   -1.3033795+03 RNMP    -1.7981694+02 APMP    -1.1613316+02 INMP    1.7213120+02  APO    2.3891335+05  TFP    1.7270279+02
   TA   -6.3664190+01   EA    -5.8370558+01   MA    -5.3234153+01  SLR    2.1375894+05  PER    7.0019123+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    2.8454033+03 ECCS     6.4928519-01 INCS     1.4518623+02 RANS   -1.7365301+02 APFS   -1.4541392+02  RPS    9.9792508+02
  VHS   -6.9455637+02 RNMPS    5.1014953+01 APMPS   -1.2364205+02 INMPS   1.7304028+02 APOS    4.6928814+03 TFPS    6.9170102+01
  TAS   -1.5047254+00  EAS    -6.9391466-01  MAS    -2.4337716-01 SLRS    1.6458629+03 PERS    9.5352805+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -6.3113818-02   WY     5.6741148-01   WZ    -8.2101209-01  PX    8.6974888-01  PY   -3.7217332-01  PZ   -3.2407390-01
   QX   -4.8944204-01   QY    -7.3452788-01   QZ    -4.7001622-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000

BODY ATTITUDE AND FORCES
 RRAT    8.8810198-08 PRAT     3.4087963-08 YRAT    -4.3292032-07 IGA     0.0000000    MGA    4.2688682-07 OGA     0.0000000
 XIX     4.3694294-01 ETX     -3.1757835-02 ZTX    -8.9892840-01 ALO     0.0000000    ALLV  -1.7784259+02 ALLI   -1.3588123+02
 XIY     6.9900505-01 ETY      6.4095713-01 ZTY     3.1712182-01 BTO     4.2688682-07 BTLV   5.4934054+00 BTLI    3.5590838+01
 XIZ     5.6610317-01 ETZ     -7.6691942-01 ZTZ     3.0226058-01 GMO     0.0000000    GMLV  -1.7933863+02 GMLI    8.2071867+01
 ALS     1.4780098+02 BTS     -3.2228347+01 ALE     9.2366071+01 BTE     1.7415971+02 ALM    8.7852489+01 RTM     1.7913220+02
 ALEI    9.2366070+01 BTEI     1.7415970+02
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****** CSM   / MOON  REF.  /PHASE   7- 16
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS.,  0 MINS.,  58.862 SECS. G.M.T.

T         .6916643509981 60+002  HRS. FROM LAUNCH       2 DAYS, 21 HRS.,  9 MINS.,  59.166 SECS. G.E.T.    RAGR  .243239836996760+003

          PHASE ELAPSED TIME      .23845650+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .25413681067247290+000      -.10463289669507527+000      -.91845929974148009-001
        RDXYZ       -.55917285291381724+000      -.85619454154849663+000      -.54625147718703220+000

GD4     THRUST **********
        **********
THETA   -2.7870339+00 BETA     1.7439901+02 FUEL     9.7899169+03  TM      2.0500000+04 VELG     1.2731773+03 TACC     1.2482370+01
 BARC    1.0732817+01 DELV     1.7177335+03 MASS     5.2839965+04 MSFL    6.5265838+01 SPI      3.1410000+02 VEX      1.0105868+04
 VRX    -2.6940009+03 VRY     -4.0868488+03 VRZ    -2.4544489+03 VDX     5.5630585+02 VDY      8.8995738+02 VDZ      7.2074971+02
 TGO     0.0000000    FC       0.0000000    GMLP     0.0000000    GMLY    0.0000000    PLCHNG   1.1370357+00 TDELV    1.7177335+03

SELENOCENTRIC
   XL    8.7523028+02   YL    -3.6034874+02   ZL    -3.1631128+02  DXL   -3.2503067+03  DYL   -4.9768062+03  DZL   -3.1751986+03
   RL    9.9796396+02 DECL    -1.8478971+01   RAL   -2.2377884+01  VL     6.7390637+03 PTHL   -4.0066876-01  AZL   -1.1994220+02

SELENOGRAPHIC
   XS   -9.8259204+02   YS    -6.8738112+01   ZS    -1.6037442+02  DXS   -2.4187435+02  DYS    6.6633630+03  DZS   -1.0808037+03
 ALTS    5.9470416+01 LATS    -9.2476231+00 LONS    -1.7599834+02  VRS    6.7547794+03  PTR   -3.9973687-01  AZR   -9.9395739+01
  LTS   -1.5083691+00  LNS     1.2389268+02  LTE     3.1238105+00  LNE    7.7169257+00 DSMP    5.0275994+00 RSMP    1.1632477+02
  LIN    1.6683028+02  LAN     4.8095155+01  LAP    -1.5536895+02  DR    -4.7125853+01  VT     6.7546150+03 SOLSV    2.9731394+01

GEOCENTRIC
    X    1.8681119+05    Y    -7.1790283+04    Z    -4.0661633+04  DX    -1.6540188+03  DY    -2.3130213+03  DZ    -1.7459869+03
    R    2.0421957+05  DEC    -1.1484768+01   RA    -2.1021430+01  V      3.3368122+03  PTH   -6.0601953+00  AZ    -1.2395294+02
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GEOGRAPHIC
  XG    -2.0011546+04  YG     1.9912760+05  ZG    -4.0661630+04  DXG   9.1038954+04  DYG    8.4312435+03  DZG   -1.7459913+03
  ALT    2.0077610+05  LAT   -1.1486030+01  LON    9.5738733+01  VE    9.1445207+04  PTE   -2.2069788-01  AZE   -9.1161270+01

EARTH-MOON PLANE
  XMP   -9.9020227+02  YMP    7.4181531+01  ZMP   -9.9642475+01  DXMP  5.9416404+02  DYMP   6.6979836+03  DZMP  -4.4605530+02
  RMP    9.9796394+02  DEMP  -5.7302891+00  RAMP   1.7571566+02  VMP   6.7390637+03  PTMP  -4.0066853-01  AZMP  -9.3854639+01
  XME   -2.0421953+05  YME    7.4181664+01  ZME   -9.9643084+01  DXME  3.5369013+02  DYME   3.2878950+03  DZME  -4.4605530+02

PLANETARY COORDINATES
  XM     1.8593597+05  YM    -7.1429935+04  ZM    -4.0345322+04  DXM   1.5962880+03  DYM    2.6637849+03  DZM    1.4292117+03
  RM     2.0322934+05  DEM   -1.1450492+01  RAM   -2.1014985+01  LOM   9.5745177+01  VM     3.4185569+03  ARGM  -2.4624810+01
 XSUN    3.7172453+06 YSUN   -7.2808238+07 ZSUN   -3.1572501+07  RAS  -8.7077284+01  LOS    2.9682878+01  DES   -2.3416232+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA     2.0051047+05  ECC    1.0716383-01  INC    1.4437907+02  RAN   1.7545217+02  APF   -5.4065527+01  RP     1.7902301+05
  VH     -1.4264143+03 RNMP   -1.7981482+02 APMP   -7.3848001+01 INMP  1.7227139+02  APO    2.2199794+05  TFP    2.3232158+02
  TA     -1.0594412+02  EA    -9.9940007+01  MA    -9.3892139+01  SLR   1.9820778+05  PER    6.2556732+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS     2.4372274+03 ECCS    5.9056005-01 INCS    1.4527053+02 RANS  -1.7355538+02 APFS  -1.4511678+02  RPS    9.9789825+02
 VHS     -8.1782817+02 RNMPS   5.1703478+01 APMPS  -1.2274006+02 INMPS  1.7309747+02 APOS   3.8765565+03  TFPS   6.9171141+01
 TAS     -1.0791364+00  EAS   -5.4752743-01  MAS   -2.2418452-01 SLRS  1.5872170+03 PERS   7.5589559+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
  WX     -6.3944936-02  WY     5.6610227-01  WZ    -8.2185113-01  PX    8.6789215-01  PY   -3.7497623-01  PZ   -3.2581594-01
  QX     -4.9261978-01  QY    -7.3411241-01  QZ    -4.6733788-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000

BODY ATTITUDE AND FORCES
 RRAT    -4.2178892-08 PRAT   -3.7477197-08 YRAT    3.3698516-07 IGA   0.0000000     MGA   -1.0672170-06 OGA   -6.9941136-03
 XIX      4.3694292-01 ETX    -3.1757805-02 ZTX    -8.9892843-01 ALO   0.0000000     ALLV  -1.7719961+02 ALLI  -1.3588123+02
 XIY      6.9900505-01 ETY     6.4095719-01 ZTY     3.1712179-01 BTO  -1.0672170-06  BTLV   5.5943350+00 BTLI   3.5590837+01
 XIZ      5.6610321-01 ETZ    -7.6691937-01 ZTZ     3.0226057-01 GMO  -6.9941136-03  GMLV  -1.7934290+02 GMLI   8.2071865+01
 ALS      1.4780088+02 BTS    -3.2228255+01 ALE     9.2364490+01 BTE   1.7415966+02  ALM    8.7212963+01 BTM    1.7907002+02
 ALEI     9.2364492+01 BTEI    1.7415965+02
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****** CSM    / MOON  REF.  /PHASE    7- 17
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS.,  1 MINS.,  8.862 SECS. G.M.T.

T        .6916921287755194+002  HRS. FROM LAUNCH       2 DAYS, 21 HRS.,  10 MINS.,  9.166 SECS. G.E.T.     RAGR  .2432816177377374+003

          PHASE ELAPSED TIME      .2384665O+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ        .2525867867250167+000      -.1069861858030007?+000      -.9334275257527778?-001
         RDXYZ      -.5568178027058359?+000      -.8381312923016339?+000      -.5314284145092?8?4+000

GD4     THRUST **********
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THETA    -3.4148717+00 BETA    1.7428953+02 FUEL    1.0442578+04  TM    2.0500000+04 VELG   1.1475769+03 TACC   1.2638476+01
 BARC     1.1363680+01 DELV    1.8433344+03 MASS    5.2187303+04 MSFL  6.5265838+01 SPI    3.1410000+02 VEX    1.0105868+04
 VRX     -2.7351920+03 VRY    -4.0696477+03 VRZ    -2.4393895+03 VDX   5.0142562+02 VDY    8.0216210+02 VDZ    6.4964694+02
 TGO      0.0000000    FC      0.0000000    GMLP    0.0000000    GMLY  0.0000000    PLCHNG 1.2427808+00 TDELV  1.8433344+03

SELENOCENTRIC
   XL     8.6989211+02  YL    -3.6845331+02  ZL    -3.2146624+02  DXL  -3.2366175+03  DYL   -4.8718099+03  DZL   -3.0890365+03
   RL     9.9790312+02 DECL    -1.8792497+01  RAL   -2.2955573+01  VL    6.6145574+03 PTHL   -2.3829710-01  AZL   -1.1965145+02

SELENOGRAPHIC
   XS    -9.8294409+02  YS    -5.7868037+01  ZS    -1.6211977+02  DXS  -1.8587171+02  DYS    6.5455467+03  DZS   -1.0401183+03
  ALTS    5.9409590+01 LATS    -9.3497379+00 LONS   -1.7663076+02  VRS   6.6302771+03 PTR    -2.3773260-01  AZR   -9.9187782+01
  LTS    -1.5083702+00  LNS    1.2389126+02  LTE    3.1236500+00  LNE   7.7169777+00 DSMP   5.0276004+00 RSMP   1.1632328+02
  LIN     1.6690487+02  LAN    4.8425782+01  LAP   -1.6385708+02  DR   -2.7510378+01  VT    6.6302200+03 SOLSV  3.0346306+01

GEOCENTRIC
     X     1.8680851+05    Y   -7.1793957+04    Z   -4.0664410+04  DX   -1.6404164+03  DY   -2.2079922+03  DZ   -1.6598062+03
     R     2.0421896+05  DEC   -1.1485598+01   RA   -2.1022689+01   V    3.2126550+03 PTH   -7.0414921+00  AZ   -1.2380087+02

GEOGRAPHIC
  XG     -1.9861838+04  YG     1.9914140+05  ZG    -4.0664409+04  DXG   9.0944817+04  DYG    8.3277932+03  DZG   -1.6597986+03
  ALT     2.0077548+05  LAT   -1.1486861+01  LON    9.5695693+01  VE    9.1340392+04  PTE   -2.4701896-01  AZE   -9.1112706+01

EARTH-MOON PLANE
  XMP    -9.8918790+02  YMP    8.5127989+01  ZMP   -1.0035536+02  DXMP  6.3583166+02  DYMP   6.5705030+03  DZMP  -4.2021267+02
  RMP     9.9790313+02 DEMP   -5.7717778+00 RAMP    1.7508133+02  VMP   6.6145574+03 PTMP   -2.3829735-01  AZMP  -9.3685111+01
  XME    -2.0421892+05  YME    8.5127103+01  ZME   -1.0035621+02  DXME  3.9535724+02  DYME   3.1604218+03  DZME  -4.2021263+02

PLANETARY COORDINATES
   XM     1.8593862+05  YM    -7.1425504+04  ZM    -4.0342944+04  DXM   1.5962011+03  DYM    2.6638177+03  DZM    1.4292303+03
   RM     2.0322973+05  DEM   -1.1449785+01  RAM   -2.1013522+01  LOM   9.5704859+01  VM     3.4185496+03  ARGM  -2.4623211+01
 XSUN     3.7174101+06 YSUN   -7.2808231+07 ZSUN   -3.1572497+07  RAS  -8.7077153+01  LOS    2.9641227+01  DES   -2.3416229+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA     1.8732553+05  ECC    1.5178423-01  INC    1.4452171+02  RAN   1.7554160+02  APF   -2.6760551+01  RP     1.5889247+05
  VH     -1.5505785+03 RNMP   -1.7981221+02 APMP   -4.8611623+01 INMP  1.7242321+02  APO    2.1575859+05  TFP    2.5661342+02
  TA     -1.3317484+02  EA    -1.2645188+02  MA    -1.1945672+02  SLR   1.8300983+05 PER    5.6489004+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS     2.1332353+03 ECCS    5.3222307-01 INCS    1.4535832+02 RANS  -1.7345067+02 APFS  -1.4479286+02  RPS    9.9787820+02
 VHS     -9.4256473+02 RNMPS   5.2444349+01 APMPS  -1.2176509+02 INMPS  1.7315547+02 APOS   3.2685923+03  TFPS   6.9172261+01
 TAS     -6.8603954-01  EAS   -3.7906273-01  MAS   -1.7731827-01 SLRS  1.5289720+03 PERS   6.1897897+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
  WX     -6.4835721-02  WY     5.6473269-01  WZ    -8.2272314-01  PX    8.6584209-01  PY   -3.7803824-01  PZ   -3.2772634-01
  QX     -4.9609859-01  QY    -7.3359668-01  QZ    -4.6445894-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000

BODY ATTITUDE AND FORCES
 RRAT    -1.8181427-08 PRAT   -2.4981004-07 YRAT   -1.3059432-06 IGA   0.0000000     MGA   -4.2688682-07 OGA   0.0000000
 XIX      4.3694293-01 ETX    -3.1757767-02 ZTX    -8.9892843-01 ALO   0.0000000     ALLV  -1.7656812+02 ALLI  -1.3588123+02
 XIY      6.9900506-01 ETY     6.4095720-01 ZTY     3.1712183-01 BTO  -4.2688682-07  BTLV   5.7002850+00 BTLI   3.5590838+01
 XIZ      5.6610319-01 ETZ    -7.6691937-01 ZTZ     3.0226056-01 GMO   0.0000000    GMLV  -1.7934877+02 GMLI   8.2071862+01
 ALS      1.4780077+02 BTS    -3.2228152+01 ALE     9.2363007+01 BTE   1.7415961+02  ALM    8.6585127+01 BTM    1.7900776+02
 ALEI     9.2363007+01 BTEI    1.7415959+02
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****** CSM    / MOON  REF.  /PHASE    7- 18
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS.,  1 MINS.,  18.862 SECS. G.M.T.
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T .691719906552878+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 10 MINS., 19.166 SECS. G.E.T. RAGR .2433233984787l4+003

PHASE ELAPSED TIME .23847650+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	.25104352767142181+000	-.10928894489180700+000	-.94798128893958702-001
RDXYZ	-.55430162972009129+000	-.81981241061318445+000	-.51640974077921663+000

GD4 THRUST **********

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THETA	-4.0308437+00	BETA	1.7417388+02	FUEL	1.1095239+04	TM	2.0500000+04	VELG	1.0203958+03	TACC	1.2798536+01
BARC	1.1982737+01	DELV	1.9705161+03	MASS	5.1534642+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04
VRX	-2.7761370+03	VRY	-4.0520658+03	VRZ	-2.4240880+03	VDX	4.4585475+02	VDY	7.1326185+02	VDZ	5.7764935+02
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	1.3539619+00	TDELV	1.9705161+03

SELENOCENTRIC

XL	8.6457722+02	YL	-3.7638386+02	ZL	-3.2647845+02	DXL	-3.2219917+03	DYL	-4.7653276+03	DZL	-3.0017374+03
RL	9.9787109+02	DECL	-1.9097396+01	RAL	-2.3525352+01	VL	6.4884517+03	PTHL	-1.0677246-01	AZL	-1.1935491+02

SELENOGRAPHIC

XS	-9.8320380+02	YS	-4.7194081+01	ZS	-1.6379776+02	DXS	-1.2974521+02	DYS	6.4256985+03	DZS	-9.9893468+02
ALTS	5.9377567+01	LATS	-9.4476982+00	LONS	-1.7725189+02	VRS	6.5041760+03	PTR	-1.0651437-01	AZR	-9.8975090+01
LTS	-1.5083711+00	LNS	1.2388986+02	LTE	3.1234930+00	LNE	7.7170292+00	DSMP	5.0276019+00	RSMP	1.1632184+02
LIN	1.6698197+02	LAN	4.8781389+01	LAP	-1.3971759+02	DR	-1.2091428+01	VT	6.5041646+03	SOLSV	3.0949777+01

GEOCENTRIC

X	1.8680579+05	Y	-7.1797553+04	Z	-4.0667097+04	DX	-1.6258756+03	DY	-2.1014779+03	DZ	-1.5724889+03
R	2.0421828+05	DEC	-1.1486406+01	RA	-2.1023928+01	V	3.0874588+03	PTH	-8.1048689+00	AZ	-1.2363536+02

GEOGRAPHIC

XG	-1.9712187+04	YG	1.9915502+05	ZG	-4.0667094+04	DXG	9.0848801+04	DYG	8.2246719+03	DZG	-1.5725370+03
ALT	2.0077480+05	LAT	-1.1487668+01	LON	9.5652673+01	VE	9.1233892+04	PTE	-2.7334169-01	AZE	-9.1063374+01

EARTH-MOON PLANE

XMP	-9.8810475+02	YMP	9.5862334+01	ZMP	-1.0102547+02	DXMP	6.7737916+02	DYMP	6.4409526+03	DZMP	-3.9407086+02
RMP	9.9787109+02	DEMP	-5.8106371+00	RAMP	1.7445870+02	VMP	6.4884516+03	PTMP	-1.0677196-01	AZMP	-9.3510858+01
XME	-2.0421823+05	YME	9.5863160+01	ZME	-1.0102581+02	DXME	4.3690427+02	DYME	3.0308786+03	DZME	-3.9407096+02

PLANETARY COORDINATES

XM	1.8594121+05	YM	-7.1421169+04	ZM	-4.0340618+04	DXM	1.5961161+03	DYM	2.6638497+03	DZM	1.4292495+03
RM	2.0323012+05	DEM	-1.1449095+01	RAM	-2.1012090+01	LOM	9.5664512+01	VM	3.4185425+03	ARGM	-2.4621644+01
XSUN	3.7175717+06	YSUN	-7.2808223+07	ZSUN	-3.1572494+07	RAS	-8.7077027+01	LOS	2.9599573+01	DES	-2.3416227+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	1.7609366+05	ECC	2.1184522-01	INC	1.4467690+02	RAN	1.7563967+02	APF	-1.3470666+01	RP	1.3878906+05
VH	-1.6757827+03	RNMP	-1.7980900+02	APMP	-3.3396945+01	INMP	1.7258847+02	APO	2.1339826+05	TFP	2.5645978+02
TA	-1.4638332+02	EA	-1.3893094+02	MA	-1.3095676+02	SLR	1.6819084+05	PER	5.1485393+02	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	1.8981693+03	ECCS	4.7430100-01	INCS	1.4544987+02	RANS	-1.7333827+02	APFS	-1.4443538+02	RPS	9.9786573+02
VHS	-1.0687917+03	RNMPS	5.3242558+01	APMPS	-1.2070603+02	INMPS	1.7321418+02	APOS	2.7984729+03	TFPS	6.9173493+01
TAS	-3.3188915-01	EAS	-1.9818432-01	MAS	-1.0418549-01	SLRS	1.4711543+03	PERS	5.1954141+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-6.5790854-02	WY	5.6329802-01	WZ	-8.2363033-01	PX	8.6354011-01	PY	-3.8143881-01	PZ	-3.2985279-01
QX	-4.9996999-01	QY	-7.3293911-01	QZ	-4.6133525-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

BODY ATTITUDE AND FORCES

RRAT	5.6507006-09	PRAT	6.4525961-07	YRAT	-1.3877071-07	IGA	0.0000000	MGA	1.0672170-06	OGA	0.0000000
XIX	4.3694291-01	ETX	-3.1757726-02	ZTX	-8.9892843-01	ALO	0.0000000	ALLV	-1.7594830+02	ALLI	-1.3588124+02
XIY	6.9900507-01	ETY	6.4095719-01	ZTY	3.1712183-01	BTO	1.0672170-06	BTLV	5.8116400+00	BTLI	3.5590836+01
XIZ	5.6610318-01	ETZ	-7.6691937-01	ZTZ	3.0226050-01	GMO	0.0000000	GMLV	-1.7935611+02	GMLI	8.2071859+01
ALS	1.4780067+02	BTS	-3.2228053+01	ALE	9.2361546+01	BTE	1.7415955+02	ALM	8.5969154+01	BTM	1.7894541+02
ALEI	9.2361548+01	BTEI	1.7415953+02								

****** CSM / MOON REF. /PHASE 7- 19

MEAN-OF-EPOCH 1969 24 DEC. 1968, 10 HRS., 1 MINS., 28.862 SECS. G.M.T.

T .691747684330237+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 10 MINS., 29.166 SECS. G.E.T. RAGR .2433651792l9690+003

PHASE ELAPSED TIME .23848651+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	.24950748564008779+000	-.11154045947083059+000	-.96211512046198654-001
RDXYZ	-.55162095341290752+000	-.80123469305670369+000	-.50119289192051741+000

GD4 THRUST **********

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THETA	-4.6347690+00	BETA	1.7405164+02	FUEL	1.1747900+04	TM	2.0500000+04	VELG	8.9159372+02	TACC	1.2962702+01
BARC	1.2589795+01	DELV	2.0993187+03	MASS	5.0881981+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04
VRX	-2.8168342+03	VRY	-4.0341122+03	VRZ	-2.4085523+03	VDX	3.8957558+02	VDY	6.2322853+02	VDZ	5.0473465+02
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	1.4710204+00	TDELV	2.0993187+03

SELENOCENTRIC

XL	8.5928720+02	YL	-3.8413793+02	ZL	-3.3134605+02	DXL	-3.2064098+03	DYL	-4.6573408+03	DZL	-2.9132863+03
RL	9.9786102+02	DECL	-1.9393632+01	RAL	-2.4086674+01	VL	6.3607487+03	PTHL	-7.7606995-03	AZL	-1.1905235+02

SELENOGRAPHIC

XS	-9.8337109+02	YS	-3.6718505+01	ZS	-1.6540755+02	DXS	-7.3492312+01	DYS	6.3037885+03	DZS	-9.5724617+02
ALTS	5.9367497+01	LATS	-9.5415103+00	LONS	-1.7786160+02	VRS	6.3764779+03	PTR	-7.7416401-03	AZR	-9.8757349+01
LTS	-1.5083725+00	LNS	1.2388844+02	LTE	3.1233325+00	LNE	7.7170812+00	DSMP	5.0276028+00	RSMP	1.1632035+02
LIN	1.6706172+02	LAN	4.9164275+01	LAP	-2.6538383+01	DR	-8.6157116-01	VT	6.3764777+03	SOLSV	3.1541654+01

GEOCENTRIC

X	1.8680315+05	Y	-7.1800876+04	Z	-4.0669587+04	DX	-1.6103805+03	DY	-1.9934583+03	DZ	-1.4840193+03
R	2.0421753+05	DEC	-1.1487162+01	RA	-2.1025087+01	V	2.9613366+03	PTH	-9.2622375+00	AZ	-1.2345425+02

GEOGRAPHIC

XG	-1.9562809+04	YG	1.9916847+05	ZG	-4.0669588+04	DXG	9.0750887+04	DYG	8.1220160+03	DZG	-1.4840373+03
ALT	2.0077406+05	LAT	-1.1488425+01	LON	9.5609734+01	VE	9.1125701+04	PTE	-2.9966704-01	AZE	-9.1013137+01

EARTH-MOON PLANE

XMP	-9.8695301+02	YMP	1.0638229+02	ZMP	-1.0165230+02	DXMP	7.1880598+02	DYMP	6.3093022+03	DZMP	-3.6762564+02
RMP	9.9786101+02	DEMP	-5.8468754+00	RAMP	1.7384791+02	VMP	6.3607487+03	PTMP	-7.7607523-03	AZMP	-9.3331450+01
XME	-2.0421748+05	YME	1.0638224+02	ZME	-1.0165190+02	DXME	4.7833052+02	DYME	2.8992354+03	DZME	-3.6762565+02

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PLANETARY COORDINATES
   XM    1.8594387+05   YM   -7.1416739+04   ZM   -4.0338241+04  DXM    1.5960293+03  DYM    2.6638824+03  DZM    1.4292670+03
   RM    2.0323052+05  DEM   -1.1448388+01  RAM   -2.1010625+01  LOM    9.5624194+01   VM    3.4185352+03  ARGM   -2.4620046+01
 XSUN    3.7177368+06 YSUN   -7.2808216+07 ZSUN   -3.1572490+07  RAS   -8.7076897+01  LOS    2.9557923+01  DES    -2.3416225+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.6644111+05  ECC    2.7583493-01  INC    1.4484666+02  RAN    1.7574787+02  APF   -6.2000355+00  RP     1.2053084+05
   VH   -1.8019136+03 RNMP   -1.7980506+02 APMP   -2.6209201+01 INMP    1.7276935+02  APO    2.1235138+05  TFP    2.4841395+02
   TA   -1.5356420+02   EA   -1.4536925+02   MA   -1.3638797+02  SLR    1.5377744+05  PER    4.7310699+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    1.7110743+03 ECCS    4.1682192-01 INCS    1.4554544+02 RANS   -1.7321752+02 APFS   -1.4403426+02  RPS    9.9786101+02
  VHS   -1.1965328+03 RNMPS   5.4103500+01 APMPS  -1.1954786+02 INMPS   1.7327348+02 APOS   2.4242874+03 TFPS   6.9174889+01
  TAS   -2.6378994-02  EAS   -1.6923927-02  MAS   -9.8696636-03 SLRS    1.4137913+03 PERS   4.4465279+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -6.6815524-02   WY    5.6179304-01   WZ   -8.2457521-01   PX    8.6089700-01   PY   -3.8529842-01   PZ   -3.3226716-01
   QX   -5.0437290-01   QY   -7.3207492-01   QZ   -4.5790203-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

BODY ATTITUDE AND FORCES
 RRAT   -8.9323301-09 PRAT    2.6629994-07 YRAT   -1.3749826-08  IGA   -6.9941136-03 MGA    1.4941039-06 OGA    0.0000000
  XIX    4.3694292-01  ETX   -3.1757692-02  ZTX   -8.9892843-01  ALO   -6.9941136-03 ALLV   -1.7534025+02 ALLI   -1.3588124+02
  XIY    6.9900507-01  ETY    6.4095718-01  ZTY    3.1712187-01  BTO    1.4941039-06 BTLV   5.9288287+00 BTLI    3.5590838+01
  XIZ    5.6610317-01  ETZ   -7.6691940-01  ZTZ    3.0226048-01  GMO    0.0000000     GMLV   -1.7936514+02 GMLI    8.2071857+01
  ALS    1.4780056+02  BTS   -3.2227947+01  ALE    9.2360185+01  BTE    1.7415950+02  ALM    8.5365228+01  RTM    1.7888297+02
 ALEI    9.2360185+01 BTEI    1.7415948+02

****** CSM    / MOON  REF.  /PHASE    7- 20
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS.,  1 MINS., 38.862 SECS. G.M.T.

T         .691775462107596+002  HRS. FROM LAUNCH        2 DAYS, 21 HRS., 10 MINS., 39.166 SECS. G.E.T.     RAGR  .2434069599606 67+003

           PHASE ELAPSED TIME      .2384965O+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ        .2479791222684939 7+000      -.1137400058510 5710+000      -.9758234777429538O-001
        RDXYZ       -.5487724431694922 4+000      -.7823947178665567 2+000      -.4857751209392618 8+000

GD4     THRUST **********
        **********
THETA    -5.2264820+00 BETA     1.7392231+02 FUEL     1.2400561+04  TM     2.0500000+04 VELG     7.6112898+02 TACC     1.3131175+01
 RARC     1.3184706+01 DELV     2.2297842+03 MASS     5.0229320+04 MSFL     5.2565838+01 SPI      3.1410000+02 VEX      1.0105868+04
  VRX    -2.8572823+03 VRY    -4.0157966+03 VRZ    -2.3927899+03 VDX     3.3256991+02 VDY      5.3203300+02 VDZ      4.3087755+02
  TGO     0.0000000    FC     0.0000000    GMLP     0.0000000    GMLY     0.0000000    PLCHNG   1.5944460+00 TDELV    2.2297842+03

SELENOCENTRIC
   XL     8.5402361+02   YL    -3.9171302+02   ZL    -3.3606712+02  DXL    -3.1898522+03  DYL    -4.5478296+03  DZL    -2.8236675+03
   RL     9.9786597+02 DECL    -1.9681170+01  RAL    -2.4639392+01   VL     6.2314532+03 PTHL     5.6913903-02  AZL    -1.1874355+02

SELENOGRAPHIC
   XS    -9.8344565+02   YS    -2.6445854+01   ZS    -1.6694831+02  DXS    -1.7124578+01  DYS    6.1797857+03  DZS    -9.1504534+02
 ALTS     5.9372449+01 LATS    -9.6311834+00 LONS    -1.7845963+02  VRS    6.2471475+03  PTR    5.6770024-02  AZR    -9.8534165+01
  LTS    -1.5083733+00  LNS     1.2388705+02  LTE     3.1231757+00  LNE    7.7171323+00  PSMP   5.0276043+00  RSMP   1.1631820+02
  LIN     1.6714423+02  LAN     4.9577180+01  LAP    -2.3463088+01   DR    6.1898611+00   VT    6.2471844+03  SOLSV  3.2121785+01

GEOCENTRIC
    X     1.8680049+05    Y    -7.1804115+04    Z    -4.0671983+04   DX   -1.5939078+03   DY   -1.8839151+03   DZ   -1.3943821+03
    R     2.0421670+05  DEC    -1.1487895+01   RA    -2.1026226+01    V    2.8344277+03  PTH    -1.0527470+01  AZ    -1.2325484+02

GEOGRAPHIC
   XG    -1.9413476+04   YG     1.9918175+05   ZG    -4.0671981+04  DXG    9.0651043+04  DYG    8.0197153+03  DZG    -1.3944069+03
  ALT     2.0077323+05  LAT    -1.1489157+01  LON     9.5566814+01   VE    9.1015780+04  PTE    -3.2598708-01  AZE    -9.0962059+01

EARTH-MOON PLANE
  XMP    -9.8573297+02   YMP    1.1668320+02   ZMP    -1.0223576+02 DXMP    7.6009650+02  DYMP   6.1755217+03  DZMP   -3.4087219+02
  RMP     9.9786597+02  DEMP   -5.8805003+00  RAMP    1.7324919+02   VMP    6.2314531+03 PTMP    5.6913682-02  AZMP   -9.3146483+01
  XME    -2.0421664+05   YME    1.1668374+02   ZME    -1.0223570+02 DXME    5.1962053+02  DYME   2.7654621+03  DZME   -3.4087218+02

PLANETARY COORDINATES
   XM     1.8594646+05   YM    -7.1412402+04   ZM    -4.0335916+04  DXM    1.5959443+03  DYM    2.6639145+03  DZM    1.4292852+03
   RM     2.0323092+05  DEM    -1.1447697+01  RAM    -2.1009194+01  LOM    9.5583845+01   VM    3.4185281+03  ARGM   -2.4618481+01
 XSUN     3.7178982+06 YSUN    -7.2808208+07 ZSUN    -3.1572487+07  RAS   -8.7076770+01  LOS    2.9516269+01  DES    -2.3416222+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA     1.5808620+05  ECC     3.4013251-01  INC     1.4503349+02  RAN    1.7586809+02  APF   -1.6278205+00  RP     1.0431594+05
   VH    -1.9288322+03 RNMP    -1.7980018+02 APMP    -2.1729000+01 INMP    1.7296853+02  APO    2.1185645+05  TFP    2.3835535+02
   TA    -1.5803668+02   EA    -1.4908370+02   MA    -1.3907097+02  SLR    1.3979717+05  PER    4.3793473+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS     1.5587134+03 ECCS     3.5981552-01 INCS     1.4564535+02 RANS   -1.7308766+02 APFS   -1.4357360+02  RPS    9.9786414+02
  VHS    -1.3258097+03 RNMPS    5.5033347+01 APMPS   -1.1826928+02 INMPS   1.7333323+02 APOS   2.1195626+03 TFPS   6.9176531+01
  TAS     2.1508847-01  EAS     1.4758082-01  MAS     9.4479007-02 SLRS    1.3569111+03 PERS   3.8660471+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX    -6.7915468-02   WY    5.6021195-01   WZ    -8.2556046-01   PX    8.5776880-01   PY   -3.8980969-01   PZ   -3.3508366-01
   QX    -5.0952933-01   QY   -7.3089736-01   QZ    -4.5405822-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

BODY ATTITUDE AND FORCES
 RRAT     2.2688963-08 PRAT    -1.6019063-07 YRAT     6.1029287-07  IGA   -6.9941136-03 MGA    -1.7075473-06 OGA    -6.9941136-03
  XIX     4.3694292-01  ETX    -3.1757650-02  ZTX    -8.9892842-01  ALO   -6.9941136-03 ALLV   -1.7474413+02 ALLI   -1.3588123+02
  XIY     6.9900504-01  ETY     6.4095716-01  ZTY     3.1712189-01  BTO   -1.7075473-06 BTLV    6.0523234+00 BTLI    3.5590836+01
  XIZ     5.6610321-01  ETZ    -7.6691940-01  ZTZ     3.0226045-01  GMO   -6.9941136-03 GMLV   -1.7937582+02 GMLI    8.2071854+01
  ALS     1.4780045+02  BTS    -3.2227845+01  ALE     9.2358850+01  BTE    1.7415944+02  ALM    8.4773515+01  RTM    1.7882042+02
 ALEI     9.2358851+01 BTEI     1.7415942+02

****** CSM    / MOON  REF.  /PHASE    7- 21
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS.,  1 MINS., 48.862 SECS. G.M.T.

T         .691803239884955+002  HRS. FROM LAUNCH        2 DAYS, 21 HRS., 10 MINS., 49.166 SECS. G.E.T.     RAGR  .2434487407016 44+003

           PHASE ELAPSED TIME      .23850650+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ        .2464589083404329 3+000      -.1158868505189067 6+000      -.9891007392059382 4-001
        RDXYZ       -.5457528082142578 6+000      -.7632888299010627 0+000      -.4701534857503167 7+000
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GD4     THRUST **********
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THETA   -5.8058187+00 BETA     1.7378536+02 FUEL     1.3053223+04  TM      2.0500000+04 VELG     6.2895760+02 TACC     1.3304002+01
 BARC    1.3767310+01 DELV     2.3619559+03 MASS     4.9576659+04 MSFL    6.5265838+01 SPI      3.1410000+02 VEX      1.0105868+04
 VRX    -2.8974814+03 VRY     -3.9971282+03 VRZ     -2.3768085+03 VDX     2.7481857+02 VDY      4.3964455+02 VDZ      3.5605490+02
 TGO     0.0000000    FC       0.0000000   GMLP     0.0000000    GMLY    0.0000000   PLCHNG    1.7247833+00 TDELV    2.3619559+03

SELENOCENTRIC
   XL    8.4878809+02  YL    -3.9910661+02  ZL    -3.4063972+02  DXL   -3.1722999+03  DYL   -4.4367727+03  DZL   -2.7328634+03
   RL    9.9787911+02 DECL    -1.9959980+01  RAL   -2.5183266+01  VL     6.1005721+03 PTHL     8.5240277-02  AZL   -1.1842820+02

SELENOGRAPHIC
   XS   -9.8342738+02  YS    -1.6378444+01  ZS    -1.6841920+02  DXS    3.9362329+01  DYS    6.0536581+03  DZS   -8.7232435+02
 ALTS    5.9385586+01 LATS    -9.7167280+00 LONS    -1.7904586+02  VRS    6.1163121+03  PTR    8.5020547-02  AZR   -9.8305110+01
  LTS   -1.5083751+00  LNS     1.2388562+02  LTE    3.1230148+00  LNE    7.7171843+00  DSMP   5.0276049+00  RSMP   1.1631742+02
  LIN    1.6722966+02  LAN     5.0023044+01  LAP    7.3201576+01  OR     9.0759216+00  VT     6.1163054+03  SOLSV  3.2690030+01

GEOCENTRIC
    X    1.8679791+05   Y     -7.1807077+04   Z    -4.0674176+04  DX    -1.5764425+03  DY    -1.7728254+03  DZ    -1.3035596+03
    R    2.0421582+05  DEC    -1.1488572+01  RA    -2.1027283+01   V     2.7069075+03  PTH   -1.1917503+01  AZ    -1.2303382+02

GEOGRAPHIC
   XG   -1.9264416+04  YG     1.9919487+05  ZG    -4.0674172+04  DXG    9.0549249+04  DYG    7.9179015+03  DZG   -1.3035198+03
  ALT    2.0077235+05  LAT    -1.1489835+01  LON    9.5523975+01  VE     9.0904122+04  PTE   -3.5230352-01  AZE   -9.0910108+01

EARTH-MOON PLANE
  XMP   -9.8444471+02  YMP    1.2676274+02  ZMP    -1.0277413+02 DXMP    8.0125158+02 DYMP    6.0395782+03 DZMP   -3.1380551+02
  RMP    9.9787909+02 DEMP    -5.9115224+00 RAMP    1.7266264+02  VMP    6.1005723+03 PTMP    8.5240302-02 AZMP   -9.2955469+01
  XME   -2.0421576+05 YME     1.2676230+02 ZME     -1.0277475+02 DXME    5.6077513+02 DYME    2.6295258+03 DZME   -3.1380551+02

PLANETARY COORDINATES
   XM    1.8594912+05  YM    -7.1407971+04   ZM    -4.0333537+04  DXM    1.5958574+03  DYM    2.6639473+03  DZM    1.4293038+03
   RM    2.0323132+05  DEM    -1.1446990+01  RAM    -2.1007729+01  LOM    9.5543529+01  VM     3.4185208+03 ARGM    -2.4616879+01
 XSUN    3.7180636+06 YSUN    -7.2808201+07 ZSUN    -3.1572484+07  RAS   -8.7076639+01  LOS    2.9474618+01  DES   -2.3416221+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.5081315+05  ECC     4.0333886-01  INC    1.4524046+02  RAN    1.7600268+02  APF    1.5685958+00  RP     8.9984348+04
   VH   -2.0563625+03 RNMP    -1.7979413+02 APMP    -1.8635424+01 INMP    1.7318933+02  APO    2.1164195+05  TFP    2.2824219+02
   TA   -1.6112142+02  EA     -1.5139217+02  MA    -1.4032701+02  SLR    1.2627852+05  PER    4.0806305+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    1.4323148+03 ECCS     3.0331354-01 INCS    1.4574992+02 RANS   -1.7294786+02 APFS   -1.4302661+02  RPS    9.9787438+02
  VHS   -1.4566408+03 RNMPS    5.6038827+01 APMPS   -1.1683744+02 INMPS   1.7339319+02 APOS    1.8667553+03 TFPS    6.9178558+01
  TAS    3.6626974-01  EAS     2.6779091-01  MAS    1.8656659-01 SLRS    1.3005431+03 PERS    3.4054577+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -6.9097065-02  WY     5.5854826-01  WZ    -8.2658905-01  PX     8.5390693-01  PY    -3.9530136-01  PZ    -3.3849631-01
   QX   -5.1581829-01  QY    -7.2921921-01  QZ    -4.4963406-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

BODY ATTITUDE AND FORCES
 RRAT    5.5131623-11 PRAT    -3.6913405-07 YRAT    -9.3670033-07 IGA    0.0000000     MGA   -4.2688682-07  OGA    0.0000000
  XIX    4.3694293-01  ETX    -3.1757668-02  ZTX    -8.9892842-01  ALO    0.0000000     ALLV  -1.7416008+02  ALLI   -1.3588123+02
  XIY    6.9900505-01  ETY     6.4095715-01  ZTY    3.1712189-01  BTO    -4.2688682-07 BTLV    6.1826392+00  BTLI   3.5590837+01
  XIZ    5.6610319-01  ETZ    -7.6691941-01  ZTZ    3.0226046-01  GMO    0.0000000     GMLV   -1.7938853+02  GMLI   8.2071856+01
  ALS    1.4780034+02  BTS    -3.2227741+01  ALE    9.2357613+01  BTF    1.7415939+02  ALM    8.4194177+01  BTM    1.7875776+02
 ALEI    9.2357615+01 BTEI     1.7415936+02
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****** CSM   / MOON  REF.  /PHASE   7- 22
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS.,  1 MINS., 58.862 SECS. G.M.T.

T         .6918310176623l4+002  HRS. FROM LAUNCH       2 DAYS, 21 HRS., 10 MINS., 59.166 SECS. G.E.T.     RAGR  .2434905214426l0+003

          PHASE ELAPSED TIME      .23851650+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .24494732373716340+000      -.11798024946457868+000      -.10019411987381262+000
        RDXYZ      -.54255878767734122+000      -.74391312531650097+000      -.45432483879537427+000

GD4     THRUST **********
        **********************
THETA   -6.3726271+00 BETA     1.7364017+02 FUEL     1.3705884+04  TM      2.0500000+04 VELG     4.9503460+02 TACC     1.3481491+01
 BARC    1.4337440+01 DELV     2.4958795+03 MASS     4.8923998+04 MSFL    6.5265838+01 SPI      3.1410000+02 VEX      1.0105868+04
 VRX    -2.9374322+03 VRY     -3.9781158+03 VRZ     -2.3606155+03 VDX     2.1630185+02 VDY      3.4603170+02 VDZ      2.8024067+02
 TGO     0.0000000    FC       0.0000000   GMLP     0.0000000    GMLY    0.0000000   PLCHNG    1.8626390+00 TDELV    2.4958795+03

SELENOCENTRIC
   XL    8.4358230+02  YL    -4.0631614+02  ZL    -3.4506189+02  DXL   -3.1537341+03  DYL   -4.3241474+03  DZL   -2.6408562+03
   RL    9.9789357+02 DECL    -2.0230043+01  RAL   -2.5718050+01  VL     5.9681161+03 PTHL     7.4996785-02  AZL   -1.1810594+02

SELENOGRAPHIC
   XS   -9.8331605+02  YS    -6.5209723+00  ZS    -1.6981933+02  DXS    9.5959291+01  DYS    5.9253716+03  DZS   -8.2907472+02
 ALTS    5.9400058+01 LATS    -9.7981574+00 LONS    -1.7962003+02  VRS    5.9838618+03  PTR    7.4799173-02  AZR   -9.8069680+01
  LTS   -1.5083762+00  LNS     1.2388423+02  LTE    3.1228580+00  LNE    7.7172354+00  DSMP   5.0276055+00  RSMP   1.1631597+02
  LIN    1.6731814+02  LAN     5.0505351+01  LAP    1.9825844+01  OR     7.8118805+00  VT     5.9838566+03  SOLSV  3.3246248+01

GEOCENTRIC
    X    1.8679530+05   Y     -7.1809951+04   Z    -4.0676273+04  DX    -1.5579616+03  DY    -1.6601682+03  DZ    -1.2115342+03
    R    2.0421486+05  DEC    -1.1489228+01  RA    -2.1028319+01   V     2.5789955+03  PTH   -1.3452355+01  AZ    -1.2278701+02

GEOGRAPHIC
   XG   -1.9115426+04  YG     1.9920781+05  ZG    -4.0676271+04  DXG    9.0445472+04  DYG    7.8164652+03  DZG   -1.2115231+03
  ALT    2.0077139+05  LAT    -1.1490490+01  LON    9.5481160+01  VE     9.0790687+04  PTE   -3.7860958-01  AZE   -9.0857233+01

EARTH-MOON PLANE
  XMP   -9.8308868+02  YMP    1.3661610+02  ZMP    -1.0326809+02 DXMP    8.4225788+02 DYMP    5.9014384+03 DZMP   -2.8642010+02
  RMP    9.9789357+02 DEMP    -5.9399500+00 RAMP    1.7208849+02  VMP    5.9681160+03 PTMP    7.4996136-02 AZMP   -9.2757820+01
  XME   -2.0421480+05 YME     1.3661568+02 ZME     -1.0326823+02 DXME    6.0178087+02 DYME    2.4913934+03 DZME   -2.8642011+02

PLANETARY COORDINATES
   XM    1.8595172+05  YM    -7.1403635+04   ZM    -4.0331212+04  DXM    1.5957725+03  DYM    2.6639792+03  DZM    1.4293220+03
   RM    2.0323171+05  DEM    -1.1446298+01  RAM    -2.1006298+01  LOM    9.5503180+01  VM     3.4185138+03 ARGM    -2.4615315+01
 XSUN    3.7182251+06 YSUN    -7.2808193+07 ZSUN    -3.1572480+07  RAS   -8.7076513+01  LOS    2.9432964+01  DES   -2.3416217+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4445401+05  ECC     4.6476478-01  INC    1.4547144+02  RAN    1.7615467+02  APF    3.9895727+00  RP     7.7316877+04
   VH   -2.1842858+03 RNMP    -1.7978653+02 APMP    -1.6330396+01 INMP    1.7343594+02  APO    2.1159115+05  TFP    2.1874584+02
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TA	-1.634161E+02	EA	-1.5288972E+02	MA	-1.4075474E+02	SLR	1.1325103E+05	PER	3.8252769E+02	MTA	3.5999990E+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	1.3258359E+03	ECCS	2.4735084E-01	INCS	1.4585954E+02	RANS	-1.7279717E+02	APFS	-1.4234366E+02	RPS	9.9788929E+02
VHS	-1.5890422E+03	RNMPS	5.7127584E+01	APMPS	-1.1519598E+02	INMPS	1.7345314E+02	APOS	1.6537825E+03	TFPS	6.9181238E+01
TAS	3.7819754E-01	EAS	2.9377932E-01	MAS	2.2111308E-01	SLRS	1.2447180E+03	PERS	3.0328602E+00	MTAS	3.5999990E+02

SELENOCENTRIC UNIT VECTORS

WX	-7.0367424E-02	WY	5.5679470E-01	WZ	-8.2766424E-01	PX	8.4883990E-01	PY	-4.0238594E-01	PZ	-3.4286492E-01
QX	-5.2394582E-01	QY	-7.2668094E-01	QZ	-4.4431469E-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

BODY ATTITUDE AND FORCES

RRAT	4.0636267E-08	PRAT	-1.2464915E-06	YRAT	-7.6725795E-07	IGA	0.0000000	MGA	0.0000000	OGA	0.0000000
XIX	4.3694290E-01	ETX	-3.1757614E-02	ZTX	-8.9892844E-01	ALO	0.0000000	ALLV	-1.7358823E+02	ALLI	-1.3588124E+02
XIY	6.9900507E-01	ETY	6.4095718E-01	ZTY	3.1712190E-01	BTO	0.0000000	BTLV	6.3203654E+00	BTLI	3.5590836E+01
XIZ	5.6610319E-01	ETZ	-7.6691940E-01	ZTZ	3.0226042E-01	GMO	0.0000000	GMLV	-1.7940347E+02	GMLI	8.2071851E+01
ALS	1.4780024E+02	BTS	-3.2227644E+01	ALF	9.2356406E+01	BTF	1.7415932E+02	ALM	8.3627369E+01	BTM	1.7869496E+02
ALEI	9.2356408E+01	BTEI	1.7415930E+02								

****** CSM / MOON REF. /PHASE 7- 23
MEAN-OF-EPOCH 1969 24 DEC. 1968, 10 HRS., 2 MINS., 8.862 SECS. G.M.T.

T .69185879543967 3+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 11 MINS., 9.166 SECS. G.E.T. RAGR .24353230218359 7+003

PHASE ELAPSED TIME .2385260+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .2434448573690139 8+000 -.1200194474729799 1+000 -.1014339059763243 3+000
RDXYZ -.5391871389417198 0+000 -.7242634372268108 0+000 -.4382858130963130 3+000

GD4 THRUST **********
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THETA	-6.9267483E+00	BETA	1.7348608E+02	FUEL	1.4358545E+04	TM	2.0500000E+04	VELG	3.5931300E+02	TACC	1.3663760E+01
BARC	1.4894956E+01	DELV	2.6316018E+03	MASS	4.8271336E+04	MSFL	6.5265838E+01	SPI	3.1410000E+02	VEX	1.0105868E+04
VRX	-2.9771364E+03	VRY	-3.9587680E+01	VRZ	-2.3442178E+03	VDX	1.5699926E+02	VDY	2.5116161E+02	VDZ	2.0340825E+02
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	2.0086921E+00	TDELV	2.6316018E+03

SELENOCENTRIC

XL	8.3840790E+02	YL	-4.1333900E+02	ZL	-3.4933162E+02	DXL	-3.1341357E+03	DYL	-4.2099296E+03	DZL	-2.5476260E+03
RL	9.9790255E+02	DECL	-2.0491343E+01	RAL	-2.6243512E+01	VL	5.8340991E+03	PTHL	2.3721126E-02	AZL	-1.1777633E+02

SELENOGRAPHIC

XS	-9.8311145E+02	YS	3.1241486E+01	ZS	-1.7114785E+02	DXS	1.5267243E+02	DYS	5.7948914E+03	DZS	-7.8528737E+02
ALTS	5.9409026E+01	LATS	-9.8754851E+01	LONS	1.7981792E+02	VRS	5.8498506E+03	PTR	2.3657402E-02	AZR	-9.7827307E+01
LTS	-1.5083767E+00	LNS	1.2388280E+02	LTE	3.1226973E+00	LNE	7.7172874E+00	DSMP	5.0276068E+00	RSMP	1.1631449E+02
LIN	1.6740980E+02	LAN	5.1027913E+01	LAE	1.4727515E+01	DR	2.4154005E+00	VT	5.8498500E+03	SOLSV	3.3790314E+01

GEOCENTRIC

X	1.8679278E+05	Y	-7.1812543E+04	Z	-4.0678166E+04	DX	-1.5384500E+03	D	-1.5459176E+03	DZ	-1.1182855E+03
R	2.0421385E+05	DEC	-1.1498826E+01	RA	-2.1029271E+01	V	2.4509697E+03	PTH	-1.5156570E+01	AZ	-1.2250999E+02

GEOGRAPHIC

XG	-1.8966710E+04	YG	1.9922060E+01	ZG	-4.0678158E+04	DXG	9.0339689E+04	DYG	7.7155213E+03	DZG	-1.1183073E+03
ALT	2.0077037E+05	LAT	-1.1491089E+01	LON	9.5438427E+01	VE	9.0675464E+04	PTE	-4.0490833E-01	AZE	-9.0803467E+01

EARTH-MOON PLANE

XMP	-9.8166490E+02	YMP	1.4624083E+02	ZMP	-1.0371673E+02	DXMP	8.8311748E+02	DYMP	5.7610662E+03	DZMP	-2.5871028E+02
RMP	9.9790254E+02	DEMP	-5.9657951E+01	RAMP	1.7152693E+02	VMP	5.8340990E+03	PTMP	2.3720776E-02	AZMP	-9.2552999E+01
XME	-2.0421377E+05	YME	1.4624038E+02	ZME	-1.0371737E+02	DXME	6.4263999E+02	DYME	2.3510285E+03	DZME	-2.5871027E+02

PLANETARY COORDINATES

XM	1.8595437E+05	YM	-7.1399204E+04	ZM	-4.0328834E+04	DXM	1.5956856E+03	DYM	2.6640119E+03	DZM	1.4293405E+03
RM	2.0323211E+05	DEM	-1.1445591E+01	RAM	-2.1004836E+01	LOM	9.5462862E+01	VM	3.4185065E+03	ARGM	-2.4613714E+01
XSUN	3.7183899E+06	YSUN	-7.2808186E+07	ZSUN	-3.1572478E+07	RAS	-8.7076383E+01	LOS	2.9391314E+01	DES	-2.3416214E+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	1.3887666E+05	ECC	5.2399468E-01	INC	1.4573134E+02	RAN	1.7632801E+02	APF	5.9422521E+00	RP	6.6106030E+04
VH	-2.3123235E+03	RNMP	-1.7977686E+02	APMP	-1.4509548E+01	INMP	1.7371368E+02	APO	2.1164729E+05	TFP	2.1007402E+02
TA	-1.6522469E+02	EA	-1.5387701E+02	MA	-1.4065804E+02	SLR	1.0074523E+05	PER	3.6058891E+02	MTA	3.5999990E+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	1.2349784E+03	ECCS	1.9196806E-01	INCS	1.4597460E+02	RANS	-1.7263453E+02	APFS	-1.4142040E+02	RPS	9.9790204E+02
VHS	-1.7230252E+03	RNMPS	5.8367973E+01	APMPS	-1.1323309E+02	INMPS	1.7351273E+02	APOS	1.4720549E+03	TFPS	6.9185136E+01
TAS	1.4728835E-01	EAS	1.2126915E-01	MAS	9.7989363E-02	SLRS	1.1894673E+03	PERS	2.7265082E+00	MTAS	3.5999990E+02

SELENOCENTRIC UNIT VECTORS

WX	-7.1734501E-02	WY	5.5494318E-01	WZ	-8.2878963E-01	PX	8.4154920E-01	PY	-4.1235183E-01	PZ	-3.4894253E-01
QX	-5.3539620E-01	QY	-7.2249846E-01	QZ	-4.3743213E-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

BODY ATTITUDE AND FORCES

RRAT	1.7410085E-08	PRAT	-3.9217460E-07	YRAT	1.0908068E-06	IGA	0.0000000	MGA	-1.2806605E-06	OGA	0.0000000
XIX	4.3694298E-01	ETX	-3.1757598E-02	ZTX	-8.9892841E-01	ALO	0.0000000	ALLV	-1.7302867E+02	ALLI	-1.3588123E+02
XIY	6.9900502E-01	ETY	6.4095718E-01	ZTY	3.1712197E-01	BTO	-1.2806605E-06	BTLV	6.4661539E+00	BTLI	3.5590840E+01
XIZ	5.6610318E-01	ETZ	-7.6691940E-01	ZTZ	3.0226046E-01	GMO	0.0000000	GMLV	-1.7942069E+02	GMLI	8.2071850E+01
ALS	1.4780013E+02	BTS	-3.2227539E+01	ALF	9.2355306E+01	BTF	1.7415926E+02	ALM	8.3073249E+01	BTM	1.7863204E+02
ALEI	9.2355301E+01	BTEI	1.7415924E+02								

****** CSM / MOON REF. /PHASE 7- 24
MEAN-OF-EPOCH 1969 24 DEC. 1968, 10 HRS., 2 MINS., 18.862 SECS. G.M.T.

T .6918865732170 2+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 11 MINS., 19.166 SECS. G.E.T. RAGR .2435740829245 4+003

PHASE ELAPSED TIME .2385365 0+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .2419520071425481 9+000 -.1220036773685428 9+000 -.1026288429036748 8+000
RDXYZ -.5356346266856276 4+000 -.7043353177517898 1+000 -.4220328129230850 9+000

GD4 THRUST **********
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THETA	-7.4680477E+00	BETA	1.7332236E+02	FUEL	1.5011206E+04	TM	2.0500000E+04	VELG	2.2174409E+02	TACC	1.3851036E+01
BARC	1.5439721E+01	DELV	2.7691714E+03	MASS	4.7618675E+04	MSFL	6.5265838E+01	SPI	3.1410000E+02	VEX	1.0105868E+04
VRX	-3.0165964E+03	VRY	-3.9390931E+03	VRZ	-2.3276221E+03	VDX	9.6889497E+01	VDY	1.5500025E+02	VDZ	1.2553005E+02
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	2.1637043E+00	TDELV	2.7691714E+03

SELENOCENTRIC

XL	8.3326663+02	YL	-4.2017256+02	ZL	-3.5344691+02	DXL	-3.1134859+03	DYL	-4.0940934+03	DZL	-2.4531522+03
RL	9.9789927+02	DECL	-2.0743868+01	RAL	-2.6759407+01	VL	5.6985393+03	PTHL	-7.1327802-02	AZL	-1.1743884+02

SELENOGRAPHIC

XS	-9.8281345+02	YS	1.2552118+01	ZS	-1.7240386+02	DXS	2.0949522+02	DYS	5.6621803+03	DZS	-7.4095263+02
ALTS	5.9405728+01	LATS	-9.9487259+00	LONS	1.7926828+02	VRS	5.7142965+03	PTR	-7.1131422-02	AZR	-9.7577310+01
LTS	-1.5083782+00	LNS	1.2388141+02	LTE	3.1225403+00	LNE	7.7173387+00	DSMP	5.0276081+00	RSMP	1.1631304+02
LIN	1.6750478+02	LAN	5.1595224+01	LAP	1.0774856+01	DR	-7.0941687+00	VT	5.7142920+03	SOLSV	3.4322099+01

GEOCENTRIC

X	1.8679024+05	Y	-7.1815041+04	Z	-4.0679955+04	DX	-1.5178853+03	DY	-1.4300493+03	DZ	-1.0237935+03
R	2.0421275+05	DEC	-1.1490403+01	RA	-2.1030200+01	V	2.3231810+03	PTH	-1.7059530+01	AZ	-1.2219317+02

GEOGRAPHIC

XG	-1.8818063+04	YG	1.9923320+05	ZG	-4.0679955+04	DXG	9.0231860+04	DYG	7.6150068+03	DZG	-1.0237838+03
ALT	2.0076928+05	LAT	-1.1491666+01	LON	9.5395717+01	VE	9.0558410+04	PTE	-4.3119407-01	AZE	-9.0748718+01

EARTH-MOON PLANE

XMP	-9.8017383+02	YMP	1.5563205+02	ZMP	-1.0411947+02	DXMP	9.2381932+02	DYMP	5.6184250+03	DZMP	-2.3066963+02
RMP	9.9789926+02	DEMP	-5.9890653+00	RAMP	1.7097788+02	VMP	5.6985393+03	PTMP	-7.1328165-02	AZMP	-9.2340106+01
XME	-2.0421267+05	YME	1.5563127+02	ZME	-1.0411971+02	DXME	6.8334132+02	DYME	2.2083944+03	DZME	-2.3066968+02

PLANETARY COORDINATES

XM	1.8595697+05	YM	-7.1394870+04	ZM	-4.0326508+04	DXM	1.5956006+03	DYM	2.6640440+03	DZM	1.4293587+03
RM	2.0323250+05	DEM	-1.1444901+01	RAM	-2.1003403+01	LOM	9.5422513+01	VM	3.4184994+03	ARGM	-2.4612150+01
XSUN	3.7185515+06	YSUN	-7.2808178+07	ZSUN	-3.1572475+07	RAS	-8.7076256+01	LOS	2.9349660+01	DES	-2.3416213+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	1.3397593+05	ECC	5.8073005-01	INC	1.4602649+02	RAN	1.7652789+02	APF	7.6012598+00	RP	5.6172082+04
VH	-2.4401249+03	RNMP	-1.7976434+02	APMP	-1.3002004+01	INMP	1.7402941+02	APO	2.1177977+05	TFP	2.0225763+02
TA	-1.6671715+02	EA	-1.5452091+02	MA	-1.4020731+02	SLR	8.8792894+04	PER	3.4167140+02	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	1.1566023+03	ECCS	1.3722041-01	INCS	1.4609557+02	RANS	-1.7245871+02	APFS	-1.3999125+02	RPS	9.9789287+02
VHS	-1.8585974+03	RNMPS	5.9589445+01	APMPS	-1.1067484+02	INMPS	1.7357154+02	APOS	1.3153117+03	TFPS	6.9191706+01
TAS	-5.9114199-01	EAS	-5.1489682-01	MAS	-4.4424341-01	SLRS	1.1348241+03	PERS	2.4711199+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-7.3207201-02	WY	5.5298453-01	WZ	-8.2996918-01	PX	8.2935009-01	PY	-4.2845242-01	PZ	-3.5861809-01
QX	-5.5391255-01	QY	-7.1458843-01	QZ	-4.2725196-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

BODY ATTITUDE AND FORCES

RRAT	3.0963945-08	PRAT	-3.9942714-06	YRAT	1.1059316-06	IGA	-6.9941136-03	MGA	-6.4033023-07	OGA	0.0000000
XIX	4.3694288-01	ETX	-3.1757601-02	ZTX	-8.9892846-01	ALO	-6.9941136-03	ALLV	-1.7248152+02	ALLI	-1.3588123+02
XIY	6.9900507-01	ETY	6.4095718-01	ZTY	3.1712189-01	BTO	-6.4033023-07	BTLV	6.6207319+00	BTLI	3.5590834+01
XIZ	5.6610321-01	ETZ	-7.6691940-01	ZTZ	3.0226039-01	GMO	0.0000000	GMLV	-1.7944050+02	GMLI	8.2071850+01
ALS	1.4780002+02	BTS	-3.2227443+01	ALE	9.2354224+01	BTE	1.7415919+02	ALM	8.2531948+01	BTM	1.7856896+02
ALEI	9.2354228+01	BTEI	1.7415916+02								

****** CSM / MOON REF. /PHASE 7- 25
MEAN-OF-EPOCH 1969 24 DEC. 1968, 10 HRS., 2 MINS., 28.862 SECS. G.M.T.

T .691914350994391+002 HRS. FROM LAUNCH 2 DAYS, 21 HRS., 11 MINS., 29.166 SECS. G.E.T. RAGR .243615863665550+003

PHASE ELAPSED TIME .23854651+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .240469279948321 80+000 -.123932159208373 42+000 -.103778331008898 36+000
RDXYZ -.531898014771364 26+000 -.684124020359370 30+000 -.405561999902656 52+000

GD4 THRUST **********
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THETA	-7.9963765+00	BETA	1.7314813+02	FUEL	1.5663867+04	TM	2.0500000+04	VELG	8.2276288+01	TACC	1.4043516+01
BARC	1.5971582+01	DELV	2.9086398+03	MASS	4.6966014+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04
VRX	-3.0558161+03	VRY	-3.9190995+03	VRZ	-2.3108353+03	VDX	3.5950036+01	VDY	5.7511543+01	VDZ	4.6576873+01
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	2.3285327+00	TDELV	2.9086398+03

SELENOCENTRIC

XL	8.2816022+02	YL	-4.2681412+02	ZL	-3.5740567+02	DXL	-3.0917662+03	DYL	-3.9766110+03	DZL	-2.3574122+03
RL	9.9787696+02	DECL	-2.0987609+01	RAL	-2.7265503+01	VL	5.5614607+03	PTHL	-2.1321136-01	AZL	-1.1709285+02

SELENOGRAPHIC

XS	-9.8242182+02	YS	2.1760373+01	ZS	-1.7358644+02	DXS	2.6643556+02	DYS	5.5271994+03	DZS	-6.9606013+02
ALTS	5.9383430+01	LATS	-1.0017895+01	LONS	1.7873112+02	VRS	5.5772234+03	PTR	-2.1260910-01	AZR	-9.7318949+01
LTS	-1.5083794+00	LNS	1.2387999+02	LTE	3.1223799+00	LNE	7.7173910+00	DSMP	5.0276090+00	RSMP	1.1631156+02
LIN	1.6760322+02	LAN	5.2212288+01	LAP	1.5169125+01	DR	-2.0695516+01	VT	5.5771850+03	SOLSV	3.4841485+01

GEOCENTRIC

X	1.8678778+05	Y	-7.1817252+04	Z	-4.0681536+04	DX	-1.4962524+03	DY	-1.3125343+03	DZ	-9.2803492+02
R	2.0421161+05	DEC	-1.1490921+01	RA	-2.1031041+01	V	2.1960797+03	PTH	-1.9197294+01	AZ	-1.2183021+02

GEOGRAPHIC

XG	-1.8669704+04	YG	1.9924566+05	ZG	-4.0681536+04	DXG	9.0121964+04	DYG	7.5150003+03	DZG	-9.2803723+02
ALT	2.0076813+05	LAT	-1.1492184+01	LON	9.5353094+01	VE	9.0439513+04	PTE	-4.5747118-01	AZE	-9.0692999+01

EARTH-MOON PLANE

XMP	-9.7861557+02	YMP	1.6478717+02	ZMP	-1.0447580+02	DXMP	9.6436692+02	DYMP	5.4734743+03	DZMP	-2.0229181+02
RMP	9.9787694+02	DEMP	-6.0097721+00	RAMP	1.7044174+02	VMP	5.5614607+03	PTMP	-2.1321142-01	AZMP	-9.2118509+01
XME	-2.0421151+05	YME	1.6478734+02	ZME	-1.0447607+02	DXME	7.2388842+02	DYME	2.0634510+03	DZME	-2.0229181+02

PLANETARY COORDINATES

XM	1.8595962+05	YM	-7.1390439+04	ZM	-4.0324131+04	DXM	1.5955137+03	DYM	2.6640767+03	DZM	1.4293773+03
RM	2.0323290+05	DEM	-1.1444193+01	RAM	-2.1001940+01	LOM	9.5382197+01	VM	3.4184921+03	ARGM	-2.4610549+01
XSUN	3.7187165+06	YSUN	-7.2808170+07	ZSUN	-3.1572472+07	RAS	-8.7076126+01	LOS	2.9308010+01	DES	-2.3416211+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	1.2966767+05	ECC	6.3472997-01	INC	1.4636523+02	RAN	1.7676139+02	APF	9.0748431+00	RP	4.7363711+04
VH	-2.5672396+03	RNMP	-1.7974769+02	APMP	-1.1704291+01	INMP	1.7439219+02	APO	2.1197161+05	TFP	1.9525821+02
TA	-1.6799573+02	EA	-1.5491979+02	MA	-1.3950415+02	SLR	7.7426875+04	PER	3.2532391+02	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	1.0883602+03	ECCS	8.3219861-02	INCS	1.4622295+02	RANS	-1.7226835+02	APFS	-1.3711619+02	RPS	9.9778700+02
VHS	-1.9957606+03	RNMPS	6.0982285+01	APMPS	-1.0657213+02	INMPS	1.7362905+02	APOS	1.1789333+03	TFPS	6.9206106+01
TAS	-2.7760828+00	EAS	-2.5539918+00	MAS	-2.3415193+00	SLRS	1.0808226+03	PERS	2.2556759+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-7.4795549-02	WY	5.5090843-01	WZ	-8.3120728-01	PX	8.0217249-01	PY	-4.6192845-01	PZ	-3.7834030-01

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   QX   -5.9238915-01   QY   -6.9506978-01   QZ   -4.6737339-01  SXO    0.0000000      SY    0.0000000      SZO    0.0000000

BODY ATTITUDE AND FORCES
 RRAT    7.0108546-08 PRAT   -4.7063373-06 YRAT   -3.5987256-06 IGA    0.0000000     MGA   -5.1226418-06 OGA    0.0000000
 XIX     4.3694275-01 ETX    -3.1757530-02 ZTX    8.9892851-01 ALO    0.0000000     ALLV  -1.7194685+02 ALLI   -1.3588123+02
 XIY     6.9900506-01 ETY     6.4095726-01 ZTY    3.1712180-01 BTO   -5.1226418-06  BTL   -1.7849295+00 RTLI    3.5590825+01
 XIZ     5.6610331-01 ETZ    -7.6691933-01 ZTZ    3.0226030-01 GMO    0.0000000     GMLV  -1.7946303+02 GMLI    8.2071846+01
 ALS     1.4779992+02 BTS    -3.2227357+01 ALE    9.2353243+01 BTE    1.7415913+02  ALM    8.2003621+01 RTM     1.7850573+02
 ALEI    9.2353254+01 BTEI    1.7415910+02

****** CSM   / MOON  REF.  /PHASE   7- 26
                  MEAN-OF-EPOCH  1969        24   EC. 1968, 10 HRS., 2 MINS., 34.697 SECS. G.M.T.

T        .6919305591499955+002  HRS. FROM LAUNCH      2 DAYS, 21 HRS., 11 MINS., 35.001 SECS. G.E.T.     RAGR  .2436402424608944+003

          PHASE ELAPSED TIME     .2385234+05 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      .2396089996095428E+000      .[illegible]13464775182D2+000      -.104427811[illegible]667+000
        RDXYZ     -.5296313837170600E+000     -.[illegible]1980497241020I+000     -.3958491571247[illegible]776+000

G04     THRUST **********
        **********
        * ENGINE CUTOFF     *
        **********
THETA   -8.2986106+00 BETA     1.7304122+02   PHIL    1.6044660+04  TM     2.0500000+04  VEL    1.2992407-04  TACC   1.4158318+01
 RANG    1.6275909+01 DELV     2.9909166+02   MASS    4.6585191+04  MSFL   6.5265838+01  SPI    3.1410000+02  VFX    1.0105868+04
 VRX    -3.0785909+03 VRY     -3.9072889+02  VRZ    -2.5009543+03  VDX   -4.3308026-05  VDY   -8.6616053-05  VDZ   -8.6616053-05
 TGO     0.0000000    FC      0.0000000     GMLX    0.0000000     GMLY   0.0000000     PLCHNG 2.4296238+00  TDELV  2.9909166+03

SELENOCENTRIC
   XL    8.2519747+02   YL    -4.3059964+02   ZL   -3.5964244+02  DXL   -3.0785909+03  DYL   -3.9072889+03  DZL   -2.3009543+03
   RL    9.9785250+02 DECL    -2.1125771+01  RAL   -2.7556185+01  VL     5.4807863+03 FPHL   -3.1898196-01  AZL   -1.1688676+02

SELENOGRAPHIC
   XS   -9.8215000+02   YS     2.7029602+01   ZS   -1.7424218+02  DXS    2.8971083+02  DYS    5.4473746+03  DZS   -5.6960154+02
 ALTS    5.9358951+01 LATS    -1.0056381+01 LONS    1.7842357+02  VRS    5.4965521+03  FPA   -3.1806669-01  AZS   -9.7163987+01
  LTS   -1.5083802+00   LNS    1.2387918+02   LTS   3.1222889+00  LNE    7.7174194+00  RSMP   5.0276095+00  RSMP   1.1631072+02
  LIN    1.6766229+02   LAN    5.2597654+01   LAP   2.4758793+01  DR    -3.0512912+01  VT     5.4966674+03  SOLSV  3.5138764+01

GEOCENTRIC
    X    1.6678632+05    Y    -7.1818534+04    Z   -4.0682428+04  DX    -1.4831263+01  DY    -1.2431936+03  DZ    -8.7156554+02
    R    2.0421089+05  DEC    -1.1491215+01   RA    -2.1031536+01  V      2.1224567+03  FPA   -2.0570008+01  AZ    -1.2159201+02

GEOGRAPHIC
   XG   -1.8583126+04   YG     1.9925284+05   ZG   -4.0682423+04  DXG    9.0056866+04  DYG    7.4568383+03  DZG   -8.7153080+02
  ALT    2.0076742+05  LAT    -1.1492478+01  LON    9.5328222+01  VE     9.0369262+04  PTP   -4.7279630-01  AZP   -9.0660024+01

EARTH-MOON PLANE
  XMP   -9.7767551+02   YMP    1.7001775+02   ZMP   -1.0466205+02 DXMP    9.8794946+02 DYMP    5.3878137+03 DZMP   -1.8557439+02
  RMP    9.9785247+02 DEMP   -6.0286731+00  RAMP    1.7013492+02  VMP    5.4807863+03 FPAM   -3.1898172-01 AZMP   -9.1944859+01
  XME   -2.0421080+05   YME    1.7001794+02   ZME   -1.0466246+02 DXME    7.4747074+02  YME    1.0777946+03 DZME   -1.8557439+02

PLANETARY COORDINATES
   XM    1.8596112+05   YM    -7.1387934+04   ZM   -4.0322787+04  DXM    1.5954646+03  DYM    2.6640952+03  DZM    1.4293878+03
   RM    2.0323312+05  DEM    -1.1443794+00  RAM   -2.1001112+01  VM     9.5359647+01  FPAM   3.4184880+03  AZM   -2.4609645+01
 XSUN    3.7188098+06 YSUN    -7.2808166+07 ZSUN   -3.1572469+07  RAS   -8.7076052+01  LOS    2.9283705+01  DES   -2.3416209+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.2739994+05  ECC     6.6458884-01  INC    1.4658730+02  RAN    1.7691690+02  APF    9.8794404+00  RP     4.2693142+04
   VH    2.6408710+03 RNMP    -1.7973528+02 APMP   -1.1016081+01 INMP   1.7463028+02  APO    2.1210674+05  TFP    1.9152729+02
   TA   -1.6867012+02   EA    -1.5506493+02   MA   -1.3900429+02  SLR    7.1079332+04  PER    3.1682709+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    1.0524931+03 ECCS    5.2212255-02  INCS    1.4630046+02 RANS   -1.7214995+02 APFS   -1.3304946+02  RPS    9.9754006+02
  VHS   -2.0765276+03 RNMPS   6.1851013+01 APMPS   -1.0173960+02 INMPS   1.7366174+02 APOS    1.1074461+03 TFPS   6.9227500+01
  TAS   -6.4399179+00  EAS   -6.1126461+00  MAS   -5.7940961+00 SLRS    1.0496238+03 PERS    2.1450954+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.5780214-02   WY    5.4963819-01   WZ   -8.3195868-01  PX    7.5926901-01  PY   -5.8903458-01  PZ   -4.0545572-01
   QX   -6.4634968-01   QY   -6.6240596-01   QZ   -3.7874849-01  SXO   0.0000000     SY    0.0000000     SZO    0.0000000

BODY ATTITUDE AND FORCES
 RRAT   -4.6964569-08 PRAT   -3.5916671-06 YRAT   -7.6128040-06 IGA    0.0000000     MGA   -5.[illegible]940534-06 OGA    0.0000000
 XIX     4.3694257-01 ETX    -3.1757480-02 ZTX   -8.9892861-01 ALO    0.0000000     ALLV  -1.7164066+02 ALLI   -1.3588132+02
 XIY     6.9900508-01 ETY     6.4095735-01 ZTY    3.1712165-01 BTO    0.0000000     BTLV  -1.7947754+02 RTLI    3.5590813+01
 XIZ     5.6610344-01 ETZ    -7.6691926-01 ZTZ    3.0226019-01 GMO    0.0000000     GMLV  -1.7947754+02 GMLI    8.2071841+01
 ALS     1.4779986+02 BTS    -3.2227319+01 ALE    9.2352667+01 BTE    1.7415909+02  ALM    8.1701386+01 RTM     1.7846076+02
 ALEI    9.2352688+01 BTEI    1.7415906+02

THRUST TERMINATION
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LUNAR ORBIT COAST
IN 60 × 170

TABLE IV.- LUNAR ORBIT COAST IN 60 × 170

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****** CSM   / MOON  REF.  /PHASE   9-  1
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS.,  2 MINS.,  34.697 SECS. G.M.T.

T         .6919305591499555+002  HRS. FROM LAUNCH       2 DAYS, 21 HRS.,  11 MINS.,  35.001 SECS. G.E.T.     RAGR  .2436402424608894+003

            PHASE ELAPSED TIME      .23855234+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ        .2396089996095428 5+000      -.1250313464775180 2+000      -.1044278110930456 7+000
        RDXYZ       -.5296313837170600 8+000      -.6721980497241020 1+000      -.3958491571247577 6+000

SELENOCENTRIC
   XL     8.2519747+02   YL    -4.3059964+02   ZL    -3.5964244+02  DXL   -3.0785909+03  DYL   -3.9072889+03  DZL   -2.3009543+03
   RL     9.9785250+02 DECL    -2.1125771+01  RAL    -2.7556185+01   VL    5.4807863+03 PTHL   -3.1898196-01  AZL   -1.1688676+02

SELENOGRAPHIC
   XS    -9.8215000+02   YS     2.7029609+01   ZS    -1.7424218+02  DXS    2.9971083+02  DYS    5.4473746+03  DZS   -6.6960364+02
 ALTS     5.9358951+01 LATS    -1.0056381+01 LONS     1.7842357+02  VRS    5.4965521+03  PTR   -3.1806669-01  AZR   -9.7163987+01
  LTS    -1.5083802+00  LNS     1.2387918+02  LTE     3.1222889+00  LNE    7.7174194+00 DSMP    5.0276095+00 RSMP    1.1631072+02
  LIN     1.6766229+02  LAN     5.2597654+01  LAP     2.4758793+01   DR   -3.0512912+01   VT    5.4964674+03 SOLSV   3.5138764+01

GEOCENTRIC
    X     1.8678632+05    Y    -7.1818534+04    Z    -4.0682428+04   DX   -1.4831263+03   DY   -1.2431936+03   DZ   -8.7156654+02
    R     2.0421089+05  DEC    -1.1491215+01   RA    -2.1031536+01    V    2.1224567+03  PTH   -2.0570008+01   AZ   -1.2159201+02

GEOGRAPHIC
   XG    -1.8583126+04   YG     1.9925284+05   ZG    -4.0682423+04  DXG    9.0056866+04  DYG    7.4568383+03  DZG   -8.7153080+02
  ALT     2.0076742+05  LAT    -1.1492478+01  LON     9.5328222+01   VE    9.0369262+04  PTE   -4.7279630-01  AZE   -9.0660024+01

EARTH-MOON PLANE
  XMP    -9.7767551+02   YMP    1.7001775+02   ZMP   -1.0466205+02 DXMP    9.8794949+02 DYMP    5.3878137+03 DZMP   -1.8557489+02
  RMP     9.9785247+02  DEMP   -6.0206731+00  RAMP    1.7013492+02  VMP    5.4807863+03 PTMP   -3.1898172-01 AZMP   -9.1984829+01
  XME    -2.0421080+05  YME    1.7001794+02   ZME   -1.0466246+02 DXME    7.4747074+02 DYME    1.9777946+03 DZME   -1.8557489+02

PLANETARY COORDINATES
   XM     1.8596112+05   YM    -7.1387934+04   ZM    -4.0322787+04  DXM    1.5954646+03  DYM    2.6640952+03  DZM    1.4293878+03
   RM     2.0323312+05  DEM    -1.1443794+01  RAM    -2.1001112+01  LOM    9.5358647+01   VM    3.4184880+03 ARGM   -2.4609645+01
 XSUN     3.7188098+06 YSUN    -7.2808166+07 ZSUN    -3.1572469+07  RAS   -8.7076052+01  LOS    2.9283705+01  DES   -2.3416209+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA     1.2739994+05   ECC    6.6488884-01   INC    1.4658730+02  RAN    1.7691690+02  APF    9.8794404+00   RP    4.2693142+04
   VH    -2.6408710+03 RNMP   -1.7973528+02 APMP   -1.1016081+01 INMP    1.7463028+02  APO    2.1210674+05  TFP    1.9152729+02
   TA    -1.6867012+02   EA   -1.5506493+02   MA   -1.3900429+02  SLR    7.1079332+04  PER    3.1682709+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS     1.0524931+03 ECCS    5.2212255-02 INCS    1.4630046+02 RANS   -1.7214995+02 APFS   -1.3304946+02  RPS    9.9754006+02
  VHS    -2.0765276+03 RNMPS   6.1851013+01 APMPS  -1.0173960+02 INMPS   1.7366174+02 APOS    1.1074461+03 TFPS   6.9227580+01
  TAS    -6.4399179+00  EAS   -6.1126461+00  MAS   -5.7940961+00 SLRS    1.0496238+03 PERS    2.1450954+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX    -7.5780214-02   WY    5.4963819-01   WZ   -8.3195868-01   PX    7.5926901-01   PY   -5.0903458-01   PZ   -4.0545572-01
   QX    -6.4634968-01   QY   -6.6240596-01   QZ   -3.7874849-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE   9-  2
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS.,  21 MINS.,  19.697 SECS. G.M.T.

T         .6950555591499555+002  HRS. FROM LAUNCH       2 DAYS, 21 HRS.,  30 MINS.,  20.001 SECS. G.E.T.     RAGR  .2483405758916344+003

            PHASE ELAPSED TIME      .23967734+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ       -.8277304318508869 7-002      -.2464522198805467 1+000      -.1620471285384734 5+000
        RDXYZ       -.9237555887893494 0+000      -.4720342776777379 5-001       .5306465104416167 4-001

SELENOCENTRIC
   XL    -2.8506485+01   YL    -8.4876507+02   ZL    -5.5807953+02  DXL   -5.3695186+03  DYL   -2.7437960+02  DZL    3.0844916+02
   RL     1.0162025+03 DECL    -3.3310872+01  RAL    -9.1923603+01   VL    5.3853648+03 PTHL    2.2390682+00  AZL   -8.4590007+01

SELENOGRAPHIC
   XS    -4.9051773+02   YS     8.6706957+02   ZS    -2.0062454+02  DXS    4.5362884+03  DYS    2.9049656+03  DZS    3.9808998+02
 ALTS     7.7708960+01 LATS    -1.1386464+01 LONS     1.1949766+02  VRS    5.4014084+03  PTR   -3.5233875+01  AZR   -8.5233875+01
  LTS    -1.5085069+00  LNS     1.2372067+02  LTE     3.1044095+00  LNE    7.7231789+00 DSMP    5.0277285+00 RSMP    1.1614588+02
  LIN     1.6766299+02  LAN     5.2454672+01  LAP    -1.9550785+02   DR    2.1040171+02   VT    5.3973089+03 SOLSV   7.9269795+01

GEOCENTRIC
    X     1.8622713+05    Y    -7.1743101+04    Z    -4.0616021+04   DX   -3.7837272+03   DY    2.3933444+03   DZ    1.7398962+03
    R     2.0365971+05  DEC    -1.1503676+01   RA    -2.1068937+01    V    4.8033246+03  PTH   -7.5481744+01   AZ    4.6477847+01

GEOGRAPHIC
   XG    -2.0567150+03   YG     1.9955797+05   ZG    -4.0616017+04  DXG    8.7591783+04  DYG   -3.4886508+03  DZG    1.7398759+03
  ALT     2.0021623+05  LAT    -1.1504943+01  LON     9.0590488+01   VE    8.7678496+04  PTE   -3.0400645+00  AZE   -8.9457461+01

EARTH-MOON PLANE
  XMP    -3.7986791+02   YMP    9.3855021+02   ZMP   -8.6552843+01 DXMP    4.8849785+03 DYMP    2.2381685+03 DZMP    3.6019869+02
  RMP     1.0162025+03  DEMP   -4.8859634+00  RAMP    1.1203510+02  VMP    5.3853648+03 PTMP    2.2390683+00 AZMP   -8.5956016+01
  XME    -2.0365752+05  YME    9.3854900+02   ZME   -8.6553144+01 DXME    4.6444441+03 DYME   -1.1710352+03 DZME    3.6019870+02

PLANETARY COORDINATES
   XM     1.8625563+05   YM    -7.0894336+04   ZM    -4.0057942+04  DXM    1.5857914+03  DYM    2.6677240+03  DZM    1.4314470+03
   RM     2.0327765+05  DEM    -1.1365102+01  RAM    -2.0838287+01  LOM    9.0821137+01   VM    3.4176785+03 ARGM   -2.4431602+01
 XSUN     3.7371846+06 YSUN    -7.2807323+07 ZSUN    -3.1572103+07  RAS   -8.7061597+01  LOS    2.4597826+01  DES   -2.3415939+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    -7.2119648+06   ECC    1.0017981+00   INC    4.4720954+01  RAN   -9.2095119+00  APF    1.3410702+02   RP    1.2967893+04
   VH     5.6677165+02 RNMP   -1.8589907-01 APMP    1.5048969+02 INMP    1.7307102+01  APO   -1.4436897+07  TFP    1.2167777+02
   TA    -1.5057154+02   EA   -1.3135180+01   MA   -1.3918515-01  SLR    2.5959285+04  PER    1.3494253+05  MTA    1.7656662+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS     1.0522773+03 ECCS    5.1960632-02 INCS    1.4630272+02 RANS   -1.7213944+02 APFS   -1.3282967+02  RPS    9.9760037+02
  VHS    -2.1034054+03 RNMPS   6.1729706+01 APMPS  -1.0147227+02 INMPS   1.7366069+02 APOS    1.1069543+03 TFPS   6.9228647+01
  TAS     5.0994264+01  EAS    4.8716779+01  MAS    4.6479596+01 SLRS    1.0494363+03 PERS    2.1444359+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX    -7.5876535-02   WY    5.4959176-01   WZ   -8.3198056-01   PX    7.5688002-01   PY   -5.1144893-01   PZ   -4.0688157-01
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   QX  -6.4913432-01   QY  -6.6058221-01   QZ  -3.7716805-01  SXO     0.0000000      SYO     0.0000000      SZO     0.0000000

****** CSM   / MOON  REF.  /PHASE   9-  3
                  MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS.,  40 MINS.,  4.697 SECS. G.M.T.

T        .69818055949955+002  HRS. FROM LAUNCH       2 DAYS, 21 HRS.,  49 MINS.,  5.001 SECS. G.E.T.     RAGR  .25304090932237+003

          PHASE ELAPSED TIME     .24080234+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.25336027843633040+000      -.15703375433003384+000      -.80616863556375839-001
        RDXYZ     -.53810051340524900+000       .56349858406147081+000       .42135663944084926+000

SELENOCENTRIC
   XL    -8.7255596+02   YL    -5.4081380+02   ZL    -2.7763911+02  DXL   -3.1278194+03  DYL    3.2754509+03  DZL    2.4492218+03
   RL     1.0634457+03  DECL   -1.5133857+01  RAL   -1.4820919+02  VL     5.1488368+03  PTHL   2.9080312+00  AZL   -5.9525909+01

SELENOGRAPHIC
   XS     4.3645145+02   YS     9.6825086+02   ZS    -5.4012018+01  DXS    4.7307509+03  DYS   -1.7867477+03  DZS    1.0541070+03
 ALTS     1.2495226+02 LATS    -2.9112840+00 LONS    6.5735919+01  VRS    5.1656184+03  PTR    2.8985762+00  AZR   -7.8043878+01
  LTS    -1.5086341+00  LNS    1.2356217+02  LTE    3.0865078+00  LNE    7.7288507+00 DSMP    5.0278466+00 RSMP    1.1598111+02
  LIN     1.6766106+02  LAN    5.2292555+01  LAP   -2.5712952+02  DR     2.6121561+02  VT     5.1590095+03 SOLSV   3.2205272+01

GEOCENTRIC
    X     1.8567579+05   Y    -7.0940883+04   Z    -4.0070357+04  DX    -1.5517102+03  DY     5.9467761+03  DZ     3.8827132+03
    R     2.0276523+05  DEC    -1.1397786+01  RA    -2.0910283+01  V      7.2696224+03  PTH   -3.5959414+01  AZ     5.8205704+01

GEOGRAPHIC
   XG     1.3696326+04   YG     1.9829401+05   ZG    -4.0070356+04  DXG    8.2624029+04  DYG   -9.2873687+03  DZG    3.8827252+03
  ALT     1.9932175+05  LAT    -1.1399048+01  LON    8.6048809+01  VE     8.3234976+04  PTE   -2.9398225+00  AZE   -8.7862643+01

EARTH-MOON PLANE
  XMP     5.5897745+02   YMP    9.0466318+02   ZMP    6.7566818+00 DXMP    4.4832425+03 DYMP   -2.4673110+03 DZMP    5.6871228+02
  RMP     1.0634457+03 DEMP     3.6403545-01 RAMP    5.8288718+01  VMP    5.1488367+03  PTMP   2.9080314+00  AZMP  -8.3668757+01
  XME    -2.0276321+05  YME    9.0466271+02  ZME    6.7559922+00 DXME    4.2426559+03 DYME   -5.8756998+03 DZME    5.6871229+02

PLANETARY COORDINATES
   XM     1.8654834+05   YM    -7.0400070+04   ZM    -3.9792719+04  DXM    1.5761092+03  DYM    2.6713251+03  DZM    1.4334914+03
   RM     2.0332219+05  DEM    -1.1286354+01  RAM   -2.0675624+01  LOM    8.6283467+01  VM     3.4168693+03 ARGM   -2.4253643+01
 XSUN     3.7555591+06 YSUN    -7.2806474+07 ZSUN   -3.1571734+07  RAS   -8.7047141+01  LOS    1.9911951+01  DES   -2.3415668+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    -7.7232729+04   ECC    2.9926781+00   INC    3.3572862+01  RAN   -3.2280844+00  APF    2.6336992+01  RP     1.5389997+05
   VH     5.4768926+03 RNMP     2.7528834-01 APMP    4.7294944+01 INMP    5.5476566+00  APO   -3.0836543+05  TFP    1.0330488+02
   TA    -4.7275196+01   EA    -3.6629926+01   MA   -8.0613188+01  SLR    6.1447304+05  PER    1.4954452+02  MTA    1.0952079+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS     1.0522687+03 ECCS     5.1830130-02 INCS    1.4630143+02 RANS   -1.7213491+02 APFS   -1.3278859+02  RPS    9.9772957+02
 VHS     -2.1717004+03 RNMPS    6.1566101+01 APMPS  -1.0142081+02 INMPS   1.7365833+02 APOS    1.1068080+03 TFPS   6.9228824+01
 TAS      1.0471833+02  EAS     1.0182568+02  MAS    9.8919058+01 SLRS    1.0494419+03 PERS    2.1444098+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX    -7.5922620-02   WY     5.4960433-01   WZ   -8.3196805-01  PX     7.5645368-01  PY    -5.1185342-01  PZ    -4.0716563-01
   QX    -6.4962568-01   QY    -6.6025837-01   QZ   -3.7688896-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE   9-  4
                  MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS.,  58 MINS.,  49.697 SECS. G.M.T.

T        .70130555949955+002  HRS. FROM LAUNCH       2 DAYS, 22 HRS.,  7 MINS.,  50.001 SECS. G.E.T.     RAGR  .25774124275311+003

          PHASE ELAPSED TIME     .24192734+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.30820675188943590+000       .54874119013045060-001       .64372468446726877-001
        RDXYZ      .19722673452840933+000       .70235015855227324+000       .44595500245948423+000

SELENOCENTRIC
   XL    -1.0614435+03   YL     1.8898281+02   ZL     2.2169450+02  DXL    1.1464208+03  DYL    4.0825542+03  DZL    2.5921467+03
   RL     1.1006931+03  DECL    1.1619630+01  RAL    1.6990466+02  VL     4.9699852+03  PTHL   1.3547593+00  AZL   -5.8145872+01

SELENOGRAPHIC
   XS     1.0436118+03   YS     3.2194380+02   ZS     1.3693713+02  DXS    1.4552429+03  DYS   -4.6889003+03  DZS    8.7770148+02
 ALTS     1.6219958+02 LATS     7.1466804+00 LONS    1.7144469+01  VRS    4.9873718+03  PTR    1.3500352+00  AZR   -7.9952935+01
  LTS    -1.5087610+00  LNS    1.2340366+02  LTE    3.0685841+00  LNE    7.7344351+00 DSMP    5.0279643+00 RSMP    1.1581643+02
  LIN     1.6766287+02  LAN    5.2123629+01  LAP   -2.3488581+01  DR     1.1750437+02  VT     4.9859873+03 SOLSV  -1.6319132+01

GEOCENTRIC
    X     1.8577783+05   Y    -6.9716156+04   Z    -3.9305422+04  DX     2.7128390+03  DY     6.7574526+03  DZ     4.0276674+03
    R     2.0228361+05  DEC    -1.1204329+01  RA    -2.0569421+01  V      8.3213440+03  PTH   -4.2733040+00  AZ     6.1314911+01

GEOGRAPHIC
   XG     2.8680871+04   YG     1.9634447+05   ZG    -3.9305417+04  DXG    7.9816396+04  DYG   -1.1491653+04  DZG    4.0276561+03
  ALT     1.9884011+05  LAT    -1.1205574+01  LON    8.1689338+01  VE     8.0739938+04  PTE   -4.4007914-01  AZE   -8.7172233+01

EARTH-MOON PLANE
  XMP     1.0832309+03   YMP    1.6969363+02   ZMP    9.6644617+01 DXMP    8.5390154+02 DYMP   -4.8840467+03 DZMP    3.4306451+02
  RMP     1.1006930+03 DEMP     5.0372518+00 RAMP    8.9033137+00  VMP    4.9699852+03  PTMP   1.3547594+00  AZMP  -8.6145117+01
  XME    -2.0228352+05  YME    1.6969422+02  ZME    9.6644846+01 DXME    6.1326587+02 DYME   -8.2916210+03 DZME    3.4306440+02

PLANETARY COORDINATES
   XM     1.8683927+05   YM    -6.9905139+04   ZM    -3.9527117+04  DXM    1.5664183+03  DYM    2.6748985+03  DZM    1.4355207+03
   RM     2.0336674+05  DEM    -1.1207556+01  RAM   -2.0513127+01  LOM    8.1745629+01  VM     3.4166604+03 ARGM   -2.4075764+01
 XSUN     3.7739334+06 YSUN    -7.2805624+07 ZSUN   -3.1571365+07  RAS   -8.7032685+01  LOS    1.5226073+01  DES   -2.3415393+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    -4.9994284+04   ECC    5.0326579+00   INC    3.0621520+01  RAN   -1.0178867+00  APF   -1.7303243+01  RP     2.0160994+05
   VH     6.8072976+03 RNMP    -7.0903692-01 APMP    5.7832057+00 INMP    2.3715863+00  APO   -3.0159841+05  TFP    7.3792035+01
   TA    -5.1216628+00   EA    -4.1921361+00   MA   -1.6924277+01  SLR    1.2162431+06  PER    7.7884132+01  MTA    1.0146107+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS     1.0524134+03 ECCS     5.1507862-02 INCS    1.4630342+02 RANS   -1.7213458+02 APFS   -1.3279580+02  RPS    9.9811120+02
 VHS     -2.2256229+03 RNMPS    6.1399927+01 APMPS  -1.0141668+02 INMPS   1.7365999+02 APOS    1.1067157+03 TFPS   6.9228400+01
 TAS      1.5408294+02  EAS     1.5275924+02  MAS    1.5140603+02 SLRS    1.0496115+03 PERS    2.1448520+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX    -7.5921787-02   WY     5.4957539-01   WZ   -8.3198725-01  PX     7.5654028-01  PY    -5.1177996-01  PZ    -4.0709706-01
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   QX   -6.4952493-01   QY   -6.6033940-01   QZ   -3.7692067-01  SXO     0.0000000      SYO     0.0000000      SZO     0.0000000

****** CSM   / MOON  REF.  /PHASE   9-  5
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 11 HRS.,  17 MINS.,  34.697 SECS. G.M.T.

T         .7044305591499555+002  HRS. FROM LAUNCH       2 DAYS, 22 HRS.,  26 MINS.,  35.001 SECS. G.E.T.    RAGR  .2624415761838554+003

            PHASE ELAPSED TIME      .2430523+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ       -.1486090700239949+000       .2301384066849644+000       .1655688320181917 3+000
         RDXYZ       .7611017943637685 7+000       .3508142097939903 5+000       .1622041422249529 9+000

SELENOCENTRIC
   XL   -5.1179975+02   YL    7.9258137+02   ZL    5.7020804+02  DXL    4.4240601+03  DYL    2.0391794+03  DZL    9.4284481+02
   RL    1.1023889+03 DECL    3.1147804+01  RAL    1.2285186+02  VL     4.9618058+03 PTHL   -1.1564973+00  AZL   -7.6451097+01

SELENOGRAPHIC
   XS    9.2326180+02   YS   -5.5513855+02   ZS    2.3381663+02  DXS   -2.6718053+03  DYS   -4.2003597+03  DZS    1.0518785+02
 ALTS    1.6389543+02 LATS    1.2245442+01 LONS   -3.1017636+01  VRS    4.9792197+03  PTR   -1.1524526+00  AZR   -8.8510872+01
  LTS   -1.5088885+00  LNS    1.2324515+02  LTE    3.0506387+00  LNE    7.7399320+00 DSMP    5.0280802+00 RSMP    1.1565183+02
  LIN    1.6766509+02  LAN    5.1970382+01  LAP    1.0951051+02  DR    -1.0014573+02  VT     4.9782124+03 SOLSV   -6.2322991+01

GEOCENTRIC
    X    1.8661660+05    Y   -6.8616967+04    Z   -3.8690934+04  DX     5.9807786+03  DY     4.7176237+03  DZ     2.3803800+03
    R    2.0256118+05  DEC   -1.1011652+01   RA   -2.0187946+01  V      7.9807201+03  PTH    2.5670819+01  AZ     6.4490193+01

GEOGRAPHIC
   XG    4.3473767+04   YG    1.9402080+05   ZG   -3.8690932+04  DXG    8.0502891+04  DYG   -1.3953970+04  DZG    2.3803806+03
  ALT    1.9911766+05  LAT   -1.1012875+01  LON    7.7370477+01  VE     8.1737967+04  PTE    2.4241010+00  AZE   -8.7826028+01

EARTH-MOON PLANE
  XMP    8.5133912+02  YMP   -6.9002584+02  ZMP    1.1978098+02 DXMP   -3.1921116+03 DYMP   -3.7971368+03 DZMP   -1.0813537+02
  RMP    1.1023889+03 DEMP    6.2378356+00 RAMP   -3.9025394+01  VMP    4.9618058+03 PTMP   -1.1564973+00 AZMP   -9.1130006+01
  XME   -2.0255996+05  YME   -6.9002549+02  ZME    1.1978051+02 DXME   -3.4327931+03 DYME   -7.2038972+03 DZME   -1.0813536+02

PLANETARY COORDINATES
   XM    1.8712839+05   YM   -6.9409548+04   ZM   -3.9261143+04  DXM    1.5567185+03  DYM    2.6784442+03  DZM    1.4375351+03
   RM    2.0341130+05  DEM   -1.1128705+01  RAM   -2.0350792+01  LOM    7.7207631+01  VM     3.4152516+03 ARGM   -2.3897970+01
 XSUN    3.7923075+06 YSUN   -7.2804768+07 ZSUN   -3.1570993+07  RAS   -8.7018228+01  LOS    1.0540194+01  DES   -2.3415120+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -5.6757084+04  ECC    4.1406755+00  INC    2.7638153+01  RAN    1.6273731+00  APF   -5.5991424+01  RP     1.7825558+05
   VH    6.3888822+03 RNMP   -1.7759430+02 APMP   1.4611294+02 INMP    8.7826432-01  APO   -2.9176975+05  TFP    4.8247462+01
   TA    3.1676127+01   EA    2.5838724+01   MA    8.4814612+01  SLR    9.1635412+05  PER    9.4210339+01  MTA    1.0397547+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    1.0523517+03 ECCS    5.1645481-02 INCS   1.4630661+02 RANS   -1.7212858+02 APFS   -1.3303597+02 RPS    9.9800256+02
  VHS   -2.2282656+03 RNMPS   6.1263880+01 APMPS  2.5837962+02 INMPS   1.7366103+02 APOS    1.1067010+03 TFPS   7.1371622+01
  TAS   -1.5815191+02  EAS   -1.5702290+02  MAS  -1.5586779+02 SLRS    1.0495448+03 PERS    2.1446634+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.5972965-02   WY    5.4952151-01   WZ   -8.3201817-01  PX     7.5931264-01  PY    -5.0895042-01  PZ    -4.0547965-01
   QX   -6.4627578-01   QY   -6.6256741-01   QZ   -3.7859216-01  SXO    0.0000000      SYO    0.0000000      SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE   9-  6
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 11 HRS.,  36 MINS.,  19.697 SECS. G.M.T.

T         .7075555591499555+002  HRS. FROM LAUNCH       2 DAYS, 22 HRS.,  45 MINS.,  20.001 SECS. G.E.T.    RAGR  .2671419096145943+003

            PHASE ELAPSED TIME      .2441773+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ        .1124091033083497 5+000       .2456487167914231 1+000       .1519661125795342 2+000
         RDXYZ       .8026302254633472 4+000      -.2678704826066243 5+000      -.2502806241063326 0+000

SELENOCENTRIC
   XL    3.8712948+02   YL    8.4599786+02   ZL    5.2336119+02  DXL    4.6654526+03  DYL   -1.5570521+03  DZL   -1.4548074+03
   RL    1.0674682+03 DECL    2.9359161+01  RAL    6.5411117+01  VL     5.1290665+03 PTHL   -2.8530166+00  AZL   -1.0732597+02

SELENOGRAPHIC
   XS    1.6317742+02   YS   -1.0413256+03   ZS    1.6882723+02  DXS   -5.0447369+03  DYS   -6.5465635+02  DZS   -7.7618621+02
 ALTS    1.2897474+02 LATS    9.0999196+00 LONS   -8.1094079+01  VRS    5.1459119+03  PTR   -2.8436691+00  AZR   -9.8336724+01
  LTS   -1.5090163+00  LNS    1.2308665+02  LTE    3.0326713+00  LNE    7.7453418+00 DSMP    5.0281961+00 RSMP    1.1548731+02
  LIN    1.6766383+02  LAN    5.1818217+01  LAP    2.5339961+02  DR    -2.5529391+02  VT     5.1395752+03 SOLSV   -6.4773333+01

GEOCENTRIC
    X    1.8780285+05    Y   -6.8067308+04    Z   -3.8471434+04  DX     6.2124627+03  DY     1.1249103+03  DZ    -1.5272814+01
    R    2.0342842+05  DEC   -1.0901160+01   RA   -1.9922552+01  V      6.3135052+03  PTH    5.8130611+01  AZ     7.2235055+01

GEOGRAPHIC
   XG    5.8618326+04   YG    1.9096324+05   ZG   -3.8471430+04  DXG    8.3178200+04  DYG   -1.9823816+04  DZG   -1.5322661+01
  ALT    1.9998489+05  LAT   -1.0902366+01  LON    7.2935539+01  VE     8.5507879+04  PTE    3.5950744+00  AZE   -8.9317061+01

EARTH-MOON PLANE
  XMP    3.0250873+01  YMP   -1.0653443+03  ZMP    6.0123362+01 DXMP   -5.1038621+03 DYMP    8.2597263+01 DZMP   -5.0109230+02
  RMP    1.0674682+03 DEMP    3.2287975+00 RAMP   -8.8373499+01  VMP    5.1290665+03 PTMP   -2.8530164+00 AZMP   -9.5460641+01
  XME   -2.0342562+05  YME   -1.0653435+03  ZME    6.0122829+01 DXME   -5.3445864+03 DYME   -3.3233496+03 DZMF   -5.0109230+02

PLANETARY COORDINATES
   XM    1.8741573+05   YM   -6.8913305+04   ZM   -3.8994795+04  DXM    1.5470102+03  DYM    2.6819623+03  DZM    1.4395346+03
   RM    2.0345587+05  DEM   -1.1049802+01  RAM   -2.0188619+01  LOM    7.2669473+01  VM     3.4144431+03 ARGM   -2.3720258+01
 XSUN    3.8106811+06 YSUN   -7.2803908+07 ZSUN   -3.1570620+07  RAS   -8.7003773+01  LOS    5.8543190+00  DES   -2.3414844+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -1.3560812+05  ECC    1.5696171+00  INC    2.0750583+01  RAN    1.0629347+01  APF   -1.2314689+02  RP     7.7244709+04
   VH    4.1332537+03 RNMP   -1.7958893+02 APMP   8.9001402+01 INMP    8.6732178+00  APO   -3.4846095+05  TFP    2.0652032+01
   TA    9.0886304+01   EA    5.9656315+01   MA    5.1841044+01  SLR    1.9848932+05  PER    3.4793412+02  MTA    1.2957576+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    1.0522200+03 ECCS    5.1835610-02 INCS   1.4630650+02 RANS   -1.7212064+02 APFS   -1.3303633+02 RPS    9.9767756+02
  VHS   -2.1776649+03 RNMPS   6.1120676+01 APMPS  2.5840688+02 INMPS   1.7365869+02 APOS    1.1067624+03 TFPS   7.1371332+01
  TAS   -1.0906673+02  EAS   -1.0623435+02  MAS  -1.0338281+02 SLRS    1.0493927+03 PERS    2.1442606+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.6049425-02   WY    5.4951254-01   WZ   -8.3201710-01  PX     7.5938717-01  PY    -5.0884016-01  PZ    -4.0547846-01
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   QX   -6.4617921-01   QY   -6.6265951-01   QZ   -3.7859577-01  SXO    0.0000000      SYO    0.0000000      SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE   9-  7
                  MEAN-OF-EPOCH  1969        24  DEC. 1968, 11 HRS.,  55 MINS.,  4.697 SECS. G.M.T.

T        .7106805591499555+002  HRS. FROM LAUNCH       2 DAYS, 23 HRS.,  4 MINS.,  5.001 SECS. G.E.T.     RAGR  .2718422304533 4+003

          PHASE ELAPSED TIME      .2453023 4+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .2847031753163498 6+000        .7724082480810790 8-001        .2498661837960260 3-001
        RDXYZ      .2061025949440374 3+000       -.7424190209716834 7+000       -.5091867741666722 7+000

SELENOCENTRIC
   XL    9.8049881+02   YL    2.6601227+02   ZL    8.6052252+01  DXL    1.1980135+03  DYL   -4.3154627+03  DZL   -2.9597524+03
   RL    1.0195810+03 DECL    4.8415017+00  RAL    1.5179136+01  VL     5.3682947+03  PTHL  -2.3874884+00  AZL   -1.2338504+02

SELENOGRAPHIC
   XS   -7.0581414+02   YS   -7.3547266+02   ZS   -2.1254574+01  DXS   -3.6219654+03  DYS    3.8187487+03  DZS   -1.1358656+03
  ALTS   8.1087481+01 LATS   -1.1944962+00 LONS   -1.3382114+02  VRS    5.3843909+03  PTR   -2.3803468+00  AZR   -1.0224252+02
   LTS   -1.5091435+00  LNS    1.2292815+02  LTE    3.0146826+00  LNE    7.7506649+00 DSMP    5.0283115+00 RSMP    1.1532287+02
   LIN    1.6766308+02  LAN    5.1649500+01  LAP    5.2978252+01  DR    -2.2362957+02  VT    5.3797448+03 SOLSV   -1.3210781+01

GEOCENTRIC
     X    1.8868175+05     Y   -6.8150400+04     Z   -3.8642027+04  DX     2.7353068+03  DY   -1.6300099+03  DZ   -1.5182333+03
     R    2.0429999+05   DEC   -1.0902807+01    RA   -1.9859330+01  V      3.5275868+03  PTH   7.2114287+01  AZ   -1.4612547+02

GEOGRAPHIC
    XG    7.4190844+04    YG    1.8639335+05    ZG   -3.8642026+04  DXG    8.4303764+04  DYG   -3.0186367+04  DZG   -1.5182874+03
   ALT    2.0085647+05   LAT   -1.0904008+01   LON    6.8298427+01  VE     8.9558066+04  PTE    2.1482593+00  AZE   -9.0575782+01

EARTH-MOON PLANE
   XMP   -7.9856640+02   YMP   -6.3241493+02   ZMP   -4.3456930+01  DXMP  -3.1191216+03  DYMP   4.3360364+03  DZMP   -5.3708243+02
   RMP    1.0195810+03  DEMP   -2.4428203+00  RAMP   -1.4162296+02  VMP    5.3682948+03  PTMP  -2.3874883+00  AZMP   -9.5854571+01
   XME   -2.0429901+05   YME   -6.3241420+02   ZME   -4.3457419+01  DXME  -3.3598857+03  DYME   9.3090250+02  DZME   -5.3708244+02

PLANETARY COORDINATES
    XM    1.8770126+05     YM   -6.8416412+04     ZM   -3.8728079+04  DXM    1.5372933+03  DYM    2.6854527+03  DZM    1.4415190+03
    RM    2.0350044+05    DEM   -1.0970849+01    RAM   -2.0026610+01  LOM    6.8131146+01  VM     3.4136350+03  ARGM   -2.3542628+01
  XSUN    3.8290550+06   YSUN   -7.2803046+07   ZSUN   -3.1570245+07  RAS   -8.6989316+01  LOS    1.1684404+00  DES    -2.3414564+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    2.2633912+05    ECC    9.5214076-01    INC    1.2318302+02  RAN    1.6737720+02  APF    3.2747114+01  RP     1.0832421+04
    VH   -1.2347020+03  RNMP   -1.7980125+02  APMP   -3.4028942+02  INMP   1.5032475+02  APO    4.4184582+05  TFP    8.8331449+00
    TA    1.6031444+02     EA    8.4130295+01     MA    2.9862671+01  SLR    2.1146405+04  PER    7.5025329+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    1.0523655+03  ECCS    5.2001721-02  INCS    1.4630600+02  RANS   -1.7211909+02  APFS   -1.3313011+02  RPS    9.9764067+02
   VHS   -2.1080577+03  RNMPS   6.0948270+01  APMPS  -1.0168303+02  INMPS  1.7365787+02  APOS   1.1070903+03  TFPS   7.1370759+01
   TAS   -5.5620788+01   EAS   -5.3196037+01   MAS   -5.0810397+01  SLRS   1.0495196+03  PERS   2.1447054+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
    WX   -7.6065281-02    WY    5.4951768-01    WZ   -8.3201227-01  PX     7.6045705-01  PY   -5.0773077-01  PZ   -4.0486353-01
    QX   -6.4491790-01    QY   -6.6350564-01    QZ   -3.7926392-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE   9-  8
                  MEAN-OF-EPOCH  1969        24  DEC. 1968, 12 HRS.,  12 MINS.,  53.447 SECS. G.M.T.

T        .7136493091499555+002  HRS. FROM LAUNCH       2 DAYS, 23 HRS.,  21 MINS.,  53.751 SECS. G.E.T.     RAGR  .2763075598045 7+003

          PHASE ELAPSED TIME      .2463710 9+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .2237544220508500 7+000       -.1434170624834245 5+000       -.1151689916590234 7+000
        RDXYZ      -.5954574096921228 0+000      -.6342235082966246 6+000       -.3643695624957234 1+000

SELENOCENTRIC
   XL    7.7059536+02   YL   -4.9391883+02   ZL   -3.9663435+02  DXL   -3.4612182+03  DYL   -3.6865541+03  DZL   -2.1179727+03
   RL    9.9754289+02 DECL   -2.3428934+01  RAL   -3.2658142+01  VL     5.4823827+03  PTHL  -6.5787369-02  AZL   -1.1493147+02

SELENOGRAPHIC
   XS   -9.7056441+02   YS    1.3762899+02   ZS   -1.8481010+02  DXS    8.8235115+02  DYS    5.3956145+03  DZS   -5.8171106+02
  ALTS    5.9049360+01 LATS   -1.0676600+01 LONS    1.7192908+02  VRS    5.4981440+03  PTR   -6.5599293-02  AZR   -9.6193191+01
   LTS   -1.5092647+00  LNS    1.2277757+02  LTE    2.9975736+00  LNE    7.7556407+00 DSMP    5.0284202+00 RSMP    1.1516673+02
   LIN    1.6766634+02  LAN    5.1497972+01  LAP    1.6135737+01  DR    -6.2949536+00  VT    5.4981403+03 SOLSV    4.0345464+01

GEOCENTRIC
     X    1.8874144+05     Y   -6.8437689+04     Z   -3.8870995+04  DX    -1.9331636+03  DY   -9.9781112+02  DZ   -6.7458227+02
     R    2.0449451+05   DEC   -1.0957648+01    RA   -1.9930655+01  V      2.2776763+03  PTH  -3.5482346+01  AZ   -1.2056281+02

GEOGRAPHIC
    XG    8.8759554+04    YG    1.8007994+05    ZG   -3.8870998+04  DXG    8.0568728+04  DYG   -4.1358427+04  DZG   -6.7455768+02
   ALT    2.0105099+05   LAT   -1.0958853+01   LON    6.3761786+01  VE     9.0566522+04  PTE   -8.3641583-01  AZE   -9.0596728+01

EARTH-MOON PLANE
   XMP   -9.5148747+02   YMP    2.7967772+02   ZMP   -1.0744210+02  DXMP   1.5654795+03  DYMP   5.2524443+03  DZMP   -1.3275040+02
   RMP    9.9754289+02  DEMP   -6.1831366+00  RAMP    1.6361997+02  VMP    5.4823827+03  PTMP  -6.5787617-02  AZMP   -9.1402735+01
   XME   -2.0449428+05   YME    2.7967636+02   ZME   -1.0744269+02  DXME   1.3246807+03  DYME   1.8480822+03  DZME   -1.3275041+02

PLANETARY COORDINATES
    XM    1.8797085+05     YM   -6.7943770+04     ZM   -3.8474362+04  DXM    1.5280546+03  DYM    2.6887430+03  DZM    1.4433904+03
    RM    2.0354280+05    DEM   -1.0895798+01    RAM   -1.9872849+01  LOM    6.3819592+01  VM     3.4128676+03  ARGM   -2.3373955+01
  XSUN    3.8465095+06   YSUN   -7.2802222+07   ZSUN   -3.1569888+07  RAS   -8.6975583+01  LOS    3.5671685+02  DES    -2.3414303+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.3261009+05    ECC    7.2922224-01    INC    1.4771193+02  RAN    1.7791218+02  APF    3.5788497+00  RP     3.5907865+04
    VH   -2.4823470+03  RNMP   -1.7966105+02  APMP   -1.6847928+01  INMP   1.7587391+02  APO    2.2931233+05  TFP    1.7423850+02
    TA   -1.6273367+02     EA   -1.3801828+02     MA   -1.1007101+02  SLR    6.2092677+04  PER    3.3645993+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    1.0524843+03  ECCS    5.2214299+02  INCS    1.4630985+02  RANS   -1.7211612+02  APFS   -1.3288305+02  RPS    9.9752963+02
   VHS   -2.0761038+03  RNMPS   6.0811338+01  APMPS  -1.0140702+02  INMPS  1.7366034+02  APOS   1.1074390+03  TFPS   7.1372037+01
   TAS   -1.3258406+00   EAS   -1.2583335+00   MAS   -1.1926358+00  SLRS   1.0496148+03  PERS   2.1450688+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
    WX   -7.6086003-02    WY    5.4945847-01    WZ   -8.3204947-01  PX     7.5769920-01  PY   -5.1057499-01  PZ   -4.0645427-01
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 QX   -6.4815338-01   QY   -6.6136869-01   QZ   -3.7747663-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE   9- 9
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 12 HRS., 31 MINS., 38.447 SECS. G.M.T.

T        .7167743091499S5+002  HRS. FROM LAUNCH       2 DAYS, 23 HRS., 40 MINS., 38.751 SECS. G.E.T.    RAGR  .281007893235277+003

          PHASE ELAPSED TIME      .24749609+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.34243562076038929-001      -.24686912834839991+000      -.15987418705536854+000
        RDXYZ     -.91811141481295415+000       .18655358530385470-001       .96380254875376309-001

SELENOCENTRIC
   XL   -1.1793255+02   YL   -8.5020088+02   ZL   -5.5059607+02  DXL   -5.3367107+03  DYL    1.0843809+02  DZL    5.6022998+02
   RL    1.0197576+03  DECL   -3.2678760+01  RAL   -9.7897185+01  VL    5.3671312+03  PTHL   2.3950191+00  AZL   -8.1318059+01

SELENOGRAPHIC
   XS   -3.9417698+02   YS    9.2047865+02   ZS   -1.9300040+02  DXS    4.7922416+03  DYS    2.4030992+03  DZS    4.8856317+02
  ALTS   8.1264108+01  LATS   -1.0909663+01  LONS   1.1318208+02  VRS    5.3832294+03  PTR    2.3878530+00  AZR   -8.4229454+01
  LTS   -1.5093925+00   LNS    1.2261907+02  LTE    2.9795437+00  LNE    7.7607936+00  DSMP   5.0285337+00  RSMP   1.1500246+02
  LIN    1.6766651+02   LAN    5.1354491+01  LAP   -1.8437580+02  DR     2.2428598+02  VT     5.3785551+03  SOLSV  7.6726986+01

GEOCENTRIC
     X    1.8813494+05     Y   -6.8295828+04     Z   -3.8757531+04  DX    -3.8183892+03  DY    2.8006174+03  DZ    2.0055757+03
     R    2.0386569+05   DEC   -1.0959382+01   RA   -1.9951662+01  V     5.1425566+03  PTH   -7.0355999+01  AZ    5.0271548+01

GEOGRAPHIC
    XG    1.0296252+05    YG    1.7163272+05    ZG   -3.8757528+04  DXG    7.2568380+04  DYG   -4.8833732+04  DZG    2.0055477+03
   ALT    2.0042218+05   LAT   -1.0960591+01   LON    5.9040444+01  VE     8.7492433+04  PTE   -3.1733198+00  AZE   -8.9275320+01

EARTH-MOON PLANE
   XMP   -2.7593938+02   YMP    9.7845171+02   ZMP   -7.9970756+01  DXMP   5.0758028+03  DYMP   1.6978638+03  DZMP   3.9947722+02
   RMP    1.0197576+03  DEMP   -4.4978299+00  RAMP   1.0574932+02  VMP    5.3671312+03  PTMP   2.3950195+00  AZMP   -8.5525490+01
   XME   -2.0386333+05   YME    9.7844984+02   ZME   -7.9970814+01  DXME   4.8349705+03  DYME   -1.7056865+03  DZME   3.9947724+02

PLANETARY COORDINATES
    XM    1.8825287+05    YM   -6.7445628+04    ZM   -3.8206935+04  DXM    1.5183215+03  DYM    2.6921794+03  DZM    1.4453457+03
    RM    2.0358738+05   DEM   -1.0816749+01   RAM   -1.9711152+01  LOM    5.9280956+01  VM     3.4120601+03  ARGM   -2.3196486+01
  XSUN    3.8648827+06  YSUN   -7.2801351+07  ZSUN   -3.1569509+07  RAS   -8.6961129+01  LOS    3.5203097+02  DES    -2.3414023+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -6.2307411+05   ECC    1.0421388+00   INC    4.0969744+01  RAN   -7.0663376+00  APF    1.1815181+02  RP     2.6255595+04
    VH    1.9282576+03  RNMP   -1.7987967-01  APMP   1.3490944+02  INMP   1.3295514+01  APO   -1.2724037+06  TFP    1.2517175+02
    TA   -1.3500717+02    EA   -4.1466896+01    MA   -5.6199457+00  SLR    5.3617577+04  PER    3.4267153+03  MTA    1.6365103+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    1.0522563+03  ECCS    5.1947134-02  INCS    1.4631157+02  RANS   -1.7210557+02  APFS   -1.3271016+02  RPS    9.9759459+02
   VHS   -2.1085738+03  RNMPS   6.0688179+01  APMPS  -1.0118904+02  INMPS  1.7365882+02  APOS   1.1069179+03  TFPS   7.1372888+01
   TAS    5.5952072+01   EAS    5.3520033+01   MAS    5.1126853+01  SLRS   1.0494167+03  PERS   2.1443715+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
    UX   -7.6183715-02    UY    5.4941951-01    UZ   -8.3206625-01  PX    7.5583601-01  PY   -5.1244139-01  PZ   -4.0757295-01
    QX   -6.5031371-01    QY   -6.5995605-01    QZ   -3.7623136-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000

****** CSM   / MOON  REF.  /PHASE   9- 10
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 12 HRS., 50 MINS., 23.447 SECS. G.M.T.

T        .7198993091499S5+002  HRS. FROM LAUNCH       2 DAYS, 23 HRS., 59 MINS., 23.751 SECS. G.E.T.    RAGR  .285708226666017+003

          PHASE ELAPSED TIME      .24862109+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.26767292990967606+000      -.14066739623599550+000      -.68366684583300993-001
        RDXYZ     -.47730741646483016+000       .59831359901118322+000       .43880980836311318+000

SELENOCENTRIC
   XL   -9.2184777+02   YL   -4.8444916+02   ZL   -2.3545031+02  DXL   -2.7744471+03  DYL    3.4778203+03  DZL    2.5506677+03
   RL    1.0676755+03  DECL   -1.2739934+01  RAL   -1.5227719+02  VL    5.1282255+03  PTHL   2.8499659+00  AZL   -5.8545648+01

SELENOGRAPHIC
   XS    5.3306381+02   YS    9.2438544+02   ZS   -3.5855911+01  DXS    4.4974003+03  DYS   -2.2574217+03  DZS    1.0720234+03
  ALTS   1.2918205+02  LATS   -1.9245348+00  LONS   6.0029311+01  VRS    5.1450749+03  PTR    2.8406253+00  AZR   -7.7854174+01
  LTS   -1.5095205+00   LNS    1.2246057+02  LTE    2.9614933+00  LNE    7.7658598+00  DSMP   5.0286467+00  RSMP   1.1483827+02
  LIN    1.6766481+02   LAN    5.1190237+01  LAP    6.8235616+01  DR     2.5497939+02  VT     5.1387528+03  SOLSV  2.7598678+01

GEOCENTRIC
     X    1.8761124+05     Y   -6.7431301+04     Z   -3.8174598+04  DX    -1.2658669+03  DY    6.1734084+03  DZ    3.9979538+03
     R    2.0298339+05   DEC   -1.0840032+01   RA   -1.9769470+01  V     7.4630439+03  PTH   -3.2162090+01  AZ    5.8405992+01

GEOGRAPHIC
    XG    1.1570655+05    YG    1.6234823+05    ZG   -3.8174596+04  DXG    6.5647253+04  DYG   -5.0814155+04  DZG    3.9979624+03
   ALT    1.9953986+05   LAT   -1.0841234+01   LON    5.4522302+01  VE     8.3112119+04  PTE   -2.7397891+00  AZE   -8.7715068+01

EARTH-MOON PLANE
   XMP    6.5035792+02   YMP    8.4657502+02   ZMP    1.6626793+01  DXMP   4.1873302+03  DYMP   -2.9063095+03  DZMP   5.6420465+02
   RMP    1.0676755+03  DEMP    8.9229687-01  RAMP   5.2467721+01  VMP    5.1282254+03  PTMP   2.8499658+00  AZMP   -8.3719630+01
   XME   -2.0298162+05   YME    8.4657209+02   ZME    1.6625997+01  DXME   3.9464676+03  DYME   -6.3090483+03  DZME   5.6420471+02

PLANETARY COORDINATES
    XM    1.8853308+05    YM   -6.6946851+04    ZM   -3.7939148+04  DXM    1.5085802+03  DYM    2.6955881+03  DZM    1.4472860+03
    RM    2.0363197+05   DEM   -1.0737653+01   RAM   -1.9549614+01  LOM    5.4742158+01  VM     3.4112529+03  ARGM   -2.3019098+01
  XSUN    3.8832557+06  YSUN   -7.2800477+07  ZSUN   -3.1569129+07  RAS   -8.6946673+01  LOS    3.4734509+02  DES    -2.3413742+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -7.0479562+04   ECC    3.3274785+00   INC    3.3219006+01  RAN   -2.7673495+00  APF    2.1290214+01  RP     1.6403966+05
    VH    5.7332822+03  RNMP   -2.9127183-01  APMP   4.1420106+01  INMP   5.1265294+00  APO   -3.0499879+05  TFP    1.0159833+02
    TA   -4.1367585+01    EA   -3.2578590+01    MA   -8.1762512+01  SLR    7.0987814+05  PER    1.3036567+02  MTA    1.0748931+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    1.0522876+03  ECCS    5.1821519-02  INCS    1.4631040+02  RANS   -1.7210194+02  APFS   -1.3264587+02  RPS    9.9775648+02
   VHS   -2.1777966+03  RNMPS   6.0521715+01  APMPS  -1.0111700+02  INMPS  1.7365681+02  APOS   1.1068187+03  TFPS   7.1373144+01
   TAS    1.0921995+02   EAS    1.0639077+02   MAS    1.0354228+02  SLRS   1.0494617+03  PERS   2.1444672+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
    UX   -7.6220943-02    UY    5.4943161-01    UZ   -8.3205485-01  PX    7.5513723-01  PY   -5.1312536-01  PZ   -4.0800744-01
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  QX   -6.5112063-01   QY   -6.5941431-01   QZ   -3.7578537-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE   9- 11
                  MEAN-OF-EPOCH  1969       24  DEC. 1968, 13 HRS.,  1 MINS., 56.310 SECS. G.M.T.

T        .721823929825540+002  HRS. FROM LAUNCH      3 DAYS,  0 HRS., 10 MINS., 56.615 SECS. G.E.T.    RAGR  .288603061514960+003

          PHASE ELAPSED TIME     .24931395+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.31634010840698186+000     -.10682646230875462-001      .21923145889080109-001
       RDXYZ      -.21254339013684462-001      .71784224988178892+000      .47594221765246845+000

SELENOCENTRIC
   XL   -1.0894543+03   YL   -3.6790323+01   ZL    7.5501856+01  DXL   -1.2354520+02  DYL    4.1726051+03  DZL    2.7665116+03
   RL    1.0926869+03 DECL    3.9621482+00  RAL   -1.7806588+02   VL    5.0079420+03 PTHL    1.9893989+00  AZL   -5.6517900+01

SELENOGRAPHIC
   XS    9.4338030+02   YS    5.4466083+02   ZS    8.5690676+01  DXS    2.5434065+03  DYS   -4.2151416+03  DZS    1.0081028+03
 ALTS    1.5419340+02 LATS    4.4978672+00 LONS    2.9999997+01  VRS    5.0251972+03  PTR    1.9825648+00  AZP   -7.8543331+01
  LTS   -1.5095996+00  LNS    1.2236293+02  LTF    2.9503637+00  LNE    7.7689381+00 DSMP    5.0287163+00 RSMP    1.1473716+02
  LIN    1.6766579+02  LAN    5.1085127+01  LAP   -3.0528109+02   DR    1.7384859+02  VT     5.0221891+03 SOLSV  -2.4733132+00

GEOCENTRIC
    X    1.8761535+05    Y   -6.6676076+04    Z   -3.7698507+04   DX    1.3790302+03  DY     6.8702792+03  DZ     4.2149855+03
    R    2.0264845+05  DEC   -1.0721135+01   RA   -1.9564556+01    V    8.1773201+03  PTH   -1.2485407+01  AZ     6.0304611+01

GEOGRAPHIC
   XG    1.2304350+05   YG    1.5654237+05   ZG   -3.7698501+04  DXG    6.3288984+04  DYG   -5.1019116+04  DZG    4.2149985+03
  ALT    1.9920491+05  LAT   -1.0722326+01  LON    5.1832382+01   VE    8.1401550+04  PTE   -1.2444941+00  AZE   -8.7214356+01

EARTH-MOON PLANE
  XMP    1.0114217+03   YMP    4.0656811+02   ZMP    7.5453872+01 DXMP    1.9929112+03 DYMP   -4.5728602+03 DZMP    4.4355011+02
  RMP    1.0926869+03 DEMP    3.9596260+00 RAMP    2.1898986+01  VMP    5.0079419+03 PTMP    1.9893990+00 AZMP   -8.5041717+01
  XME   -2.0264803+05 YME     4.0656777+02 ZME     7.5453134+01 DXME    1.7520314+03 DYME   -7.9750995+03 DZME    4.4355007+02

PLANETARY COORDINATES
   XM    1.8870480+05   YM   -6.6639286+04   ZM   -3.7774009+04  DXM    1.5025754+03  DYM    2.6976742+03  DZM    1.4484739+03
   RM    2.0365945+05  DEM   -1.0688905+01  RAM   -1.9450182+01  LOM    5.1946757+01   VM    3.4107558+03 ARGM   -2.2909865+01
 XSUN    3.8945736+06 YSUN   -7.2799936+07 ZSUN   -3.1568895+07  RAS   -8.6937768+01  LOS    3.4445917+02  DES   -2.3413569+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -5.2647088+04  ECC    4.7394418+00  INC    3.1404695+01  RAN   -1.4979864+00  APF   -5.8166213+00   RP    1.9687072+05
   VH    6.6335765+03 RNMP   -4.9778441-01 APMP    1.5483308+01 INMP    3.1895206+00  APO   -3.0216490+05  TFP    8.3046318+01
   TA   -1.5099880+01   EA   -1.2306401+01   MA   -4.6468568+01  SLR    1.1299279+06  PER    8.4164701+01  MTA    1.0218068+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    1.0523885+03 ECCS    5.1668568-02 INCS    1.4631142+02 RANS   -1.7210207+02 APFS   -1.3262177+02  RPS    9.9801308+02
  VHS   -2.2139794+03 RNMPS   6.0417338+01 APMPS  -1.0108797+02 INMPS   1.7365775+02 APOS    1.1067639+03 TFPS    7.1373103+01
  TAS    1.3977783+02  EAS    1.3782651+02  MAS    1.3583897+02 SLRS    1.0495789+03 PERS    2.1447756+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.6217668-02   WY    5.4941708-01   WZ   -8.3206475-01   PX    7.5486309-01   PY   -5.1341165-01   PZ   -4.0815457-01
   QX   -6.5143882-01   QY   -6.5920355-01   QZ   -3.7560363-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

LONG   TERMINATION
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****** CSM   / MOON  REF.  /PHASE   9= 1
                    MEAN-OF-EPOCH  1969       24  DEC. 1968, 13 HRS.,  1 MINS.,  56.310 SECS. G.M.T.      USNM  USFT  / SEC

T        .721823929825540+002  HRS. FROM LAUNCH       3 DAYS,  0 HRS.,  10 MINS.,  56.615 SECS. G.E.T.     RAGR  .2886030615149 60+003

          PHASE ELAPSED TIME      .24931395+06 SECS.        PHASE ORBIT COUNT   .000        TOTAL ORBIT COUNT  1.835

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       -.31634010840698186+000       -.10682646230875462-001       .21923145889080109-001
        RDXYZ      -.21254339013684462-001       .71784224988178892+000        .47594221765246845+000

SELENOCENTRIC
   XL   -1.0894543+03   YL    -3.6790323+01   ZL     7.5501856+01  DXL   -1.2354520+02  DYL     4.1726051+03  DZL     2.7665116+03
   RL    1.0926869+03  DECL    3.9621482+00   RAL   -1.7806588+02  VL     5.0079420+03  PTHL    1.9893989+00  AZL    -5.6517900+01

SELENOGRAPHIC
   XS    9.4338030+02   YS     5.4466083+02   ZS     8.5690676+01  DXS    2.5434065+03  DYS    -4.2151416+03  DZS     1.0081028+03
 ALTS    1.5419340+02  LATS    4.4978672+00  LONS    2.9999997+01  VRS    5.0251972+03  PTR     1.9825648+00  AZR    -7.8543331+01
  LTS   -1.5095996+00   LNS    1.2236293+02   LTE    2.9503637+00  LNE    7.7689381+00  DSMP    5.0287163+00  RSMP    1.1473716+02
  LIN    1.6766579+02   LAN    5.1085127+01   LAP   -3.0528109+02   DR    1.7384859+02   VT     5.0221891+03  SOLSV  -2.4733132+00

GEOCENTRIC
    X    1.8761535+05    Y    -6.6676076+04   Z     -3.7698507+04  DX     1.3790302+03  DY     6.8702792+03  DZ     4.2149855+03
    R    2.0264845+05  DEC    -1.0721135+01   RA    -1.9564556+01   V     8.1773201+03  PTH   -1.2485407+01  AZ     6.0304611+01

GEOGRAPHIC
   XG    1.2304350+05   YG     1.5654237+05   ZG    -3.7698501+04  DXG    6.3288984+04  DYG    -5.1019116+04  DZG     4.2149985+03
  ALT    1.9920491+05  LAT    -1.0722326+01   LON    5.1832382+01  VE     8.1401550+04  PTE    -1.2444941+00  AZE    -8.7214356+01

EARTH-MOON PLANE
  XMP    1.0114217+03  YMP     4.0656811+02   ZMP    7.5453872+01 DXMP    1.9929112+03 DYMP    -4.5728602+03 DZMP     4.4355011+02
  RMP    1.0926869+03 DEMP     3.9596260+00  RAMP    2.1898986+01  VMP    5.0079419+03  PTMP    1.9893990+00  AZMP   -8.5041717+01
  XME   -2.0264803+05  YME     4.0656777+02   ZME    7.5453134+01 DXME    1.7520314+03 DYME    -7.9750995+03 DZME     4.4355007+02

PLANETARY COORDINATES
   XM    1.8870480+05   YM    -6.6639286+04   ZM    -3.7774009+04  DXM    1.5025754+03  DYM     2.6976742+03  DZM     1.4484739+03
   RM    2.0365945+05  DEM    -1.0688905+01   RAM   -1.9450182+01  LOM    5.1946757+01  VM      3.4107558+03  ARGM   -2.2909865+01
 XSUN    3.8945736+06 YSUN    -7.2799936+07  ZSUN   -3.1568895+07  RAS   -8.6937768+01  LOS     3.4445917+02  DES    -2.3413569+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -5.2647088+04   ECC     4.7394418+00   INC    3.1404695+01  RAN   -1.4979864+00  APF    -5.8166213+00  RP      1.9687072+05
   VH    6.6335765+03 RNMP    -4.9778441-01  APMP    1.5483308+01 INMP    3.1895206+00  APO    -3.0216490+05  TFP     8.3046318+01
   TA   -1.5099880+01   EA    -1.2306401+01   MA    -4.6468568+01  SLR    1.1299279+06  PER     8.4164701+01  MTA     1.0218068+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    1.0523885+03 ECCS     5.1668568-02  INCS    1.4631142+02 RANS   -1.7210207+02 APFS   -1.3262177+02  RPS     9.9801308+02
  VHS   -2.2139794+03 RNMPS    6.0417338+01 APMPS   -1.0108797+02 INMPS   1.7365775+02 APOS    1.1067639+03 TFPS    7.1373103+01
  TAS    1.3977783+02  EAS     1.3782651+02   MAS    1.3583897+02 SLRS    1.0495789+03 PERS    2.1447756+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   UX   -7.6217668-02   UY     5.4941708-01   UZ    -8.3206475-01   PX    7.5486309-01   PY    -5.1341165-01   PZ    -4.0815457-01
   QX   -6.5143882-01   QY    -6.5920355-01   QZ    -3.7560363-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE   9= 2
                    MEAN-OF-EPOCH  1969       24  DEC. 1968, 13 HRS.,  20 MINS.,  41.310 SECS. G.M.T.

T        .729498929825540+002  HRS. FROM LAUNCH       3 DAYS,  0 HRS.,  29 MINS.,  41.615 SECS. G.E.T.     RAGR  .2933033949457 00+003

          PHASE ELAPSED TIME      .25043895+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       -.21309583723140423+000       .19110874552153927+000        .14569967534885580+000
        RDXYZ       .63720926095170366+000       .49528468275925614+000        .26860276826387075+000

SELENOCENTRIC
   XL   -7.3388790+02   YL     6.5816581+02   ZL     5.0178000+02  DXL    3.7039094+03  DYL     2.8789437+03  DZL     1.5613086+03
   RL    1.1061450+03  DECL    2.6976787+01   RAL    1.3811359+02  VL     4.9441830+03  PTHL   -4.1904829-01  AZL    -6.9017961+01

SELENOGRAPHIC
   XS    1.0314313+03   YS    -3.3300524+02   ZS     2.2093801+02  DXS   -1.6261031+03  DYS    -4.6732726+03  DZS     3.6657798+02
 ALTS    1.6765150+02  LATS    1.1521576+01  LONS   -1.7893057+01  VRS    4.9616597+03  PTR    -4.1757189-01  AZR    -8.5590226+01
  LTS   -1.5097279+00   LNS    1.2220443+02   LTE    2.9322798+00  LNE    7.7738641+00  DSMP    5.0288279+00  RSMP    1.1457310+02
  LIN    1.6766850+02   LAN    5.0927249+01   LAP    9.1895334+01   DR   -3.6160277+01   VT     4.9615279+03  SOLSV  -4.9172415+01

GEOCENTRIC
    X    1.8824822+05    Y    -6.5481330+04   Z     -3.7003864+04  DX     5.1967306+03  DY     5.5799819+03  DZ     3.0116986+03
    R    2.0271774+05  DEC    -1.0517676+01   RA    -1.9180010+01   V     8.1983250+03  PTH    1.7561078+01  AZ     6.3214453+01

GEOGRAPHIC
   XG    1.3461052+05   YG     1.4698707+05   ZG    -3.7003863+04  DXG    6.2057682+04  DYG    -5.2662633+04  DZG     3.0117048+03
  ALT    1.9927419+05  LAT    -1.0518845+01   LON    4.7516597+01  VE     8.1446791+04  PTE    1.7403450+00   AZE    -8.7520109+01

EARTH-MOON PLANE
  XMP    9.0693182+02  YMP    -4.8441446+02   ZMP    1.2192224+02 DXMP   -2.2140101+03 DYMP    -4.4206572+03 DZMP     2.9921916+01
  RMP    1.1061450+03 DEMP     6.3281509+00  RAMP   -2.6143129+01  VMP    4.9441830+03  PTMP   -4.1904882-01  AZMP   -8.9604596+01
  XME   -2.0271712+05  YME    -4.8441503+02   ZME    1.2192275+02 DXME   -2.4549152+03 DYME    -7.8220861+03 DZME     2.9921927+01

PLANETARY COORDINATES
   XM    1.8898210+05   YM    -6.6139496+04   ZM    -3.7505645+04  DXM    1.4928211+03  DYM     2.7010382+03  DZM     1.4503900+03
   RM    2.0370405+05  DEM    -1.0609732+01   RAM   -1.9288900+01  LOM    4.7407704+01  VM      3.4099492+03  ARGM   -2.2732610+01
 XSUN    3.9129464+06 YSUN    -7.2799055+07  ZSUN   -3.1568512+07  RAS   -8.6923313+01  LOS     3.3977329+02  DES    -2.3413286+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -5.2229549+04   ECC     4.6635670+00   INC    2.8633735+01  RAN    6.9958215-01  APF    -4.3661081+01  RP      1.9134645+05
   VH    6.6600391+03 RNMP    -9.2507565+00  APMP   -1.1875837+01 INMP    2.1110188-01  APO    -2.9580554+05  TFP     5.7443130+01
   TA    2.1270575+01   EA     1.7440134+01   MA     6.5154883+01  SLR    1.0837033+06  PER     8.3165435+01  MTA     1.0238198+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    1.0523896+03 ECCS     5.1598985-02  INCS    1.4631485+02 RANS   -1.7209803+02 APFS   -1.3285467+02  RPS     9.9808738+02
  VHS   -2.2336706+03 RNMPS    6.0274552+01 APMPS    2.5870997+02 INMPS   1.7365956+02 APOS    1.1066918+03 TFPS    7.3516305+01
  TAS   -1.7227044+02  EAS    -1.7186209+02   MAS   -1.7144360+02 SLRS    1.0495876+03 PERS    2.1447790+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   UX   -7.6249553-02   UY     5.4936232-01   UZ    -8.3209798-01   PX    7.5754432-01   PY    -5.1069847-01   PZ    -4.0658782-01
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 QX   -6.4831518-01   QY   -6.6135323-01   QZ   -3.7722577-01  SXO     0.0000000     SYO     0.0000000     SZO     0.0000000

****** CSM   / MOON  REF.  /PHASE   9-  3
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 13 HRS., 39 MINS., 26.310 SECS. G.M.T.

T        .7280739298255+002  HRS. FROM LAUNCH       3 DAYS,  0 HRS., 48 MINS., 26.615 SECS. G.E.T.    RAGR  .2980037283764+003

          PHASE ELAPSED TIME      .25156395+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .35739315903861229-001       .26166194586085693+000       .16946454500488511+000
        RDXYZ       .85793336888054450+000      -.78755616476722886-001      -.13068946247119329+000

SELENOCENTRIC
   XL    1.2308383+02   YL    9.0114634+02   ZL    5.8362462+02  DXL    4.9869135+03  DYL   -4.5778316+02  DZL   -7.5965927+02
   RL    1.0806628+03 DECL   3.2687839+01  RAL    8.2222334+01  VL     5.0651706+03 PTHL   -2.5347415+00  AZL   -9.8625031+01

SELENOGRAPHIC
   XS    4.0888481+02   YS   -9.7917340+02   ZS    2.0460863+02  DXS   -4.7091827+03  DYS   -1.8325926+03  DZS   -5.4244909+02
 ALTS    1.4216926+02 LATS    1.0914050+01 LONS   -6.7335480+01  VRS    5.0822286+03  PTR   -2.5262287+00  AZR   -9.5756389+01
  LTS   -1.5098566+00  LNS    1.2204594+02  LTE    2.9141759+00  LNE    7.7787044+00 DSMP    5.0289387+00 RSMP    1.1440912+02
  LIN    1.6766822+02  LAN    5.0777431+01  LAP    2.8306489+02  DR    -2.2400798+02  VT     5.0772894+03 SOLSV   -7.6763133+01

GEOCENTRIC
    X    1.8938068+05    Y   -6.4737941+04    Z   -3.6653303+04  DX     6.4699724+03  DY     2.2465914+03  DZ     6.9263190+02
    R    2.0346869+05  DEC   -1.0378044+01   RA   -1.8872492+01  V      6.8838546+03  PTH    4.8836760+01  AZ     6.8600063+01

GEOGRAPHIC
   XG    1.4607795+05   YG    1.3681109+05   ZG   -3.6653302+04  DXG    6.1672179+04  DYG   -5.7956534+04  DZG    6.9266531+02
  ALT    2.0002513+05  LAT   -1.0379195+01  LON    4.3123778+01  VE     8.4633904+04  PTE    3.5105899+00  AZE   -8.8878532+01

EARTH-MOON PLANE
  XMP    2.8264363+02  YMP   -1.0395952+03  ZMP    8.4772401+01 DXMP   -4.9185458+03 DYMP   -1.1379136+03 DZMP   -4.1111305+02
  RMP    1.0806628+03 DEMP    4.4991798+00 RAMP   -7.4790152+01  VMP    5.0651706+03 PTMP   -2.5347414+00 AZMP   -9.4474294+01
  XME   -2.0346601+05  YME   -1.0395939+03  ZME    8.4772183+01 DXME   -5.1594733+03 DYME   -4.5385326+03 DZME   -4.1111306+02

PLANETARY COORDINATES
   XM    1.8925760+05   YM   -6.5639087+04   ZM   -3.7236927+04  DXM    1.4830590+03  DYM    2.7043746+03  DZM    1.4522912+03
   RM    2.0374866+05  DEM   -1.0530512+01  RAM   -1.9127775+01  LOM    4.2868496+01  VM     3.4091429+03 ARGM   -2.2555438+01
 XSUN    3.9313187+06 YSUN   -7.2798171+07 ZSUN   -3.1568128+07  RAS   -8.6908857+01  LOS    3.3508741+02  DES   -2.3413002+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -9.4115888+04  ECC    2.2131595+00  INC    2.3676881+01  RAN    5.8143440+00  APF   -9.5376602+01  RP     1.1417759+05
   VH    4.9613909+03 RNMP   -1.7944662+02 APMP    1.1101465+02 INMP    5.2332664+00  APO   -3.0240936+05  TFP    2.9183517+01
   TA    6.8723632+01   EA    5.1319475+01   MA    7.8066348+01  SLR    3.6687079+05  PER    2.0116984+02  MTA    1.1686197+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    1.0522387+03 ECCS    5.1808634-02 INCS    1.4631583+02 RANS   -1.7208965+02 APFS   -1.3291912+02  RPS    9.9772371+02
  VHS   -2.1968175+03 RNMPS   6.0138763+01 APMPS   2.5867964+02 INMPS   1.7365801+02 APOS    1.1067538+03 TFPS    7.3515572+01
  TAS   -1.2392661+02  EAS   -1.2142606+02  MAS   -1.1889307+02 SLRS    1.0494144+03 PERS    2.1443179+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.6327945-02   WY    5.4933710-01   WZ   -8.3210744-01  PX     7.5834858-01  PY    -5.0985021-01  PZ    -4.0615287-01
   QX   -6.4736499-01   QY   -6.6202830-01   QZ   -3.7767319-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE   9-  4
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 13 HRS., 58 MINS., 11.310 SECS. G.M.T.

T        .7311989298255+002  HRS. FROM LAUNCH       3 DAYS,  1 HRS.,  7 MINS., 11.615 SECS. G.E.T.    RAGR  .3027040618071804003

          PHASE ELAPSED TIME      .25268895+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .25490908698212365+000       .14159463239702144+000       .70086836443084408-001
        RDXYZ       .43717390680573789+000      -.64887231075135710+000      -.46850544176381755+000

SELENOCENTRIC
   XL    8.7788995+02   YL    4.8764250+02   ZL    2.4137440+02  DXL    2.5411629+03  DYL   -3.7717032+03  DZL   -2.7232838+03
   RL    1.0328346+03 DECL   1.3515057+01  RAL    2.9050906+01  VL     5.3008988+03 PTHL   -2.7817929+00  AZL   -1.2115238+02

SELENOGRAPHIC
   XS   -5.0214395+02   YS   -9.0165377+02   ZS    4.0242966+01  DXS   -4.4329679+03  DYS    2.7134009+03  DZS   -1.1219900+03
 ALTS    9.4341205+01 LATS    2.2330154+00 LONS   -1.1911406+02  VRS    5.3171994+03  PTR   -2.7732573+00  AZR   -1.0209484+02
  LTS   -1.5099848+00  LNS    1.2188744+02  LTE    2.8960516+00  LNE    7.7834582+00 DSMP    5.0290487+00 RSMP    1.1424523+02
  LIN    1.6766657+02  LAN    5.0612903+01  LAP   -1.0350791+02  DR    -2.5726511+02  VT     5.3109720+03 SOLSV   -2.9030624+01

GEOCENTRIC
    X    1.9040918+05    Y   -6.4650421+04    Z   -3.6726484+04  DX     4.0144519+03  DY    -1.0640199+03  DZ    -1.2691065+03
    R    2.0441175+05  DEC   -1.0350489+01   RA   -1.8754105+01  V      4.3426482+03  PTH    8.2349968+01  AZ     1.5067330+02

GEOGRAPHIC
   XG    1.5727961+05   YG    1.2529346+05   ZG   -3.6726484+04  DXG    5.8579046+04  DYG   -6.6883866+04  DZG   -1.2690856+03
  ALT    2.0096819+05  LAT   -1.0351631+01  LON    3.8541835+01  VE     8.8918880+04  PTE    2.7744149+00  AZE   -9.0325059+01

EARTH-MOON PLANE
  XMP   -6.1680363+02  YMP   -8.2832623+02  ZMP   -1.3286352+01 DXMP   -4.0628686+03 DYMP    3.3554180+03 DZMP   -5.7775274+02
  RMP    1.0328346+03 DEMP   -7.3707139-01 RAMP   -1.2667279+02  VMP    5.3008989+03 PTMP   -2.7817927+00 AZMP   -9.6301141+01
  XME   -2.0441008+05  YME   -8.2832525+02  ZME   -1.3286593+01 DXME   -4.3038151+03 DYME   -4.4391695+01 DZME   -5.7775274+02

PLANETARY COORDINATES
   XM    1.8953128+05   YM   -6.5138063+04   ZM   -3.6967859+04  DXM    1.4732890+03  DYM    2.7076833+03  DZM    1.4541773+03
   RM    2.0379326+05  DEM   -1.0451248+01  RAM   -1.8966807+01  LOM    3.8329132+01  VM     3.4083370+03 ARGM   -2.2378347+01
 XSUN    3.9496908+06 YSUN   -7.2797283+07 ZSUN   -3.1567742+07  RAS   -8.6894402+01  LOS    3.3040153+02  DES   -2.3412714+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    6.0831291+05  ECC    9.9503324-01  INC    6.1195766+01  RAN    1.5548223+02  APF    2.4578078+01  RP     3.0213476+03
   VH   -4.1833860+02 RNMP   -1.7976800+02 APMP   -3.4724993+02 INMP    8.7327886+01  APO    1.2136044+06  TFP    2.0963050+01
   TA    1.6725366+02   EA    4.8142240+01   MA    5.6800842+00  SLR    6.0276798+03  PER    3.3056662+03  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    1.0522962+03 ECCS    5.1929031-02 INCS    1.4631468+02 RANS   -1.7208613+02 APFS   -1.3297678+02  RPS    9.9765147+02
  VHS   -2.1273290+03 RNMPS   5.9972156+01 APMPS   -1.0137057+02 INMPS   1.7365607+02 APOS    1.1069409+03 TFPS    7.3515171+01
  TAS   -7.1943904+01  EAS   -6.9136347+01  MAS   -6.6356122+01 SLRS    1.0494585+03 PERS    2.1444935+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.6363952-02   WY    5.4934896-01   WZ   -8.3209632-01  PX     7.5902079-01  PY    -5.0912908-01  PZ    -4.0578480-01
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   QX   -6.4656188-01   QY   -6.6257323-01   QZ   -3.7809312-01   SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE   9-  5
                    MEAN-OF-EPOCH  1969        24   DEC. 1968, 14 HRS.,  16 MINS.,  56.310 SECS. G.M.T.

T        .73432392982554O+002  HRS. FROM LAUNCH       3 DAYS,  1 HRS.,  25 MINS.,  56.615 SECS. G.E.T.     RAGR  .307404395237920+003

          PHASE ELAPSED TIME      .25381395+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .262198768595890940+000      -.913197515796490540-001      -.843457235350158610-001
        RDXYZ       -.408192800566014710+000     -.724849979287001900+000      -.441028112590738000+000

SELENOCENTRIC
    XL     9.0299513+02    YL    -3.1449915+02   ZL    -2.9048107+02   DXL   -2.3727042+03   DYL   -4.2133390+03   DZL   -2.5635663+03
    RL     9.9934436+02  DECL    -1.6898170+01   RAL   -1.9202431+01   VL     5.4730086+03  PTHL   -7.6245577-01   AZL   -1.1957910+02

SELENOGRAPHIC
    XS    -9.8357641+02    YS    -8.7633584+01   ZS    -1.5358036+02   DXS   -2.8418735+02   DYS    5.4226992+03   DZS   -8.0029254+02
  ALTS     6.0850835+01  LATS    -8.8403138+00  LONS   -1.7490856+02   VRS    5.4887974+03   PTR   -7.6026198-01   AZR   -9.8605742+01
   LTS    -1.5101131+00   LNS     1.2172894+02   LTE    2.8779076+00   LNE    7.7881251+00  DSMP    5.0291581+00  RSMP    1.1408141+02
   LIN     1.6766922+02   LAN     5.0447129+01   LAP    1.5848964+02   DR    -7.2829124+01   VT    5.4883141+03  SOLSV   2.6545894+01

GEOCENTRIC
     X     1.9070616+05     Y    -6.4950927+04   Z    -3.6988923+04   DX    -9.0919293+02   DY   -1.5023746+03   DZ   -1.1075176+03
     R     2.0483076+05   DEC    -1.0403710+01   RA   -1.8807875+01   V      2.0761398+03  PTH   -4.6996250+00   AZ   -1.2400673+02

GEOGRAPHIC
    XG     1.6743686+05    YG     1.1203729+05   ZG    -3.6988919+04   DXG    5.0282341+04   DYG   -7.5822312+04   DZG   -1.1075459+03
   ALT     2.0138720+05   LAT    -1.0404856+01   LON    3.3787730+01   VE     9.0986612+04   PTE   -1.0710156-01   AZE   -9.0728752+01

EARTH-MOON PLANE
   XMP    -9.9284603+02   YMP     5.6853678+01   ZMP   -9.8557581+01  DXMP    4.1176206+02  DYMP    5.4510573+03  DZMP   -2.6504536+02
   RMP     9.9934436+02  DEMP    -5.6598385+00  RAMP    1.7672263+02   VMP    5.4730086+03  PTMP   -7.6245595-01  AZMP   -9.2865307+01
   XME    -2.0483073+05   YME     5.6852807+01   ZME   -9.8558004+01  DXME    1.7079940+02  DYME    2.0520563+03  DZME   -2.6504532+02

PLANETARY COORDINATES
    XM     1.8980316+05    YM    -6.4636428+04   ZM    -3.6698443+04   DXM    1.4635114+03   DYM    2.7109644+03   DZM    1.4560486+03
    RM     2.0383788+05   DEM    -1.0371937+01   RAM   -1.8805995+01   LOM    3.3789611+01   VM     3.4075315+03  ARGM   -2.2201338+01
  XSUN     3.9680626+06  YSUN    -7.2796391+07  ZSUN   -3.1567355+07   RAS   -8.6879947+01   LOS    3.2571565+02   DES   -2.3412428+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA     1.2652463+05    ECC     6.2223727-01   INC    1.4462133+02   RAN    1.7617651+02   APF    1.5307074+01   RP     4.7796289+04
    VH    -2.6799749+03  RNMP    -1.7980251+02  APMP   -2.6515085+00  INMP    1.7263824+02   APO    2.0525296+05   TFP    2.2183368+02
    TA    -1.7713333+02    EA    -1.7406354+02   MA    -1.7037627+02   SLR    7.7536916+04   PER    3.1356750+02   MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS     1.0524956+03  ECCS     5.2219693-02  INCS    1.4631764+02  RANS   -1.7208502+02  APFS   -1.3286511+02  RPS    9.9753464+02
   VHS    -2.0786622+03  RNMPS    5.9814849+01  APMPS  -1.0124032+02  INMPS   1.7365830+02  APOS    1.1074566+03  TFPS   7.3515709+01
   TAS    -1.5525782+01   EAS    -1.4744047+01   MAS   -1.3982586+01  SLRS    1.0496255+03  PERS    2.1451032+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
    WX    -7.6368747-02    WY     5.4930492-01   WZ    -8.3212495-01   PX     7.5778102-01   PY    -5.1042552-01   PZ    -4.0648948-01
    QX    -6.4802448-01    QY    -6.6161158-01   QZ    -3.7727229-01   SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE   9-  6
                    MEAN-OF-EPOCH  1969        24   DEC. 1968, 14 HRS.,  21 MINS.,  58.506 SECS. G.M.T.

T        .735163362076869+002  HRS. FROM LAUNCH       3 DAYS,  1 HRS.,  30 MINS.,  58.810 SECS. G.E.T.     RAGR  .308666990909523+003

          PHASE ELAPSED TIME      .25411615+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .219104570702544640+000      -.148234091644047550+000      -.117959857827238050+000
        RDXYZ       -.612665867306017880+000     -.623056359207835830+000      -.355033613987339110+000

SELENOCENTRIC
    XL     7.5458157+02    YL    -5.1050835+02   ZL    -4.0624590+02   DXL   -3.5612459+03   DYL   -3.6216427+03   DZL   -2.0637056+03
    RL     9.9752084+02  DECL    -2.4032550+01   RAL   -3.4080116+01   VL     5.4824857+03  PTHL    3.2228512-06   AZL   -1.1433965+02

SELENOGRAPHIC
    XS    -9.6269377+02    YS     1.8196575+02   ZS    -1.8750206+02   DXS    1.1202283+03   DYS    5.3541767+03   DZS   -5.5551591+02
  ALTS     5.9027331+01  LATS    -1.0834226+01  LONS    1.6929638+02   VRS    5.4982467+03   PTR    2.8362566-06   AZR   -9.5904385+01
   LTS    -1.5101481+00   LNS     1.2168638+02   LTE    2.8730319+00   LNE    7.7893639+00  DSMP    5.0291876+00  RSMP    1.1403743+02
   LIN     1.6767018+02   LAN     5.0407217+01   LAP    1.5711533+02   DR     2.7217430-04   VT    5.4982467+03  SOLSV   4.1826724+01

GEOCENTRIC
     X     1.9063044+05     Y    -6.5012117+04   Z    -3.7032277+04   DX    -2.1003616+03   DY   -9.0980194+02   DZ   -6.0715703+02
     R     2.0478752+05   DEC    -1.0418264+01   RA   -1.8831297+01   V      2.3681001+03  PTH   -4.1093939+01   AZ   -1.2041559+02

GEOGRAPHIC
    XG     1.6986538+05    YG     1.0822333+05   ZG    -3.7032274+04   DXG    4.7349381+04   DYG   -7.7471879+04   DZG   -6.0714479+02
   ALT     2.0134397+05   LAT    -1.0419411+01   LON    3.2501714+01   VE     9.0797716+04   PTE   -9.8225579-01   AZE   -9.0570233+01

EARTH-MOON PLANE
   XMP    -9.3737914+02   YMP     3.2354362+02   ZMP   -1.0810977+02  DXMP    1.8003814+03  DYMP    5.1771288+03  DZMP   -1.1667143+02
   RMP     9.9752083+02  DEMP    -6.2218490+00  RAMP    1.6095749+02   VMP    5.4824856+03  PTMP    3.1999616-06  AZMP   -9.1226599+01
   XME    -2.0478724+05   YME     3.2354330+02   ZME   -1.0811024+02  DXME    1.5594150+03  DYME    1.7783450+03  DZME   -1.1667144+02

PLANETARY COORDINATES
    XM     1.8987586+05    YM    -6.4501609+04   ZM    -3.6626031+04   DXM    1.4608842+03   DYM    2.7118408+03   DZM    1.4565486+03
    RM     2.0384986+05   DEM    -1.0350631+01   RAM   -1.8762833+01   LOM    3.2570177+01   VM     3.4073152+03  ARGM   -2.2153816+01
  XSUN     3.9729965+06  YSUN    -7.2796150+07  ZSUN   -3.1567250+07   RAS   -8.6876065+01   LOS    3.2445694+02   DES   -2.3412352+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA     1.3613630+05    ECC     7.5925692-01   INC    1.4801195+02   RAN    1.7828909+02   APF    1.0899200+00   RP     3.2773873+04
    VH    -2.3885167+03  RNMP    -1.7963208+02  APMP   -1.8410383+01  INMP    1.7622512+02   APO    2.3949873+05   TFP    1.6985337+02
    TA    -1.6113017+02    EA    -1.3161942+02   MA    -9.9098338+01   SLR    5.7657658+04   PER    3.4996884+02   MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS     1.0524791+03  ECCS     5.2217975-02  INCS    1.4631892+02  RANS   -1.7208311+02  APFS   -1.3274663+02  RPS    9.9752086+02
   VHS    -2.0760845+03  RNMPS    5.9781792+01  APMPS  -1.0110909+02  INMPS   1.7365886+02  APOS    1.1074375+03  TFPS   7.3516335+01
   TAS     6.8631733-05   EAS     6.5136706-05   MAS    6.1735398-05  SLRS    1.0496093+03  PERS    2.1450529+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
    WX    -7.6384474-02    WY     5.4928400-01   WZ    -8.3213732-01   PX     7.5645769-01   PY    -5.1177632-01   PZ    -4.0725509-01
    QX    -6.4956687-01    QY    -6.6058464-01   QZ    -3.7641834-01   SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

GAMMA  TERMINATION
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CIRCULARIZATION

TABLE V.- CIRCULARIZATION

CIRCULARIZATION EXTERNAL ΔV TARGET PARAMETERS:

DRTX = -138.4999 fps
DRTY = 0.0000 fps
DRTZ = 0.0041 fps

VEHICLE CSM INERTIAL MEASUREMENT UNIT

XIMUX	.64877632-00	YIMUX	-.76384120-01	ZIMUX	-.75713590-00
XIMUY	.66111865-00	YIMUY	.54928435-00	ZIMUY	.51108595-00
XIMUZ	.37684405-00	YIMUZ	-.83213712-00	ZIMUZ	.40686164-00

VEHICLE CSM IMU MANEUVER ANGLES

ALPHA	.15150246+02	BETA	.65537664+01	GAMMA	-.22844121+01

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****** CSM   / MOON  REF.  /PHASE  11-  1
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 14 HRS., 21 MINS., 52.494 SECS. G.M.T.

T        .7351466620767 45+002  HRS. FROM LAUNCH       3 DAYS,  1 HRS., 30 MINS., 52.798 SECS. G.E.T.     RAGR  .30864187232748 3+003

          PHASE ELAPSED TIME      .25411014+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .22012463793014348+000      -.14719150861578151+000      -.11736529569007467+000
        RDXYZ       -.60896865973013364+000     -.62554313412122900+000      -.35701517521312871+000

GD4     THRUST **********
        ********************
        * ENGINE IGNITION   *
        ********************
THETA    2.5165746-01 BETA    -1.7999999+02 FUEL     0.0000000     TM     2.0500000+04 VELG    1.3849995+02 TACC    1.4164400+01
 BARC    0.0000000    DELV     0.0000000    MASS     4.6565191+04 MSFL    6.5265838+01 SPI     3.1410000+02 VEX     1.0105868+04
 VRX    -3.4498996+03 VRY     -3.5445327+03 VRZ     -2.0230310+03 VDX     8.9855494+01 VDY     9.1564904+01 VDZ     5.2192885+01
 TGO     0.0000000    FC       0.0000000    GMLP     0.0000000    GMLY    0.0000000    PLCHNG   0.0000000    TDELV   2.9909166+03

SELENOCENTRIC
   XL    7.5809462+02   YL    -5.0691777+02   ZL    -4.0419827+02  DXL   -3.5397550+03  DYL   -3.6360976+03  DZL   -2.0752238+03
   RL    9.9752159+02 DECL    -2.3903818+01   RAL   -3.3769595+01   VL    5.4824835+03 PTHL   -1.5347212-02  AZL   -1.1446582+02

SELENOGRAPHIC
   XS   -9.6378850+02   YS     1.7666572+02   ZS    -1.8694977+02  DXS    1.0926876+03  DYS    5.3593084+03  DZS   -5.6083950+02
 ALTS    5.9028062+01 LATS    -1.0801922+01 LONS     1.6961280+02  VRS    5.4982446+03  PTR   -1.5303072-02  AZR   -9.5963466+01
  LTS   -1.5101476+00  LNS     1.2168722+02  LTE    2.8731277+00  LNE    7.7893399+00 DSMP    5.0291868+00 RSMP    1.1403829+02
  LIN    1.6767016+02  LAN     5.0407980+01  LAP    1.6508628+02   DR   -1.4685205+00   VT    5.4982444+03 SOLSV   4.1523891+01

GEOCENTRIC
    X    1.9063253+05    Y    -6.5011173+04    Z    -3.7031651+04   DX   -2.0788193+03   DY   -9.2427401+02   DZ   -6.1868504+02
    R    2.0478905+05  DEC    -1.0418006+01   RA    -1.8830851+01    V    2.3576562+03  PTH   -4.0456874+01   AZ   -1.2049409+02

GEOGRAPHIC
   XG    1.6981849+05   YG     1.0830001+05   ZG    -3.7031645+04  DXG    4.7409058+04  DYG   -7.7443589+04  DZG   -6.1878437+02
  ALT    2.0134550+05  LAT    -1.0419154+01  LON     3.2527276+01   VE    9.0804799+04  PTE   -9.6531954-01  AZE   -9.0574551+01

EARTH-MOON PLANE
  XMP   -9.3915253+02  YMP     3.1840131+02  ZMP    -1.0799281+02 DXMP    1.7736361+03 DYMP    5.1862802+03 DZMP   -1.1974520+02
  RMP    9.9752158+02 DEMP    -6.2150870+00 RAMP     1.6127177+02  VMP    5.4824836+03 PTMP   -1.5346803-02 AZMP   -9.1260595+01
  XME   -2.0478877+05  YME     3.1840138+02  ZME    -1.0799324+02 DXME    1.5326698+03 DYME    1.7874919+03 DZME   -1.1974522+02

PLANETARY COORDINATES
   XS    1.8987444+05   YM    -6.4504257+04   ZM    -3.0627453+04  DXM    1.4609358+03  DYM    2.7118236+03  DZM    1.4565388+03
   RS    2.0384963+05  DEM    -1.0351051+01  RAM    -1.8763682+01  LOM    3.2594448+01   VM    3.4073195+03 ARGM   -2.2154740+01
 XSUN    3.9728995+06 YSUN    -7.2796154+07 ZSUN    -3.1567252+07  RAS   -8.6876141+01  LOS    3.2448198+02  DES   -2.3412353+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.3574395+05  ECC     7.5553046-01  INC     1.4793824+02  RAN    1.7823866+02  APF    1.1873996+00   RP    3.3185263+04
   VH   -2.3989427+03 RNMP    -1.7964049+02 APMP    -1.8279469+01 INMP    1.7614670+02  APO    2.3830265+05  TFP    1.7060561+02
   TA   -1.6127092+02   EA    -1.3231647+02   MA    -1.0030718+02  SLR    5.8257735+04  PER    3.4845702+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    1.0524799+03 ECCS    5.2218619-02 INCS     1.4631890+02 RANS   -1.7208315+02 APFS   -1.3274893+02  RPS    9.9752087+02
  VHS   -2.0760838+03 RNMPS   5.9782414+01 APMPS   -1.0111167+02 INMPS   1.7365885+02 APOS    1.1074390+03 TFPS   7.3516323+01
  TAS   -3.0925061-01  EAS    -2.9350218-01  MAS    -2.7817596-01 SLRS    1.0496099+03 PERS    2.1450552+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.6384077-02   WY     5.4928439-01   WZ    -8.3213710-01   PX    7.5648337-01   PY   -5.1175024-01   PZ   -4.0724023-01
   GX   -6.4953706-01   GY    -6.6060454-01   GZ    -3.7643494-01  SXO    0.0000000     SYO    0.0000000     SZO   0.0000000

BODY ATTITUDE AND FORCES
 RRAT    0.0000000    PRAT     0.0000000    YRAT     0.0000000    IGA    0.0000000    MGA   -2.1344341-07  OGA   0.0000000
  XIX    6.4877632-01  ETX    -7.6384120-02  ZTX    -7.5713590-01  ALO    0.0000000   ALLV    1.7974850+02 ALLI   -1.4297095+02
  XIY    6.6111865-01  ETY     5.4928435-01  ZTY     5.1108595-01  BTO   -2.1344341-07 BTLV   -3.4150945-06 BTLI   5.1262239+01
  XIZ    3.7684405-01  ETZ    -8.3213712-01  ZTZ     4.0686164-01  GMO    0.0000000   GMLV   -1.7999999+02 GMLI   8.5582759+01
  ALS    1.3644245+02  BTS    -1.4834691+01  ALE     1.0902066+02  BTE    1.7423265+02  ALM    9.0251654+01  RTM   -1.7999999+02
 ALEI    1.0902066+02 BTEI     1.7423265+02

****** CSM   / MOON  REF.  /PHASE  11-  2
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 14 HRS., 21 MINS., 57.494 SECS. G.M.T.

T        .7351605509652 43+002  HRS. FROM LAUNCH       3 DAYS,  1 HRS., 30 MINS., 57.798 SECS. G.E.T.     RAGR  .30866276269769 8+003

          PHASE ELAPSED TIME      .25411513+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .21928221285013131+000      -.14805327762352624+000      -.11785681093785627+000
        RDXYZ       -.60411222654525662+000     -.61539278484878633+000      -.35076025316317790+000

GD4     THRUST **********
        ********************
THETA   -5.8065145-03 BETA     1.7999300+02 FUEL     3.2633301+02  TM     2.0500000+04 VELG    6.7428869+01 TACC    1.4264365+01
 BARC    2.5745645-01 DELV     7.1071687+01 MASS     4.6238858+04 MSFL    6.5265838+01 SPI     3.1410000+02 VEX     1.0105868+04
 VRX    -3.4677798+03 VRY     -3.5325181+03 VRZ     -2.0134556+03 VDX     4.3746261+01 VDY     4.4578467+01 VDZ     2.5410183+01
 TGO     0.0000000    FC       0.0000000    GMLP     0.0000000    GMLY    0.0000000    PLCHNG   2.9442621-05 TDELV   3.0619882+03

SELENOCENTRIC
   XL    7.5519337+02   YL    -5.0988565+02   ZL    -4.0589102+02  DXL   -3.5115261+03  DYL   -3.5770966+03  DZL   -2.0388658+03
   RL    9.9752087+02 DECL    -2.4010231+01   RAL   -3.4026130+01   VL    5.4114147+03 PTHL   -4.3904778-03  AZL   -1.1436163+02

SELENOGRAPHIC
   XS   -9.6288592+02   YS     1.8104525+02   ZS    -1.8740650+02  DXS    1.1011809+03  DYS    5.2858320+03  DZS   -5.4919779+02
 ALTS    5.9027344+01 LATS    -1.0828638+01 LONS     1.6935136+02  VRS    5.4271758+03  PTR   -4.3771231-03  AZR   -9.5914433+01
  LTS   -1.5101478+00  LNS     1.2168654+02  LTE    2.8730496+00  LNE    7.7893596+00 DSMP    5.0291875+00 RSMP    1.1403759+02
  LIN    1.6767018+02  LAN     5.0407364+01  LAP    1.5938649+02   DR   -4.1461024-01   VT    5.4271758+03 SOLSV   4.1774122+01

GEOCENTRIC
    X    1.9063079+05    Y    -6.5011985+04    Z    -3.7032185+04   DX   -2.0506322+03   DY   -8.6525904+02   DZ   -5.8231903+02
    R    2.0478779+05  DEC    -1.0418225+01   RA    -1.8831228+01    V    2.3006219+03  PTH   -4.1648021+01   AZ   -1.2052578+02

GEOGRAPHIC
   XG    1.6985751+05   YG     1.0823622+05   ZG    -3.7032184+04  DXG    4.7351544+04  DYG   -7.7401777+04  DZG   -5.8230130+02
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 ALT    2.0134424+05  LAT   -1.0419372+01  LON    3.2506010+01  VE    9.0738875+04  PTE   -9.6542706-01  AZE   -9.0551479+01

EARTH-MOON PLANE
 XMP   -9.3768917+02  YMP    3.2265081+02  ZMP   -1.0808967+02 DXMP   1.7726126+03 DYMP   5.1115433+03 DZMP   -1.1566853+02
 RMP    9.9752086+02 DEMP   -6.2206877+00 RAMP    1.6101210+02  VMP   5.4114147+03 PTMP   -4.3895610-03 AZMP   -9.1232488+01
 XME   -2.0478751+05  YME    3.2264953+02  ZME   -1.0809013+02 DXME   1.5316463+03 DYME   1.7127585+03 DZME   -1.1566852+02

PLANETARY COORDINATES
  XM    1.8987560+05   YM   -6.4502099+04   ZM   -3.6626295+04  DXM   1.4608938+03  DYM   2.7118376+03  DZM    1.4565468+03
  RM    2.0384982+05  DEM   -1.0350709+01  RAM   -1.8762991+01  LOM   3.2574247+01   VM   3.4073160+03 ARGM   -2.2153988+01
XSUN    3.9729786+06 YSUN   -7.2796151+07 ZSUN   -3.1567251+07  RAS  -8.6876078+01  LOS   3.2446115+02  DES   -2.3412352+01

GEOCENTRIC    OSCULATING ELEMENTS
 SMA    1.3366210+05  ECC    7.7442874-01  INC    1.4790838+02  RAN   1.7821830+02  APF   2.4415369+00   RP    3.0150331+04
  VH   -2.4559917+03 RNMP   -1.7964495+02 APMP   -1.7011774+01 INMP   1.7611495+02  APO   2.3717389+05  TFP   1.6919378+02
  TA   -1.6254188+02   EA   -1.3340306+02   MA   -1.0116549+02  SLR   5.3499611+04  PER   3.4047163+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
SMAS    1.0232185+03 ECCS    2.5114570-02 INCS    1.4631891+02 RANS  -1.7208312+02 APFS  -1.3262149+02  RPS    9.9752077+02
 VHS   -2.1471553+03 RNMPS   5.9781916+01 APMPS  -1.0098400+02 INMPS  1.7365886+02 APOS   1.0489161+03 TFPS   7.3517027+01
 TAS   -1.7920384-01  EAS   -1.7475795-01  MAS   -1.7036898-01 SLRS   1.0225730+03 PERS   2.0562233+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
  WX   -7.6384412-02   WY    5.4928406-01   WZ   -8.3213729-01   PX   7.5503711-01   PY   -5.1321796-01   PZ   -4.0807630-01
  QX   -6.5121760-01   QY   -6.5946520-01   QZ   -3.7552799-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000

BODY ATTITUDE AND FORCES
 RRAT   -7.3426387-08 PRAT    8.7389331-06 YRAT   -9.4455076-07  IGA   0.0000000     MGA   5.9764154-06  OGA   0.0000000
  XIX    6.4877620-01  ETX   -7.6384158-02  ZTX   -7.5713597-01  ALO   0.0000000     ALLV  -1.7999011+02 ALLI  -1.4297096+02
  XIY    6.6111877-01  ETY    5.4928426-01  ZTY    5.1108587-01  BTO   5.9764154-06  BTLV   1.9850237-05 BTLI   5.1262230+01
  XIZ    3.7684401-01  ETZ   -8.3213716-01  ZTZ    4.0686155-01  GMO   0.0000000     GMLV   1.7999999+02 GMLI   8.5582765+01
  ALS    1.3644240+02  BTS   -1.4834674+01  ALE    1.0902022+02  BTE   1.7423267+02  ALM    8.9994192+01 BTM   -1.7999999+02
 ALEI    1.0902023+02 BTEI    1.7423267+02
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****** CSM    / MOON  REF.  /PHASE  11-  3
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 14 HRS., 22 MINS., 2.205 SECS. G.M.T.

T        .7351736381861910+002  HRS. FROM LAUNCH       3 DAYS, 1 HRS., 31 MINS., 2.510 SECS. G.E.T.    RAGR  .3086824472743830+003

          PHASE ELAPSED TIME      .2541198+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .2184946263261987O+000      -.1488523624306163O+000      -.1183119821126853O+000
        RDXYZ      -.5994739606976509O+000     -.6057649925351142O+000      -.3448302745819091O+000

GD4     THRUST **********
        **********
        * ENGINE CUTOFF     *
        **********
THETA   -2.4521318-01 BETA    1.7999999+02 FUEL    6.3383008+02  TM    2.0500000+04 VELG   1.3865333-04 TACC    1.4359861+01
 BARC    4.9693296-01 DELV    1.3850137+02 MASS    4.5931361+04 MSFL   6.5265838+01 SPI    3.1410000+02 VEX    1.0105868+04
 VRX    -3.4845652+03 VRY   -3.5211331+03 VRZ   -2.0043966+03 VDX   -8.6616053-05 VDY   -8.6616053-05 VDZ   -6.4962039-05
 TGO     0.0000000     FC    0.0000000    GMLP    0.0000000    GMLY   0.0000000    PLCHNG  5.7781746-05 TDELV   3.1294179+03

SELENOCENTRIC
   XL    7.5248097+02   YL   -5.1263764+02   ZL   -4.0745860+02  DXL  -3.4845652+03  DYL  -3.5211331+03  DZL   -2.0043966+03
   RL    9.9752066+02 DECL   -2.4108842+01  RAL   -3.4265164+01   VL   5.3439853+03 PTHL  -3.1707169-03  AZL   -1.1426415+02

SELENOGRAPHIC
   XS   -9.6202893+02   YS    1.8511716+02   ZS   -1.8782807+02  DXS   1.1090723+03  DYS   5.2160533+03  DZS   -5.3817156+02
 ALTS    5.9027112+01 LATS   -1.0853295+01 LONS    1.6910806+02  VRS   5.3597464+03  PTR  -3.1613431-03  AZR   -9.5868702+01
  LTS   -1.5101484+00  LNS    1.2168585+02  LTE    2.8729716+00  LNE   7.7893791+00 DSMP   5.0291874+00 RSMP   1.1403689+02
  LIN    1.6767019+02  LAN    5.0406740+01  LAP    3.1329039+02   DR  -2.9572855-01   VT   5.3597464+03 SOLSV   4.2006864+01

GEOCENTRIC
    X    1.9062924+05    Y   -6.5012579+04    Z   -3.7032594+04   DX  -2.0237134+03   DY   -8.0928155+02  DZ   -5.4784183+02
    R    2.0478661+05  DEC   -1.0418402+01   RA   -1.8831532+01    V   2.2473280+03  PTH  -4.2831085+01  AZ   -1.2055912+02

GEOGRAPHIC
   XG    1.6989419+05   YG    1.0817628+05   ZG   -3.7032595+04  DXG   4.7297363+04  DYG   -7.7361824+04  DZG   -5.4788249+02
  ALT    2.0134305+05  LAT   -1.0419550+01  LON    3.2486022+01   VE   9.0676310+04  PTE   -9.6542232-01  AZE   -9.0529624+01

EARTH-MOON PLANE
  XMP   -9.3631081+02  YMP    3.2659924+02  ZMP   -1.0817786+02 DXMP   1.7714681+03 DYMP   5.0405931+03 DZMP   -1.1181526+02
  RMP    9.9752064+02 DEMP   -6.2257848+00 RAMP    1.6077046+02  VMP   5.3439853+03 PTMP   -3.1704696-03 AZMP   -9.1206405+01
  XME   -2.0478632+05  YME    3.2659922+02  ZME   -1.0817799+02 DXME   1.5305016+03 DYME   1.6418117+03 DZME   -1.1181523+02

PLANETARY COORDINATES
   XM    1.8987677+05   YM   -6.4499941+04   ZM   -3.6625135+04  DXM   1.4608517+03  DYM   2.7118516+03  DZM    1.4565548+03
   RM    2.0385002+05  DEM   -1.0350367+01  RAM   -1.8762301+01  LOM   3.2555252+01   VM   3.4073126+03 ARGM   -2.2153228+01
 XSUN    3.9730576+06 YSUN   -7.2796147+07 ZSUN   -3.1567249+07  RAS  -8.6876016+01  LOS   3.2444153+02  DES   -2.3412349+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.3181777+05  ECC    7.9182292-01  INC    1.4787698+02  RAN   1.7819692+02  APF   3.5560299+00   RP    2.7441441+04
   VH   -2.5092994+03 RNMP   -1.7964950+02 APMP   -1.5882956+01 INMP   1.7608155+02  APO   2.3619411+05  TFP   1.6791563+02
   TA   -1.6367413+02   EA   -1.3435432+02   MA   -1.0191476+02  SLR   4.9170201+04  PER   3.3344901+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9724774+02 ECCS    2.7921234-04 INCS    1.4631893+02 RANS  -1.7208308+02 APFS   3.6010998+01  RPS    9.9696930+02
  VHS   -2.2145855+03 RNMPS   5.9781409+01 APMPS   6.7650424+01 INMPS  1.7365886+02 APOS   9.9752617+02 TFPS   7.4443743+01
  TAS   -1.6857387+02  EAS   -1.6856898+02  MAS   -1.6856581+02 SLRS   9.9724763+02 PERS   1.9784375+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
  WX   -7.6384732-02   WY    5.4928372-01   WZ   -8.3213747-01   PX  -8.6858179-01   PY   3.7316823-01   PZ   3.2605385-01
  QX    4.8962333-01   QY    7.4764498-01   QZ    4.4859348-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000

BODY ATTITUDE AND FORCES
 RRAT   -4.2303717-08 PRAT    1.3393586-04 YRAT   -5.0760482-05  IGA   0.0000000     MGA  -7.6839627-06  OGA   0.0000000
  XIX    6.4877759-01  ETX   -7.6383942-02  ZTX   -7.5713482-01  ALO   0.0000000     ALLV  -1.7975490+02 ALLI  -1.4297082+02
  XIY    6.6111772-01  ETY    5.4928440-01  ZTY    5.1108711-01  BTO  -7.6839627-06  BTLV   6.1685144-05 BTLI   5.1262332+01
  XIZ    3.7684347-01  ETZ   -8.3213711-01  ZTZ    4.0686218-01  GMO   0.0000000     GMLV   1.7999999+02 GMLI   8.5582733+01
  ALS    1.3644224+02  BTS   -1.4834647+01  ALE    1.0901998+02  BTE   1.7423269+02  ALM    8.9754784+01 BTM   -1.7999999+02
 ALEI    1.0901988+02 BTEI    1.7423268+02

THRUST TERMINATION
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LUNAR ORBIT COAST
TO PASS OVER LUNAR
TARGET SITE

TABLE VI.- LUNAR ORBIT COAST TO PASS OVER LUNAR TARGET SITE

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****** CSM   / MOON  REF.  /PHASE  12-  1
                  MEAN-OF-EPOCH  1969        24  DEC. 1968, 14 HRS., 22 MINS., 2.205 SECS. G.M.T.

T        .7351736381861 91+002  HRS. FROM LAUNCH       3 DAYS, 1 HRS., 31 MINS., 2.510 SECS. G.E.T.    RAGR  .3086824472743 83+003

          PHASE ELAPSED TIME      .2541198 4+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .2184946263261 9870+000      -.1488523624306 1636+000      -.1183119821126 8535+000
        RDXYZ      -.5994739606976 5090+000     -.6057649925351 1428+000      -.3448302745819 0918+000

SELENOCENTRIC
    XL    7.5248097+02   YL   -5.1263764+02   ZL   -4.0745860+02  DXL   -3.4845652+03  DYL   -3.5211331+03  DZL   -2.0043966+03
    RL    9.9752066+02 DECL   -2.4108842+01   RAL  -3.4265164+01  VL     5.3439853+03 PTHL   -3.1707169-03  AZL   -1.1426415+02

SELENOGRAPHIC
    XS   -9.6202893+02   YS    1.8511716+02   ZS   -1.8782807+02  DXS    1.1090723+03  DYS    5.2160533+03  DZS   -5.3817156+02
  ALTS    5.9027112+01 LATS   -1.0853295+01 LONS    1.6910806+02  VRS    5.3597464+03  PTR   -3.1613431-03  AZR   -9.5868702+01
   LTS   -1.5101484+00  LNS    1.2168585+02  LTE    2.8729716+00  LNE    7.7893791+00 DSMP    5.0291874+00 RSMP    1.1403689+02
   LIN    1.6767019+02  LAN    5.0406740+01  LAP    3.1329039+02  DR    -2.9572855-01  VT    5.3597464+03 SOLSV   4.2006864+01

GEOCENTRIC
     X    1.9062924+05    Y   -6.5012579+04    Z   -3.7032594+04   DX   -2.0237134+03   DY   -8.0928155+02   DZ   -5.4784183+02
     R    2.0478661+05  DEC   -1.0418402+01   RA   -1.8831532+01    V    2.2473280+03  PTH   -4.2831085+01   AZ   -1.2055912+02

GEOGRAPHIC
    XG    1.6989419+05   YG    1.0817628+05   ZG   -3.7032595+04  DXG    4.7297363+04  DYG   -7.7361824+04  DZG   -5.4788249+02
   ALT    2.0134305+05  LAT   -1.0419550+01  LON    3.2486022+01   VE    9.0676310+04  PTE   -9.6542232-01  AZE   -9.0529624+01

EARTH-MOON PLANE
   XMP   -9.3631081+02  YMP    3.2659924+02  ZMP   -1.0817786+02 DXMP    1.7714681+03 DYMP    5.0405931+03 DZMP   -1.1181526+02
   RMP    9.9752064+02 DEMP   -6.2257848+00 RAMP    1.6077046+02  VMP    5.3439853+03 PTMP   -3.1704696-03 AZMP   -9.1206405+01
   XME   -2.0478632+05  YME    3.2659922+02  ZME   -1.0817799+02 DXME    1.5305016+03 DYME    1.6418117+03 DZME   -1.1181523+02

PLANETARY COORDINATES
    XM    1.8987677+05   YM   -6.4499941+04   ZM   -3.6625135+04  DXM    1.4608517+03  DYM    2.7118516+03  DZM    1.4565548+03
    RM    2.0385002+05  DEM   -1.0350367+01  RAM   -1.8762301+01  LOM    3.2555252+01   VM    3.4073126+03 ARGM   -2.2153228+01
  XSUN    3.9730576+06 YSUN   -7.2796147+07 ZSUN   -3.1567249+07  RAS   -8.6876016+01  LOS    3.2444153+02  DES   -2.3412349+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.3181777+05   ECC    7.9182292-01   INC    1.4787698+02  RAN    1.7819692+02  APF    3.5560299+00   RP    2.7441441+04
    VH   -2.5092994+03 RNMP   -1.7964950+02 APMP   -1.5882956+01 INMP    1.7608155+02  APO    2.3619411+05  TFP    1.6791563+02
    TA   -1.6367413+02   EA   -1.3435432+02   MA   -1.0191476+02  SLR    4.9170201+04  PER    3.3344901+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.9724774+02 ECCS    2.7921234-04 INCS    1.4631893+02 RANS   -1.7208308+02 APFS    3.6010998+01  RPS    9.9696930+02
   VHS   -2.2145855+03 RNMPS   5.9781409+01 APMPS   6.7650424+01 INMPS   1.7365886+02 APOS    9.9752617+02 TFPS    7.4443743+01
   TAS   -1.6857387+02  EAS   -1.6856898+02  MAS   -1.6856581+02 SLRS    9.9724763+02 PERS    1.9784375+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
    WX   -7.6384732-02   WY    5.4928372-01   WZ   -8.3213747-01   PX   -8.6858179-01   PY    3.7316823-01   PZ    3.2605385-01
    QX    4.8962333-01   QY    7.4768498-01   QZ    4.4859348-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12-  2
                  MEAN-OF-EPOCH  1969        24  DEC. 1968, 14 HRS., 37 MINS., 2.205 SECS. G.M.T.

T        .7376736381861 91+002  HRS. FROM LAUNCH       3 DAYS, 1 HRS., 46 MINS., 2.510 SECS. G.E.T.    RAGR  .3124427140189 75+003

          PHASE ELAPSED TIME      .2550198 4+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .1858483567844 1965-001      -.2403957033739 5641+000      -.1603756090295 7947+000
        RDXYZ      -.9149351474108 9854+000     -.8767187224651 4669-001       .2620782531394 3048-001

SELENOCENTRIC
    XL    6.4004938+01   YL   -8.2790682+02   ZL   -5.5232294+02  DXL   -3.5182480+03  DYL   -5.0961072+02  DZL    1.5233835+02
    RL    9.9728979+02 DECL   -3.3629744+01   RAL  -8.5579292+01  VL     5.3447798+03 PTHL   -2.8204606-02  AZL   -8.8057062+01

SELENOGRAPHIC
    XS   -5.2539796+02   YS    8.2293980+02   ZS   -2.0325845+02  DXS    4.4719601+03  DYS    2.9361010+03  DZS    3.4094334+02
  ALTS    5.8796281+01 LATS   -1.1759894+01 LONS    1.2255580+02  VRS    5.3605371+03  PTR   -2.8121942-02  AZR   -8.6280964+01
   LTS   -1.5102517+00  LNS    1.2155906+02  LTE    2.8584380+00  LNE    7.7930327+00 DSMP    5.0292743+00 RSMP    1.1390591+02
   LIN    1.6767067+02  LAN    5.0293791+01  LAP    8.2144085+01  DR    -2.6310612+00  VT    5.3605364+03 SOLSV   7.9702783+01

GEOCENTRIC
     X    1.9015657+05    Y   -6.4925973+04    Z   -3.6961602+04   DX   -3.8652255+03   DY    2.2048398+03   DZ    1.6103761+03
     R    2.0430630+05  DEC   -1.0422926+01   RA   -1.8851662+01    V    4.7322930+03  PTH   -7.5891016+01   AZ    4.6562415+01

GEOGRAPHIC
    XG    1.7623994+05   YG    9.6511045+04   ZG   -3.6961602+04  DXG    3.8526323+04  DYG   -7.9452338+04  DZG    1.6103373+03
   ALT    2.0086274+05  LAT   -1.0424077+01  LON    2.8705624+01   VE    8.8315035+04  PTE   -2.9788876+00  AZE   -8.9484843+01

EARTH-MOON PLANE
   XMP   -4.1858632+02  YMP    9.0063778+02  ZMP   -9.0686563+01 DXMP    4.8254529+03 DYMP    2.2735742+03 DZMP    3.3546435+02
   RMP    9.9728979+02 DEMP   -5.2172847+00 RAMP    1.1492743+02  VMP    5.3447798+03 PTMP   -2.8204443-02 AZMP   -8.6389059+01
   XME   -2.0430429+05  YME    9.0063707+02  ZME   -9.0686961+01 DXME    4.5844764+03 DYME   -1.1245607+03 DZME    3.3546435+02

PLANETARY COORDINATES
    XM    1.9009256+05   YM   -6.4098067+04   ZM   -3.6409279+04  DXM    1.4530225+03  DYM    2.7144505+03  DZM    1.4580377+03
    RM    2.0388570+05  DEM   -1.0286879+01  RAM   -1.8633796+01  LOM    2.8923491+01   VM    3.4066685+03 ARGM   -2.2011697+01
  XSUN    3.9877549+06 YSUN   -7.2795430+07 ZSUN   -3.1566937+07  RAS   -8.6864453+01  LOS    3.2069283+02  DES   -2.3412119+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    8.1545774+06   ECC    9.9852879-01   INC    4.4427058+01  RAN   -8.0351681+00  APF    1.3714400+02   RP    1.1997189+04
    VH   -2.9922381+01 RNMP   -1.6834207-01 APMP    1.5203391+02 INMP    1.6800360+01  APO    1.6297158+07  TFP    1.2631413+02
    TA   -1.5212190+02   EA   -1.2477141+01   MA   -1.1659444-01  SLR    2.3976574+04  PER    1.6224474+05  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.9708261+02 ECCS    5.3432763-04 INCS    1.4632076+02 RANS   -1.7207412+02 APFS    2.5832600+01  RPS    9.9654984+02
   VHS   -2.2146657+03 RNMPS   5.9687569+01 APMPS   5.7513977+01 INMPS   1.7365784+02 APOS    9.9761537+02 TFPS    7.4387439+01
   TAS   -1.1291841+02  EAS   -1.1288643+02  MAS   -1.1285822+02 SLRS    9.9708229+02 PERS    1.9779461+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
    WX   -7.6467013-02   WY    5.4924551-01   WZ   -8.3215514-01   PX   -9.4147328-01   PY    2.3502959-01   PZ    2.4163835-01
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QX 3.2829985-01 QY 8.0192918-01 QZ 4.9912795-01 SXO 0.0000000 SYO 0.0000000 SZO 0.0000000

****** CSM / MOON REF. /PHASE 12- 3
MEAN-OF-EPOCH 1969 24 DEC. 1968, 14 HRS., 52 MINS., 2.205 SECS. G.M.T.

T .7401736381861 91+002 HRS. FROM LAUNCH 3 DAYS, 2 HRS., 1 MINS., 2.510 SECS. G.E.T. RAGR .3162029807635 67+003

PHASE ELAPSED TIME .2559184+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ -.1924027316532 4721+000 -.1881840401302 6050+000 -.1065177516327 9587+000
RDXYZ -.6832593662577 2193+000 .4833095528447 5106+000 .3818395548724 8571+000

SELENOCENTRIC
XL -6.6262222+02 YL -6.4809332+02 ZL -3.6684005+02 DXL -3.9715850+03 DYL 2.8093358+03 DZL 2.2195207+03
RL 9.9682735+02 DECL -2.1592792+01 RAL -1.3563508+02 VL 5.3471606+03 PTHL -3.5046455-02 AZL -6.3501787+01

SELENOGRAPHIC
XS 2.2718828+02 YS 9.6572488+02 ZS -9.7086070+01 DXS 5.1469190+03 DYS -1.1119944+03 DZS 1.0166172+03
ALTS 5.8333824+01 LATS -5.5891868+00 LONS 7.6761789+01 VRS 5.3629113+03 PTR -3.4943550-02 AZR -7.9023267+01
LTS -1.5103543+00 LNS 1.2143226+02 LTE 2.8438920+00 LNE 7.7966303+00 DSMP 5.0293607+00 RSMP 1.1377499+02
LIN 1.6766868+02 LAN 5.0168640+01 LAP 5.9667128+01 DR -3.2707319+00 VT 5.3629103+03 SOLSV 4.5243216+01

GEOCENTRIC
X 1.8964459+05 Y -6.4343902+04 Z -3.6560044+04 DX -2.5263965+03 DY 5.5263675+03 DZ 3.6790318+03
R 2.0357270+05 DEC -1.0346000+01 RA -1.8741395+01 V 7.1034282+03 PTH -4.2085645+01 AZ 5.7007030+01

GEOGRAPHIC
XG 1.8141752+05 YG 8.4810896+04 ZG -3.6560042+04 DXG 3.1929410+04 DYG -7.8141612+04 DZG 3.6790201+03
ALT 2.0012914+05 LAT -1.0347147+01 LON 2.5055623+01 VE 8.4493398+04 PTE -3.2302341+00 AZE -8.8049957+01

EARTH-MOON PLANE
XMP 3.5084028+02 YMP 9.3285494+02 ZMP -1.8909114+01 DXMP 4.9778774+03 DYMP -1.8638387+03 DZMP 5.8221014+02
RMP 9.9682736+02 DEMP -1.0869258+00 RAMP 6.9389066+01 VMP 5.3471605+03 PTMP -3.5046376-02 AZMP -8.3748665+01
XME -2.0357056+05 YME 9.3285345+02 ZME -1.8909470+01 DXME 4.7368930+03 DYME -5.2613276+03 DZME 5.8221015+02

PLANETARY COORDINATES
XM 1.9030721+05 YM -6.3695809+04 ZM -3.6193204+04 DXM 1.4451884+03 DYM 2.7170318+03 DZM 1.4595111+03
RM 2.0392140+05 DEM -1.0223363+01 RAM -1.8505388+01 LOM 2.5291630+01 VM 3.4060246+03 ARGM -2.1870220+01
XSUN 4.0024520+06 YSUN -7.2794710+07 ZSUN -3.1566625+07 RAS -8.6852889+01 LOS 3.1694412+02 DES -2.3411888+01

GEOCENTRIC OSCULATING ELEMENTS
SMA -8.3640607+04 ECC 2.6351089+00 INC 3.4401315+01 RAN -3.2787871+00 APF 3.8286577+01 RP 1.3676150+05
VH 5.2629147+03 RNMP -2.1462138-01 APMP 5.6772511+01 INMP 6.3358019+00 APO -3.0404271+05 TFP 1.1268578+02
TA -5.6820738+01 EA -4.3555894+01 MA -8.2597073+01 SLR 4.9714295+05 PER 1.6853660+02 MTA 1.1230215+02

SELENOCENTRIC OSCULATING ELEMENTS
SMAS 9.9704580+02 ECCS 6.4972700-04 INCS 1.4631954+02 RANS -1.7206859+02 APFS 2.8754126+01 RPS 9.9639799+02
VHS -2.2140382+03 RNMPS 5.9564589+01 APMPS 6.0448571+01 INMPS 1.7365524+02 APOS 9.9769360+02 TFPS 7.4403366+01
TAS -7.0332412+01 EAS -7.0294242+01 MAS -7.0259196+01 SLRS 9.9704534+02 PERS 1.9778365+00 MTAS 3.5999999+02

SELENOCENTRIC UNIT VECTORS
WX -7.6522458-02 WY 5.4925573-01 WZ -8.3214331-01 PX -9.2354260-01 PY 2.7550220-01 PZ 2.6677246-01
QX 3.7578361-01 QY 7.8893387-01 QZ 4.8617896-01 SXO 0.0000000 SYO 0.0000000 SZO 0.0000000

****** CSM / MOON REF. /PHASE 12- 4
MEAN-OF-EPOCH 1969 24 DEC. 1968, 15 HRS., 7 MINS., 2.205 SECS. G.M.T.

T .7426736391861 91+002 HRS. FROM LAUNCH 3 DAYS, 2 HRS., 16 MINS., 2.510 SECS. G.E.T. RAGR .3199632475081 59+003

PHASE ELAPSED TIME .2568198+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ -.2881702476045 2385+000 -.2331372123374 5288-001 .1111140540332 9501-001
RDXYZ -.4195757344120 3564-001 .7655576264382 1096+000 .5091498857857 6470+000

SELENOCENTRIC
XL -9.9243917+02 YL -8.0290905+01 ZL 3.8266941+01 DXL -2.4388699+02 DYL 4.4499605+03 DZL 2.9595380+03
RL 9.9641681+02 DECL 2.2009599+00 RAL -1.7537469+02 VL 5.3498125+03 PTHL -2.1452658-02 AZL -5.6383809+01

SELENOGRAPHIC
XS 8.4295131+02 YS 5.2703064+02 ZS 6.7218039+01 DXS 2.7216999+03 DYS -4.4952030+03 DZS 1.0838360+03
ALTS 5.7923301+01 LATS 3.8680971+00 LONS 3.2014474+01 VRS 5.3655569+03 PTR -2.1389553-02 AZR -7.8317671+01
LTS -1.5104579+00 LNS 1.2130547+02 LTE 2.8293337+00 LNE 7.8001733+00 DSMP 5.0294466+00 RSMP 1.1364412+02
LIN 1.6766933+02 LAN 5.0032099+01 LAP 3.2451218+01 DR -2.0030594+00 VT 5.3655564+03 SOLSV 6.0525247-01

GEOCENTRIC
X 1.8952825+05 Y -6.3373460+04 Z -3.5938644+04 DX 1.1934627+03 DY 7.1695559+03 DZ 4.4205130+03
R 2.0304861+05 DEC -1.0194791+01 RA -1.8488633+01 V 8.5069276+03 PTH -1.2947900+01 AZ 5.9973460+01

GEOGRAPHIC
XG 1.8587569+05 YG 7.3398773+04 ZG -3.5938641+04 DXG 2.8823061+04 DYG -7.6100332+04 DZG 4.4205175+03
ALT 1.9960504+05 LAT -1.0195924+01 LON 2.1548119+01 VE 8.1495833+04 PTE -1.3402698+00 AZE -8.7081252+01

EARTH-MOON PLANE
XMP 9.0889241+02 YMP 4.0328608+02 ZMP 6.4198294+01 DXMP 2.1308043+03 DYMP -4.8836092+03 DZMP 4.8013463+02
RMP 9.9641682+02 DEMP 3.6940773+00 RAMP 3.2927414+01 VMP 5.3498125+03 PTMP -2.1453281-02 AZMP -8.4838748+01
XME -2.0304821+05 YME 4.0328359+02 ZME 6.4197527+01 DXME 1.4898139+03 DYME -8.2804525+03 DZME 4.8013461+02

PLANETARY COORDINATES
XM 1.9052069+05 YM -6.3293169+04 ZM -3.5976911+04 DXM 1.4373497+03 DYM 2.7195953+03 DZM 1.4609750+03
RM 2.0395710+05 DEM -1.0159819+01 RAM -1.8377080+01 LOM 2.1659673+01 VM 3.4053811+03 ARGM -2.1728793+01
XSUN 4.0171490+06 YSUN -7.2793988+07 ZSUN -3.1566311+07 RAS -8.6841323+01 LOS 3.1319542+02 DES -2.3411655+01

GEOCENTRIC OSCULATING ELEMENTS
SMA -4.6756069+04 ECC 5.2116979+00 INC 3.1556521+01 RAN -1.4621005+00 APF -4.3555021+00 RP 1.9692244+05
VH 7.0390803+03 RNMP -4.2567810-01 APMP 1.5724367+01 INMP 3.3242380+00 APO -2.9043458+05 TFP 8.4942441+01
TA -1.5411961+01 EA -1.2820884+01 MA -5.4556706+01 SLR 1.2232226+06 PER 7.0440989+01 MTA 1.0106229+02

SELENOCENTRIC OSCULATING ELEMENTS
SMAS 9.9721373+02 ECCS 8.8248561-04 INCS 1.4632028+02 RANS -1.7206850+02 APFS 2.9097477+01 RPS 9.9633370+02
VHS -2.2129437+03 RNMPS 5.9427758+01 APMPS 6.0794609+01 INMPS 1.7365588+02 APOS 9.9809374+02 TFPS 7.4405207+01
TAS -2.5127722+01 EAS -2.5104901+01 MAS -2.5083448+01 SLRS 9.9721291+02 PERS 1.9783363+00 MTAS 3.5999999+02

SELENOCENTRIC UNIT VECTORS
WX -7.6521795-02 WY 5.4924493-01 WZ -8.3215049-01 PX -9.2127501-01 PY 2.8022709-01 PZ 2.6967590-01

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 QX    3.8130923-01   QY    7.8727553-01   QZ    4.8456215-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12-  5
                    MEAN-OF-EPOCH  1969        24  DEC. 196A, 15 HRS.,  22 MINS.,  2.205 SECS. G.M.T.

T        .7451736381861 91+002  HRS. FROM LAUNCH       3 DAYS,  2 HRS.,  31 MINS.,  2.510 SECS. G.E.T.     RAGR  .323723514252751+003

          PHASE ELAPSED TIME      .2577198+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.21118196716627545+000       .15553021415742246+000       .12206528299421538+000
        RDXYZ      .62510337039513657+000       .58896827315152274+000       .33117768721789545+000

SELENOCENTRIC
   XL   -7.2729666+02   YL    5.3563571+02   ZL    4.2038472+02  DXL    3.6335414+03  DYL    3.4234987+03  DZL    1.9250381+03
   RL    9.9628779+02  DECL   2.4957828+01   RAL   1.4362928+02  VL     5.3505830+03  PTHL   3.6788077-03  AZL   -6.6621190+01

SELENOGRAPHIC
   XS    9.5049950+02   YS   -2.2932071+02   ZS    1.9118579+02  DXS   -1.3477343+03  DYS   -5.1701314+03  DZS    5.0079466+02
  ALTS   5.7794248+01  LATS   1.1063578+01  LONS  -1.3564156+01  VRS    5.3663247+03  PTR    3.6684908-03  AZR   -8.4544281+01
  LTS   -1.5105611+00  LNS    1.2117868+02  LTE   2.8147633+00  LNE    7.8036613+00  DSMP   5.0295316+00  RSMP   1.1351330+02
  LIN    1.6767237+02  LAN    4.9908221+01  LAP  -2.3089415+01  DR     3.4359097-01  VT     5.3663247+03  SOLSV  -4.4079989+01

GEOCENTRIC
   X     1.9000571+05   Y    -6.2354517+04   Z    -3.5340019+04  DX     5.0630477+03  DY     6.1456399+03  DZ     3.3874673+03
   R     2.0307431+05  DEC   -1.0021927+01   RA   -1.8168376+01  V      8.6532235+03  PTH    1.5144433+01  AZ     6.2634318+01

GEOGRAPHIC
   XG    1.9007120+05   YG    6.2154619+04   ZG   -3.5340015+04  DXG    2.7984719+04  DYG   -7.6266083+04  DZG    3.3874780+03
   ALT   1.9963072+05  LAT   -1.0023042+01   LON   1.8108108+01  VE     8.1308887+04  PTE    1.5931832+00  AZE   -8.7292359+01

EARTH-MOON PLANE
   XMP   9.1885021+02  YMP   -3.6941940+02   ZMP   1.0877938+02 DXMP   -2.0044424+03 DYMP   -4.9601316+03 DZMP   8.9683517+01
   RMP   9.9628779+02 DEMP    6.2683193+00  RAMP  -2.1902360+01  VMP    5.3505829+03  PTMP   3.6787615-03  AZMP  -8.9034207+01
   XME  -2.0307394+05  YME   -3.6942049+02   ZME   1.0877903+02 DXME   -2.2454368+03 DYME   -8.3563298+03 DZME   8.9683473+01

PLANETARY COORDINATES
   XM    1.9073301+05   YM   -6.2890152+04   ZM   -3.5760403+04  DXM    1.4295063+03  DYM    2.7221411+03  DZM    1.4624292+03
   RM    2.0399279+05  DEM   -1.0096249+01   RAM  -1.8248870+01  LOM    1.8027615+01  VM     3.4047379+03  ARGM  -2.1587420+01
  XSUN   4.0318459+06 YSUN   -7.2793263+07  ZSUN  -3.1565996+07  RAS   -8.6829760+01  LOS    3.0944672+02  DES   -2.3411422+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -4.4498874+04  ECC    5.3767125+00   INC   2.9009454+01  RAN    4.1535464-01  APF   -3.8959018+01  RP     1.9475877+05
   VH     7.2154000+03 RNMP    -2.7906945+00 APMP  -1.5034323+01 INMP   6.0764603-01  APO   -2.8375652+05  TFP    6.2370595+01
   TA     1.7929517+01  EA     1.5062595+01   MA    6.6860746+01  SLR    1.2419206+06  PER    6.5402143+01  MTA    1.0071869+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.9724289+02 ECCS    5.5988812-04 INCS   1.4632400+02 RANS   -1.7206477+02 APFS   4.5709539+01  RPS    9.9628565+02
  VHS    -2.2126631+03 RNMPS   5.9320745+01 APMPS  7.7436114+01 INMPS   1.7365801+02 APOS   9.9820013+02  TFPS   7.4496302+01
  TAS     3.8398734+00  EAS    3.8359927+00  MAS   3.8323133+00 SLRS    9.9724191+02 PERS   1.9784230+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.6550138-02   WY    5.4918639-01   WZ   -8.3218653-01  PX    -7.7384641-01  PY    4.9358050-01  PZ    3.9691310-01
   QX    6.2873030-01   QY    6.7436831-01   QZ    3.8720226-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12-  6
                    MEAN-OF-EPOCH  1969        24  DEC. 196A, 15 HRS.,  37 MINS.,  2.205 SECS. G.M.T.

T        .7476736381861 91+002  HRS. FROM LAUNCH       3 DAYS,  2 HRS.,  46 MINS.,  2.510 SECS. G.E.T.     RAGR  .3274837809973 43+003

          PHASE ELAPSED TIME      .2586198+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.75474698651975483-002       .24110801385991855+000       .15979650322941414+000
        RDXYZ      .91718195015720250+000       .59283850948716158-001      -.45338692621335504-001

SELENOCENTRIC
   XL   -2.5992984+01   YL    8.3035998+02   ZL    5.5032854+02  DXL    5.3313080+03  DYL    3.4459953+02  DZL   -2.6354044+02
   RL    9.9651132+02  DECL   3.3521864+01   RAL   9.1792960+01  VL     5.3489295+03  PTHL   2.7208494-02  AZL   -9.3406171+01

SELENOGRAPHIC
   XS    4.8473950+02   YS   -8.4728388+02   ZS    2.0043062+02  DXS   -4.6038063+03  DYS   -2.7273466+03  DZS   -3.8247003+02
  ALTS   5.8017791+01  LATS   1.1603181+01  LONS  -6.0225698+01  VRS    5.3646747+03  PTR    2.7129326-02  AZR   -9.4179343+01
  LTS   -1.5106644+00  LNS    1.2105189+02  LTE   2.8001807+00  LNE    7.8070943+00  DSMP   5.0296167+00  RSMP   1.1338254+02
  LIN    1.6767266+02  LAN    4.9795215+01  LAP  -1.9972728+02  DR     2.5401522+00  VT     5.3646740+03  SOLSV  -7.9828198+01

GEOCENTRIC
   X     1.9091818+05   Y    -6.1656399+04   Z    -3.4993351+04  DX     6.7529662+03  DY     3.0692688+03  DZ     1.2003335+03
   R     2.0365607+05  DEC   -9.8939873+00   RA   -1.7897691+01  V      7.5142374+03  PTH    4.3738800+01  AZ     6.6962182+01

GEOGRAPHIC
   XG    1.9413238+05   YG    5.0634740+04   ZG   -3.4993351+04  DXG    2.6479619+04  DYG   -7.9797553+04  DZG    1.2003202+03
   ALT   2.0021248+05  LAT   -9.8950852+00   LON   1.4618527+01  VE     8.4084842+04  PTE    3.5422141+00  AZE   -8.8549311+01

EARTH-MOON PLANE
   XMP   3.7450854+02   YMP   -9.1925226+02   ZMP   8.8053951+01 DXMP   -4.9297845+03 DYMP   -2.0451357+03 DZMP   -3.5453163+02
   RMP   9.9651133+02  DEMP    5.0693936+00  RAMP  -6.7833740+01  VMP    5.3489295+03  PTMP   2.7209637-02  AZMP   -9.3817772+01
   XME  -2.0365398+05  YME   -9.1925279+02   ZME   8.8053290+01 DXME   -5.1707809+03 DYME   -5.4406892+03 DZME   -3.5453162+02

PLANETARY COORDINATES
   XM    1.9094416+05   YM   -6.2486759+04   ZM   -3.5543679+04  DXM    1.4216582+03  DYM    2.7246694+03  DZM    1.4638739+03
   RM    2.0402849+05  DEM   -1.0032654+01   RAM  -1.8120758+01  LOM    1.4395460+01  VM     3.4040949+03  ARGM  -2.1446098+01
  XSUN   4.0465424+06 YSUN   -7.2792536+07  ZSUN  -3.1565680+07  RAS   -8.6818196+01  LOS    3.0569801+02  DES   -2.3411187+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -6.8718994+04  ECC    2.9459779+00   INC   2.4965747+01  RAN    4.1036915+00  APF   -8.1334309+01  RP     1.3372564+05
   VH     5.8062606+03 RNMP    -1.7936524+02 APMP   1.2231129+02 INMP   3.7680789+00  APO   -2.7116363+05  TFP    3.7957284+01
   TA     5.7311757+01  EA     4.6348954+01   MA    1.0558096+02  SLR    5.2767842+05  PER    1.2551154+02  MTA    1.0984311+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.9707329+02 ECCS    7.3700763-04 INCS   1.4632564+02 RANS   -1.7205574+02 APFS   5.4982346+01  RPS    9.9633845+02
  VHS    -2.2134683+03 RNMPS   5.9226449+01 APMPS  8.6746030+01 INMPS   1.7365681+02 APOS   9.9780813+02  TFPS   7.4547108+01
  TAS     4.0145100+01  EAS    4.0115608+01  MAS   4.0088399+01 SLRS    9.9707271+02 PERS   1.9779184+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.6633365-02   WY    5.4915074-01   WZ   -8.3220239-01  PX    -6.6251896-01  PY    5.9570365-01  PZ    4.5409885-01
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 QX   7.4511471-01   QY   5.8614898-01   QZ   3.1817200-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12-  7
                  MEAN-OF-EPOCH  1969        24  DEC. 19GA, 15 HRS.,  52 MINS.,  2.205 SECS. G.M.T.

T        .7501736381861 91+002  HRS. FROM LAUNCH      3 DAYS,  3 HRS.,  1 MINS.,  2.510 SECS. G.E.T.    RAGR  .331244047741935+003

          PHASE ELAPSED TIME      .2595985+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .2006243334172678 4+000      .1822055897500905 6+000      .1017500694206200 3+000
        RDXYZ      .6597072080144608 2+000     -.5053200536307594 6+000     -.3942515723150903 8+000

SELENOCENTRIC
   XL    6.9093686+02   YL    6.2750395+02   ZL    3.5042048+02  DXL    3.8346833+03  DYL   -2.9372763+03  DZL   -2.2916680+03
   RL    9.9697013+02 DECL    2.0578197+01  RAL    4.2245503+01   VL    5.3464128+03 PTHL    3.5732227-02  AZL   -1.1726358+02

SELENOGRAPHIC
   XS   -2.7328626+02   YS   -9.5459601+02   ZS    8.9501385+01  DXS   -5.0837900+03  DYS    1.3548401+03  DZS   -1.0355243+03
 ALTS    5.8476605+01 LATS    5.1505704+00 LONS   -1.0597561+02  VRS    5.3621659+03  PTR    3.5627352-02  AZR   -1.0118373+02
  LTS   -1.5107679+00  LNS    1.2092509+02  LTE    2.7855860+00  LNE    7.8104720+00 OSMP    5.0297008+00 RSMP    1.1325182+02
  LIN    1.6767070+02  LAN    4.9669093+01  LAP   -2.5669460+02   DR    3.3342727+00   VT    5.3621648+03 SOLSV   -4.3049930+01

GEOCENTRIC
    X    1.9184510+05    Y   -6.1455488+04    Z   -3.4976322+04   DX    5.2484889+03   DY   -2.1009646+02   DZ   -8.2635899+02
    R    2.0446188+05  DEC   -9.8497603+00   RA   -1.7762293+01    V    5.3172968+03  PTH    7.4711896+01   AZ    8.7881812+01

GEOGRAPHIC
   XG    1.9775113+05   YG    3.8416221+04   ZG   -3.4976321+04  DXG    2.1723593+04  DYG   -8.5278302+04  DZG   -8.2673967+02
  ALT    2.0101829+05  LAT   -9.8508491+00  LON    1.0993661+01   VE    8.8005609+04  PTE    3.3411966+00  AZE   -8.9965028+01

EARTH-MOON PLANE
  XMP   -3.9565457+02  YMP   -9.1498459+02  ZMP    1.4496304+01 DXMP   -4.8824233+03 DYMP    2.0983281+03 DZMP   -5.8574030+02
  RMP    9.9697013+02 DEMP    8.3313060-01 RAMP   -1.1338446+02  VMP    5.3464127+03 PTMP    3.5732437-02 AZMP   -9.6291002+01
  XME   -2.0445984+05  YME   -9.1498391+02  ZME    1.4496070+01 DXME   -5.1234199+03 DYME   -1.2965810+03 DZME   -5.8574028+02

PLANETARY COORDINATES
   XM    1.9115417+05   YM   -6.2082992+04   ZM   -3.5326742+04  DXM    1.4138056+03  DYM    2.7271798+03  DZM    1.4653090+03
   RM    2.0406418+05  DEM   -9.9690302+00  RAM   -1.7992744+01  LOM    1.0763210+01   VM    3.4034522+03 ARGM   -2.1304828+01
 XSUN    4.0612391+06 YSUN   -7.2791806+07 ZSUN   -3.1565364+07  RAS   -8.6806632+01  LOS    3.0194931+02  DES   -2.3410952+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -4.1279661+05  ECC    1.0420783+00  INC    1.0072744+01  RAN    6.0037418+01  APF    1.3953747+02   RP    1.7369702+04
   VH    2.3690098+03 RNMP   -1.7973477+02 APMP    3.7510008+01 INMP    2.4710946+01  APO   -8.4296300+05  TFP    2.4844932+01
   TA    1.4248027+02   EA    5.1668950+01   MA    9.7745100+00  SLR    3.5470485+04  PER    1.8478752+03  MTA    1.6366237+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9705246+02 ECCS    6.2909336-04 INCS    1.4632439+02 RANS   -1.7205058+02 APFS    5.8168280+01  RPS    9.9642523+02
  VHS   -2.2142446+03 RNMPS   5.9101898+01 APMPS   8.9940815+01 INMPS   1.7365429+02 APOS    9.9767967+02 TFPS    7.4564529+01
  TAS    8.2499748+01  EAS    8.2458323+01  MAS    8.2422590+01 SLRS    9.9705201+02 PERS    1.9778564+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.6685295-02   WY    5.4916183-01   WZ   -8.3219028-01   PX   -6.2013923-01   PY    6.2729299-01   PZ    4.7109529-01
   QX    7.8073466-01   QY    5.5219992-01   QZ    2.9245264-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12-  8
                  MEAN-OF-EPOCH  1969        24  DEC. 19GA, 16 HRS.,  7 MINS.,  2.205 SECS. G.M.T.

T        .7526736381861 91+002  HRS. FROM LAUNCH      3 DAYS,  3 HRS.,  16 MINS.,  2.510 SECS. G.E.T.    RAGR  .335004314486527+003

          PHASE ELAPSED TIME      .2604198+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .2887466171271540 1+000      .1423024756603298 2-001     -.1721657834940680 8-001
        RDXYZ      .7936667870707400 8-002     -.7670745753694114 0+000     -.5069053647160051 9+000

SELENOCENTRIC
   XL    9.9442415+02   YL    4.9008026+01   ZL   -5.9292751+01  DXL    4.6133507+01  DYL   -4.4587781+03  DZL   -2.9464912+03
   RL    9.9739499+02 DECL   -3.4081066+00  RAL    2.8214148+00   VL    5.3445899+03 PTHL    2.2205323-02  AZL   -1.2352201+02

SELENOGRAPHIC
   XS   -8.6701053+02   YS   -4.8729741+02   ZS   -7.5038210+01  DXS   -2.5049526+03  DYS    4.6171071+03  DZS   -1.0681217+03
 ALTS    5.8901472+01 LATS   -4.3146789+00 LONS   -1.5066212+02  VRS    5.3603498+03  PTR    2.2140025-02  AZR   -1.0152530+02
  LTS   -1.5108714+00  LNS    1.2079830+02  LTE    2.7709795+00  LNE    7.8137956+00 OSMP    5.0297840+00 RSMP    1.1312116+02
  LIN    1.6767155+02  LAN    4.9532628+01  LAP   -2.7967331+02   DR    2.0713267+00   VT    5.3603493+03 SOLSV   1.5694862+00

GEOCENTRIC
    X    1.9235742+05    Y   -6.1629848+04    Z   -3.5168887+04   DX    1.4520820+03   DY   -1.7291054+03   DZ   -1.4797567+03
    R    2.0502796+05  DEC   -9.8769134+00   RA   -1.7765061+01    V    2.6996347+03  PTH    5.2296942+01   AZ   -1.3319667+02

GEOGRAPHIC
   XG    2.0038284+05   YG    2.5423066+04   ZG   -3.5168887+04  DXG    1.3311089+04  DYG   -8.9738671+04  DZG   -1.4798046+03
  ALT    2.0158437+05  LAT   -9.8780020+00  LON    7.2306260+00   VE    9.0732598+04  PTE    1.3489322+00  AZE   -9.0713864+01

EARTH-MOON PLANE
  XMP   -9.2775640+02  YMP   -3.5982279+02  ZMP   -6.7767438+01 DXMP   -1.8975546+03 DYMP    4.9746157+03 DZMP   -4.6596862+02
  RMP    9.9739499+02 DEMP   -3.8959306+00 RAMP   -1.5480162+02  VMP    5.3445899+03 PTMP    2.2204622-02 AZMP   -9.5011786+01
  XME   -2.0502764+05  YME   -3.5982145+02  ZME   -6.7767660+01 DXME   -2.1385493+03 DYME    1.5803505+03 DZME   -4.6596861+02

PLANETARY COORDINATES
   XM    1.9136300+05   YM   -6.1678855+04   ZM   -3.5109594+04  DXM    1.4059485+03  DYM    2.7296726+03  DZM    1.4667346+03
   RM    2.0409988+05  DEM   -9.9053816+00  RAM   -1.7864826+01  LOM    7.1308608+00   VM    3.4028097+03 ARGM   -2.1163612+01
 XSUN    4.0759355+06 YSUN   -7.2791073+07 ZSUN   -3.1565046+07  RAS   -8.6795069+01  LOS    2.9820061+02  DES   -2.3410717+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.5131108+05  ECC    8.2043955-01  INC    1.3590634+02  RAN    1.7258782+02  APF    3.6629367+01   RP    2.7169487+04
   VH   -2.0541922+03 RNMP   -1.7983496+02 APMP   -3.3757471+02 INMP    1.6363207+02  APO    2.7545268+05  TFP   -8.1854590+00
   TA    1.5764191+02   EA    1.1563944+02   MA    7.3260342+01  SLR    4.9460402+04  PER    4.1008565+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9722211+02 ECCS    4.2457702-04 INCS    1.4632533+02 RANS   -1.7205056+02 APFS    7.2028460+01  RPS    9.9679872+02
  VHS   -2.2144570+03 RNMPS   5.8965930+01 APMPS  -2.5619660+02 INMPS   1.7365512+02 APOS    9.9764548+02 TFPS    7.4640432+01
  TAS    1.1413473+02  EAS    1.1410407+02  MAS    1.1408186+02 SLRS    9.9722185+02 PERS    1.9783612+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.6683640-02   WY    5.4914831-01   WZ   -8.3219936-01   PX   -4.1505662-01   PY    7.4131796-01   PZ    5.2742356-01
```

QX	9.0655808-01	QY	3.8585461-01	QZ	1.7108069-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / MOON REF. /PHASE 12- 9
MEAN-OF-EPOCH 1969 24 DEC. 1968, 16 HRS., 21 MINS., 5.955 SECS. G.M.T.

T .755017388186191+002 HRS. FROM LAUNCH 3 DAYS, 3 HRS., 30 MINS., 6.260 SECS. G.E.T. RAGR .338529564559582+003

PHASE ELAPSED TIME .26126359+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	.21409754227773067+000	-.15317982497999080+000	-.12079973984015839+000		
RDXYZ	-.61522442814425089+000	-.59493676469836907+000	-.33582074052433900+000		

SELENOCENTRIC

XL	7.3733770+02	YL	-5.2754114+02	ZL	-4.1602627+02	DXL	-3.5761180+03	DYL	-3.4581918+03	DZL	-1.9520269+03
RL	9.9751911+02	DECL	-2.4649171+01	RAL	-3.5582485+01	VL	5.3439797+03	PTHL	-4.0169599-03	AZL	-1.1369886+02

SELENOGRAPHIC

XS	-9.5290223+02	YS	2.2550350+02	ZS	-1.9018379+02	DXS	1.3257339+03	DYS	5.1677922+03	DZS	-5.1300766+02
ALTS	5.9025586+01	LATS	-1.0991116+01	LONS	1.6668593+02	VRS	5.3597409+03	PTR	-4.0057219-03	AZR	-9.5596205+01
LTS	-1.5109687+00	LNS	1.2067944+02	LTE	2.7572753+00	LNE	7.8168613+00	OSMP	5.0298630+00	RSMP	1.1299872+02
LIN	1.6767441+02	LAN	4.9416710+01	LAP	1.5187895+02	DR	-3.7471577-01	VT	5.3597409+03	SOLSV	4.3363632+01

GEOCENTRIC

X	1.9229506+05	Y	-6.1827182+04	Z	-3.5321853+04	DX	-2.1775395+03	DY	-7.2619817+02	DZ	-4.8396447+02
R	2.0505517+05	DEC	-9.9189764+00	RA	-1.7823763+01	V	2.3459036+03	PTH	-4.7867493+01	AZ	-1.2036467+02

GEOGRAPHIC

XG	2.0158109+05	YG	1.2847271+04	ZG	-3.5321852+04	DXG	3.9317151+03	DYG	-9.0788839+04	DZG	-4.8391159+02
ALT	2.0161158+05	LAT	-9.9200695+00	LON	3.6466721+00	VE	9.0875225+04	PTE	-1.0969252+00	AZE	-9.0501684+01

EARTH-MOON PLANE

XMP	-9.2146900+02	YMP	3.6622176+02	ZMP	-1.0872388+02	DXMP	1.9835563+03	DYMP	4.9612829+03	DZMP	-9.6410661+01
RMP	9.9751910+02	DEMP	-6.2573435+00	RAMP	1.5832552+02	VMP	5.3439797+03	PTMP	-4.0170334-03	AZMP	-9.1040394+01
XME	-2.0505481+05	YME	3.6622109+02	ZME	-1.0872401+02	DXME	1.7425652+03	DYME	1.5676210+03	DZME	-9.6410661+01

PLANETARY COORDINATES

XM	1.9155772+05	YM	-6.1299641+04	ZM	-3.4905826+04	DXM	1.3985784+03	DYM	2.7319936+03	DZM	1.4680623+03
RM	2.0413335+05	DEM	-9.8456881+00	RAM	-1.7744988+01	LOM	3.7254481+00	VM	3.4022078+03	ARGM	-2.1031266+01
XSUN	4.0897133+06	YSUN	-7.2790385+07	ZSUN	-3.1564746+07	RAS	-8.6784227+01	LOS	2.9468621+02	DES	-2.3410495+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	1.3553813+05	ECC	8.1752767-01	INC	1.4820386+02	RAN	1.7856048+02	APF	1.8393450+00	RP	2.4731960+04
VH	-2.4076078+03	RNMP	-1.7961209+02	APMP	-1.6751610+01	INMP	1.7645397+02	APO	2.4634431+05	TFP	1.6471728+02
TA	-1.6275720+02	EA	-1.2885672+02	MA	-9.2380920+01	SLR	4.4951019+04	PER	3.4766480+02	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	9.9724259+02	ECCS	2.8601827-04	INCS	1.4632884+02	RANS	-1.7204698+02	APFS	3.4598897+01	RPS	9.9695737+02
VHS	-2.2145969+03	RNMPS	5.8866222+01	APMPS	6.6415430+01	INMPS	1.7365709+02	APOS	9.9752781+02	TFPS	7.6412944+01
TAS	-1.6581786+02	EAS	-1.6581011+02	MAS	-1.6580608+02	SLRS	9.9724244+02	PERS	1.9784222+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-7.6710845-02	WY	5.4909299-01	WZ	-8.3223335-01	PX	-8.8061471-01	PY	3.5412870-01	PZ	3.1481829-01
QX	4.6758222-01	QY	7.5702690-01	QZ	4.5637386-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / MOON REF. /PHASE 12- 10
MEAN-OF-EPOCH 1969 24 DEC. 1968, 16 HRS., 36 MINS., 5.955 SECS. G.M.T.

T .757517388186191+002 HRS. FROM LAUNCH 3 DAYS, 3 HRS., 45 MINS., 6.260 SECS. G.E.T. RAGR .342289831304174+003

PHASE ELAPSED TIME .26216359+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	.11965203607582165-001	-.24099772825328624+000	-.16009644727190818+000		
RDXYZ	-.91602204123294102+000	-.70276292312495969-001	.38159899990692818-001		

SELENOCENTRIC

XL	4.1207366+01	YL	-8.2998016+02	ZL	-5.5136152+02	DXL	-5.3245658+03	DYL	-4.0849534+02	DZL	2.2181223+02
RL	9.9727861+02	DECL	-3.3563860+01	RAL	-8.7157676+01	VL	5.3448170+03	PTHL	-2.8668272-02	AZL	-8.7164300+01

SELENOGRAPHIC

XS	-4.9020735+02	YS	8.4476865+02	ZS	-2.0156208+02	DXS	4.5884384+03	DYS	2.7471564+03	DZS	3.6759079+02
ALTS	5.8785082+01	LATS	-1.1660495+01	LONS	1.2012599+02	VRS	5.3605745+03	PTR	-2.8583697-02	AZR	-8.5990883+01
LTS	-1.5110725+00	LNS	1.2055265+02	LTE	2.7426460+00	LNE	7.8200784+00	OSMP	5.0299457+00	RSMP	1.1286816+02
LIN	1.6767476+02	LAN	4.9303575+01	LAP	5.9647733+01	DR	-2.6742812+00	VT	5.3605738+03	SOLSV	7.9841752+01

GEOCENTRIC

X	1.9180550+05	Y	-6.1724774+04	Z	-3.5239633+04	DX	-3.9338531+03	DY	2.3259568+03	DZ	1.6912816+03
R	2.0455104+05	DEC	-9.9202899+00	RA	-1.7838651+01	V	4.8729568+03	PTH	-7.3906144+01	AZ	4.8329078+01

GEOGRAPHIC

XG	2.0149217+05	YG	-4.5183521+02	ZG	-3.5239632+04	DXG	-4.6551966+03	DYG	-8.8257574+04	DZG	1.6911659+03
ALT	2.0110745+05	LAT	-9.9213859+00	LON	3.5987151+02	VE	8.8396439+04	PTE	-3.0361434+00	AZE	-8.9417122+01

EARTH-MOON PLANE

XMP	-3.7992708+02	YMP	9.1776657+02	ZMP	-8.9020011+01	DXMP	4.9169092+03	DYMP	2.0663315+03	DZMP	3.4834883+02
RMP	9.9727861+02	DEMP	-5.1212054+00	RAMP	1.1248805+02	VMP	5.3448170+03	PTMP	-2.8668258-02	AZMP	-8.6250678+01
XME	-2.0454896+05	YME	9.1776682+02	ZME	-8.9020133+01	DXME	4.6759237+03	DYME	-1.3266873+03	DZME	3.4834884+02

PLANETARY COORDINATES

XM	1.9176430+05	YM	-6.0894795+04	ZM	-3.4688272+04	DXM	1.3907127+03	DYM	2.7344522+03	DZM	1.4694694+03
RM	2.0416904+05	DEM	-9.7819912+00	RAM	-1.7617257+01	LOM	9.2914477-02	VM	3.4015659+03	ARGM	-2.0890150+01
XSUN	4.1044093+06	YSUN	-7.2789648+07	ZSUN	-3.1564426+07	RAS	-8.6772664+01	LOS	2.9093750+02	DES	-2.3410256+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-2.1173547+06	ECC	1.0077524+00	INC	4.2624529+01	RAN	-6.8840469+00	APF	1.3161111+02	RP	1.6414620+04
VH	1.0460154+03	RNMP	-1.6305992-01	APMP	1.4625193+02	INMP	1.4854638+01	APO	-4.2511241+06	TFP	1.2873752+02
TA	-1.4634919+02	EA	-2.3886893+01	MA	-8.8859310-01	SLR	3.2956529+04	PER	2.1466385+04	MTA	1.7288854+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	9.9707413+02	ECCS	5.4075732-04	INCS	1.4633054+02	RANS	-1.7203803+02	APFS	2.6581352+01	RPS	9.9653497+02
VHS	-2.2146709+03	RNMPS	5.8772022+01	APMPS	5.8437359+01	INMPS	1.7365597+02	APOS	9.9761328+02	TFPS	7.6368518+01
TAS	-1.1232114+02	EAS	-1.1228838+02	MAS	-1.1225972+02	SLRS	9.9707380+02	PERS	1.9779208+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-7.6793161-02	WY	5.4905657-01	WZ	-8.3224979-01	PX	-9.3726299-01	PY	2.4494082-01	PZ	2.4807667-01

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  QX   3.4006007-01   QY   7.9908752-01   QZ   4.9580063-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 11
                  MEAN-OF-EPOCH  1969       24  DEC. 1968, 16 HRS.,  51 MINS.,  5.955 SECS. G.M.T.

T        .7600173881861 91+002  HRS. FROM LAUNCH      3 DAYS,  4 HRS.,  0 MINS.,  6.260 SECS. G.E.T.    RAGR  .3460500980487 66+003

        PHASE ELAPSED TIME     .26306359+08 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ      -.1972865048796 6347+000      -.1846976762822 0028+000      -.1036371421358 2132+000
       RDXYZ     -.6690157842926 4994+000       .4968850906164 7252+000       .3895935748050 0667+000

SELENOCENTRIC
   XL   -6.7944160+02   YL   -6.3608652+02   ZL   -3.5691943+02  DXL   -3.8887913+03  DYL    2.8882464+03  DZL    2.2645924+03
   RL    9.9681412+02 DECL   -2.0981110+01  RAL   -1.3688757+02  VL    5.3472463+03 PTHL   -3.4881724-02  AZL   -6.3041443+01

SELENOGRAPHIC
   XS    2.6728281+02   YS    9.5586064+02   ZS   -9.2351083+01  DXS    5.0930645+03  DYS   -1.3281447+03  DZS    1.0288166+03
 ALTS    5.8320609+01 LATS   -5.3158620+00 LONS    7.4377663+01  VRS    5.3629971+03  PTR   -3.4778854-02  AZP   -7.8894960+01
  LTS   -1.5111760+00  LNS    1.2042586+02  LTE    2.7280051+00  LNE    7.8232410+00 DSMP    5.0300279+00 RSMP    1.1273765+02
  LIN    1.6767280+02  LAN    4.9177731+01  LAP   -1.0330853+02  DR    -3.2553685+00  VT    5.3629960+03 SOLSV    4.3889584+01

GEOCENTRIC
    X    1.9129027+05    Y   -6.1125670+04    Z   -3.4827428+04  DX    -2.5059487+03  DY    5.6251395+03  DZ    3.7354593+03
    R    2.0381673+05  DEC   -9.8387665+00   RA   -1.7720971+01   V    7.2024738+03  PTH   -4.0495923+01  AZ    5.7037453+01

GEOGRAPHIC
   XG    2.0038429+05   YG   -1.3207876+04   ZG   -3.4827427+04  DXG   -9.6402246+03  DYG   -8.3930617+04  DZG    3.7354464+03
  ALT    2.0037314+05  LAT   -9.8398577+00  LON    3.5622893+02   VE    8.4564983+04  PTE   -3.1706547+00  AZE   -8.7977457+01

EARTH-MOON PLANE
  XMP    3.9006150+02  YMP    9.1718708+02  ZMP   -1.6027090+01 DXMP    4.8936211+03 DYMP   -2.0744763+03 DZMP    5.8486301+02
  RMP    9.9681413+02 DEMP   -9.2125917-01 RAMP    6.6960928+01  VMP    5.3472463+03 PTMP   -3.4881383-02 AZMP   -8.3720372+01
  XME   -2.0381468+05  YME    9.1718753+02  ZME   -1.6027007+01 DXME    4.6526431+03 DYME   -5.4668525+03 DZME    5.8486303+02

PLANETARY COORDINATES
   XM    1.9196971+05   YM   -6.0489584+04   ZM   -3.4470508+04  DXM    1.3828426+03  DYM    2.7368931+03  DZM    1.4708668+03
   RM    2.0420473+05  DEM   -9.7182689+00  RAM   -1.7489620+01  LOM    3.5646027+02   VM    3.4009244+03 ARGM   -2.0749086+01
 XSUN    4.1191055+06 YSUN   -7.2788908+07 ZSUN   -3.1564105+07  RAS   -8.6761100+01  LOS    2.8718880+02  DES   -2.3410019+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -7.9495697+04  ECC    2.7868701+00  INC    3.4240152+01  RAN   -2.9589076+00  APF    3.6291324+01   RP    1.4204848+05
   VH    5.3983757+03 RNMP   -2.1585742-01 APMP    5.3928591+01 INMP    6.1260114+00  APO   -3.0103987+05  TFP    1.1305942+02
   TA   -5.3970810+01   EA   -4.1848429+01   MA   -8.5427330+01  SLR    5.3791914+05  PER    1.5616506+02  MTA    1.1102808+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9705133+02 ECCS    6.5362616-04 INCS    1.4632931+02 RANS   -1.7203277+02 APFS    2.8463555+01  RPS    9.9639962+02
  VHS   -2.2140027+03 RNMPS  5.8648158+01 APMPS   6.0332859+01 INMPS   1.7365342+02 APOS    9.9770302+02 TFPS   7.6378749+01
  TAS   -6.8696170+01  EAS   -6.8656593+01  MAS   -6.8621711+01 SLRS    9.9705086+02 PERS    1.9778530+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.6846037-02   WY    5.4906723-01   WZ   -8.3223788-01  PX   -9.2561219-01  PY    2.7096392-01  PZ    2.6423579-01
   QX    3.7058965-01   QY    7.9063499-01   QZ    4.8740081-01 SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 12
                  MEAN-OF-EPOCH  1969       24  DEC. 1968, 17 HRS.,  6 MINS.,  5.955 SECS. G.M.T.

T        .7625173881861 91+002  HRS. FROM LAUNCH      3 DAYS,  4 HRS.,  15 MINS.,  6.260 SECS. G.E.T.    RAGR  .3498103647933 58+003

        PHASE ELAPSED TIME     .26396360+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ      -.2883904215341 8175+000      -.1782156949494 7741-001       .1487089118193 7350-001
       RDXYZ     -.2087438842622 4136-001       .7671667375004 4125+000       .5080473635037 1183+000

SELENOCENTRIC
   XL   -9.9319744+02   YL   -6.1376300+01   ZL    5.1214360+01  DXL   -1.2133666+02  DYL    4.4593138+03  DZL    2.9531293+03
   RL    9.9640909+02 DECL    2.9462399+00  RAL   -1.7646381+02  VL    5.3498761+03 PTHL   -2.0876450-02  AZL   -5.6444192+01

SELENOGRAPHIC
   XS    8.6380368+02   YS    4.9139351+02   ZS    7.2157408+01  DXS    2.5295878+03  DYS   -4.6083712+03  DZS    1.0742368+03
 ALTS    5.7915590+01 LATS    4.1528496+00 LONS    2.9634324+01  VRS    5.3656206+03  PTR   -2.0814730-02  AZP   -7.8418549+01
  LTS   -1.5112804+00  LNS    1.2029907+02  LTE    2.7133528+00  LNE    7.8263490+00 DSMP    5.0301097+00 RSMP    1.1260719+02
  LIN    1.6767358+02  LAN    4.9041229+01  LAP   -1.4380587+02  DR    -1.0492523+00  VT    5.3656202+03 SOLSV   -7.7221190-01

GEOCENTRIC
    X    1.9118075+05    Y   -6.0145389+04    Z   -3.4201325+04  DX    1.2536316+03  DY    7.1986302+03  DZ    4.4253841+03
    R    2.0331571+05  DEC   -9.6842153+00   RA   -1.7463552+01   V    8.5425927+03  PTH   -1.1445378+01  AZ    5.9891491+01

GEOGRAPHIC
   XG    1.9880550+05   YG   -2.5375583+04   ZG   -3.4201325+04  DXG   -1.1282972+04  DYG   -8.0779343+04  DZG    4.4253904+03
  ALT    1.9987211+05  LAT   -9.6852926+00  LON    3.5272608+02   VE    8.1683487+04  PTE   -1.1891723+00  AZE   -8.7052001+01

EARTH-MOON PLANE
  XMP    9.2505273+02  YMP    3.6424877+02  ZMP    6.6568890+01 DXMP    1.9212817+03 DYMP   -4.9707212+03 DZMP    4.7093903+02
  RMP    9.9640912+02 DEMP    3.8307150+00 RAMP    2.1492536+01  VMP    5.3498762+03 PTMP   -2.0876728-02 AZMP   -8.4937084+01
  XME   -2.0331538+05  YME    3.6424799+02  ZME    6.6568857+01 DXME    1.6803132+03 DYME   -8.3624553+03 DZME    4.7093902+02

PLANETARY COORDINATES
   XM    1.9217395+05   YM   -6.0084012+04   ZM   -3.4252539+04  DXM    1.3749682+03  DYM    2.7393164+03  DZM    1.4722547+03
   RM    2.0424043+05  DEM   -9.6545233+00  RAM   -1.7362078+01  LOM    3.5282755+02   VM    3.4002831+03 ARGM   -2.0608073+01
 XSUN    4.1338011+06 YSUN   -7.2788167+07 ZSUN   -3.1563783+07  RAS   -8.6749535+01  LOS    2.8344009+02  DES   -2.3409778+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -4.6161633+04  ECC    5.3006754+00  INC    3.1488012+01  RAN   -1.2865516+00  APF   -5.1967002+00   RP    1.9852620+05
   VH    7.0842575+03 RNMP   -4.3524698-01 APMP    1.3923906+01 INMP    3.2282616+00  APO   -2.9084946+05  TFP    8.5669974+01
   TA   -1.3590778+01   EA   -1.1318039+01   MA   -4.9066132+01  SLR    1.2508491+06  PER    6.9101935+01  MTA    1.0087431+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9722200+02 ECCS    8.9288741-04 INCS    1.4633018+02 RANS   -1.7203274+02 APFS    2.9424174+01  RPS    9.9633159+02
  VHS   -2.2129095+03 RNMPS  5.8512131+01 APMPS   6.1294959+01 INMPS   1.7365419+02 APOS    9.9811240+02 TFPS   7.6383974+01
  TAS   -2.4105939+01  EAS   -2.4083765+01  MAS   -2.4062888+01 SLRS    9.9722117+02 PERS    1.9783609+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.6844645-02   WY    5.4905465-01   WZ   -8.3224631-01  PX   -9.1926989-01  PY    2.8418445-01  PZ    2.7236378-01
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   QX    9.1066806-01   QY    3.7856871-01   QZ    1.6543686-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 17
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 18 HRS.,  20 MINS.,  9.705 SECS. G.M.T.

T        .774861138186191+002  HRS. FROM LAUNCH       3 DAYS,  5 HRS.,  29 MINS.,  10.010 SECS. G.E.T.    RAGR  .837668184478127+001

          PHASE ELAPSED TIME     .26840734+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .209587508526471A3+000      -.157429873624854 67+000      -.123219261676269 68+000
        RDXYZ      -.630650931683563 49+000      -.583794558856659 64+000      -.326631253307513 70+000

SELENOCENTRIC
   XL    7.2180544+02   YL   -5.4217801+02   ZL   -4.2435895+02  DXL   -3.6657877+03  DYL   -3.3934255+03  DZL   -1.8986110+03
   RL    9.9751721+02 DECL   -2.5176944+01  RAL   -3.6911730+01   VL    5.3439742+03 PTHL   -4.8611049-03  AZL   -1.1311737+02

SELENOGRAPHIC
   XS   -9.4209144+02   YS    2.6547765+02   ZS   -1.9242120+02  DXS    1.5401740+03  DYS    5.1104713+03  DZS   -4.8755808+02
 ALTS    5.9023687+01 LATS   -1.1122081+01 LONS    1.6426237+02  VRS    5.3597356+03  PTR   -4.8469972-03  AZR   -9.5320375+01
  LTS   -1.5117942+00  LNS    1.1967307+02  LTE    2.6408415+00  LNE    7.8408955+00 DSMP    5.0305057+00 RSMP    1.1196382+02
  LIN    1.6767864+02  LAN    4.8426003+01  LAP    1.8914610+01   DR   -4.5341252-01   VT    5.3597356+03 SOLSV   4.4718777+01

GEOCENTRIC
    X    1.9388710+05    Y   -5.8618493+04    Z   -3.3597700+04   DX   -2.3297605+03   DY   -6.4240316+02   DZ   -4.1964371+02
    R    2.0532204+05  DEC   -9.4178993+00   RA   -1.6821805+01    V    2.4528690+03  PTH   -5.2574765+01   AZ   -1.2013972+02

GEOGRAPHIC
   XG    1.8327908+05   YG   -8.6238683+04   ZG   -3.3597700+04  DXG   -4.0608894+04  DYG   -8.1502956+04  DZG   -4.1963701+02
  ALT    2.0187841+05  LAT   -9.4189379+00  LON    3.3480151+02   VE    9.1060369+04  PTE   -1.2257408+00  AZE   -9.0471162+01

EARTH-MOON PLANE
  XMP   -9.0497950+02   YMP    4.0512913+02   ZMP   -1.0919280+02 DXMP    2.1918082+03 DYMP    4.8731390+03 DZMP   -8.0944975+01
  RMP    9.9751721+02 DEMP   -6.2844518+00 RAMP    1.5588353+02  VMP    5.3439741+03 PTMP   -4.8616036-03 AZMP   -9.0873654+01
  XME   -2.0532161+05   YME    4.0512942+02   ZME   -1.0919327+02 DXME    1.9509151+03 DYME    1.4845689+03 DZME   -8.0944937+01

PLANETARY COORDINATES
   XM    1.9316529+05   YM   -5.8076315+04   ZM   -3.3173341+04  DXM    1.3360272+03  DYM    2.7510224+03  DZM    1.4789674+03
   RM    2.0441663+05  DEM   -9.3394335+00  RAM   -1.6733721+01  LOM    3.3488959+02   VM    3.3971219+03 ARGM   -1.9912584+01
 XSUN    4.2063595+06 YSUN   -7.2784468+07 ZSUN   -3.1562176+07  RAS   -8.6692440+01  LOS    2.6493087+02  DES   -2.3408595+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.3998242+05   ECC    8.4328946-01   INC    1.4855561+02  RAN    1.7891779+02  APF    5.1215766-01   RP    2.1936721+04
   VH   -2.2975522+03 RNMP   -1.7955985+02 APMP   -1.7214542+01 INMP    1.7684723+02  APO    2.5802813+05  TFP    1.6198966+02
   TA   -1.6223142+02   EA   -1.2360823+02   MA   -8.3367870+01  SLR    4.0435724+04  PER    3.6490410+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9723674+02 ECCS    2.9378685-04 INCS    1.4633875+02 RANS   -1.7201118+02 APFS    3.3350339+01  RPS    9.9694376+02
  VHS   -2.2146097+03 RNMPS   5.7952624+01 APMPS   6.5339328+01 INMPS   1.7365535+02 APOS    9.9752969+02 TFPS    7.8383045+01
  TAS   -1.6322226+02  EAS   -1.6321491+02  MAS   -1.6321005+02 SLRS    9.9723660+02 PERS    1.9784047+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.7033935-02   WY    5.4890244-01   WZ   -8.3232921-01   PX   -8.9081220-01   PY    3.3704483-01   PZ    3.0472016-01
   QX    4.4779389-01   QY    7.6492281-01   QZ    4.6300510-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 18
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 18 HRS.,  35 MINS.,  9.705 SECS. G.M.T.

T        .777361138186191+002  HRS. FROM LAUNCH       3 DAYS,  5 HRS.,  44 MINS.,  10.010 SECS. G.E.T.    RAGR  .121369485893732+002

          PHASE ELAPSED TIME     .26930735+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .533908899359448 11-002      -.241474968527500 83+000      -.159729039501470 31+000
        RDXYZ      -.916626311044973 33+000      -.528356547824766 71-001       .500837308909883 30-001

SELENOCENTRIC
   XL    1.8387467+01   YL   -8.3162374+02   ZL   -5.5009620+02  DXL   -5.3280782+03  DYL   -3.0711807+02  DZL    2.9112194+02
   RL    9.9726725+02 DECL   -3.3477093+01  RAL   -8.8733377+01   VL    5.3448565+03 PTHL   -2.9111609-02  AZL   -8.6275179+01

SELENOGRAPHIC
   XS   -4.5413418+02   YS    8.6510467+02   ZS   -1.9974478+02  DXS    4.6968935+03  DYS    2.5534579+03  DZS    3.9398643+02
 ALTS    5.8773714+01 LATS   -1.1554043+01 LONS    1.1769710+02  VRS    5.3606138+03  PTR   -2.9025749-02  AZR   -8.5703781+01
  LTS   -1.5118985+00  LNS    1.1954628+02  LTE    2.6261231+00  LNE    7.8436801+00 DSMP    5.0305847+00 RSMP    1.1183368+02
  LIN    1.6767886+02  LAN    4.8312646+01  LAP    2.7212987+02   DR   -2.7156593+00   VT    5.3606132+03 SOLSV   7.9791626+01

GEOCENTRIC
    X    1.9338099+05    Y   -5.8500282+04    Z   -3.3504272+04   DX   -3.9999498+03   DY    2.4462228+03   DZ    1.7714204+03
    R    2.0479508+05  DEC   -9.4158576+00   RA   -1.6831251+01    V    5.0121387+03  PTH   -7.1954235+01   AZ    4.9647425+01

GEOGRAPHIC
   XG    1.7675888+05   YG   -9.7850841+04   ZG   -3.3504272+04  DXG   -4.6751715+04  DYG   -7.5085322+04  DZG    1.7714175+03
  ALT    2.0135146+05  LAT   -9.4168987+00  LON    3.3103180+02   VE    8.8468450+04  PTE   -3.0878962+00  AZE   -8.9347991+01

EARTH-MOON PLANE
  XMP   -3.4062730+02   YMP    9.3321769+02   ZMP   -8.7291311+01 DXMP    4.9993744+03 DYMP    1.8556503+03 DZMP    3.6098146+02
  RMP    9.9726725+02 DEMP   -5.0215549+00 RAMP    1.1005223+02  VMP    5.3448565+03 PTMP   -2.9111251-02 AZMP   -8.6115018+01
  XME   -2.0479294+05   YME    9.3321905+02   ZME   -8.7291311+01 DXME    4.7585022+03 DYME   -1.5322804+03 DZME    3.6098145+02

PLANETARY COORDINATES
   XM    1.9336261+05   YM   -5.7668658+04   ZM   -3.2954177+04  DXM    1.3281284+03  DYM    2.7533408+03  DZM    1.4802985+03
   RM    2.0445231+05  DEM   -9.2755510+00  RAM   -1.6606737+01  LOM    3.3125631+02   VM    3.3964825+03 ARGM   -1.9771878+01
 XSUN    4.2210545+06 YSUN   -7.2783711+07 ZSUN   -3.1561848+07  RAS   -8.6680876+01  LOS    2.6118217+02  DES   -2.3408341+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -9.2780586+05   ECC    1.0232491+00   INC    4.1252846+01  RAN   -5.9322906+00  APF    1.2590000+02   RP    2.1570627+04
   VH    1.5801793+03 RNMP   -1.5831476-01 APMP    1.4016002+02 INMP    1.3366960+01  APO   -1.8771823+06  TFP    1.3124248+02
   TA   -1.4026565+02   EA   -3.5047751+01   MA   -3.0935270+00  SLR    4.3642768+04  PER    6.2266453+03  MTA    1.6776298+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9706610+02 ECCS    5.4668100-04 INCS    1.4634032+02 RANS   -1.7200226+02 APFS    2.7295898+01  RPS    9.9652102+02
  VHS   -2.2146746+03 RNMPS   5.7858002+01 APMPS   5.9325680+01 INMPS   1.7365410+02 APOS    9.9761117+02 TFPS    7.8349411+01
  TAS   -1.1169032+02  EAS   -1.1165627+02  MAS   -1.1162716+02 SLRS    9.9706575+02 PERS    1.9778970+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.7116163-02   WY    5.4886784-01   WZ   -8.3234441-01   PX   -9.3311424-01   PY    2.5434755-01   PZ    2.5417528-01
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QX	3.5121340-01	QY	7.9627343-01	QZ	4.9254209-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / MOON REF. /PHASE 12- 19
MEAN-OF-EPOCH 1969 24 DEC. 1968, 18 HRS., 50 MINS., 9.705 SECS. G.M.T.

T .7798611381861 91+002 HRS. FROM LAUNCH 3 DAYS, 5 HRS., 59 MINS., 10.010 SECS. G.E.T. RAGR .1589721533396 53+002

PHASE ELAPSED TIME .2702073 5+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	-.2020663369053612 1+000	-.4111365391279602+000	-.1007009841881907 6+000
RDXYZ	-.6544180805144694 4+000	.1030977474073471+000	.3971279373847807+000

SELENOCENTRIC

XL	-6.9590303+02	YL	-6.2374339+02	ZL	-3.4680749+02	DXL	-3.8039391+03	DYL	2.9656988+03	DZL	2.3083874+03
RL	9.9680101+02	DECL	-2.0360173+01	RAL	-1.3812988+02	VL	5.3473334+03	PTHL	-3.4701951-02	AZL	-6.2597904+01

SELENOGRAPHIC

XS	3.0692724+02	YS	9.4432002+01	ZS	-8.7564798+01	DXS	5.0301969+03	DYS	-1.5418845+03	DZS	1.0403768+03
ALTS	5.8307485+01	LATS	-5.0396906+00	LONS	7.1994562+01	VRS	5.3630842+03	PTR	-3.4599749-02	AZR	-7.8773493+01
LTS	-1.5120035+00	LNS	1.1941950+02	LTE	2.6113940+00	LNE	7.8464107+00	RSMP	5.0306622+00	RSMP	1.1170358+02
LIN	1.6767693+02	LAN	4.8186124+01	LAP	-2.6363907+01	OR	-3.2386564+00	VT	5.3630831+03	SOLSV	4.2533663+01

GEOCENTRIC

X	1.9286285+05	Y	-5.7884403+04	Z	-3.3081622+04	DX	-2.4837135+03	DY	5.7213404+03	DZ	3.7900075+03
R	2.0406144+05	DEC	-9.3297372+00	RA	-1.6706207+01	V	7.2984056+03	PTH	-3.8916414+01	AZ	5.7062655+01

GEOGRAPHIC

XG	1.0963147+05	YG	-1.0949812+05	ZG	-3.3081622+04	DXG	-4.8894632+04	DYG	-6.8977012+04	DZG	3.7900212+03
ALT	2.0081781+05	LAT	-9.3307727+00	LON	3.2739657+02	VE	8.4633788+04	PTE	-3.1053677+00	AZE	-8.7906259+01

EARTH-MOON PLANE

XMP	4.2853118+02	YMP	8.9988932+02	ZMP	-1.3135024+01	DXMP	4.8006152+03	DYMP	-2.2810917+03	DZMP	5.8710136+02
RMP	9.9680103+02	DEMP	-7.5501849-01	RAMP	6.4536007+01	VMP	5.3473333+03	PTMP	-3.4701812-02	AZMP	-8.3696509+01
XME	-2.0405946+05	YME	8.9988823+02	ZME	-1.3136332+01	DXME	4.5597659+03	DYME	-5.6683836+03	DZME	5.8710141+02

PLANETARY COORDINATES

XP	1.9355875+05	YP	-5.7260660+04	ZM	-3.2734815+04	DXM	1.3202256+03	DYM	2.7556416+03	DZM	1.4816201+03
RP	2.0448799+05	DEM	-9.2116471+00	RAM	-1.6479845+01	LOM	3.2762294+02	VM	3.3958437+03	ARGM	-1.9631225+01
XSUN	4.2357492+06	YSUN	-7.2782952+07	ZSUN	-3.1561518+07	RAS	-8.6669312+01	LOS	2.5743347+02	DES	-2.3408095+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-7.5806223+04	ECC	2.9404042+00	INC	3.4089442+01	RAN	-2.6572716+00	APE	3.4439570+01	RP	1.4709470+05
VM	5.5281840+03	RNMP	-2.1716706-01	APMP	5.1216435+01	INMP	5.9313054+00	APO	-2.9870715+05	TFP	1.1344249+02
TM	-5.1252128+01	EA	-4.0137298+01	MA	-4.7775059+01	SLR	5.7961261+05	PER	1.4542054+02	MTA	1.0988231+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	9.9705756+02	ECCS	6.5804844-04	INCS	1.4633909+02	RANS	-1.7199727+02	APES	2.8136662+01	RPS	9.9640146+02
VMS	-2.2134653+03	RNMPS	5.7733298+01	APMPS	6.0177933+01	INMPS	1.7365164+02	APOS	9.9771366+02	TFPS	7.8353931+01
TAS	-5.7022222+01	EAS	-6.6982727+01	MAS	-6.6948026+01	SLRS	9.9705707+02	PERS	1.9778716+00	MTAS	3.5999994+02

SELENOCENTRIC UNIT VECTORS

UX	-7.7166480-02	WY	5.4887883-01	WZ	-8.3233250-01	PX	-9.2788261-01	PY	2.6591793-01	PZ	2.6138370-01
QX	3.5480011-01	QY	7.9247691-01	QZ	4.8877516-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / MOON REF. /PHASE 12- 20
MEAN-OF-EPOCH 1969 24 DEC. 1968, 19 HRS., 5 MINS., 9.705 SECS. G.M.T.

T .7923611381861 91+002 HRS. FROM LAUNCH 3 DAYS, 6 HRS., 14 MINS., 10.010 SECS. G.E.T. RAGR .1965748207855 73+002

PHASE ELAPSED TIME .2711073 5+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	-.2884561517967714 1+000	-.1231748296871937 9-001	.1861986041720939 0-001
RDXYZ	.3214352488460816 3-003	.7683772000776168 4+000	.5066640472104300 5+000

GEOCENTRIC

XL	-9.4346702+02	YL	-4.2420592+01	ZL	6.4125562+01	DXL	1.2871378+00	DYL	4.4663499+03	DZL	2.9450806+03
RL	9.4681159+02	DECL	3.6899436+00	RAL	-1.7755499+02	VL	5.3499374+03	PTHL	-2.0297447-02	AZL	-5.6519253+01

SELENOGRAPHIC

XS	8.2716250+02	YS	4.5490601+02	ZS	7.7047522+01	DXS	2.3329002+03	DYS	-4.7133895+03	DZS	1.0639916+03
ALTS	5.7906672+01	LATS	4.4348676+00	LONS	2.7252965+01	VRS	5.3656819+03	PTR	-2.0237501-02	AZR	-7.8526273+01
LTS	-1.5161176+00	LNS	1.1923272+02	LTE	2.5966541+00	LNE	7.8490873+00	RSMP	5.0307406+00	RSMP	1.1157354+02
LIN	1.7277754+02	LAN	4.8040768+01	LAP	-1.1037592+02	OR	-1.8952178+00	VT	5.3656815+03	SOLSV	-2.1499213+00

GEOCENTRIC

X	1.9278024+05	Y	-5.6894743+04	Z	-3.2451134+04	DX	1.3136061+03	DY	7.2242747+03	DZ	4.4280237+03
R	2.0359441+05	DEC	-9.1720086+00	RA	-1.6444386+01	V	8.5745695+03	PTH	-9.9450486+00	AZ	5.9816547+01

GEOGRAPHIC

XG	1.0783710+05	YG	-1.1842282+05	ZG	-3.2451134+04	DXG	-4.8803196+04	DYG	-6.5588689+04	DZG	4.4280240+03
ALT	2.0014077+05	LAT	-9.1732897+00	LON	3.2389813+02	VE	8.1873292+04	PTE	-1.0365215+00	AZE	-8.7026642+01

EARTH-MOON PLANE

XMP	9.3956800+02	YMP	3.2460872+02	ZMP	6.8891306+01	DXMP	1.7085225+03	DYMP	-5.0487501+03	DZMP	4.6141382+02
RMP	9.9641154+02	DEMP	3.9845687+00	RAMP	1.9060264+01	VMP	5.3499373+03	PTMP	-2.0297331-02	AZMP	-8.5038981+01
XME	-2.0354414+05	YME	3.2460806+02	ZME	6.8890100+01	DXME	1.4676980+03	DYME	-9.4354034+03	DZME	4.6141386+02

PLANETARY COORDINATES

XP	1.9375371+05	YP	-5.6852324+04	ZM	-3.2515259+04	DXM	1.3123190+03	DYM	2.7579248+03	DZM	1.4829321+03
RP	2.0452366+05	DEM	-9.1477215+00	RAM	-1.6353045+01	LOM	3.2398947+02	VM	3.3952051+03	ARGM	-1.9490623+01
XSUN	4.2504439+06	YSUN	-7.2782191+07	ZSUN	-3.1561188+07	RAS	-8.6657749+01	LOS	2.5368477+02	DES	-2.3407847+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-4.5508711+04	ECC	5.3816791+00	INC	3.1420115+01	RAN	-1.1183915+00	APE	-6.0191733+00	RP	1.9996542+05
VM	7.1248843+03	RNMP	-4.4531674-01	APMP	1.2139601+01	INMP	3.1352603+00	APO	-2.9123884+05	TFP	8.6407036+01
TM	-1.1785107+01	EA	-4.8238013+00	MA	-4.3304561+01	SLR	1.2761150+06	PER	6.7926612+01	MTA	1.0070869+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	9.9722979+02	ECCS	9.0283121-04	INCS	1.4634009+02	RANS	-1.7199727+02	APES	2.9789455+01	RPS	9.9632930+02
VMS	-2.2128768+03	RNMPS	5.7598127+01	APMPS	6.1832096+01	INMPS	1.7365254+02	APOS	9.9813017+02	TFPS	7.8362951+01
TAS	-2.2122402+01	EAS	-2.3101315+01	MAS	-2.3081017+01	SLRS	9.9722894+02	PERS	1.9783441+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

UX	-7.7166479-02	WY	5.4886445-01	WZ	-8.3234216-01	PX	-9.1697546-01	PY	2.8866919-01	PZ	2.7536535-01

QX	3.9140978-01	QY	7.8448576-01	QZ	4.8102023-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / MOON REF. /PHASE 12- 21
MEAN-OF-EPOCH 1969 24 DEC. 1968, 19 HRS., 20 MINS., 9.705 SECS. G.M.T.

T .7848611381861 91+002 HRS. FROM LAUNCH 3 DAYS, 6 HRS., 29 MINS., 10.010 SECS. G.E.T. RAGR .234177488231493+002

PHASE ELAPSED TIME .27200735+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	-.20191259263229925+000	.16386079859655924+000	.12676282964690268+000
RDXYZ	.65529650277887008+000	.56595859519603740+000	.31237551578779018+000

SELENOCENTRIC

XL	-6.9537354+02	YL	5.6432570+02	ZL	4.3656275+02	DXL	3.8090451+03	DYL	3.2897502+03	DZL	1.8157467+03
RL	9.9629056+02	DECL	2.5988337+01	RAL	1.4093918+02	VL	5.3505342+03	PTHL	5.0383662-03	AZL	-6.7821702+01

SELENOGRAPHIC

XS	9.2688300+02	YS	-3.0869330+02	ZS	1.9542572+02	DXS	-1.7742528+03	DYS	-5.0445194+03	DZS	4.4919449+02
ALTS	5.7797032+01	LATS	1.1312106+01	LONS	-1.8420053+01	VRS	5.3662765+03	PTR	5.0230739-03	AZR	-8.5103976+01
LTS	-1.5122121+00	LNS	1.1916594+02	LTE	2.5819036+00	LNE	7.8517096+00	DSMP	5.0308178+00	RSMP	1.1144354+02
LIN	1.6768082+02	LAN	4.7926820+01	LAP	2.7803521+01	DR	4.7045707-01	VT	5.3662765+03	SOLSV	-4.6791929+01

GEOCENTRIC

X	1.9325214+05	Y	-5.5879322+04	Z	-3.1858946+04	DX	5.1134536+03	DY	6.0499407+03	DZ	3.2999814+03
R	2.0367591+05	DEC	-8.9991494+00	RA	-1.6127353+01	V	8.5813208+03	PTH	1.8168384+01	AZ	6.2499996+01

GEOGRAPHIC

XG	1.5512601+05	YG	-1.2808124+05	ZG	-3.1858946+04	DXG	-4.9653185+04	DYG	-6.5213452+04	DZG	3.2999891+03
ALT	2.0023226+05	LAT	-9.0001514+00	LON	3.2045490+02	VE	8.2031236+04	PTE	1.8691961+00	AZE	-8.7368022+01

EARTH-MOON PLANE

XMP	8.8393709+02	YMP	-4.4636740+02	ZMP	1.0957309+02	DXMP	-2.4170437+03	DYMP	-4.7731214+03	DZMP	5.8569190+01
RMP	9.9629054+02	DEMP	6.3142240+00	RAMP	-2.6792698+01	VMP	5.3505344+03	PTMP	5.0389814-03	AZMP	-8.9369544+01
XME	-2.0367540+05	YME	-4.4636803+02	ZME	1.0957221+02	DXME	-2.6578416+03	DYME	-8.1591370+03	DZME	5.8569190+01

PLANETARY COORDINATES

XM	1.9394751+05	YM	-5.6443647+04	ZM	-3.2295509+04	DXM	1.3044085+03	DYM	2.7601904+03	DZM	1.4842346+03
RM	2.0455933+05	DEM	-9.0837749+00	RAM	-1.6226336+01	LOM	3.2035591+02	VM	3.3945669+03	ARGM	-1.9350073+01
XSUN	4.2651385+06	YSUN	-7.2781427+07	ZSUN	-3.1560856+07	RAS	-8.6646186+01	LOS	2.4993607+02	DES	-2.3407601+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-4.5523521+04	ECC	5.2105046+00	INC	2.8825486+01	RAN	5.9709861-01	APF	-4.0529961+01	RP	1.9167700+05
VH	7.1337354+03	RNMP	-4.2648230+00	APMP	-1.7207899+01	INMP	4.0257268-01	APO	-2.8272404+05	TFP	6.3822866+01
TA	2.1599168+01	EA	1.8148337+01	MA	7.8002837+01	SLR	1.1904108+06	PER	6.7674059+01	MTA	1.0106485+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	9.9723029+02	ECCS	9.4642168-04	INCS	1.4634381+02	RANS	-1.7199315+02	APFS	4.6910662+01	RPS	9.9628649+02
VHS	-2.2127012+03	RNMPS	5.7493583+01	APMPS	7.8984525+01	INMPS	1.7365450+02	APOS	9.9817408+02	TFPS	7.8456843+01
TAS	5.3365352+00	EAS	5.3311941+00	MAS	5.3261558+00	SLRS	9.9729934+02	PERS	1.9783856+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

UX	-7.7196416-02	WY	5.4880535-01	WZ	-8.3237817-01	PX	-7.6115027-01	PY	5.0679583-01	PZ	4.0473230-01
QX	6.4396504-01	QY	6.6480875-01	QZ	3.7860052-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / MOON REF. /PHASE 12- 22
MEAN-OF-EPOCH 1969 24 DEC. 1968, 19 HRS., 35 MINS., 9.705 SECS. G.M.T.

T .7873611381861 91+002 HRS. FROM LAUNCH 3 DAYS, 6 HRS., 44 MINS., 10.010 SECS. G.E.T. RAGR .271780155677413+002

PHASE ELAPSED TIME .27290735+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	.57178901036061184-002	.24177842187040256+000	.15886716660319380+000
RDXYZ	.91726498393891252+000	.24285057179387857-001	-.69148417543221245-001

SELENOCENTRIC

XL	1.9692033+01	YL	8.3266882+02	ZL	5.4712796+02	DXL	5.3317907+03	DYL	1.4116187+02	DZL	-4.0193934+02
RL	9.9653104+02	DECL	3.3300664+01	RAL	8.8645245+01	VL	5.3487824+03	PTHL	2.8191268-02	AZL	-9.5176955+01

SELENOGRAPHIC

XS	4.1156853+02	YS	-8.8603462+02	ZS	1.9654027+02	DXS	-4.8105901+03	DYS	-2.3339544+03	DZS	-4.3479303+02
ALTS	5.8037511+01	LATS	1.1374699+01	LONS	-6.5084840+01	VRS	5.3645284+03	PTR	2.8108235-02	AZR	-9.4747926+01
LTS	-1.5123170+00	LNS	1.1903915+02	LTE	2.5671425+00	LNE	7.8542779+00	DSMP	5.0308944+00	RSMP	1.1131360+02
LIN	1.6768086+02	LAN	4.7813310+01	LAP	-6.8859725+00	DR	2.6317368+00	VT	5.3645276+03	SOLSV	-7.9322146+01

GEOCENTRIC

X	1.9415982+05	Y	-5.5201972+04	Z	-3.1528439+04	DX	6.6282850+03	DY	2.9036001+03	DZ	1.0835883+03
R	2.0430207+05	DEC	-8.8775144+00	RA	-1.5871087+01	V	7.3170499+03	PTH	4.6955401+01	AZ	6.7242707+01

GEOGRAPHIC

XG	1.4750910+05	YG	-1.3779099+05	ZG	-3.1528437+04	DXG	-5.3829359+04	DYG	-6.5802431+04	DZG	1.0835966+03
ALT	2.0085841+05	LAT	-8.8785001+00	LON	3.1695089+02	VE	8.5021964+04	PTE	3.6059819+00	AZE	-8.8695282+01

EARTH-MOON PLANE

XMP	2.9514270+02	YMP	-9.4806599+02	ZMP	8.4473804+01	DXMP	-5.0836874+03	DYMP	-1.6191690+03	DZMP	-3.7932552+02
RMP	9.9653104+02	DEMP	4.8626760+00	RAMP	-7.2708096+01	VMP	5.3487824+03	PTMP	2.8191980-02	AZMP	-9.4083843+01
XME	-2.0429985+05	YME	-9.4806655+02	ZME	8.4474125+01	DXME	-5.3244568+03	DYME	-5.0045472+03	DZME	-3.7932552+02

PLANETARY COORDINATES

XM	1.9414013+05	YM	-5.6034639+04	ZM	-3.2075567+04	DXM	1.2964942+03	DYM	2.7624383+03	DZM	1.4855276+03
RM	2.0459500+05	DEM	-9.0198075+00	RAM	-1.6099719+01	LOM	3.1672226+02	VM	3.3939291+03	ARGM	-1.9209573+01
XSUN	4.2798325+06	YSUN	-7.2780661+07	ZSUN	-3.1560523+07	RAS	-8.6634623+01	LOS	2.4618736+02	DES	-2.3407354+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-7.5071166+04	ECC	2.6431797+00	INC	2.4341518+01	RAN	4.3267998+00	APF	-8.4994355+01	RP	1.2335542+05
VH	5.5551826+03	RNMP	-1.7942491+02	APMP	1.1668343+02	INMP	4.3813318+00	APO	-2.7349775+05	TFP	3.8943990+01
TA	6.3006455+01	EA	5.0138080+01	MA	9.9958885+01	SLR	4.4940594+05	PER	1.4331056+02	MTA	1.1223041+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	9.9705788+02	ECCS	7.2200271-04	INCS	1.4634520+02	RANS	-1.7198421+02	APFS	5.4833738+01	RPS	9.9633801+02
VHS	-2.2135406+03	RNMPS	5.7398336+01	APMPS	8.6943811+01	INMPS	1.7365308+02	APOS	9.9777775+02	TFPS	7.8500246+01
TAS	4.2989135+01	EAS	4.2959368+01	MAS	4.2931176+01	SLRS	9.9705733+02	PERS	1.9778725+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-7.7279251-02	WY	5.4877338-01	WZ	-8.3239157-01	PX	-6.6521215-01	PY	5.9350453-01	PZ	4.5303989-01

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 DX    7.4264439-01   DY    5.8872756-01   DZ    3.1918513-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 23
                    MEAN-OF-EPOCH  1969        24  DEC.  1968, 19 HRS.,  50 MINS.,  9.705 SECS. G.M.T.

T        .7898611381861 91+002  HRS. FROM LAUNCH       3 DAYS,  6 HRS.,  59 MINS.,  10.010 SECS. G.E.T.    RAGR  .3093828231233 33+002

          PHASE ELAPSED TIME     .2738073 5+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ       .2099384851532414 3+000        .1748226387897033 2+000        .9575718519879606 4-001
         RDXYZ      .6297077464096 5566+000        -.5313296861457 4657+000       -.4088021283231 3375+000

SELENOCENTRIC
   XL    7.2301418+02   YL    9.0207754+02   ZL    3.2978138+02  DXL    3.6603053+03  DYL   -3.0884627+03  DZL   -2.3762461+03
   RL    9.0691691+02 DECL    1.9315807+01  RAL    3.9785253+01  VL     5.3463054+03  PTHL   3.5654332-02  AZL   -1.1811187+02

SELENOGRAPHIC
   XS   -3.5190498+02   YS   -9.2940519+02   ZS    7.9821422+01  DXS   -4.0467529+03  DYS    1.7786431+03  DZS   -1.0572351+03
 ALTS    5.8503265+01 LATS    4.5921219+00 LONS   -1.1073840+02  VRS    5.3620594+03  PTR    3.5548805-02  AZR   -1.0181152+02
  LTS   -1.5124219+00  LNS    1.1891237+02  LTE    2.5523715+00  LNE    7.8567921+00  DSMP   5.0309703+00  RSMP   1.1118371+02
  LIN    1.6767897+02  LAN    4.7685847+01  LAP    8.3563741+01  DR     3.3268557+00  VT     5.3620584+03  SOLSV  -4.0334934+01

GEOCENTRIC
    X    1.9505459+05   Y    -5.5023222+04   Z   -3.1525653+04  DX     4.9488816+03  DY    -3.2379406+02  DZ    -8.8943507+02
    R    2.0510416+05  DEC   -8.8417315+00  RA   -1.5753302+01  V      5.0385877+03  PTH    7.8081878+01  AZ     9.7357660+01

GEOGRAPHIC
   XG    1.3901430+05   YG   -1.4747499+05   ZG   -3.1525653+04  DXG   -6.1264518+04  DYG   -6.4416111+04  DZG   -8.8933483+02
  ALT    2.0166050+05  LAT   -8.8427096+00  LON    3.1330841+02  VE     8.8902013+04  PTE    3.1789138+00  AZE   -9.0086229+01

EARTH-MOON PLANE
  XMP   -4.7162248+02  YMP   -8.7835032+02  ZMP    8.6934044+00 DXMP   -4.6855438+03 DYMP    2.5062519+03 DZMP   -5.8937404+02
  RMP    9.9699679+02 DEMP    4.9960209-01 RAMP   -1.1823318+02  VMP    5.3463053+03 PTMP    3.5653912-02 AZMP   -9.6329679+01
  YME   -2.0510227+05 YME    -8.7834981+02 ZME    8.6929619+00 DXME   -4.9262827+03 DYME   -8.7848929+02 DZME   -5.8937403+02

PLANETARY COORDINATES
   XM    1.9433158+05   YM   -5.5625294+04   ZM   -3.1855434+04  DXM    1.2885763+03  DYM    2.7646686+03  DZM    1.4868110+03
   RM    2.0463066+05  DEM   -8.9558206+00  RAM   -1.5973192+01  LOM    3.1308852+02  VM     3.3932917+03  APGM   -1.9069127+01
 XSUN    4.2945267+06 YSUN   -7.2779892+07 ZSUN   -3.1560189+07  RAS   -8.6623058+01  LOS    2.4243865+02  DES   -2.3407105+01

GEOCENTRIC  OSCULATING ELEMENTS
  SMA   -6.9313947+05  ECC    1.0117982+00  INC    1.1483923+01  RAN    1.1427986+02  APF    7.7207140+01  RP     9.7725739+03
   VH    1.6723904+03 RNMP   -1.7975110+02 APMP    2.6666404+01 INMP    3.4514467+01  APO   -1.6663975+06  TFP    2.8990558+01
   TA    1.5332931+02  EA    3.8395704+01  MA     3.4266846+00  SLR    1.9660468+04  PER    5.2524238+03  MTA    1.7124166+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMS    9.9706574+02 ECCS    6.2610814-04 INCS    1.4634395+02 RANS   -1.7197959+02 APFS    5.9659499+01  RPS    9.9641148+02
  VHS   -2.2142509+03 RNMPS   5.7272166+01 APMPS   9.1777616+01 INMPS   1.7365071+02 APOS    9.9769998+02 TFPS   7.8526665+01
  TAS    8.3700109+01  EAS    8.3660612+01  MAS    8.3624957+01 SLRS    9.9706531+02 PERS    1.9778959+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.7326032-02   WY    5.4874496-01   WZ   -8.3237958-01  PX    -6.0042871-01  PY    6.4086918-01  PZ    4.7830118-01
    X    7.9593091-01   QY    5.3676972-01   QZ    2.7995037-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 24
                    MEAN-OF-EPOCH  1969        24  DEC.  1968, 20 HRS.,  5 MINS.,  9.705 SECS. G.M.T.

T        .7923611381861 91+002  HRS. FROM LAUNCH       3 DAYS,  7 HRS.,  14 MINS.,  10.010 SECS. G.E.T.    RAGR  .3469854905692 53+002

          PHASE ELAPSED TIME     .2747073 5+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ       .2485423978308 6262+000        .3216798809186 391-002         -.2468287761265 6310-001
         RDXYZ      -.3416807706876 3661-001       -.7685724563 8259480+000       -.5035203741261 8869+000

SELENOCENTRIC
   XL    9.9372084+02   YL    1.1078410+01   ZL   -8.5006190+01  DXL   -1.9860894+02  DYL   -4.4678848+03  DZL   -2.9268153+03
   RL    9.9741159+02 DECL   -4.8890664+00  RAL    6.3873056-01  VL     5.3445406+03  PTHL   2.0883176-02  AZL   -1.2333928+02

SELENOGRAPHIC
   XS   -9.0376710+02   YS   -4.1335124+02   ZS   -8.4709062+01  DXS   -2.1069802+03  DYS    4.8165040+03  DZS   -1.0463037+03
 ALTS    5.4918073+01 LATS   -4.8719360+00 LONS   -1.5542231+02  VRS    5.3603011+03  PTR    2.0822087-02  AZR   -1.0129565+02
  LTS   -1.5125269+00  LNS    1.1878559+02  LTE    2.5375895+00  LNE    7.8592525+00  DSMP   5.0310459+00  RSMP   1.1105387+02
  LIN    1.6768008+02  LAN    4.7549579+01  LAP   -2.7264015+02  DR     1.9480082+00  VT     5.3603008+03  SOLSV  4.3200118+00

GEOCENTRIC
    X    1.9551558+05   Y    -5.5204550+04   Z   -3.1720117+04  DX     1.0820457+03  DY    -1.7006035+03  DZ    -1.4387304+03
    R    2.0562113+05  DEC   -8.8741632+00  RA   -1.5767223+01  V      2.4764531+03  PTH    4.3586420+01  AZ    -1.3154200+02

GEOGRAPHIC
   XG    1.2931912+05   YG   -1.5668583+05   ZG   -3.1720115+04  DXG   -6.9502409+04  DYG   -5.9312499+04  DZG   -1.4387175+03
  ALT    2.0217747+05  LAT   -8.8751423+00  LON    3.0953422+02  VE     9.1381769+04  PTE    1.0705946+00  AZE   -9.0746001+01

EARTH-MOON PLANE
  XMP   -9.5461682+02  YMP   -2.7983382+02  ZMP   -7.2316339+01 DXMP   -1.4688852+03 DYMP    5.1193064+03 DZMP   -4.4630951+02
  RMP    9.9741159+02 DEMP   -4.1578219+00 RAMP   -1.6366217+02  VMP    5.3445406+03 PTMP    2.0883145-02 AZMP   -9.4801351+01
  YME   -2.0562093+05 YME    -2.7983380+02 ZME   -7.2316130+01 DXME   -1.7095917+03 DYME    1.7352016+03 DZME   -4.4630954+02

PLANETARY COORDINATES
   XM    1.9452186+05   YM   -5.5215628+04   ZM   -3.1635111+04  DXM    1.2806547+03  DYM    2.7668813+03  DZM    1.4880849+03
   RM    2.0486632+05  DEM   -8.8918126+00  RAM   -1.5846755+01  LOM    3.0945469+02  VM     3.3926546+03  ARGM   -1.8928730+01
 XSUN    4.3092205+06 YSUN   -7.2779121+07 ZSUN   -3.1559855+07  RAS   -8.6611496+01  LOS    2.3868995+02  DES   -2.3406857+01

GEOCENTRIC  OSCULATING ELEMENTS
  SMA    1.4125482+05  ECC    7.6438150-01  INC    1.3768971+02  RAN    1.7410938+02  APF    3.4079818+01  RP     3.3282250+04
   VH   -2.2765118+03 RNMP   -1.7984346+02 APMP   -3.3908731+02 INMP    1.6561272+02  APO    2.4922740+05  TFP   -1.4706545+01
   TA    1.5916840+02  EA    1.2659364+02  MA     9.1430678+01  SLR    5.8722584+04  PER    3.6989068+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMS    9.9723685+02 ECCS    4.0441273-04 INCS    1.4634515+02 RANS   -1.7197961+02 APFS    7.3149514+01  RPS    9.9683356+02
  VHS   -2.2144435+03 RNMPS   5.7138007+01 APMPS  -2.5472925+02 INMPS   1.7365178+02 APOS    9.9764012+02 TFPS   7.8600521+01
  TAS    1.1570386+02  EAS    1.1567603+02  MAS    1.1565515+02 SLRS    9.9723664+02 PERS    1.9784051+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.7323397-02   WY    5.4876786-01   WZ   -8.3239110-01  PX    -3.9819296-01  PY    7.4841449-01  PZ    5.3039426-01
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   WX    9.1403688-01   WY    3.7246416-01   WZ    1.6064554-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 25
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 20 HRS., 19 MINS., 13.455 SECS. G.M.T.

T        .794704888186191+002  HRS. FROM LAUNCH       3 DAYS,  7 HRS., 28 MINS., 13.760 SECS. G.E.T.    RAGR  .3822379912998O3+002

          PHASE ELAPSED TIME     .27555110+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .2049668791841980 9+000      -.161600219122118 84+000      -.125569286642017 36+000
        RDXYZ      -.645745290992455 10+000     -.572343094876090 88+000      -.317267094050012 44+000

SELENOCENTRIC
   XL    7.0589231+02   YL   -5.5654041+02   ZL   -4.3245227+02  DXL   -3.7535267+03  DYL   -3.3268662+03  DZL   -1.8441800+03
   RL    9.9751499+02 DECL   -2.5691766+01  RAL   -3.8252991+01  VL    5.3439686+03 PTHL   -5.7004473-03  AZL   -1.1251980+02

SELENOGRAPHIC
   XS   -9.2961516+02   YS    3.0496926+02   ZS   -1.9453921+02  DXS    1.7520145+03  DYS    5.0441907+03  DZS   -4.6183922+02
 ALTS    5.9021455+01 LATS   -1.1246117+01 LONS    1.6183742+02  VRS    5.3597303+03  PTR   -5.6840210-03  AZR   -9.5041371+01
  LTS   -1.5126252+00  LNS    1.1866674+02  LTE    2.5237226+00  LNE    7.8615100+00 DSMP    5.0311161+00 RSMP    1.1093220+02
  LIN    1.6768287+02  LAN    4.7434604+01  LAP    2.9396048+02  DR    -5.3171142-01  VT    5.3597303+03 SOLSV    4.6072119+01

GEOCENTRIC
    X    1.9540507+05    Y   -5.5387807+04    Z   -3.1860840+04  DX    -2.4803019+03  DY   -5.5792639+02  DZ   -3.5490945+02
    R    2.0558712+05  DEC   -8.9153395+00   RA   -1.5825445+01  V     2.5669321+03  PTH   -5.6972792+01  AZ   -1.1987337+02

GEOGRAPHIC
   XG    1.1923986+05   YG   -1.6441656+05   ZG   -3.1860840+04  DXG   -7.5142988+04  DYG   -5.1736129+04  DZG   -3.5494706+02
  ALT    2.0214346+05  LAT   -8.9163233+00  LON    3.0595075+02  VE    9.1231695+04  PTE   -1.3517195+00  AZE   -9.0437792+01

EARTH-MOON PLANE
  XMP   -8.8687826+02  YMP    4.4325425+02  ZMP   -1.0958457+02 DXMP    2.3958638+03 DYMP    4.7763540+03 DZMP   -6.5429593+01
  RMP    9.9751497+02 DEMP   -6.3071050+00 RAMP    1.5344450+02  VMP    5.3439686+03 PTMP   -5.6999824-03 AZMP   -9.0706424+01
  XME   -2.0556661+05 YME    4.4325361+02 ZME   -1.0958494+02 DXME    2.1551894+03 DYME    1.3928451+03 DZMF   -6.5429593+01

PLANETARY COORDINATES
   XM    1.9469918+05   YM   -5.4831266+04   ZM   -3.1428398+04  DXM    1.2732248+03  DYM    2.7689397+03  DZM    1.4892706+03
   RM    2.0469974+05  DEM   -8.8317882+00  RAM   -1.5728303+01  LOM    3.0604789+02   VM    3.3920576+03 ARGM   -1.8797156+01
 XSUN    4.3229961+06 YSUN   -7.2778396+07 ZSUN   -3.1559540+07  RAS   -8.6600655+01  LOS    2.3517554+02  DES   -2.3406621+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4526346+05  ECC    8.6842576-01  INC    1.4894272+02  RAN    1.7927343+02  APF   -4.3810023-01  RP    1.9112930+04
   VH   -2.1804257+03 RNMP   -1.7948249+02 APMP   -1.7277979+01 INMP    1.7727230+02  APO    2.7141398+05  TFP    1.5969261+02
   TA   -1.6208025+02   EA   -1.1856712+02   MA   -7.4867544+01  SLR    3.5711088+04  PER    3.8574743+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9723022+02 ECCS    3.0240866-04 INCS    1.4634865+02 RANS   -1.7197567+02 APFS    3.2272354+01  RPS    9.9692864+02
  VHS   -2.2146236+03 RNMPS   5.7040577+01 APMPS   6.4434223+01 INMPS   1.7365361+02 APOS    9.9753178+02 TFPS    8.0354083+01
  TAS   -1.6079922+02  EAS   -1.6079041+02  MAS   -1.6078471+02 SLRS    9.9723008+02 PERS    1.9783853+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.7354005-02   WY    5.4871213-01   WZ   -8.3242498-01  PX    -8.9928589-01  PY    3.2208786-01  PZ    2.9587878-01
   UX    4.3046625-01   UY    7.7147544-01   UZ    4.6853429-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 26
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 20 HRS., 34 MINS., 13.455 SECS. G.M.T.

T        .797204888186191+002  HRS. FROM LAUNCH       3 DAYS,  7 HRS., 43 MINS., 13.760 SECS. G.E.T.    RAGR  .4198406587457O4+002

          PHASE ELAPSED TIME     .27645110+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       -.1290024543464858O-002      -.2418270540393394 8+000      -.1592736835761716 2+000
        RDXYZ      -.9167475520897641 3+000     -.3535897008927828 3-001       .6197279270493389-001

SELENOCENTRIC
   XL   -4.4427587+00   YL   -8.3283630+02   ZL   -5.4852798+02  DXL   -5.3287829+03  DYL   -2.0553125+02  DZL    3.6022955+02
   RL    9.9725572+02 DECL   -3.3369578+01  RAL   -9.0305640+01  VL    5.3448981+03 PTHL   -2.9534523-02  AZL   -8.5390637+01

SELENOGRAPHIC
   XS   -4.1724171+02   YS    8.8391192+02   ZS   -1.9780795+02  DXS    4.7971325+03  DYS    2.3553457+03  DZS    4.2011478+02
 ALTS    5.8762181+01 LATS   -1.1440621+01 LONS    1.1526918+02  VRS    5.3606557+03  PTR   -2.9448033-02  AZR   -8.5419784+01
  LTS   -1.5127301+00  LNS    1.1853996+02  LTE    2.5089216+00  LNE    7.8638661+00 DSMP    5.0311910+00 RSMP    1.1080246+02
  LIN    1.6768298+02  LAN    4.7321000+01  LAP    1.2695768+02  DR    -2.7551898+00  VT    5.3606550+03 SOLSV    7.9555029+01

GEOCENTRIC
    X    1.9438274+05    Y   -5.5253804+04    Z   -3.1756231+04  DX    -4.0634867+03  DY    2.5655871+03  DZ    1.8507554+03
    R    2.0503835+05  DEC   -8.9098060+00   RA   -1.5829270+01  V     5.1497045+03  PTH   -7.0035847+01  AZ    5.0662392+01

GEOGRAPHIC
   XG    1.0790177+05   YG   -1.7143358+05   ZG   -3.1756230+04  DXG   -7.7262665+04  DYG   -4.3183584+04  DZG    1.8507510+03
  ALT    2.0159470+05  LAT   -8.9107918+00  LON    3.0218666+02  VE    8.8531163+04  PTE   -3.1340918+00  AZE   -8.9277653+01

EARTH-MOON PLANE
  XMP   -3.9076002+02  YMP    9.4696981+02  ZMP   -8.5501908+01 DXMP    5.0727344+03 DYMP    1.6419220+03 DZMP    3.7335400+02
  RMP    9.9725573+02 DEMP   -4.9184177+00 RAMP    1.0761998+02  VMP    5.3448980+03 PTMP   -2.9534232-02 AZMP   -8.5982212+01
  XME   -2.0503614+05 YME    9.4696998+02 ZME   -8.5501729+01 DXME    4.8320960+03 DYME   -1.7409514+03 DZMF    3.7335399+02

PLANETARY COORDINATES
   XM    1.9488718+05   YM   -5.4420967+04   ZM   -3.1207703+04  DXM    1.2652963+03  DYM    2.7711184+03  DZM    1.4905259+03
   RM    2.0473538+05  DEM   -8.7677433+00  RAM   -1.5602041+01  LOM    3.0241389+02   VM    3.3914214+03 ARGM   -1.8656860+01
 XSUN    4.3376898+06 YSUN   -7.2777620+07 ZSUN   -3.1559203+07  RAS   -8.6589092+01  LOS    2.3142684+02  DES   -2.3406370+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -5.9073404+05  ECC    1.0464077+00  INC    4.0173746+01  RAN   -5.1281329+00  APF    1.2006974+02  RP    2.7414581+04
   VH    1.9803362+03 RNMP   -1.5404249-01 APMP    1.3384805+02 INMP    1.2192304+01  APO   -1.2088826+06  TFP    1.3375625+02
   TA   -1.3396119+02   EA   -4.2457107+01   MA   -6.1493233+00  SLR    5.6101417+04  PER    3.1634171+03  MTA    1.6287225+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9705859+02 ECCS    5.5209262-04 INCS    1.4635009+02 RANS   -1.7196680+02 APFS    2.7971077+01  RPS    9.9650813+02
  VHS   -2.2146767+03 RNMPS   5.6945486+01 APMPS   6.0170721+01 INMPS   1.7365226+02 APOS    9.9760905+02 TFPS    8.0330087+01
  TAS   -1.1101786+02  EAS   -1.1098493+02  MAS   -1.1095539+02 SLRS    9.9705824+02 PERS    1.9778746+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.7436043-02   WY    5.4867936-01   WZ   -8.3243898-01  PX    -9.2908009-01  PY    2.6318191-01  PZ    2.5989505-01
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 QX   3.6168192-01   QY   7.9352771-01   QZ   4.8938730-01   SXO   0.0000000   SYO   0.0000000   SZO   0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 27
                MEAN-OF-EPOCH  1969      24  DEC. 1968, 20 HRS., 49 MINS., 13.455 SECS. G.M.T.

T       .7997048881861910+002  HRS. FROM LAUNCH      3 DAYS, 7 HRS., 58 MINS., 13.760 SECS. G.E.T.    RAGR  .4574433261916440+002

        PHASE ELAPSED TIME     .2773511+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.2067396443256905S+000      -.1774337402516304S+000      -.9771095466678E822-001
        RDXYZ     -.6394738045818277?+000       .5232763953314848?+000       .4044386740103?256+000

SELENOCENTRIC
   XL   -7.1199773+02   YL   -6.1107000+02   ZL   -3.3651003+02   DXL   -3.7170725+03   DYL    3.0416512+03   DZL    2.3508827+03
   RL    9.9678799+02  DECL   -1.9730377+01   RAL   -1.3936225+02   VL    5.3474217+03   PTHL   -3.4507338-02   AZL   -6.2171090+01

SELENOGRAPHIC
   XS    3.4605160+02   YS    9.3112312+02   ZS   -8.2730277+01   DXS    4.9584239+03   DYS   -1.7528370+03   DZS    1.0512923+03
 ALTS    5.8294463+01  LATS   -4.7608466+00  LONS    6.9612432+01   VRS    5.3631726+03   PTR   -3.4405947-02   AZR   -7.8658912+01
  LTS   -1.5128353+00   LNS    1.1841318+02   LTE    2.4941105+00   LNE    7.8661684+00  DSMP    5.0312649+00  RSMP    1.1067277+02
  LIN    1.6768108+02   LAN    4.7193816+01   LAP    7.2281072+01   DR    -3.2205689+00   VT    5.3631715+03  SOLSV   4.1175631+01

GEOCENTRIC
    X    1.9436201+05    Y   -5.4621416+04    Z   -3.1323343+04   DX   -2.4597084+03   DY    5.8149306+03   DZ    3.8426545+03
    R    2.0430674+05  DEC   -8.8191004+00   RA   -1.5696916+01    V    7.3911823+03  PTH   -3.7346493+01   AZ    5.7084147+01

GEOGRAPHIC
   XG    9.6516079+04   YG   -1.7732664+05   ZG   -3.1323342+04   DXG   -7.6121102+04   DYG   -3.6944347+04   DZG    3.8426600+03
  ALT    2.0086308+05  LAT   -8.8200798+00  LON    2.9855875+02   VE    8.4699903+04   PTE   -3.0345098+00   AZE   -8.7836583+01

EARTH-MOON PLANE
   XMP    4.6618302+02   YMP    8.8099658+02   ZMP   -1.0235035+01  DXMP    4.6990598+03  DYMP   -2.4833291+03  DZMP    5.8892478+02
   RMP    9.9678800+02  DEMP   -5.8832429-01  RAMP    6.2114257+01   VMP    5.3474217+03  PTMP   -3.4507668-02  AZMP   -8.3677069+01
   XME   -2.0456484+05   YME    8.8099600+02   ZME   -1.0234573+01  DXME    4.4584593+03  DYME   -5.8655677+03  DZME    5.8892476+02

PLANETARY COORDINATES
    XM    1.9507401+05    YM   -5.4010347+04    ZM   -3.0986833+04   DXM    1.2573641+03   DYM    2.7732793+03   DZM    1.4917718+03
    RM    2.0477102+05   DEM   -8.7036800+00   RAM   -1.5475869+01   LOM    2.9877979+02    VM    3.3907854+03  ARGM   -1.8516616+01
  XSUN    4.3523832+06  YSUN   -7.2776841+07  ZSUN   -3.1558865+07   RAS   -8.6577529+01   LOS    2.2767814+02   DES   -2.3406117+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -7.2508068+04   ECC    3.0950419+00   INC    3.3947995+01   RAN   -2.3721965+00   APF    3.2715023+01    RP    1.5190744+05
    VH    5.6525154+03  RNMP   -2.1856417-01  APMP    4.8621096+01  INMP    5.7500935+00   APO   -2.9692357+05   TFP    1.1383991+02
    TA   -4.9649744+01    EA   -3.8429406+01    MA   -8.9631835+01   SLR    6.2206731+05   PER    1.3603415+02   MTA    1.0885035+02

SELENOCENTRIC  OSCULATING ELEMENTS
  SMAS    9.9706446+02  ECCS    6.0830890-04  INCS    1.4634887+02  RANS   -1.7196207+02  APFS    2.7781092+01   RPS    9.9640337+02
   VHS   -2.2139265+03 RNMPS   5.6819979+01  APMPS   5.9992810+01  INMPS   1.7364987+02  APOS    9.9772553+02  TFPS   8.0328958+01
   TAS   -6.5319587+01   EAS   -6.5280295+01   MAS   -6.5245787+01   SLRS   9.9706396+02  PERS    1.9778921+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.7483818-02   WY    5.4869061-01   WZ   -8.3242711-01   PX   -9.3029498-01   PY    2.6046699-01   PZ    2.5827919-01
   QX    3.5855515-01   QY    7.9441521-01   QZ    4.9026214-01  SXO    0.0000000  SYO    0.0000000  SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 28
                MEAN-OF-EPOCH  1969      24  DEC. 1968, 21 HRS.,  4 MINS., 13.455 SECS. G.M.T.

T       .8022048881861910+002  HRS. FROM LAUNCH      3 DAYS,  8 HRS., 13 MINS., 13.760 SECS. G.E.T.    RAGR  .4950459936375640+002

        PHASE ELAPSED TIME     .2782511+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.2883733644343073?+000      -.6804327548911324S-002       .2235624970782497?-001
        RDXYZ      .2131872424678282?-001       .7691879407656221?+000       .5050009748389982?+000

SELENOCENTRIC
   XL   -9.9313869+02   YL   -2.3433652+01   ZL    7.6993437+01   DXL    1.2391945+02   DYL    4.4710625+03   DZL    2.9354216+03
   RL    9.9639428+02  DECL    4.4317807+00   RAL   -1.7864832+02   VL    5.3499958+03  PTHL   -1.9715748-02   AZL   -5.6609005+01

SELENOGRAPHIC
   XS    9.0093262+02   YS    4.1763230+02   ZS    8.1885497+01   DXS    2.1319824+03   DYS   -4.8100713+03   DZS    1.0531082+03
 ALTS    5.7900759+01  LATS    4.7139881+00  LONS    2.4870341+01   VRS    5.3657404+03   PTR   -1.9657784-02   AZR   -7.8640775+01
  LTS   -1.5129401+00   LNS    1.1828641+02   LTE    2.4792893+00   LNE    7.8684171+00  DSMP    5.0313383+00  RSMP    1.1054314+02
  LIN    1.7602?2+02   LAN    4.7057475+01   LAP    7.4856494+00   DR    -1.8409482+00   VT    5.3657401+03  SOLSV   -3.5278578+00

GEOCENTRIC
    X    1.9426654+05    Y   -5.3622639+04    Z   -3.0688784+04   DX    1.3733479+03   DY    7.2464853+03   DZ    4.4284208+03
    R    2.0385459+05  DEC   -8.6583678+00   RA   -1.5430951+01    V    8.6028264+03  PTH   -8.4493798+00   AZ    5.9748823+01

GEOGRAPHIC
   XG    8.5376240+04   YG   -1.8255352+05   ZG   -3.0688784+04   DXG   -7.4482846+04   DYG   -3.4166875+04   DZG    4.4284179+03
  ALT    2.0041092+05  LAT   -9.6593320+00  LON    2.9506445+02   VE    8.2065103+04   PTE   -8.8262070-01   AZE   -8.7005219+01

EARTH-MOON PLANE
   XMP    9.5227697+02   YMP    2.8443951+02   ZMP    7.1164019+01  DXMP    1.4929210+03  DYMP   -5.1175899+03  DZMP    4.5156703+02
   RMP    9.9639428+02  DEMP    4.0956401+00  RAMP    1.6630573+01   VMP    5.3499958+03  PTMP   -1.9715995-02  AZMP   -8.5144331+01
   XME   -2.0385438+05   YME    2.8443831+02   ZME    7.1163310+01  DXME    1.2523612+03  DYME   -8.4991942+03  DZME    4.5156708+02

PLANETARY COORDINATES
    XM    1.9525967+05    YM   -5.3599406+04    ZM   -3.0765778+04   DXM    1.2494285+03   DYM    2.7754228+03   DZM    1.4930081+03
    RM    2.0480666+05   DEM   -8.6395972+00   RAM   -1.5349785+01   LOM    2.9514561+02    VM    3.3901500+03  ARGM   -1.8376420+01
  XSUN    4.3670768+06  YSUN   -7.2776060+07  ZSUN   -3.1558526+07   RAS   -8.6565965+01   LOS    2.2392943+02   DES   -2.3405866+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -4.5177746+04   ECC    5.4544286+00   INC    3.1352698+01   RAN   -9.5728214-01   APF   -6.8251174+00    RP    2.0124104+05
    VH    7.1609829+03  RNMP   -4.5595214-01  APMP    1.0369583+01  INMP    3.0449595+00   APO   -2.9159653+05   TFP    8.7152394+01
    TA   -9.9930444+00    EA   -8.3374500+00    MA   -3.7299230+01   SLR    1.2988959+06   PER    6.6904495+01   MTA    1.0056420+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.9723701+02  ECCS    9.1242654-04  INCS    1.4634909+02  RANS   -1.7196210+02  APFS    3.0191889+01   RPS    9.9632711+02
   VHS   -2.2128460+03 RNMPS   5.6685705+01  APMPS   6.2405740+01  INMPS   1.7365086+02  APOS    9.9814691+02  TFPS   8.0342140+01
   TAS   -2.2176895+01   EAS   -2.2156117+01   MAS   -2.2136401+01   SLRS   9.9723615+02  PERS    1.9784056+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.7481330-02   WY    5.4867447-01   WZ   -8.3243797-01   PX   -9.1439086-01   PY    2.9365845-01   PZ    2.7866475-01
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   QX    3.9734867-01   QY    7.8276498-01   QZ    4.7A949A7-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 29
                    MEAN-OF-EPOCH  1969       24  DEC. 1968, 21 HRS., 19 MINS., 13.455 SECS. G.M.T.

T        .A04704888186191+002  HRS. FROM LAUNCH      3 DAYS,  8 HRS., 28 MINS., 13.760 SECS. G.E.T.    RAGR  .5326486610834B4+002

          PHASE ELAPSED TIME     .27915110+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.19711626304098206+000      .16790206772234230+000      .12900478850753A92+000
        RDXYZ      .6A9877273059625 41+000      .5540003167943319S+000      .3027211621579A712+000

SELENOCENTRIC
   XL   -6.7885530+02   YL    5.7824356+02   ZL    4.4428392+02  DXL    3.A937989+03  DYL    3.2202403+03  DZL    1.75962A7+03
   RL    9.9629229+02 DECL    2.6483322+01   RAL   1.3957591+02  VL     5.3505056+03  PTHL   5.7175031-03  AZL   -6.8445988+01

SELENOGRAPHIC
   XS    9.1259916+02   YS   -3.4757511+02   ZS    1.9736417+02  DXS   -1.9831695+03  DYS   -4.9683714+03  DZS    4.2301746+02
 ALTS    5.7798751+01 LATS    1.1425796+01 LONS   -2.0849977+01  VRS    5.3662481+03  PTR    5.7006431-03  AZR   -8.5388272+01
  LTS   -1.5130453+00  LNS    1.1815963+02  LTE    2.4644586+00  LNE    7.A706122+00 OSMP    5.0314113+00 RSMP    1.1041355+02
  LIN    1.6768505+02  LAN    4.6935088+01  LAP    1.0146800+02  DR     5.3391481-01  VT     5.3662481+03 SOLSV   -4.81447A8+01

GEOCENTRIC
    X    1.9476529+05    Y   -5.2609907+04    Z   -3.0100258+04  DX     5.1352885+03  DY     5.9977889+03  DZ     3.2538638+03
    R    2.0397879+05  DEC   -8.4858771+00   RA   -1.5115956+01  V      8.5400403+03  PTH    1.9681663+01  AZ     6.2451493+01

GEOGRAPHIC
   XG    7.4330319+04   YG   -1.8755352+05   ZG   -3.0100257+04  DXG   -7.5222529+04  DYG   -3.3462168+04  DZG    3.2538614+03
  ALT    2.0053511+05  LAT   -8.4868222+00  LON    2.9161917+02  VE     8.2393772+04  PTE    2.0004672+00  AZE   -8.7411343+01

EARTH-MOON PLANE
  XMP    8.6410110+02  YMP   -4.8359048+02  ZMP    1.0985370+02 DXMP   -2.6166205+03 DYMP   -4.6668365+03 DZMP    4.2955888+01
  RMP    9.9629226+02 DEMP    6.3304491+00 RAMP   -2.9233371+01  VMP    5.3505056+03  PTMP   5.7167096-03  AZMP  -8.9537852+01
  XME   -2.0397819+05  YME   -4.8359147+02  ZME    1.0985323+02 DXME   -2.A571396+03 DYME   -8.0478070+03 DZME    4.2955910+01

PLANETARY COORDINATES
   XM    1.9544415+05   YM   -5.3188150+04   ZM   -3.0544541+04  DXM    1.2414895+03  DYM    2.7775486+03  DZM    1.4942349+03
   RM    2.0484228+05  DEM   -8.5754969+00  RAM   -1.5223788+01  LOM    2.9151134+02  VM     3.3895148+03 ARGM   -1.8236279+01
 XSUN    4.3817697+06 YSUN   -7.2775277+07 ZSUN   -3.1558185+07  RAS   -8.6554402+01  LOS    2.2018073+02  DES   -2.3405611+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -4.6133618+04  ECC    5.1158449+00  INC    2.8727791+01  RAN    6.7950529-01  APF   -4.1335704+01  RP     1.898788A+05
   VH    7.0864082+03 RNMP   -5.8346962+00 APMP   -1.7485838+01 INMP    2.9665300-01  APO   -2.8214605+05  TFP    6.4531177+01
   TA    2.3456375+01   EA    1.9707905+01   MA    8.3114595+01  SLR    1.1612693+06  PER    6.9039037+01  MTA    1.0127224+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9722303+02 ECCS    9.3864475-04 INCS    1.4635371+02 RANS   -1.719577A+02 APFS    4.7486831+01  RPS    9.9628700+02
  VHS   -2.2127233+03 RNMPS   5.6582312+01 APMPS   7.9732207+01 INMPS   1.7365277+02 APOS    9.9815906+02 TFPS    8.0436941+01
  TAS    6.1090352+00  EAS    6.1029817+00  MAS    6.0972641+00 SLRS    9.9722211+02 PERS    1.9783639+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   #X   -7.7515051-02   WY    5.4861525-01   WZ   -8.3247386-01  PX    -7.5496282-01  PY    5.1305936-01  PZ    4.0841304-01
   QX    6.5117013-01   QY    6.6014495-01   QZ    3.7441429-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 30
                    MEAN-OF-EPOCH  1969       24  DEC. 1968, 21 HRS., 34 MINS., 13.455 SECS. G.M.T.

T        .A07204888186191+002  HRS. FROM LAUNCH      3 DAYS,  8 HRS., 43 MINS., 13.760 SECS. G.E.T.    RAGR  .5702513285294O4+002

          PHASE ELAPSED TIME     .28005110+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .12348098600417661-001      .24192519738739438+000      .15827098746825657+000
        RDXYZ      .9165799043847000+000       .67508273572691768-002      -.80987452024302096-001

SELENOCENTRIC
   XL    4.2526031+01   YL    8.3317430+02   ZL    5.4507476+02  DXL    5.3278085+03  DYL    3.9240567+01  DZL   -4.7075616+02
   RL    9.9654120+02 DECL    3.3159155+01   RAL   8.7078101+01  VL     5.3487096+03  PTHL   2.8673418-02  AZL   -9.6053702+01

SELENOGRAPHIC
   XS    3.7383084+02   YS   -9.0307610+02   ZS    1.9441804+02  DXS   -4.9014203+03  DYS   -2.1310532+03  DZS   -4.6052174+02
 ALTS    5.8047659+01 LATS    1.1250147+01 LONS   -6.7512754+01  VRS    5.3644560+03  PTR    2.8588766-02  AZR   -9.5027158+01
  LTS   -1.5131510+00  LNS    1.1803285+02  LTE    2.4496180+00  LNE    7.A727532+00 OSMP    5.0314838+00 RSMP    1.1028402+02
  LIN    1.6768497+02  LAN    4.6821282+01  LAP   -2.0906968+02  DR     2.6766922+00  VT     5.3644552+03 SOLSV   -7.8814887+01

GEOCENTRIC
    X    1.9566997+05    Y   -5.1943406+04    Z   -2.9778048+04  DX     6.5613557+03  DY     2.8188974+03  DZ     1.0246961+03
    R    2.0462548+05  DEC   -8.3676608+00   RA   -1.4867085+01  V      7.2144004+03  PTH    4.8574894+01  AZ     6.7438515+01

GEOGRAPHIC
   XG    6.2921700+04   YG   -1.9242067+05   ZG   -2.9778048+04  DXG   -7.9321282+04  DYG   -3.1849317+04  DZG    1.0246998+03
  ALT    2.0118179+05  LAT   -8.3685903+00  LON    2.8A10778+02  VE     8.5482717+04  PTE    3.6281914+00  AZE   -8.8769834+01

EARTH-MOON PLANE
  XMP    2.5469412+02  YMP   -9.5989759+02  ZMP    8.2594965+01 DXMP   -5.1468185+03 DYMP   -1.4020794+03 DZMP   -3.9131590+02
  RMP    9.9654120+02 DEMP    4.7542217+00 RAMP   -7.5139855+01  VMP    5.3487096+03  PTMP   2.8673941-02  AZMP  -9.4212455+01
  XME   -2.0462321+05  YME   -9.5989734+02  ZME    8.2594838+01 DXME   -5.3872940+03 DYME   -4.7824167+03 DZME   -3.9131590+02

PLANETARY COORDINATES
   XM    1.9562745+05   YM   -5.2776580+04   ZM   -3.0323123+04  DXM    1.2335472+03  DYM    2.7796569+03  DZM    1.4954522+03
   RM    2.0487791+05  DEM   -8.5113783+00  RAM   -1.5097882+01  LOM    2.A787698+02  VM     3.3888800+03 ARGM   -1.8096187+01
 XSUN    4.3964626+06 YSUN   -7.2774491+07 ZSUN   -3.1557844+07  RAS   -8.6542839+01  LOS    2.1643203+02  DES   -2.3405356+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -7.8787930+04  ECC    2.4953524+00  INC    2.3987003+01  RAN    4.4364337+00  APF   -8.7037227+01  RP     1.1781572+05
   VH    5.4225688+03 RNMP   -1.7945164+02 APMP   1.1365770+02  INMP   4.7287058+00  APO   -2.7539158+05  TFP    3.9454752+01
   TA    6.6061756+01   EA    5.2035747+01   MA    9.6412666+01  SLR    4.1180746+05  PER    1.5408415+02  MTA    1.1362476+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9705103+02 ECCS    7.1547996-04 INCS    1.4635496+02 RANS   -1.7194890+02 APFS    5.4757204+01  RPS    9.9633765+02
  VHS   -2.2135749+03 RNMPS   5.6486510+01 APMPS   8.7037625+01 INMPS   1.7365125+02 APOS    9.9776440+02 TFPS    8.0476803+01
  TAS    4.4413777+01  EAS    4.4383235+01  MAS    4.4354562+01 SLRS    9.9705049+02 PERS    1.9778521+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   #X   -7.7597518-02   WY    5.4858513-01   WZ   -8.3248603-01  PX    -6.6657948-01  PY    5.9238336-01  PZ    4.5249722-01
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VX	7.4138412-01	VY	5.9003076-01	VZ	3.1970811-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / MOON REF. /PHASE 12- 31
MEAN-OF-EPOCH 1969 24 DEC. 1968, 21 HRS., 49 MINS., 13.455 SECS. G.M.T.

T .809704888186191+002 HRS. FROM LAUNCH 3 DAYS, 8 HRS., 58 MINS., 13.760 SECS. G.E.T. RAGR .607853995975324+002

PHASE ELAPSED TIME .28095110+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .214430917022153260+000 .170991218222154900+000 .926832896079490683-001
RDXYZ .614205625214376100+000 -.543932686856029360+000 -.415733910613198620+000

SELENOCENTRIC

XL	7.3848582+02	YL	5.8888239+0	ZL	3.1919508+02	DXL	3.5701960+03	DYL	-3.1617202+03	DZL	-2.4165395+03
RL	9.9701016+02	DECL	1.8672134+01	RAL	3.8569510+01	VL	5.3462540+03	PTHL	3.5585959-02	AZL	-1.1851107+02

SELENOGRAPHIC

XS	-3.9035124+02	YS	-9.1435383+02	ZS	7.4914703+01	DXS	-4.8650372+03	DYS	1.9859055+03	DZS	-1.0671117+03
ALTS	5.8516634+01	LATS	4.3092348+00	LONS	-1.1311835+02	VRS	5.3620084+03	PTR	3.5481466-02	AZR	-1.0151409+02
LTS	-1.5132565+00	LNS	1.1790608+02	LTE	2.4347679+00	LNE	7.8748418+00	DSMP	5.0315554+00	RSMP	1.1015454+02
LIN	1.6768312+02	LAN	4.6693172+01	LAP	8.0988982+01	DR	3.3205221+00	VT	5.3620074+03	SOLSV	-3.8974635+01

GEOCENTRIC

X	1.9654806+05	Y	-5.1775818+04	Z	-2.9782330+04	DX	4.7957975+03	DY	-3.7997258+02	DZ	-9.1987868+02
R	2.0542362+05	DEC	-8.3361249+00	RA	-1.4757913+01	V	4.8979821+03	PTH	7.9613493+01	AZ	1.0467914+02

GEOGRAPHIC

XG	5.0741774+04	YG	-1.9681755+0	ZG	-2.9782329+04	DXG	-9.5196277+04	DYG	-2.6853797+04	DZG	-9.1953808+02
ALT	2.0197993+05	LAT	-8.3370472+0	LON	2.8445669+02	VE	8.9332961+04	PTE	3.0914618+00	AZE	-9.0143678+01

EARTH-MOON PLANE

XMP	-5.0830670+02	YMP	-8.5768659+02	ZMP	5.7837323+00	DXMP	-4.5745276+03	DYMP	2.7032128+03	DZMP	-5.9056760+02
RMP	9.9701619+02	DEMP	3.3237906-01	RAMP	-1.2065274+02	VMP	5.3462540+03	PTMP	3.5584935-02	AZMP	-9.6342367+01
XME	-2.0542183+05	YME	-8.5768688+02	ZME	5.7836072+00	DXME	-4.8149578+03	DYME	-6.7649189+02	DZME	-5.9056766+02

PLANETARY COORDINATES

XM	1.9580958+05	YM	-5.2364700+04	ZM	-3.0101525+04	DXM	1.2256015+03	DYM	2.7817476+03	DZM	1.4966600+03
RM	2.0491353+05	DEM	-8.4472425+00	RAM	-1.4972062+01	LOM	2.8424253+02	VM	3.3882459+03	ARGM	-1.7956146+01
XSUN	4.4111557+06	YSUN	-7.2773702+07	ZSUN	-3.1557502+07	RAS	-8.6531276+01	LOS	2.1268332+02	DES	-2.3405101+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-1.0145540+06	ECC	1.0043800+00	INC	1.6835649+01	RAN	1.3627967+02	APF	5.2098219+01	RP	7.0862100+03
VH	1.1978670+03	RNMP	-1.7975848+02	APMP	2.2057736+01	INMP	4.1985237+01	APO	-3.2361942+06	TFP	3.0827720+01
TA	1.5793978+02	EA	2.8056423+01	MA	1.2628838+00	SLR	1.4203537+04	PER	1.4293787+04	MTA	1.7464171+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	9.9707329+02	ECCS	6.2431205-04	INCS	1.4635374+02	RANS	-1.7194454+02	APFS	6.0487138+01	RPS	9.9645081+02
VHS	-2.2142516+03	RNMPS	5.6359608+01	APMPS	9.2775144+01	INMPS	1.7364896+02	APOS	9.9769577+02	TFPS	8.0508193+01
TAS	8.4218790+01	EAS	8.4179516+01	MAS	8.4143930+01	SLRS	9.9707287+02	PERS	1.9779184+00	MTAS	3.5999900+02

SELENOCENTRIC UNIT VECTORS

UX	-7.7441757-02	UY	5.4359692-01	UZ	-8.3247420-01	PX	-5.4927731-01	PY	6.4827693-01	PZ	4.8217133-01
UR	8.4413114-01	QY	5.2799478-01	QZ	2.7294230-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / MOON REF. /PHASE 12- 32
MEAN-OF-EPOCH 1969 24 DEC. 1968, 22 HRS., 4 MINS., 13.455 SECS. G.M.T.

T .812204988186191+002 HRS. FROM LAUNCH 3 DAYS, 9 HRS., 13 MINS., 13.760 SECS. G.E.T. RAGR .645456663421244+002

PHASE ELAPSED TIME .28185110+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .288212039007926450+000 -.229786749745857680-002 -.283932739415625225-001
RDXYZ -.551998570281344760-001 -.768722979429358480+000 -.501411619785177640+000

SELENOCENTRIC

XL	9.9258310+02	YL	-7.9137029+00	ZL	-9.7784429+01	DXL	-3.2086048+02	DYL	-4.4683598+03	DZL	-2.9145595+03
RL	9.9741948+02	DECL	-5.6261674+00	RAL	-4.5680021-01	VL	5.3445156+03	PTHL	2.0197159-02	AZL	-1.2322591+02

SELENOGRAPHIC

XS	-9.1978766+02	YS	-3.7527720+02	ZS	-8.9461090+01	DXS	-1.9020867+03	DYS	4.9035227+03	DZS	-1.0344547+03
ALTS	5.8925951+01	LATS	-5.1459198+00	LONS	-1.5780433+02	VRS	5.3602766+03	PTR	2.0137598-02	AZR	-1.0117081+02
LTS	-1.5133619+00	LNS	1.1777931+02	LTE	2.4199088+00	LNE	7.8768762+00	DSMP	5.0316272+00	RSMP	1.1002511+02
LIN	1.6764435+02	LAN	4.6557045+01	LAP	8.0603727+01	DR	1.0839624+00	VT	5.3602763+03	SOLSV	5.6954996+00

GEOCENTRIC

X	1.9698311+05	Y	-5.1960424+04	Z	-2.9977534+04	DX	8.9679211+02	DY	-1.6845391+03	DZ	-1.4167012+03
R	2.0591474+05	DEC	-8.3709981+00	RA	-1.4779653+01	V	2.3767520+03	PTH	3.8797949+01	AZ	-1.3090049+02

GEOGRAPHIC

XG	3.7745152+04	YG	-2.0019374+05	ZG	-2.9977533+04	DXG	-8.9836889+04	DYG	-1.8257761+04	DZG	-1.4166935+03
ALT	2.0247106+05	LAT	-8.3719220+00	LON	2.8067738+02	VE	9.1684349+04	PTE	9.3070019-01	AZE	-9.0758036+01

EARTH-MOON PLANE

XMP	-5.1554804+02	YMP	-2.3913196+02	ZMP	-7.4513693+01	DXMP	-1.2507650+03	DYMP	5.1777725+03	DZMP	-4.3601239+02
RMP	9.9741946+02	DEMP	-4.2843574+00	RAMP	-1.6608852+02	VMP	5.3445157+03	PTMP	2.0196755-02	AZMP	-9.4691081+01
XME	-2.0591459+05	YME	-2.3913199+02	ZME	-7.4513794+01	DXME	-1.4911478+03	DYME	1.7986990+03	DZME	-4.3601239+02

PLANETARY COORDINATES

XM	1.9599053+05	YM	-5.1952510+04	ZM	-2.9879750+04	DXM	1.2176526+03	DYM	2.7838207+03	DZM	1.4978592+03
RM	2.0494913+05	DEM	-8.3839899+00	RAM	-1.4846330+01	LOM	2.8060800+02	VM	3.3876120+03	ARGM	-1.7816157+01
XSUN	4.4258481+06	YSUN	-7.2772912+07	ZSUN	-3.1557158+07	RAS	-8.6519713+01	LOS	2.0893461+02	DES	-2.3404844+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	1.3746843+05	ECC	7.3700650-01	INC	1.3839974+02	RAN	1.7476312+02	APF	3.2097864+01	RP	3.6153306+04
VH	-2.3668275+03	RNMP	-1.7984774+02	APMP	-3.4048831+02	INMP	1.6640288+02	APO	2.3878357+05	TFP	-1.8770296+01
TA	1.6056851+02	EA	1.3249907+02	MA	1.0136533+02	SLR	6.2798525+04	PER	3.5511823+02	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	9.9722334+02	ECCS	3.9428778-04	INCS	1.4635505+02	RANS	-1.7194457+02	APFS	7.3556700+01	RPS	9.9685013+02
VHS	-2.2144385+03	RNMPS	5.6224411+01	APMPS	-2.5415123+02	INMPS	1.7365012+02	APOS	9.9763653+02	TFPS	8.0579727+01
TAS	1.1769173+02	EAS	1.1661508+02	MAS	1.1659468+02	SLRS	9.9724314+02	PERS	1.9784244+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

UX	-7.7638811-02	UY	5.4857708-01	UZ	-8.3248689-01	PX	-3.9215779-01	PY	7.5089445-01	PZ	5.3130474-01

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   QX    9.1661575-01   QY    3.6772230-01   QZ    1.5683058-01   SXO    0.0000000      SYO    0.0000000      SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 33
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 22 HRS., 18 MINS., 17.205 SECS. G.M.T.

T        .8145486381861 91+002  HRS. FROM LAUNCH       3 DAYS,  9 HRS., 27 MINS., 17.510 SECS. G.E.T.     RAGR  .680709164151795+002

          PHASE ELAPSED TIME      .2826948+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ       .2002380675864332 8+000      -.1656886098328576 6+000      -.1278485950846641 3+000
         RDXYZ      -.6604994991468778 6+000     -.5605904674316674 8+000      -.3077336269912003 9+000

SELENOCENTRIC
    XL     6.8960659+02   YL    -5.7062056+02   ZL    -4.4030206+02   DXL   -3.8392887+03   DYL   -3.2585469+03   DZL   -1.7887647+03
    RL     9.9751239+02 DECL    -2.6193246+01   RAL   -3.9606330+01   VL     5.3439634+03 PTHL   -6.5361904-03   AZL   -1.1190624+02

SELENOGRAPHIC
    XS    -9.1549493+02   YS     3.4390877+02   ZS    -1.9653685+02   DXS    1.9608820+03   DYS    4.9690659+03   DZS   -4.3586750+02
  ALTS     5.9018863+01 LATS    -1.1363159+01 LONS     1.5941113+02   VRS    5.3597253+03   PTR   -6.5172186-03   AZR   -9.4759391+01
   LTS    -1.5134608+00   LNS    1.1766046+01   LTE    2.4059695+00   LNE    7.8787355+00 DSMP    5.0316931+00 RSMP    1.0990381+02
   LIN     1.6768710+02   LAN    4.6442518+01   LAP    1.7185539+02   DR    -6.0965228-01   VT    5.3597253+03 SOLSV    4.7423451+01

GEOCENTRIC
     X     1.9684870+05   Y     -5.2136426+04   Z     -3.0111977+04   DX    -2.6290911+03   DY    -4.7279862+02   DZ    -2.8979176+02
     R     2.0585030+05 DEC     -8.4114625+00   RA    -1.4834481+01   V      2.6869383+03   PTH   -6.1085278+01   AZ    -1.1955071+02

GEOGRAPHIC
    XG     2.5150677+04   YG    -2.0207687+05   ZG    -3.0111976+04   DXG   -9.0956122+04   DYG   -8.8814103+03   DZG   -2.8970426+02
   ALT     2.0240662+05   LAT   -8.4123912+00   LON    2.7709460+02   VE     9.1389168+04   PTE   -1.4747167+00   AZE   -9.0401845+01

EARTH-MOON PLANE
   XMP    -8.6720378+02   YMP    4.8053171+02   ZMP   -1.0989917+02 DXMP    2.5953733+03 DYMP    4.6711341+03 DZMP   -4.9875905+01
   RMP     9.9751237+02 DEMP    -6.3253023+00 RAMP     1.5100845+02   VMP    5.3439633+03 PTMP   -6.5364528-03 AZMP   -9.0538782+01
   YME    -2.0584971+05 YME     4.8053093+02   ZME   -1.0989880+02 DXME    2.3550364+03 DYME    1.2926538+03 DZME   -4.9875908+01

PLANETARY COORDINATES
    XM     1.9615909+05   YM    -5.1565805+04   ZM    -2.9671675+04   DXM    1.2101975+03   DYM    2.7857483+03   DZM    1.4989729+03
    RM     2.0494251+05   DEM   -8.3229313+00   RAM   -1.4728533+01   LOM    2.7720055+02   VM     3.3870181+03   ARGM   -1.7684964+01
  XSUN     4.4396225+06 YSUN    -7.2772168+07 ZSUN    -3.1556835+07   RAS   -8.6508872+01   LOS    2.0542020+02   DES   -2.3404604+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA     1.5152772+05   ECC    8.9233761-01   INC    1.4937972+02   RAN    1.7963329+02   APF   -1.0237550+00   RP    1.6313837+04
    VH    -2.0573837+03 RNMP    -1.7935719+02 APMP    -1.6936618+01 INMP    1.7774418+02   APO    2.8674160+05   TFP    1.5778986+02
    TA    -1.6228622+02   EA    -1.1368781+02   MA    -6.6968200+01   SLR    3.0871285+04   PER    4.1096666+02   MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS     9.9722305+02 ECCS    3.1177063-04 INCS     1.4635854+02 RANS    -1.7194046+02 APFS    3.1365965+01   RPS    9.9691215+02
   VHS    -2.2146387+03 RNMPS   5.6130042+01 APMPS    6.3699462+01 INMPS    1.7365188+02 APOS    9.9753394+02 TFPS    8.2326044+01
   TAS    -1.5854809+02   EAS   -1.5853765+02   MAS   -1.5853111+02 SLRS    9.9722290+02 PERS    1.9783640+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
    UX    -7.7671101-02   WY     5.4852220-01   WZ    -8.3252064-01   PX    -9.0618009-01   PY    3.0933612-01   PZ    2.8835530-01
    VX     4.1569798-01   QY     7.7681050-01   QZ     4.7303342-01   SXO    0.0000000      SYO    0.0000000      SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 34
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 22 HRS., 33 MINS., 17.205 SECS. G.M.T.

T        .8170486381861 91+002  HRS. FROM LAUNCH       3 DAYS,  9 HRS., 42 MINS., 17.510 SECS. G.E.T.     RAGR  .718311831597715+002

          PHASE ELAPSED TIME      .2835948+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ      -.7918650103700337 6-002      -.2420536796665818 8+000      -.1587307246620025 9+000
         RDXYZ     -.9163856085723520 0+000      -.1785528431253633 7-001       .7382059596144941 8-001

SELENOCENTRIC
    XL    -2.7271304+01   YL    -8.3361679+02   ZL    -5.4665805+02   DXL   -5.3266791+03   DYL   -1.0378750+02   DZL    4.2909734+02
    RL     9.9724405+02 DECL    -3.3241472+01   RAL   -9.1873731+01   VL     5.3449421+03 PTHL   -2.9936992-02   AZL   -8.4511543+01

SELENOGRAPHIC
    XS    -3.7959464+02   YS     9.0115719+02   ZS    -1.9575308+02   DXS    4.8889765+03   DYS    2.1531675+03   DZS    4.4596058+02
  ALTS     5.8750518+01 LATS    -1.1320328+01 LONS     1.1284229+02   VRS    5.3606998+03   PTR   -2.9849219-02   AZR   -8.5139095+01
   LTS    -1.5135666+00   LNS    1.1753368+02   LTE    2.3910920+00   LNE    7.8806667+00 DSMP    5.0317634+00 RSMP    1.0977448+02
   LIN     1.6768708+02   LAN    4.6328634+01   LAP   -4.4331288+01   DR    -2.7927481+00   VT    5.3606990+03 SOLSV    7.9144058+01

GEOCENTRIC
     X     1.9631049+05   Y     -5.1986643+04   Z     -2.9996216+04   DX    -4.1244366+03   DY    2.6839999+03   DZ    1.9292501+03
     R     2.0528077+05 DEC     -8.4023078+00   RA    -1.4832507+01   V      5.2855311+03   PTH   -6.8150116+01   AZ    5.1463809+01

GEOGRAPHIC
    XG     1.1818432+04   YG    -2.0273318+05   ZG    -2.9996215+04   DXG   -8.8562366+04   DYG   -4.8076534+02   DZG    1.9292867+03
   ALT     2.0183708+05   LAT   -8.4032380+00   LON    2.7333631+02   VE     8.8584685+04   PTE   -3.1746839+00   AZE   -8.9206087+01

EARTH-MOON PLANE
   XMP    -2.6039881+02   YMP    9.5900485+02   ZMP   -8.3653341+01 DXMP    5.1368923+03 DYMP    1.4255407+03 DZMP    3.8545852+02
   RMP     9.9724406+02 DEMP    -4.8118836+00 RAMP     1.0519126+02   VMP    5.3449421+03 PTMP   -2.9936638-02 AZMP   -8.5852318+01
   YME    -2.0527851+05 YME     9.5900388+02   ZME   -8.3653232+01 DXME    4.8966061+03 DYME   -1.9523087+03 DZME    3.8545854+02

PLANETARY COORDINATES
    XM     1.9633776+05   YM    -5.1153027+04   ZM    -2.9449558+04   DXM    1.2022424+03   DYM    2.7877874+03   DZM    1.5001528+03
    RM     2.0501811+05   DEM   -8.2587462+00   RAM   -1.4602970+01   LOM    2.7356584+02   VM     3.3863851+03   ARGM   -1.7545073+01
  XSUN     4.4543147+06 YSUN    -7.2771373+07 ZSUN    -3.1556489+07   RAS   -8.6497309+01   LOS    2.0167150+02   DES   -2.3404346+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    -4.3175308+05   ECC    1.0784383+00   INC    3.9301929+01   RAN   -4.4364265+00   APF    1.1420230+02   RP    3.3865976+04
    VH     2.3164194+03 RNMP    -1.5018868-01 APMP     1.2742043+02 INMP    1.1240753+01   APO   -8.9737213+05   TFP    1.3620244+02
    TA    -1.2754020+02   EA    -4.7764382+01   MA    -9.9256299+00   SLR    7.0388351+04   PER    1.9766128+03   MTA    1.5801268+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS     9.9705166+02 ECCS    5.5699167-04 INCS     1.4635986+02 RANS    -1.7193164+02 APFS    2.8601982+01   RPS    9.9649630+02
   VHS    -2.2146769+03 RNMPS   5.6034426+01 APMPS    6.0973080+01 INMPS    1.7365043+02 APOS    9.9760701+02 TFPS    8.2310523+01
   TAS    -1.1030428+02   EAS   -1.1026945+02   MAS   -1.1023951+02 SLRS    9.9705131+02 PERS    1.9778540+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
    UX    -7.7752834-02   WY     5.4849125-01   WZ    -8.3253340-01   PX    -9.2521426-01   PY    2.7138062-01   PZ    2.6520008-01
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   QX    3.7139335-01   QY    7.9089183-01   QZ    4.8637131-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 35
                  MEAN-OF-EPOCH  1969        24  DEC. 1968, 22 HRS., 48 MINS., 17.205 SECS. G.M.T.

T        .8195486318b191+002  HRS. FROM LAUNCH       3 DAYS, 9 HRS., 57 MINS., 17.510 SECS. G.E.T.    RAGR  .755914499043635+002

         PHASE ELAPSED TIME     .2844943E+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.2113040574801037 4+000      -.1736547570899172 4+000      -.9466875620928 1029-001
        RDXYZ     -.6241906929018156 7+000       .5360778587280884 9+000       .4115220052728514 5+000

SELENOCENTRIC
   XL   -7.2771713+02   YL   -5.9807266+02   ZL   -3.2603290+02  DXL   -3.6282363+03  DYL    3.1160624+03  DZL    2.3920559+03
   RL    9.9677508+02 DECL   -1.9092107+01  RAL   -1.4058500+02   VL    5.3475110+03 PTHL   -3.4300391-02  AZL   -6.1760914+01

SELENOGRAPHIC
   XS    3.8459684+02   YS    9.1629295+02   ZS   -7.7850605+01  DXS    4.8778686+03  DYS   -1.9606307+03  DZS    1.0615578+03
 ALTS    5.8281556+01 LATS   -4.4795045+10 LONS    6.7231213+01  VPS    5.3632620+03  PTR   -3.4199521-02  AZR   -7.8551263+01
  LTS   -1.5136722+00  LNS    1.1740691+02  LTE    2.3762053+00  LNE    7.8825444+00 DSMP    5.0318339+00 RSMP    1.0964520+02
  LIN    1.6768523+02  LAN    4.6200801+01  LAP    2.3725874+02   DR   -3.2012099+00   VT    5.3632610+03 SOLSV    3.9815647+01

GEOCENTRIC
    X    1.9578753+05    Y   -5.1338018+04    Z   -2.4553299+04   DX   -2.4339520+03   DY    5.9058714+03   DZ    3.8933791+03
    R    2.0455255+05  DEC   -8.3070397+00   RA   -1.4692912+01    V    7.4807645+03  PTH   -3.5785576+01   AZ    5.7103221+01

GEOGRAPHIC
   XG   -1.0045469+03   YG   -2.0240390+01   ZG   -2.9553208+04  DXG   -8.4566122+04  DYG    4.2720685+03  DZG    3.8933934+03
  ALT    2.0110887+05  LAT   -8.3079628+00  LON    2.6971564+02   VE    8.4763425+04  PTE   -2.9582249+00  AZE   -8.7768608+01

EARTH-MOON PLANE
  XMP    5.0295261+02  YMP    8.6054957+02  ZMP   -7.5292340+00 DXMP    4.5891679+03 DYMP   -2.6808430+03 DZMP    5.9033374+02
  RMP    9.9677508+02 DEMP   -4.2129660-01 RAMP    5.3696630+01  VMP    5.3475110+03 PTMP   -3.4300020-02 AZMP   -8.3662041+01
  XME   -2.0455074+05  YME    8.6054831+02  ZME   -7.5295290+00 DXME    4.3489345+03 DYME   -6.0580619+03 DZME    5.9033374+02

PLANETARY COORDINATES
   XM    1.9651525+05   YM   -5.0739945+04   ZM   -2.9227266+04  DXM    1.1942843+03  DYM    2.7898090+03  DZM    1.5013231+03
   RM    2.0505369+05  DEM   -8.1945449+00  RAM   -1.4477402+01  LOM    2.6993106+02   VM    3.3857525+03 ARGM   -1.7405234+01
 XSUN    4.4690072+06 YSUN   -7.2770575+07 ZSUN   -3.1556144+07  RAS   -8.6485747+01  LOS    1.9792280+02  DES   -2.3404088+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -8.9548760+04   ECC    3.2501315+00   INC    3.3814788+01  RAN   -2.1022066+00  APF    3.1103338+01   RP    1.5649385+05
    VH    5.7715202+03 RNMP   -2.2003360-01 APMP    4.6129385+01 INMP    5.5810016+00  APO   -2.9559137+05  TFP    1.1425513+02
    TA   -4.9150494+01    EA   -3.6729701+01    MA   -9.0992605+01  SLR    6.6511944+05  PER    1.2779167+02  MTA    1.0791946+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.9707194+02 ECCS    6.6860212-04 INCS    1.4635855+02 RANS   -1.7192717+02 APFS    2.7404895+01  RPS    9.9640530+02
   VHS   -2.2138860+03 RNMPS   5.5908172+01 APMPS   5.4784509+01 INMPS   1.7364811+02 APOS    9.9773858+02 TFPS    8.2303872+01
   TAS   -6.3595293+01  EAS   -6.3557341+01   MAS   -6.3523041+01 SLRS    9.9707146+02 PERS    1.9779144+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.7798086-02   WY    5.4850267-01   WZ   -8.3252165-01   PX   -9.3279043-01   PY    2.5472032-01   PZ    2.5498927-01
   QX    3.5192247-01   QY    7.9640589-01   QZ    4.9182129-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  12- 36
                  MEAN-OF-EPOCH  1969        24  DEC. 1968, 22 HRS., 59 MINS., 25.700 SECS. G.M.T.

T        .821405566855301+002  HRS. FROM LAUNCH       3 DAYS, 10 HRS., 8 MINS., 26.005 SECS. G.E.T.    RAGR  .783844717616420+002

         PHASE ELAPSED TIME     .2851634+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.2348389111111876 21+000      -.5040377037739357 4-001      -.6590700786724670 2-002
        RDXYZ     -.1445835985910722 8+000       .7527097351769770 4+000       .5094197549769476 +000

SELENOCENTRIC
   XL   -9.8096627+02   YL   -1.7358723+02   ZL   -2.2697935+01  DXL   -8.4042179+02  DYL    4.3752795+03  DZL    2.9611067+03
   RL    9.9646502+02 DECL   -1.3052223+00  RAL   -1.6996508+02   VL    5.3495356+03 PTHL   -2.4487630-02  AZL   -5.6381539+01

SELENOGRAPHIC
   XS    8.2500144+02   YS    5.5700021+02   ZS    4.5452053+01  DXS    2.8924936+03  DYS   -4.3792479+03  DZS    1.1144140+03
 ALTS    5.7971489+01 LATS    2.6143564+00 LONS    3.4025276+01  VPS    5.3652819+03  PTR   -2.4415095-02  AZR   -7.7998091+01
  LTS   -1.5137507+00  LNS    1.1731276+02  LTE    2.3651432+00  LNE    7.8839048+00 DSMP    5.0318854+00 RSMP    1.0954922+02
  LIN    1.6768572+02  LAN    4.6098938+01  LAP   -1.3140258+02   DR   -2.2862741+00   VT    5.3652813+03 SOLSV    6.6336377+00

GEOCENTRIC
    X    1.9666534+05    Y   -5.0606555+04    Z   -2.9084761+04   DX    3.4795013+02   DY    7.1665785+03   DZ    4.4632927+03
    R    2.0413507+05  DEC   -8.1392123+00   RA   -1.4501112+01    V    8.4499644+03  PTH   -1.4239459+01   AZ    5.9066759+01

GEOGRAPHIC
   XG   -1.0174337+04   YG   -2.0184754+05   ZG   -2.9084761+04  DXG   -8.2344200+04  DYG    5.6100935+03  DZG    4.4632855+03
  ALT    2.0074218+05  LAT   -8.1901244+00  LON    2.6711441+02   VE    8.2655682+04  PTE   -1.4410113+00  AZE   -8.7079413+01

EARTH-MOON PLANE
  XMP    6.9471970+02  YMP    4.3517501+02  ZMP    5.5153824+01 DXMP    2.3014422+03 DYMP   -4.8019244+03 DZMP    5.1226868+02
  RMP    9.9646503+02 DEMP    3.1729133+00 RAMP    2.5937425+01  VMP    5.3495357+03 PTMP   -2.4487685-02 AZMP   -8.4495143+01
  XME   -2.0418540+05  YME    4.3517370+02  ZME    5.5153546+01 DXME    2.0612490+03 DYME   -8.1786755+03 DZME    5.1226865+02

PLANETARY COORDINATES
   XM    1.9664630+05   YM   -5.0432968+04   ZM   -2.9062064+04  DXM    1.1883719+03  DYM    2.7912990+03  DZM    1.5021861+03
   RM    2.0508012+05  DEM   -8.1468538+00  RAM   -1.4384356+01  LOM    2.6723117+02   VM    3.3852830+03 ARGM   -1.7301410+01
 XSUN    4.4799185+06 YSUN   -7.2769980+07 ZSUN   -3.1555885+07  RAS   -8.6477159+01  LOS    1.9513837+02  DES   -2.3403895+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -4.7561248+04   ECC    5.1363739+00   INC    3.1894733+01  RAN   -1.1305284+00  APF    1.3447259+00   RP    1.9673111+05
    VH    6.9792427+03 RNMP   -3.6879776-01 APMP    1.7231983+01 INMP    3.5898965+00  APO   -2.9185360+05  TFP    9.4012104+01
    TA   -1.6984812+01    EA   -1.4118919+01    MA   -5.9137304+01  SLR    1.2072156+06  PER    7.2268379+01  MTA    1.0122661+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.9720690+02 ECCS    8.5796525-04 INCS    1.4635918+02 RANS   -1.7192729+02 APFS    2.7545203+01  RPS    9.9635132+02
   VHS   -2.2130378+03 RNMPS   5.5806854+01 APMPS   5.9925716+01 INMPS   1.7364863+02 APOS    9.9806245+02 TFPS    8.2304606+01
   TAS   -2.9903692+01  EAS   -2.9877230+01   MAS   -2.9852742+01 SLRS    9.9720609+02 PERS    1.9783159+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.7795856-02   WY    5.4849512-01   WZ   -8.3252684-01   PX   -9.3192564-01   PY    2.5667413-01   PZ    2.5618929-01
   QX    3.5220667-01   QY    7.9578356-01   QZ    4.9118848-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

LONG   TERMINATION
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LUNAR ORBIT COAST FROM
PASS OVER TARGET SITE
TO TEI INITIATION

TABLE VII.- LUNAR ORBIT COAST FROM PASS OVER LUNAR TARGET SITE TO TEI INITIATION

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****** CSM   / MOON  REF.  /PHASE  16-  1
                  MEAN-OF-EPOCH  1969        24  DEC. 1968, 22 HRS., 59 MINS., 25.700 SECS. G.M.T.

T         .8214055688556O1+002  HRS. FROM LAUNCH       3 DAYS, 10 HRS.,  8 MINS., 26.005 SECS. G.E.T.    RAGR  .783844717616420+002

          PHASE ELAPSED TIME      .28516334+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.284838911111187621+000      -.504037703773935T4-001      -.659070078672467O2-002
        RDXYZ     -.144583598591072284000       .752709735176977O4+000       .509419754976588476+000

SELENOCENTRIC
   XL   -9.8096627+02   YL   -1.7358723+02   ZL   -2.2697935+01  DXL   -8.4042179+02  DYL    4.3752795+03  DZL    2.9611067+03
   RL    9.9646502+02  DECL  -1.3052223+00  RAL  -1.6996508+02  VL    5.3495356+03  PTHL   -2.4487630-02  AZL   -5.6381539+01

SELENOGRAPHIC
   XS    8.2500144+02   YS    5.5700021+02   ZS    4.5452053+01  DXS   2.8924936+03  DYS    -4.3792479+03  DZS    1.1144140+03
 ALTS    5.7971489+01 LATS    2.6143564+00 LONS    3.4025276+01  VRS   5.3652819+03  PTR    -2.4415095-02  AZR   -7.7998091+01
  LTS   -1.5137507+00  LNS    1.1731276+02  LTE   2.3651432+00  LNE   7.8839048+00 DSMP    5.0318854+00 RSMP    1.0954922+02
  LIN    1.6768572+02  LAN    4.6098938+01  LAP  -1.3140258+02  DR   -2.2862741+00  VT     5.3652813+03 SOLSV   6.6336377+00

GEOCENTRIC
    X    1.9566534+05    Y   -5.0606555+04    Z   -2.9084761+04  DX    3.4795013+02  DY     7.1665785+03  DZ     4.4632927+03
    R    2.0418587+05  DEC   -8.1892123+00   RA   -1.4501112+01  V     8.4499644+03  PTH    -1.4239859+01  AZ     5.9066759+01

GEOGRAPHIC
   XG   -1.0174237+04   YG   -2.0184754+05   ZG   -2.9084761+04  DXG   -8.2344200+04  DYG    5.6100935+03  DZG    4.4632855+03
  ALT    2.0074218+05  LAT   -8.1901244+00  LON    2.6711441+02  VE    8.2655682+04  PTE    -1.4410113+00  AZE   -8.7079413+01

EARTH-MOON PLANE
  XMP    8.9471970+02  YMP    4.3517501+02  ZMP    5.5153824+01 DXMP    2.3014422+03 DYMP    -4.8019244+03 DZMP    5.1226868+02
  RMP    9.9646503+02 DEMP    3.1729133+00 RAMP    2.5937425+01  VMP   5.3495357+03 PTMP    -2.4487685-02 AZMP   -8.4495143+01
  XME   -2.0418540+05  YME    4.3517379+02  ZME    5.5153546+01 DXME    2.0612490+03 DYME    -8.1786755+03 DZME    5.1226865+02

PLANETARY COORDINATES
   XM    1.9664630+05   YM   -5.0432968+04   ZM   -2.9062064+04  DXM   1.1883719+03  DYM    2.7912990+03  DZM    1.5021861+03
   RM    2.0508012+05  DEM   -8.1468538+00  RAM   -1.4384356+01  LOM   2.6723117+02   VM    3.3852830+03 ARGM   -1.7301410+01
 XSUN    4.4799185+06 YSUN   -7.2769980+07 ZSUN   -3.1555885+07  RAS  -8.6477159+01  LOS    1.9513837+02  DES   -2.3403895+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -4.7561248+04   ECC    5.1363739+00   INC    3.1894733+01  RAN   -1.1305284+00  APF    1.3447259+00  RP     1.9673111+05
    VH    6.9792427+03 RNMP   -3.6879776-01 APMP    1.7231983+01 INMP    3.5898965+00  APO   -2.9185360+05  TFP    9.4012104+01
    TA   -1.6984812+01    EA   -1.4118919+01   MA   -5.9137304+01  SLR   1.2072156+06  PER    7.2268379+01  MTA    1.0122661+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.9720690+02 ECCS    8.5796525-04 INCS    1.4635918+02 RANS   -1.7192729+02 APFS    2.7545203+01  RPS    9.9635132+02
   VHS   -2.2130378+03 RNMPS  5.5806854+01 APMPS   5.9925716+01 INMPS   1.7364863+02 APOS    9.9806245+02 TFPS   8.2304606+01
   TAS   -2.9903692+01  EAS   -2.9877230+01  MAS   -2.9852742+01 SLRS   9.9720609+02 PERS    1.9783159+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
    WX   -7.7795856-02   WY    5.4840512-01   WZ   -8.3252684-01   PX   -9.3192564-01   PY    2.5667413-01   PZ    2.5618929-01
    QX    3.5420667-01   QY    7.9578356-01   QZ    4.9118848-01  SXO   0.0000000      SYO   0.0000000      SZO   0.0000000

****** CSM   / MOON  REF.  /PHASE  16-  2
                  MEAN-OF-EPOCH  1969        24  DEC. 1968, 23 HRS., 14 MINS., 25.700 SECS. G.M.T.

T         .4239055688556O1+002  HRS. FROM LAUNCH       3 DAYS, 10 HRS., 23 MINS., 26.005 SECS. G.E.T.    RAGR  .821447385062340+002

          PHASE ELAPSED TIME      .28606334+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.231894A0039411147+000       .133678960337230O4+000       .109733547830671I2+000
        RDXYZ      .545646706717645O2+000       .641501285542965O2+000       .371583868517200O2+000

SELENOCENTRIC
   XL   -7.9863028+02   YL    4.6038146+02   ZL    3.7791504+02  DXL   3.1716833+03  DYL    3.7288576+03  DZL    2.1599074+03
   RL    9.9628367+02  DECL   2.2291862+01  RAL   1.5003810+02  VL    5.3506218+03  PTHL   -4.7160970-04  AZL   -6.4133009+01

SELENOGRAPHIC
   XS    9.6069616+02   YS   -1.9296927+02   ZS    1.8001907+02  DXS  -1.1589605+03  DYS    -5.2045943+03  DZS    6.0570362+02
 ALTS    5.7790142+01 LATS    1.0409987+01 LONS   -1.1357524+01  VRS   5.3663645+03  PTR    -4.7073819-04  AZR   -8.3410171+01
  LTS   -1.5138564+00  LNS    1.1718599+02  LTE   2.3502409+00  LNE   7.8856903+00 DSMP    5.0319543+00 RSMP    1.0942003+02
  LIN    1.6768868+02  LAN    4.5972354+01  LAP  -5.8122806+01  DR   -4.4089682-02  VT     5.3663645+03 SOLSV   -3.8127400+01

GEOCENTRIC
    X    1.9602311+05    Y   -4.9558989+04    Z   -2.8461558+04  DX    4.3520916+03  DY     6.5221477+03  DZ     3.6632472+03
    R    2.0418426+05  DEC   -8.0126391+00   RA   -1.4188329+01  V     8.6543913+03  PTH    1.3937182+01  AZ     6.1617613+01

GEOGRAPHIC
   XG   -2.2303259+04   YG   -2.0095699+05   ZG   -2.8461558+04  DXG   -8.1983735+04  DYG    6.4622051+03  DZG    3.6632381+03
  ALT    2.0074055+05  LAT   -8.0135319+00  LON    2.6366693+02  VE    8.2319576+04  PTE    1.4509433+00  AZE   -8.7218951+01

EARTH-MOON PLANE
  XMP    9.3174077+02  YMP   -3.3622880+02  ZMP    1.0672625+02 DXMP   -1.8304329+03 DYMP    -5.0256430+03 DZMP    1.4691027+02
  RMP    9.9628365+02 DEMP    6.1495738+00 RAMP   -1.9842530+01  VMP   5.3506218+03 PTMP    -4.7134982-04 AZMP   -8.8417504+01
  XME   -2.0418395+05  YME   -3.3622782+02  ZME    1.0672628+02 DXME   -2.0705700+03 DYME    -8.4017646+03 DZME    1.4691027+02

PLANETARY COORDINATES
   XM    1.9682173+05   YM   -5.0019370+04   ZM   -2.8839473+04  DXM   1.1804084+03  DYM    2.7932899+03  DZM    1.5033399+03
   RM    2.0511569+05  DEM   -8.0826255+00  RAM   -1.4259028+01  LOM   2.6359623+02   VM    3.3846511+03 ARGM   -1.7161660+01
 XSUN    4.4946103+06 YSUN   -7.2769178+07 ZSUN   -3.1555536+07  RAS  -8.6465597+01  LOS    1.9138966+02  DES   -2.3403636+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -4.4375924+04   ECC    5.4416741+00   INC    2.9400955+01  RAN   2.7789644-01  APF   -3.2969540+01  RP     1.9710340+05
    VH    7.2253887+03 RNMP   -1.6299601+00 APMP   -1.4749435+01 INMP   9.9516945-01  APO   -2.8585524+05  TFP    7.1134698+01
    TA    1.6474020+01    EA    1.3841560+01   MA    6.2214486+01  SLR   1.2696758+06  PER    6.5131275+01  MTA    1.0058925+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.9724916+02 ECCS    9.6816455-04 INCS    1.4636269+02 RANS   -1.7192456+02 APFS    4.3706444+01  RPS    9.9628365+02
   VHS   -2.2126400+03 RNMPS  5.5696196+01 APMPS   7.6111621+01 INMPS   1.7365082+02 APOS    9.9821463+02 TFPS   8.2393232+01
   TAS   -4.6787721-01  EAS   -4.8738004-01  MAS   -4.8690818-01 SLRS   9.9724816+02 PERS    1.9784417+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
    WX   -7.7814776-02   WY    5.4844089-01   WZ   -8.3256079-01   PX   -7.9653316-01   PY    4.6801582-01   PZ    3.8274810-01
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   QX    5.9956633-01   QY    6.9294573-01   QZ    4.0043280-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  16-  3
                MEAN-OF-EPOCH  1969       24  DEC. 1968, 23 HRS., 29 MINS., 25.700 SECS. G.M.T.

T        .8264155e3855601+002  HRS. FROM LAUNCH       3 DAYS, 10 HRS., 38 MINS., 26.005 SECS. G.E.T.    RAGR  .859050052508260+00

          PHASE ELAPSED TIME      .28696334+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.3988164515O020821-001        .237595A17597009Q4+000        .160229OA8O2674200+000
        RDXYZ      .9086063211136675B+000        .1456284658766924Q+000        .1091701456478695Q-001

SELENOCENTRIC
   XL   -1.3734973+02   YL    8.1826421+0?   ZL    -.5181832+02  DXL    5.2814604+03  DYL    8.4649530+02  DZL    6.34573B4+01
   RL    9.9645606+02 DECL    3.3626784+01   RAL   9.9528556+01   VL    5.3492434+03 PTHL    2.4363485-02  AZL   -8.9199887+01

SELENOGRAPHIC
   XS    5.1693636+02   YS   -8.2645886+02   ZS    2.0656047+02  DXS   -4.5114762+03  DYS   -2.8911538+03  DZS   -2.6630003+02
 ALTS    5.7962546+01 LATS    1.1963886+01 LONS   -5.7974700+01  VRS    5.3649887+03  PTR    2.4291421-02  AZR   -9.2913520+01
  LTS   -1.5139624+00  LNS    1.1705922+0?  LTE    2.3353297+00  LNE    7.8874223+00 DSMP    5.0320219+00 RSMP    1.0929099+02
  LIN    1.6768948+02  LAN    4.5859677+0?  LAP   -4.9588536+01   DR    2.2745688+00   VT    5.3649881+03 SOLSV   -7.8447827+01

GEOCENTRIC
    X    1.9685864+05    Y   -4.8787215+04    Z   -2.8064895+04   DX    6.4539024+03   DY    3.6417587+03   DZ    1.5679414+03
    R    2.0474656+05  DEC   -7.8784151+00   RA   -1.3919094+01    V    7.5745430+03  PTH    4.2554348+01   AZ    6.5749420+01

GEOGRAPHIC
   XS   -3.4604922+04   YG   -1.9983997+0?   ZG   -2.8064894+04  DXG   -8.4451224+04  DYG    9.1552887+03  DZG    1.5679508+03
  ALT    2.0130284+05  LAT   -7.8792911+0?  LON    2.6017590+02   VE    8.4960505+04  PTE    3.4566467+00  AZE   -8.8451438+01

EARTH-MOON PLANE
  XMP    4.0671922+02   YMP   -9.0477934+02   ZMP    9.4225983+01 DXMP   -4.8579755+03 DYMP   -2.2182105+03 DZMP   -3.0663052+02
  RMP    9.9645606+02 DEMP    5.4260591+00 RAMP   -6.5794980+01  VMP    5.3492434+03 PTMP    2.4363299-02 AZMP   -9.3303252+01
  XME   -2.0474454+05   YME   -9.0477993+02   ZME    9.4225277+01 DXME   -5.0980549+03 DYME   -5.5937035+03 DZME   -3.0663052+02

PLANETARY COORDINATES
   XM    1.9699599+05   YM   -4.9605480+04   ZM   -2.8616713+04  DXM    1.1724420+03  DYM    2.7952635+03  DZM    1.5044840+03
   RM    2.0515126+05  DEM   -8.0183820+00  RAM   -1.4133784+01  LOM    2.5996120+02   VM    3.3840198+03 ARGM   -1.7021961+01
 XSUN    4.5093021+06 YSUN   -7.2768373+07 ZSUN   -3.1555187+07  RAS   -8.6454034+01  LOS    1.8764096+02  DES   -2.3403373+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -8.8679581+04   ECC    3.0738725+00   INC    2.5424476+01  RAN    3.0048092+00  APF   -7.3883166+01   RP    1.3828494+05
   VH    5.8943848+03 RNMP   -1.7927140+02 APMP    1.2425977+02 INMP    3.1746242+00  APO   -2.7164411+05  TFP    4.6677670+01
   TA    5.5264094+01    EA    4.4976905+01   MA    1.0791934+02  SLR    5.6335524+05  PER    1.1996588+02  MTA    1.0898511+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9707983+02 ECCS    7.5640693-04 INCS    1.4636481+02 RANS   -1.7191605+02 APFS    5.4567415+01  RPS    9.9632563+02
  VHS   -2.2133641+03 RNMPS   5.5603333+01 APMPS   8.7011003+01 INMPS   1.7365012+02 APOS    9.9783400+02 TFPS    8.2452757+01
  TAS    3.4230749+01   EAS    3.4205386+01   MAS   3.4181023+01  SLRS   9.9707922+02 PERS    1.9779378+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.7892018-02   WY    5.4839884-01   WZ   -8.3258126-01   PX   -6.6938104-01   PY    5.9011868-01   PZ    4.5131911-01
   UX    7.3832463-01   QY    5.9246827-01   QZ    3.2112225-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  16-  4
                MEAN-OF-EPOCH  1969       24  DEC. 1968, 23 HRS., 44 MINS., 25.700 SECS. G.M.T.

T        .9289055e3855601+002  HRS. FROM LAUNCH       3 DAYS, 10 HRS., 53 MINS., 26.005 SECS. G.E.T.    RAGR  .896652719954180+002

          PHASE ELAPSED TIME      .28786334+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .1760463512526186Z+000        .1991163200230946S+000        .1146733630433076O+000
        RDXYZ      .7269954423608223O+000       -.4369634470172764Z+000       -.3558892833901991Q+000

SELENOCENTRIC
   XL    8.0629133+02   YL    6.8574337+0?   ZL    3.9492743+02  DXL    4.2258099+03  DYL   -2.5399395+03  DZL   -2.0686793+03
   RL    9.9684595+02 DECL    2.3338160+01   RAL   4.8518871+01   VL    5.3467932+03 PTHL    3.6004797-02  AZL   -1.1493868+02

SELENOGRAPHIC
   XS   -2.3552653+02   YS   -9.6175581+02   ZS    1.0923539+02  DXS   -5.1432355+03  DYS    1.1610468+03  DZS   -9.7775197+02
 ALTS    5.8402437+01 LATS    6.2908465+00 LONS   -1.0392896+02  VRS    5.3625460+03  PTR    3.5899256-02  AZR   -1.0057389+02
  LTS   -1.5140684+00  LNS    1.1693245+02  LTE    2.3204005+00  LNE    7.8891018+00 DSMP    5.0320895+00 RSMP    1.0916180+02
  LIN    1.6768757+02  LAN    4.5734573+01  LAP   -1.7335211+02   DR    3.3599576+00   VT    5.3625449+03 SOLSV   -4.8970611+01

GEOCENTRIC
    X    1.4777535+05    Y   -4.8505553+04    Z   -2.7998856+04   DX    5.3902825+03   DY    2.5727981+02   DZ   -5.6306057+02
    R    2.0555246+05  DEC   -7.8287501+00   RA   -1.3780127+01    V    5.4257143+03  PTH    7.3501575+01   AZ    8.4528077+01

GEOGRAPHIC
   XG   -4.7349305+04   YG   -1.9805534+05   ZG   -2.7998854+04  DXG   -8.7465065+04  DYG    1.5590725+04  DZG   -5.6312794+02
  ALT    2.0210874+05  LAT   -7.8296171+00  LON    2.5655460+02   VE    8.8845516+04  PTE    3.3568571+00  AZE   -8.9905124+01

EARTH-MOON PLANE
  XMP   -3.6355125+02   YMP   -9.2789964+02   ZMP    2.5185608+01 DXMP   -4.9558717+03 DYMP    1.9224708+03 DZMP   -5.7588109+02
  RMP    9.9689593+02 DEMP    1.4476763+01 RAMP   -1.1139525+02  VMP    5.3467031+03 PTMP    3.6004954-02 AZMP   -9.6185997+01
  XME   -2.0555037+05   YME   -9.2789906+02   ZME    2.5184915+01 DXME   -5.1958915+03 DYME   -1.4523938+03 DZME   -5.7588109+02

PLANETARY COORDINATES
   XM    1.9716906+05   YM   -4.9191296+04   ZM   -2.8393763+04  DXM    1.1644726+03  DYM    2.7972194+03  DZM    1.5056188+03
   RM    2.0518681+05  DEM   -7.9541235+00  RAM   -1.4008624+01  LOM    2.5632610+02   VM    3.3833889+03 ARGM   -1.6882310+01
 XSUN    4.5239939+06 YSUN   -7.2767586+07 ZSUN   -3.1554837+07  RAS   -8.6442471+01  LOS    1.8389225+02  DES   -2.3403112+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -3.3589141+05   ECC    1.0625027+00   INC    9.5417257+00  RAN    4.1102273+01  APF    1.6676282+02   RP    2.0994124+04
   VH    2.8262464+03 RNMP   -1.7972396+02 APMP    4.2001165+01 INMP    2.1972270+01  APO   -6.9277696+05  TFP    3.2240100+01
   TA    1.3798007+02    EA    5.6012096+01   MA    1.3443681+01  SLR    4.3300437+04  PER    1.3563345+03  MTA    1.6024967+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9704593+02 ECCS    6.4615528-04 INCS    1.4636375+02 RANS   -1.7191016+02 APFS    5.7766427+01  RPS    9.9640169+02
  VHS   -2.2141456+03 RNMPS   5.5483926+01 APMPS   9.0222773+01 INMPS   1.7364751+02 APOS    9.9769016+02 TFPS    8.2470251+01
  TAS    7.6578182+01   EAS    7.6538754+01   MAS   7.6502748+01  SLRS   9.9704548+02 PERS    1.9778370+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.7950490-02   WY    5.4840615-01   WZ   -8.3257098-01   PX   -6.2717099-01   PY    6.2218838-01   PZ    4.6854889-01
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QX 7.7497108-01 QY 5.5868798-01 QZ 2.9544454-01 SXO 0.0000000 SYO 0.0000000 SZO 0.0000000

****** CSM / MOON REF. /PHASE 16- 5
MEAN-OF-EPOCH 1969 24 DEC. 1968, 23 HRS., 59 MINS., 25.700 SECS. G.M.T.

T .93140556885560l+002 HRS. FROM LAUNCH 3 DAYS, 11 HRS., 8 MINS., 26.005 SECS. G.E.T. RAGR .934255387400100+002

PHASE ELAPSED TIME .28876334+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .2866170581747l481+000 .4142319829208564Z-001 .4494935405226000Z-003
RDXYZ .1106918725972294O+000 -.7575171871032958+000 -.5093239701743286Z+000

SELENOCENTRIC
XL 9.8709010+02 YL 1.4265874+02 ZL 1.5480259+00 DXL 6.4341919+02 DYL -4.4032238+03 DZL -2.9605499+03
RL 9.9734685+02 DECL 8.8931332+00 RAL 8.2237046+00 VL 5.3448314+03 PTHL 2.5487952-02 AZL -1.2363569+02

SELENOGRAPHIC
XS -8.5058724+02 YS -5.1801240+02 ZS -5.3528007+01 DXS -2.6798129+03 DYS 4.5097237+03 DZS -1.1031498+03
ALTS 5.8853335+01 LATS -3.0765658+00 LONS -1.4865835+02 VRS 5.3605918+03 PTR 2.5412723-02 AZR -1.0189167+02
LTS -1.5141747+00 LNS 1.1680568+02 LTE 2.3054807+00 LNE 7.8907288+00 DSMP 5.0321572+00 RSMP 1.0903276+02
LIN 1.6768793+02 LAN 4.5597997+01 LAP -1.7708527+02 DR 2.3776136+00 VT 5.3605912+03 SOLSV -4.4463230+00

GEOCENTRIC
X 1.9832804+05 Y -4.8634169+04 Z -2.8169138+04 DX 1.7999195+03 DY -1.6040660+03 DZ -1.4538059+03
R 2.0613781+05 DEC -7.8541563+00 RA -1.3778236+01 V 2.8153668+03 PTH 5.5093333+01 AZ -1.3549908+02

GEOGRAPHIC
XG -6.0397629+04 YG -1.9506773+05 ZG -2.8169137+04 DXG -8.8138834+04 DYG 2.5059967+04 DZG -1.4538506+03
ALT 2.0269409+05 LAT -7.8550237+00 LON 2.5279623+02 VE 9.1643713+04 PTE 1.4436543+00 AZE -9.0718679+01

EARTH-MOON PLANE
XMP -9.1506232+02 YMP -3.9228126+02 ZMP -5.8967236+01 DXMP -2.0716503+03 DYMP 4.9015836+03 DZMP -4.9996708+02
RMP 9.9734685+02 DEMP -3.3895382+00 RAMP -1.5679550+02 VMP 5.3448314+03 PTMP 2.5488635-02 AZMP -9.5375339+01
XME -2.0613743+05 YME -3.9228078+02 ZME -5.8967339+01 DXME -2.3116087+03 DYME 1.5273467+03 DZME -4.9996708+02

PLANETARY COORDINATES
XM 1.9734096+05 YM -4.8776828+04 ZM -2.8170686+04 DXM 1.1565004+03 DYM 2.7991578+03 DZM 1.5067440+03
RM 2.0522236+05 DEM -7.8898507+00 RAM -1.3883549+01 LOM 2.5269091+02 VM 3.3827584+03 ARGM -1.6742712+01
XSUN 4.5386852+06 YSUN -7.2766757+07 ZSUN -3.1554485+07 RAS -8.6430908+01 LOS 1.8014355+02 DES -2.3402847+01

GEOCENTRIC OSCULATING ELEMENTS
SMA 1.5921344+05 ECC 8.3724802-01 INC 1.3397508+02 RAN 1.7387035+02 APF 3.4231837+01 RP 2.5912334+04
VH -1.9256455+03 RNMP -1.7984068+02 APMP -3.3666157+02 INMP 1.6194542+02 APO 2.9251458+05 TFP 2.3482512+00
TA 1.5671445+02 EA 1.1061078+02 MA 6.5710448+01 SLR 4.7607325+04 PER 4.4262716+02 MTA 3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
SMAS 9.9721597+02 ECCS 4.6380985-04 INCS 1.4636420+02 RANS -1.7190997+02 APFS 7.3373928+01 RPS 9.9675346+02
VHS -2.2143978+03 RNMPS 5.5347884+01 APMPS -2.5416982+02 INMPS 1.7364787+02 APOS 9.9767847+02 TFPS 8.2555766+01
TAS 1.0647237+02 EAS 1.0644003+02 MAS 1.0641454+02 SLRS 9.9721569+02 PERS 1.9783429+00 MTAS 3.5999999+02

SELENOCENTRIC UNIT VECTORS
WX -7.7951469-02 WY 5.4839941-01 WZ -8.3257533-01 PX -3.9554594-01 PY 7.4956213-01 PZ 5.3075416-01
QX 9.1513219-01 QY 3.7069485-01 QZ 1.5848769-01 SXO 0.0000000 SYO 0.0000000 SZO 0.0000000

****** CSM / MOON REF. /PHASE 16- 6
MEAN-OF-EPOCH 1969 25 DEC. 1968, 0 HRS., 14 MINS., 25.700 SECS. G.M.T.

T .93390556885560l+002 HRS. FROM LAUNCH 3 DAYS, 11 HRS., 23 MINS., 26.005 SECS. G.E.T. RAGR .971858054846020+002

PHASE ELAPSED TIME .28966334+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .2257991751725110Z+000 -.1410719418615148Z+000 -.1140537205360655Z+000
RDXYZ -.5713501964948315Z+000 -.6249497528920438O+000 -.3580760956461843+000

SELENOCENTRIC
XL 7.7763735+02 YL -4.8584239+02 ZL -3.9279342+02 DXL -3.3210900+03 DYL -3.6326484+03 DZL -2.0813906+03
RL 9.9752160+02 DECL -2.3189242+01 RAL -3.1995793+01 VL 5.3439648+03 PTHL -1.6391670-03 AZL -1.1507024+02

SELENOGRAPHIC
XS -9.5119958+02 YS 2.3729847+02 ZS -1.8427731+02 DXS 1.3936118+03 DYS 5.1440497+03 DZS -5.6857416+02
ALTS 5.9028088+01 LATS -1.0645692+01 LONS 1.6599219+02 VRS 5.3597273+03 PTR -1.6344837-03 AZR -9.6196915+01
LTS -1.5142806+00 LNS 1.1667891+02 LTE 2.2905432+00 LNE 7.8923018+00 DSMP 5.0322241+00 RSMP 1.0890377+02
LIN 1.6769088+02 LAN 4.5472205+01 LAP 1.9375938+02 DR -1.5289760-01 VT 5.3597273+03 SOLSV 4.0192684+01

GEOCENTRIC
X 1.9828930+05 Y -4.8847913+04 Z -2.8340216+04 DX -2.1725646+03 DY -8.3156976+02 DZ -5.7353090+02
R 2.0617452+05 DEC -7.9007438+00 RA -1.3839068+01 V 2.3959305+03 PTH -4.9196734+01 AZ -1.2204405+02

GEOGRAPHIC
XG -7.3267748+04 YG -1.9062162+05 ZG -2.8340214+04 DXG -8.5013395+04 DYG 3.4722802+04 DZG -5.7356594+02
ALT 2.0273090+05 LAT -7.9016161+00 LON 2.4897512+02 VE 9.1832889+04 PTE -1.1316065+00 AZE -9.0518421+01

EARTH-MOON PLANE
XMP -9.1624416+02 YMP 3.7936413+02 ZMP -1.0783705+02 DXMP 2.0564476+03 DYMP 4.9308615+03 DZMP -1.2485141+02
RMP 9.9752159+02 DEMP -6.2068874+00 RAMP 1.5750876+02 VMP 5.3439648+03 PTMP -1.6390793-03 AZMP -9.1346795+01
XME -2.0617414+05 YME 3.7936430+02 ZME -1.0783661+02 DXME 1.8165524+03 DYME 1.5572517+03 DZME -1.2485142+02

PLANETARY COORDINATES
XM 1.9751167+05 YM -4.8362071+04 ZM -2.7947422+04 DXM 1.1485253+03 DYM 2.8010787+03 DZM 1.5078594+03
RM 2.0525790+05 DEM -7.8255634+00 RAM -1.3758559+01 LOM 2.4905563+02 VM 3.3821285+03 ARGM -1.6603164+01
XSUN 4.5533764+06 YSUN -7.2765944+07 ZSUN -3.1554133+07 RAS -8.6419345+01 LOS 1.7639484+02 DES -2.3402585+01

GEOCENTRIC OSCULATING ELEMENTS
SMA 1.3845336+05 ECC 8.2167272-01 INC 1.4709643+02 RAN 1.7854617+02 APF -3.2539073+00 RP 2.4690010+04
VH -2.3446596+03 RNMP -1.7973366+02 APMP -1.7538349+01 INMP 1.7539123+02 APO 2.5221670+05 TFP 1.7183411+02
TA -1.6208868+02 EA -1.2653267+02 MA -8.8704363+01 SLR 4.4977117+04 PER 3.5894153+02 MTA 3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
SMAS 9.9724203+02 ECCS 2.8180391-04 INCS 1.4636775+02 RANS -1.7190695+02 APFS 3.9488497+01 RPS 9.9696101+02
VHS -2.2146024+03 RNMPS 5.5238871+01 APMPS 7.1980328+01 INMPS 1.7365001+02 APOS 9.9752304+02 TFPS 8.4347741+01
TAS -1.7417680+02 EAS -1.7417423+02 MAS -1.7417260+02 SLRS 9.9724191+02 PERS 1.9784205+00 MTAS 3.5999999+02

SELENOCENTRIC UNIT VECTORS
WX -7.7973069-02 WY 5.4834417-01 WZ -8.3260968-01 PX -8.3860638-01 PY 4.1555457-01 PZ 3.5221262-01

QX 5.3912848-01 QY 7.2569487-01 QZ 4.2744285-01 SXO 0.0000000 SYO 0.0000000 SZO 0.0000000

****** CSM / MOON REF. /PHASE 16- 7
MEAN-OF-EPOCH 1969 25 DEC. 1968, 0 HRS., 29 MINS., 25.700 SECS. G.M.T.

T .4364055688556O1+002 HRS. FROM LAUNCH 3 DAYS, 11 HRS., 38 MINS., 26.005 SECS. G.E.T. RAGR .10094607229194+003

PHASE ELAPSED TIME .29056334+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .3002340694805600 4-001 -.2392493495705318 3+000 -.1603659064209767 9+000
RDXYZ -.9117455440041328 3+000 -.1117567228293789 0+000 .7263578941130405 7-002

SELENOCENTRIC

XL	1.0339862+02	YL	-8.2396092+02	ZL	-5.5228952+02	DXL	-5.2997077+03	DYL	-6.9029778+02	DZL	4.2221041+01
RL	4.9730967+02	DECL	-3.3626680+01	RAL	-8.2847357+01	VL	5.3446417+03	PTHL	-2.7112531-02	AZL	-8.9474501+01

SELENOGRAPHIC

XS	-4.3000542+02	YS	8.4986552+02	ZS	-2.0481692+02	DXS	4.6291675+03	DYS	2.6853420+03	DZS	3.0601137+02
ALTS	1.8816154+01	LATS	-1.1851124+01	LONS	1.1945783+02	VRS	5.3604008+03	PTR	-2.7032237-02	AZS	-8.6661675+01
LTS	-1.5143866+00	LNS	1.1655215+02	LTE	2.2755974+00	LNE	7.8938226+00	DSMP	5.0322901+00	RSMP	1.0877494+02
LIN	1.5769149+02	LAN	4.5358431+01	LAP	2.6852726+02	DR	-2.5290450+00	VT	5.3604002+03	SOLSV	7.9269049+01

GEOCENTRIC

X	1.9778460+05	Y	-4.8770991+04	Z	-2.8276284+04	DX	-4.1591602+03	DY	2.1126843+03	DZ	1.5511870+03
R	2.0566211+05	DEC	-7.9025731+00	RA	-1.3852015+01	V	4.9161194+03	PTH	-7.3518670+01	AZ	4.9180043+01

GEOGRAPHIC

XG	-8.5439987+04	YG	-1.8492529+05	ZG	-2.8276283+04	DXG	-7.9072195+04	DYG	4.1538838+04	DZG	1.5512273+03
ALT	2.0221839+05	LAT	-7.9034478+00	LON	2.1520191+02	VE	8.9332490+04	PTE	-3.0240454+00	AZE	-8.9414494+01

EARTH-MOON PLANE

XMP	-3.6658803+02	YMP	9.2289860+02	ZMP	-9.2184541+01	DXMP	4.9476761+03	DYMP	1.9950138+03	DZMP	3.2408959+02
RMP	9.9730967+02	DEMP	-5.3036038+00	RAMP	1.1166366+02	VMP	5.3446418+03	PTMP	-2.7113001-02	AZMP	-8.6501405+01
XME	-2.0566002+05	YME	9.2289919+02	ZME	-9.2184643+01	DXME	4.7078457+03	DYME	-1.3779696+03	DZME	3.2498961+02

PLANETARY COORDINATES

XM	1.9768120+05	YM	-4.7947031+04	ZM	-2.7723995+04	DXM	1.1405475+03	DYM	2.8029821+03	DZM	1.5089660+03
RM	2.0529343+05	DEM	-7.7612624+00	RAM	-1.3633651+01	LOM	2.4542027+02	VM	3.3814991+03	ARGM	-1.6463666+01
XSUN	4.5680676+06	YSUN	-7.2765130+07	ZSUN	-3.1553779+07	RAS	-8.6407784+01	LOS	1.7264614+02	DES	-2.3402320+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-1.4134479+06	ECC	1.0124853+00	INC	4.1445932+01	RAN	-4.8080874+00	APF	1.3280830+02	RP	1.7647203+04
VH	1.2802506+03	RNMP	-1.4918977-01	APMP	1.4468582+02	INMP	1.3385405+01	APO	-2.8445431+06	TFP	1.3698515+02
TA	-1.4479676+02	EA	-2.9057296+01	MA	-1.8402209+00	SLR	3.5514930+04	PER	1.1708147+04	MTA	1.7099279+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	9.9707085+02	ECCS	5.3037555-04	INCS	1.4636969+02	RANS	-1.7189838+02	APFS	2.7665681+01	RPS	9.9654203+02
VHS	-2.2147285+03	RNMPS	5.5145492+01	APMPS	6.0199540+01	INMPS	1.7364914+02	APOS	9.9759965+02	TFPS	8.4282395+01
TAS	-1.1687981+02	EAS	-1.1684840+02	MAS	-1.1682129+02	SLRS	9.9707053+02	PERS	1.9779111+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-7.8051076-02	WY	5.4830462-01	WZ	-8.3262842-01	PX	-9.3131567-01	PY	2.5792369-01	PZ	2.5715065-01
QX	3.5575148-01	QY	7.9551077-01	QZ	4.9051346-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / MOON REF. /PHASE 16- 8
MEAN-OF-EPOCH 1969 25 DEC. 1968, 0 HRS., 44 MINS., 25.700 SECS. G.M.T.

T .4383055688556O1+002 HRS. FROM LAUNCH 3 DAYS, 11 HRS., 53 MINS., 26.005 SECS. G.E.T. RAGR .1047063389733786+003

PHASE ELAPSED TIME .29146334+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ -.1436712226944547+000 -.1943659473434511 0+000 -.1107680632147704 9+000
RDXYZ -.7269687862583450 7+000 .4588902834589409 7+000 .3685177108580462 2+000

SELENOCENTRIC

XL	6.3255148+02	YL	-6.6938340+02	ZL	-3.8147765+02	DYL	-4.1094009+03	DYL	2.6673938+03	DZL	2.1420847+03
RL	9.3685548+02	DECL	-2.2499860+01	RAL	-1.3337953+02	VL	5.3470264+03	PTHL	-3.5035624-02	AZL	-6.4318633+01

SELENOGRAPHIC

XS	2.7942292+02	YS	9.5123395+02	ZS	-1.0282972+02	DXS	5.0822799+03	DYS	-1.3905813+03	DZS	9.9805404+02
ALTS	5.8361959+01	LATS	-5.9208263+00	LONS	7.3607784+01	VRS	5.3627788+03	PTR	-3.4932424-02	AZR	-7.9219753+01
LTS	-1.5144929+00	LNS	1.1645538+02	LTE	2.2606432+00	LNE	7.8952907+00	DSMP	5.0323554+00	RSMP	1.0864595+02
LIN	1.6768959+02	LAN	4.5233455+01	LAP	2.4618266+02	DR	-3.2696098+00	VT	5.3627777+03	SOLSV	4.7061017+01

GEOCENTRIC

X	1.9721700+05	Y	-4.8201095+04	Z	-2.7881882+04	DX	-2.9768338+03	DY	5.4722618+03	DZ	3.6521474+03
R	2.0492752+05	DEC	-7.8197622+00	RA	-1.3734210+01	V	7.2211751+03	PTH	-4.0074418+01	AZ	5.6523165+01

GEOGRAPHIC

XG	-9.0684488+04	YG	-1.7851953+05	ZG	-2.7881882+04	DXG	-7.3049254+04	DYG	4.4330572+04	DZG	3.6521468+03
ALT	2.0148379+05	LAT	-7.8206310+00	LON	2.4155905+02	VE	8.5526205+04	PTE	-3.1159366+00	AZE	-8.7954685+01

EARTH-MOON PLANE

XMP	4.0346132+02	YMP	9.1130885+02	ZMP	-2.1354632+01	DXMP	4.8640831+03	DYMP	-2.1434342+03	DZMP	5.8058359+02
RMP	9.9685548+02	DEMP	-1.2274837+00	RAMP	6.6119717+01	VMP	5.3470264+03	PTMP	-3.5035647-02	AZMP	-8.3765811+01
XME	-2.0492549+05	YME	9.1130886+02	ZME	-2.1354494+01	DXME	4.6243197+03	DYME	-5.5157920+03	DZME	5.8058359+02

PLANETARY COORDINATES

XM	1.9784954+05	YM	-4.7531712+04	ZM	-2.7500404+04	DXM	1.1325672+03	DYM	2.8048681+03	DZM	1.5100627+03
RM	2.0532895+05	DEM	-7.6969481+00	RAM	-1.3508826+01	LOM	2.4178483+02	VM	3.3808701+03	ARGM	-1.6324219+01
XSUN	4.5827583+06	YSUN	-7.2764313+07	ZSUN	-3.1553423+07	RAS	-8.6396221+01	LOS	1.6888744+02	DES	-2.3402055+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-7.4438025+04	ECC	2.8383702+00	INC	3.4274141+01	RAN	-2.1083566+00	APF	3.9203051+01	RP	1.4419812+05
VH	5.4346502+03	RNMP	-1.9823644-01	APMP	5.3127119+01	INMP	6.0261182+00	APO	-3.0107418+05	TFP	1.2072482+02
TA	-5.3183990+01	EA	-4.1412055+01	MA	-8.6635536+01	SLR	5.5348580+05	PER	1.5305884+02	MTA	1.1062896+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	9.9705201+02	ECCS	6.4246706-04	INCS	1.4636859+02	RANS	-1.7189282+02	APFS	2.8463834+01	RPS	9.9641144+02
VHS	-2.2140657+03	RNMPS	5.5024642+01	APMPS	6.1011235+01	INMPS	1.7364659+02	APOS	9.9769256+02	TFPS	8.4286671+01
TAS	-7.2173164+01	EAS	-7.2134129+01	MAS	-7.2099002+01	SLRS	9.9705155+02	PERS	1.9778550+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-7.8106521-02	WY	5.4831298-01	WZ	-8.3261772-01	PX	-9.2629503-01	PY	2.6888524-01	PZ	2.6396622-01

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   QX    3.6861471-01   QY    7.9186713-01   QZ    4.8689789-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000
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****** CSM   / MOON  REF.  /PHASE  16- 9
                    MEAN-OF-EPOCH  1969       25  DEC. 1968,  0 HRS.,  58 MINS.,  29.450 SECS. G.M.T.

T        .841249318855601+002  HRS. FROM LAUNCH       3 DAYS, 12 HRS.,  7 MINS.,  29.755 SECS. G.E.T.    RAGR  .108231589046841+003

          PHASE ELAPSED TIME     .29230709+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.285802416883245522+000      -.449968107797416695-001      -.282118797337370098-002
        RDXYZ     -.123710851865435470+000       .756285906542048480+000       .509641608219875540+000

SELENOCENTRIC
   XL    9.8428453+02   YL   -1.5496602+02   ZL   -9.7159839+00  DXL   -7.1909467+02  DYL    4.3960667+03  DZL    2.9623962+03
   RL    9.9645616+02 DECL   -5.5867355-01   RAL  -1.7105278+02  VL    5.3496066+03 PTHL   -2.3966997-02  AZL   -5.6373142+01

SELENOGRAPHIC
   XS    8.4717693+02   YS    5.2217054+02   ZS    5.0537815+01  DXS    2.7046023+03  DYS   -4.4994624+03  DZS    1.1076900+03
 ALTS    5.7962649+01 LATS    2.9071488+00 LONS   3.1648242+01  VRS    5.3653529+03  PTR   -2.3896459-02  AZR   -7.8068645+01
  LTS   -1.5145926+00  LNS    1.1630654+02  LTE   2.2466160+00  LNE    7.8966184+00 DSMP    5.0324167+00 RSMP    1.0852517+02
  LIN    1.6768997+02  LAN    4.5105256+01  LAP   2.5698952+01  DR    -2.2377377+00  VT    5.3653525+03 SOLSV   5.2558065+00

GEOCENTRIC
    X    1.9702201+05    Y   -4.7297063+04    Z   -2.7300358+04  DX    4.0598836+02  DY    7.2026870+03  DZ    4.4734786+03
    R    2.0445047+05  DEC   -7.6736498+00   RA   -1.3498971+01  V     8.4885532+03  PTH   -1.2742788+01  AZ    5.9021167+01

GEOGRAPHIC
   XG   -1.0656276+05   YG   -1.7233415+05   ZG   -2.7300357+04  DXG   -6.9643263+04  DYG    4.4576513+04  DZG    4.4734827+03
  ALT    2.0100674+05  LAT   -7.6745047+00  LON   2.3826943+02  VE    8.2808587+04  PTE   -1.2956519+00  AZE   -8.7049317+01

EARTH-MOON PLANE
  XMP    9.1216361+02   YMP   3.9693359+02   ZMP   5.7673484+01 DXMP   2.0961534+03 DYMP   -4.8959189+03 DZMP    5.0439191+02
  RMP    9.9645619+02 DEMP    3.3180535+00 RAMP   2.3516563+01  VMP   5.3496066+03 PTMP   -2.3966455-02 AZMP   -8.4579275+01
  XME   -2.0445008+05  YME    3.9693343+02  ZME   5.7673084+01 DXME   1.8564542+03 DYME   -8.2676903+03 DZME    5.0439186+02

PLANETARY COORDINATES
   XM    1.9800629+05   YM   -4.7142097+04   ZM   -2.7290642+04  DXM    1.1250830+03  DYM    2.8066202+03  DZM    1.5110824+03
   RM    2.0536224+05  DEM   -7.6366416+00  RAM   -1.3391879+01  LOM    2.3837653+02  VM    3.3802808+03 ARGM   -1.6193534+01
 XSUN    4.5965311+06 YSUN   -7.2763545+07 ZSUN   -3.1553090+07  RAS   -8.6385380+01  LOS    1.6538303+02  DES   -2.3401805+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -4.6903569+04   ECC    5.2316148+00   INC   3.1823155+01  RAN   -9.5947396-01  APF    4.9019974-01  RP    1.9847703+05
   VH    7.0280036+03 RNMP   -3.7576856-01  APMP   1.5424227+01 INMP    3.4963541+00  APO   -2.9228497+05  TFP   9.4725551+01
   TA   -1.5159203+01   EA   -1.2616030+01   MA   -5.3920816+01  SLR    1.2368374+06  PER    7.0774579+01  MTA   1.0101964+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9721563+02 ECCS    8.6889899-04  INCS   1.4636904+02 RANS   -1.7189272+02 APFS    2.7793286+01  RPS   9.9634915+02
  VHS   -2.2130004+03 RNMPS   5.4897121+01 APMPS   6.0340543+01 INMPS   1.7364698+02 APOS    9.9808209+02 TFPS   8.4282947+01
  TAS   -2.8802915+01  EAS   -2.8778070+01  MAS   -2.8754103+01 SLRS    9.9721485+02 PERS    1.9783419+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.8106572-02   WY    5.4830621-01   WZ   -8.3262216-01  PX   -9.3054631-01  PY    2.5959992-01  PZ    2.5824683-01
   QX    3.5774700-01   QY    7.9496425-01   QZ    4.8994786-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000
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****** CSM   / MOON  REF.  /PHASE  16- 10
                    MEAN-OF-EPOCH  1969       25  DEC. 1968,  1 HRS.,  13 MINS.,  29.450 SECS. G.M.T.

T        .843749318855601+002  HRS. FROM LAUNCH       3 DAYS, 12 HRS.,  22 MINS.,  29.755 SECS. G.E.T.    RAGR  .111991855791433+003

          PHASE ELAPSED TIME     .29320709+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.227881969401057950+000       .138267058266727330+000       .112421973169138590+000
        RDXYZ      .562457417030119340+000       .631720947319806520+000       .363173483675262700+000

SELENOCENTRIC
   XL   -7.8481036+02   YL    4.7618256+02   ZL    3.8717380+02  DXL    3.2693990+03  DYL    3.6720074+03  DZL    2.1110202+03
   RL    9.9628341+02 DECL    2.2868542+01  RAL   1.4475277+02  VL    5.3506088+03 PTHL    2.0920410-04  AZL   -6.4647038+01

SELENOGRAPHIC
   XS    9.5120448+02   YS   -2.3327487+02   ZS    1.8268418+02  DXS   -1.3757107+03  DYS   -5.1543212+03  DZS    5.8148402+02
 ALTS    5.7789898+01 LATS    1.0565862+01 LONS   -1.3779356+01  VRS    5.3663518+03  PTR    2.0903992-04  AZR   -8.3671672+01
  LTS   -1.5146995+00  LNS    1.1617977+02  LTE   2.2316458+00  LNE    7.8979845+00 DSMP    5.0324811+00 RSMP    1.0839638+02
  LIN    1.6769293+02  LAN    4.4979174+01  LAP   -2.0622213+01  DR    1.9578785-02  VT    5.3663518+03 SOLSV   -3.9492559+01

GEOCENTRIC
    X    1.9738755+05    Y   -4.6250057+04    Z   -2.6679565+04  DX    4.3864963+03  DY    6.4804797+03  DZ    3.6231811+03
    R    2.0448156+05  DEC   -7.4969943+00   RA   -1.3187130+01  V     8.6235378+03  PTH   1.5439864+01  AZ    6.1576426+01

GEOGRAPHIC
   XG   -1.1680142+05   YG   -1.6570557+05   ZG   -2.6679564+04  DXG   -6.9054072+04  DYG    4.5257962+04  DZG    3.6231795+03
  ALT    2.0103782+05  LAT   -7.4978299+00  LON   2.3482101+02  VE    8.2643063+04  PTE   1.5918366+00  AZE   -8.7254839+01

EARTH-MOON PLANE
  XMP    9.1655081+02   YMP   -3.7546182+02   ZMP   1.0744158+02 DXMP   -2.0408548+03 DYMP   -4.9443477+03 DZMP    1.3172574+02
  RMP    9.9628341+02 DEMP    6.1900534+00 RAMP   -2.2276287+01  VMP   5.3506088+03 PTMP   2.1040172-04  AZMP   -8.8581031+01
  XME   -2.0448119+05  YME   -3.7546100+02  ZME   1.0744146+02 DXME   -2.2804835+03 DYME   -8.3154947+03 DZME    1.3172569+02

PLANETARY COORDINATES
   XM    1.9817235+05   YM   -4.6726239+04   ZM   -2.7066739+04  DXM    1.1170974+03  DYM    2.8084722+03  DZM    1.5121607+03
   RM    2.0539774+05  DEM   -7.5723018+00  RAM   -1.3267213+01  LOM    2.3474093+02  VM    3.3796528+03 ARGM   -1.6054185+01
 XSUN    4.6112216+06 YSUN   -7.2762723+07 ZSUN   -3.1552733+07  RAS   -8.6373819+01  LOS    1.6163432+02  DES   -2.3401538+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -4.4805118+04   ECC    5.3696077+00   INC   2.9315715+01  RAN   3.6654779-01  APF   -3.3736659+01  RP    1.9578070+05
   VH    7.1906990+03 RNMP   -1.8111327+00  APMP   -1.6365182+01 INMP   9.0018724-01  APO   -2.8539103+05  TFP   7.1870840+01
   TA    1.8281772+01   EA    1.5363178+01   MA    6.8123150+01  SLR    1.2470468+06  PER    6.6078459+01  MTA   1.0073305+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9724379+02 ECCS    9.6301387-04  INCS   1.4637258+02 RANS   -1.7188981+02 APFS    4.4349433+01  RPS   9.9628344+02
  VHS   -2.2126539+03 RNMPS   5.4787752+01 APMPS   7.6923212+01 INMPS   1.7364913+02 APOS    9.9820413+02 TFPS   8.4373738+01
  TAS    2.1756580-01  EAS    2.1734458-01  MAS    2.1713527-01 SLRS    9.9724280+02 PERS    1.9784257+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.8127127-02   WY    5.4825139-01   WZ   -8.3265635-01  PX   -7.9005247-01  PY    4.7534966-01  PZ    3.8711726-01
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  QX    6.0804049-01   QY    6.8808656-01   QZ    3.9600966-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  16- 11
                MEAN-OF-EPOCH  1969        25  DEC. 1968,  1 HRS.,  28 MINS.,  29.450 SECS. G.M.T.

T        .8462493188556O1+002  HRS. FROM LAUNCH       3 DAYS,  12 HRS.,  37 MINS.,  29.755 SECS. G.E.T.    RAGR  .1157521225360Z5+003

          PHASE ELAPSED TIME     .2941070?+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.3329973752539845-001        .238613622092888Z5+000      .160224242028610S3+000
        RDXYZ      .9112571351545124?+000       .1283729079927759Z+000     -.1067753177533693?-002

SELENOCENTRIC
   XL   -1.1468208+02   YL    8.2176945+0?   ZL    5.5180164+02  DXL    5.2968688+03  DYL    7.4619383+02  DZL   -6.2065341+00
   RL    9.9646477+02 DECL    3.3625299+01  RAL    9.7944605+01  VL     5.3491740+03 PTHL    2.4922699-02  AZL   -9.0096153+01

SELENOGRAPHIC
   XS    4.8150452+02   YS   -8.4793019+02   ZS    2.0520680+02  DXS   -4.6262256+03  DYS   -2.7007940+03  DZS   -2.9344826+02
  ALTS   5.7971258+01 LATS    1.1884229+01 LONS   -6.0409546+01  VRS    5.3649197+03  PTR    2.4850369-02  AZR   -9.3209492+01
  LTS   -1.5148057+00  LNS    1.1605301+02  LTE    2.2166673+00  LNE    7.8992982+00 DSMP    5.0325450+00 RSMP    1.0826764+02
  LIP    1.6769360+02  LAN    4.4865378+01  LAP   -1.9267718+02  DR     2.3268769+00  VT     5.3649191+03 SOLSV   -7.9053171+01

GEOCENTRIC
    X    1.9822255+05    Y   -4.5489340+04    Z   -2.6290875+04  DX     6.4059780+03  DY     3.5565007+03  DZ    1.5070232+03
    R    2.0506725+05  DEC   -7.3659425+00   RA   -1.2924526+01  V      7.4803989+03  PTH    4.4146272+01  AZ    6.5884802+01

GEOGRAPHIC
   XG   -1.2709398+05   YG   -1.5877180+05   ZG   -2.6290874+04  DXG   -6.9928167+04  DYG    4.8997491+04  DZG   1.5070091+03
  ALT    2.0162351+05  LAT   -7.3667615+00  LON    2.3132335+02  VE     8.5398912+04  PTF    3.4976688+00  AZE   -8.8525669+01

EARTH-MOON PLANE
  XMP    3.6806992+02  YMP   -9.2134239+02  ZMP    9.2708190+01 DXMP   -4.9465053+03 DYMP   -2.0108095+03 DZMP   -3.1998934+02
  RMP    9.9646477+02 DEMP    5.3383533+00 RAMP   -6.8223631+01  VMP    5.3491740+03 PTMP    2.4922657-02 AZMP   -9.3446791+01
  XME   -2.0506516+05  YME   -9.2134208+02  ZME    9.2707887+01 DXME   -5.1860620+03 DYME   -5.3813323+03 DZMF   -3.1998929+02

PLANETARY COORDINATES
   XM    1.9833723+05   YM   -4.6310110+04   ZM   -2.6842676+04  DXM    1.1091092+03  DYM    2.8103068+03  DZM   1.5132297+03
   RM    2.0543323+05  DEM   -7.5079495+00  RAM   -1.3142630+01  LOM    2.3110525+02  VM     3.3790252+03 ARGM   -1.5914886+01
 XSUN    4.6259122+06 YSUN   -7.2761898+07 ZSUN   -3.1552376+07  RAS   -8.6362256+01  LOS    1.5788562+02  DES   -2.3401271+01

GEOCENTRIC   OSCULATING ELEMENTS
   SMA   -6.9441643+04   ECC    2.9208499+00   INC    2.5150627+01  RAN    3.0574252+00  APF   -7.5499112+01  RP    1.3338697+05
    VH    5.7759700+03 RNMP   -1.7931203+02 APMP    1.2162701+02 INMP    3.4429508+00  APO   -2.7227025+05  TFP   4.7166385+01
    TA    5.7941671+01   EA    4.6853171+01   MA    1.0576816+02  SLR    5.2299028+05  PER    1.2749655+02  MTA   1.1002109+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.9707136+02 ECCS    7.4786779-04 INCS    1.4637458+02 RANS   -1.7188129+02 APFS    5.4554708+01  RPS   9.9632569+02
  VHS    -2.2134005+03 RNMPS   5.4694653+01 APMPS   8.7165231+01 INMPS   1.7364831+02 APOS    9.9781702+02 TFPS  8.4429665+01
  TAS     3.5592306+01  EAS    3.5565333+01  MAS    3.5540410+01 SLRS    9.9707075+02 PERS    1.9779126+00 MTAS  3.5999999+02

SELENOCENTRIC UNIT VECTORS
   AX   -7.8204643-02   WY    5.4821107-01   WZ   -8.3267562-01  PX    -6.6991350-01  PY    5.8965709-01  PZ    4.5113231-01
   WX    7.3830881-01   QY    5.9310127-01   QZ    3.2114007-01  SXO    0.0000000     SYO    0.0000000     SZO   0.0000000

****** CSM   / MOON  REF.  /PHASE  16- 12
                MEAN-OF-EPOCH  1969        25  DEC. 1968,  1 HRS.,  43 MINS.,  29.450 SECS. G.M.T.

T        .3487493185556O1+002  HRS. FROM LAUNCH       3 DAYS,  12 HRS.,  52 MINS.,  29.755 SECS. G.E.T.    RAGR  .1195123892806Z7+003

          PHASE ELAPSED TIME     .2950070?+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      .1612528307588206?4+000      .1959578637855885?+000      .1119812140435761S+000
        RDXYZ      .7139333950809581S+000     -.4513436731502628?+000     -.3642618386619165S+000

SELENOCENTRIC
   XL    6.2422270+02   YL    6.7486586+02   ZL    3.8565586+02  DXL    4.1498841+03  DYL   -2.6235276+03  DZL   -2.1173465+03
   RL    9.9690939+02 DECL    2.2758728+01  RAL    4.7232463+01  VL     5.3467365+03 PTHL    3.6070127-02  AZL   -1.1544897+02

SELENOGRAPHIC
   XS   -2.7853625+02   YS   -9.5146635+02   ZS    1.0467877+02  DXS   -5.0870534+03  DYS    1.3765889+03  DZS   -9.9155843+02
  ALTS    5.8415870+01 LATS    6.0273562+00 LONS   -1.0631709+02  VRS    5.3624897+03  PTR    3.5964626-02  AZR   -1.0071947+02
  LTS   -1.5149126+00  LNS    1.1592624+02  LTE    2.2016810+00  LNE    7.9005592+00 DSMP    5.0326084+00 RSMP    1.0813895+02
  LIP    1.6769169+02  LAN    4.4740599+01  LAP   -2.0313812+02  DR     3.3660407+00  VT     5.3624887+03 SOLSV   -4.7622713+01

GEOCENTRIC
    X    1.9912514+05    Y   -4.5219845+04    Z   -2.6232801+04  DX     5.2510027+03  DY     1.8859636+02  DZ   -6.0305740+02
    R    2.0547308+05  DEC   -7.3206565+00   RA   -1.2794178+01  V      5.2888823+03  PTH    7.5237931+01  AZ    8.7915490+01

GEOGRAPHIC
   XG   -1.3744304+05   YG   -1.5101316+05   ZG   -2.6232801+04  DXG   -6.9333055+04  DYG    5.6235344+04  DZG   -6.0341530+02
  ALT    2.0242033+05  LAT   -7.3214673+00  LON    2.2769343+02  VE     8.9274022+04  PTF    3.2841443+00  AZE   -8.9967947+01

EARTH-MOON PLANE
  XMP   -4.0235342+02  YMP   -9.1183352+02  ZMP    2.2347118+01 DXMP   -4.8694506+03 DYMP    2.1308036+03 DZMP   -5.7941157+02
  RMP    9.9690939+02 DEMP    1.2944725+00 RAMP   -1.1380955+02  VMP    5.3467365+03 PTMP    3.6070485-02 AZMP   -9.6223588+01
  XME   -2.0547106+05  YME   -9.1183253+02  ZME    2.2347466+01 DXME   -5.1089334+03 DYME   -1.2390958+03 DZME   -5.7941157+02

PLANETARY COORDINATES
   XM    1.9850092+05   YM   -4.5893712+04   ZM   -2.6618458+04  DXM    1.1011185+03  DYM    2.8121239+03  DZM   1.5142892+03
   RM    2.0546871+05  DEM   -7.4435855+00  RAM   -1.3018130+01  LOM    2.2746947+02  VM     3.3783982+03 ARGM   -1.5775637+01
 XSUN    4.6406023+06 YSUN   -7.2761072+07 ZSUN   -3.1552017+07  RAS   -8.6350694+01  LOS    1.5413691+02  DES   -2.3401002+01

GEOCENTRIC   OSCULATING ELEMENTS
   SMA   -4.2438474+05   ECC    1.0384580+00   INC    7.6100921+00  RAN    6.1263966+01  APF    1.4195091+02  RP    1.6299466+04
    VH    2.3379853+03 RNMP   -1.7973318+02 APMP    3.6127966+01 INMP    2.5490296+01  APO   -8.6394894+05  TFP   3.4429769+01
    TA    1.4365758+02   EA    5.1434327+01   MA    9.4465689+00  SLR    3.3225781+04  PER    1.9224184+03  MTA   1.6435821+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.9705169+02 ECCS    6.4551567-04 INCS    1.4637349+02 RANS   -1.7187566+02 APFS    5.8424456+01  RPS   9.9640808+02
  VHS    -2.2141513+03 RNMPS   5.4574338+01 APMPS   9.1047071+01 INMPS   1.7364575+02 APOS    9.9769529+02 TFPS  8.4450841+01
  TAS     7.7267276+01  EAS    7.7227146+01  MAS    7.7191076+01 SLRS    9.9705123+02 PERS    1.9778541+00 MTAS  3.5999999+02

SELENOCENTRIC UNIT VECTORS
   AX   -7.8260720-02   WY    5.4821902-01   WZ   -8.3266512-01  PX    -6.1861922-01  PY    6.2827060-01  PZ    4.7179048-01
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   QX    7.8178352-01   QY    5.5202530-01   QZ    2.8996991-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  16- 13
                    MEAN-OF-EPOCH  1969        25  DEC. 1968,  1 HRS.,  58 MINS.,  29.450 SECS. G.M.T.

T        .851249318855601+002  HRS. FROM LAUNCH       3 DAYS,  13 HRS.,   7 MINS.,  29.755 SECS. G.E.T.     RAGR  .123272656025209+003

          PHASE ELAPSED TIME      .29590709+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .28733493943576375+000       .35981700444993104-001      -.33164351490143745-002
        RDXYZ       .89752660855148702-001       -.76043443952816887+000     -.50908773819341414+000

SELENOCENTRIC
   XL    9.8956243+02   YL    1.2391858+02   ZL   -1.1421582+01  DXL    5.2170572+02  DYL   -4.4201809+03  DZL   -2.9591767+03
   RL    9.9735653+02 DECL   -6.5615728-01   RAL   7.1377450+00  VL     5.3448015+03  PTHL   2.4896311-02  AZL   -1.2362029+02

SELENOGRAPHIC
   XS   -8.7109344+02   YS   -4.8216942+02   ZS   -5.8556992+01  DXS   -2.4867431+03  DYS    4.6208073+03  DZS   -1.0953879+03
 ALTS    5.8863009+01 LATS   -3.3658967+00 LONS   -1.5103450+02  VRS    5.3605621+03  PTR    2.4822433-02  AZP   -1.0181016+02
  LTS   -1.5150191+00  LNS    1.1579948+02  LTE    2.1866867+00  LNE    7.9017676+00  DSMP   5.0326711+00  RSMP   1.0801032+02
  LIN    1.6769217+02  LAN    4.4603989+01  LAP   -2.8097775+02  DR     2.3223732+00  VT     5.3605615+03  SOLSV  -3.0703694+00

GEOCENTRIC
    X    1.9965298+05   Y   -4.5353124+04   Z   -2.6405503+04  DX     1.6148312+03  DY    -1.6062574+03  DZ    -1.4438376+03
    R    2.0643515+05  DEC  -7.3489428+00   RA  -1.2798110+01  V      2.6967405+03  PTH    5.1121370+01  AZ    -1.3443509+02

GEOGRAPHIC
   XG   -1.4745274+05   YG   -1.4204192+05  ZG   -2.6405502+04  DXG   -6.5164427+04  DYG    6.4864092+04  DZG   -1.4438888+03
  ALT    2.0299140+05  LAT   -7.3497546+00  LON   2.2392923+02  VE     9.1955631+04  PTE    1.3081894+00  AZE   -9.0738587+01

EARTH-MOON PLANE
  XMP   -9.3066660+02  YMP   -3.5327987+02  ZMP  -6.1425327+01  DXMP  -1.8625673+03  DYMP   4.9855892+03  DZMP  -4.9157722+02
  RMP    9.9735652+02 DEMP   -3.5309747+00 RAMP   -1.5921330+02  VMP    5.3448016+03  PTMP   2.4894843-02  AZMP  -9.5285645+01
  XME   -2.0643484+05  YME   -3.5328058+02  ZME  -6.1425090+01  DXME  -2.1019743+03  DYME   1.6163123+03  DZME  -4.9157719+02

PLANETARY COORDINATES
   XM    1.9866342+05   YM   -4.5477043+04   ZM   -2.6394081+04  DXM    1.0931254+03  DYM    2.8139236+03  DZM    1.5153391+03
   RM    2.0550417+05  DEM   -7.3792093+00  RAM   -1.2893708+01  LOM    2.2383364+02  VM     3.3777716+03  ARGM   -1.5636440+01
 XSUN    4.6552922+06 YSUN   -7.2760243+07 ZSUN   -3.1551656+07  RAS   -8.6339132+01  LOS    1.5038820+02  DES    -2.3400733+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.5269161+05  ECC    8.0921856-01  INC    1.3508689+02  RAN    1.7463467+02  APF    3.3473067+01  RP     2.9130726+04
   VH   -2.0408562+03 RNMP   -1.7984569+02 APMP   -3.3690605+02 INMP   1.6313927+02  APO    2.7625249+05  TFP   -3.6507458-01
   TA    1.5696482+02   EA    1.1578249+02  MA    7.4033216+01  SLR    5.2703848+04  PER    4.1571072+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9722414+02 ECCS   4.5435701-04 INCS    1.4637405+02 RANS   -1.7187554+02 APFS   7.4168447+01  RPS    9.9677105+02
  VHS   -2.2143912+03 RNMPS  5.4438940+01 APMPS  -2.5320961+02 INMPS  1.7364623+02 APOS   9.9767721+02 TFPS   8.4537099+01
  TAS    1.0702490+02  EAS   1.0699161+02  MAS    1.0696671+02 SLRS   9.9722386+02 PERS   1.9783672+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.8260759-02   WY    5.4821068-01   WZ   -8.3267060-01  PX    -3.8328455-01  PY    7.5449087-01  PZ    5.3276300-01
   QX    9.2030872-01   QY    3.6084421-01   QZ    1.5107366-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  16- 14
                    MEAN-OF-EPOCH  1969        25  DEC. 1968,  2 HRS.,  13 MINS.,  29.450 SECS. G.M.T.

T        .853749318855601+002  HRS. FROM LAUNCH       3 DAYS,  13 HRS.,  22 MINS.,  29.755 SECS. G.E.T.     RAGR  .127032922769A01+003

          PHASE ELAPSED TIME      .29680709+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .22160165298306577+000       -.14554151001094126+000     -.11664054052913048+000
        RDXYZ       -.58764805125627385+000      -.61467123117791650+000     -.34938136579514523+000

SELENOCENTRIC
   XL    7.8318137+02   YL   -5.0123528+02   ZL   -4.0170226+02  DXL   -3.4158247+03  DYL   -3.5729025+03  DZL   -2.0308507+03
   RL    9.9752057+02 DECL   -2.3747122+01   RAL  -3.3295741+01  VL     5.3439540+03  PTHL  -2.4892168-03  AZL   -1.1453187+02

SELENOGRAPHIC
   XS   -9.3987339+02   YS    2.7713226+02   ZS   -1.8676988+02  DXS    1.6074034+03  DYS    5.0839926+03  DZS   -5.4390839+02
 ALTS    5.9027049+01 LATS   -1.0791413+01 LONS    1.6357125+02  VRS    5.3597166+03  PTR   -2.4818963-03  AZP   -9.5930155+01
  LTS   -1.5151259+00  LNS    1.1567272+02  LTE    2.1716846+00  LNE    7.9029241+00  DSMP   5.0327332+00  RSMP   1.0788173+02
  LIN    1.6769511+02  LAN    4.4478689+01  LAP    3.3853821+02  DR    -2.3216826-01  VT     5.3597166+03  SOLSV  4.1552749+01

GEOCENTRIC
    X    1.9958793+05   Y   -4.5561344+04   Z   -2.6571252+04  DX    -2.3306948+03  DY    -7.5719672+02  DZ    -5.1447111+02
    R    2.0643935+05  DEC  -7.3951785+00   RA  -1.2858970+01  V      2.5040298+03  PTH   -5.3775094+01  AZ    -1.2185433+02

GEOGRAPHIC
   XG   -1.5657772+05   YG   -1.3188855+05  ZG   -2.6571252+04  DXG   -5.7637584+04  DYG    7.1692640+04  DZG   -5.1437863+02
  ALT    2.0299561+05  LAT   -7.3959953+00  LON   2.2010811+02  VE     9.1990168+04  PTE   -1.2582508+00  AZE   -9.0486535+01

EARTH-MOON PLANE
  XMP   -8.9927878+02  YMP    4.1783365+02  ZMP  -1.0844375+02  DXMP   2.2623795+03  DYMP   4.8401941+03  DZMP  -1.0957266+02
  RMP    9.9752057+02 DEMP   -6.2411483+00 RAMP   1.5507891+02  VMP    5.3439540+03  PTMP  -2.4885061-03  AZMP  -9.1182131+01
  XME   -2.0643891+05  YME    4.1783375+02  ZME  -1.0844402+02  DXME   2.0230501+03  DYME   1.4715393+03  DZME  -1.0957268+02

PLANETARY COORDINATES
   XM    1.9882475+05   YM   -4.5060109+04   ZM   -2.6169550+04  DXM    1.0851298+03  DYM    2.8157058+03  DZM    1.5163796+03
   RM    2.0553963+05  DEM   -7.3148216+00  RAM   -1.2769368+01  LOM    2.2019771+02  VM     3.3771456+03  ARGM   -1.5497291+01
 XSUN    4.6699823+06 YSUN   -7.2759411+07 ZSUN   -3.1551295+07  RAS   -8.6327568+01  LOS    1.4663950+02  DES    -2.3400462+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4323430+05  ECC    8.4780443-01  INC    1.4738670+02  RAN    1.7884446+02  APF   -4.4946884+00  RP     2.1799626+04
   VH   -2.2335185+03 RNMP   -1.7971452+02 APMP   -1.7908614+01 INMP   1.7571222+02  APO    2.6466897+05  TFP    1.6918879+02
   TA   -1.6168882+02   EA   -1.2136486+02  MA   -7.9887590+01  SLR    4.0281443+04  PER    3.7769306+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9723594+02 ECCS   2.8872673-04 INCS    1.4637762+02 RANS   -1.7187233+02 APFS   3.8006038+01  RPS    9.9694800+02
  VHS   -2.2146171+03 RNMPS  5.4331169+01 APMPS  7.0665872+01 INMPS  1.7364831+02 APOS   9.9752386+02 TFPS   8.6316559+01
  TAS   -1.7134915+02  EAS   -1.7134566+02  MAS  -1.7134317+02 SLRS   9.9723583+02 PERS   1.9784023+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.8284022-02   WY    5.4815497-01   WZ   -8.3270509-01  PX    -8.5252118-01  PY    3.9618433-01  PZ    3.4094808-01
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  QX    5.1679708-01   QY    7.3658950-01   QZ    4.3629882-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  16- 15
                    MEAN-OF-EPOCH  1969        25  DEC.  1968,  2 HRS.,  28 MINS.,  29.450 SECS. G.M.T.

T        .8562493188556O1+002  HRS. FROM LAUNCH       3 DAYS,  13 HRS.,  37 MINS.,  29.755 SECS. G.E.T.     RAGR  .130793189514393+003

          PHASE ELAPSED TIME      .2977070?+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .2342075154756463B-001      -.2400752435018406?+000      -.1602270157895456?+000
        RDXYZ      -.9136688910782372?+000     -.1014261401320292?+000       .1921847024761224O-001

SELENOCENTRIC
   XL    8.0659511+01   YL   -8.2680318+01   ZL   -5.5181120+02  DXL   -5.3108876+03  DYL   -5.8956022+02  DZL    1.1171129+02
   RL    9.4729887+02 DECL   -3.3594096+01  RAL   -8.4428089+01   VL    5.3446784+03 PTHL   -2.7591864-02  AZL   -8.8584096+01

SELENOGRAPHIC
   XS   -4.4386638+02   YS    8.6974037+02   ZS   -2.0328292+02  DXS    4.7351887+03  DYS    2.4902813+03  DZS    3.3283132+02
  ALTS    5.8805352+01 LATS   -1.1761222+01 LONS    1.1702633+02  VRS    5.3604375+03  PTR   -2.7510735-02  AZR   -8.6369491+01
   LTS   -1.5152324+00  LNS    1.1554594+02   LTE    2.1566749+00  LNE    7.9040281+00 OSMP    5.0327954+00 RSMP    1.0775320+02
   LIN    1.6769560+02  LAN    4.4364753+01   LAP    2.3604550+02   DR   -2.5738293+00   VT    5.3604368+03 SOLSV    7.9649322+01

GEOCENTRIC
     X    1.9906554+05    Y   -4.5460718+04    Z   -2.6496679+04  DX   -4.2337556+03  DY    2.2279102+03  DZ    1.6291220+03
     R    2.0498449+05  DEC   -7.3935705+00   RA   -1.2866527+01   V    5.0539399+03 PTH   -7.1571376+01  AZ    5.0297271+01

GEOGRAPHIC
   XG   -1.6447949+05   YG   -1.2100034+05   ZG   -2.6496679+04  DXG   -4.9159770+04  DYG    7.4626834+04  DZG    1.6290914+03
  ALT    2.4286075+05  LAT   -7.3943892+00  LON    2.1634028+02   VE    8.9378418+04  PTE   -3.0751559+00  AZE   -8.9344847+01

EARTH-MOON PLANE
  XMP   -3.2726534+02   YMP    9.3770900+02   ZMP   -9.0577357+01 DXMP    5.0267039+03 DYMP    1.7842590+03 DZMP    3.3801760+02
  RMP    9.9729885+02 DEMP   -5.2109371+00 RAMP    1.0923925+02  VMP    5.3446785+03 PTMP   -2.7592390-02 AZMP   -8.6361434+01
  XME   -2.0540234+05   YME    9.3770953+02   ZME   -9.0577549+01 DXME    4.7874536+03 DYME   -1.5837742+03 DZME    3.3801760+02

PLANETARY COORDINATES
   XM    1.9898488+05   YM   -4.4642915+04   ZM   -2.5944867+04  DXM    1.0771320+03  DYM    2.8174705+03  DZM    1.5174107+03
   RM    2.0557507+05  DEM   -7.2504230+00  RAM   -1.2645110+01  LOM    2.1656170+02   VM    3.3765201+03 ARGM   -1.5358194+01
 XSUN    4.6846720+06 YSUN   -7.2758577+07 ZSUN   -3.1550933+07  RAS   -8.6316007+01  LOS    1.4289080+02  DES   -2.3400191+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -7.2216232+05   ECC    1.0301891+00   INC    4.0273065+01  RAN   -4.0565792+00  APF    1.2714931+02   RP    2.3008932+04
   VH    1.7434567+03 RNMP   -1.4373244-01  APMP    1.3851165+02 INMP    1.2136988+01  APO   -1.5473336+06  TFP    1.3950556+02
    TA   -1.3853183+02    EA   -3.8385323+01    MA   -4.1840370+00   SLR    4.6712607+04  PER    4.6359597+03  MTA    1.6609501+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.9706293+02 ECCS    5.3657323-04  INCS    1.4637943+02 RANS   -1.7186378+02 APFS    2.8333313+01  RPS    9.9652793+02
   VHS   -2.2147328+05 RNMPS   5.4237466+01 APMPS   6.1034314+01 INMPS   1.7364732+02 APOS    9.9750792+02 TFPS    8.6263032+01
   TAS   -1.1620176+02   EAS   -1.1616993+02   MAS   -1.1614233+02 SLRS    9.9706259+02 PERS    1.9778975+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.8362153-02   WY    5.4811716-01   WZ   -8.3272262-01  PX   -9.2727470-01  PY    2.6665985-01  PZ    2.6278148-01
   UX    3.0608872-01   QY    7.9275472-01   QZ    4.8735913-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  16- 16
                    MEAN-OF-EPOCH  1969        25  DEC.  1968,  2 HRS.,  43 MINS.,  29.450 SECS. G.M.T.

T        .8587493186556O1+002  HRS. FROM LAUNCH       3 DAYS,  13 HRS.,  52 MINS.,  29.755 SECS. G.E.T.     RAGR  .134553456258985+003

          PHASE ELAPSED TIME      .2986070?+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       -.1387311991826645+000      -.1910506386671152?+000      -.1079850743?6152031+000
        RDXYZ      -.8933517356552946?+000       .4729268702117903?+000       .3765923201015304?+000

SELENOCENTRIC
   XL    6.4997771+02   YL   -6.5796570+02   ZL   -3.7189341+02  DXL   -4.0302493+03  DYL    2.7489843+03  DZL    2.1890200+03
   RL    9.9684230+02 DECL   -2.1905167+01  RAL   -1.3465008+02   VL    5.3471144+03 PTHL   -3.4905847-02  AZL   -6.3832622+01

SELENOGRAPHIC
   XS    3.1933502+02   YS    9.3919028+02   ZS   -9.8185411+01  DXS    5.0166742+03  DYS   -1.6034976+03  DZS    1.0109981+03
  ALTS    5.8348703+01 LATS   -5.6525951+00 LONS    7.1221318+01  VRS    5.3628668+03  PTR   -3.4803430-02  AZR   -7.9083434+01
   LTS   -1.5153205+00  LNS    1.1541919+02   LTE    2.1416573+00  LNE    7.9050796+00 OSMP    5.0328562+00 RSMP    1.0762471+02
   LIN    1.6769371+02  LAN    4.4239113+01   LAP    9.0183868+01   DR   -3.2575898+00   VT    5.3628659+03 SOLSV    4.5709249+01

GEOCENTRIC
     X    1.9844386+05    Y   -4.4803424+04    Z   -2.6091924+04  DX   -2.9611176+03  DY    5.5682021+03  DZ    3.7074523+03
     R    2.0517096+05  DEC   -7.3061816+00   RA   -1.2741444+01   V    7.3156198+03 PTH   -3.8502590+01  AZ    5.6571911+01

GEOGRAPHIC
   XG   -1.7124196+05   YG   -1.0995691+05   ZG   -2.6091924+04  DXG   -4.2674090+04  DYG    7.4077003+04  DZG    3.7074434+03
  ALT    2.0172721+05  LAT   -7.3069936+00  LON    2.1270510+02   VE    8.5570008+04  PTE   -3.0509562+00  AZE   -8.7884796+01

EARTH-MOON PLANE
  XMP    4.4145004+02   YMP    8.9355389+02   ZMP   -1.8494979+01 DXMP    4.7686089+03 DYMP   -2.3476484+03 DZMP    5.8356611+02
  RMP    9.9683431+02 DEMP   -1.0631020+00 RAMP    6.3706761+01  VMP    5.3471144+03 PTMP   -3.4905966-02 AZMP   -8.3734015+01
  XME   -2.0516901+05   YME    8.9355367+02   ZME   -1.8494815+01 DXME    4.5294397+03 DYME   -5.7150610+03 DZME    5.8356608+02

PLANETARY COORDINATES
   XM    1.9914384+05   YM   -4.4225459+04   ZM   -2.5720031+04  DXM    1.0691317+03  DYM    2.8192177+03  DZM    1.5184323+03
   RM    2.0561051+05  DEM   -7.1860130+00  RAM   -1.2520930+01  LOM    2.1292561+02   VM    3.3758952+03 ARGM   -1.5219146+01
 XSUN    4.6993614+06 YSUN   -7.2757741+07 ZSUN   -3.1550570+07  RAS   -8.6304445+01  LOS    1.3914210+02  DES   -2.3399919+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -7.4888867+04   ECC    2.9420752+00   INC    3.4126417+01  RAN   -1.8364367+00  APF    3.7410018+01   RP    1.4918425+05
   VH    5.5619398+03 RNMP   -1.9909213-01  APMP    5.0460944+01 INMP    5.8463009+00  APO   -2.9896199+05  TFP    1.2110850+02
    TA   -5.0511648+01    EA   -3.9703643+01    MA   -8.8831051+01   SLR    5.9555475+05  PER    1.4278886+02  MTA    1.0952488+02

SELENOCENTRIC OSCULATING ELEMENTS
   SMAS    9.9705848+02 ECCS    6.4664973-04  INCS    1.4637832+02 RANS   -1.7185847+02 APFS    2.8087161+01  RPS    9.9641374+02
   VHS   -2.2140278+03 RNMPS   5.4115756+01 APMPS   6.0800324+01 INMPS   1.7364483+02 APOS    9.9770321+02 TFPS    8.6261584+01
   TAS   -7.0449521+01   EAS   -7.0411026+01   MAS   -7.0376119+01 SLRS    9.9705801+02 PERS    1.9778743+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.8415189-02   WY    5.4812606-01   WZ   -8.3271176-01  PX   -9.2886253-01  PY    2.6316059-01  PZ    2.6069298-01
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QX 3.6202954-01 QY 7.9391704-01 QZ 4.8849797-01 SXO 0.0000000 SYO 0.0000000 SZO 0.0000000

****** CSM / MOON REF. /PHASE 16- 17
MEAN-OF-EPOCH 1969 25 DEC. 1968, 2 HRS., 57 MINS., 33.200 SECS. G.M.T.

T .861093068855601+002 HRS. FROM LAUNCH 3 DAYS, 14 HRS., 6 MINS., 33.505 SECS. G.E.T. RAGR .138078706332040+003

PHASE ELAPSED TIME .2994508+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ -.28661480027900132+000 -.39563811484901132-001 .94761930650882353-003
RDXYZ -.10277091426772210+000 .75946942368055635+000 .50958160242901568+000

SELENOCENTRIC											
XL	-9.8708232+02	YL	-1.3625513+02	ZL	3.2635379+00	DXL	-5.9737699+02	DYL	4.4145716+03	DZL	2.9620475+03
RL	9.9644748+02	DECL	1.8765392-01	RAL	-1.7214066+02	VL	5.3496753+03	PTHL	-2.3442513-02	AZL	-5.6379352+01
SELENOGRAPHIC											
XS	8.6787047+02	YS	4.8643441+02	ZS	5.5587528+01	DXS	2.5118331+03	DYS	-4.6117007+03	DZS	1.1003008+03
ALTS	5.7953951+01	LATS	3.1979459+00	LONS	2.9270278+01	VRS	5.3654217+03	PTR	-2.3374756-02	AZR	-7.8146192+01
LTS	-1.5154401+00	LNS	1.1530036+02	LTE	2.1275716+00	LNE	7.9060183+00	DSMP	5.0329126+00	RSMP	1.0750430+02
LIN	1.6769421+02	LAN	4.4110895+01	LAP	-1.4627071+02	DR	-2.1889120+00	VT	5.3654213+03	SOLSV	3.8776123+00
GEOCENTRIC											
X	1.9830470+05	Y	-4.3970115+04	Z	-2.5505847+04	DX	4.6425252+02	DY	7.2354117+03	DZ	4.4814289+03
R	2.0471608+05	DEC	-7.1571557+00	RA	-1.2501933+01	V	8.5234921+03	PTH	-1.1248953+01	AZ	5.8982008+01
GEOGRAPHIC											
XG	-1.7692807+05	YG	-9.9772634+04	ZG	-2.5505847+04	DXG	-3.9718380+04	DYG	7.2699044+04	DZG	4.4814225+03
ALT	2.0127232+05	LAT	-7.1579534+00	LON	2.0941935+02	VE	8.2962548+04	PTE	-1.1484146+00	AZE	-8.7022994+01
EARTH-MOON PLANE											
XMP	9.2795473+02	YMP	3.5803551+02	ZMP	6.0151579+01	DXMP	1.8873382+03	DYMP	-4.9810442+03	DZMP	4.9616624+02
RMP	9.9644749+02	DEMP	3.4608228+00	RAMP	2.1098256+01	VMP	5.3496754+03	PTMP	-2.3443563-02	AZMP	-8.4667172+01
XME	-2.0471576+05	YME	3.5803474+02	ZME	6.0151157+01	DXME	1.6482467+03	DYME	-8.3478753+03	DZME	4.9616620+02
PLANETARY COORDINATES											
XM	1.9929178+05	YM	-4.3833860+04	ZM	-2.5509110+04	DXM	1.0616295+03	DYM	2.8208400+03	DZM	1.5193814+03
RM	2.0564371+05	DEM	-7.1256193+00	RAM	-1.2404584+01	LOM	2.0951670+02	VM	3.3753096+03	ARGM	-1.5088835+01
XSUN	4.7131328+08	YSUN	-7.2756954+07	ZSUN	-3.1550229+07	RAS	-8.6293606+01	LOS	1.3562768+02	DES	-2.3399663+01
GEOCENTRIC OSCULATING ELEMENTS											
SMA	-4.6318610+04	ECC	5.3191958+00	INC	3.1752649+01	RAN	-7.9548754-01	APF	-3.4424756-01	RP	2.0005915+05
VH	7.0722429+03	RNMP	-3.8307426-01	APMP	1.3634019+01	INMP	3.4059957+00	APO	-2.9269636+05	TFP	9.5449585+01
TA	-1.3350650+01	EA	-1.1122569+01	MA	-4.8412842+01	SLR	1.2642129+06	PER	6.9454715+01	MTA	1.0083599+02
SELENOCENTRIC OSCULATING ELEMENTS											
SMAS	9.9722393+02	ECCS	8.7954351-04	INCS	1.4637888+02	RANS	-1.7185844+02	APFS	2.8084414+01	RPS	9.9634682+02
VHS	-2.2129646+03	RNMPS	5.3988866+01	APMPS	6.0799216+01	INMPS	1.7364533+02	APOS	9.9810103+02	TFPS	8.6261523+01
TAS	-2.7747360+01	EAS	-2.7722052+01	MAS	-2.7698609+01	SLRS	9.9722309+02	PERS	1.9783666+00	MTAS	3.5999999+02
SELENOCENTRIC UNIT VECTORS											
WX	-7.8414400-02	WY	5.4811779-01	WZ	-8.3271730-01	PX	-9.2888045-01	PY	2.6312445-01	PZ	2.6066565-01
QX	3.6198376-01	QY	7.9393476-01	QZ	4.8850315-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / MOON REF. /PHASE 16- 18
MEAN-OF-EPOCH 1969 25 DEC. 1968, 3 HRS., 12 MINS., 33.200 SECS. G.M.T.

T .863593068855601+002 HRS. FROM LAUNCH 3 DAYS, 14 HRS., 21 MINS., 33.505 SECS. G.E.T. RAGR .141838973076632+003

PHASE ELAPSED TIME .3003508+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ -.22374840238027289+000 .14278515019777795+000 .11504659554000171+000
RDXYZ .57897074467108499+000 .62160631883307589+000 .35456740186699799+000

SELENOCENTRIC											
XL	-7.7057462+02	YL	4.9174257+02	ZL	3.9621282+02	DYL	3.3653861+03	DYL	3.6132140+03	DZL	2.0609956+03
RL	9.9628339+02	DECL	2.3433904+01	RAL	1.4745600+02	VL	5.3505927+03	PTHL	8.9202577-04	AZL	-6.5177397+01
SELENOGRAPHIC											
XS	9.4002978+02	YS	-2.7315265+02	ZS	1.8523555+02	DXS	-1.5901505+03	DYS	-5.0949781+03	DZS	5.5693939+02
ALTS	5.7789859+01	LATS	1.0715158+01	LONS	-1.6202740+01	VRS	5.3663359+03	PTR	8.8848478-04	AZR	-8.3936958+01
LTS	-1.5155466+00	LNS	1.1517360+02	LTE	2.1125396+00	LNE	7.9069697+00	DSMP	5.0329729+00	RSMP	1.0737591+02
LIN	1.6769715+02	LAN	4.3985305+01	LAP	1.3465173+02	DR	8.3215689-02	VT	5.3663359+03	SOLSV	-4.0856500+01
GEOCENTRIC											
X	1.9867786+05	Y	-4.2924164+04	Z	-2.4887770+04	DX	4.4190110+03	DY	6.4357677+03	DZ	3.5813803+03
R	2.0477983+05	DEC	-6.9806589+00	RA	-1.2191318+01	V	8.5891238+03	PTH	1.6943143+01	AZ	6.1546621+01
GEOGRAPHIC											
XG	-1.8273761+05	YG	-8.9007532+04	ZG	-2.4887770+04	DXG	-3.8935295+04	DYG	7.3176204+04	DZG	3.5813820+03
ALT	2.0133606+05	LAT	-6.9814371+00	LON	2.0596971+02	VE	8.2967106+04	PTE	1.7288027+00	AZE	-8.7294376+01
EARTH-MOON PLANE											
XMP	8.9973738+02	YMP	-4.1397058+02	ZMP	1.0808145+02	DXMP	-2.2473834+03	DYMP	-4.8543329+03	DZMP	1.1645710+02
RMP	9.9628337+02	DEMP	6.2279695+00	RAMP	-2.4707232+01	VMP	5.3505927+03	PTMP	8.9165943-04	AZMP	-8.8745531+01
XME	-2.0477939+05	YME	-4.1397151+02	ZME	1.0808151+02	DXME	-2.4863904+03	DYME	-8.2205444+03	DZME	1.1645710+02
PLANETARY COORDINATES											
XM	1.9944844+05	YM	-4.3415907+04	ZM	-2.5283983+04	DXM	1.0536249+03	DYM	2.8225536+03	DZM	1.5203847+03
RM	2.0567912+05	DEM	-7.0611893+00	RAM	-1.2280559+01	LOM	2.0588046+02	VM	3.3746857+03	ARGM	-1.4949884+01
XSUN	4.7278222+06	YSUN	-7.2756113+07	ZSUN	-3.1549863+07	RAS	-8.6282043+01	LOS	1.3187898+02	DES	-2.3399389+01
GEOCENTRIC OSCULATING ELEMENTS											
SMA	-4.5295119+04	ECC	5.2894045+00	INC	2.9227507+01	RAN	4.4942909-01	APF	-3.4514119+01	RP	1.9428909+05
VH	7.1516988+03	RNMP	-2.0409472+00	APMP	-1.7944471+01	INMP	8.0347775-01	APO	-2.8487933+05	TFP	7.2596578+01
TA	2.0101482+01	EA	1.6894270+01	MA	7.3766882+01	SLR	1.2219626+06	PER	6.7165394+01	MTA	1.0089777+02
SELENOCENTRIC OSCULATING ELEMENTS											
SMAS	9.9723771+02	ECCS	9.5707619-04	INCS	1.4638244+02	RANS	-1.7185535+02	APFS	4.4982483+01	RPS	9.9628327+02
VHS	-2.2126701+03	RNMPS	5.3880739+01	APMPS	7.7723398+01	INMPS	1.7364743+02	APOS	9.9819213+02	TFPS	8.6354189+01
TAS	9.3283130-01	EAS	9.3188057-01	MAS	9.3098873-01	SLRS	9.9723674+02	PERS	1.9784076+00	MTAS	3.5999999+02
SELENOCENTRIC UNIT VECTORS											
WX	-7.8436592-02	WY	5.4806244-01	WZ	-8.3275163-01	PX	-7.8358614-01	PY	4.8251846-01	PZ	3.9136768-01

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  QX    6.1631196-01   QY    6.8323018-01   QZ    3.9160703-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  16- 19
                MEAN-OF-EPOCH  1969          25  DEC. 1968,  3 HRS.,  27 MINS.,  33.200 SECS. G.M.T.

T        .866093068855601+002  HRS. FROM LAUNCH      3 DAYS, 14 HRS.,  36 MINS.,  33.505 SECS. G.E.T.     RAGR  .145599239821224+003

         PHASE ELAPSED TIME      .301250A4+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.267000101767857 69-001        .239507508315102 38+000        .160130A9266167217+000
        RDXYZ      .913426333066065 09+000        .111043106420143 82+000        -.130441145888330 77-001

SELENOCENTRIC
   XL    9.195306 0+01   YL    8.248479 4+00   ZL    5.514801 4+02   DXL    5.309477 7+03   DYL    6.454608 1+02   DZL   -7.582158 8+01
   RL    9.964736 8+02   DECL  3.360276 1+00   RAL   9.636100 1+01   VL     5.349104 7+03   PTHL   2.547763 8-02   AZL   -9.099205 6+01

SELENOGRAPHIC
   XS    4.452043 0+02   YS   -8.678980 2+00   ZS    2.037301 6+02   DXS   -4.732880 4+03   DYS   -2.505757 1+03   DZS   -3.203884 4+02
   ALT   5.798017 5+01   LATS  1.179736 9+01   LONS -6.284360 7+01   VRS    5.364850 3+03   PTR    2.540322 2-02   AZR   -9.350302 1+01
   LTS  -1.515653 7+00   LNS   1.150468 4+00   LTE   2.097500 6+00   LNE    7.907868 9+00   DSMP   5.033032 8+00   RSMP   1.072475 8+02
   LTE   1.676976 9+02   LAN   4.387136 1+01   LAP  -9.394215 8+00   DR     2.378613 1+00   VT     5.364850 2+03   SOLSV -7.950753 6+01

GEOCENTRIC
   X     1.995119 6+05   Y    -4.217285 5+04   Z    -2.450723 0+04   DX     6.355096 0+03   DY     3.469710 5+03   DZ     1.445557 0+03
   R     2.053878 6+05   DEC  -6.852957 8+00   RA   -1.193549 0+01   V      7.383479 5+03   PTH    4.574501 3+01   AZ     6.605146 5+01

GEOGRAPHIC
   XG   -1.084452 4+05   YG   -7.792278 7+04   ZG   -2.450723 0+04   DXG   -3.780914 1+04   DYG    7.704244 3+04   DZG    1.445599 4+03
   ALT   2.013941 0+05   LAT  -6.853719 8+00   LON   2.024652 7+02   VE     8.583215 8+04   PTE    3.532367 4+00   AZE   -8.860094 4+01

EARTH-MOON PLANE
   XMP   3.288058 6+02   YMP  -9.362385 0+00   ZMP   9.112646 7+01   DXMP  -5.026087 5+03   DYMP  -1.800110 8+03   DZMP  -3.331177 4+02
   RMP   9.964736 8+02   DEMP  5.246969 2+00   RAMP -7.064878 3+01   VMP    5.349104 8+03   PTMP   2.547786 9-02   AZMP  -9.358782 1+01
   XME  -2.053857 1+05   YME  -9.362391 5+00   ZME   9.112665 9+01   DXME  -5.265008 3+03   DYME  -5.165703 4+03   DZME  -3.331177 1+02

PLANETARY COORDINATES
   XM    1.996039 1+05   YM   -4.299770 3+04   ZM   -2.505871 0+04   DXM    1.045618 2+03   DYM    2.824249 8+03   DZM    1.521378 5+03
   RM    2.057145 1+05   DEM  -6.996749 7+00   RAM  -1.215661 2+01   LOM    2.022441 4+02   VM     3.374062 3+03   ARGM  -1.481090 3+01
   XSUN  4.742511 1+06   YSUN -7.275526 9+07   ZSUN -3.154949 6+07   RAS   -8.627048 2+01   LOS    1.281302 7+02   DES   -2.339911 5+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA  -7.249543 0+04   ECC   2.769179 9+00   INC   2.485408 0+01   RAN    3.101972 4+00   APF   -7.722737 9+01   RP     1.282574 6+05
   VH    5.853008 1+03   RNMP -1.293492 0+02   APMP  1.188747 1+02   INMP   3.733021 0+00   APO   -2.732483 1+05   TFP    4.765604 7+01
   TA    8.073483 5+01   EA    4.874182 9+01   MA    1.031126 4+02   SLR    4.834254 0+05   PER    1.359985 8+02   MTA    1.111688 5+02

SELENOCENTRIC OSCULATING ELEMENTS
   SMAS  9.870633 8+02   ECCS  7.309290 9-04   INCS  1.463843 1+02   RANS  -1.718468 2+02   APFS   5.452837 6+01   RPS    9.963256 2+02
   VMS  -2.213435 8+03   RNMPS 5.378733 7+01   APMPS 8.730616 6+01   INMPS  1.736464 8+02   APOS   9.978011 3+02   TFPS   8.640650 0+01
   TAS   3.596552 2+01   EAS   3.643875 1+01   MAS   3.691327 3+01   SLRS   9.970627 9+02   PERS   1.977888 9+00   MTAS   3.599999 9+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.851428 2-02   WY    5.480238 4-01   WZ   -8.327697 1-01   PX    -6.706179 8-01   PY     5.890570 7-01   PZ     4.508694 3-01
   UX    7.376360 8-01   QY    5.938700 2-01   QZ    3.212652 4-01   SXO    0.000000 0       SYO    0.000000 0       SZO    0.000000 0

****** CSM   / MOON  REF.  /PHASE  16- 20
                MEAN-OF-EPOCH  1969          25  DEC. 1968,  3 HRS.,  42 MINS.,  33.200 SECS. G.M.T.

T        .866853068855601+002  HRS. FROM LAUNCH      3 DAYS, 14 HRS.,  51 MINS.,  33.505 SECS. G.E.T.     RAGR  .149359506565816+003

         PHASE ELAPSED TIME      .302150A4+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      .196363830257099 72+000        .192695881973905 44+000        .109228903478529 27+000
        RDXYZ      .730494429940571 86+000        -.465495437816545 60+000       -.372428255062227 49+000

SELENOCENTRIC
   XL    6.418246 5+02   YL    6.636318 0+02   ZL    3.761770 8+02   DXL    4.071767 3+03   DYL   -2.705787 6+03   DZL   -2.164815 5+03
   RL    9.969228 8+02   DECL  2.216890 1+01   RAL   4.595701 3+01   VL     5.346681 4+03   PTHL   3.611680 5-02   AZL   -1.159423 8+02

SELENOGRAPHIC
   XS   -3.180778 1+02   YS   -9.395046 5+00   ZS    1.000635 8+02   DXS   -5.021883 3+03   DYS    1.589615 2+03   DZS   -1.004749 7+03
   ALTS  5.842936 6+01   LATS  5.760617 9+00   LONS -1.087040 0+02   VRS    5.362435 1+03   PTR    3.601020 2-02   AZR   -1.008584 1+02
   LTS  -1.515760 8+00   LNS   1.149200 8+00   LTE   2.082454 0+00   LNE    7.908715 9+00   DSMP   5.033091 7+00   RSMP   1.071192 9+02
   LTE   1.676958 1+02   LAN   4.374591 9+01   LAP  -7.163572 8+01   DR     3.370271 8+00   VT     5.362434 0+03   SOLSV -4.627199 4+01

GEOCENTRIC
   X     2.004000 2+05   Y    -4.191561 6+04   Z    -2.445711 2+04   DX     5.109376 8+03   DY     1.201408 8+02   DZ    -6.424526 1+02
   R     2.061922 3+05   DEC  -6.812070 8+00   RA   -1.181366 1+01   V      5.151010 5+03   PTH    7.693280 5+01   AZ     9.234401 7+01

GEOGRAPHIC
   XG   -1.937828 5+05   YG   -6.607034 9+04   ZG   -2.445711 1+04   DXG   -3.360905 7+04   DYG    8.315342 9+04   DZG   -6.424705 6+02
   ALT   2.027484 6+05   LAT  -6.812825 3+00   LON   1.988269 3+02   VE     8.969099 5+04   PTE    3.207001 2+00   AZE   -9.003048 6+01

EARTH-MOON PLANE
   XMP  -4.103942 7+02   YMP  -8.941633 3+00   ZMP   1.949447 0+01   DXMP  -4.774431 4+03   DYMP   2.335049 8+03   DZMP  -5.825364 4+02
   RMP   9.969228 5+02   DEMP  1.210468 9+00   RAMP -1.162212 2+02   VMP    5.346681 4+03   PTMP   3.611812 7-02   AZMP  -9.625686 8+01
   XME  -2.061002 9+05   YME  -8.941636 4+00   ZME   1.949429 7+01   DXME  -5.013264 1+03   DYME  -1.029924 5+03   DZME  -5.825364 1+02

PLANETARY COORDINATES
   XM    1.997581 9+05   YM   -4.257924 8+04   ZM   -2.483328 9+04   DXM    1.037609 4+03   DYM    2.825928 5+03   DZM    1.522362 9+03
   RM    2.057498 9+05   DEM  -6.932300 1+00   RAM  -1.203274 3+01   LOM    1.986077 5+02   VM     3.373439 4+03   ARGM  -1.467213 2+01
   XSUN  4.757199 9+06   YSUN -7.275442 3+07   ZSUN -3.154912 9+07   RAS   -8.625891 9+01   LOS    1.243815 7+02   DES   -2.339884 0+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA  -5.703847 7+05   ECC   1.021586 2+00   INC   7.202278 6+00   RAN    9.722610 9+01   APF    1.017039 3+02   RP     1.231243 8+04
   VH    2.015352 2+03   RNMP -1.797421 6+02   APMP  3.059334 9+01   INMP   3.004008 7+01   APO   -1.153082 0+06   TFP    3.653985 9+01
   TA    1.493958 2+02   EA    4.553175 0+01   MA    6.035566 2+00   SLR    2.489064 3+04   PER    3.001375 5+03   MTA    1.682007 1+02

SELENOCENTRIC OSCULATING ELEMENTS
   SMAS  9.970581 3+02   ECCS  6.447840 2-04   INCS  1.463832 0+02   RANS  -1.718414 5+02   APFS   5.914162 9+01   RPS    9.964152 5+02
   VMS  -2.214155 1+03   RNMPS 5.366615 4+01   APMPS 9.192931 7+01   INMPS  1.736439 8+02   APOS   9.977010 0+02   TFPS   8.643175 5+01
   TAS   7.789681 3+01   EAS   7.785625 7+01   MAS   7.782013 9+01   SLRS   9.970576 7+02   PERS   1.977873 3+00   MTAS   3.599999 9+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.256795 9-02   WY    5.480323 8-01   WZ   -8.327590 3-01   PX    -6.091759 4-01   PY     6.348471 5-01   PZ     4.752617 4-01
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   GX    7.8913351-01   GY    5.4463710-01   GZ    2.8396949-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000
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****** CSM   / MOON  REF.  /PHASE  16- 21
                    MEAN-OF-EPOCH  1969       25  DEC. 1968,  3 HRS.,  57 MINS.,  33.200 SECS. G.M.T.      USNM  USFT  / SEC

T          .871093068855601+002  HRS. FROM LAUNCH       3 DAYS, 15 HRS.,  6 MINS.,  33.505 SECS. G.E.T.     RAGR  .153119773310408+003

          PHASE ELAPSED TIME      .303050844+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .287901255404720000+000       .305188902638580 75-001       -.707828617244122 94-002
        RDXYZ       .687654843868946 84-001       -.762957256125243 28+000      -.508570947709705 74+000

SELENOCENTRIC
   XL     9.9151278+02   YL     1.0510503+02   ZL    -2.4377147+01  DXL    3.9971346+02  DYL    -4.4348454+03  DZL    -2.9561728+03
   RL     9.9736597+02 DECL    -1.4005358+00   RAL    6.0510252+00   VL    5.3447714+03 PTHL     2.4285903-02  AZL    -1.2359034+02

SELENOGRAPHIC
   XS    -8.9007767+02   YS    -4.4549141+02   ZS    -6.3545259+01  DXS   -2.2891915+03  DYS    4.7237065+03  DZS    -1.0869717+03
 ALTS     5.8872452+01 LATS    -3.6529649+00  LONS   -1.5341164+02  VRS    5.3605324+03  PTR    2.4214561-02  AZR    -1.0172174+02
  LTS    -1.5158685+00   LNS     1.1479332+02   LTE    2.0674002+00   LNE    7.9095113+00 DSMP     5.0331490+00 RSMP     1.0699105+02
  LIN     1.6769641+02   LAN     4.3609301+01   LAP   -9.2106648+01   DR     2.2654884+00   VT     5.3605319+03 SOLSV    -1.6941404+00

GEOCENTRIC
    X     2.0090280+05    Y    -4.2055439+04    Z    -2.4632099+04  DX     1.4293119+03  DY    -1.6072555+03  DZ    -1.4328349+03
    R     2.0673010+05  DEC    -6.8431069+00   RA    -1.1823132+01   V     2.5844184+03  PTH    4.6889222+01  AZ    -1.3354095+02

GEOGRAPHIC
   XG    -1.9821037+05   YG    -5.3322066+04   ZG    -2.4632099+04  DXG   -2.5627349+04  DYG    8.8609891+04  DZG    -1.4329353+03
  ALT     2.0328633+05  LAT    -6.8438628+00  LON     1.9505709+02   VE    9.2252520+04  PTE    1.1718829+00  AZF    -9.0755838+01

EARTH-MOON PLANE
  XMP    -9.4459231+02  YMP    -3.1370176+02  ZMP    -6.3839431+01 DXMP   -1.6503970+03 DYMP    5.0605956+03 DZMP    -4.8284942+02
  RMP     9.9736597+02 DEMP    -3.6698987+00 RAMP    -1.6162852+02  VMP    5.3447714+03 PTMP    2.4285940-02 AZMP    -9.5192318+01
  XME    -2.0672986+05  YME    -3.1370100+02  ZME    -6.3839734+01 DXME   -1.8891399+03 DYME    1.6962387+03 DZME    -4.8284942+02

PLANETARY COORDINATES
   XM     1.9991130+05   YM    -4.2160545+04   ZM    -2.4607722+04  DXM    1.0295984+03  DYM    2.8275898+03  DZM     1.5233378+03
   RM     2.0578527+05  DEM    -6.8678413+00  RAM    -1.1908953+01  LOM    1.9497127+02   VM    3.3728171+03 ARGM    -1.4533331+01
 XSUN     4.7718888+06 YSUN    -7.2753574+07 ZSUN    -3.1548761+07  RAS   -8.6247357+01  LOS    1.2063287+02  DES    -2.3398563+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA     1.4724558+05   ECC     7.8049508-01   INC    1.3603131+02  RAN    1.7532331+02  APF    3.2277186+01  RP     3.2321130+04
   VH    -2.1497972+03 RNMP    -1.7985072+02 APMP    -3.3754013+02 INMP    1.6415413+02  APO    2.6217003+05  TFP    -3.5532831+00
   TA     1.5760493+02   EA     1.2117118+02   MA    8.2908437+01  SLR    5.7547611+04  PER    3.9366960+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS     9.9723180+02 ECCS     4.4471977-04  INCS    1.4638389+02 RANS   -1.7184138+02 APFS    7.4892032+01  RPS    9.9678831+02
  VHS    -2.2143854+03 RNMPS   5.3531448+01 APMPS   -2.5231726+02 INMPS   1.7364457+02 APOS    9.9767526+02 TFPS    8.6518044+01
  TAS     1.0764367+02  EAS     1.0761400+02  MAS    1.0758972+02 SLRS    9.9723155+02 PERS    1.9783900+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX    -7.8567182-02   WY     5.4802245-01   WZ    -8.3276565-01  PX    -3.7209705-01  PY    7.5885688-01  PZ     5.3449037-01
   UX     9.2486265-01   UY     3.5186304-01   UZ    1.4429629-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000
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****** CSM   / MOON  REF.  /PHASE  16- 22
                    MEAN-OF-EPOCH  1969       25  DEC. 1968,  4 HRS.,  12 MINS.,  33.200 SECS. G.M.T.

T          .873593068855601+002  HRS. FROM LAUNCH       3 DAYS, 15 HRS.,  21 MINS.,  33.505 SECS. G.E.T.     RAGR  .156880040055000+003

          PHASE ELAPSED TIME      .303950944+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .217287123561079 96+000       -.149937467044479 27+000      -.119161528706076 74+000
        RDXYZ       -.603636250448642 52+000      -.604068138643 2855+000       -.340499420518971 61+000

SELENOCENTRIC
   XL     7.4832241+02   YL    -5.1637466+02   ZL    -4.1038438+02  DXL   -3.5087594+03  DYL    -3.5112698+03  DZL    -1.9792226+03
   RL     9.9751920+02 DECL    -2.4293124+01   RAL   -3.4607344+01   VL    5.3439432+03 PTHL     -3.3365680-03  AZL    -1.1397731+02

SELENOGRAPHIC
   XS    -9.2688715+02   YS     3.1646198+02   ZS    -1.8914690+02  DXS    1.8184792+03  DYS    5.0150059+03  DZS    -5.1894032+02
 ALTS     5.9025676+01 LATS    -1.0930450+01  LONS    1.6114883+02  VRS    5.3597061+03  PTR    -3.3261807-03  AZR    -9.5659865+01
  LTS    -1.5159753+00   LNS     1.1466656+02   LTE    2.0523395+00   LNE    7.9102547+00 DSMP     5.0332073+00 RSMP     1.0686296+02
  LIN     1.6769933+02   LAN     4.3484485+01   LAP    8.3239159+01   DR    -3.1114598-01   VT     5.3597061+03 SOLSV    4.2911401+01

GEOCENTRIC
    X     2.0081153+05    Y    -4.2257974+04    Z    -2.4792397+04  DX    -2.4871738+03  DY    -6.8203606+02  DZ    -4.5491929+02
    R     2.0670188+05  DEC    -6.8888000+00   RA    -1.1883703+01   V     2.6188085+03  PTH    -5.8058771+01  AZ    -1.2163608+02

GEOGRAPHIC
   XG    -2.0127621+05   YG    -3.9986141+04   ZG    -2.4792396+04  DXG   -1.5697339+04  DYG    9.0784790+04  DZG    -4.5495369+02
  ALT     2.0325811+05  LAT    -6.8895610+00  LON     1.9123625+02   VE    9.2133012+04  PTE    -1.3821332+00  AZF    -9.0452086+01

EARTH-MOON PLANE
  XMP    -8.8072845+02  YMP     4.5550683+02  ZMP    -1.0897471+02 DXMP    2.4640394+03 DYMP    4.7410294+03 DZMP    -9.4225728+01
  RMP     9.9751919+02 DEMP    -6.2718367+00 RAMP     1.5265229+02  VMP    5.3439433+03 PTMP    -3.3365569-03 AZMP    -9.1016754+01
  XME    -2.0670135+05  YME     4.5550705+02  ZME    -1.0897496+02 DXME    2.2253884+03 DYME    1.3772894+03 DZME    -9.4225760+01

PLANETARY COORDINATES
   XM     2.0006321+05   YM    -4.1741599+04   ZM    -2.4382013+04  DXM    1.0215856+03  DYM    2.8292337+03  DZM     1.5243033+03
   RM     2.0582062+05  DEM    -6.8033738+00  RAM    -1.1785239+01  LOM    1.9133472+02   VM    3.3721953+03 ARGM    -1.4394579+01
 XSUN     4.7865772+06 YSUN    -7.2752723+07 ZSUN    -3.1548391+07  RAS   -8.6235796+01  LOS    1.1688416+02  DES    -2.3398285+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA     1.4891019+05   ECC     8.7307758-01   INC    1.4769877+02  RAN    1.7913336+02  APF    -5.3686092+00  RP     1.8900042+04
   VH    -2.1157304+03 RNMP    -1.7968861+02 APMP    -1.7900819+01 INMP    1.7605165+02  APO    2.7892033+05  TFP    1.6696806+02
   TA    -1.6166048+02   EA    -1.1639243+02   MA    -7.1582708+01  SLR    3.5401241+04  PER    4.0036404+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS     9.9722917+02 ECCS     2.9661083-04  INCS    1.4638747+02 RANS   -1.7183801+02 APFS    3.6684242+01  RPS    9.9693339+02
  VHS    -2.2146331+03 RNMPS   5.3424875+01 APMPS    6.9510835+01 INMPS   1.7364661+02 APOS    9.9752495+02 TFPS    8.8286258+01
  TAS    -1.6868255+02  EAS    -1.6867788+02  MAS   -1.6867454+02 SLRS    9.9722905+02 PERS    1.9783822+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX    -7.8592111-02   WY     5.4796637-01   WZ    -8.3280018-01  PX    -8.6445066-01  PY    3.7862591-01  PZ     3.3070751-01
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   RX    4.9653631-01    QY    7.4590567-01    QZ    4.4793288-01   SX0    0.0000000     SY0    0.0000000     SZ0    0.0000000

****** CSM   / MOON  REF.  /PHASE  16- 23
                MEAN-OF-EPOCH  1969        25  DEC.  1968,  4 HRS.,  27 MINS.,  33.200 SECS. G.M.T.

T        .8760930688556O1+002  HRS. FROM LAUNCH       3 DAYS, 15 HRS.,  36 MINS.,  33.505 SECS. G.E.T.     RAGR  .160640306799592+003

          PHASE ELAPSED TIME      .304850A4+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

          RXYZ        .168055397760761A9-001       -.2407760402739672B+000       -.1599999308116285B+000
          RDXYZ       -.9151105594631236l+000      -.8403442703285931A-001        .3115569724823A002-001

SELENOCENTRIC
   XL    5.7877161+01   YL   -8.2921668+00   ZL   -5.5102912+02   DXL   -5.3192676+03   DYL   -4.8846732+02   DZL    1.8109887+02
   RL    9.9728789+02 DECL   -3.3540590+01   RAL  -8.6007378+01   VL     5.3447174+03 PTHL   -2.8051341-02   AZL   -8.7688740+01

SELENOGRAPHIC
   XS   -4.0651116+02   YS    8.8807549+02   ZS   -2.0162769+02   DXS    4.8329342+03   DYS    2.2909106+03   DZS    3.5942189+02
 ALTS    5.8794370+01 LATS   -1.1664235+01 LONS    1.1459565+02   VRS    5.3604765+03   PTR   -2.7968693-02   AZR   -8.6080000+01
  LTS   -1.5160826+00   LNS    1.1453981+02   LTF   2.0372719+00   LNE    7.9109469+00 DSMP    5.0332645+00 RSMP    1.0673472+02
  LIS    1.6769969+02   LAN    4.3370359+01   LAP   1.0122472+02   DR    -2.6166938+00   VT     5.3604759+03 SOLSV   7.9851604+01

GEOCENTRIC
    X    2.8027181+05    Y   -4.2151625+04    Z   -2.4707189+04   DX    -4.3056969+03   DY     2.3423930+03   DZ    1.7063503+03
    R    2.8614558+05  DEC   -8.8836255+00   RA   -1.1885683+01    V     5.1901339+03  PTH   -6.9659223+01   AZ    5.1167823+01

GEOGRAPHIC
   XG   -4.0242081+05   YG   -2.6621399+04   ZG   -2.4707189+04   DXG   -6.9566062+03   DYG    8.9126991+04   DZG    1.7063692+03
  ALT    2.9270181+05  LAT   -8.8843879+00  LON    1.8747400+02   VE     8.9414356+04  PTH   -3.1199447+00   AZE   -8.9274038+01

EARTH-MOON PLANE
  XMP   -2.8274038+02   YMP    9.5062094+02   ZMP   -8.8907965+01  DXMP    5.0967775+03  DYMP    1.5706113+03  DZMP    3.5080306+02
  RMP    9.9728789+02  DEMP   -5.1146964+01  RAMP   1.0681829+02   VMP    5.3447174+03  PTMP   -2.8051475-02  AZMP   -8.6224093+01
  XME   -2.0614336+05   YME    9.5083073+03   ZME   -8.8908463+01  DXME    4.8581195+03  DYME   -1.7925125+03  DZME    3.5080306+02

PLANETARY COORDINATES
    X    2.0021393+05    YM   -4.1322409+04    ZM   -2.4156161+04   DXM    1.0135707+03   DYM    2.8308603+03   DZM    1.5252594+03
   RS    2.0585597+05   DEM   -6.7388974+00   RAM   -1.1661605+01   LOM    1.8769808+02    VM    3.3715741+03  ARGM   -1.4255877+01
 XSUN    4.8012656+06  YSUN   -7.2751869+07  ZSUN   -3.1548020+07   RAS   -8.6224233+01   LOS    1.1313546+02   DES   -2.3398007+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -5.1930688+05   ECC    1.0559206+00   INC    3.9342447+01   RAN   -3.4167957+00   APF    1.2138264+02    RP    2.9039960+04
    VH    2.1121408+03 RNMP   -1.3883600-01  APMP   1.3215252+02  INMP    1.1144530+01   APO   -1.0676537+06   TFP    1.4201401+02
    TA   -1.3228036+02    EA   -4.4892462+01    MA   -7.5116339+00   SLR    5.9703853+04   PER    2.6073814+03   MTA    1.6126975+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.4705555+02  ECCS    5.4222573-04  INCS    1.4638916+02  RANS   -1.7182947+02  APFS    2.8964297+01   RPS    9.9651491+02
    VS   -2.2147353+03 RNMPS   5.3330801+01 APMPS   6.1931364+01 INMPS   1.7364550+02  APOS    9.9759615+02  TFPS   8.8243470+01
   TAS   -1.1548758+02   EAS   -1.1545493+02   MAS   -1.1542688+02  SLRS    9.9705520+02  PERS    1.9778655+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   UX   -7.8670263-02    WY    5.4793042-01    WZ   -8.3281653-01    PX   -9.2335808-01    PY    2.7486613-01    PZ    2.6806401-01
   QX    3.7579356-01    QY    7.9007655-01    QZ    4.8431209-01   SY0    0.0000000     SY0    0.0000000     SZ0    0.0000000

****** CSM   / MOON  REF.  /PHASE  16- 24
                MEAN-OF-EPOCH  1969        25  DEC.  1968,  4 HRS.,  42 MINS.,  33.200 SECS. G.M.T.

T        .8785930688561601+002  HRS. FROM LAUNCH       3 DAYS, 15 HRS.,  51 MINS.,  33.505 SECS. G.E.T.     RAGR  .164400573544184+003

          PHASE ELAPSED TIME      .305750A4+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

          RXYZ        -.1936416983999170?+000      -.1876342528437900A+000      -.1051441893375133B+000
          RDXYZ       -.8793675175238803?+000       .4867245859483504?+000       .3844548361556199?+000

SELENOCENTRIC
   XL   -5.8776133+02   YL   -6.4619990+02   ZL   -3.6210959+02   DXL   -3.9489628+03   DYL    2.8291864+03   DZL    2.2347225+03
   RL    9.9442920+02 DECL   -2.1300627+01   RAL  -1.3591007+02   VL     5.3472037+03 PTHL   -3.4762534-02   AZL   -6.3363417+01

SELENOGRAPHIC
   XS    3.5830877+02   YS    9.2549637+02   ZS   -9.3486619+01   DYS    4.9421950+03   DYS   -1.8135126+03   DZS    1.0233175+03
  ALTS    5.4335684+01 LATS   -5.3813350+00 LONS    6.8835933+01   VRS    5.3629561+03   PTR   -3.4660453-02   AZR   -7.8953826+01
  LTS   -1.5161900+00   LNS    1.1441365+02   LTF   2.0221974+00   LNE    7.9115877+00 DSMP    5.0333218+00 RSMP    1.0660664+02
  LIS    1.6769782+02   LAN    4.3240066+01   LAP   1.3719903+01   DR    -3.2442611+00   VT     5.3629550+03 SOLSV   4.4354930+01

GEOCENTRIC
    X    1.9969641+05    Y   -4.1540179+04    Z   -2.4292276+04   DX    -2.9434090+03   DY     5.6616559+03   DZ    3.7609286+03
    R    2.0541447+05  DEC   -6.7916821+00   RA   -1.1753373+01    V     7.4069282+03  PTH   -3.6940194+01   AZ    5.6617747+01

GEOGRAPHIC
   XG   -2.0351363+05   YG   -1.3681674+04   ZG   -2.4292276+04   DXG   -1.7045732+03   DYG    8.5510679+04   DZG    3.7609269+03
  ALT    2.0147070+05  LAT   -6.7924372+00  LON    1.8384605+02   VE     8.5610319+04  PTE   -2.9805440+00   AZE   -8.7816533+01

EARTH-MOON PLANE
  XMP    4.7868890+02   YMP    8.7423185+02   ZMP   -1.5623915+01  DXMP    4.6647301+03  DYMP   -2.5474143+03  DZMP    5.8614123+02
  RMP    9.9632921+02  DEMP   -8.6806853-01  RAMP   6.1296926+01   VMP    5.3472037+03  PTMP   -3.4762973-02  AZMP   -8.3706573+01
  XME   -2.0541260+05   YME    8.7423170+03   ZME   -1.5624053+01  DXME    4.4262671+03  DYME   -5.9099226+03  DZME    5.8614123+02

PLANETARY COORDINATES
    X    2.0036346+05    YM   -4.0902979+04    ZM   -2.3030167+04   DXM    1.0055538+03   DYM    2.8324695+03   DZM    1.5262061+03
   RS    2.0589129+05   DEM   -6.6744126+00   RAM   -1.1538045+01   LOM    1.8406138+02    VM    3.3709534+03  ARGM   -1.4117224+01
 XSUN    4.8159538+06  YSUN   -7.2751013+07  ZSUN   -3.1547648+07   RAS   -8.6212672+01   LOS    1.0938675+02   DES   -2.3397728+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA   -7.1710613+04   ECC    3.1466699+00   INC    3.3987579+01   RAN   -1.5787404+00   APF    3.5737471+01    RP    1.5393902+05
    VH    5.6838578+03 RNMP   -2.0002293-01  APMP   4.7906690+01  INMP    5.6788090+00   APO   -2.9736024+05   TFP    1.2150749+02
    TA   -4.7950732+01    EA   -3.8000514+01    MA   -9.0535837+01   SLR    6.3833430+05   PER    1.3379615+02   MTA    1.0852978+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    9.4706558+02  ECCS    6.5138631-04  INCS    1.4638802+02  RANS   -1.7182442+02  APFS    2.7680528+01   RPS    9.9641611+02
    VS   -2.2138882+03 RNMPS   5.3208265+01 APMPS   6.0559418+01 INMPS   1.7364307+02  APOS    9.9771505+02  TFPS   8.8236333+01
   TAS   -6.8697460+01   EAS   -6.8658067+01   MAS   -6.8623303+01  SLRS    9.9706511+02  PERS    1.9778954+00  MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   UX   -7.8720898-02    WY    5.4793968-01    WZ   -8.3280569-01    PX   -9.3156756-01    PY    2.5700902-01    PZ    2.5715399-01
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   QX    3.5494342-01   QY    7.9605806-01   QZ    4.9021085-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  16- 25
                    MEAN-OF-EPOCH  1969       25  DEC. 1968,  4 HRS.,  56 MINS.,  36.950 SECS. G.M.T.

T        .8809368168556O1+002  HRS. FROM LAUNCH       3 DAYS, 16 HRS.,  5 MINS.,  37.255 SECS. G.E.T.    RAGR  .167925823617239+003

          PHASE ELAPSED TIME     .30659459+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.287275591767068l7+000      -.341075992981032l8-001       .4713647306018597Z-002
       RDXYZ      -.81774867614055015-001      .7622581851045437B+000       .5092400325967364Z+000

SELENOCENTRIC
   XL    9.8935804+02   YL   -1.1746430+02   ZL    1.6233487+01  DXL   -4.7533317+02  DYL    4.4307818+03  DZL    2.9600620+03
   RL    9.9643901+02 DECL    9.3347560-01   RAL  -1.7322909+02   VL    5.3497417+03 PTHL   -2.2914071-02  AZL   -5.6400152+01

SELENOGRAPHIC
   XS    8.4704525+02   YS    4.4985473+02   ZS    6.0598227+01  DXS    2.3145245+03  DYS   -4.7157634+03  DZS    1.0922524+03
 ALTS    5.7945497+01 LATS    3.4865821+00 LONS    2.6891318+01  VRS    5.3654882+03  PTR   -2.2847361-02  AZR   -7.8230686+01
  LTS   -1.5162911+00  LNS    1.1429422+02  LTE    2.0080589+00  LNE    7.9121415+00 DSMP    5.0333740+00 RSMP    1.0648660+02
  LIN    1.6769843+02  LAN    4.3115856+01  LAP    5.3898205+01   DR   -2.1395509+00   VT    5.3654876+03 SOLSV    2.4990832+00

GEOCENTRIC
    X    1.9951322+05    Y   -4.0627012+04    Z   -2.3701938+04   DX    5.2270322+02   DY    7.2647443+03   DZ    4.4871470+03
    R    2.0498259+05  DEC   -6.6399081+00   RA   -1.1509813+01    V    8.5547774+03  PTH   -9.7581144+00   AZ    5.8949478+01

GEOGRAPHIC
   XG   -2.0359778+05   YG   -2.0055085+03   ZG   -2.3701938+04  DXG    1.1988780+02  DYG    8.2996189+04  DZG    4.4871528+03
  ALT    2.0153881+05  LAT   -6.6406482+00  LON    1.8056436+02   VE    8.3117489+04  PTE   -9.9958437-01  AZE   -8.7000501+01

EARTH-MOON PLANE
  XMP    3.4207118+02  YMP    3.1855230+02  ZMP    6.2586508+01 DXMP    1.6753806+03 DYMP   -5.0571815+03 DZMP    4.8759875+02
  RMP    9.9643902+02 DEMP    3.6011282+00 RAMP    1.8682471+01  VMP    5.3497417+03 PTMP   -2.2914453-02 AZMP   -8.4758724+01
  XME   -2.0498233+05  YME    3.1855246+02  ZME    6.2586328+01 DXME    1.4370083+03 DYME   -8.4191134+03 DZME    4.8759870+02

PLANETARY COORDINATES
   XM    2.0050258+05   YM   -4.0509548+04   ZM   -2.3718172+04  DXM    9.9803640+02  DYM    2.8339624+03  DZM    1.5270850+03
   RM    2.0592440+05  DEM   -6.6139511+00  RAM   -1.1422278+01  LOM    1.8065190+02   VM    3.3703721+03 ARGM   -1.3987284+01
 XSUN    4.8297239+06 YSUN   -7.2750208+07 ZSUN   -3.1547299+07  RAS   -8.6201832+01  LOS    1.0587234+02  DES   -2.3397467+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -4.5802383+04   ECC    5.3988133+00   INC    3.1683061+01  RAN   -6.3823686-01  APF   -1.1609063+00   RP    2.0147613+05
   VH    7.1119858+03 RNMP   -3.9074025-01 APMP   1.1859348+01 INMP    3.3185425+00  APO   -2.9308090+05  TFP    9.6182967+01
   TA   -1.1557141+01   EA   -9.6375518+00   MA   -4.2639499+01  SLR    1.2892081+06  PER    6.8296833+01  MTA    1.0067430+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9723171+02 ECCS    8.8982409-04 INCS    1.4638870+02 RANS   -1.7182443+02 APFS    2.8417450+01  RPS    9.9634434+02
  VHS   -2.2129304+03 RNMPS   5.3082047+01 APMPS   6.1296887+01 INMPS   1.7364367+02 APOS    9.9811905+02 TFPS    8.8240329+01
  TAS   -2.6732441+01  EAS   -2.6708031+01  MAS   -2.6685117+01 SLRS    9.9723087+02 PERS    1.9783898+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.8719376-02   WY    5.4792988-01   WZ   -8.3281218-01   PX   -9.2692587-01   PY    2.6722944-01   PZ    2.6343277-01
   QX    3.6689461-01   QY    7.9269241-01   QZ    4.8685425-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / MOON  REF.  /PHASE  16- 26
                    MEAN-OF-EPOCH  1969       25  DEC. 1968,  5 HRS.,  11 MINS.,  36.950 SECS. G.M.T.

T        .8834368168556O1+002  HRS. FROM LAUNCH       3 DAYS, 16 HRS.,  20 MINS.,  37.255 SECS. G.E.T.    RAGR  .171686090361831+003

          PHASE ELAPSED TIME     .30749459+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.219496264148684960+000      .1472307973130662l+000       .1176060378866936Z+000
       RDXYZ       .595177869534498l4+000      .6111624417008968l+000       .3457705999829828B+000

SELENOCENTRIC
   XL    7.5593054+02   YL    5.0705308+02   ZL    4.0502737+02  DXL    3.4595933+03  DYL    3.5525069+03  DZL    2.0098624+03
   RL    9.9628356+02 DECL    2.3987557+01   RAL   1.4614760+02   VL    5.3505736+03 PTHL    1.5761546-03  AZL   -6.5724057+01

SELENOGRAPHIC
   XS    9.2719133+02   YS   -3.1253223+02   ZS    1.8767196+02  DXS   -1.8019004+03  DYS   -5.0266691+03  DZS    5.3208269+02
 ALTS    5.7790039+01 LATS    1.0857793+01 LONS   -1.8627630+01  VRS    5.3663170+03  PTR    1.5714557-03  AZR   -8.4205864+01
  LTS   -1.5163984+00  LNS    1.1416747+02  LTE    1.9929714+00  LNE    7.9126820+00 DSMP    5.0334293+00 RSMP    1.0635861+02
  LIN    1.6776136+02  LAN    4.2990752+01  LAP    1.1021927+01   DR    1.4718238-01   VT    5.3663170+03 SOLSV   -4.2219087+01

GEOCENTRIC
    X    1.9989388+05    Y   -3.9582612+04    Z   -2.3086883+04   DX    4.4496093+03   DY    6.3880448+03   DZ    3.5378759+03
    R    2.0507889+05  DEC   -6.4638101+00   RA   -1.1200705+01    V    8.5511814+03  PTH    1.8447261+01   AZ    6.1528408+01

GEOGRAPHIC
   XG   -2.0351664+05   YG    1.0262683+04   ZG   -2.3086882+04  DXG    1.0680027+03  DYG    8.3209300+04  DZG    3.5378814+03
  ALT    2.0163511+05  LAT   -6.4645305+00  LON    1.7711320+02   VE    8.3291329+04  PTE    1.8616478+00  AZE   -8.7337470+01

EARTH-MOON PLANE
  XMP    8.8133637+02  YMP   -4.5168939+02  ZMP    1.0864568+02 DXMP   -2.4496658+03 DYMP   -4.7557914+03 DZMP    1.0111541+02
  RMP    9.9628358+02 DEMP    6.2606105+00 RAMP   -2.7135371+01  VMP    5.3505736+03 PTMP    1.5764505-03 AZMP   -8.8910826+01
  XME   -2.0507836+05  YME   -4.5168895+02  ZME    1.0864539+02 DXME   -2.6879396+03 DYME   -8.1171092+03 DZME    1.0111541+02

PLANETARY COORDINATES
   XM    2.0064981+05   YM   -4.0089665+04   ZM   -2.3491911+04  DXM    9.9001603+02  DYM    2.8355379+03  DZM    1.5280133+03
   RM    2.0595970+05  DEM   -6.5494514+00  RAM   -1.1298867+01  LOM    1.7701504+02   VM    3.3697525+03 ARGM   -1.3848728+01
 XSUN    4.8444118+06 YSUN   -7.2749348+07 ZSUN   -3.1546925+07  RAS   -8.6190270+01  LOS    1.0212364+02  DES   -2.3397196+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -4.5848517+04   ECC    5.2013742+00   INC    2.9136101+01  RAN    5.2642366-01  APF   -3.5303719+01   RP    1.9262677+05
   VH    7.1084069+03 RNMP   -2.3421808+00 APMP   -1.9466485+01 INMP    7.0474599-01  APO   -2.8432381+05  TFP    7.3310943+01
   TA    2.1935071+01   EA    1.8436950+01   MA    7.9119615+01  SLR    1.1945506+06  PER    6.8400046+01  MTA    1.0108452+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9723095+02 ECCS    9.5039573-04 INCS    1.4639227+02 RANS   -1.7182117+02 APFS    4.5603244+01  RPS    9.9628320+02
  VHS   -2.2126885+03 RNMPS   5.2975129+01 APMPS   7.8509798+01 INMPS   1.7364572+02 APOS    9.9817870+02 TFPS    8.8334575+01
  TAS    1.6602638+00  EAS    1.6586796+00  MAS    1.6570035+00 SLRS    9.9722999+02 PERS    1.9783875+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.8743222-02   WY    5.4787412-01   WZ   -8.3284660-01   PX   -7.7716474-01   PY    4.8949594-01   PZ    3.9548534-01
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QX	6.2435121-01	QY	6.7840080-01	QZ	3.8724396-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000		

****** CSM / MOON REF. /PHASE 16- 27
MEAN-OF-EPOCH 1969 25 DEC. 1968, 5 HRS., 26 MINS., 36.950 SECS. G.M.T.

T .885936818855601+002 HRS. FROM LAUNCH 3 DAYS, 16 HRS., 35 MINS., 37.255 SECS. G.E.T. RAGR .1754463571064 23+003

PHASE ELAPSED TIME .3083959+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ -.2008594458053413 7-001 .2402768979317151 9+000 .1599491875042470 8+000
RLXYZ .9151127331355361 6+000 .9364807938946335 0-001 -.2500550380501677 9-001

SELENOCENTRIC

XL	-6.9174558+01	YL	8.2749767+01	ZL	5.5085437+02	DXL	5.3192803+03	DYL	5.4434865+02	DZL	-1.4534961+02
RL	9.9648223+02	DECL	3.3559223+ 1	RAL	9.4778530+01	VL	5.3490357+03	PTHL	2.6027916-02	AZL	-9.1885938+01

SELENOGRAPHIC

XS	4.0809944+02	YS	-8.8632704+02	ZS	2.0213177+02	DXS	-4.8312509+03	DYS	-2.3663870+03	DZS	-3.4710485+02
ALTS	5.7949322+01	LATS	1.1703389+01	LONS	-6.5276817+01	VRS	5.3647821+03	PTR	2.5952195-02	AZR	-9.3793924+01
LTS	-1.5165061+00	LNS	1.1404071+00	LTE	1.9778774+00	LNE	7.9131711+00	DSMP	5.0334851+00	RSMP	1.0623067+02
LIN	1.6778177+02	LAN	4.2876627+01	LAP	1.9021021+01	DR	2.4299845+00	VT	5.3647815+03	SOLSV	-7.9790641+01

GEOCENTRIC

X	2.0072669+05	Y	-3.8842048+04	Z	-2.2714657+04	DX	6.3012740+03	DY	3.3814447+03	DZ	1.3835828+03
R	2.0570820+05	DEC	-6.3396274+00	RA	-1.0951784+01	V	7.2838536+03	PTH	4.7351105+01	AZ	6.6252277+01

GEOGRAPHIC

XG	-2.0317684+05	YG	2.2783256+04	ZG	-2.2714657+04	DXG	4.0818191+03	DYG	8.6152007+04	DZG	1.3836113+03
ALT	2.0226441+05	LAT	-6.3403322+00	LON	1.7360186+02	VE	8.6259750+04	PTE	3.5607974+00	AZE	-8.8677254+01

EARTH-MOON PLANE

XMP	2.8899902+02	YMP	-9.4944753+02	ZMP	8.9482122+01	DXMP	-5.0966145+03	DYMP	-1.5865009+03	DZMP	-3.4600625+02
RMP	9.9648285+02	DEMP	5.1519836+00	RAMP	-7.3070457+01	VMP	5.3490358+03	PTMP	2.6028275-02	AZMP	-9.3726228+01
XME	-2.0570599+05	YME	-9.4944692+02	ZME	8.9482410+01	DXME	-5.3347881+03	DYME	-4.9472053+03	DZME	-3.4600625+02

PLANETARY COORDINATES

XM	2.0079586+05	YM	-3.9669546+04	ZM	-2.3265512+04	DXM	9.8199385+02	DYM	2.8370962+03	DZM	1.5289324+03
RM	2.0599499+05	DEM	-6.4849441+00	RAM	-1.1175531+01	LOM	1.7337811+02	VM	3.3691335+03	ARGM	-1.3710220+01
XSUN	4.8590091+06	YSUN	-7.2748484+07	ZSUN	-3.1546550+07	RAS	-8.6178710+01	LOS	9.8374933+01	DES	-2.3396904+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-7.5881790+04	ECC	2.6195316+00	INC	2.4531917+01	RAN	3.1372699+00	APF	-7.9081331+01	RP	1.2289296+05
VH	5.5254307+03	RNMP	-1.7938334+02	APMP	1.1598888+02	INMP	4.0477811+00	APO	-2.7466654+05	TFP	4.8153578+01
TA	6.3658030+01	EA	5.0637119+01	MA	9.9963151+01	SLR	4.4481494+05	PER	1.4563803+02	MTA	1.1244197+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	9.9706594+02	ECCS	7.3262791-04	INCS	1.4639401+02	RANS	-1.7181265+02	APFS	5.4493635+01	RPS	9.9632547+02
VHS	-2.2134701+03	RNMPS	5.2881372+01	APMPS	8.7435874+01	INMPS	1.7364466+02	APOS	9.9778640+02	TFPS	8.8383289+01
TAS	3.8348240+01	EAS	3.8320427+01	MAS	3.8294399+01	SLRS	9.9705536+02	PERS	1.9778667+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-7.8820479-02	WY	5.4783729-01	WZ	-8.3286348-01	PX	-6.7142694-01	PY	5.8837215-01	PZ	4.5055971-01
QX	7.3686768-01	QY	5.9472052-01	QZ	3.2145664-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / MOON REF. /PHASE 16- 28
MEAN-OF-EPOCH 1969 25 DEC. 1968, 5 HRS., 41 MINS., 36.950 SECS. G.M.T.

T .8843681855601+002 HRS. FROM LAUNCH 3 DAYS, 16 HRS., 50 MINS., 37.255 SECS. G.E.T. RAGR .1792066238510 15+003

PHASE ELAPSED TIME .3092959+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .1913766366494542 6+000 .1893319868335457 4+000 .1064180054598606 3+000
RLXYZ .6866855402700662 5+000 -.4794111369851829 1+000 -.3803848724448152+000

SELENOCENTRIC

XL	6.5901842+02	YL	6.5204678+02	ZL	3.6649653+02	DXL	3.9915004+03	DYL	-2.7866755+03	DZL	-2.2110616+03
RL	9.9603642+02	DECL	2.1569082+01	RAL	4.4692286+01	VL	5.3466278+03	PTHL	3.5144233-02	AZL	-1.1641896+02

SELENOGRAPHIC

XS	-3.5702141+02	YS	-8.2589162+02	ZS	9.5392769+01	DXS	-4.9478380+03	DYS	1.7997502+03	DZS	-1.0173196+03
ALTS	5.8442902+01	LATS	5.4307994+00	LONS	-1.1108974+02	VRS	5.3623820+03	PTR	3.6037607-02	AZR	-1.0099067+02
LTS	-1.5166140+00	LNS	1.1391396+00	LTE	1.9627767+00	LNE	7.9136094+00	DSMP	5.0335393+00	RSMP	1.0610278+02
LIN	1.6769991+02	LAN	4.2750533+01	LAP	8.9521839+01	DR	3.3728032+00	VT	5.3623809+03	SOLSV	-4.4918697+01

GEOCENTRIC

X	2.0159981+05	Y	-3.8597150+04	Z	-2.2672480+04	DX	4.9654703+03	DY	5.1961555+01	DZ	-6.8121962+02
R	2.0650972+05	DEC	-6.3031481+00	RA	-1.0883867+01	V	5.0122505+03	PTH	7.8549603+01	AZ	9.8248034+01

GEOGRAPHIC

XG	-2.0211492+05	YG	3.5901975+04	ZG	-2.2672480+04	DXG	1.0898816+04	DYG	8.9431817+04	DZG	-6.8165570+02
ALT	2.0306592+05	LAT	-6.3038461+00	LON	1.6995501+02	VE	9.0096054+04	PTE	3.1256062+00	AZE	-9.0090923+01

EARTH-MOON PLANE

XMP	-4.7740794+02	YMP	-9.7492650+02	ZMP	1.6629699+01	DXMP	-4.6710145+03	DYMP	2.5348626+03	DZMP	-5.8525407+02
RMP	9.9694643+02	DEMP	9.5578386-01	RAMP	-1.1862900+02	VMP	5.3466278+03	PTMP	3.6144224-02	AZMP	-9.6285814+01
XME	-2.0650787+05	YME	-9.7492593+02	ZME	1.6629839+01	DXME	-4.9090864+03	DYME	-8.2522902+02	DZME	-5.8525407+02

PLANETARY COORDINATES

XM	2.0094072+05	YM	-3.9249197+04	ZM	-2.3038977+04	DXM	9.7396993+02	DYM	2.8386370+03	DZM	1.5298419+03
RM	2.0603026+05	DEM	-6.4204296+00	RAM	-1.1052270+01	LOM	1.6974110+02	VM	3.3685151+03	ARGM	-1.3571763+01
XSUN	4.8737869+06	YSUN	-7.2747618+07	ZSUN	-3.1546174+07	RAS	-8.6167147+01	LOS	9.4626228+01	DES	-2.3396622+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-8.6212945+05	ECC	1.0105100+00	INC	1.0367471+01	RAN	1.3202189+02	APF	6.3137708+01	RP	9.0651824+03
VH	1.6368830+03	RNMP	-1.7975091+02	APMP	2.5535231+01	INMP	3.6056037+01	APO	-1.7341240+06	TFP	3.8512687+01
TA	1.5445696+02	EA	3.7472599+01	MA	3.2464405+00	SLR	1.8225640+04	PER	5.5812228+03	MTA	1.7172933+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	9.9706522+02	ECCS	6.4391904-04	INCS	1.4639200+02	RANS	-1.7180753+02	APFS	5.9914812+01	RPS	9.9642318+02
VHS	-2.2141574+03	RNMPS	5.2709357+01	APMPS	9.2868387+01	INMPS	1.7364223+02	APOS	9.9770723+02	TFPS	8.8412978+01
TAS	7.4467877+01	EAS	7.8429224+01	MAS	7.8393080+01	SLRS	9.9706477+02	PERS	1.9778943+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-7.8472272-02	WY	5.4784632-01	WZ	-8.3285268-01	PX	-5.9886330-01	PY	6.4186462-01	PZ	4.7892848-01

```
  QX    7.9695787-01   QY    5.3653908-01   QZ    2.7745973-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000
****** CSM   / MOON  REF.  /PHASE  16- 29
                    MEAN-OF-EPOCH  1969       25  DEC. 1968,  5 HRS., 55 MINS., 26.699 SECS. G.M.T.

T        .890741677803833+002  HRS. FROM LAUNCH      3 DAYS, 17 HRS.,  4 MINS., 27.004 SECS. G.E.T.    RAGR  .182673377632620+003

          PHASE ELAPSED TIME     .31012434+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .28683115252606581+000      .39909861799968858-001      -.91078195259294212-003
       RDXYZ        .10435911873854326+000     -.75868459432037819+000      -.50893040837574179+000

SELENOCENTRIC
   XL    9.8782742+02   YL    1.3744691+02   ZL   -3.1366725+00  DXL    6.0660876+02  DYL   -4.4100096+03  DZL   -2.9582623+03
   RL    9.9734873+02 DECL   -1.8019614-01  RAL    7.9213117+00   VL    5.3448549+03 PTHL    2.5383871-02  AZL   -1.2360608+02

SELENOGRAPHIC
   XS   -8.8163405+02   YS   -4.6292616+02   ZS   -5.5903876+01  DXS   -2.3865284+03  DYS    4.6726640+03  DZS   -1.0985883+03
  ALTS    5.8855208+01 LATS   -3.2132550+00 LONS   -1.5229704+02  VRS    5.3606158+03  PTR    2.5308741-02  AZR   -1.0184325+02
   LTS   -1.5167131+00  LNS    1.1379708+02  LTE    1.9488465+00  LNE    7.9139678+00 DSMP    5.0335888+00 RSMP    1.0598489+02
   LIN    1.6770043+02  LAN    4.2624375+01  LAP   -1.1323517+02   DR    2.3678956+00   VT    5.3606153+03 SOLSV  -3.8131524+00

GEOCENTRIC
    X    2.0206107+05    Y   -3.8723938+04    Z   -2.2833102+04   DX    1.5731782+03   DY   -1.5699670+03   DZ   -1.4275899+03
    R    2.0700138+05  DEC   -6.3328464+00   RA   -1.0848891+01    V    2.6415335+03  PTH    4.8775887+01   AZ   -1.3430301+02

GEOGRAPHIC
   XG   -2.0003498+05   YG    4.8106384+04   ZG   -2.2833102+04  DXG    1.9816615+04  DYG    9.0272599+04  DZG   -1.4276487+03
  ALT    2.0355759+05  LAT   -6.3335459+00  LON    1.6647772+02   VE    9.2433105+04  PTE    1.2316442+00  AZE   -9.0753863+01

EARTH-MOON PLANE
  XMP   -9.3833496+02  YMP   -3.3250395+02  ZMP   -6.0606429+01 DXMP   -1.7513542+03 DYMP    5.0254680+03 DZMP   -4.9487811+02
  RMP    9.9734873+02 DEMP   -3.4838700+00 RAMP   -1.6048794+02  VMP    5.3448550+03 PTMP    2.5384069-02 AZMP   -9.5320911+01
  XME   -2.0700110+05  YME   -3.3250312+02  ZME   -6.0606456+01 DXME   -1.9893306+03 DYME    1.6659408+03 DZME   -4.9487814+02

PLANETARY COORDINATES
   XM    2.0107324+05   YM   -3.8861385+04   ZM   -2.2829966+04  DXM    9.6656946+02  DYM    2.8400426+03  DZM    1.5306723+03
   RM    2.0606276+05  DEM   -6.3609336+00  RAM   -1.0938676+01  LOM    1.6638795+02   VM    3.3679453+03 ARGM   -1.3444133+01
 XSUN    4.8873304+06 YSUN   -7.2746818+07 ZSUN   -3.1545827+07  RAS   -8.6156486+01  LOS    9.1170135+01  DES   -2.3396362+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.5037914+05  ECC    7.9201153-01  INC    1.3533989+02  RAN    1.7559937+02  APF    3.1994613+01   RP    3.1277128+04
   VH   -2.0895792+03 RNMP   -1.7985132+02 APMP   -3.3697489+02 INMP    1.6350389+02  APO    2.6948115+05  TFP    5.1904660-01
   TA    1.5703397+02   EA    1.1838602+02   MA    7.8463253+01  SLR    5.6048971+04  PER    4.0630285+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    9.9722845+02 ECCS    4.5915762-04 INCS    1.4639349+02 RANS   -1.7180753+02 APFS    7.5070328+01  RPS    9.9677056+02
  VHS   -2.2143673+03 RNMPS   5.2635065+01 APMPS  -2.5197530+02 INMPS   1.7364275+02 APOS    9.9768633+02 TFPS    8.8496016+01
  TAS    1.0526026+02  EAS    1.0522985+02  MAS    1.0520447+02 SLRS    9.9722821+02 PERS    1.9783801+00 MTAS    3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.8871074-02   WY    5.4783776-01   WZ   -8.3285842-01   PX   -3.6967894-01   PY    7.5981860-01   PZ    5.3480192-01
   QX    9.2580600-01   QY    3.5007062-01   QZ    1.4259638-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

LONG   TERMINATION
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TRANSEARTH
INJECTION BURN

TABLE VIII.- TRANSEARTH INJECTION BURN

TRANSEARTH INJECTION EXTERNAL ΔV TARGET PARAMETERS:

DRTX = 2836.8614 fps
DRTY = 28.8079 fps
DRTZ = 67.1419 fps

VEHICLE CSM INERTIAL MEASUREMENT UNIT

XIMUX	.26239786-01	YIMUX	.77488323-01	ZIMUX	-.99664790-00
XIMUY	-.83960059-00	YIMUY	-.53941564-00	ZIMUY	-.64044034-01
XIMUZ	-.54257014-00	YIMUZ	.83846665-00	ZIMUZ	.50905091-01

VEHICLE CSM IMU MANEUVER ANGLES

ALPHA	.13795053+03	BETA	-.66986173-00	GAMMA	.17991873+03

****** CSM / MOON REF. /PHASE 18- 1
MEAN-OF-EPOCH 1969 25 DEC. 1968, 5 HRS., 55 MINS., 1.550 SECS. G.M.T.

T .8906718195512970+002 HRS. FROM LAUNCH 3 DAYS, 17 HRS., 4 MINS., 1.855 SECS. G.E.T. RAGR .1825683033670800+003

PHASE ELAPSED TIME .3100991900+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .2860315872630433800+000 .4519963539338780900-001 .2644449020644145600-002
RDXYZ .1245423205169637200+000 -.7556838169690303800+000 -.5088691958845343200+000

GD4 THRUST **********
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* ENGINE IGNITION *
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THETA	-6.3200551+00	BETA	5.8525566-01	FUEL	0.0000000	TM	2.0500000+04	VELG	2.8378021+03	TACC	1.4443191+01		
BARC	0.0000000	DELV	0.0000000	MASS	4.5666361+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04		
VRX	7.9839108+02	VRY	-6.7751873+03	VRZ	-4.4976132+03	VDX	7.4463322+01	VDY	-2.3826203+03	VDZ	-1.5397067+03		
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	0.0000000	TDELV	3.1294179+03		

SELENOCENTRIC

XL	9.8507378+02	YL	1.5566453+02	ZL	9.1073066+00	DXL	7.2392776+02	DYL	-4.3925670+03	DZL	-2.9579064+03		
RL	9.9733881+02	DECL	5.2320984-01	RAL	8.9798095+00	VL	5.3448972+03	PTHL	2.5976133-02	AZL	-1.2360297+02		

SELENOGRAPHIC

XS	-8.7153865+02	YS	-4.8215033+02	ZS	-5.1343474+01	DXS	-2.4913993+03	DYS	4.6161267+03	DZS	-1.1049696+03		
ALTS	5.8845304+01	LATS	-2.9509182+00	LONS	-1.5104786+02	VRS	5.3606580+03	PTR	2.5899713-02	AZR	-1.0191007+02		
LTS	-1.5167100+00	LNS	1.1380064+02	LTE	1.9492708+00	LNE	7.9139577+00	DSMP	5.0335873+00	RSMP	1.0598848+02		
LIN	1.6770037+02	LAN	4.2628159+01	LAP	-2.7488327+02	DR	2.4232063+00	VT	5.3606573+03	SOLSV	-5.0644516+00		

GEOCENTRIC

X	2.0205430+05	Y	-3.8717532+04	Z	-2.2827224+04	DX	1.6907226+03	DY	-1.5525670+03	DZ	-1.4272592+03		
R	2.0699292+05	DEC	-6.3314693+00	RA	-1.0847494+01	V	2.7029753+03	PTH	5.0918550+01	AZ	-1.3491847+02		

GEOGRAPHIC

XG	-2.0011639+05	YG	4.7732754+04	ZG	-2.2827224+04	DXG	1.9529853+04	DYG	9.0293802+04	DZG	-1.4273104+03		
ALT	2.0354912+05	LAT	-6.3321687+00	LON	1.6658420+02	VE	9.2392767+04	PTE	1.3012750+00	AZE	-9.0746362+01		

EARTH-MOON PLANE

XMP	-9.3083184+02	YMP	-3.5328387+02	ZMP	-5.8543368+01	DXMP	-1.8628415+03	DYMP	4.9845538+03	DZMP	-5.0196887+02		
RMP	9.9733881+02	DEMP	-3.3651725+00	RAMP	-1.5921646+02	VMP	5.3448973+03	PTMP	2.5975669-02	AZMP	-9.5396703+01		
XME	-2.0699261+05	YME	-3.5328284+02	ZME	-5.8543243+01	DXME	-2.1008208+03	DYME	1.6250093+03	DZME	-5.0196889+02		

PLANETARY COORDINATES

XM	2.0106923+05	YM	-3.8873196+04	ZM	-2.2836331+04	DXM	9.6679483+02	DYM	2.8399999+03	DZM	1.5306472+03		
RM	2.0606178+05	DEM	-6.3627453+00	RAM	-1.0942133+01	LOM	1.6648956+02	VM	3.3679626+03	ARGM	-1.3448019+01		
XSUN	4.8869177+06	YSUN	-7.2746842+07	ZSUN	-3.1545837+07	RAS	-8.6156812+01	LOS	9.1274883+01	DES	-2.3396370+01		

GEOCENTRIC OSCULATING ELEMENTS

SMA	1.5364500+05	ECC	8.0652288-01	INC	1.3473212+02	RAN	1.7546345+02	APF	3.2264112+01	RP	2.9726793+04		
VH	-2.0282339+03	RNMP	-1.7984957+02	APMP	-3.3661128+02	INMP	1.6288858+02	APO	2.7756321+05	TFP	3.0575162+00		
TA	1.5666635+02	EA	1.1549987+02	MA	7.3791040+01	SLR	5.3702129+04	PER	4.1961028+02	MTA	3.5999999+02		

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	9.9722441+02	ECCS	4.6766181-04	INCS	1.4639343+02	RANS	-1.7180753+02	APFS	7.4826826+01	RPS	9.9675804+02		
VHS	-2.2143625+03	RNMPS	5.2638611+01	APMPS	-2.5222301+02	INMPS	1.7364269+02	APOS	9.9769076+02	TFPS	8.8494686+01		
TAS	1.0423673+02	EAS	1.0420187+02	MAS	1.0417589+02	SLRS	9.9722412+02	PERS	1.9783680+00	MTAS	3.5999999+02		

SELENOCENTRIC UNIT VECTORS

WX	-7.8871223-02	WY	5.4783873-01	WZ	-8.3285777-01	PX	-3.7361013-01	PY	7.5832334-01	PZ	5.3419203-01		
QX	9.2422657-01	QY	3.5329647-01	QZ	1.4486821-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000		

BODY ATTITUDE AND FORCES

RRAT	0.0000000	PRAT	0.0000000	YRAT	0.0000000	IGA	0.0000000	MGA	0.0000000	OGA	6.9941136-03		
XIX	2.6239786-02	ETX	7.7488323-02	ZTX	-9.9664790-01	ALO	0.0000000	ALLV	-6.3203873+00	ALLI	3.3354919+01		
XIY	-8. 960059-01	ETY	-5.3941564-01	ZTY	-6.4044034-02	BTO	0.0000000	BTLV	5.8164969-01	BTLI	-9.3171205+00		
XIZ	-5.4257014-01	ETZ	8.3846665-01	ZTZ	5.0905091-02	GMO	6.9941136-03	GMLV	6.5236752-02	GMLI	9.2608757+01		
ALS	9.6087170+00	BTS	8.2989418+01	ALE	1.0403377+02	BTE	-1.7502873+02	ALM	8.3679943+01	BTM	-1.7999999+02		
ALE1	1.0403377+02	BTE1	-1.7502873+02										

****** CSM / MOON REF. /PHASE 18- 2
MEAN-OF-EPOCH 1969 25 DEC. 1968, 5 HRS., 55 MINS., 21.550 SECS. G.M.T.

T .8907273751060150+002 HRS. FROM LAUNCH 3 DAYS, 17 HRS., 4 MINS., 21.855 SECS. G.E.T. RAGR .1826518648490340+003

PHASE ELAPSED TIME .3101191900+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .2866825882911498800+000 .4087755173549126000-001 -.2584869925881445300-003
RDXYZ .1098180514173054400+000 -.8004306050289556000+000 -.5362928851464668500+000

GD4 THRUST **********
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THETA	-5.2819551+00	BETA	5.5390770-01	FUEL	1.3053222+03	TM	2.0500000+04	VELG	2.5447305+03	TACC	1.4868181+01		
BARC	1.0381586+00	DELV	2.9307287+02	MASS	4.4361039+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04		
VRX	7.0511311+02	VRY	-6.7892241+03	VRZ	-4.4980071+03	VDX	6.6773187+01	VDY	-2.1365573+03	VDZ	-1.3806947+03		
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	3.0293602-02	TDELV	3.4224908+03		

SELENOCENTRIC

XL	9.8731578+02	YL	1.4077957+02	ZL	-8.9021202-01	DXL	6.3833992+02	DYL	-4.6526669+03	DZL	-3.1173122+03		
RL	9.9730241+02	DECL	-5.1143363-02	RAL	8.1150001+00	VL	5.6367031+03	PTHL	-2.2404991-01	AZL	-1.2357624+02		

SELENOGRAPHIC

XS	-8.7977836+02	YS	-4.6644413+02	ZS	-5.5063482+01	DXS	-2.5155358+03	DYS	4.9281923+03	DZS	-1.1555778+03		
ALTS	5.8808894+01	LATS	-3.1650482+00	LONS	-1.5206819+02	VRS	5.6524649+03	PTR	-2.2342473-01	AZR	-1.0182758+02		
LTS	-1.5167125+00	LNS	1.1379782+02	LTE	1.9489351+00	LNE	7.9139655+00	DSMP	5.0335886+00	RSMP	1.0598564+02		
LIN	1.6772970+02	LAN	4.2660773+01	LAP	-1.4765288+01	DR	-2.2041715+01	VT	5.6524219+03	SOLSV	-4.0422703+00		

GEOCENTRIC

X	2.0205972+05	Y	-3.8723071+04	Z	-2.2832184+04	DX	1.6049564+03	DY	-1.8126332+03	DZ	-1.5866451+03		
R	2.0699979+05	DEC	-6.3326394+00	RA	-1.0848725+01	V	2.8946445+03	PTH	4.5957690+01	AZ	-1.3273065+02		

GEOGRAPHIC

XG	-2.0005172+05	YG	4.8030345+04	ZG	-2.2832184+04	DXG	1.9761781+04	DYG	9.0523332+04	DZG	-1.5866057+03		

ALT	2.0355600+05	LAT	-6.3333390+00	LON	1.6649941+02	VE	9.2668869+04	PTE	1.2866137+00	AZE	-9.0844496+01

EARTH-MOON PLANE

XMP	-9.3695354+02	YMP	-3.3630840+02	ZMP	-6.0223283+01	DXMP	-1.8457761+03	DYMP	5.3005975+03	DZMP	-5.1884536+02
RMP	9.9730242+02	DEMP	-3.4619794+00	RAMP	-1.6025499+02	VMP	5.6367032+03	PTMP	-2.2405101-01	AZMP	-9.5304751+01
XME	-2.0699951+05	YME	-3.3630829+02	ZME	-6.0223003+01	DXME	-2.0837531+03	DYME	1.9410665+03	DZME	-5.1884536+02

PLANETARY COORDINATES

XM	2.0107241+05	YM	-3.8863850+04	ZM	-2.2831294+04	DXM	9.6661649+02	DYM	2.8400336+03	DZM	1.5306671+03
RM	2.0606256+05	DEM	-6.3613117+00	RAM	-1.0939397+01	LOM	1.6640873+02	VM	3.3679490+03	ARGM	-1.3444944+01
XSUN	4.8872443+06	YSUN	-7.2746823+07	ZSUN	-3.1545829+07	RAS	-8.6156554+01	LOS	9.1191579+01	DES	-2.3396363+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	1.6542386+05	ECC	7.3975635-01	INC	1.3689223+02	RAN	1.7596034+02	APF	3.9669149+01	RP	4.3050510+04
VH	-1.8364862+03	RNMP	-1.7984436+02	APMP	-3.2955464+02	INMP	1.6507626+02	APO	2.8779721+05	TFP	-2.0752323+00
TA	1.4961937+02	EA	1.0986144+02	MA	6.9997706+01	SLR	7.4897395+04	PER	4.6877635+02	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	1.1230920+03	ECCS	1.1207029-01	INCS	1.4642372+02	RANS	-1.7180795+02	APFS	-1.7768388+02	RPS	9.9722674+02
VHS	-1.9226947+03	RNMPS	5.2783220+01	APMPS	-1.4457768+02	INMPS	1.7366822+02	APOS	1.2489572+03	TFPS	8.9084326+01
TAS	-2.2236425+00	EAS	-1.9870052+00	MAS	-1.7643656+00	SLRS	1.1089861+03	PERS	2.3645077+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-7.8804465-02	WY	5.4740338-01	WZ	-8.3315028-01	PX	9.9378511-01	PY	1.0904870-01	PZ	-2.2350202-02
QX	7.8619381-02	QY	-8.2973363-01	QZ	-5.5259485-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

BODY ATTITUDE AND FORCES

RRAT	1.6385012-09	PRAT	4.6288337-09	YRAT	-3.2083892-07	IGA	0.0000000	MGA	4.0554247-06	OGA	0.0000000
XIX	2.6239786-02	ETX	7.7488322-02	ZTX	-9.9664789-01	ALO	0.0000000	ALLV	-5.2821947+00	ALLI	3.3354915+01
XIY	-8.3960062-01	ETY	-5.3941572-01	ZTY	-6.4044029-02	BTO	4.0554247-06	BTLV	5.5151597-01	BTLI	-9.3171211+00
XIZ	-5.4257007-01	ETZ	8.3846661-01	ZTZ	5.0905088-02	GMO	0.0000000	GMLV	6.0973272-02	GMLI	9.2608760+01
ALS	9.6087654+00	BTS	8.2988052+01	ALE	1.0403543+02	BTE	-1.7502908+02	ALM	8.4718043+01	BTM	1.7998963+02
ALEI	1.0403543+02	BTEI	-1.7502908+02								

****** CSM / MOON REF. /PHASE 18- 3
MEAN-OF-EPOCH 1969 25 DEC. 1968, 5 HRS., 55 MINS., 41.550 SECS. G.M.T.

T .890782930660733+002 HRS. FROM LAUNCH 3 DAYS, 17 HRS., 4 MINS., 41.855 SECS. G.E.T. RAGR .182735426330987+003

PHASE ELAPSED TIME .31013919+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .287251791214105000+000 .363040817299202960-001 -.331556424564306000-002
RDXYZ .950957071411691060-001 -.846193006265596710+000 -.564366607393529470+000

GD4 THRUST **********
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THETA	-4.1877042+00	BETA	5.2488665-01	FUEL	2.6106445+03	TM	2.0500000+04	VELG	2.2429052+03	TACC	1.5318941+01
BARC	2.1324697+00	DELV	5.9489954+02	MASS	4.3055716+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04
VRX	6.1161663+02	VRY	-6.8018147+03	VRZ	-4.4974299+03	VDX	5.8853356+01	VDY	-1.8831445+03	VDZ	-1.2169334+03
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	5.8375307-02	TDELV	3.7243175+03

SELENOCENTRIC

XL	9.8927607+02	YL	1.2502884+02	ZL	-1.1418583+01	DXL	5.5276328+02	DYL	-4.9186702+03	DZL	-3.2804965+03
RL	9.9721096+02	DECL	-6.5608073-01	RAL	7.2030906+00	VL	5.9380570+03	PTHL	-2.9687268-01	AZL	-1.2354253+02

SELENOGRAPHIC

XS	-8.8810137+02	YS	-4.4970024+02	ZS	-5.8952190+01	DXS	-2.5420327+03	DYS	5.2467136+03	DZS	-1.2074868+03
ALTS	5.8717456+01	LATS	-3.3891346+00	LONS	-1.5314411+02	VRS	5.9538188+03	PTR	-2.9608764-01	AZR	-1.0174012+02
LTS	-1.5167148+00	LNS	1.1379501+02	LTE	1.9485995+00	LNE	7.9139739+00	DSMP	5.0335900+00	RSMP	1.0598280+02
LIN	1.6775674+02	LAN	4.2693315+01	LAP	-2.9262974+00	DR	-3.0767438+01	VT	5.9537391+03	SOLSV	-2.9646765+00

GEOCENTRIC

X	2.0206486+05	Y	-3.8729476+04	Z	-2.2837676+04	DX	1.5192015+03	DY	-2.0786028+03	DZ	-1.7498095+03
R	2.0700662+05	DEC	-6.3339590+00	RA	-1.0850207+01	V	3.1129400+03	PTH	4.1553464+01	AZ	-1.3109932+02

GEOGRAPHIC

XG	-1.9998629+05	YG	4.8328694+04	ZG	-2.2837676+04	DXG	1.9995078+04	DYG	9.0758126+04	DZG	-1.7498239+03
ALT	2.0356283+05	LAT	-6.3346587+00	LON	1.6641437+02	VE	9.2951079+04	PTE	1.2729192+00	AZE	-9.0944222+01

EARTH-MOON PLANE

XMP	-9.4302058+02	YMP	-3.1828120+02	ZMP	-6.1959577+01	DXMP	-1.8302195+03	DYMP	5.6234575+03	DZMP	-5.3623080+02
RMP	9.9721096+02	DEMP	-3.5622455+00	RAMP	-1.6134982+02	VMP	5.9380569+03	PTMP	-2.9687293-01	AZMP	-9.5209781+01
XME	-2.0700637+05	YME	-3.1828088+02	ZME	-6.1959419+01	DXME	-2.0681942+03	DYME	2.2639403+03	DZME	-5.3623080+02

PLANETARY COORDINATES

XM	2.0107559+05	YM	-3.8854505+04	ZM	-2.2826258+04	DXM	9.6643821+02	DYM	2.8400673+03	DZM	1.5306870+03
RM	2.0606335+05	DEM	-6.3598785+00	RAM	-1.0936661+01	LOM	1.6632791+02	VM	3.3679353+03	ARGM	-1.3441870+01
XSUN	4.8875704+06	YSUN	-7.2746803+07	ZSUN	-3.1545820+07	RAS	-8.6156297+01	LOS	9.1108274+01	DES	-2.3396356+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	1.8252564+05	ECC	6.7086935-01	INC	1.3850133+02	RAN	1.7635767+02	APF	4.9426524+01	RP	6.0074783+04
VH	-1.6181126+03	RNMP	-1.7983931+02	APMP	-3.2008328+02	INMP	1.6670743+02	APO	3.0497649+05	TFP	-7.3163275+00
TA	1.4015786+02	EA	1.0153257+02	MA	6.3870601+01	SLR	1.0037711+05	PER	5.4331823+02	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	1.3017905+03	ECCS	2.3402394-01	INCS	1.4645180+02	RANS	-1.7180739+02	APFS	-1.7724723+02	RPS	9.9714041+02
VHS	-1.6216874+03	RNMPS	5.2922095+01	APMPS	-1.4400042+02	INMPS	1.7369156+02	APOS	1.6064406+03	TFPS	8.9086036+01
TAS	-1.5655284+00	EAS	-1.2334367+00	MAS	-9.4480529-01	SLRS	1.2304950+03	PERS	2.9507295+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-7.8751589-02	WY	5.4699837-01	WZ	-8.3342126-01	PX	9.9435624-01	PY	1.0271902-01	PZ	-2.6541199-02
QX	7.1090221-02	QY	-8.3080778-01	QZ	-5.5200052-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

BODY ATTITUDE AND FORCES

RRAT	4.7786541-10	PRAT	3.3341522-08	YRAT	-1.0682016-06	IGA	0.0000000	MGA	0.0000000	OGA	0.0000000
XIX	2.6239786-02	ETX	7.7488335-02	ZTX	-9.9664789-01	ALO	0.0000000	ALLV	-4.1878834+00	ALLI	3.3354919+01
XIY	-8.3960058-01	ETY	-5.3941578-01	ZTY	-6.4044038-02	BTO	0.0000000	BTLV	5.2352378-01	BTLI	-9.3171205+00
XIZ	-5.4257013-01	ETZ	8.3846656-01	ZTZ	5.0905096-02	GMO	0.0000000	GMLV	5.8516955-02	GMLI	9.2608760+01
ALS	9.6088141+00	BTS	8.2986694+01	ALE	1.0403738+02	BTE	-1.7502941+02	ALM	8.5812293+01	BTM	1.7997930+02
ALEI	1.0403738+02	BTEI	-1.7502941+02								

****** CSM / MOON REF. /PHASE 18- 4
MEAN-OF-EPOCH 1969 25 DEC. 1968, 5 HRS., 56 MINS., 1.550 SECS. G.M.T.

T .890838486215451+002 HRS. FROM LAUNCH 3 DAYS, 17 HRS., 5 MINS., 1.855 SECS. G.E.T. RAGR .182818987812941+003

PHASE ELAPSED TIME .3101591[illegible]+0[illegible] SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	.2877392210499[illegible]7437+000	.3147340911295[illegible]6228-001	-.6530507275551[illegible]1791-002
RDXYZ	.8038091824884[illegible]2675-001	-.8930346867604[illegible]8918+000	-.5931318414333[illegible]7260+000

GD4 THRUST **********
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THETA	-3.0354393+00	BETA	4.9820638-01	FUEL	3.9159667+03	TM	2.0500000+04	VELG	1.9317871+03	TACC	1.5797886+01
BARC	3.2847738+00	DELV	9.0601868+01	MASS	4.1750394+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04
VRX	5.1792024+02	VRY	-6.8128768+03	VRZ	-4.4958304+03	VDX	5.0689685+01	VDY	-1.6219296+03	VDZ	-1.0481300+03
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	8.4482014-02	TDELV	4.0354366+03

SELENOCENTRIC

XL	9.9096476+02	YL	1.0839233+02	ZL	-2.2496633+01	DXL	4.6723056+02	DYL	-5.1909471+03	DZL	-3.4477004+03
RL	9.9711887+02	DECL	-1.2924514+00	RAL	6.2422944+00	VL	6.2490697+03	PTHL	-2.0333844-01	AZL	-1.2350008+02

SELENOGRAPHIC

XS	-8.9651574+02	YS	-4.3189673+02	ZS	-6.3014019+01	DXS	-2.5710795+03	DYS	5.5720859+03	DZS	-1.2607822+03
ALTS	5.8625339+01	LATS	-3.6232840+00	LONS	-1.5427754+02	VRS	6.2648317+03	PTR	-2.0282743-01	AZR	-1.0164669+02
LTS	-1.5167177+00	LNS	1.1379219+02	LTE	1.9482637+00	LNE	7.9139821+00	DSMP	5.0335911+00	RSMP	1.0597996+02
LIN	1.6778175+02	LAN	4.2725823+01	LAP	6.6287993+01	DR	-2.2177498+01	VT	6.2647924+03	SOLSV	-1.8298376+00

GEOCENTRIC

X	2.0206972+05	Y	-3.8736767+04	Z	-2.2843711+04	DX	1.4334904+03	DY	-2.3508460+03	DZ	-1.9169934+03
R	2.0701339+05	DEC	-6.3354315+00	RA	-1.0851946+01	V	3.3550314+03	PTH	3.7678379+01	AZ	-1.2983856+02

GEOGRAPHIC

XG	-1.9992009+05	YG	4.8627827+04	ZG	-2.2843710+04	DXG	2.0229751+04	DYG	9.0998557+04	DZG	-1.9170254+03
ALT	2.0356960+05	LAT	-6.3361312+00	LON	1.6632906+02	VE	9.3239776+04	PTE	1.2602625+00	AZE	-9.1045625+01

EARTH-MOON PLANE

XMP	-9.4903809+02	YMP	-2.9917919+02	ZMP	-6.3753983+01	DXMP	-1.8162988+03	DYMP	5.9535568+03	DZMP	-5.5416071+02
RMP	9.9711885+02	DEMP	-3.6658896+00	RAMP	-1.6250282+02	VMP	6.2490697+03	PTMP	-2.0333908-01	AZMP	-9.5111186+01
XME	-2.0701317+05	YME	-2.9917938+02	ZME	-6.3753929+01	DXME	-2.0542712+03	DYME	2.5940531+03	DZME	-5.5416069+02

PLANETARY COORDINATES

XM	2.0107877+05	YM	-3.8845158+04	ZM	-2.2821220+04	DXM	9.6625987+02	DYM	2.8401010+03	DZM	1.5307069+03
RM	2.0606413+05	DEM	-6.3584448+00	RAM	-1.0933925+01	LOM	1.6624708+02	VM	3.3679215+03	ARGM	-1.3438794+01
XSUN	4.8878966+06	YSUN	-7.2746784+07	ZSUN	-3.1545812+07	RAS	-8.6156041+01	LOS	9.1024970+01	DES	-2.3396350+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	2.0822600+05	ECC	6.1124582-01	INC	1.3974385+02	RAN	1.7668247+02	APF	6.2585922+01	RP	8.0948731+04
VH	-1.3759440+03	RNMP	-1.7983440+02	APMP	-3.0716169+02	INMP	1.6796799+02	APO	3.3550327+05	TFP	-1.1017022+01
TA	1.2724634+02	EA	8.9454116+01	MA	5.4433899+01	SLR	1.3042830+05	PER	6.6201968+02	MTA	3.5999990+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	1.5739567+03	ECCS	3.6650471-01	INCS	1.4647790+02	RANS	-1.7180595+02	APFS	-1.7690109+02	RPS	9.9709547+02
VHS	-1.3110238+03	RNMPS	5.3055800+01	APMPS	-1.4351956+02	INMPS	1.7371292+02	APOS	2.1508220+03	TFPS	8.9087412+01
TAS	-7.5815050-01	EAS	-5.1620822-01	MAS	-3.2701803-01	SLRS	1.3625356+03	PERS	3.9229047+00	MTAS	3.5999999+02

SELENOCENTRIC UNIT VECTORS

WX	-7.8711265-02	WY	5.4662052-01	WZ	-8.3367293-01	PX	9.9476705-01	PY	9.7709686-02	PZ	-2.9854939-02
QX	6.5138597-02	QY	-8.3166027-01	QZ	-5.5145092-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

BODY ATTITUDE AND FORCES

RRAT	-2.5893718-09	PRAT	5.8102265-08	YRAT	3.2569115-07	IGA	0.0000000	MGA	1.4041039-06	OGA	0.0000000
XIX	2.6239782-02	ETX	7.7488303-02	ZTX	-9.9664791-01	ALO	0.0000000	ALLV	-3.0355586+00	ALLI	3.3354917+01
XIY	-8.3960060-01	ETY	-5.3941570-01	ZTY	-6.4044018-02	BTO	1.4941039-06	BTLV	4.9746301-01	BTLI	-9.3171211+00
XIZ	-5.4257011-01	ETZ	8.3846661-01	ZTZ	5.0905075-02	GMO	0.0000000	GMLV	5.8097473-02	GMLI	9.2608760+01
ALS	9.6088549+00	BTS	8.2985319+01	ALE	1.0403963+02	BTE	-1.7502975+02	ALM	8.6964557+01	BTM	1.7996900+02
ALEI	1.0403963+02	BTEI	-1.7502975+02								

****** CSM / MOON REF. /PHASE 18- 5
MEAN-OF-EPOCH 1969 25 DEC. 196[illegible], 5 HRS., 56 MINS., 21.550 SECS. G.M.T.

T .8908940417701[illegible]9+002 HRS. FROM LAUNCH 3 DAYS, 17 HRS., 5 MINS., 21.855 SECS. G.E.T. RAGR .1829025492948[illegible]4+003

PHASE ELAPSED TIME .3101791[illegible]+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	.2881449422785[illegible]9+000	.2637934570452[illegible]2-001	-.9907283523437[illegible]1-002
RDXYZ	.6568231241477[illegible]7-001	-.9410260413945[illegible]0+000	-.6226366694346[illegible]4+000

GD4 THRUST **********
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THETA	-1.8233301+00	BETA	4.7338453-01	FUEL	5.2212890+03	TM	2.0500000+04	VELG	1.6107861+03	TACC	1.6307746+01
BARC	4.4969276+00	DELV	1.2270211+03	MASS	4.0445071+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04
VRX	4.2405858+02	VRY	-6.8223237+03	VRZ	-4.4931560+03	VDX	4.2266685+01	VDY	-1.3524169+03	VDZ	-8.7396446+02
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	1.0882007-01	TDELV	4.3564390+03

SELENOCENTRIC

XL	9.9235202+02	YL	9.0848713+01	ZL	-3.4120025+01	DXL	3.8179190+02	DYL	-5.4699066+03	DZL	-3.6191916+03
RL	9.9708585+02	DECL	-1.9610299+00	RAL	5.2307834+00	VL	6.5699460+03	PTHL	4.7448082-02	AZL	-1.2344701+02

SELENOGRAPHIC

XS	-9.0503014+02	YS	-4.1301037+02	ZS	-6.7253684+01	DXS	-2.6028616+03	DYS	5.9047417+03	DZS	-1.3155596+03
ALTS	5.8592328+01	LATS	-3.8676507+00	LONS	-1.5547042+02	VRS	6.5857087+03	PTR	4.7334405-02	AZR	-1.0154631+02
LTS	-1.5167197+00	LNS	1.1378939+02	LTE	1.9479280+00	LNE	7.9139897+00	DSMP	5.0335919+00	RSMP	1.0597712+02
LIN	1.6780490+02	LAN	4.2758331+01	LAP	1.6828214+02	DR	5.4407246+00	VT	6.5857065+03	SOLSV	-6.3595828-01

GEOCENTRIC

X	2.0207430+05	Y	-3.8744964+04	Z	-2.2850303+04	DX	1.3478734+03	DY	-2.6297720+03	DZ	-2.0884647+03
R	2.0702012+05	DEC	-6.3370603+00	RA	-1.0853949+01	V	3.6185837+03	PTH	3.4284687+01	AZ	-1.2883639+02

GEOGRAPHIC

XG	-1.9985311+05	YG	4.8927768+04	ZG	-2.2850303+04	DXG	2.0465810+04	DYG	9.1245031+04	DZG	-2.0885106+03
ALT	2.0357633+05	LAT	-6.3377602+00	LON	1.6624349+02	VE	9.3535380+04	PTE	1.2487296+00	AZE	-9.1148858+01

EARTH-MOON PLANE

XMP	-9.5501161+02	YMP	-2.7897774+02	ZMP	-6.5608358+01	DXMP	-1.8041687+03	DYMP	6.2913600+03	DZMP	-5.7267498+02
RMP	9.9708585+02	DEMP	-3.7727944+00	RAMP	-1.6371587+02	VMP	6.5699461+03	PTMP	4.7447674-02	AZMP	-9.5008331+01
XME	-2.0701993+05	YME	-2.7897760+02	ZME	-6.5608378+01	DXME	-2.0421387+03	DYME	2.9318700+03	DZME	-5.7267500+02

PLANETARY COORDINATES

XM	2.0108195+05	YM	-3.8835812+04	ZM	-2.2816183+04	DXM	9.6608153+02	DYM	2.8401347+03	DZM	1.5307268+03

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  RM     2.0606491+05  DEM    -6.3570111+00  RAM    -1.0931189+01  LOM     1.6616626+02  VM     3.3679078+03 ARGM    -1.3435720+01
 XSUN    4.8882233+06 YSUN    -7.2746765+07 ZSUN    -3.1545804+07  RAS    -8.6155783+01  LOS    9.0941665+01  DES    -2.3396345+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    2.4944946+05  ECC     5.8057198-01  INC     1.4073077+02  RAN     1.7695280+02  APF    7.9766622+01  RP     1.0462610+05
   VH   -1.1123148+03 RNMP    -1.7982963+02 APMP    -2.9018112+02 INMP     1.6896994+02  APO    3.9427283+05  TFP    -1.0155308+01
   TA    1.1027603+02  EA     7.2963967+01  MA     4.1159258+01  SLR     1.6536906+05  PER    8.6804517+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    2.0364290+03 ECCS    5.1037583-01 INCS    1.4650222+02 RANS    -1.7180369+02 APFS   -1.7658562+02  RPS    9.9708486+02
  VHS   -9.9027267+02 RNMPS   5.3184857+01 APMPS   -1.4307463+02 INMPS    1.7373253+02 APOS   3.0757730+03 TFPS   8.9088775+01
  TAS    1.4041534-01  EAS    7.9947261-02  MAS    3.9144123-02 SLRS     1.5059727+03 PERS   5.7732670+00 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.8682360-02   WY    5.4626708-01   WZ   -8.3390728-01   PX     9.9510894-01   PY   9.3154517-02   PZ   -3.2869690-02
   QX    5.9726600-02   QY   -8.3241485-01   QZ   -5.5092487-01   SXO    0.0000000      SYO  0.0000000      SZO   0.0000000

BODY ATTITUDE AND FORCES
 RRAT   -3.9624517-09 PRAT   -1.8381244-08 YRAT   -1.5334455-09 IGA     0.0000000     MGA    6.4033023-07 OGA    0.0000000
  XIX    2.6239785-02  ETX    7.7488313-02  ZTX   -9.9664790-01 ALO     0.0000000     ALLV  -1.8233553+00 ALLI   3.3354918+01
  XIY   -8.3960059-01  ETY   -5.3941575-01  ZTY   -6.4044026-02 BTO     6.4033023-07  RTLV   4.7313087-01 RTLI  -9.3171207+00
  XIZ   -5.4257012-01  ETZ    8.3846658-01  ZTZ    5.0905079-02 GMO     0.0000000     GMLV   5.5952911-02 GMLI   9.2608760+01
  ALS    9.6089061+00  BTS    8.2983954+01  ALE    1.0404218+02 BTE    -1.7503007+02  ALM    8.8176668+01 BTM    1.7995872+02
 ALEI    1.0404218+02 BTEI   -1.7503007+02
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****** CSM   / MOON  REF.  /PHASE  18-  6
                    MEAN-OF-EPOCH  1969       25  DEC. 1968,  5 HRS.,  56 MINS.,  41.550 SECS. G.M.T.

T          .8909495973248870+002  HRS. FROM LAUNCH       3 DAYS, 17 HRS.,  5 MINS.,  41.855 SECS. G.E.T.     RAGR  .1829861107768470+003

           PHASE ELAPSED TIME      .31019919+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ        .2884690763742744Z+000        .2101529101255429Z-001       -.1345013096780267Z-001
         RDXYZ       .5101183497605922Z-001       -.9902453122333937Z+000       -.6529265390327678+000

GD4     THRUST **********
        **********
 THETA   -5.4961251-01 BETA     4.5034821-01 FUEL     6.5266113+03  TM     2.0500000+04 VELG    1.2792528+03 TACC    1.6851614+01
  BARC    5.7706852+00 DELV     1.5585556+03 MASS     3.9139750+04 MSFL     6.5265838+01 SPI     3.1410000+02 VEX     1.0105868+04
  VRX     3.3008406+02 VRY     -6.8300652+03 VRZ     -4.4893537+03 VDX     3.3567320+01 VDY    -1.0740615+03 VDZ    -6.9408441+02
  TGO     0.0000000    FC       0.0000000    GMLP     0.0000000    GMLY     0.0000000    PLCHNG  1.3156975-01 TDELV    4.6879735+03

SELENOCENTRIC
   XL     9.9346833+02   YL     7.2375265+01   ZL    -4.6321357+01  DXL     2.9651674+02  DYL   -5.7560038+03  DZL   -3.7952693+03
   RL     9.9717759+02 DECL    -2.6624883+00  RAL     4.1666999+00  VL      6.9009832+03 PTHL    4.4786056-01  AZL   -1.2338130+02

SELENOGRAPHIC
   XS    -9.1365406+02   YS    -3.9301642+02   ZS    -7.1676239+01  DXS    -2.6376555+03  DYS    6.2451577+03  DZS   -1.3719269+03
 ALTS     5.8684073+01 LATS    -4.1219244+00 LONS    -1.5672461+02  VRS     6.9167481+03  PTR    4.4683988-01  AZP   -1.0143797+02
  LTS    -1.5167219+00  LNS     1.1378656+02  LTE     1.9475923+00  LNE     7.9139979+00 DSMP    5.0335931+00 RSMP    1.0597428+02
  LIN     1.6782641+02  LAN     4.2790876+01  LAP     1.7405476+02  DR      5.3941976+01  VT     6.9165377+03 SOLSV    6.1868531-01

GEOCENTRIC
    X     2.0207860+05    Y    -3.8754091+04    Z    -2.2857467+04  DX     1.2624200+03  DY   -2.9158354+03  DZ   -2.2645225+03
    R     2.0702681+05  DEC    -6.3388497+00   RA    -1.0856219+01   V     3.9017768+03 PTH    3.1317984+01  AZ   -1.2802159+02

GEOGRAPHIC
   XG    -1.9978535+05   YG     4.9228522+04   ZG    -2.2857467+04  DXG    2.0703238+04  DYG    9.1497997+04  DZG   -2.2645719+03
  ALT     2.0358302+05  LAT    -6.3395499+00  LON     1.6615766+02  VE     9.3838354+04  PTE    1.2384244+00  AZE   -9.1254018+01

EARTH-MOON PLANE
  XMP    -9.6094729+02  YMP    -2.5765071+02  ZMP    -6.7524695+01 DXMP    -1.7940144+03 DYMP   6.6373815+03 DZMP   -5.9181951+02
  RMP     9.9717759+02 DEMP    -3.8828018+00 RAMP    -1.6499078+02  VMP     6.9009833+03 PTMP   4.4786038-01 AZMP   -9.4900649+01
  XME    -2.0702664+05  YME    -2.5765031+02  ZME    -6.7524615+01 DXME    -2.0319822+03 DYME   3.2779050+03 DZME   -5.9181951+02

PLANETARY COORDINATES
   XM     2.0108513+05   YM    -3.8826467+04   ZM    -2.2811146+04  DXM     9.6590325+02  DYM    2.8401683+03  DZM    1.5307467+03
   RM     2.0606569+05  DEM    -6.3555777+00  RAM    -1.0928454+01  LOM     1.6608543+02  VM     3.3678941+03 ARGM    -1.3432646+01
 XSUN     4.8885494+06 YSUN    -7.2746745+07 ZSUN    -3.1545796+07  RAS    -8.6155527+01  LOS    9.0858361+01  DES    -2.3396337+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    3.2370548+05  ECC     6.0415121-01  INC     1.4153261+02  RAN     1.7718117+02  APF    9.9548364+01  RP     1.2813842+05
   VH   -8.2904525+02 RNMP    -1.7982499+02 APMP    -2.7056960+02 INMP     1.6978449+02  APO    5.1927254+05  TFP    -2.1272290+00
   TA    9.0674973+01  EA     5.3371996+01  MA     2.5592307+01  SLR     2.0555340+05  PER    1.2831976+03  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    2.9906524+03 ECCS    6.6659401-01 INCS    1.4652494+02 RANS    -1.7180068+02 APFS   -1.7628867+02  RPS    9.9710146+02
  VHS   -6.5888771+02 RNMPS   5.3309717+01 APMPS   -1.4265303+02 INMPS    1.7375054+02 APOS   4.9842034+03 TFPS   8.9090194+01
  TAS    1.1197332+00  EAS    5.0083812-01  MAS    1.6698667-01 SLRS     1.6617632+03 PERS   1.0274641+01 MTAS   3.5999999+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.8663897-02   WY    5.4593568-01   WZ   -8.3412603-01   PX     9.9540249-01   PY   8.8877340-02   PZ   -3.5703148-02
   QX    5.4643281-02   QY   -8.3309967-01   QZ   -5.5041716-01   SXO    0.0000000      SYO  0.0000000      SZO   0.0000000

BODY ATTITUDE AND FORCES
 RRAT   -2.2437270-09 PRAT    1.4031251-07 YRAT   -6.3163383-07 IGA     0.0000000     MGA    3.4150945-06 OGA    0.0000000
  XIX    2.6239783-02  ETX    7.7488312-02  ZTX   -9.9664789-01 ALO     0.0000000     ALLV  -5.4969672-01 ALLI   3.3354916+01
  XIY   -8.3960061-01  ETY   -5.3941573-01  ZTY   -6.4044021-02 BTO     3.4150945-06  RTLV   4.5036191-01 RTLI  -9.3171211+00
  XIZ   -5.4257008-01  ETZ    8.3846659-01  ZTZ    5.0905081-02 GMO     0.0000000     GMLV   5.5952911-02 GMLI   9.2608760+01
  ALS    9.6089547+00  BTS    8.2982582+01  ALE    1.0404504+02 BTE    -1.7503038+02  ALM    8.9450385+01 BTM    1.7994845+02
 ALEI    1.0404504+02 BTEI   -1.7503038+02
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****** CSM   / MOON  REF.  /PHASE  18-  7
                    MEAN-OF-EPOCH  1969       25  DEC. 1968,  5 HRS.,  57 MINS.,  1.550 SECS. G.M.T.

T          .8910051528796050+002  HRS. FROM LAUNCH       3 DAYS, 17 HRS.,  6 MINS.,  1.855 SECS. G.E.T.     RAGR  .1830696722588010+003

           PHASE ELAPSED TIME      .31021919+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ        .2887118211643640Z+000        .1537418501590982Z-001       -.1716359033103877Z-001
         RDXYZ       .3638508369852263Z-001       -.1040779929427982Z+001       -.6840651528489156Z+000

GD4     THRUST **********
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THETA	7.8736798-01	BETA	4.2904299-01	FUEL	7.8319336+03	TM	2.0500000+04	VELG	9.3647362+02	TACC	1.7433010+01		
BARC	7.1077019+00	DELV	1.9013361+03	MASS	3.7834428+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04		
VRX	2.3606862+02	VRY	-6.8360104+03	VRZ	-4.4843715+03	VDX	2.4572868+01	VDY	-7.8626380+02	VDZ	-5.0810263+02		
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	1.5288965-01	TDELV	5.0307540+03		
SELENOCENTRIC													
XL	9.9430432+02	YL	5.2947671+01	ZL	-5.9110264+01	DXL	2.1149575+02	DYL	-6.0497466+03	DZL	-3.9762688+03		
RL	9.9746606+02	DECL	-3.3973628+00	RAL	3.0481768+00	VL	7.2425739+03	PTHL	9.9150772-01	AZL	-1.2330081+02		
SELENOGRAPHIC													
XS	-9.2239784+02	YS	-3.7188847+02	ZS	-7.6287114+01	DXS	-2.6757433+03	DYS	6.5938623+03	DZS	-1.4300056+03		
ALTS	5.9972548+01	LATS	-4.3863168+00	LONS	-1.5804189+02	VRS	7.2583427+03	PTR	9.8935348-01	AZR	-1.0132062+02		
LTS	-1.5167248+00	LNS	1.1378374+02	LTE	1.9472566+00	LNE	7.9140059+00	DSMP	5.0335947+00	RSMP	1.0597144+02		
LIN	1.6784640+02	LAN	4.2823493+01	LAP	-1.0737528+02	DR	1.2532703+02	VT	7.2572605+03	SOLSV	1.9357078+00		
GEOCENTRIC													
X	2.0208261+05	Y	-3.8764172+04	Z	-2.2865219+04	DX	1.1772206+03	DY	-3.2095446+03	DZ	-2.4455022+03		
R	2.0703347+05	DEC	-6.3408033+00	RA	-1.0858766+01	V	4.2032731+03	PTH	2.8724687+01	AZ	-1.2734681+02		
GEOGRAPHIC													
XG	-1.9971681+05	YG	4.9530124+04	ZG	-2.2865219+04	DXG	2.0942015+04	DYG	9.1757972+04	DZG	-2.4455000+03		
ALT	2.0358968+05	LAT	-6.3415036+00	LON	1.6607156+02	VE	9.4149213+04	PTE	1.2294695+00	AZE	-9.1361215+01		
EARTH-MOON PLANE													
XMP	-9.6685190+02	YMP	-2.3517010+02	ZMP	-6.9505155+01	DXMP	-1.7860560+03	DYMP	6.9921936+03	DZMP	-6.1164618+02		
RMP	9.9746606+02	DEMP	-3.9957067+00	RAMP	-1.6632925+02	VMP	7.2425739+03	PTMP	9.9150702-01	AZMP	-9.4787544+01		
XME	-2.0703333+05	YME	-2.3517091+02	ZME	-6.9504897+01	DXME	-2.0240214+03	DYME	3.6327307+03	DZME	-6.1164618+02		
PLANETARY COORDINATES													
XM	2.0108830+05	YM	-3.8817120+04	ZM	-2.2806108+04	DXM	9.6572491+02	DYM	2.8402019+03	DZM	1.5307666+03		
RM	2.0606647+05	DEM	-6.3541441+00	RAM	-1.0925718+01	LOM	1.6600461+02	VM	3.3678804+03	ARGM	-1.3429570+01		
XSUN	4.8888756+06	YSUN	-7.2746726+07	ZSUN	-3.1545787+07	RAS	-8.6155270+01	LOS	9.0775056+01	DES	-2.3396332+01		
GEOCENTRIC OSCULATING ELEMENTS													
SMA	4.9161252+05	ECC	6.9904827-01	INC	1.4219625+02	RAN	1.7737650+02	APF	1.1822230+02	RP	1.4795164+05		
VH	-5.2747270+02	RNMP	-1.7982047+03	APMP	-2.5204182+02	INMP	1.7045899+02	APO	8.3527341+05	TFP	1.1420982+01		
TA	7.2157867+01	EA	3.4097887+01	MA	1.1644108+01	SLR	2.5137696+05	PER	2.4016120+03	MTA	3.5999999+02		
SELENOCENTRIC OSCULATING ELEMENTS													
SMAS	6.0843965+03	ECCS	9.3622319-01	INCS	1.4654620+02	RANS	-1.7179697+02	APFS	-1.7600606+02	RPS	9.9713819+02		
VHS	-3.1620377+02	RNMPS	5.3430800+01	APMPS	-1.4225008+02	INMPS	1.7376710+02	APOS	1.1179655+04	TFPS	8.9091644+01		
TAS	2.1772307+00	EAS	6.5030259-01	MAS	1.0651615-01	SLRS	1.8309680+03	PERS	2.9845037+01	MTAS	3.5999999+02		
SELENOCENTRIC UNIT VECTORS													
WX	-7.8655028-02	WY	5.4562416-01	WZ	-8.3433068-01	PX	9.9565645-01	PY	8.4817266-02	PZ	-3.8396091-02		
QX	4.9815812-02	QY	-8.3372676-01	QZ	-5.4992551-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000		
BODY ATTITUDE AND FORCES													
PRAT	2.1127204-09	PRAT	-5.9090234-08	YRAT	2.0962272-07	IGA	0.0000000	MGA	3.2016511-06	OGA	0.0000000		
XIX	2.0239784-02	ETX	7.7488292-02	ZTX	-9.9664789-01	ALO	0.0000000	ALLV	7.8739554-01	ALLI	3.3354916+01		
XIY	-8.3960061-01	ETY	-5.3941570-01	ZTY	-6.4044012-02	BTO	3.2016511-06	BTLV	4.2900029-01	BTLI	-9.3171211+00		
XIZ	-5.4257008-01	ETZ	8.3846662-01	ZTZ	5.0905065-02	GMO	0.0000000	GMLV	5.5514057-02	GMLI	9.2608762+01		
ALS	9.6089982+00	BTS	8.2981209+01	ALE	1.0404823+02	BTE	-1.7503069+02	ALM	9.0787365+01	BTM	1.7993819+02		
ALEI	1.0404823+02	BTEI	-1.7503069+02										

****** CSM / MOON REF. /PHASE 18- 8
MEAN-OF-EPOCH 1969 25 DEC. 1968, 5 HRS., 57 MINS., 21.550 SECS. G.M.T.

T .4910607014434323+002 HRS. FROM LAUNCH 3 DAYS, 17 HRS., 6 MINS., 21.856 SECS. G.E.T. RAGR .1831532337407544+003

PHASE ELAPSED TIME .3102391 9+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ .2888734720561990 6+000 .9448452828829475 3-002 -.2105254269433921 3-001
RDXYZ .2182164583342002 1-001 -.1092728103922388 0+001 -.7161155296743337 0+000

GD4	THRUST **********												
	**********												
THETA	2.1891166+00	BETA	4.0932088-01	FUEL	9.1372558+03	TM	2.0500000+04	VELG	5.8165795+02	TACC	1.8055957+01		
BARC	8.5094793+00	DELV	2.2561532+03	MASS	3.6529105+04	MSFL	6.5265838+01	SPI	3.1410000+02	VEX	1.0105868+04		
VRX	1.4210536+02	VRY	-6.8400663+03	VRZ	-4.4781584+03	VDX	1.5262581+01	VDY	-4.0836036+02	VDZ	-3.1559022+02		
TGO	0.0000000	FC	0.0000000	GMLP	0.0000000	GMLY	0.0000000	PLCHNG	1.7291988-01	TDELV	5.3855711+03		
SELENOCENTRIC													
XL	9.9486104+02	YL	3.2539843+01	ZL	-7.2503557+01	DXL	1.2684279+02	DYL	-6.3517059+03	DZL	-4.1625682+03		
RL	9.9803009+02	DECL	-4.1660172+00	RAL	1.8733584+00	VL	7.5952110+03	PTHL	1.6730112+00	AZL	-1.2320323+02		
SELENOGRAPHIC													
XS	-9.3127287+02	YS	-3.4959830+02	ZS	-8.1092162+01	DXS	-2.7174634+03	DYS	6.9514453+03	DZS	-1.4899330+03		
ALTS	5.9536579+01	LATS	-4.6605472+00	LONS	-1.5942395+02	VRS	7.6109854+03	PTR	1.6695423+00	AZR	-1.0119318+02		
LTS	-1.5167271+00	LNS	1.1378093+02	LTE	1.9469208+00	LNE	7.9140141+00	DSMP	5.0335957+00	RSMP	1.0596860+02		
LIN	1.6786503+02	LAN	4.2856219+01	LAP	-8.7001129+00	DR	2.2174519+02	VT	7.6077545+03	SOLSV	3.3165701+00		
GEOCENTRIC													
X	2.0208634+05	Y	-3.8775233+04	Z	-2.2873574+04	DX	1.0923893+03	DY	-3.5114703+03	DZ	-2.6317817+03		
R	2.0704012+05	DEC	-6.3429255+00	RA	-1.0861594+01	V	4.5221690+03	PTH	2.6455662+01	AZ	-1.2677940+02		
GEOGRAPHIC													
XG	-1.9964749+05	YG	4.9832585+04	ZG	-2.2873573+04	DXG	2.1182109+04	DYG	9.2025516+04	DZG	-2.6318036+03		
ALT	2.0359632+05	LAT	-6.3436260+00	LON	1.6598517+02	VE	9.4468535+04	PTE	1.2220086+00	AZE	-9.1470699+01		
EARTH-MOON PLANE													
XMP	-9.7273309+02	YMP	-2.1150593+02	ZMP	-7.1552080+01	DXMP	-1.7805524+03	DYMP	7.3564374+03	DZMP	-6.3221455+02		
RMP	9.9803010+02	DEMP	-4.1112509+00	RAMP	-1.6773285+02	VMP	7.5952112+03	PTMP	1.6730112+00	AZMP	-9.4668438+01		
XME	-2.0703999+05	YME	-2.1150492+02	ZME	-7.1552304+01	DXME	-2.0185155+03	DYME	3.9969879+03	DZME	-6.3221455+02		
DIA	4.7329526+00	LIA	4.0886588+00	DOA	2.7841298+00	LOA	2.7037446+01	DRP	-3.8349658+00	LRP	-1.6442395+02		
PLANETARY COORDINATES													
XM	2.0109148+05	YM	-3.8807772+04	ZM	-2.2801071+04	DXM	9.6554656+02	DYM	2.8402356+03	DZM	1.5307865+03		
RM	2.0606726+05	DEM	-6.3527105+00	RAM	-1.0922981+01	LOM	1.6592378+02	VM	3.3678667+03	ARGM	-1.3426497+01		
XSUN	4.8892022+06	YSUN	-7.2746707+07	ZSUN	-3.1545778+07	RAS	-8.6155013+01	LOS	9.0691752+01	DES	-2.3396395+01		
GEOCENTRIC OSCULATING ELEMENTS													
SMA	1.2008441+06	ECC	8.6454656-01	INC	1.4275394+02	RAN	1.7754535+02	APF	1.3304409+02	RP	1.6265848+05		
VH	-2.0850103+02	RNMP	-1.7981607+03	APMP	-2.3734656+02	INMP	1.7102609+02	APO	2.2390299+06	TFP	2.5812953+01		
TA	5.7473507+01	EA	1.6813613+01	MA	2.9651952+00	SLR	3.0328429+05	PER	9.1685034+03	MTA	3.5999999+02		

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SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -4.8759587+04 ECCS    1.0204511+00 INCS    1.4656615+02 RANS   -1.7179262+02 APFS   -1.7573589+02  RPS    9.9718787+02
  VHS    7.6446152+02 RNMPS   5.3548480+01 APMPS  -1.4186348+02 INMPS   1.7378234+02 APOS   -9.8516363+04 TFPS   8.9093255+01
  TAS    3.3124839+00  EAS    3.3335634-01  MAS    6.8206502-03 SLRS    2.0147693+03 PERS    6.7640650+02 MTAS   1.6850978+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.8655032-02  WY    5.4533068-01  WZ   -8.3452253-01  PX    9.9587616-01  PY    8.0946647-02  PZ   -4.0967115-02
   QX    4.5211176-02  QY   -8.3430335-01  QZ   -5.4944868-01  SXO  -9.6691146-01  SYO  -2.4551801-01  SZO  -6.9304370-02

BODY ATTITUDE AND FORCES
 RRAT    1.7680480-09 PRAT   -1.1541766-07 YRAT    7.4063749-07 IGA    0.0000000   MGA    6.4033023-07 OGA    0.0000000
 XIX     2.6239786-02 ETX     7.7488311-02 ZTX   -9.9664790-01 ALO    0.0000000   ALLV   2.1891566+00 ALLI   3.3354918+01
 XIY    -8.3960059-01 ETY    -5.3941582-01 ZTY   -6.4044025-02 BTO    6.4033023-07 BTLV   4.0891516-01 BTLI  -9.3171205+00
 XIZ    -5.4257012-01 ETZ     8.3846654-01 ZTZ    5.0905075-02 GMO    0.0000000   GMLV   5.6388348-02 GMLI   9.2608762+01
 ALS     9.6090468+00 BTS     8.2979844+01 ALE    1.0405174+02 BTE   -1.7503098+02 ALM    9.2189115+01 BTM    1.7992794+02
 ALEI    1.0405174+02 BTEI   -1.7503098+02
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****** CSM   / MOON  REF.  /PHASE  18-  9
                    MEAN-OF-EPOCH  1969       25  DEC.  1968,  5 HRS.,  57 MINS.,  41.550 SECS.  G.M.T.

T        .8911162639890 41+002  HRS. FROM LAUNCH      3 DAYS,  17 HRS.,  6 MINS.,  41.855 SECS.  G.E.T.    RAGR  .183236795222708+003

          PHASE ELAPSED TIME      .31025919+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .288954445121946 59+000        .322993969106998 76-002        -.251222535431361 62-001
        RDXYZ       .734542632907612 31-002        -.114620072557618 09+001       -.749151262592169 71+000

GD4     THRUST **********
        **********
THETA     3.6569344+00 BETA     3.9079588-01 FUEL     1.0442578+04  TM     2.0500000+04 VELG     2.1392992+02 TACC     1.8725074+01
 BARC     9.9773369+00 DELV     2.6238826+03 MASS     3.5223783+04 MSFL   6.5265838+01 SPI     3.1410000+02 VEX      1.0105868+04
 VRX      4.8310272+01 VRY     -6.8421423+03 VRZ     -4.4706672+03 VDX    5.6134768+00 VDY     -1.7961571+02 VDZ     -1.1607196+02
 TGO      0.0000000    FC       0.0000000    GMLP     0.0000000    GMLY   0.0000000    PLCHNG   1.9178480-01 TDELV    5.7533005+03

SELENOCENTRIC
   XL     9.9513990+02   YL     1.1123697+01   ZL    -8.6519371+01  DXL    4.2696795+01  DYL    -6.6625265+03  DZL    -4.3545952+03
   RL     9.9895582+02 DECL    -4.9686014+00  RAL    6.4042691-01   VL     7.9594962+03 PTHL     2.4877986+00  AZL    -1.2308610+02

SELENOGRAPHIC
   XS    -9.4029173+02   YS    -3.2611562+02   ZS    -8.6097724+01  DXS   -2.7632081+03  DYS    7.3185692+03   DZS    -1.5518662+03
 ALTS     6.0462315+01 LATS    -4.9443270+00 LONS    -1.6087223+02  VRS    7.9752781+03  PTR    2.4828724+00   AZR    -1.0105456+02
  LTS    -1.5167296+00  LNS     1.1377811+02  LTE     1.9465853+00  LNE    7.9140222+00  OSMP   5.0335962+00   RSMP   1.0596576+02
  LIN     1.6788240+02  LAN     4.2889091+01  LAP    -1.9196957+01  OR     3.4549492+02  VT     7.9677910+03   SOLSV  4.7625259+00

GEOCENTRIC
    X     2.0208980+05    Y    -3.8787304+04    Z    -2.2882553+04  DX     1.0080651+03  DY    -3.8222573+03   DZ    -2.8237888+03
    R     2.0704674+05  DEC    -6.3452218+00   RA    -1.0864713+01   V     4.8579449+03  PTH    2.4467623+01   AZ    -1.2629615+02

GEOGRAPHIC
   XG    -1.9957737+05   YG     5.0135954+04   ZG    -2.2882552+04  DXG    2.1423461+04  DYG    9.2301283+04   DZG    -2.8237846+03
  ALT     2.0360295+05  LAT    -6.3459226+00  LON     1.6589849+02  VE     9.4796971+04  PTE    1.2162095+00   AZE    -9.1582556+01

EARTH-MOON PLANE
  XMP    -9.7859927+02  YMP    -1.8662603+02  ZMP    -7.3668018+01 DXMP   -1.7778067+03 DYMP   7.7308346+03   DZMP   -6.5359239+02
  RMP     9.9895582+02 DEMP    -4.2291176+00 RAMP    -1.6920292+02  VMP    7.9594962+03 PTMP   2.4877982+00   AZMP   -9.4542807+01
  XME    -2.0704664+05  YME    -1.8662628+02  ZME    -7.3668068+01 DXME   -2.0157674+03 DYME   4.3713988+03   DZMF   -6.5359235+02
  DIA     5.9471280+00  LIA    -1.9742020+01  DOA     3.8005757-01  LOA    5.0164463+01  DRP    -3.8579091+00  LRP    -1.6468115+02

PLANETARY COORDINATES
   XM     2.0109466+05   YM    -3.8798428+04   ZM    -2.2796034+04  DXM    9.6536829+02  DYM    2.8402693+03   DZM    1.5308063+03
   RM     2.0606804+05  DEM    -6.3512772+00  RAM    -1.0920245+01  LOM    1.6584296+02  VM     3.3678529+03  ARGM   -1.3423424+01
 XSUN     4.8895284+06 YSUN    -7.2746687+07 ZSUN    -3.1545770+07  RAS   -8.6154756+01  LOS    9.0608448+01   DES    -2.3396319+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    -1.8972154+06  ECC     1.0911868+00  INC     1.4322864+02  RAN    1.7769262+02  APF    1.4386455+02   RP     1.7300098+05
   VH     1.1050364+03 RNMP    -1.7981180+02 APMP    -2.2663645+02 INMP   1.7150901+02  APO   -3.9674318+06   TFP    3.8119216+01
   TA     4.6774518+01   EA     1.0376901+01   MA     1.0082416+00  SLR    3.6177741+05  PER    1.8207211+04   MTA    1.5641011+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS    -4.5204107+03 ECCS    1.2206091+00 INCS    1.4658490+02 RANS   -1.7178765+02 APFS   -1.7547715+02  RPS    9.9724367+02
  VHS     2.5107108+03 RNMPS   5.3663114+01 APMPS  -1.4149188+02 INMPS   1.7379636+02 APOS   -1.0038065+04 TFPS   8.9094916+01
  TAS     4.5257498+00  EAS    1.4272961+00  MAS    3.1505642-01 SLRS    2.2144883+03 PERS    1.9093458+01 MTAS   1.4501109+02

SELENOCENTRIC UNIT VECTORS
   WX    -7.8663280-02  WY    5.4505359-01  WZ   -8.3470276-01  PX    9.9606549-01  PY    7.7250589-02  PZ   -4.3426320-02
   QX     4.0811607-02  QY   -8.3483467-01  QZ   -5.4898585-01  SXO  -7.9263762-01  SYO  -5.4199757-01  SZO  -2.7922065-01

BODY ATTITUDE AND FORCES
 RRAT    -2.1931764-09 PRAT   -1.0144539-07 YRAT    2.0621629-07 IGA    0.0000000   MGA   -8.5377364-07 OGA    0.0000000
 XIX      2.6239775-02 ETX     7.7488307-02 ZTX   -9.9664792-01 ALO    0.0000000   ALLV   3.6570173+00 ALLI   3.3354920+01
 XIY     -8.3960058-01 ETY    -5.3941575-01 ZTY   -6.4044016-02 BTO   -8.5377364-07 BTLV   3.8999336-01 BTLI  -9.3171211+00
 XIZ     -5.4257014-01 ETZ     8.3846659-01 ZTZ    5.0905079-02 GMO    0.0000000   GMLV   5.6820448-02 GMLI   9.2608762+01
 ALS      9.6090926+00 BTS     8.2978464+01 ALE    1.0405558+02 BTE   -1.7503127+02 ALM    9.3656933+01 BTM    1.7991769+02
 ALEI     1.0405559+02 BTEI   -1.7503127+02
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****** CSM   / MOON  REF.  /PHASE  18- 10
                    MEAN-OF-EPOCH  1969       25  DEC.  1968,  5 HRS.,  57 MINS.,  52.855 SECS.  G.M.T.

T        .8911476661160 13+002  HRS. FROM LAUNCH      3 DAYS,  17 HRS.,  6 MINS.,  53.160 SECS.  G.E.T.    RAGR  .183284027372213+003

          PHASE ELAPSED TIME      .31027050+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .288964730722866 62+000        -.417821878481793 81-003       -.275047084372127 60-001
        RDXYZ       -.787912642408628 01-003       -.117714676260948 18+001       -.768291383981704 71+000

GD4     THRUST **********
        **********
        * ENGINE CUTOFF     *
        **********
THETA     4.5162405+00 BETA     3.8097130-01 FUEL     1.1180396+04  TM     2.0500000+04 VELG     8.4585989-07 TACC     1.9125693+01
 BARC     1.0836649+01 DELV     2.8378133+03 MASS     3.4485964+04 MSFL   6.5265838+01 SPI     3.1410000+02 VEX      1.0105868+04
 VRX     -4.5799036+00 VRY     -6.8424068+03 VRZ     -4.4658511+03 VDX   -8.4585989-07 VDY     0.0000000    VDZ      0.0000000
 TGO      0.0000000    FC       0.0000000    GMLP     0.0000000    GMLY   0.0000000    PLCHNG   2.0197502-01 TDELV    5.9672313+03
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SELENOCENTRIC

XL	9.9517533+02	YL	-1.4389508+00	ZL	-9.4724388+01	DXL	-4.5799036+00	DYL	-6.8424068+03	DZL	-4.4658511+03
RL	9.9967428+02	DECL	-5.4372331+00	RAL	-8.2845451-02	VL	8.1708247+03	PTHL	3.0057910+00	AZL	-1.2301027+02

SELENOGRAPHIC

XS	-9.4545847+02	YS	-3.1230222+02	ZS	-8.9018339+01	DXS	-2.7910110+03	DYS	7.5305825+03	DZS	-1.5878266+03
ALTS	6.1180762+01	LATS	-5.1088039+00	LONS	-1.6172066+02	VRS	8.1866115+03	PTR	2.9999893+00	AZR	-1.0097084+02
LTS	-1.5167311+00	LNS	1.1377650+02	LTE	1.9463934+00	LNE	7.9140262+00	DSMP	5.0335976+00	RSMP	1.0596414+02
LIN	1.6789171+02	LAN	4.2907730+01	LAP	9.7538482+01	DR	4.2845262+02	VT	8.1753921+03	SOLSV	5.6090199+00

GEOCENTRIC

X	2.0209165+05	Y	-3.8794525+04	Z	-2.2887879+04	DX	9.6068646+02	DY	-4.0021183+03	DZ	-2.9350334+03
R	2.0705049+05	DEC	-6.3465895+00	RA	-1.0866591+01	V	5.0551251+03	PTH	2.3453837+01	AZ	-1.2605362+02

GEOGRAPHIC

XG	-1.9953740+05	YG	5.0307772+04	ZG	-2.2887879+04	DXG	2.1560387+04	DYG	9.2461079+04	DZG	-2.9350185+03
ALT	2.0360669+05	LAT	-6.3472904+00	LON	1.6584938+02	VE	9.4986928+04	PTE	1.2137366+00	AZE	-9.1646936+01

EARTH-MOON PLANE

XMP	-9.8191205+02	YMP	-1.7201179+02	ZMP	-7.4895603+01	DXMP	-1.7776027+03	DYMP	7.9472552+03	DZMP	-6.6606285+02
RMP	9.9967428+02	DEMP	-9.4296259+00	RAMP	-1.7006372+02	VMP	8.1708246+03	PTMP	3.0057909+00	AZMP	-9.4468697+01
XME	-2.0705040+05	YME	-1.7201155+02	ZME	-7.4895815+01	DXME	-2.0155621+03	DYME	4.5878274+03	DZME	-6.6606290+02
DIA	6.1110421+00	LIA	-2.6727019+01	DOA	-3.3277383-01	LOA	5.6793302+01	DRP	-3.8705244+00	LRP	-1.6482152+02

PLANETARY COORDINATES

XM	2.0109648+05	YM	-3.8793086+04	ZM	-2.2793155+04	DXM	9.6526635+02	DYM	2.8402884+03	DZM	1.5308177+03
RM	2.0606849+05	DEM	-6.3504580+00	RAM	-1.0918682+01	LOM	1.6579729+02	VM	3.3678450+03	ARGM	-1.3421667+01
XSUN	4.8897146+06	YSUN	-7.2746676+07	ZSUN	-3.1545765+07	RAS	-8.6154609+01	LOS	9.0561364+01	DES	-2.3396316+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	-7.2940031+05	ECC	1.2432245+00	INC	1.4346677+02	RAN	1.7776778+02	APF	1.4857625+02	RP	1.7740802+05
VH	1.7821816+03	RNMP	-1.7980943+02	APMP	-2.2198097+02	INMP	1.7175133+02	APO	-1.6362086+06	TFP	4.3890414+01
TA	4.2125433+01	EA	1.4610361+01	MA	3.7510898+00	SLR	3.9796603+05	PER	4.3402763+03	MTA	1.4354848+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-2.9215436+03	ECCS	1.3413521+00	INCS	1.4659500+02	RANS	-1.7178459+02	APFS	-1.7533573+02	RPS	9.9727517+02
VHS	3.1230537+03	RNMPS	5.3726669+01	APMPS	-1.4128807+02	INMPS	1.7380381+02	APOS	-6.8403623+03	TFPS	8.9095803+01
TAS	5.2462006+00	EAS	2.0047510+00	MAS	6.8487656-01	SLRS	2.3349724+03	PERS	9.9205623+00	MTAS	1.3820346+02

SELENOCENTRIC UNIT VECTORS

WX	-7.8671382-02	WY	5.4490363-01	WZ	-8.3479989-01	PX	9.9616030-01	PY	7.5235111-02	PZ	-4.4769319-02
QX	3.8411298-02	QY	-8.3511657-01	QZ	-5.4873020-01	SXO	-7.1705317-01	SYO	-6.1268358-01	SZO	-3.3234544-01

BODY ATTITUDE AND FORCES

RRAT	-3.8080780-10	PRAT	2.9359125-06	YRAT	-2.8576439-05	IGA	0.0000000	MGA	-1.9850237-05	OGA	6.9941136-03
XIX	2.6239819-02	ETX	7.7488326-02	ZTX	-9.9664790-01	ALO	0.0000000	ALLV	4.5163286+00	ALLI	3.3354930+01
XIY	-8.3960039-01	ETY	-5.3941608-01	ZTY	-6.4044078-02	BTO	-1.9850237-05	BTLV	3.7975276-01	BTLI	-9.3171161+00
XIZ	-5.4257043-01	ETZ	8.3846637-01	ZTZ	5.0905047-02	GMO	6.9941136-03	GMLV	5.8097473-02	GMLI	9.2608763+01
ALS	9.6091389+00	BTS	8.2977720+01	ALE	1.0405789+02	BTE	-1.7503143+02	ALM	9.4516239+01	BTM	1.7991188+02
ALEI	1.0405789+02	BTEI	-1.7503144+02								

THRUST TERMINATION

TRANSEARTH COAST
TO ENTRY INTERFACE

TABLE IX.- TRANSEARTH COAST TO ENTRY INTERFACE

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****** CSM   / MOON  REF.  /PHASE  19-  1
                  MEAN-OF-EPOCH  1969        25  DEC. 1968,  5 HRS.,  57 MINS.,  52.855 SECS. G.M.T.

T        .891147666116013+002  HRS. FROM LAUNCH        3 DAYS, 17 HRS.,  6 MINS.,  53.160 SECS. G.E.T.    RAGR  .183284027372213+003

          PHASE ELAPSED TIME      .31027050+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .288964730722866662+000      -.417821878848179381-003      -.275047084372127 60-001
        RDXYZ       -.787912642408628 01-003     -.117714676260948 18+001      -.768291383981704 71+000

SELENOCENTRIC
   XL     9.9517533+02   YL    -1.4389508+00   ZL    -9.4724388+01  DXL    -4.5799036+00  DYL    -6.8424068+03  DZL    -4.4658511+03
   RL     9.9967428+02 DECL    -5.4372331+00   RAL   -8.2845451-02  VL      8.1708247+03 PTHL     3.0057910+00  AZL    -1.2301027+02

SELENOGRAPHIC
   XS    -9.4545847+02   YS    -3.1230222+02   ZS    -8.9018339+01  DXS    -2.7910110+03  DYS     7.5305825+03  DZS    -1.5878266+03
 ALTS     6.1180762+01 LATS    -5.1088039+00 LONS    -1.6172066+02  VRS     8.1866115+03  PTR     2.9999893+00  AZR    -1.0097084+02
  LTS    -1.5167311+00  LNS     1.1377650+02  LTE     1.9463934+00  LNE     7.9140262+00 DSMP     5.0335976+00 RSMP     1.0596414+02
  LIN     1.6789171+02  LAN     4.2907730+01  LAP     9.7538482+01  DR      4.2845262+02  VT      8.1753921+03 SOLSV    5.6090199+00

GEOCENTRIC
    X     2.0209165+05   Y    -3.8794525+04   Z    -2.2887879+04  DX      9.6068646+02  DY     -4.0021183+03  DZ    -2.9350334+03
    R     2.0705049+05 DEC    -6.3465895+00   RA    -1.0866591+01  V       5.0551251+03  PTH    2.3453837+01  AZ    -1.2605362+02

GEOGRAPHIC
   XG    -1.9953740+05   YG     5.0307772+04   ZG    -2.2887879+04  DXG     2.1560387+04  DYG    9.2461079+04  DZG    -2.9350185+03
  ALT     2.0360669+05  LAT    -6.3472904+00   LON    1.6584938+02  VE      9.4986928+04  PTE    1.2137366+00  AZE    -9.1646936+01

EARTH-MOON PLANE
  XMP    -9.8191205+02  YMP    -1.7201179+02  ZMP    -7.4895603+01 DXMP    -1.7776027+03 DYMP    7.9472552+03 DZMP    -6.6606285+02
  RMP     9.9967428+02 DEMP    -4.2966259+00  RAMP    -1.7006372+02  VMP     8.1708246+03 PTMP    3.0057909+00 AZMP    -9.4468697+01
  XME    -2.0705040+05  YME    -1.7201155+02  ZME    -7.4895815+01 DXME    -2.0155621+03 DYME    4.5878274+03 DZME    -6.6606290+02
  DIA     6.1110421+00  LIA    -2.6727019+01  DOA    -3.3277383-01  LOA     5.6793302+01  DRP    -3.8705244+00 LRP    -1.6482152+02

PLANETARY COORDINATES
   XM     2.0109648+05   YM    -3.8793086+04   ZM    -2.2793155+04  DXM     9.6526635+02  DYM    2.8402884+03  DZM     1.5308177+03
   RM     2.0606849+05 DEM    -6.3504580+00   RAM   -1.0918682+01  LOM     1.6579729+02  VM     3.3678450+03 ARGM    -1.3421667+01
 XSUN     4.8897146+06 YSUN   -7.2746676+07 ZSUN    -3.1545765+07  RAS    -8.6154609+01  LOS    9.0561364+01  DES    -2.3396316+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    -7.2940031+05   ECC     1.2432245+00   INC     1.4346677+02  RAN     1.7776778+02  APF     1.4857625+02  RP     1.7740802+05
    VH     1.7821816+03 RNMP    -1.7980943+02 APMP    -2.2198097+02 INMP     1.7175133+02  APO    -1.6362086+06 TFP    4.3890414+01
    TA     4.2125433+01   EA     1.4610361+01   MA     3.7510898+00  SLR     3.9796603+05  PER    4.3402763+03  MTA    1.4354848+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    -2.9215436+03 ECCS     1.3413521+00 INCS     1.4659500+02 RANS    -1.7178459+02 APFS    -1.7533573+02 RPS    9.9727517+02
   VHS     3.1230537+03 RNMPS    5.3726669+01 APMPS   -1.4128807+02 INMPS    1.7380381+02 APOS    -6.8403623+03 TFPS   8.9095893+01
   TAS     5.2462006+00  EAS     2.0047510+00   MAS     6.8487656-01 SLRS     2.3349724+03 PERS     9.9205623+00 MTAS    1.3820346+02

SELENOCENTRIC UNIT VECTORS
   WX    -7.8671382-02   WY     5.4490363-01   WZ    -8.3479989-01  PX      9.9616030-01  PY     7.5235111-02  PZ    -4.4769319-02
   QX     3.8411298-02   QY    -8.3511657-01   QZ    -5.4873020-01  SXO    -7.1705317-01  SYO    -6.1268358-01  SZO   -3.3234544-01

****** CSM   / MOON  REF.  /PHASE  19-  2
                  MEAN-OF-EPOCH  1969        25  DEC. 1968,  6 HRS.,  50 MINS.,  59.695 SECS. G.M.T.

T        .899999999999999+002  HRS. FROM LAUNCH        3 DAYS, 17 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .196598882058604+003

          PHASE ELAPSED TIME      .31345733+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        -.133017291451608 72+000     -.753411866033576 65+000      -.479199443074924 70+000
        RDXYZ       -.561679228961811 93+000     -.624285586028512 80+000      -.354504829105970 69+000

SELENOCENTRIC
   XL    -4.5810271+02   YL    -2.5947004+03   ZL    -1.6503310+03  DXL    -3.2648756+03  DYL    -3.6287878+03  DZL    -2.0606320+03
   RL     3.1090063+03 DECL    -3.2061053+01   RAL   -1.0001257+02  VL      5.2984636+03 PTHL     6.0321490+01  AZL    -8.0081645+01

SELENOGRAPHIC
   XS    -5.9772839+02   YS     2.9989257+03   ZS    -5.6132485+02  DXS     1.7110561+03  DYS    5.0102612+03  DZS    -5.5108046+02
 ALTS     2.1705126+03 LATS    -1.0401680+01 LONS     1.0127214+02  VRS     5.3229804+03  PTR    5.9861662+01  AZR    -8.3884253+01
  LTS    -1.5171127+00  LNS     1.1332771+02  LTE     1.8928514+00  LNE     7.9149704+00 DSMP    5.0337832+00 RSMP    1.0551189+02
  LIN     1.6789256+02  LAN     4.2433798+01  LAP    -1.3627998+02  DR      4.6033967+03  VT     2.6726125+03 SOLSV    7.5086854+01

GEOCENTRIC
    X     2.0113716+05   Y    -3.9896774+04   Z    -2.3639809+04  DX     -2.3280391+03  DY    -7.8324913+02  DZ    -5.2670527+02
    R     2.0641403+05 DEC    -6.5762961+00   RA    -1.1219334+01  V       2.5121035+03  PTH   -5.4960943+01  AZ    -1.2214147+02

GEOGRAPHIC
   XG    -1.8135811+05   YG     9.5692984+04   ZG    -2.3639808+04  DXG     4.4854166+04  DYG    8.0441224+04  DZG    -5.2670132+02
  ALT     2.0297025+05  LAT    -6.5770242+00   LON    1.5218178+02  VE      9.2103011+04  PTE   -1.2796096+00  AZE    -9.0477454+01

EARTH-MOON PLANE
  XMP    -1.9751517+02  YMP     3.0950473+03  ZMP    -2.1815211+02 DXMP     2.3158375+03 DYMP    4.7643445+03 DZMP    -1.0786700+02
  RMP     3.1090063+03 DEMP    -4.0236246+00 RAMP     9.3651466+01  VMP     5.2984636+03 PTMP    6.0321490+01 AZMP    -8.5284354+01
  XME    -2.0639071+05  YME     3.0950475+03  ZME    -2.1815212+02 DXME     2.0782591+03 DYME    1.4070777+03 DZME    -1.0786699+02
  DIA     6.1111064+00  LIA    -2.7202689+01  DOA    -3.2736935-01  LOA     5.6283069+01  DRP    -3.8731431+00 LRP    -1.6531454+02

PLANETARY COORDINATES
   XM     2.0159527+05   YM    -3.7302074+04   ZM    -2.1989477+04  DXM     9.3683642+02  DYM    2.8455387+03  DZM     1.5339267+03
   RM     2.0619319+05 DEM    -6.1219516+00   RAM   -1.0483126+01  LOM     1.5291799+02  VM     3.3656625+03 ARGM    -1.2932005+01
 XSUN     4.9417175+06 YSUN   -7.2743582+07 ZSUN    -3.1544422+07  RAS    -8.6113673+01  LOS    7.7287444+01  DES    -2.3395307+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA     1.4356934+05   ECC     8.5646322-01   INC     1.4726342+02  RAN     1.7911096+02  APF    -5.7486165+00  RP     2.0607480+04
    VH    -2.2257356+03 RNMP     1.7993215+02 APMP    -1.7181712+01 INMP     1.7562389+02  APO     2.6653119+05 TFP    1.7270833+02
    TA    -1.6202466+02   EA    -1.2073652+02   MA    -7.8558064+01  SLR     3.8257024+04  PER    3.7901901+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS    -2.9246838+03 ECCS     1.3409867+00 INCS     1.4659674+02 RANS    -1.7178020+02 APFS    -1.7532843+02 RPS    9.9727826+02
   VHS     3.1213766+03 RNMPS    5.3266187+01 APMPS   -1.4125552+02 INMPS    1.7380401+02 APOS    -6.8466461+03 TFPS   8.9095874+01
   TAS     1.0070450+02  EAS     5.7068775+01  MAS     3.2756293+01 SLRS     2.3346150+03 PERS     9.9365618+00 MTAS    1.3822094+02
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SELENOCENTRIC UNIT VECTORS
   WX   -7.8709536-02   WY    5.4487248-01   WZ   -8.3481663-01   PX    9.9615958-01   PY    7.5203776-02   PZ   -4.4837132-02
   QX    3.8350844-02   QY   -8.3513969-01   QZ   -5.4869919-01   SXO  -7.1730406-01   SYO  -6.1250105-01   SZO  -3.3214036-01

****** CSM   / MOON  REF. /PHASE  19-  3
                MEAN-OF-EPOCH  1969       25  DEC. 1968, 11 HRS., 50 MINS., 59.695 SECS. G.M.T.

T       .94999999999999+002  HRS. FROM LAUNCH       3 DAYS, 22 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .27180421695044E+003

        PHASE ELAPSED TIME     .3314573+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ      -.25700215406558090+001      -.30010431871756914+001      -.17166240655325580+001
       RDXYZ     -.44986743156229788+000      -.39167294392879222+000      -.21334942335150278+000

SELENOCENTRIC
   XL   -8.8509834+03   YL   -1.0335393+04   ZL   -5.9119391+03   DXL   -2.6149466+03   DYL   -2.2766792+03   DZL   -1.2401372+03
   RL    1.4836148+04  DECL   -2.3483321+01  RAL   -1.3057595+02   VL    3.6822756+03  PTHL    8.1332237+01  AZL   -6.5579512+01

SELENOGRAPHIC
   XS    4.9792539+03   YS    1.3862515+04   ZS   -1.6106202+03   DXS    1.9637410+03   DYS    3.1515986+03   DZS   -2.9600990+02
  ALTS   1.3897654+04  LATS   -6.2323436+00  LONS   7.0268566+01   VRS    3.7251140+03   PTR    7.7744379+01   AZR   -8.2751976+01
   LTS   -1.5192858+00  LNS    1.1079287+02   LTE   1.5491398+00   LNE    7.9084326+00  DSMP    5.0346965+00  RSMP   1.0296892+02
   LIN    1.6791634+02  LAN    3.9553015+01   LAP   -1.3497622+02   DR    3.6402196+03   VT    7.9074309+02  SOLSV   4.9310215+01

GEOCENTRIC
     X    1.9528140+05    Y   -3.9168170+04    Z   -2.3333611+04   DX   -1.8389768+03   DY    5.9445941+02   DZ    3.0914759+02
     R    2.0053286+05  DEC   -6.6819610+00   RA   -1.1341493+01    V    1.9572404+03  PTH   -8.3060074+01   AZ    6.9287002+01

GEOGRAPHIC
    XG    4.5297039+04   YG    1.9395141+05   ZG   -2.3333611+04   DXG    8.5283417+04   DYG   -2.1889408+04   DZG    3.0942743+02
   ALT    1.9708909+05  LAT   -6.6827223+00  LON    7.6854292+01   VE    8.8048301+04  PTE   -1.2644094+00  AZE   -8.9945821+01

EARTH-MOON PLANE
   XMP    6.7946996+03  YMP    1.3184343+04  ZMP   -3.4124714+02  DXMP    2.1583437+03  DYMP    2.9832947+03  DZMP   -2.5678260+01
   RMP    1.4836148+04  DEMP   -1.3179800+00  RAMP   6.2735174+01  VMP    3.6822757+03  PTMP    8.1332232+01  AZMP   -8.3993832+01
   XME   -2.0009869+05  YME    1.3184343+04  ZME   -3.4124760+02  DXME    1.9233119+03  DYME   -3.6194212+02  DZME   -2.5678257+01
   DIA    6.0726871+00  LIA   -3.0552168+01  DOA   -3.2240802-01  LOA    5.3397749+01  DRP   -3.8647256+00  LRP   -1.6843259+02

PLANETARY COORDINATES
    XM    2.0413239+05    YM   -2.8832778+04    ZM   -1.7421672+04   DXM    7.7596977+02   DYM    2.8711387+03   DZM    1.5492848+03
    RM    2.0689339+05   DEM   -4.8303704+00   RAM   -8.0395873+00   LOM    8.0156197+01    VM    3.3534832+03  ARGM   -1.0177634+01
  XSUN    5.2354121+06  YSUN   -7.2725524+07  ZSUN   -3.1536580+07   RAS   -8.5882456+01   LOS    2.3133270+00   DES   -2.3389404+01

GEOCENTRIC     OSCULATING ELEMENTS
   SMA    1.2019414+05   ECC    9.9595335-01   INC    2.1718946+01   RAN    5.7627653+00   APF    1.5938462+02    RP    4.8638847+02
    VH   -2.8495716+03  RNMP    1.7544080+02  APMP   -1.4931733+00  INMP    7.0406011+00   APO    2.3990190+05   TFP    1.6746160+02
    TA   -1.7771135+02    EA   -1.3215385+02    MA   -8.9849783+01   SLR    9.7079833+02   PER    2.9033100+02   MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -2.9322543+03  ECCS    1.3458272+00  INCS    1.4662851+02  RANS   -1.7184661+02  APFS   -1.7502274+02   RPS    1.0140514+03
   VHS    3.1173446+03 RNMPS    5.0403518+01 APMPS   -1.4100233+02 INMPS    1.7385144+02  APOS   -6.8785620+03  TFPS    8.9089256+01
   TAS    1.2860153+02   EAS    1.2520400+02   MAS    2.1331646+02  SLRS    2.3787940+03  PERS    9.9751677+00  MTAS   1.3799080+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.8012184-02   WY    5.4450503-01   WZ   -8.3512177-01   PX    9.9643505-01   PY    6.9565654-02   PZ   -4.7723845-02
   QX    3.2109918-02   QY   -8.3586764-01   QZ   -5.4799086-01   SXO  -7.1889899-01   SYO  -6.1109416-01   SZO  -3.3128219-01

****** CSM   / MOON  REF. /PHASE  19-  4
                MEAN-OF-EPOCH  1969       25  DEC. 1968, 16 HRS., 50 MINS., 59.695 SECS. G.M.T.

T       .99999999999999+002  HRS. FROM LAUNCH       4 DAYS,  3 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .34700955184228E+003

        PHASE ELAPSED TIME     .3494573+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ      -.47545081471525372+001      -.48759440855742234+001      -.27358935689461200+001
       RDXYZ     -.42811954663786213+000      -.36287757821202613+000      -.19700571610124298+000

SELENOCENTRIC
   XL   -1.0374210+04   YL   -1.6792427+04   ZL   -9.4222356+03   DXL   -2.4885326+03   DYL   -2.1093003+03   DZL   -1.1451361+03
   RL    2.5276054+04  DECL   -2.1886750+01  RAL   -1.3427756+02   VL    3.4573513+03  PTHL    8.4310926+01  AZL   -6.4417956+01

SELENOGRAPHIC
   XS    1.1108556+04   YS    2.2572191+04   ZS   -2.4443899+03   DXS    2.1820898+03   DYS    2.7492347+03   DZS   -2.7067983+02
  ALTS   2.4333559+04  LATS   -5.5496186+00  LONS   6.3796604+01   VRS    3.5203799+03   PTR    7.7757461+01   AZR   -8.5211346+01
   LTS   -1.5214821+00  LNS    1.0825832+02   LTE   1.2837843+00   LNE    7.8821943+00  DSMP    5.0353707+00  RSMP   1.0044521+02
   LIN    1.6816333+02  LAN    3.6176214+01   LAP   -1.2286200+02   DR    3.4403220+03   VT    7.4649794+02  SOLSV   4.5454254+01

GEOCENTRIC
     X    1.4981835+05    Y   -3.7090214+04    Z   -2.2236117+04   DX   -1.8736336+03   DY    7.8060923+02   DZ    4.1579542+02
     R    1.9468214+05  DEC   -6.5584968+00   RA   -1.1056201+01    V    2.0718926+03  PTH   -7.7532479+01   AZ    6.5435665+01

GEOGRAPHIC
    XG    1.9329789+05   YG    6.5280238+03   ZG   -2.2236117+04   DXG    8.9126522+02   DYG   -8.5306451+04   DZG    4.1579960+02
   ALT    1.9123835+05  LAT   -6.5592667+00  LON    1.9342481+00   VE    8.5312122+04  PTE   -1.3588026+00  AZE   -8.9875079+01

EARTH-MOON PLANE
   XMP    1.4040775+04   YMP    2.1013535+04  ZMP   -4.0848279+02  DXMP    2.1949030+03  DYMP    2.6711875+03  DZMP   -2.0893351+01
   RMP    2.5276054+04  DEMP   -9.2598941-01  RAMP   5.6250034+01   VMP    3.4573513+03  PTMP    8.4310926+01  AZMP   -8.4187302+01
   XME   -1.9354431+05   YME    2.1013534+04  ZME   -4.0848209+02  DXME    1.9630596+03  DYME   -6.6234418+02  DZME   -2.0893320+01
   DIA    5.8509441+00   LIA   -3.6523589+01  DOA   -3.1581463-01   LOA    5.0294489+01   DRP   -3.8069677+00   LRP   -1.7297342+02

PLANETARY COORDINATES
    XM    2.0619256+05    YM   -2.0297787+04    ZM   -1.2813682+04   DXM    6.1489901+02   DYM    2.8899095+03   DZM    1.5609315+03
    RM    2.0758508+05   DEM   -5.5390230+00   RAM   -5.6221358+00   LOM    7.3683123+00    VM    3.3415841+03  ARGM   -7.4423839+00
  XSUN    5.5290303+06  YSUN   -7.2706482+07  ZSUN   -3.1528312+07   RAS   -8.5651258+01   LOS    2.8733919+02   DES   -2.3383162+01

GEOCENTRIC     OSCULATING ELEMENTS
   SMA    1.1876200+05   ECC    9.8612341-01   INC    2.5372224+01   RAN    2.9737660+00   APF    1.6011813+02    RP    1.6480129+03
    VH   -2.8066135+03  RNMP    1.7166881+02  APMP   -2.2844592+00  INMP    3.2239909+00   APO    2.3587598+05   TFP    1.6922168+02
    TA   -1.7557743+02    EA   -1.3041043+02    MA   -8.7389643+01   SLR    3.2731539+03   PER    2.8515743+02   MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -2.9380832+03  ECCS    1.3770823+00  INCS    1.4682009+02  RANS   -1.7218416+02  APFS   -1.7351380+02   RPS    1.1078987+03
   VHS    3.1142513+03 RNMPS    4.7229416+01 APMPS   -1.3964780+02 INMPS    1.7411434+02  APOS   -6.9840631+03  TFPS    8.9054954+01
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 TAS    1.3058017+02  EAS    1.5069162+02  MAS    3.9382783+02 SLRS    2.6335664+03 PERS    1.0004921+01 MTAS    1.3656651+02

SELENOCENTRIC UNIT VECTORS
   WX   -7.4422833-02  WY    5.4218575-01  WZ   -8.3695631-01  PX    9.9722600-01  PY    4.1451454-02  PZ   -6.1821640-02
   QX    1.1742441-03  QY   -8.3923553-01  QZ   -5.4376666-01  SXO  -7.2335131-01  SYO  -6.0708541-01  SZO  -3.2895289-01
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****** CSM   / EARTH REF.  /PHASE  19-  5
                    MEAN-OF-EPOCH  1969       25  DEC. 1968, 21 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .1049999999999999+003  HRS. FROM LAUNCH      4 DAYS, 8 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .622148867341256+002

          PHASE ELAPSED TIME     .36745734+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .5345585429209175 2+002      -.1005369465300476 3+002      -.6073347605653910 4+001
        RDXYZ      -.3434909100106704 4+000      .1509169910522984 9+000       .8109661553643794 2-001

GEOCENTRIC
     X    1.8409841+05    Y   -3.4624255+04    Z   -2.0916205+04   DX   -1.9966113+03   DY    8.7723593+02   DZ    4.7139069+02
     R    1.8849018+05  DEC   -6.3710664+00   RA   -1.0651462+01    V    2.2311899+03  PTH   -7.5855017+01   AZ    6.4731455+01

GEOGRAPHIC
    XG    5.5186568+04   YG   -1.7901258+05   ZG   -2.0916205+04  DXG   -7.9471049+04  DYG   -2.2276604+04  DZG    4.7160328+02
   ALT    1.8504639+05  LAT   -6.3718392+00  LON    2.8713365+02   VE    8.2535552+04  PTE   -1.5020940+00  AZE   -8.9838375+01

EARTH-MOON PLANE
   XMP   -1.8643384+05  YMP    2.7762490+04  ZMP   -4.6704040+02 DXMP    2.0597686+03 DYMP   -8.5743823+02 DZMP   -1.9019434+01
   RMP    1.8849018+05 DEMP   -1.4196745-01 RAMP    1.7153013+02  VMP    2.2311899+03 PTMP   -7.5855019+01 AZMP    9.2562763+01
   XME   -1.8643384+05  YME    2.7762490+04  ZME   -4.6704040+02 DXME    2.0597686+03 DYME   -8.5743823+02 DZME   -1.9019434+01

PLANETARY COORDINATES
    XM    2.0777573+05   YM   -1.1717182+04   ZM   -8.1770238+03  DXM    4.5398630+02  DYM    2.9019464+03  DZM    1.5689149+03
    RM    2.0826643+05  DEM   -2.2501437+00  RAM   -3.2276858+00  LOM    2.9455742+02   VM    3.3299986+03 ARGM   -4.7256827+00
  XSUN    5.8225683+06 YSUN   -7.2686457+07 ZSUN   -3.1519619+07  RAS   -8.5420084+01  LOS    2.1236502+02  DES   -2.3376583+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.1817822+05  ECC    9.8052029-01  INC    2.6008099+01  RAN    2.5777927+00  APF    1.5972375+02   RP    2.3020788+03
    VH   -2.7267988+03 RNMP   -1.1638463+01 APMP   -2.4456960+00 INMP    2.5666922+00  APO    2.3405436+05  TFP    1.7002627+02
    TA   -1.7438252+02   EA   -1.2735743+02   MA   -8.2702143+01  SLR    4.5593107+03  PER    2.8305747+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -2.9388633+03 ECCS    1.4608848+00 INCS    1.4724696+02 RANS   -1.7289588+02 APFS   -1.7011789+02  RPS    1.3544774+03
   VHS    3.1138375+03 RNMPS  -1.3635334+02 APMPS  -1.3651679+02 INMPS   1.7468490+02 APOS   -7.2322042+03 TFPS   8.8975816+01
   TAS    1.2831036+02  EAS    1.6485965+02  MAS    5.7635697+02 SLRS    3.3332130+03 PERS    1.0008911+01 MTAS    1.3319761+02

GEOCENTRIC    UNIT VECTORS
   WX    1.9721806-02  WY   -4.3805450-01  WZ    8.9873207-01  PX   -9.5109130-01  PY    2.6894873-01  PZ    1.5196013-01
   QX   -3.0827966-01  QY   -8.5777317-01  QZ   -4.1132567-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000
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****** CSM   / EARTH REF.  /PHASE  19-  6
                    MEAN-OF-EPOCH  1969       26  DEC. 1968,  2 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .1099999999999999+003  HRS. FROM LAUNCH      4 DAYS, 13 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .137420221625965+003

          PHASE ELAPSED TIME     .38545734+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .5167071612379966 7+002      -.9268024815781515 2+001      -.5649783117840128 6+001
        RDXYZ      -.3714602630976292 3+000      .1628814724130570 8+000       .8807292400350158 7-001

GEOCENTRIC
     X    1.7795051+05    Y   -3.1918462+04    Z   -1.9457477+04   DX   -2.1591888+03   DY    9.4678193+02   DZ    5.1194192+02
     R    1.8183444+05  DEC   -6.1427851+00   RA   -1.0168844+01    V    2.4125872+03  PTH   -7.5339980+01   AZ    6.4413211+01

GEOGRAPHIC
    XG    1.5262789+05   YG   -9.6901474+04   ZG   -1.9457477+04  DXG   -4.0704361+04  DYG    6.8389745+04  DZG    5.1205888+02
   ALT    1.7839064+05  LAT   -6.1435579+00  LON    2.1241093+02   VE    7.9588095+04  PTE   -1.6805311+00  AZE   -8.9810123+01

EARTH-MOON PLANE
   XMP   -1.7870870+05  YMP    3.3566256+04  ZMP   -5.2119754+02 DXMP    2.1813685+03 DYMP   -1.0304818+03 DZMP   -1.7773246+01
   RMP    1.8183444+05 DEMP   -1.6422884-01 RAMP    1.6936226+02  VMP    2.4125872+03 PTMP   -7.5339985+01 AZMP    9.2296208+01
   XME   -1.7870870+05  YME    3.3566256+04  ZME   -5.2119754+02 DXME    2.1813685+03 DYME   -1.0304818+03 DZME   -1.7773246+01

PLANETARY COORDINATES
    XM    2.0888286+05   YM   -3.1107661+03   ZM   -3.5218766+03  DXM    2.9357923+02  DYM    2.9073563+03  DZM    1.5732900+03
    RM    2.0893570+05  DEM   -9.6583887-01  RAM   -8.5320834-01  LOM    2.2172657+02   VM    3.3187574+03 ARGM   -2.0269411+00
  XSUN    6.1160206+06 YSUN   -7.2665453+07 ZSUN   -3.1510500+07  RAS   -8.5188933+01  LOS    1.3739084+02  DES   -2.3369662+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.1783319+05  ECC    9.7716167-01  INC    2.6265436+01  RAN    2.4281901+00  APF    1.5943372+02   RP    2.6911144+03
    VH   -2.6353256+03 RNMP   -1.4726472+01 APMP   -2.4810696+00 INMP    2.3020684+00  APO    2.3297527+05  TFP    1.7045610+02
    TA   -1.7342689+02   EA   -1.2376900+02   MA   -7.7227625+01  SLR    5.3207660+03  PER    2.8181878+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -2.9301573+03 ECCS    1.6355503+00 INCS    1.4785696+02 RANS   -1.7390610+02 APFS   -1.6455643+02  RPS    1.8622622+03
   VHS    3.1184600+03 RNMPS  -1.4042056+02 APMPS  -1.3146634+02 INMPS   1.7549283+02 APOS   -7.7225768+03 TFPS   8.8847237+01
   TAS    1.2302363+02  EAS    1.7171415+02  MAS    7.6421480+02 SLRS    4.9080859+03 PERS    9.9644685+00 MTAS    1.2769188+02

GEOCENTRIC    UNIT VECTORS
   WX    1.8748785-02  WY   -4.4213302-01  WZ    8.9675353-01  PX   -9.4877239-01  PY    2.7507113-01  PZ    1.5545671-01
   QX   -3.1540355-01  QY   -8.5372961-01  QZ   -4.1432635-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000
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****** CSM   / EARTH REF.  /PHASE  19-  7
                    MEAN-OF-EPOCH  1969       26  DEC. 1968,  7 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .1149999999999999+003  HRS. FROM LAUNCH      4 DAYS, 18 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .212625556517806+003

          PHASE ELAPSED TIME     .40345734+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .4973323074751015 3+002      -.8428121776918869 6+001      -.5194353367197165 3+001
        RDXYZ      -.4042873613889354 8+000      .1728560018557264 6+000       .9398285385217679 8-001

GEOCENTRIC
     X    1.7127794+05    Y   -2.9025891+04    Z   -1.7889008+04   DX   -2.3500031+03   DY    1.0047609+03   DZ    5.4629459+02
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   R     1.7463863+05  DEC   -5.8793728+00   RA   -9.6183398+00    V    2.6135219+03  PTH   -7.5279363+01   AZ    6.4214887+01

GEOGRAPHIC
  XG    -1.2860313+05  YG     1.1678985+05  ZG    -1.7889007+04  DXG   5.3184424+04  DYG    5.4867911+04  DZG   5.4627076+02
  ALT    1.7119481+05  LAT   -5.8801435+00  LON    1.3775610+02  VE    7.6415766+04  PTE   -1.8956203+00  AZE  -8.9783294+01

EARTH-MOON PLANE
  XMP   -1.7035703+05  YMP    3.8429239+04  ZMP   -5.7202205+02 DXMP   2.3198085+03 DYMP   -1.2036225+03 DZMP  -1.6681174+01
  RMP    1.7463863+05 DEMP   -1.8767043-01 RAMP    1.6728795+02  VMP   2.6135219+03 PTMP   -7.5279363+01 AZMP   9.2153978+01
  XME   -1.7035703+05  YME    3.8429239+04  ZME   -5.7202205+02 DXME   2.3198085+03 DYME   -1.2036225+03 DZME  -1.6681174+01

PLANETARY COORDINATES
  XM     2.0951596+05  YM     5.5020019+03  ZM    1.1409592+03  DXM   1.3400985+02  DYM    2.9062556+03  DZM   1.5741166+03
  RM     2.0959129+05  DEM    3.1190451-01  RAM   1.5042723+00  LOM   1.4887871+02  VM     3.3078881+03  ARGM  6.5447183-01
 XSUN    6.4093839+06 YSUN   -7.2643468+07 ZSUN  -3.1500955+07  RAS  -8.4957808+01  LOS    6.2416634+01  DES  -2.3362401+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.1759384+05  ECC    9.7499987-01  INC   2.6402113+01  RAN   2.3531403+00  APF    1.5922422+02  RP    2.9398625+03
   VH   -2.5373381+03 RNMP   -1.7689143+01 APMP -2.4767597+00 INMP   2.1621241+00  APO    2.3224782+05  TFP   1.7070749+02
   TA   -1.7254257+02  EA    -1.1983729+02  MA   -7.1379060+01  SLR   5.8062252+03  PER    2.8096054+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -2.9062569+03 ECCS    1.9574809+00 INCS   1.4850941+02 RANS  -1.7500235+02 APFS   -1.5729475+02  RPS   2.7826855+03
  VHS    3.1312565+03 RNMPS  -1.4500215+02 APMPS -1.2516851+02 INMPS  1.7635423+02 APOS   -8.5951992+03  TFPS  8.8695102+01
  TAS    1.1574150+02  EAS    1.7244182+02  MAS   9.6209703+02 SLRS   8.2297378+03 PERS    9.8428019+00  MTAS  1.2072117+02

GEOCENTRIC    UNIT VECTORS
  WX     1.8257413-02  WY    -4.4429330-01  WZ    8.9569535-01  PX   -9.4723213-01  PY    2.7905699-01  PZ    1.5772903-01
  QX    -3.2002799-01  QY    -8.5131114-01  QZ   -4.1575404-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000

****** CSM   / EARTH REF.  /PHASE  19-  8
                    MEAN-OF-EPOCH  1969        26  DEC. 1968, 12 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .1199999999999999+003  HRS. FROM LAUNCH      4 DAYS, 23 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .2878308914096466+003

          PHASE ELAPSED TIME     .4214573+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

          RXYZ      .4762034331148758+002      -.7541092995811430l+001      -.4710763929716558?+001
          RDXYZ     -.4416356430070901S+000      .1818379146571349?+000      .9939846779192875B-001

GEOCENTRIC
     X     1.6400129+05    Y    -2.5971023+04    Z   -1.6223568+04   DX   -2.5670976+03  DY    1.0569701+03  DZ    5.7777307+02
     R     1.6683561+05  DEC    -5.5804189+00   RA   -8.9985581+00    V    2.8356655+03  PTH   -7.5408620+01  AZ    6.4067756+01

GEOGRAPHIC
    XG     7.4942094+04   YG     1.4817045+05   ZG   -1.6223557+04  DXG   6.3858876+04  DYG   -3.5325278+04  DZG   5.7772322+02
   ALT     1.6339179+05  LAT    -5.5811851+00  LON    6.3170551+01   VE    7.2980582+04  PTE   -2.1549404+00  AZE  -8.9754704+01

EARTH-MOON PLANE
   XMP    -1.7137957+05   YMP    4.2312833+04   ZMP   -6.1971284+02 DXMP   2.4734932+03 DYMP   -1.3865742+03 DZMP  -1.5565836+01
   RMP     1.6683562+05  DEMP   -2.1282633-01  RAMP    1.6530807+02  VMP   2.8356655+03 PTMP   -7.5408624+01 AZMP   9.2066472+01
   XME    -1.7137957+05   YME    4.2312833+04   ZME   -6.1971284+02 DXME   2.4734932+03 DYME   -1.3865742+03 DZME  -1.5565836+01

PLANETARY COORDINATES
    XM     2.0967799+05    YM    1.4102224+00   ZM    5.8010707+03  DXM  -2.4404614+01  DYM    2.8987692+03  DZM   1.5714597+03
    RM     2.1023172+05   DEM    1.5812032+00   RAM   3.8476689+00  LOM   7.6016777+01  VM     3.2974147+03  ARGM  3.3192167+00
  XSUN     6.7026549+06  YSUN   -7.2620501+07  ZSUN  -3.1490985+07  RAS  -8.4726709+01  LOS    3.4744240+02  DES  -2.3354800+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.1741274+05   ECC    9.7353071-01   INC   2.6485182+01  RAN   2.3101124+00  APF    1.5906748+02  RP    3.1067751+03
    VH   -2.4342728+03  RNMP   -2.0569564+01  APMP -2.4565270+00  INMP   2.0773891+00  APO    2.3171870+05  TFP   1.7086259+02
    TA   -1.7166198+02   EA    -1.1561829+02   MA   -6.5322018+01   SLR   6.1313430+03  PER    2.8031174+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -2.8600547+03  ECCS    2.5023967+00  INCS   1.4908370+02  RANS  -1.7598524+02  APFS   -1.4940085+02  RPS   4.2969370+03
  VHS    3.1564467+03  RNMPS  -1.5005172+02  APMPS -1.1881490+02  INMPS  1.7710987+02  APOS   -1.0017046+04  TFPS  8.8601664+01
  TAS    1.0785240+02  EAS    1.6811979+02  MAS    1.1763318+03  SLRS   1.5049579+04  PERS   9.6090236+00  MTAS  1.1355433+02

GEOCENTRIC    UNIT VECTORS
  WX     1.7276078-02  WY    -4.4560395-01  WZ    8.9504972-01  PX   -9.4613224-01  PY    2.8186494-01  PZ    1.5932956-01
  QX    -3.2328102-01  QY    -8.4969951-01  QZ   -4.1653344-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000

****** CSM   / EARTH REF.  /PHASE  19-  9
                    MEAN-OF-EPOCH  1969        26  DEC. 1968, 17 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .1249999999999999+003  HRS. FROM LAUNCH      5 DAYS,  4 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .3036226301486854+001

          PHASE ELAPSED TIME     .4394573+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

          RXYZ      .4530874037682757?+002      -.6610620894761039?+001      -.4200732592774575?+001
          RDXYZ     -.4438810926687798?+000      .1902859464091202l+000      .1045920834317917B+000

GEOCENTRIC
     X     1.5604029+05    Y    -2.2766539+04    Z   -1.4467044+04   DX   -2.8126580+03  DY    1.1060760+03  DZ    6.0796201+02
     R     1.5835460+05  DEC    -5.2417669+00   RA   -8.3009787+00    V    3.0828668+03  PTH   -7.5607552+01  AZ    6.3946107+01

GEOGRAPHIC
    XG     1.5461536+05   YG    -3.0999619+04   ZG   -1.4467043+04  DXG  -1.6485363+04  DYG   -6.7253055+04  DZG   6.0782990+02
   ALT     1.5491077+05  LAT    -5.2425258+00  LON    3.4866279+02   VE    6.9246735+04  PTE   -2.4715251+00  AZE  -8.9721283+01

EARTH-MOON PLANE
   XMP    -1.5177830+05   YMP    4.5156268+04   ZMP   -6.6406618+02 DXMP   2.6438309+03 DYMP   -1.5855666+03 DZMP  -1.4321780+01
   RMP     1.5835461+05  DEMP   -2.4027276-01  RAMP    1.6343149+02  VMP   3.0828668+03 PTMP   -7.5607556+01 AZMP   9.2007563+01
   XME    -1.5177830+05   YME    4.5156268+04   ZME   -6.6406618+02 DXME   2.6438309+03 DYME   -1.5855666+03 DZME  -1.4321780+01

PLANETARY COORDINATES
    XM     2.0937280+05    YM    2.2677566+04   ZM    1.0448233+04  DXM  -1.8136101+02  DYM    2.8850296+03  DZM   1.5653884+03
    RM     2.1085562+05   DEM    2.8402606+00   RAM   6.1798228+00  LOM   3.1435965+00  VM     3.2873589+03  ARGM  5.9679715+00
  XSUN     6.9958295+06  YSUN   -7.2596554+07  ZSUN  -3.1480590+07  RAS  -8.4495638+01  LOS    2.7246813+02  DES  -2.3346861+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.1726814+05   ECC    9.7252300-01   INC   2.6539691+01  RAN   2.2836462+00  APF    1.5894695+02  RP    3.2221761+03
    VH   -2.3285521+03  RNMP   -2.0390541+01  APMP -2.4285396+00  INMP   2.0210877+00  APO    2.3131409+05  TFP   1.7096122+02
    TA   -1.7074513+02   EA    -1.1111631+02   MA   -5.9136489+01   SLR   6.3558148+03  PER    2.7979406+02  MTA   3.5999999+02
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SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -2.7830933+03 ECCS    3.3676138+00 INCS    1.4953154+02 RANS   -1.7676085+02 APFS   -1.4184657+02  RPS    6.5892902+03
  VHS    3.1997921+03 RNMPS  -1.5542515+02 APMPS  -1.1331559+02 INMPS   1.7769485+02 APOS   -1.2155477+04 TFPS   8.8716044+01
  TAS    1.0048756+02  EAS    1.6027651+02  MAS    1.4161450+03 SLRS    2.8779477+04 PERS    9.2237896+00 MTAS   1.0727427+02

GEOCENTRIC    UNIT VECTORS
   WX    1.7804161-02   WY   -4.4646281-01   WZ    8.9462505-01   PX   -9.4531289-01   PY    2.8393596-01   PZ    1.6051121-01
   QX   -3.2567851-01   QY   -8.4855835-01   QZ   -4.1699181-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000
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****** CSM   / EARTH REF.  /PHASE  19- 10
                  MEAN-OF-EPOCH  1969       26  DEC. 1968, 22 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .1299999999999999+003  HRS. FROM LAUNCH       5 DAYS, 9 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .7824156119332 71+002

          PHASE ELAPSED TIME      .4574573+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .4277189315549836+002      -.5638731340834 9435+001      -.3664957356739 4476+001
        RDXYZ     -.5319294785153685 0+000      .1984313086826 6616+000      .1097152834428 53 80+000

GEOCENTRIC
     X    1.4730355+05    Y   -1.9419415+04    Z   -1.2621869+04   DX   -3.0919491+03   DY    1.1534226+03   DZ    6.3774256+02
     R    1.4911325+05  DEC   -4.8556799+00   RA   -7.5101450+00    V    3.3611379+03  PTH   -7.5812522+01   AZ    6.3838445+01

GEOGRAPHIC
    XG    1.1006487+04   YG   -1.4816986+05   ZG   -1.2621869+04  DXG   -6.5151582+04  DYG   -1.6146111+03  DZG    6.3778743+02
   ALT    1.4566940+05  LAT   -4.8564271+00  LON    2.7424829+02   VE    6.5174709+04  PTE   -2.8658863+00  AZE   -8.9680403+01

EARTH-MOON PLANE
   XMP   -1.4154977+05  YMP    4.6882055+04  ZMP   -7.0457853+02 DXMP    2.8346015+03 DYMP   -1.8061334+03 DZMP   -1.2853877+01
   RMP    1.4911325+05 DEMP   -2.7073064-01 RAMP    1.6167445+02  VMP    3.3611380+03 PTMP   -7.5812522+01 AZMP    9.1965296+01
   XME   -1.4154977+05  YME    4.6882055+04  ZME   -7.0457853+02 DXME    2.8346015+03 DYME   -1.8061334+03 DZME   -1.2853877+01

PLANETARY COORDINATES
    XM    2.0860518+05   YM    3.1189317+04   ZM    1.5072443+04  DXM   -3.3657057+02  DYM    2.8651755+03  DZM    1.5559755+03
    RM    2.1146175+05  DEM    4.0873600+00  RAM    8.5035099+00  LOM    2.9026195+02   VM    3.2777385+03 ARGM   8.6014386+00
  XSUN    7.2889043+06 YSUN   -7.2571628+07 ZSUN   -3.1469771+07  RAS   -8.4264594+01  LOS    1.9749384+02  DES   -2.3338594+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.1714836+05  ECC    9.7180277-01  INC    2.6577094+01  RAN    2.2667960+00  APF    1.5885273+02   RP    3.3032591+03
    VH   -2.2131807+03 RNMP   -2.6165521+01 APMP   -2.3964333+00 INMP    1.9838522+00  APO    2.3099346+05  TFP    1.7102490+02
    TA   -1.6975855+02   EA   -1.0630648+02   MA   -5.2866102+01  SLR    6.5133741+03  PER    2.7936551+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -2.8660036+03 ECCS    4.6868426+00 INCS    1.4985714+02 RANS   -1.7732530+02 APFS   -1.3504249+02  RPS    9.8291358+03
  VHS    3.2693037+03 RNMPS  -1.6088718+02 APMPS  -1.0885045+02 INMPS   1.7811482+02 APOS   -1.5161143+04 TFPS   8.9247183+01
  TAS    9.4110790+01  EAS    1.5049978+02  MAS    1.6964898+03 SLRS    5.5896746+04 PERS    8.6478641+00 MTAS   1.0231952+02

GEOCENTRIC    UNIT VECTORS
   WX    1.7695957-02   WY   -4.4705150-01   WZ    8.9433317-01   PX   -9.4468792-01   PY    2.8550367-01   PZ    1.6140741-01
   QX   -3.2749283-01   QY   -8.4772199-01   QZ   -4.1727189-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000
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****** CSM   / EARTH REF.  /PHASE  19- 11
                  MEAN-OF-EPOCH  1969       27  DEC. 1968, 3 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .1349999999999999+003  HRS. FROM LAUNCH       5 DAYS, 14 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .1534468960 85167+003

          PHASE ELAPSED TIME      .4754573+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .3997730432079 8236+002      -.4626634398182 3276+001      -.3103542463027 5650+001
        RDXYZ     -.5872910863539 1222+000      .2063772135255 2764+000      .1148595366682 7560+000

GEOCENTRIC
     X    1.3767917+05    Y   -1.5933821+04    Z   -1.0688394+04   DX   -3.4137498+03   DY    1.1996098+03   DZ    6.6764459+02
     R    1.3900965+05  DEC   -4.4098008+00   RA   -6.6015591+00    V    3.6794701+03  PTH   -7.5983341+01   AZ    6.3738334+01

GEOGRAPHIC
    XG   -1.3027968+05   YG   -4.7293194+04   ZG   -1.0688394+04  DXG   -1.7364603+04  DYG    5.8176939+04  DZG    6.6748350+02
   ALT    1.3556579+05  LAT   -4.4105294+00  LON    1.9995154+02   VE    6.0716815+04  PTE   -3.3707202+00  AZE   -8.9627333+01

EARTH-MOON PLANE
   XMP   -1.3067831+05  YMP    4.7395320+04  ZMP   -7.4043023+02 DXMP    3.0524279+03 DYMP   -2.0545224+03 DZMP   -1.1046436+01
   RMP    1.3900965+05 DEMP   -3.0518547-01 RAMP    1.6006495+02  VMP    3.6794701+03 PTMP   -7.5983341+01 AZMP    9.1933111+01
   XME   -1.3067831+05  YME    4.7395320+04  ZME   -7.4043023+02 DXME    3.0524279+03 DYME   -2.0545224+03 DZME   -1.1046436+01

PLANETARY COORDINATES
    XM    2.0738068+05   YM    3.9640374+04   ZM    1.9663911+04  DXM   -4.8975772+02  DYM    2.8393516+03  DZM    1.5432967+03
    RM    2.1204899+05  DEM    5.3208468+00  RAM    1.0821428+01  LOM    2.1737453+02   VM    3.2685692+03 ARGM   1.1220332+01
  XSUN    7.5818751+06 YSUN   -7.2545722+07 ZSUN   -3.1458526+07  RAS   -8.4033580+01  LOS    1.2251952+02  DES   -2.3329967+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.1704644+05  ECC    9.7128922-01  INC    2.6603373+01  RAN    2.2559798+00  APF    1.5877858+02   RP    3.3604944+03
    VH   -2.0938738+03 RNMP   -2.8903079+01 APMP   -2.3614524+00 INMP    1.9570226+00  APO    2.3073239+05  TFP    1.7106611+02
    TA   -1.6866529+02   EA   -1.0113912+02   MA   -4.6536756+01  SLR    6.6245043+03  PER    2.7900101+02  MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -2.4995621+03 ECCS    6.6654560+00 INCS    1.5008392+02 RANS   -1.7771423+02 APFS   -1.2894778+02  RPS    1.4161164+04
  VHS    3.3763983+03 RNMPS  -1.6615508+02 APMPS  -1.0506779+02 INMPS   1.7840234+02 APOS   -1.9160288+04 TFPS   9.0452911+01
  TAS    8.8687134+01  EAS    1.4002430+02  MAS    2.0427168+03 SLRS    1.0855181+05 PERS    7.8507949+00 MTAS   9.8628501+01

GEOCENTRIC    UNIT VECTORS
   WX    1.7627709-02   WY   -4.4746469-01   WZ    8.9412786-01   PX   -9.4420622-01   PY    2.8670458-01   PZ    1.6209579-01
   QX   -3.2888269-01   QY   -8.4709845-01   QZ   -4.1744500-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000
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****** CSM   / EARTH REF.  /PHASE  19- 12
                  MEAN-OF-EPOCH  1969       27  DEC. 1968, 8 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .1399999999999999+003  HRS. FROM LAUNCH       5 DAYS, 19 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .2286522309770 07+003

          PHASE ELAPSED TIME      .4934573+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .3988287216097 0885+002      -.3575298365203 7877+001      -.2516243052211 3029+001
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      RDXYZ      -.65236687874282659+000      .21411449710899807+000      .12007345566136522+000

GEOCENTRIC
   X    1.2702216+05    Y   -1.2313090+04    Z   -8.6657738+03   DX   -3.7920161+03   DY    1.2445843+03   DZ    6.9795157+02
   R    1.2791144+05  DEC   -3.8846632+00   RA   -5.5367560+00    V    4.0516062+03  PTH   -7.6087276+01   AZ    6.3642480+01

GEOGRAPHIC
  XG   -7.4670767+04   YG    1.0349163+05   ZG   -8.6657736+03  DXG    4.7425579+04  DYG    2.9415998+04  DZG    6.9794152+02
 ALT    1.2446756+05  LAT   -3.8853613+00  LON    1.2581101+02   VE    5.5811950+04  PTE   -4.0406556+00  AZE   -8.9554890+01

EARTH-MOON PLANE
 XMP   -1.1912655+05  YMP    4.6579055+04  ZMP   -7.7037966+02 DXMP    3.3082684+03 DYMP   -2.3389735+03 DZMP   -8.7311202+00
 RMP    1.2791144+05 DEMP   -3.4508070-01 RAMP    1.5866426+02  VMP    4.0516062+03 PTMP   -7.6087279+01 AZMP    9.1906977+01
 XME   -1.1912655+05  YME    4.6579055+04  ZME   -7.7037966+02 DXME    3.3082684+03 DYME   -2.3389735+03 DZME   -8.7311202+00

PLANETARY COORDINATES
  XM    2.0570570+05   YM    4.8006267+04   ZM    2.4213079+04  DXM   -6.4065972+02  DYM    2.8077067+03  DZM    1.5274308+03
  RM    2.1261634+05  DEM    6.5391189+00  RAM    1.3136206+01  LOM    1.4448398+02   VM    3.2598629+03 ARGM    1.3825376+01
XSUN    7.6747380+06 YSUN   -7.2518837+07 ZSUN   -3.1446857+07  RAS   -8.3802598+01  LOS    4.7545172+01  DES   -2.3321010+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.1695787+05  ECC    9.7092429-01  INC    2.6621968+01  RAN    2.2491510+00  APF    1.5872039+02   RP    3.4006333+03
   VH   -1.9669902+03 RNMP   -3.1609065+01 APMP   -2.3246600+00 INMP    1.9379289+00  APO    2.3051510+05  TFP    1.7109252+02
   TA   -1.6741624+02   EA   -9.5535276+01   MA   -4.0164815+01  SLR    6.7023906+03  PER    2.7868438+02  MTA    3.5999990+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -2.2765486+03 ECCS    9.6484926+00 INCS    1.5023563+02 RANS   -1.7796878+02 APFS   -1.2335870+02  RPS    1.9688714+04
  VHS    3.5379132+03 RNMPS  -1.7096303+02 APMPS  -1.0145988+02 INMPS    1.7859080+02 APOS   -2.4241811+04 TFPS    9.2630894+01
  TAS    8.4008241+01  EAS    1.2967336+02  MAS    2.4989900+03 SLRS    2.0965514+05 PERS    6.8239077+00 MTAS    9.5948996+01

GEOCENTRIC    UNIT VECTORS
  RX    1.7585763-02   WY   -4.4775669-01   WZ    8.9398249-01   PX   -9.4383539-01   PY    2.8762450-01   PZ    1.6262485-01
  QX   -3.2994768-01   QY   -8.4663219-01   QZ   -4.1755050-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE  19- 13
                    MEAN-OF-EPOCH  1969       27  DEC. 1968, 13 HRS., 50 MINS., 59.695 SECS. G.M.T.

T      .14499999999999999+003  HRS. FROM LAUNCH      6 DAYS,  0 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .30385756586884P+003

         PHASE ELAPSED TIME      .51145734+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      .33431055295757855+002      -.24861137666913819+001      -.19026985925421571+001
       RDXYZ      -.73108196419551535+000      .22146639292438850+000      .12534930147447029+000

GEOCENTRIC
   X    1.1513433+05    Y   -8.5620105+03    Z   -6.5527675+03   DX   -4.2495637+03   DY    1.2873188+03   DZ    7.2861849+02
   R    1.1563806+05  DEC   -3.2484733+00   RA   -4.2529950+00    V    4.4996517+03  PTH   -7.6087765+01   AZ    6.3549455+01

GEOGRAPHIC
  XG    7.1254923+04   YG    9.0840285+04   ZG   -6.5527675+03  DXG    3.6812655+04  DYG   -3.4383184+04  DZG    7.2853911+02
 ALT    1.1219416+05  LAT   -3.2491196+00  LON    5.1889438+01   VE    5.0377655+04  PTE   -4.9736951+00  AZE   -8.9449993+01

EARTH-MOON PLANE
 XMP   -1.0681960+05  YMP    4.4284372+04  ZMP   -7.9252667+02 DXMP    3.6207096+03 DYMP   -2.6715719+03 DZMP   -5.6306823+00
 RMP    1.1563806+05 DEMP   -3.9266031-01 RAMP    1.5748249+02  VMP    4.4996517+03 PTMP   -7.6087768+01 AZMP    9.1883861+01
 XME   -1.0681960+05  YME    4.4284372+04  ZME   -7.9252667+02 DXME    3.6207096+03 DYME   -2.6715719+03 DZME   -5.6306823+00

PLANETARY COORDINATES
  XM    2.0358738+05   YM    5.6269983+04   ZM    2.8710624+04  DXM   -7.8902623+02  DYM    2.7703939+03  DZM    1.5084598+03
  RM    2.1316292+05  DEM    7.7406158+00  RAM    1.5450389+01  LOM    7.1592823+01   VM    3.2516292+03 ARGM    1.6417301+01
XSUN    8.1674892+06 YSUN   -7.2490974+07 ZSUN   -3.1434763+07  RAS   -8.3571646+01  LOS    3.3257078+02  DES   -2.3311716+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.1687956+05  ECC    9.7066852-01  INC    2.6634997+01  RAN    2.2450406+00  APF    1.5867535+02   RP    3.4282517+03
   VH   -1.8302871+03 RNMP   -3.4287647+01 APMP   -2.2863494+00 INMP    1.9243362+00  APO    2.3033087+05  TFP    1.7110902+02
   TA   -1.6593701+02   EA   -8.9372996+01   MA   -3.3761117+01  SLR    6.7559449+03  PER    2.7840455+02  MTA    3.5999990+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.7994356+03 ECCS    1.4254530+01 INCS    1.5032982+02 RANS   -1.7812181+02 APFS   -1.1809037+02  RPS    2.6443572+04
  VHS    3.7799824+03 RNMPS  -1.7511398+02 APMPS  -9.7617757+01 INMPS    1.7870528+02 APOS   -3.0432183+04 TFPS    9.6100826+01
  TAS    7.9891207+01  EAS    1.1998804+02  MAS    3.1462856+03 SLRS    4.0351667+05 PERS    5.5950674+00 MTAS    9.4021366+01

GEOCENTRIC    UNIT VECTORS
  RX    1.7561606-02   WY   -4.4796111-01   WZ    8.9388056-01   PX   -9.4355357-01   PY    2.8832063-01   PZ    1.6302709-01
  QX   -3.3075400-01   QY   -8.4628721-01   QZ   -4.1761193-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE  19- 14
                    MEAN-OF-EPOCH  1969       27  DEC. 1968, 18 HRS., 50 MINS., 59.695 SECS. G.M.T.

T      .14999999999999999+003  HRS. FROM LAUNCH      6 DAYS,  5 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .19062900760683+002

         PHASE ELAPSED TIME      .52945734+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      .28538193756072491+002      -.13621306496099365+001      -.12628523737789791+001
       RDXYZ      -.83038702885190050+000      .22789212548396862+000      .13055331240917470+000

GEOCENTRIC
   X    1.1172744+05    Y   -4.6910874+03    Z   -4.3491796+03   DX   -4.8263395+03   DY    1.3246696+03   DZ    7.5886797+02
   R    1.1619851+05  DEC   -2.4454916+00   RA   -2.6402794+00    V    5.0620334+03  PTH   -7.5930060+01   AZ    6.3460411+01

GEOGRAPHIC
  XG    9.4616757+04   YG   -3.7658664+04   ZG   -4.3491796+03  DXG   -2.0814721+04  DYG   -3.9094202+04  DZG    7.5886642+02
 ALT    9.8484598+04  LAT   -2.4460441+00  LON    3.3829602+02   VE    4.4296560+04  PTE   -6.3641898+00  AZE   -8.9284432+01

EARTH-MOON PLANE
 XMP   -9.3614628+04  YMP    4.0312240+04  ZMP   -8.0383621+02 DXMP    4.0234987+03 DYMP   -3.0717485+03 DZMP   -1.2347984+00
 RMP    1.1619851+05 DEMP   -4.5185492-01 RAMP    1.5670236+02  VMP    5.0620334+03 PTMP   -7.5930060+01 AZMP    9.1860773+01
 XME   -9.3614628+04  YME    4.0312240+04  ZME   -8.0383621+02 DXME    4.0234987+03 DYME   -3.0717485+03 DZME   -1.2347984+00

PLANETARY COORDINATES
  XM    2.0103358+05   YM    6.4414962+04   ZM    3.3147468+04  DXM   -9.3461859+02  DYM    2.7275703+03  DZM    1.4864636+03
  RM    2.1368796+05  DEM    9.9238077+00  RAM    1.7766440+01  LOM    3.5870353+02   VM    3.2438751+03 ARGM    1.8996843+01
XSUN    8.4601249+06 YSUN   -7.2462132+07 ZSUN   -3.1422246+07  RAS   -8.3340730+01  LOS    2.5754637+02  DES   -2.3302005+01
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GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.1680937+05  ECC     9.7049397-01  INC     2.6643874+01  RAN     2.2427990+00  APF     1.5864144+02  RP      3.4465803+03
  VH    -1.6801734+03  RNMP   -3.6941948+01  APMP   -2.2469392+00  INMP    1.9148163+00  APO     2.3017215+05  TFP     1.7111890+02
  TA    -1.6410132+02  EA     -8.2457153+01  MA     -2.7333097+01  SLR     6.7914646+03  PER     2.7815378+02  MTA     3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.6573630+03 ECCS     2.1721530+01 INCS     1.5037620+02 RANS    -1.7819411+02 APFS    -1.1304692+02  RPS     3.4343100+04
  VHS    4.1464536+03 RNMPS   -1.7849308+02 APMPS   -9.3311395+01 INMPS   1.7876014+02 APOS    -3.7657826+04 TFPS    1.0117673+02
  TAS    7.6255984+01  EAS     1.1137466+02  MAS     4.1465327+03 SLRS    7.8032782+05 PERS     4.2388127+00 MTAS    9.2638673+01

GEOCENTRIC    UNIT VECTORS
   #X    1.7549499-02   WY    -4.4810015-01   WZ     8.9381110-01   PX    -9.4334535-01   PY     2.8883311-01   PZ    1.6332467-01
   QX   -3.3134805-01   QY    -8.4603880-01   QZ    -4.1764431-01  SXO     0.0000000     SYO     0.0000000     SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE  19- 15
                    MEAN-OF-EPOCH  1969       27  DEC. 1968, 23 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .1549999999999999+003  HRS. FROM LAUNCH       6 DAYS, 10 HRS., 59 MINS., 59.999 SECS. G.E.T.     RAGR  .9426823565252B6+002

          PHASE ELAPSED TIME      .5474573+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .2507221422285696 3+002      -.2111619865892448B+000      -.5980755838805500+000
        RDXYZ      -.9634926592202B862+000       .2318431341627016 1+000      .1351744820126707 7+000

GEOCENTRIC
     X    8.6347040+04    Y    -7.2722784+02    Z    -2.0597325+03   DX    -5.6004985+03   DY     1.3476357+03   DZ    7.8572937+02
     R    8.6374664+04  DEC    -1.3664328+00   RA    -4.8254232-01    V     5.8136972+03  PTH    -7.5510760+01   AZ    6.3382905+01

GEOGRAPHIC
    XG   -7.1516642+03   YG    -8.6053433+04   ZG    -2.0597325+03  DXG    -3.6367604+04  DYG     8.6534064+03  DZG    7.8574360+02
   ALT    8.2930735+04   LAT   -1.3667974+00   LON    2.6524922+02   VE     3.7391195+04  PTE    -8.6581041+00  AZE   -8.8989B8+01

EARTH-MOON PLANE
   XMP   -7.9234682+04   YMP    3.4377453+04   ZMP   -7.9903105+02  DXMP    4.5852377+03  DYMP   -3.5741630+03  DZMP   5.5378840+00
   RMP    8.6374664+04  DEMP   -5.3003690-01   RAMP   1.5654548+02   VMP    5.8136972+03  PTMP   -7.5510760+01  AZMP   9.1833319+01
   XME   -7.9234682+04   YME    3.4377453+04   ZME   -7.9903105+02  DXME    4.5852377+03  DYME   -3.5741630+03  DZME   5.5378840+00

PLANETARY COORDINATES
    XM    1.9805288+05    YM    7.2425111+04    ZM    3.7514779+04   DXM   -1.0772091+03   DYM    2.6793951+03   DZM    1.4615300+03
    RM    2.1419080+05   DEM    1.0087186+01   RAM    2.0086743+01   LOM    2.8581850+02    VM    3.2366043+03  ARGM    2.1564731+01
  XSUN    8.7526410+06  YSUN   -7.2432315+07  ZSUN   -3.1409305+07   RAS   -8.3109847+01   LOS    1.8262191+02   DES   -2.3292113+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.1674578+05  ECC     9.7038001-01  INC     2.6649586+01  RAN     2.2418153+00  APF     1.5861715+02  RP      3.4580089+03
   VH   -1.5104443+03  RNMP   -3.9574402+01  APMP   -2.2068341+00  INMP    1.9083664+00  APO     2.3003355+05  TFP     1.7112438+02
   TA   -1.6166475+02  EA     -7.4449462+01  MA     -2.0886008+01  SLR     6.8135899+03  PER     2.7792667+02  MTA     3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.2738872+03 ECCS     3.4720646+01 INCS     1.5037458+02 RANS    -1.7819214+02 APFS    -1.0824439+02  RPS     4.3124904+04
  VHS    4.7202990+03 RNMPS   1.7895673+02 APMPS   -8.8493647+01 INMPS   1.7875713+02 APOS    -4.5682679+04 TFPS    1.0815143+02
  TAS    7.3155752+01  EAS     1.0424513+02  MAS     5.8699264+03 SLRS    1.5404493+06 PERS     2.8732017+00 MTAS    9.1650419+01

GEOCENTRIC    UNIT VECTORS
   #X    1.7545290-02   WY    -4.4818947-01   WZ     8.9376639-01   PX    -9.4319919-01   PY     2.8919165-01   PZ    1.6353418-01
   QX   -3.3176406-01   QY    -8.4586897-01   QZ    -4.1765799-01  SXO     0.0000000     SYO     0.0000000     SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE  19- 16
                    MEAN-OF-EPOCH  1969       28  DEC. 1968,  4 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .1599999999999999+003  HRS. FROM LAUNCH       6 DAYS, 15 HRS., 59 MINS., 59.999 SECS. G.E.T.     RAGR  .1694735705443B8+003

          PHASE ELAPSED TIME      .5654573+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .1979703069458087 9+002      .9442742087125303 5+000      .8493429129121056 3-001
        RDXYZ      -.1162131788366179 6+001      .2281604994799705 4+000      .1372448509497565 9+000

GEOCENTRIC
     X    6.8179659+04    Y     3.2520176+03    Z     2.9250805+02   DX    -6.7551291+03   DY     1.3262296+03   DZ    7.9776382+02
     R    6.8257797+04  DEC     2.4553280-01   RA     2.7308112+00    V     6.9301573+03  PTH    -7.4583156+01   AZ    6.3348167+01

GEOGRAPHIC
    XG   -6.8438134+04   YG    -1.5652968+04   ZG     2.9250804+02  DXG    -5.1742784+01  DYG     2.9367409+04  DZG    7.9775281+02
   ALT    6.4813864+04   LAT    2.4561574-01   LON    1.9325723+02   VE     2.9378289+04  PTE    -1.3144382+01  AZE   -8.8346698+01

EARTH-MOON PLANE
   XMP   -6.3095613+04   YMP    2.6028474+04   ZMP   -7.6753917+02  DXMP    5.4739155+03  DYMP   -4.2500616+03  DZMP   1.7517853+01
   RMP    6.8257796+04  DEMP   -6.4428803-01   RAMP   1.5758266+02   VMP    6.9301573+03  PTMP   -7.4583153+01  AZMP   9.1791932+01
   XME   -6.3095613+04   YME    2.6028474+04   ZME   -7.6753917+02  DXME    5.4739155+03  DYME   -4.2500616+03  DZME   1.7517853+01

PLANETARY COORDINATES
    XM    1.9465447+05    YM    8.0284819+04    ZM    4.1803980+04   DXM   -1.2165809+03   DYM    2.6260307+03   DZM    1.4337444+03
    RM    2.1467089+05   DEM    1.1229255+01   RAM    2.2413594+01   LOM    2.1294002+02    VM    3.2298188+03  ARGM    2.4121696+01
  XSUN    9.0450340+06  YSUN   -7.2401520+07  ZSUN   -3.1395942+07   RAS   -8.2878999+01   LOS    1.0764743+02   DES   -2.3281807+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.1668792+05  ECC     9.7031073-01  INC     2.6652879+01  RAN     2.2416128+00  APF     1.5860120+02  RP      3.4643797+03
   VH   -1.3088289+03  RNMP   -4.2186924+01  APMP   -2.1662405+00  INMP    1.9041957+00  APO     2.2991145+05  TFP     1.7112705+02
   TA   -1.5805393+02  EA     -6.4675844+01  MA     -1.4423659+01  SLR     6.8259022+03  PER     2.7772008+02  MTA     3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -8.7951015+02 ECCS     6.0315059+01 INCS     1.5030477+02 RANS    -1.7809747+02 APFS    -1.0385215+02  RPS     5.2168196+04
  VHS    5.6920043+03 RNMPS   1.7729174+02 APMPS   -8.3292762+01 INMPS   1.7867409+02 APOS    -5.3927217+04 TFPS    1.1736879+02
  TAS    7.0837487+01  EAS     9.9264292+01  MAS     9.3659354+03 SLRS    3.1986959+06 PERS     1.6386229+00 MTAS    9.0949983+01

GEOCENTRIC    UNIT VECTORS
   #X    1.7545715-02   WY    -4.4824088-01   WZ     8.9374061-01   PX    -9.4310594-01   PY     2.8941970-01   PZ    1.6366852-01
   QX   -3.3202905-01   QY    -8.4576375-01   QZ    -4.1766056-01  SXO     0.0000000     SYO     0.0000000     SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE  19- 17
                    MEAN-OF-EPOCH  1969       28  DEC. 1968,  9 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .1649999999999999+003  HRS. FROM LAUNCH       6 DAYS, 20 HRS., 59 MINS., 59.999 SECS. G.E.T.     RAGR  .2446789054362B9+003

          PHASE ELAPSED TIME      .5834573+06 SECS.
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RESTART COORDINATES (ER AND ER/HR)

RXYZ	.1318588357607930 3+002	.2021195888677524 2+001	.7548645853934890 4+000
RDXYZ	-.1529624770419924 9+001	.1914742593901190 6+000	.1260703985865316 7+000

GEOCENTRIC

X	4.5411307+04	Y	6.9608643+03	Z	2.5997034+03	DX	-8.8912573+03	DY	1.1129833+03	DZ	7.3281002+02
R	4.6015202+04	DEC	3.2387424+00	RA	8.7147416+00	V	8.9905616+03	PTH	-7.2296699+01	AZ	6.3528823+01

GEOGRAPHIC

XG	-2.5714095+04	YG	3.8071322+04	ZG	2.5997034+03	DXG	1.9665194+04	DYG	2.8802895+03	DZG	7.3280776+02
ALT	4.2571305+04	LAT	3.2403623+00	LON	1.2403544+02	VE	1.9888514+04	PTE	-2.5508118+01	AZE	-8.6106344+01

EARTH-MOON PLANE

XMP	-4.3688827+04	YMP	1.4429844+04	ZMP	-6.8173701+02	DXMP	7.2758958+03	DYMP	-5.2810463+03	DZMP	4.5709164+01
RMP	4.6015202+04	DEMP	-8.4889515-01	RAMP	1.6172229+02	VMP	8.9905616+03	PTMP	-7.2296695+01	AZMP	9.1701818+01
XME	-4.3688827+04	YME	1.4429844+04	ZME	-6.8173701+02	DXME	7.2758958+03	DYME	-5.2810463+03	DZME	4.5709164+01

PLANETARY COORDINATES

XM	1.9094822+05	YM	8.7978958+04	ZM	4.6006753+04	DXM	-1.3525266+03	DYM	2.5676415+03	DZM	1.4031944+03
RM	2.1512777+05	DEM	1.2348526+01	RAM	2.4749187+01	LOM	1.4007028+02	VM	3.2235175+03	ARGM	2.6668464+01
XSUN	9.3372998+06	YSUN	-7.2369749+07	ZSUN	-3.1382155+07	RAS	-8.2648189+01	LOS	3.2672906+01	DES	-2.3271162+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	1.1663619+05	ECC	9.7027340-01	INC	2.6654366+01	RAN	2.2417802+00	APE	1.5859281+02	RP	3.4671905+03
VH	-1.0440194+03	RNMP	-4.4781072+01	APMP	-2.1261627+00	INMP	1.9017275+00	APO	2.2980519+05	TFP	1.7112804+02
TA	-1.5135789+02	EA	-5.1388879+01	MA	-7.9488795+00	SLR	6.8313262+03	PER	2.7753545+02	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-4.8242398+02	ECCS	1.2425513+02	INCS	1.5006252+02	RANS	-1.7779910+02	APES	-1.0047014+02	RPS	5.9461229+04
VHS	7.6854835+03	RNMPS	1.7669223+02	APMPS	-7.8224269+01	INMPS	1.7839284+02	APOS	-6.0426077+04	TFPS	1.2965341+02
TAS	7.0102111+01	EAS	9.8472106+01	MAS	1.9115643+04	SLRS	7.4478233+06	PERS	6.6567320-01	MTAS	9.0461118+01

GEOCENTRIC UNIT VECTORS

WX	1.7547932-02	WY	-4.4826399-01	WZ	8.9372897-01	PX	-9.4305746-01	PY	2.8953789-01	PZ	1.6373831-01
QX	-3.3216661-01	QY	-8.4571104-01	QZ	-4.1765791-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / EARTH REF. /PHASE 19- 18
MEAN-OF-EPOCH 1969 28 DEC. 1968, 14 HRS., 50 MINS., 59.695 SECS. G.M.T.

T .1699999999999999+003 HRS. FROM LAUNCH 7 DAYS, 1 HRS., 59 MINS., 59.999 SECS. G.E.T. RAGR .3198842403290049+003

PHASE ELAPSED TIME .6014573+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	.3095459322434720+001	.2288931008699830 3+001	.1087267170995154 6+001
RDXYZ	-.3027016776120654 1+001	-.4237593844363221 3+000	-.1531352113811733 0+000

GEOCENTRIC

X	1.0660556+04	Y	7.8829262+03	Z	3.7444758+03	DX	-1.7595155+04	DY	-2.4631882+03	DZ	-8.9012979+02
R	1.3777121+04	DEC	1.5770775+01	RA	3.6480905+01	V	1.7789016+04	PTH	-5.9113000+01	AZ	6.8232174+01

GEOGRAPHIC

XG	3.0733608+03	YG	1.2897380+04	ZG	3.7444757+03	DXG	-6.1541393+03	DYG	-1.4582601+04	DZG	-8.9012975+02
ALT	1.0334041+04	LAT	1.5795892+01	LON	7.6596756+01	VE	1.5853014+04	PTE	-7.4342143+01	AZE	3.7526631+01

EARTH-MOON PLANE

XMP	-1.3593141+04	YMP	-2.2113490+03	ZMP	-3.8150449+02	DXMP	1.6532970+04	DYMP	-6.5608310+03	DZMP	2.5590815+02
RMP	1.3777121+04	DEMP	-1.5867895+00	RAMP	-1.7075099+02	VMP	1.7789016+04	PTMP	-5.9113000+01	AZMP	9.1047102+01
XME	-1.3593141+04	YME	-2.2113490+03	ZME	-3.8150449+02	DXME	1.6532970+04	DYME	-6.5608310+03	DZME	2.5590815+02

PLANETARY COORDINATES

XM	1.8664455+05	YM	9.5492882+04	ZM	5.0115038+04	DXM	-1.4848486+03	DYM	2.5043940+03	DZM	1.3699697+03
RM	2.1556111+05	DEM	1.3443503+01	RAM	2.7095629+01	LOM	6.7211390+01	VM	3.2176977+03	ARGM	2.9205744+01
XSUN	9.5294345+06	YSUN	-7.2337003+07	ZSUN	-3.1367945+07	RAS	-8.2417417+01	LOS	3.1769834+02	DES	-2.3260178+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	1.1663928+05	ECC	9.7026952-01	INC	2.6653573+01	RAN	2.2406085+00	APE	1.5859161+02	RP	3.4677421+03
VH	-5.4977304+02	RNMP	-4.7331090+01	APMP	-2.1138974+00	INMP	1.9010971+00	APO	2.2981081+05	TFP	1.7112814+02
TA	-1.2130027+02	EA	-2.4645556+01	MA	-1.4633465+00	SLR	6.8323847+03	PER	2.7754647+02	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-9.8583951+01	ECCS	3.8280483+02	INCS	1.4685547+02	RANS	-1.7470098+02	APES	-1.0421188+02	RPS	3.7639829+04
VHS	1.7001315+04	RNMPS	1.7818192+02	APMPS	-8.0579518+01	INMPS	1.7480660+02	APOS	-3.7836996+04	TFPS	1.5031461+02
TAS	7.9383852+01	EAS	1.3534937+02	MAS	1.1524431+05	SLRS	1.4446347+07	PERS	6.1493196-02	MTAS	9.0149672+01

GEOCENTRIC UNIT VECTORS

WX	1.7538283-02	WY	-4.4825202-01	WZ	8.9373517-01	PX	-9.4304466-01	PY	2.8957716-01	PZ	1.6374306-01
QX	-3.3220344-01	QY	-8.4570394-01	QZ	-4.1764299-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

****** CSM / EARTH REF. /PHASE 19- 19
MEAN-OF-EPOCH 1969 28 DEC. 1968, 15 HRS., 56 MINS., 31.377 SECS. G.M.T.

T .1710921339098554+003 HRS. FROM LAUNCH 7 DAYS, 3 HRS., 5 MINS., 31.682 SECS. G.E.T. RAGR .3363110996155364+003

PHASE ELAPSED TIME .6053890+06 SECS.

RESTART COORDINATES (ER AND ER/HR)

RXYZ	-.3031599845217331+000	.4771906361679078 3+000	.2557585483098589 5+000
RDXYZ	-.2702849094935852+001	-.5013146720030715 9+001	-.2464053035364173 9+001

GEOCENTRIC

X	-2.9726653+03	Y	1.6434128+03	Z	8.8081544+02	DX	-1.5710816+04	DY	-2.9139943+04	DZ	-1.4322813+04
R	3.5090426+03	DEC	1.4537467+01	RA	1.5106436+02	V	3.6070888+04	PTH	-6.2600030+00	AZ	1.1259548+02

GEOGRAPHIC

XG	-3.3824643+03	YG	3.1061059+02	ZG	8.8081546+02	DXG	-2.5418383+03	DYG	-3.1498069+04	DZG	-1.4322814+04
ALT	6.5839876+01	LAT	1.4629468+01	LON	1.7475326+02	VE	3.4694846+04	PTE	-6.5460972+00	AZE	1.1354701+02

EARTH-MOON PLANE

XMP	1.6110985+03	YMP	-3.1171723+03	ZMP	-3.1283130+01	DXMP	3.0035772+04	DYMP	1.9939782+04	DZMP	1.1689565+03
RMP	3.5090426+03	DEMP	-5.1079890-01	RAMP	-6.2667900+01	VMP	3.6070888+04	PTMP	-6.2600046+00	AZMP	8.8187721+01
XME	1.6110985+03	YME	-3.1171723+03	ZME	-3.1283130+01	DXME	3.0035772+04	DYME	1.9939782+04	DZME	1.1689565+03

PLANETARY COORDINATES

XM	1.8567453+05	YM	9.7108786+04	ZM	5.0999075+04	DXM	-1.5132511+03	DYM	2.4899486+03	DZM	1.3623639+03
RM	2.1565261+05	DEM	1.3679301+01	RAM	2.7609812+01	LOM	5.1298712+01	VM	3.2164901+03	ARGM	2.9758776+01
XSUN	9.6932286+06	YSUN	-7.2329721+07	ZSUN	-3.1364784+07	RAS	-8.2367013+01	LOS	3.0132188+02	DES	-2.3257735+01

GEOCENTRIC OSCULATING ELEMENTS

SMA	1.1998484+05	ECC	9.7110718-01	INC	2.6660389+01	RAN	2.1608142+00	APF	1.5869125+02	RP	3.4667014+03
VH	-2.6665756+02	RNMP	-4.6932434+01	APMP	-3.0366865+00	INMP	1.8828528+00	APO	2.3650297+05	TFP	1.7112818+02
TA	-1.2707035+01	EA	-1.5446958+00	MA	-4.4812315-02	SLR	6.8332371+03	PER	2.8957296+02	MTA	3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS

SMAS	-1.9681931+01	ECCS	6.8511198+03	INCS	2.5999372+01	RANS	-2.2383651+00	APFS	1.6009530+02	RPS	1.3482358+05
VHS	3.8049749+04	RNMPS	1.7934382+02	APMPS	-5.1818222+01	INMPS	2.8480228+00	APOS	-1.3486294+05	TFPS	1.6353408+02
TAS	5.1652205+01	EAS	6.0513263+01	MAS	4.9601341+05	SLRS	9.2382734+08	PERS	5.4855388-03	MTAS	9.0008362+01

GEOCENTRIC UNIT VECTORS

WX	1.6918006-02	WY	-4.4838225-01	WZ	8.9368179-01	PX	-9.4321810-01	PY	2.8940043-01	PZ	1.6305511-01
QX	-3.3174291-01	QY	-8.4569540-01	QZ	-4.1802617-01	SXO	0.0000000	SYO	0.0000000	SZO	0.0000000

EARTH ENTRY RANGE AND TOUCHDOWN

ENTRG	1.4600000+03	ENTDT	1.4233299-01	LATTD	4.3619484+00	LONTD	1.9500001+02	AZTD	1.1632920+02

GAMMA TERMINATION

ENTRY

TABLE X.- ENTRY

(a) Position vector

TIME SECONDS	TIME DAY HR MIN SEC	GEODETIC LATITUDE DEGREES	GEODETIC LATITUDE DEG MIN SEC	LONGITUDE DEGREES	LONGITUDE DEG MIN SEC	ALTITUDE FEET	ALTITUDE METERS	RADIUS FEET
615931.680	7. 3. 5. 31.680	14.62948	14. 37. 46.1	174.76332	174. 45. 11.9	400049.0	121936.	21321348.
			ATMOSPHERIC ENTRY					
615931.680	7. 3. 5. 31.680	14.62948	14. 37. 46.1	174.76332	174. 45. 11.9	400049.0	121936.	21321348.
615933.680	7. 3. 5. 33.672	14.55499	14. 33. 17.8	174.92878	174. 55. 43.6	392197.2	119542.	21313640.
615935.680	7. 3. 5. 35.672	14.48021	14. 28. 48.7	175.10425	175. 6. 15.3	384463.3	117185.	21306850.
615937.670	7. 3. 5. 37.672	14.40527	14. 24. 19.0	175.27971	175. 16. 47.0	376896.5	114863.	21298277.
615939.680	7. 3. 5. 39.672	14.33014	14. 19. 48.5	175.45518	175. 27. 18.7	369347.8	112577.	21290823.
615941.670	7. 3. 5. 41.672	14.25482	14. 15. 17.3	175.63066	175. 37. 50.4	361967.3	110328.	21283986.
615943.680	7. 3. 5. 43.672	14.17930	14. 10. 45.5	175.80614	175. 48. 22.1	354704.8	108114.	21276267.
615945.670	7. 3. 5. 45.672	14.10359	14. 6. 12.9	175.98164	175. 58. 54.0	347560.8	105937.	21269167.
615947.680	7. 3. 5. 47.672	14.02769	14. 1. 39.7	176.15714	176. 9. 25.7	340535.3	103796.	21262185.
615949.680	7. 3. 5. 49.672	13.95159	13. 57. 5.7	176.33262	176. 19. 57.4	333628.6	101690.	21255322.
615951.670	7. 3. 5. 51.672	13.87532	13. 52. 31.1	176.50810	176. 30. 29.2	326841.1	99621.	21248578.
615953.680	7. 3. 5. 53.672	13.79885	13. 47. 55.9	176.68357	176. 41. .9	320172.9	97589.	21241952.
615955.670	7. 3. 5. 55.672	13.72220	13. 43. 19.9	176.85904	176. 51. 32.5	313624.6	95593.	21235447.
615957.680	7. 3. 5. 57.672	13.64537	13. 38. 43.3	177.03448	177. 2. 4.2	307195.9	93633.	21229061.
615959.670	7. 3. 5. 59.672	13.56836	13. 34. 6.1	177.20994	177. 12. 35.8	300888.9	91711.	21222796.
			ENTER S-BAND COMMUNICATION BLACKOUT					
615959.670	7. 3. 5. 59.672	13.56836	13. 34. 6.1	177.20994	177. 12. 35.8	300888.9	91711.	21222796.
615961.680	7. 3. 6. 1.672	13.49118	13. 29. 28.2	177.38536	177. 23. 7.3	294701.7	89825.	21216653.
615963.680	7. 3. 6. 3.672	13.41382	13. 24. 49.7	177.56079	177. 33. 38.7	288637.2	87977.	21210631.
			ENTER C-BAND COMMUNICATION BLACKOUT LOAD FACTOR = 0.05 G					
615963.680	7. 3. 6. 3.672	13.41382	13. 24. 49.7	177.56079	177. 33. 38.7	288637.2	87977.	21210631.
615965.670	7. 3. 6. 5.672	13.33629	13. 20. 10.6	177.73609	177. 44. 9.9	282695.9	86166.	21204732.
615967.680	7. 3. 6. 7.672	13.25860	13. 15. 31.0	177.91139	177. 54. 41.0	276879.4	84393.	21198957.
615969.670	7. 3. 6. 9.672	13.18076	13. 10. 50.7	178.08662	178. 5. 11.9	271189.2	82659.	21193310.
615971.680	7. 3. 6. 11.672	13.10276	13. 6. 9.9	178.26178	178. 15. 42.4	265628.2	80964.	21187790.
615973.670	7. 3. 6. 13.672	13.02463	13. 1. 28.7	178.43685	178. 26. 12.7	260199.2	79309.	21182409.
615975.680	7. 3. 6. 15.672	12.94636	12. 56. 46.9	178.61176	178. 36. 42.4	254906.5	77696.	21177153.
615977.670	7. 3. 6. 17.672	12.86798	12. 52. 4.7	178.78649	178. 47. 11.4	249753.5	76125.	21172041.
615979.680	7. 3. 6. 19.672	12.78950	12. 47. 22.2	178.96101	178. 57. 39.6	244745.5	74599.	21167074.
615981.680	7. 3. 6. 21.672	12.71093	12. 42. 39.4	179.13525	179. 8. 6.9	239889.3	73118.	21162269.
615983.670	7. 3. 6. 23.672	12.63231	12. 37. 56.3	179.30917	179. 18. 33.0	235191.3	71686.	21157601.
615985.680	7. 3. 6. 25.672	12.55365	12. 33. 13.1	179.48268	179. 28. 57.7	230659.5	70305.	21153111.
615987.670	7. 3. 6. 27.672	12.47498	12. 28. 29.9	179.65576	179. 39. 20.8	226303.3	68977.	21148795.
615989.680	7. 3. 6. 29.672	12.39634	12. 23. 46.9	179.82826	179. 49. 41.7	222132.0	67706.	21144664.
615991.670	7. 3. 6. 31.672	12.31780	12. 19. 4.1	-179.99989	-179. 59. 59.6	218156.5	66494.	21140728.
615993.680	7. 3. 6. 33.672	12.23936	12. 14. 21.7	-179.82879	-179. 49. 43.6	214388.3	65346.	21137000.
615995.680	7. 3. 6. 35.672	12.16108	12. 9. 39.9	-179.65852	-179. 39. 30.7	210838.0	64264.	21133488.
615997.670	7. 3. 6. 37.672	12.08301	12. 5. 58.8	-179.48823	-179. 29. 21.2	207517.6	63251.	21130207.
615999.680	7. 3. 6. 39.672	12.00521	12. 0. 18.7	-179.32098	-179. 19. 15.6	204438.6	62313.	21127167.
616001.670	7. 3. 6. 41.672	11.92772	11. 55. 39.8	-179.15390	-179. 9. 14.0	201610.3	61451.	21124377.
			MAXIMUM HEATING RATE					
616001.670	7. 3. 6. 41.672	11.92772	11. 55. 39.8	-179.15390	-179. 9. 14.0	201610.3	61451.	21124377.
616003.680	7. 3. 6. 43.672	11.85059	11. 51. 2.1	-178.98811	-178. 59. 17.2	199042.8	60668.	21121847.
616005.670	7. 3. 6. 45.672	11.77387	11. 46. 25.9	-178.82372	-178. 49. 25.4	196744.6	59968.	21119586.
616007.680	7. 3. 6. 47.672	11.69760	11. 41. 51.4	-178.66082	-178. 39. 39.0	194722.3	59351.	21117601.
616009.670	7. 3. 6. 49.672	11.62182	11. 37. 18.5	-178.49963	-178. 29. 58.3	192980.3	58821.	21115895.
616011.670	7. 3. 6. 51.672	11.54656	11. 32. 47.6	-178.33989	-178. 20. 23.6	191521.1	58376.	21114472.
			GUIDANCE INITIATE AT RDOT = -700 FT/SEC					
616011.670	7. 3. 6. 51.672	11.54656	11. 32. 47.6	-178.33989	-178. 20. 23.6	191521.1	58376.	21114472.
616013.680	7. 3. 6. 53.672	11.47184	11. 28. 18.6	-178.18196	-178. 10. 55.1	190344.8	58017.	21113331.
616015.670	7. 3. 6. 55.672	11.39769	11. 23. 51.7	-178.02584	-178. 1. 33.0	189448.8	57744.	21112470.
616017.680	7. 3. 6. 57.672	11.32411	11. 19. 24.8	-177.87153	-177. 52. 17.5	188828.1	57555.	21111884.
			MAXIMUM LOAD FACTOR FIRST ENTRY					
616017.680	7. 3. 6. 57.672	11.32411	11. 19. 24.8	-177.87153	-177. 52. 17.5	188828.1	57555.	21111884.
616019.670	7. 3. 6. 59.672	11.25111	11. 15. 4.0	-177.71903	-177. 43. 8.5	188476.1	57448.	21111566.
616021.680	7. 3. 7. 1.672	11.17869	11. 10. 43.3	-177.56833	-177. 34. 6.0	188383.3	57419.	21111507.
616023.670	7. 3. 7. 3.672	11.10681	11. 6. 24.5	-177.41942	-177. 25. 9.9	188538.4	57467.	21111695.
616025.680	7. 3. 7. 5.672	11.03540	11. 2. 7.5	-177.27228	-177. 16. 20.2	188918.1	57582.	21112107.
616027.680	7. 3. 7. 7.672	10.96438	10. 57. 51.7	-177.12688	-177. 7. 36.8	189474.4	57762.	21112696.
616029.670	7. 3. 7. 9.672	10.89353	10. 53. 36.7	-176.98327	-176. 58. 59.8	190116.1	57948.	21113370.
616031.680	7. 3. 7. 11.672	10.82297	10. 49. 22.7	-176.84133	-176. 50. 28.8	190735.6	58136.	21114022.
616033.670	7. 3. 7. 13.672	10.75276	10. 45. 9.9	-176.70091	-176. 42. 3.3	191263.9	58297.	21114581.
616035.680	7. 3. 7. 15.672	10.68300	10. 40. 58.8	-176.56193	-176. 33. 43.0	191679.6	58424.	21115027.
616037.670	7. 3. 7. 17.672	10.61367	10. 36. 49.2	-176.42432	-176. 25. 27.5	191983.9	58517.	21115362.
616039.680	7. 3. 7. 19.672	10.54477	10. 32. 41.2	-176.28803	-176. 17. 16.9	192180.1	58577.	21115588.
616041.680	7. 3. 7. 21.672	10.47627	10. 28. 34.6	-176.15302	-176. 9. 10.9	192270.6	58604.	21115709.
616043.670	7. 3. 7. 23.672	10.40818	10. 24. 29.4	-176.01930	-176. 1. 9.5	192256.9	58600.	21115725.
616045.680	7. 3. 7. 25.672	10.34048	10. 20. 25.7	-175.88684	-175. 53. 12.6	192137.9	58564.	21115635.
616047.670	7. 3. 7. 27.672	10.27318	10. 16. 23.4	-175.75561	-175. 45. 20.2	191913.9	58495.	21115439.
616049.680	7. 3. 7. 29.672	10.20628	10. 12. 22.6	-175.62558	-175. 37. 32.1	191583.4	58396.	21115138.
616051.670	7. 3. 7. 31.672	10.13978	10. 8. 23.2	-175.49675	-175. 29. 48.3	191145.1	58261.	21114728.
616053.680	7. 3. 7. 33.672	10.07368	10. 4. 25.3	-175.36912	-175. 22. 8.9	190597.1	58094.	21114207.
616055.670	7. 3. 7. 35.672	10.00797	10. 0. 28.7	-175.24268	-175. 14. 33.7	189940.9	57894.	21113578.
616057.680	7. 3. 7. 37.672	9.94261	9. 56. 33.4	-175.11751	-175. 7. 3.0	189184.6	57664.	21112860.
616059.680	7. 3. 7. 39.672	9.87752	9. 52. 39.1	-174.99361	-174. 59. 37.0	188349.4	57409.	21112040.
616061.670	7. 3. 7. 41.672	9.81266	9. 48. 45.6	-174.87106	-174. 52. 15.8	187468.9	57141.	21111187.
616063.680	7. 3. 7. 43.672	9.74801	9. 44. 52.8	-174.74986	-174. 44. 59.5	186585.1	56871.	21110329.
616065.670	7. 3. 7. 45.672	9.68356	9. 41. .8	-174.63003	-174. 37. 48.1	185741.6	56614.	21109512.
616067.680	7. 3. 7. 47.672	9.61936	9. 37. 9.7	-174.51159	-174. 30. 41.7	184963.6	56377.	21108760.
616069.670	7. 3. 7. 49.672	9.55540	9. 33. 19.5	-174.39460	-174. 23. 40.2	184251.6	56160.	21108073.
616071.680	7. 3. 7. 51.672	9.49170	9. 29. 30.1	-174.27884	-174. 16. 43.8	183602.1	55962.	21107449.
616073.680	7. 3. 7. 53.672	9.42826	9. 25. 41.7	-174.16457	-174. 9. 52.5	183007.9	55781.	21106879.
616075.670	7. 3. 7. 55.672	9.36507	9. 21. 54.3	-174.05172	-174. 3. 6.2	182457.9	55613.	21106354.
616077.680	7. 3. 7. 57.672	9.30214	9. 18. 7.7	-173.94027	-173. 56. 25.0	181938.1	55455.	21105869.
616079.670	7. 3. 7. 59.672	9.23946	9. 14. 22.1	-173.83023	-173. 49. 48.8	181432.2	55301.	21105377.
616081.680	7. 3. 8. 1.672	9.17704	9. 10. 37.3	-173.72159	-173. 43. 17.7	180934.4	55149.	21104904.
616083.670	7. 3. 8. 3.672	9.11491	9. 6. 53.7	-173.61429	-173. 36. 51.5	180481.9	55011.	21104474.

TABLE X.- Continued

(a) Position vector - Continued

TIME SECONDS	TIME DAY	HR	MIN	SEC	GEODETIC LATITUDE DEGREES	GEODETIC LATITUDE DEG	MIN	SEC	LONGITUDE DEGREES	LONGITUDE DEG	MIN	SEC	ALTITUDE FEET	ALTITUDE METERS	RADIUS FEET
616085.680	7.	3.	8.	5.672	9.05318	9.	3.	11.4	-173.50835	-173.	30.	30.0	180129.4	54904.	21104146.
616087.680	7.	3.	8.	7.672	8.99200	8.	59.	31.2	-173.40359	-173.	24.	12.9	179904.9	54835.	21103944.
616089.670	7.	3.	8.	9.672	8.93148	8.	55.	53.3	-173.29996	-173.	17.	59.9	179806.9	54805.	21103869.
616091.680	7.	3.	8.	11.672	8.87166	8.	52.	18.0	-173.19740	-173.	11.	50.7	179827.2	54811.	21103911.
616093.670	7.	3.	8.	13.672	8.81253	8.	48.	45.1	-173.09590	-173.	5.	45.3	179958.7	54852.	21104065.
616095.680	7.	3.	8.	15.672	8.75407	8.	45.	14.7	-172.99540	-172.	59.	43.4	180193.4	54923.	21104321.
616097.670	7.	3.	8.	17.672	8.69628	8.	41.	46.6	-172.89591	-172.	53.	46.3	180524.2	55024.	21104673.
616099.680	7.	3.	8.	19.672	8.63915	8.	38.	20.9	-172.79737	-172.	47.	50.6	180943.2	55152.	21105112.
616101.670	7.	3.	8.	21.672	8.58264	8.	34.	57.5	-172.69977	-172.	41.	59.2	181444.2	55304.	21105634.
616103.680	7.	3.	8.	23.672	8.52674	8.	31.	36.3	-172.60306	-172.	36.	11.0	182020.9	55480.	21106230.
616105.680	7.	3.	8.	25.672	8.47142	8.	28.	17.1	-172.50721	-172.	30.	26.0	182666.4	55677.	21106896.
616107.670	7.	3.	8.	27.672	8.41666	8.	24.	60.0	-172.41219	-172.	24.	43.9	183373.7	55892.	21107622.
616109.680	7.	3.	8.	29.672	8.36246	8.	21.	44.9	-172.31792	-172.	19.	4.5	184132.7	56124.	21108400.
616111.670	7.	3.	8.	31.672	8.30881	8.	18.	31.7	-172.22442	-172.	13.	27.9	184934.7	56368.	21109220.
616113.680	7.	3.	8.	33.672	8.25570	8.	15.	20.5	-172.13161	-172.	7.	53.8	185769.9	56623.	21110074.
616115.670	7.	3.	8.	35.672	8.20311	8.	12.	11.2	-172.03947	-172.	2.	22.1	186631.9	56886.	21110954.
EXIT C-BAND COMMUNICATION BLACKOUT															
616115.670	7.	3.	8.	35.672	8.20311	8.	12.	11.2	-172.03947	-172.	2.	22.1	186631.9	56886.	21110954.
616117.680	7.	3.	8.	37.672	8.15100	8.	9.	3.6	-171.94798	-171.	56.	52.7	187518.2	57156.	21111859.
616119.680	7.	3.	8.	39.672	8.09934	8.	5.	57.6	-171.85711	-171.	51.	25.6	188428.9	57433.	21112787.
616121.670	7.	3.	8.	41.672	8.04808	8.	2.	53.1	-171.76684	-171.	46.	.6	189362.7	57718.	21113738.
616123.680	7.	3.	8.	43.672	7.99722	7.	59.	50.0	-171.67713	-171.	40.	37.7	190315.4	58008.	21114708.
616125.670	7.	3.	8.	45.672	7.94672	7.	56.	48.2	-171.58800	-171.	35.	16.8	191282.7	58303.	21115692.
616127.680	7.	3.	8.	47.672	7.89659	7.	53.	47.7	-171.49938	-171.	29.	57.8	192258.4	58600.	21116684.
616129.670	7.	3.	8.	49.672	7.84681	7.	50.	48.5	-171.41126	-171.	24.	40.6	193235.4	58898.	21117678.
616131.680	7.	3.	8.	51.672	7.79739	7.	47.	50.6	-171.32360	-171.	19.	25.0	194206.7	59194.	21118666.
616133.670	7.	3.	8.	53.672	7.74832	7.	44.	53.9	-171.23637	-171.	14.	10.9	195165.2	59486.	21119639.
616135.670	7.	3.	8.	55.672	7.69959	7.	41.	58.6	-171.14955	-171.	8.	58.4	196103.9	59773.	21120594.
616137.680	7.	3.	8.	57.672	7.65119	7.	39.	4.3	-171.06310	-171.	3.	47.1	197017.4	60051.	21121523.
616139.670	7.	3.	8.	59.672	7.60310	7.	36.	11.2	-170.97703	-170.	58.	37.3	197900.7	60320.	21122421.
EXIT S-BAND COMMUNICATION BLACKOUT															
616139.670	7.	3.	8.	59.672	7.60310	7.	36.	11.2	-170.97703	-170.	58.	37.3	197900.7	60320.	21122421.
616141.680	7.	3.	9.	1.672	7.55534	7.	33.	19.2	-170.89132	-170.	53.	28.8	198748.4	60579.	21123285.
616143.670	7.	3.	9.	3.672	7.50787	7.	30.	28.3	-170.80595	-170.	48.	21.4	199557.7	60825.	21124109.
616145.680	7.	3.	9.	5.672	7.46068	7.	27.	38.5	-170.72091	-170.	43.	15.3	200326.9	61060.	21124893.
616147.670	7.	3.	9.	7.672	7.41378	7.	24.	49.6	-170.63617	-170.	38.	10.2	201054.7	61282.	21125636.
616149.680	7.	3.	9.	9.672	7.36714	7.	22.	1.7	-170.55174	-170.	33.	6.3	201740.9	61491.	21126336.
616151.680	7.	3.	9.	11.672	7.32076	7.	19.	14.7	-170.46757	-170.	28.	3.3	202384.9	61687.	21126994.
616153.670	7.	3.	9.	13.672	7.27462	7.	18.	28.6	-170.38371	-170.	23.	1.4	202984.4	61870.	21127608.
616155.680	7.	3.	9.	15.672	7.22873	7.	18.	43.4	-170.30013	-170.	18.	.5	203540.7	62039.	21128178.
616157.670	7.	3.	9.	17.672	7.18307	7.	10.	59.0	-170.21682	-170.	13.	.6	204051.9	62195.	21128703.
616159.680	7.	3.	9.	19.672	7.13763	7.	8.	15.5	-170.13377	-170.	8.	1.6	204517.4	62337.	21129182.
616161.670	7.	3.	9.	21.672	7.09242	7.	5.	32.7	-170.05097	-170.	3.	3.5	204936.2	62465.	21129614.
616163.680	7.	3.	9.	23.672	7.04742	7.	2.	50.7	-169.96843	-169.	58.	6.3	205306.7	62578.	21129999.
616165.680	7.	3.	9.	25.672	7.00264	7.	0.	9.5	-169.88610	-169.	53.	9.9	205627.4	62675.	21130332.
616167.670	7.	3.	9.	27.672	6.95806	6.	57.	29.0	-169.80403	-169.	48.	14.5	205896.9	62758.	21130615.
616169.680	7.	3.	9.	29.672	6.91369	6.	54.	49.3	-169.72219	-169.	43.	19.9	206113.7	62824.	21130844.
616171.670	7.	3.	9.	31.672	6.86952	6.	52.	10.3	-169.64059	-169.	38.	26.1	206276.7	62873.	21131020.
616173.680	7.	3.	9.	33.672	6.82556	6.	49.	32.0	-169.55921	-169.	33.	33.2	206384.4	62906.	21131141.
616175.670	7.	3.	9.	35.672	6.78179	6.	46.	54.5	-169.47806	-169.	28.	41.0	206435.7	62922.	21131205.
616177.680	7.	3.	9.	37.672	6.73823	6.	44.	17.6	-169.39709	-169.	23.	49.5	206429.7	62920.	21131211.
616179.670	7.	3.	9.	39.672	6.69485	6.	41.	41.5	-169.31630	-169.	18.	59.0	206369.2	62900.	21131157.
616181.680	7.	3.	9.	41.672	6.65168	6.	39.	6.0	-169.23568	-169.	14.	9.2	206238.9	62862.	21131045.
616183.680	7.	3.	9.	43.672	6.60870	6.	36.	31.3	-169.15520	-169.	9.	20.2	206052.7	62805.	21130870.
616185.670	7.	3.	9.	45.672	6.56592	6.	33.	57.3	-169.07553	-169.	4.	31.9	205804.2	62729.	21130633.
616187.680	7.	3.	9.	47.672	6.52333	6.	31.	24.0	-168.99567	-168.	59.	44.4	205491.7	62634.	21130333.
616189.670	7.	3.	9.	49.672	6.48094	6.	28.	51.4	-168.91604	-168.	54.	57.7	205115.4	62519.	21129968.
616191.680	7.	3.	9.	51.672	6.43874	6.	26.	19.5	-168.83659	-168.	50.	11.7	204672.9	62384.	21129537.
616193.670	7.	3.	9.	53.672	6.39675	6.	23.	48.3	-168.75739	-168.	45.	26.6	204163.9	62229.	21129039.
616195.680	7.	3.	9.	55.672	6.35496	6.	21.	17.9	-168.67840	-168.	40.	42.3	203586.4	62053.	21128473.
616197.680	7.	3.	9.	57.672	6.31338	6.	18.	48.2	-168.59964	-168.	35.	58.7	202939.9	61856.	21127838.
616199.670	7.	3.	9.	59.672	6.27200	6.	16.	19.2	-168.52111	-168.	31.	16.0	202223.4	61638.	21127132.
616201.680	7.	3.	10.	1.672	6.23083	6.	13.	51.0	-168.44280	-168.	26.	34.1	201434.7	61397.	21126354.
616203.670	7.	3.	10.	3.672	6.18988	6.	11.	23.6	-168.36473	-168.	21.	53.1	200573.4	61135.	21125504.
616205.680	7.	3.	10.	5.672	6.14916	6.	8.	57.0	-168.28687	-168.	17.	12.8	199637.7	60850.	21124578.
616207.670	7.	3.	10.	7.672	6.10866	6.	6.	31.2	-168.20929	-168.	12.	33.5	198626.0	60541.	21123577.
616209.680	7.	3.	10.	9.672	6.06839	6.	4.	6.2	-168.13197	-168.	7.	55.1	197537.5	60210.	21122499.
616211.680	7.	3.	10.	11.672	6.02837	6.	1.	42.1	-168.05490	-168.	3.	17.7	196370.0	59854.	21121342.
616213.670	7.	3.	10.	13.672	5.98859	5.	59.	18.9	-167.97811	-167.	58.	41.2	195122.9	59474.	21120104.
616215.680	7.	3.	10.	15.672	5.94908	5.	56.	56.7	-167.90160	-167.	54.	5.8	193795.2	59069.	21118787.
616217.670	7.	3.	10.	17.672	5.90983	5.	54.	35.4	-167.82538	-167.	49.	31.4	192387.7	58640.	21117389.
616219.680	7.	3.	10.	19.672	5.87087	5.	52.	15.1	-167.74944	-167.	44.	58.0	190899.5	58186.	21115910.
616221.670	7.	3.	10.	21.672	5.83221	5.	49.	56.0	-167.67386	-167.	40.	25.9	189332.0	57708.	21114352.
616223.680	7.	3.	10.	23.672	5.79387	5.	47.	37.9	-167.59859	-167.	35.	54.9	187685.0	57206.	21112715.
616225.670	7.	3.	10.	25.672	5.75586	5.	45.	21.1	-167.52367	-167.	31.	25.2	185958.7	56680.	21110998.
616227.680	7.	3.	10.	27.672	5.71819	5.	43.	5.5	-167.44914	-167.	26.	56.9	184154.7	56130.	21109203.
616229.680	7.	3.	10.	29.672	5.68090	5.	40.	51.3	-167.37499	-167.	22.	30.0	182273.0	55557.	21107330.

TABLE X.- Continued

(a) Position vector - Continued

TIME SECONDS	TIME DAY HR MIN SEC	GEODETIC LATITUDE DEGREES	GEODETIC LATITUDE DEG MIN SEC	LONGITUDE DEGREES	LONGITUDE DEG MIN SEC	ALTITUDE FEET	ALTITUDE METERS	RADIUS FEET
616231.670	7. 3. 10. 31.672	5.644401	5. 38. 38.4	-167.30125	-167. 18. 4.5	180316.2	54960.	21105381.
616233.680	7. 3. 10. 33.672	5.640753	5. 38. 27.1	-167.32792	-167. 19. 40.6	178282.5	54341.	21103358.
616235.670	7. 3. 10. 35.672	5.637150	5. 38. 17.4	-167.35507	-167. 21. 18.3	176178.0	53699.	21101261.
616237.680	7. 3. 10. 37.672	5.633594	5. 38. 9.4	-167.38272	-167. 23. 57.8	174009.7	53037.	21099097.
616239.670	7. 3. 10. 39.672	5.630088	5. 38. 3.2	-167.41088	-167. 26. 39.2	171766.5	52355.	21096867.
616241.680	7. 3. 10. 41.672	5.626636	5. 37. 58.9	-166.93960	-166. 56. 22.6	169467.7	51654.	21094576.
616243.680	7. 3. 10. 43.672	5.623242	5. 37. 56.7	-166.86892	-166. 52. 8.1	167119.0	50936.	21092229.
616245.670	7. 3. 10. 45.672	5.619909	5. 37. 56.7	-166.79884	-166. 47. 55.8	164711.2	50204.	21089834.
616247.680	7. 3. 10. 47.672	5.616641	5. 37. 59.1	-166.72947	-166. 43. 46.1	162267.7	49459.	21087398.
616249.670	7. 3. 10. 49.672	5.613443	5. 38. 4.0	-166.66085	-166. 39. 39.0	159791.0	48704.	21084929.
616251.680	7. 3. 10. 51.672	5.610319	5. 38. 11.5	-166.59300	-166. 35. 34.8	157298.5	47945.	21082443.
616253.670	7. 3. 10. 53.672	5.607265	5. 38. 21.6	-166.52603	-166. 31. 33.7	154842.0	47196.	21079993.
616255.680	7. 3. 10. 55.672	5.604270	5. 38. 33.7	-166.46005	-166. 27. 36.2	152476.0	46476.	21077634.
616257.670	7. 3. 10. 57.672	5.601311	5. 38. 47.2	-166.39525	-166. 23. 42.9	150207.7	45783.	21075372.
616259.670	7. 3. 10. 59.672	5.598372	5. 39. 1.4	-166.33178	-166. 19. 54.4	147994.5	45109.	21073166.
616261.680	7. 3. 11. 1.672	5.595450	5. 39. 16.2	-166.26980	-166. 16. 11.3	145789.5	44437.	21070967.
616263.670	7. 3. 11. 3.672	5.592545	5. 39. 31.6	-166.20937	-166. 12. 33.8	143575.5	43762.	21068759.
616265.680	7. 3. 11. 5.672	5.589657	5. 39. 47.7	-166.15058	-166. 9. 2.1	141349.0	43083.	21066539.
616267.670	7. 3. 11. 7.672	5.586791	5. 40. 4.5	-166.09349	-166. 5. 36.6	139118.5	42403.	21064314.
616269.680	7. 3. 11. 9.672	5.583950	5. 40. 22.2	-166.03818	-166. 2. 17.5	136903.5	41728.	21062105.
616271.670	7. 3. 11. 11.672	5.581136	5. 40. 40.9	-165.98470	-165. 59. 4.9	134730.7	41066.	21059939.
616273.680	7. 3. 11. 13.672	4.978356	4. 59. .8	-165.93307	-165. 55. 59.0	132629.2	40425.	21057843.
616275.680	7. 3. 11. 15.672	4.975617	4. 57. 22.2	-165.88336	-165. 53. .1	130636.5	39818.	21055856.
616277.670	7. 3. 11. 17.672	4.972932	4. 56. 45.6	-165.83580	-165. 50. 7.8	128800.0	39258.	21054026.
616279.680	7. 3. 11. 19.672	4.970315	4. 56. 11.3	-165.78946	-165. 47. 22.1	127152.5	38756.	21052383.
		MAXIMUM LOAD FACTOR SECOND ENTRY						
616279.680	7. 3. 11. 19.672	4.970315	4. 56. 11.3	-165.78946	-165. 47. 22.1	127152.5	38756.	21052383.
616281.670	7. 3. 11. 21.672	4.967776	4. 55. 39.9	-165.74518	-165. 44. 42.6	125701.2	38314.	21050937.
616283.680	7. 3. 11. 23.672	4.965319	4. 55. 11.3	-165.70265	-165. 42. 9.5	124435.5	37928.	21049677.
616285.670	7. 3. 11. 25.672	4.962922	4. 54. 45.2	-165.66188	-165. 39. 42.8	123333.7	37592.	21048579.
616287.680	7. 3. 11. 27.672	4.960591	4. 54. 21.3	-165.62284	-165. 37. 22.2	122363.2	37296.	21047614.
616289.680	7. 3. 11. 29.672	4.958312	4. 54. 59.2	-165.58559	-165. 35. 8.1	121476.2	37026.	21046732.
616291.670	7. 3. 11. 31.672	4.956077	4. 53. 38.8	-165.55008	-165. 33. .3	120620.2	36765.	21045880.
616293.680	7. 3. 11. 33.672	4.953883	4. 53. 19.8	-165.51626	-165. 30. 58.5	119739.5	36497.	21045004.
616295.670	7. 3. 11. 35.672	4.951729	4. 53. 2.2	-165.48409	-165. 29. 2.7	118783.2	36205.	21044052.
616297.680	7. 3. 11. 37.672	4.949617	4. 52. 46.2	-165.45349	-165. 27. 12.6	117715.2	35880.	21042988.
616299.670	7. 3. 11. 39.672	4.947548	4. 52. 31.7	-165.42442	-165. 25. 27.9	116534.2	35520.	21041811.
616301.680	7. 3. 11. 41.672	4.945523	4. 52. 18.8	-165.39680	-165. 23. 48.5	115248.7	35128.	21040529.
616303.670	7. 3. 11. 43.672	4.943543	4. 52. 7.5	-165.37064	-165. 22. 14.4	113865.5	34706.	21039150.
616305.670	7. 3. 11. 45.672	4.941609	4. 51. 57.9	-165.34591	-165. 20. 45.3	112393.2	34258.	21037681.
616307.680	7. 3. 11. 47.672	4.939721	4. 51. 50.0	-165.32255	-165. 19. 21.2	110843.2	33785.	21036135.
616309.670	7. 3. 11. 49.672	4.937882	4. 51. 43.7	-165.30053	-165. 18. 1.9	109227.5	33293.	21034523.
616311.680	7. 3. 11. 51.672	4.936091	4. 51. 39.3	-165.27984	-165. 16. 47.4	107560.5	32785.	21032859.
616313.670	7. 3. 11. 53.672	4.934350	4. 51. 36.6	-165.26043	-165. 15. 37.6	105856.0	32265.	21031158.
616315.680	7. 3. 11. 55.672	4.932661	4. 51. 35.8	-165.24227	-165. 14. 32.2	104127.5	31738.	21029433.
616317.670	7. 3. 11. 57.672	4.931025	4. 51. 36.9	-165.22535	-165. 13. 31.3	102389.5	31208.	21027698.
616319.680	7. 3. 11. 59.672	4.929441	4. 51. 39.9	-165.20961	-165. 12. 34.6	100654.0	30679.	21025965.
616321.680	7. 3. 12. 1.672	4.927912	4. 51. 44.8	-165.19501	-165. 11. 42.0	98931.7	30154.	21024247.
616323.670	7. 3. 12. 3.672	4.926438	4. 51. 51.8	-165.18149	-165. 10. 53.4	97232.7	29637.	21022560.
616325.680	7. 3. 12. 5.672	4.925019	4. 52. .7	-165.16899	-165. 10. 8.4	95576.2	29132.	21020897.
616327.670	7. 3. 12. 7.672	4.923660	4. 52. 11.8	-165.15734	-165. 9. 26.4	94007.0	28653.	21019330.
616329.680	7. 3. 12. 9.672	4.922374	4. 52. 25.5	-165.14637	-165. 8. 46.9	92548.5	28209.	21017873.
616331.670	7. 3. 12. 11.672	4.921175	4. 52. 42.3	-165.13585	-165. 8. 9.1	91165.2	27787.	21016493.
616333.680	7. 3. 12. 13.672	4.920069	4. 52. 2.5	-165.12568	-165. 7. 32.5	89793.5	27369.	21015123.
616335.680	7. 3. 12. 15.672	4.919056	4. 53. 26.0	-165.11588	-165. 6. 57.2	88385.2	26940.	21013717.
616337.670	7. 3. 12. 17.672	4.918132	4. 53. 52.7	-165.10646	-165. 6. 23.2	86924.5	26495.	21012258.
616339.680	7. 3. 12. 19.672	4.917291	4. 54. 22.5	-165.09739	-165. 5. 50.6	85415.5	26035.	21010750.
616341.670	7. 3. 12. 21.672	4.916530	4. 54. 55.1	-165.08867	-165. 5. 19.2	83865.7	25562.	21009202.
616343.680	7. 3. 12. 23.672	4.915845	4. 55. 30.4	-165.08035	-165. 4. 49.3	82282.5	25080.	21007620.
616345.670	7. 3. 12. 25.672	4.915231	4. 55. 8.3	-165.07242	-165. 4. 20.7	80673.5	24589.	21006012.
616347.680	7. 3. 12. 27.672	4.914685	4. 56. 48.7	-165.06485	-165. 3. 53.5	79046.2	24093.	21004386.
616349.670	7. 3. 12. 29.672	4.914202	4. 56. 31.3	-165.05765	-165. 3. 27.5	77406.2	23593.	21002746.
616351.680	7. 3. 12. 31.672	4.913779	4. 56. 16.1	-165.05080	-165. 3. 2.9	75759.7	23092.	21001101.
616353.680	7. 3. 12. 33.672	4.913411	4. 56. 2.8	-165.04432	-165. 2. 39.6	74111.5	22589.	20999453.
616355.670	7. 3. 12. 35.672	4.913096	4. 55. 51.4	-165.03816	-165. 2. 17.4	72468.7	22089.	20997810.
616357.680	7. 3. 12. 37.672	4.912828	4. 55. 41.8	-165.03237	-165. 1. 56.6	70835.7	21591.	20996179.
616359.670	7. 3. 12. 39.672	4.912604	4. 55. 33.7	-165.02692	-165. 1. 36.9	69222.7	21099.	20994566.
616361.680	7. 3. 12. 41.672	4.912415	4. 55. 26.9	-165.02175	-165. 1. 18.3	67656.0	20622.	20993000.
616363.670	7. 3. 12. 43.672	4.912245	4. 55. 20.8	-165.01684	-165. 1. .7	66150.7	20163.	20991495.
616365.680	7. 3. 12. 45.672	4.912078	4. 55. 14.8	-165.01224	-165. 0. 44.1	64697.2	19720.	20990041.
616367.680	7. 3. 12. 47.672	4.911908	4. 55. 8.7	-165.00799	-165. 0. 28.8	63268.0	19284.	20988613.
616369.670	7. 3. 12. 49.672	4.911733	4. 55. 2.4	-165.00412	-165. 0. 14.8	61838.0	18848.	20987182.
616371.680	7. 3. 12. 51.672	4.911556	4. 54. 56.0	-165.00069	-165. 0. 2.5	60395.7	18409.	20985740.
		TERMINATION OF AGC GUIDANCE						
616371.680	7. 3. 12. 51.672	4.911556	4. 54. 56.0	-165.00069	-165. 0. 2.5	60395.7	18409.	20985740.
616373.670	7. 3. 12. 53.672	4.911380	4. 54. 49.7	-164.99764	-164. 59. 51.5	58946.2	17967.	20984291.
616375.680	7. 3. 12. 55.672	4.911207	4. 54. 43.4	-164.99493	-164. 59. 41.7	57496.0	17525.	20982841.
616377.670	7. 3. 12. 57.672	4.911036	4. 54. 37.3	-164.99252	-164. 59. 33.1	56046.7	17083.	20981392.
616379.680	7. 3. 12. 59.672	4.910870	4. 54. 31.3	-164.99040	-164. 59. 25.9	54604.2	16643.	20979951.
616381.680	7. 3. 13. 1.672	4.910708	4. 54. 25.5	-164.98853	-164. 59. 18.7	53171.2	16207.	20978518.
616383.670	7. 3. 13. 3.672	4.910550	4. 54. 19.8	-164.98687	-164. 59. 12.7	51750.2	15774.	20977097.
616385.680	7. 3. 13. 5.672	4.910398	4. 54. 14.3	-164.98546	-164. 59. 7.7	50345.5	15345.	20975693.
616387.670	7. 3. 13. 7.672	4.910251	4. 54. 9.0	-164.98426	-164. 59. 3.4	48958.7	14923.	20974306.
616389.680	7. 3. 13. 9.672	4.910109	4. 54. 3.9	-164.98325	-164. 58. 59.7	47593.2	14506.	20972941.
616391.670	7. 3. 13. 11.672	4.909973	4. 53. 59.0	-164.98241	-164. 58. 56.7	46250.5	14097.	20971598.
616393.680	7. 3. 13. 13.672	4.909842	4. 53. 54.3	-164.98173	-164. 58. 54.2	44933.2	13696.	20970281.
616395.670	7. 3. 13. 15.672	4.909717	4. 53. 49.8	-164.98119	-164. 58. 52.3	43642.0	13302.	20968990.
616397.680	7. 3. 13. 17.672	4.909598	4. 53. 45.5	-164.98076	-164. 58. 50.7	42378.5	12917.	20967727.
616399.680	7. 3. 13. 19.672	4.909484	4. 53. 41.4	-164.98047	-164. 58. 49.7	41142.7	12540.	20966492.
616401.670	7. 3. 13. 21.672	4.909375	4. 53. 37.5	-164.98029	-164. 58. 49.1	39936.0	12173.	20965285.
616403.680	7. 3. 13. 23.672	4.909272	4. 53. 33.8	-164.98020	-164. 58. 48.7	38758.2	11814.	20964108.
616405.670	7. 3. 13. 25.672	4.909173	4. 53. 30.2	-164.98020	-164. 58. 48.7	37609.7	11463.	20962959.
616407.680	7. 3. 13. 27.672	4.909078	4. 53. 26.8	-164.98026	-164. 58. 49.0	36489.7	11122.	20961839.
616409.670	7. 3. 13. 29.672	4.908988	4. 53. 23.6	-164.98037	-164. 58. 49.3	35398.0	10789.	20960747.
616411.680	7. 3. 13. 31.672	4.908900	4. 53. 20.4	-164.98055	-164. 58. 50.0	34333.2	10465.	20959683.
616413.680	7. 3. 13. 33.672	4.908816	4. 53. 17.4	-164.98076	-164. 58. 50.8	33293.2	10148.	20958643.
616415.670	7. 3. 13. 35.672	4.908735	4. 53. 14.5	-164.98102	-164. 58. 51.7	32276.2	9838.	20957626.

TABLE X.- Continued

(a) Position vector - Concluded

TIME SECONDS	TIME DAY HR MIN SEC	GEODETIC LATITUDE DEGREES	GEODETIC LATITUDE DEG MIN SEC	LONGITUDE DEGREES	LONGITUDE DEG MIN SEC	ALTITUDE FEET	ALTITUDE METERS	RADIUS FEET
616417.680	7. 3. 13. 37.672	4.28657	4. 17. 11.6	-164.98129	-164. 58. 52.7	31280.7	9534.	20956631.
616419.670	7. 3. 13. 39.672	4.28580	4. 17. 8.9	-164.98160	-164. 58. 53.7	30305.5	9237.	20955656.
616421.680	7. 3. 13. 41.672	4.28506	4. 17. 6.2	-164.98191	-164. 58. 54.9	29349.0	8946.	20954700.
616423.670	7. 3. 13. 43.672	4.28434	4. 17. 3.6	-164.98221	-164. 58. 56.0	28410.0	8659.	20953760.
616425.680	7. 3. 13. 45.672	4.28364	4. 17. 1.1	-164.98255	-164. 58. 57.2	27487.7	8378.	20952839.
616427.670	7. 3. 13. 47.672	4.28295	4. 16. 58.6	-164.98290	-164. 58. 58.4	26581.0	8102.	20951932.
616429.670	7. 3. 13. 49.672	4.28228	4. 16. 56.2	-164.98324	-164. 58. 59.7	25689.2	7830.	20951040.
616431.680	7. 3. 13. 51.672	4.28162	4. 16. 53.8	-164.98359	-164. 59. .9	24811.7	7563.	20950163.
616433.670	7. 3. 13. 53.672	4.28097	4. 16. 51.5	-164.98394	-164. 59. 2.2	23947.7	7299.	20949299.
616435.270	7. 3. 13. 55.273	4.28046	4. 16. 49.7	-164.98419	-164. 59. 3.1	23265.6	7091.	20948617.
			DROGUE PARACHUTES DEPLOYMENT					
616435.270	7. 3. 13. 55.273	4.28046	4. 16. 49.7	-164.98419	-164. 59. 3.1	23265.6	7091.	20948617.
616445.280	7. 3. 14. 5.273	4.27864	4. 16. 43.1	-164.98519	-164. 59. 6.7	19763.0	6024.	20945115.
616455.280	7. 3. 14. 15.273	4.27821	4. 16. 41.6	-164.98541	-164. 59. 7.5	17279.2	5267.	20942631.
616465.280	7. 3. 14. 25.273	4.27813	4. 16. 41.3	-164.98544	-164. 59. 7.6	15135.5	4613.	20940487.
616475.280	7. 3. 14. 35.273	4.27811	4. 16. 41.2	-164.98544	-164. 59. 7.6	13080.5	3987.	20938432.
616485.280	7. 3. 14. 45.273	4.27810	4. 16. 41.2	-164.98546	-164. 59. 7.7	11093.2	3381.	20936445.
616488.480	7. 3. 14. 48.477	4.27810	4. 16. 41.2	-164.98545	-164. 59. 7.6	10470.7	3191.	20935822.
			MAIN PARACHUTES DEPLOYMENT					
616488.480	7. 3. 14. 48.477	4.27810	4. 16. 41.2	-164.98545	-164. 59. 7.6	10470.7	3191.	20935822.
616518.480	7. 3. 15. 18.477	4.27810	4. 16. 41.2	-164.98545	-164. 59. 7.6	7014.0	2138.	20932366.
616548.480	7. 3. 15. 48.477	4.27810	4. 16. 41.2	-164.98545	-164. 59. 7.6	4098.0	1858.	20931447.
616578.480	7. 3. 16. 18.477	4.27810	4. 16. 41.2	-164.98546	-164. 59. 7.7	5188.7	1582.	20930541.
616608.480	7. 3. 16. 48.477	4.27810	4. 16. 41.2	-164.98543	-164. 59. 7.6	4294.7	1309.	20929646.
616638.480	7. 3. 17. 18.477	4.27810	4. 16. 41.2	-164.98544	-164. 59. 7.6	3412.6	1040.	20928764.
616668.480	7. 3. 17. 48.477	4.27810	4. 16. 41.2	-164.98544	-164. 59. 7.6	2541.7	775.	20927893.
616698.480	7. 3. 18. 18.477	4.27810	4. 16. 41.2	-164.98545	-164. 59. 7.6	1682.5	513.	20927034.
616728.480	7. 3. 18. 48.477	4.27810	4. 16. 41.2	-164.98546	-164. 59. 7.7	833.7	254.	20926186.
616758.480	7. 3. 19. 18.477	4.27810	4. 16. 41.2	-164.98543	-164. 59. 7.6	-4.5	-1.	20925348.
			SPLASHDOWN					
616758.480	7. 3. 19. 18.477	4.27810	4. 16. 41.2	-164.98543	-164. 59. 7.6	-4.5	-1.	20925348.
616758.320	7. 3. 19. 18.312	4.27810	4. 16. 41.2	-164.98543	-164. 59. 7.6	.0	0.	20925352.

TABLE X.- Continued

(b) Velocity vector

TIME SECONDS	-INERTIAL- VELOCITY FT/SEC	VELOCITY M/SEC	PATH ANGLE DEG	AZIMUTH DEG	-EARTH FIXED- VELOCITY FT/SEC	VELOCITY M/SEC	PATH ANGLE DEG	AZIMUTH DEG
615931.680	36070.888	10994.9	-6.260	112.595	34694.847	10575.0	-6.509	113.557
			ATMOSPHERIC ENTRY					
615931.680	36070.888	10994.9	-6.260	112.595	34694.847	10575.0	-6.509	113.557
615933.680	36077.657	10996.5	-6.165	112.642	34701.879	10577.2	-6.410	113.604
615935.680	36084.261	10998.5	-6.070	112.687	34708.744	10579.2	-6.312	113.651
615937.670	36090.839	11000.5	-5.975	112.733	34715.579	10581.3	-6.213	113.699
615939.680	36097.225	11002.5	-5.880	112.778	34722.219	10583.4	-6.114	113.745
615941.670	36103.491	11004.4	-5.786	112.824	34728.736	10585.3	-6.015	113.792
615943.680	36109.629	11006.2	-5.689	112.869	34735.119	10587.3	-5.915	113.838
615945.670	36115.625	11008.1	-5.594	112.913	34741.358	10589.2	-5.816	113.885
615947.680	36121.461	11009.8	-5.499	112.958	34747.433	10591.0	-5.717	113.930
615949.680	36127.108	11011.6	-5.403	113.002	34753.814	10592.8	-5.617	113.976
615951.670	36132.518	11013.2	-5.308	113.046	34758.956	10594.4	-5.518	114.021
615953.680	36137.630	11014.8	-5.212	113.090	34764.894	10596.2	-5.418	114.067
615955.670	36142.351	11016.2	-5.116	113.133	34769.239	10597.7	-5.318	114.112
615957.680	36146.585	11017.5	-5.020	113.176	34773.690	10599.0	-5.218	114.156
615959.670	36150.122	11018.6	-4.923	113.219	34777.441	10600.2	-5.118	114.201
			ENTER S-BAND COMMUNICATION BLACKOUT					
615959.670	36150.122	11018.6	-4.923	113.219	34777.441	10600.2	-5.118	114.201
615961.680	36152.723	11019.4	-4.826	113.262	34780.253	10601.0	-5.017	114.245
615963.680	36154.058	11019.8	-4.728	113.305	34781.793	10601.5	-4.915	114.289
			ENTER C-BAND COMMUNICATION BLACKOUT		LOAD FACTOR = 0.05 G			
615963.680	36154.058	11019.8	-4.728	113.305	34781.793	10601.5	-4.915	114.289
615965.670	36153.696	11019.7	-4.630	113.347	34781.630	10601.5	-4.813	114.333
615967.680	36151.017	11018.9	-4.531	113.389	34779.193	10600.7	-4.710	114.376
615969.670	36145.262	11017.1	-4.430	113.431	34773.681	10599.0	-4.605	114.420
615971.680	36135.535	11014.1	-4.328	113.473	34764.050	10596.1	-4.499	114.465
615973.670	36120.496	11009.5	-4.223	113.517	34749.206	10591.6	-4.390	114.510
615975.680	36099.062	11003.0	-4.116	113.561	34727.976	10585.1	-4.279	114.556
615977.670	36070.293	10994.2	-4.006	113.606	34699.421	10576.4	-4.165	114.605
615979.680	36032.723	10982.8	-3.892	113.652	34662.058	10565.0	-4.046	114.653
615981.680	35984.769	10968.2	-3.774	113.699	34614.322	10550.5	-3.924	114.703
615983.670	35924.836	10949.9	-3.651	113.747	34554.604	10532.3	-3.796	114.754
615985.680	35851.223	10927.5	-3.522	113.795	34481.204	10509.9	-3.662	114.806
615987.670	35762.214	10900.3	-3.387	113.844	34392.414	10482.8	-3.522	114.860
615989.680	35656.197	10868.0	-3.244	113.893	34286.616	10450.6	-3.373	114.915
615991.670	35531.677	10830.1	-3.093	113.943	34162.311	10412.7	-3.217	114.971
615993.680	35387.374	10786.1	-2.933	113.994	34018.217	10368.8	-3.052	115.027
615995.680	35222.313	10735.8	-2.765	114.044	33853.861	10318.5	-2.877	115.084
615997.670	35038.906	10679.0	-2.587	114.094	33667.852	10261.8	-2.692	115.142
615999.680	34828.027	10615.6	-2.400	114.143	33459.461	10198.5	-2.498	115.200
616001.670	34599.038	10545.8	-2.204	114.192	33230.665	10128.7	-2.295	115.259
			MAXIMUM HEATING RATE					
616001.670	34599.038	10545.8	-2.204	114.192	33230.665	10128.7	-2.295	115.259
616003.680	34348.968	10469.6	-1.999	114.243	32980.803	10052.6	-2.082	115.320
616005.670	34078.391	10387.1	-1.786	114.297	32710.472	9970.2	-1.861	115.384
616007.680	33789.223	10299.0	-1.565	114.352	32421.572	9882.1	-1.631	115.451
616009.670	33483.911	10205.9	-1.339	114.409	32116.561	9789.1	-1.396	115.521
616011.670	33165.398	10108.8	-1.107	114.469	31798.901	9692.2	-1.155	115.595
			GUIDANCE INITIATE AT RDOT = -700 FT/SEC					
616011.670	33165.398	10108.8	-1.107	114.469	31798.901	9692.2	-1.155	115.595
616013.680	32837.028	10008.7	-.873	114.530	31470.405	9592.2	-.911	115.671
616015.670	32502.296	9906.7	-.637	114.594	31136.101	9490.3	-.665	115.751
616017.680	32165.026	9803.9	-.401	114.660	30799.290	9387.6	-.419	115.832
			MAXIMUM LOAD FACTOR FIRST ENTRY					
616017.680	32165.026	9803.9	-.401	114.660	30799.290	9387.6	-.419	115.832
616019.670	31828.757	9701.4	-.168	114.728	30463.521	9285.3	-.176	115.916
616021.680	31496.779	9600.2	.061	114.798	30132.088	9184.3	.064	116.003
616023.670	31171.902	9501.2	.281	114.869	29807.901	9085.5	.294	116.101
616025.680	30856.371	9405.0	.475	114.995	29493.468	8989.6	.497	116.236
616027.680	30551.911	9312.2	.609	115.156	29190.635	8897.3	.638	116.417

TABLE X.- Continued

(b) Velocity vector - Continued

TIME SECONDS	-INERTIAL- VELOCITY FT/SEC	VELOCITY M/SEC	PATH ANGLE DEG	AZIMUTH DEG	-EARTH FIXED- VELOCITY FT/SEC	VELOCITY M/SEC	PATH ANGLE DEG	AZIMUTH DEG
616029.670	30259.750	9223.2	.694	115.333	28900.286	8808.8	.674	116.616
616031.680	29980.644	9138.1	.585	115.470	28622.504	8724.2	.613	116.773
616033.670	29713.505	9056.7	.486	115.553	28356.052	8642.9	.509	116.872
616035.680	29456.294	8978.3	.380	115.616	28099.298	8564.7	.398	116.950
616037.670	29207.277	8902.4	.275	115.678	27850.761	8488.9	.288	117.028
616039.680	28965.058	8828.6	.171	115.742	27609.051	8415.3	.180	117.107
616041.680	28728.449	8756.4	.068	115.806	27372.980	8343.3	.071	117.186
616043.670	28496.393	8685.7	-.037	115.870	27141.966	8272.7	-.039	117.265
616045.680	28267.900	8616.1	-.144	115.931	26913.506	8203.3	-.151	117.342
616047.670	28042.026	8547.2	-.254	115.990	26688.156	8134.6	-.267	117.416
616049.680	27817.865	8478.9	-.366	116.046	26464.509	8066.4	-.385	117.488
616051.670	27594.511	8410.8	-.483	116.101	26241.670	7998.5	-.508	117.558
616053.680	27371.046	8342.7	-.602	116.159	26018.773	7930.5	-.634	117.631
616055.670	27146.433	8274.2	-.719	116.233	25794.946	7862.3	-.757	117.722
616057.680	26919.693	8205.1	-.823	116.335	25569.861	7793.6	-.867	117.843
616059.680	26690.087	8135.2	-.899	116.469	25341.816	7724.0	-.947	117.998
616061.670	26457.203	8064.2	-.934	116.627	25110.293	7653.6	-.984	118.179
616063.680	26220.996	7992.2	-.922	116.799	24876.057	7582.2	-.972	118.370
616065.670	25981.812	7919.3	-.867	116.956	24638.785	7509.9	-.914	118.556
616067.680	25740.167	7845.6	-.800	117.115	24399.037	7436.8	-.844	118.740
616069.670	25496.654	7771.4	-.736	117.277	24157.466	7363.2	-.776	118.928
616071.680	25251.917	7696.8	-.675	117.442	23914.727	7289.2	-.713	119.119
616073.680	25006.539	7622.0	-.624	117.611	23671.422	7215.1	-.659	119.315
616075.670	24761.049	7547.2	-.587	117.785	23428.092	7140.9	-.621	119.517
616077.680	24515.872	7472.5	-.568	117.964	23185.159	7066.9	-.601	119.724
616079.670	24271.272	7397.9	-.567	118.145	22942.870	6993.0	-.600	119.935
616081.680	24027.348	7323.6	-.550	118.325	22701.247	6919.4	-.582	120.145
616083.670	23784.748	7249.6	-.465	118.473	22460.830	6846.0	-.493	120.321
616085.680	23544.663	7176.4	-.324	118.549	22221.369	6773.1	-.344	120.423
616087.680	23308.197	7104.4	-.168	118.543	21984.719	6701.0	-.178	120.436
616089.670	23075.800	7033.5	-.019	118.499	21751.653	6629.9	-.020	120.411
616091.680	22847.955	6964.1	.124	118.450	21523.065	6560.2	.132	120.379
616093.670	22625.440	6896.2	.261	118.396	21299.741	6492.2	.277	120.342
616095.680	22408.908	6830.2	.390	118.337	21082.340	6425.9	.415	120.300
616097.670	22198.868	6766.2	.512	118.274	20871.387	6361.6	.545	120.253
616099.680	21995.658	6704.3	.627	118.212	20667.276	6299.4	.667	120.207
616101.670	21799.539	6644.5	.736	118.153	20470.297	6239.4	.783	120.164
616103.680	21610.695	6587.0	.838	118.098	20280.634	6181.5	.893	120.124
616105.680	21429.306	6531.7	.932	118.041	20098.409	6126.0	.994	120.082
616107.670	21255.467	6478.7	1.016	117.978	19923.656	6072.7	1.084	120.034
616109.680	21089.144	6428.0	1.088	117.909	19756.817	6021.7	1.161	119.977
616111.670	20930.193	6379.5	1.148	117.833	19596.264	5973.0	1.226	119.913
616113.680	20778.420	6333.3	1.196	117.752	19443.319	5926.3	1.278	119.844
616115.670	20633.452	6289.1	1.239	117.676	19297.238	5881.8	1.325	119.779
	EXIT C-BAND COMMUNICATION BLACKOUT							
616115.670	20633.452	6289.1	1.239	117.676	19297.238	5881.8	1.325	119.779
616117.680	20494.916	6246.9	1.281	117.612	19157.749	5839.3	1.371	119.726
616119.680	20362.560	6206.5	1.323	117.540	19024.594	5798.7	1.416	119.686
616121.670	20236.211	6168.0	1.361	117.517	18897.558	5760.0	1.457	119.654
616123.680	20115.712	6131.3	1.893	117.476	18776.399	5723.1	1.492	119.624
616125.670	20000.847	6096.3	1.917	117.432	18660.836	5687.8	1.519	119.591
616127.680	19891.407	6062.9	1.932	117.384	18550.825	5654.2	1.535	119.552
616129.670	19787.172	6031.1	1.936	117.329	18445.524	5622.2	1.540	119.506
616131.680	19687.822	6000.9	1.929	117.268	18345.233	5591.6	1.534	119.453
616133.670	19593.039	5972.0	1.912	117.205	18249.463	5562.4	1.516	119.397
616135.670	19502.556	5944.4	1.885	117.139	18157.964	5534.6	1.488	119.338
616137.680	19416.077	5918.0	1.849	117.072	18070.448	5507.9	1.450	119.277
616139.670	19333.281	5892.8	1.806	117.006	17986.618	5482.3	1.404	119.216
	EXIT S-BAND COMMUNICATION BLACKOUT							
616139.670	19333.281	5892.8	1.806	117.006	17986.618	5482.3	1.404	119.216
616141.680	19253.916	5868.6	1.756	116.940	17906.228	5457.8	1.351	119.155
616143.670	19177.715	5845.4	1.701	116.875	17829.020	5434.3	1.292	119.095
616145.680	19104.397	5823.0	1.645	116.814	17754.734	5411.7	1.232	119.038
616147.670	19033.740	5801.5	1.587	116.754	17683.145	5389.8	1.170	118.984
616149.680	18965.546	5780.7	1.526	116.696	17614.044	5368.8	1.105	118.930
616151.680	18899.591	5760.6	.965	116.641	17547.219	5348.4	1.039	118.879
616153.670	18835.641	5741.1	.900	116.587	17482.419	5328.7	.970	118.830
616155.680	18773.509	5722.2	.836	116.534	17419.466	5309.5	.901	118.781
616157.670	18713.038	5703.7	.769	116.483	17358.195	5290.8	.829	118.735
616159.680	18654.113	5685.8	.700	116.433	17298.484	5272.6	.755	118.688
616161.670	18596.574	5668.2	.629	116.384	17240.179	5254.8	.679	118.643
616163.680	18540.332	5651.1	.554	116.334	17183.173	5237.4	.598	118.597
616165.680	18485.222	5634.3	.478	116.285	17127.318	5220.4	.516	118.552
616167.670	18431.164	5617.8	.398	116.236	17072.916	5203.7	.430	118.506

TABLE X.- Continued

(b) Velocity vector - Continued

TIME SECONDS	-INERTIAL- VELOCITY FT/SEC	VELOCITY M/SEC	PATH ANGLE DEG	AZIMUTH DEG	-EARTH FIXED- VELOCITY FT/SEC	VELOCITY M/SEC	PATH ANGLE DEG	AZIMUTH DEG
616169.680	18378.000	5601.6	.317	116.188	17018.624	5187.3	.342	118.461
616171.670	18325.652	5585.7	.232	116.139	16965.553	5171.1	.250	118.416
616173.680	18273.976	5569.9	.148	116.091	16913.146	5155.1	.167	118.371
616175.670	18222.888	5554.3	.055	116.042	16861.872	5139.4	.059	118.326
616177.680	18172.256	5538.9	-.037	115.993	16810.093	5123.7	-.039	118.280
616179.670	18121.990	5523.6	-.131	115.944	16759.086	5108.2	-.142	118.234
616181.680	18071.967	5508.3	-.228	115.895	16708.880	5092.7	-.246	118.188
616183.680	18022.088	5493.1	-.326	115.846	16657.823	5077.3	-.353	118.142
616185.670	17972.237	5477.9	-.428	115.795	16607.299	5061.9	-.463	118.095
616187.680	17922.305	5462.7	-.531	115.745	16556.698	5046.5	-.575	118.047
616189.670	17872.179	5447.5	-.638	115.694	16505.907	5031.0	-.691	117.999
616191.680	17821.737	5432.1	-.746	115.641	16454.806	5015.4	-.808	117.950
616193.670	17770.869	5416.6	-.858	115.589	16403.279	4999.7	-.929	117.900
616195.680	17719.439	5400.9	-.970	115.535	16351.191	4983.9	-1.052	117.849
616197.680	17667.329	5385.0	-1.088	115.480	16298.827	4967.8	-1.179	117.797
616199.670	17614.388	5368.9	-1.206	115.423	16244.828	4951.4	-1.307	117.744
616201.680	17560.469	5352.4	-1.329	115.366	16190.255	4934.8	-1.441	117.689
616203.670	17505.316	5335.6	-1.453	115.306	16134.941	4917.8	-1.576	117.633
616205.680	17448.764	5318.4	-1.581	115.246	16077.227	4900.3	-1.716	117.575
616207.670	17390.605	5300.7	-1.712	115.183	16018.399	4882.4	-1.859	117.514
616209.680	17330.642	5282.4	-1.847	115.117	15957.762	4863.9	-2.006	117.454
616211.680	17268.644	5263.5	-1.987	115.050	15895.087	4844.8	-2.159	117.390
616213.670	17204.381	5243.9	-2.127	114.979	15830.119	4825.0	-2.312	117.323
616215.680	17137.580	5223.5	-2.271	114.905	15762.699	4804.4	-2.469	117.253
616217.670	17067.979	5202.3	-2.415	114.826	15692.239	4783.0	-2.626	117.177
616219.680	16995.250	5180.2	-2.560	114.742	15618.718	4760.6	-2.785	117.097
616221.670	16919.073	5156.9	-2.707	114.652	15541.706	4737.1	-2.947	117.012
616223.680	16839.101	5132.6	-2.854	114.557	15460.896	4712.5	-3.109	116.920
616225.670	16754.933	5106.9	-3.003	114.455	15375.790	4686.5	-3.273	116.822
616227.680	16666.166	5079.9	-3.155	114.345	15285.980	4659.2	-3.440	116.717
616229.680	16572.374	5051.3	-3.306	114.228	15191.119	4630.3	-3.607	116.604
616231.670	16473.066	5021.0	-3.457	114.101	15090.664	4599.6	-3.774	116.481
616233.680	16367.741	4988.9	-3.608	113.964	14984.109	4567.2	-3.942	116.350
616235.670	16255.879	4954.8	-3.759	113.817	14870.917	4532.7	-4.110	116.207
616237.680	16136.933	4918.5	-3.906	113.658	14750.627	4496.0	-4.274	116.052
616239.670	16010.316	4880.0	-4.050	113.485	14622.343	4456.9	-4.435	115.885
616241.680	15875.086	4838.7	-4.189	113.299	14485.411	4415.2	-4.591	115.703
616243.680	15730.161	4794.6	-4.322	113.096	14338.632	4370.4	-4.743	115.506
616245.670	15574.784	4747.2	-4.449	112.877	14181.235	4322.4	-4.887	115.292
616247.680	15408.207	4696.4	-4.568	112.640	14012.460	4271.0	-5.024	115.060
616249.670	15229.712	4642.0	-4.675	112.384	13831.580	4215.9	-5.149	114.809
616251.680	15038.417	4583.7	-4.726	112.124	13637.785	4156.8	-5.213	114.557
616253.670	14833.145	4521.2	-4.662	111.934	13430.857	4093.6	-5.150	114.383
616255.680	14611.933	4453.7	-4.827	111.908	13209.069	4026.1	-5.009	114.396
616257.670	14374.197	4381.3	-4.938	112.072	12973.278	3954.3	-4.918	114.623
616259.670	14121.307	4304.2	-4.961	112.351	12723.893	3878.3	-4.952	114.982
616261.680	13854.256	4222.8	-4.858	112.676	12461.117	3798.2	-5.048	115.401
616263.670	13573.302	4137.2	-4.680	113.027	12184.891	3714.0	-5.215	115.855
616265.680	13278.391	4047.3	-4.806	113.401	11895.105	3625.6	-5.366	116.342
616267.670	12969.618	3953.1	-4.910	113.795	11591.780	3533.2	-5.496	116.861
616269.680	12647.438	3854.9	-4.973	114.202	11275.268	3436.7	-5.580	117.406
616271.670	12312.770	3752.9	-4.977	114.613	10946.832	3336.4	-5.600	117.967
616273.680	11967.177	3647.6	-4.912	115.015	10606.360	3232.8	-5.545	118.528
616275.680	11613.534	3539.8	-4.731	115.382	10257.883	3126.5	-5.358	119.029
616277.670	11255.237	3430.6	-4.434	115.672	9902.140	3018.2	-5.042	119.410
616279.680	10896.122	3321.1	-4.061	115.655	9544.258	2909.1	-4.637	119.647
		MAXIMUM LOAD FACTOR		SECOND ENTRY				
616279.680	10896.122	3321.1	-4.061	115.655	9544.258	2909.1	-4.637	119.647
616281.670	10538.563	3212.2	-3.674	115.712	9187.696	2800.4	-4.215	119.865
616283.680	10185.420	3104.5	-3.305	115.810	8836.246	2693.3	-3.810	120.142
616285.670	9839.239	2999.0	-2.984	115.992	8493.097	2588.7	-3.458	120.528
616287.680	9501.942	2896.2	-2.761	116.289	8160.663	2487.4	-3.215	121.058
616289.680	9175.154	2796.6	-2.680	116.690	7840.559	2389.8	-3.136	121.725
616291.670	8859.851	2700.5	-2.766	117.162	7533.361	2296.2	-3.253	122.489
616293.680	8556.199	2607.9	-3.034	117.664	7238.759	2206.4	-3.587	123.305
616295.670	8263.768	2518.8	-3.484	118.156	6955.840	2120.1	-4.140	124.127
616297.680	7981.340	2432.7	-4.028	118.625	6683.144	2037.0	-4.812	124.941
616299.670	7707.142	2349.1	-4.580	119.086	6419.009	1956.5	-5.501	125.768
616301.680	7439.701	2267.6	-5.137	119.542	6162.029	1878.2	-6.206	126.613
616303.670	7177.869	2187.8	-5.699	119.994	5911.096	1801.7	-6.926	127.480
616305.670	6920.696	2109.4	-6.260	120.444	5665.297	1726.8	-7.655	128.377
616307.680	6667.501	2032.3	-6.810	120.893	5423.969	1653.2	-8.381	129.306
616309.670	6417.832	1956.2	-7.340	121.340	5186.644	1580.9	-9.096	130.273
616311.680	6171.479	1881.1	-7.844	121.782	4953.070	1509.7	-9.790	131.279
616313.670	5928.458	1807.0	-8.317	122.216	4723.201	1439.6	-10.461	132.323
616315.680	5689.252	1734.1	-8.756	122.635	4497.805	1370.8	-11.102	133.402

TABLE X.- Continued

(b) Velocity vector - Concluded

TIME SECONDS	-INERTIAL- VELOCITY FT/SEC	M/SEC	PATH ANGLE DEG	AZIMUTH DEG	-EARTH FIXED- VELOCITY FT/SEC	M/SEC	PATH ANGLE DEG	AZIMUTH DEG
616317.670	5454.998	1662.7	-9.156	123.033	4276.871	1303.5	-11.710	134.510
616319.680	5226.282	1593.0	-9.816	123.900	4061.442	1237.9	-12.283	135.692
616321.680	5003.588	1525.1	-9.837	123.732	3852.076	1174.1	-12.822	136.793
616323.670	4787.137	1459.1	-10.111	124.030	3648.806	1112.2	-13.316	137.970
616325.680	4580.023	1396.0	-10.178	124.201	3451.971	1052.2	-13.760	139.034
616327.670	4389.814	1338.0	-9.909	123.943	3262.073	994.3	-13.390	139.541
616329.680	4221.146	1286.6	-9.598	123.026	3080.288	938.9	-13.208	139.151
616331.670	4071.029	1240.9	-9.650	121.567	2908.211	886.4	-13.571	138.004
616333.680	3931.562	1198.3	-10.128	119.904	2745.735	836.9	-14.584	136.563
616335.680	3799.161	1158.0	-10.864	118.212	2592.606	790.2	-16.034	135.063
616337.670	3673.536	1119.7	-11.661	116.821	2447.969	746.1	-17.656	133.526
616339.680	3554.663	1083.5	-12.425	114.826	2311.495	704.5	-19.322	131.926
616341.670	3441.726	1049.0	-13.152	113.124	2182.257	665.2	-21.030	130.253
616343.680	3334.173	1016.3	-13.845	111.418	2059.832	627.8	-22.789	128.499
616345.670	3231.629	985.0	-14.498	109.712	1943.900	592.5	-24.594	126.657
616347.680	3134.314	955.3	-15.110	108.015	1834.830	559.3	-26.442	124.724
616349.670	3042.216	927.3	-15.674	106.337	1732.628	528.1	-28.317	122.695
616351.680	2954.962	900.7	-16.185	104.682	1636.917	498.9	-30.210	120.562
616353.680	2872.049	875.4	-16.648	103.055	1547.270	471.6	-32.126	118.317
616355.670	2792.790	851.2	-17.058	101.460	1462.975	445.9	-34.055	115.955
616357.680	2717.175	828.2	-17.403	99.909	1383.831	421.8	-35.964	113.474
616359.670	2646.961	806.8	-17.529	98.482	1309.461	399.1	-37.504	111.002
616361.680	2584.765	787.8	-17.289	97.503	1241.333	378.4	-38.230	109.298
616363.670	2526.581	770.1	-16.975	97.193	1180.849	359.9	-38.657	109.156
616365.680	2465.436	751.5	-16.930	97.436	1126.349	343.3	-39.599	110.593
616367.680	2397.207	730.7	-17.305	97.929	1075.431	327.8	-41.634	113.075
616369.670	2326.638	709.2	-17.972	98.347	1029.016	313.6	-44.238	115.836
616371.680	2260.383	689.0	-18.662	98.635	987.980	301.1	-47.063	118.538
	TERMINATION OF AGC GUIDANCE							
616371.680	2260.383	689.0	-18.662	98.635	987.980	301.1	-47.063	118.538
616373.670	2199.664	670.5	-19.256	98.823	951.046	289.9	-49.709	121.192
616375.680	2143.836	653.4	-19.767	98.938	917.716	279.7	-52.189	123.859
616377.670	2092.348	637.7	-20.209	98.996	887.589	270.5	-54.521	126.582
616379.680	2044.530	623.2	-20.591	99.000	860.057	262.1	-56.724	129.382
616381.680	1999.438	609.4	-20.909	98.966	834.250	254.3	-58.799	132.344
616383.670	1956.682	596.4	-21.167	98.897	809.768	246.8	-60.753	135.502
616385.680	1916.160	584.0	-21.364	98.793	786.394	239.7	-62.580	138.872
616387.670	1877.959	572.4	-21.496	98.659	763.959	232.9	-64.259	142.482
616389.680	1842.060	561.5	-21.564	98.497	742.349	226.3	-65.786	146.239
616391.670	1808.312	551.2	-21.576	98.308	721.482	219.9	-67.174	150.239
616393.680	1776.689	541.5	-21.535	98.092	701.296	213.8	-68.425	154.437
616395.670	1747.308	532.6	-21.440	97.857	681.756	207.8	-69.524	158.788
616397.680	1720.116	524.3	-21.296	97.609	662.850	202.0	-70.469	163.267
616399.680	1694.819	516.6	-21.111	97.356	644.589	196.5	-71.267	167.901
616401.670	1671.307	509.4	-20.894	97.096	626.974	191.1	-71.930	172.653
616403.680	1649.947	502.9	-20.639	96.842	610.029	185.9	-72.430	177.335
616405.670	1630.948	497.1	-20.347	96.605	593.755	181.0	-72.759	-178.250
616407.680	1614.147	492.0	-20.025	96.384	578.128	176.2	-72.951	-174.185
616409.670	1599.277	487.5	-19.688	96.173	563.263	171.7	-73.052	-170.462
616411.680	1586.347	483.5	-19.362	95.972	549.658	167.5	-73.103	-167.096
616413.680	1575.302	480.2	-19.044	95.787	537.179	163.7	-73.110	-164.155
616415.670	1566.096	477.3	-18.730	95.620	525.650	160.2	-73.081	-161.710
616417.680	1558.317	475.0	-18.426	95.466	514.951	157.0	-73.039	-159.642
616419.670	1551.606	472.9	-18.131	95.322	504.929	153.9	-72.995	-157.844
616421.680	1545.779	471.2	-17.848	95.184	495.518	151.0	-72.958	-156.244
616423.670	1540.948	469.7	-17.571	95.058	486.648	148.3	-72.923	-154.987
616425.680	1537.164	468.5	-17.299	94.946	478.257	145.8	-72.889	-154.071
616427.670	1534.118	467.6	-17.035	94.845	470.300	143.3	-72.866	-153.392
616429.670	1531.295	466.7	-16.784	94.743	462.741	141.0	-72.858	-152.714
616431.680	1528.889	466.0	-16.541	94.646	455.524	138.8	-72.857	-152.159
616433.670	1526.859	465.4	-16.307	94.555	448.631	136.7	-72.867	-151.710
616435.270	1525.704	465.0	-16.123	94.490	443.339	135.1	-72.879	-151.539
	DROGUE PARACHUTES DEPLOYMENT							
616435.270	1525.704	465.0	-16.123	94.490	443.339	135.1	-72.879	-151.539
616445.280	1533.396	467.4	-10.615	91.127	281.839	85.9	-83.155	-151.969
616455.280	1535.912	468.1	-8.806	90.240	221.994	67.7	-88.161	-153.537
616465.280	1536.619	468.4	-7.825	90.053	209.221	63.8	-89.593	-160.450
616475.280	1536.047	468.2	-7.556	90.013	201.987	61.6	-89.897	171.797
616485.280	1535.168	467.9	-7.318	90.006	195.537	59.6	-89.938	134.006
616488.480	1534.883	467.8	-7.246	90.005	193.583	59.0	-89.940	128.253
	MAIN PARACHUTES DEPLOYMENT							
616488.480	1534.883	467.8	-7.246	90.005	193.583	59.0	-89.940	128.253
616518.480	1522.533	464.1	-1.161	90.001	30.850	9.4	-89.968	165.245
616548.480	1522.457	464.0	-1.145	90.001	30.419	9.3	-89.968	165.466
616578.480	1522.383	464.0	-1.129	90.001	30.003	9.1	-89.968	165.695
616608.480	1522.310	464.0	-1.114	90.001	29.600	9.0	-89.968	165.881
616638.480	1522.238	464.0	-1.100	90.001	29.211	8.9	-89.967	166.086
616668.480	1522.167	464.0	-1.085	90.001	28.833	8.8	-89.967	166.268
616698.480	1522.098	463.9	-1.072	90.001	28.468	8.7	-89.967	166.416
616728.480	1522.030	463.9	-1.058	90.001	28.114	8.6	-89.967	166.620
616758.480	1521.962	463.9	-1.046	90.001	27.770	8.5	-89.967	166.765
	SPLASHDOWN							
616758.480	1521.962	463.9	-1.046	90.001	27.770	8.5	-89.967	166.765
616758.320	1521.963	463.9	-1.046	90.001	27.772	8.5	-89.967	166.777

TABLE X.- Continued

(c) Position and velocity vector - earth centered inertial coordinate system

TIME SECONDS	X FEET	Y FEET	Z FEET	DX FT/SEC	DY FT/SEC	DZ FT/SEC
615931.680	-18062257.	9985566.	5351936.	-15711.	-29140.	-14323.
		ATMOSPHERIC ENTRY				
615931.680	-18062257.	9985566.	5351936.	-15711.	-29140.	-14323.
615933.680	-18093626.	9927257.	5323275.	-15658.	-29169.	-14338.
615935.680	-18124890.	9868890.	5294583.	-15606.	-29198.	-14354.
615937.670	-18156049.	9810466.	5265860.	-15553.	-29226.	-14369.
615939.680	-18187101.	9751985.	5237106.	-15500.	-29255.	-14385.
615941.670	-18218088.	9693447.	5208321.	-15447.	-29283.	-14400.
615943.680	-18248887.	9634852.	5179506.	-15393.	-29311.	-14416.
615945.670	-18279620.	9576201.	5150661.	-15340.	-29339.	-14430.
615947.680	-18310247.	9517495.	5121785.	-15286.	-29367.	-14446.
615949.680	-18340765.	9458733.	5092880.	-15232.	-29395.	-14460.
615951.670	-18371178.	9399916.	5063945.	-15178.	-29422.	-14475.
615953.680	-18401478.	9341045.	5034981.	-15124.	-29449.	-14489.
615955.670	-18431672.	9282120.	5005988.	-15070.	-29476.	-14504.
615957.680	-18461758.	9223143.	4976966.	-15015.	-29502.	-14518.
615959.670	-18491734.	9164114.	4947916.	-14961.	-29527.	-14532.
		ENTER S-BAND COMMUNICATION BLACKOUT				
615959.670	-18491734.	9164114.	4947916.	-14961.	-29527.	-14532.
615961.680	-18521601.	9105036.	4918840.	-14906.	-29551.	-14545.
615963.680	-18551357.	9045910.	4889737.	-14851.	-29575.	-14558.
	ENTER C-BAND COMMUNICATION BLACKOUT			LOAD FACTOR = 0.05 G		
615963.680	-18551357.	9045910.	4889737.	-14851.	-29575.	-14558.
615965.670	-18581002.	8986739.	4860610.	-14795.	-29596.	-14569.
615967.680	-18610536.	8927527.	4831460.	-14739.	-29616.	-14580.
615969.670	-18639958.	8868279.	4802290.	-14682.	-29632.	-14590.
615971.680	-18669266.	8809002.	4773102.	-14625.	-29644.	-14598.
615973.670	-18698457.	8749705.	4743899.	-14567.	-29652.	-14604.
615975.680	-18727532.	8690400.	4714687.	-14508.	-29653.	-14608.
615977.670	-18756487.	8631099.	4685469.	-14447.	-29646.	-14610.
615979.680	-18785320.	8571820.	4656252.	-14384.	-29632.	-14607.
615981.680	-18814029.	8512579.	4627043.	-14322.	-29607.	-14601.
615983.670	-18842609.	8453399.	4597852.	-14258.	-29571.	-14589.
615985.680	-18871059.	8394303.	4568689.	-14191.	-29522.	-14572.
615987.670	-18899374.	8335319.	4539567.	-14123.	-29459.	-14548.
615989.680	-18927550.	8276478.	4510500.	-14052.	-29379.	-14517.
615991.670	-18955582.	8217814.	4481503.	-13980.	-29282.	-14478.
615993.680	-18983466.	8159361.	4452594.	-13906.	-29167.	-14430.
615995.680	-19011198.	8101159.	4423791.	-13827.	-29032.	-14372.
615997.670	-19038773.	8043245.	4395113.	-13747.	-28878.	-14305.
615999.680	-19066184.	7985661.	4366580.	-13664.	-28703.	-14227.
616001.670	-19093428.	7928445.	4338212.	-13579.	-28509.	-14140.
		MAXIMUM HEATING RATE				
616001.670	-19093428.	7928445.	4338212.	-13579.	-28509.	-14140.
616003.680	-19120497.	7871637.	4310028.	-13491.	-28295.	-14043.
616005.670	-19147389.	7815276.	4282044.	-13400.	-28062.	-13939.
616007.680	-19174094.	7759400.	4254275.	-13306.	-27811.	-13828.
616009.670	-19200611.	7704042.	4226737.	-13210.	-27545.	-13710.
616011.670	-19226933.	7649230.	4199439.	-13111.	-27266.	-13588.
		GUIDANCE INITIATE AT RDOT = -700 FT/SEC				
616011.670	-19226933.	7649230.	4199439.	-13111.	-27266.	-13588.
616013.680	-19253055.	7594986.	4172389.	-13011.	-26977.	-13441.
616015.670	-19278975.	7541325.	4145594.	-12909.	-26683.	-13334.
616017.680	-19304690.	7488257.	4119054.	-12806.	-26386.	-13206.
		MAXIMUM LOAD FACTOR FIRST ENTRY				
616017.680	-19304690.	7488257.	4119054.	-12806.	-26386.	-13206.
616019.670	-19330199.	7436783.	4092769.	-12703.	-26089.	-13080.
616021.680	-19355502.	7385898.	4066734.	-12600.	-25796.	-12956.
616023.670	-19380597.	7335596.	4040937.	-12495.	-25508.	-12842.
616025.680	-19405476.	7285866.	4015349.	-12382.	-25223.	-12751.
616027.680	-19430108.	7231696.	3989912.	-12245.	-24949.	-12691.
616029.670	-19454426.	7182055.	3964570.	-12065.	-24698.	-12653.

TABLE X.- Continued

(c) Position and velocity vector - earth centered inertial coordinate system - Continued

TIME SECONDS	X FEET	Y FEET	Z FEET	DX FT/SEC	DY FT/SEC	DZ FT/SEC
616031.680	-19478342.	7132879.	8939306.	-11848.	-24484.	-12609.
616033.670	-19501808.	7084098.	8914147.	-11618.	-24300.	-12548.
616035.680	-19524816.	7035672.	8889119.	-11391.	-24128.	-12481.
616037.670	-19547378.	6987585.	8864222.	-11171.	-23960.	-12416.
616039.680	-19569504.	6939828.	8839451.	-10956.	-23797.	-12355.
616041.680	-19591206.	6892394.	8814802.	-10746.	-23637.	-12294.
616043.670	-19612491.	6845279.	8790273.	-10539.	-23479.	-12235.
616045.680	-19633365.	6798477.	8765862.	-10335.	-23324.	-12176.
616047.670	-19653834.	6751982.	8741570.	-10133.	-23171.	-12116.
616049.680	-19673900.	6705793.	8717399.	-9933.	-23018.	-12055.
616051.670	-19693565.	6659908.	8693351.	-9733.	-22867.	-11994.
616053.680	-19712832.	6614328.	8669425.	-9534.	-22713.	-11933.
616055.670	-19731703.	6569060.	8645616.	-9338.	555.77	-11877.
616057.680	-19750191.	6524121.	8621910.	-9150.	-22383.	-11830.
616059.680	-19768313.	6479538.	8598289.	-8975.	-22198.	-11792.
616061.670	-19786103.	6435338.	8574739.	-8819.	-21999.	-11758.
616063.680	-19803602.	6391549.	8551259.	-8684.	-21789.	-11721.
616065.670	-19820853.	6348188.	8527861.	-8568.	-21571.	-11676.
616067.680	-19837879.	6305267.	8504557.	-8457.	-21350.	-11628.
616069.670	-19854683.	6262790.	8481351.	-8346.	-21127.	-11578.
616071.680	-19871263.	6220758.	8458245.	-8234.	-20904.	-11528.
616073.680	-19887617.	6179175.	8435238.	-8119.	-20680.	-11479.
616075.670	-19903736.	6138040.	8412328.	-7999.	-20456.	-11431.
616077.680	-19919609.	6097350.	8389512.	-7873.	-20234.	-11385.
616079.670	-19935225.	6057102.	8366787.	-7742.	-20014.	-11340.
616081.680	-19950583.	6017295.	8344154.	-7619.	-19793.	-11292.
616083.670	-19965720.	5977931.	8321629.	-7524.	-19572.	-11228.
616085.680	-19980693.	5939002.	8299261.	-7452.	-19361.	-11135.
616087.680	-19995534.	5900476.	8277111.	-7389.	-19168.	-11012.
616089.670	-20010248.	5862323.	8255218.	-7324.	-18986.	-10880.
616091.680	-20024831.	5824528.	8233590.	-7259.	-18810.	-10749.
616093.670	-20039283.	5787080.	8212224.	-7193.	-18639.	-10619.
616095.680	-20053604.	5749968.	8191115.	-7127.	-18474.	-10491.
616097.670	-20067792.	5713178.	8170259.	-7061.	-18316.	-10366.
616099.680	-20081846.	5676699.	8149648.	-6994.	-18164.	-10245.
616101.670	-20095769.	5640520.	8129274.	-6928.	-18017.	-10130.
616103.680	-20109561.	5604628.	8109125.	-6863.	-17876.	-10019.
616105.680	-20123221.	5569013.	8089193.	-6797.	-17741.	-9913.
616107.670	-20136749.	5533659.	8069471.	-6731.	-17614.	-9809.
616109.680	-20150144.	5498550.	8049954.	-6663.	-17496.	-9708.
616111.670	-20163401.	5463670.	8030637.	-6594.	-17386.	-9609.
616113.680	-20176519.	5429003.	8011517.	-6524.	-17283.	-9513.
616115.670	-20189498.	5394536.	7992584.	-6455.	-17185.	-9421.
		EXIT C-BAND COMMUNICATION BLACKOUT				
616115.670	-20189498.	5394536.	7992584.	-6455.	-17185.	-9421.
616117.680	-20202339.	5360262.	7973826.	-6388.	-17089.	-9337.
616119.680	-20215049.	5326176.	7955230.	-6323.	-16997.	-9260.
616121.670	-20227632.	5292271.	7936781.	-6259.	-16908.	-9189.
616123.680	-20240088.	5258540.	7918471.	-6196.	-16824.	-9121.
616125.670	-20252418.	5224972.	7900293.	-6133.	-16745.	-9056.
616127.680	-20264619.	5191555.	7882245.	-6068.	-16673.	-8993.
616129.670	-20276690.	5158277.	7864322.	-6002.	-16606.	-8930.
616131.680	-20288627.	5125128.	7846523.	-5935.	-16545.	-8869.
616133.670	-20300428.	5092095.	7828845.	-5866.	-16489.	-8809.
616135.670	-20312089.	5059170.	7811285.	-5795.	-16437.	-8752.
616137.680	-20323609.	5026345.	7793837.	-5724.	-16389.	-8696.
616139.670	-20334984.	4993612.	7776499.	-5651.	-16345.	-8643.
		EXIT S-BAND COMMUNICATION BLACKOUT				
616139.670	-20334984.	4993612.	7776499.	-5651.	-16345.	-8643.
616141.680	-20346214.	4960965.	7759266.	-5578.	-16303.	-8591.
616143.670	-20357297.	4928398.	7742133.	-5505.	-16264.	-8542.
616145.680	-20368236.	4895908.	7725096.	-5433.	-16227.	-8495.
616147.670	-20379029.	4863491.	7708152.	-5361.	-16191.	-8450.
616149.680	-20389680.	4831144.	7691296.	-5290.	-16157.	-8406.
616151.680	-20400189.	4798863.	7674525.	-5219.	-16124.	-8365.
616153.670	-20410556.	4766647.	7657835.	-5149.	-16093.	-8325.
616155.680	-20420785.	4734492.	7641225.	-5079.	-16062.	-8286.
616157.670	-20430873.	4702398.	7624691.	-5010.	-16033.	-8248.
616159.680	-20440822.	4670361.	7608231.	-4940.	-16004.	-8212.
616161.670	-20450633.	4638380.	7591844.	-4871.	-15977.	-8176.
616163.680	-20460305.	4606452.	7575527.	-4801.	-15950.	-8141.
616165.680	-20469838.	4574577.	7559279.	-4732.	-15925.	-8107.
616167.670	-20479231.	4542753.	7543100.	-4662.	-15900.	-8073.
616169.680	-20488485.	4510978.	7526987.	-4592.	-15875.	-8040.
616171.670	-20497598.	4479251.	7510939.	-4521.	-15852.	-8007.
616173.680	-20506570.	4447572.	7494957.	-4451.	-15828.	-7975.
616175.670	-20515400.	4415939.	7479039.	-4380.	-15805.	-7943.

TABLE X.- Continued

(d) IMU gimbal angles

TIME SECONDS	INNER DEGREES	MIDDLE DEGREES	OUTER DEGREES
615931.680	-23.512	-.881	-.383
	ATMOSPHERIC ENTRY		
615931.680	-23.512	-.881	-.383
615933.680	-26.799	-1.312	-.488
615935.680	-30.400	-1.806	-.637
615937.670	-31.842	-2.189	-.731
615939.680	-31.775	-2.413	-.773
615941.670	-31.634	-2.644	-.812
615943.680	-31.394	-2.836	-.845
615945.670	-31.026	-2.968	-.872
615947.680	-30.494	-3.008	-.891
615949.680	-29.770	-2.916	-.902
615951.670	-28.839	-2.641	-.908
615953.680	-27.732	-2.134	-.917
615955.670	-26.571	-1.389	-.941
615957.680	-27.116	-.664	-1.032
615959.670	-27.759	-.001	-1.118
	ENTER S-BAND COMMUNICATION BLACKOUT		
615959.670	-27.759	-.001	-1.118
615961.680	-28.281	.248	-1.187
615963.680	-28.253	-.238	-1.235
	ENTER C-BAND COMMUNICATION BLACKOUT	LOAD FACTOR = 0.05 G	
615963.680	-28.253	-.235	-1.235
615965.670	-27.803	-.798	-2.560
615967.680	-27.357	.040	-5.899
615969.670	-27.410	2.590	-9.653
615971.680	-27.694	4.210	-13.372
615973.670	-27.375	4.147	-17.085
615975.680	-26.581	6.258	-19.694
615977.670	-27.316	5.493	-19.920
615979.680	-27.027	5.903	-19.310
615981.680	-27.655	4.692	-18.328
615983.670	-27.372	5.541	-17.489
615985.680	-27.770	4.499	-16.537
615987.670	-28.053	3.681	-15.605
615989.680	-28.065	3.759	-14.719
615991.670	-28.078	3.820	-13.832
615993.680	-28.151	3.619	-12.939
615995.680	-28.254	3.230	-12.031
615997.670	-28.379	2.648	-11.122
615999.680	-28.477	2.076	-10.649
616001.670	-28.469	1.984	-10.688
	MAXIMUM HENTING RATE		
616001.670	-28.469	1.984	-10.688
616003.680	-28.305	2.705	-11.008
616005.670	-28.205	3.019	-11.588
616007.680	-28.284	2.382	-12.134
616009.670	-28.041	3.219	-12.736
616011.670	-27.982	3.205	-13.307
	GUIDANCE INITIATE AT RDOT = -700 FT/SEC		
616011.670	-27.982	3.205	-13.307
616013.680	-27.902	3.167	-13.909
616015.670	-27.702	3.770	-14.624
616017.680	-27.772	3.402	-15.296
	MAXIMUM LOAD FACTOR FIRST ENTRY		
616017.680	-27.772	3.402	-15.296
616019.670	-27.513	4.250	-16.024
616021.680	-27.431	4.421	-16.318
616023.670	-26.338	7.064	-25.492
616025.680	-22.633	12.310	-43.948
616027.680	-13.691	17.277	-76.547
616029.670	-.266	16.085	-114.569
616031.680	7.807	9.128	-145.960
616033.670	9.956	4.219	-161.656
616035.680	9.842	4.039	-162.415
616037.670	9.572	4.088	-161.552
616039.680	9.256	4.299	-160.681
616041.680	8.937	4.510	-160.344
616043.670	8.712	4.455	-160.802
616045.680	8.558	4.195	-161.498
616047.670	8.444	3.806	-162.201
616049.680	8.334	3.380	-162.906
616051.670	8.103	3.340	-162.773
616053.680	7.423	4.449	-159.477
616055.670	5.597	7.710	-150.089
616057.680	1.862	12.075	-136.276
616059.680	-3.772	15.676	-117.049
616061.670	-10.222	17.310	-97.709
616063.680	-16.787	16.925	-78.280
616065.670	-20.597	15.706	-66.823
616067.680	-21.312	15.339	-66.342
616069.670	-21.541	15.148	-66.873
616071.680	-20.931	15.296	-68.712
616073.680	-19.430	15.718	-72.214
616075.670	-17.599	16.088	-77.031
616077.680	-16.026	16.228	-82.364
616079.670	-15.584	16.060	-84.879
616081.680	-21.686	14.449	-68.545
616083.670	-30.092	8.253	-39.780

TABLE X.- Continued

(d) IMU gimbal angles - Continued

TIME SECONDS	INNER DEGREES	MIDDLE DEGREES	OUTER DEGREES
616085.680	-34.428	-.670	-12.231
616087.680	-34.804	-8.095	7.101
616089.670	-34.594	-9.552	10.863
616091.680	-34.396	-10.514	12.573
616093.670	-34.166	-11.424	14.292
616095.680	-33.949	-12.147	16.007
616097.670	-33.849	-12.434	16.989
616099.680	-33.922	-12.214	16.806
616101.670	-34.047	-11.859	16.245
616103.680	-34.072	-11.840	16.490
616105.680	-33.856	-12.546	16.590
616107.670	-33.370	-13.842	22.259
616109.680	-32.702	-15.267	26.419
616111.670	-31.928	-16.615	30.623
616113.680	-31.531	-17.234	32.716
616115.670	-12.310	-16.102	29.676
	EXIT C-BAND COMMUNICATION BLACKOUT		
616115.670	-32.310	-16.102	29.676
616117.680	-33.493	-14.036	24.560
616119.680	-34.363	-12.064	20.243
616121.670	-34.690	-11.125	18.319
616123.680	-34.453	-12.026	19.785
616125.670	-33.748	-13.987	23.783
616127.680	-32.971	-15.575	27.044
616129.670	-32.302	-16.708	34.618
616131.680	-30.995	-18.555	40.436
616133.670	-28.960	-20.589	46.527
616135.670	-28.104	-21.259	51.284
616137.680	-27.338	-21.845	55.317
616139.670	-25.327	-23.069	59.863
	EXIT S-BAND COMMUNICATION BLACKOUT		
616139.670	-25.327	-23.069	59.863
616141.680	-24.897	-23.267	62.657
616143.670	-25.217	-23.129	63.187
616145.680	-24.565	-23.446	63.468
616147.670	-25.581	-22.998	63.055
616149.680	-25.377	-23.104	63.148
616151.670	-25.407	-23.126	63.144
616153.670	-26.251	-22.745	62.806
616155.680	-25.524	-23.114	63.113
616157.670	-26.600	-22.613	63.062
616159.680	-25.489	-23.164	64.528
616161.670	-25.786	-23.051	65.845
616163.680	-24.963	-23.413	67.818
616165.680	-24.556	-23.561	69.619
616167.670	-24.357	-23.636	71.334
616169.680	-23.356	-23.933	73.388
616171.670	-23.650	-23.846	74.895
616173.680	-22.229	-24.173	77.131
616175.670	-22.840	-24.025	78.501
616177.680	-21.172	-24.301	80.846
616179.670	-21.951	-24.152	82.144
616181.680	-20.171	-24.332	84.938
616183.680	-21.002	-24.213	85.812
616185.670	-19.225	-24.277	88.206
616187.680	-20.001	-24.195	89.504
616189.670	-18.344	-24.144	91.843
616191.680	-18.942	-24.089	93.219
616193.670	-17.555	-23.944	95.440
616195.680	-17.807	-23.881	96.963
616197.680	-16.885	-23.694	98.983
616199.670	-16.590	-23.551	100.736
616201.680	-16.334	-23.408	102.474
616203.670	-15.344	-23.085	104.513
616205.680	-15.806	-23.074	105.953
616207.670	-14.268	-22.526	108.208
616209.680	-15.019	-22.607	109.536
616211.680	-13.914	-22.099	110.989
616213.670	-14.621	-22.202	110.748
616215.680	-15.424	-22.315	107.924
616217.670	-15.088	-22.056	109.324
616219.680	-16.736	-22.435	107.935
616221.670	-16.900	-22.310	107.139
616223.680	-16.945	-22.143	106.387
616225.670	-18.531	-22.453	105.022
616227.680	-18.986	-22.387	103.927
616229.680	-18.968	-22.228	102.837

TABLE X.- Continued

(d) IMU gimbal angles - Continued

TIME SECONDS	INNER DEGREES	MIDDLE DEGREES	OUTER DEGREES
616231.670	-20.278	-22.354	101.083
616233.680	-21.904	-22.456	98.885
616235.670	-22.739	-22.378	96.685
616237.680	-23.303	-22.266	94.486
616239.670	-24.309	-22.185	92.052
616241.680	-25.816	-22.064	89.317
616243.680	-27.465	-21.849	86.396
616245.670	-28.987	-21.646	83.532
616247.680	-30.361	-21.176	80.733
616249.670	-32.579	-20.639	75.135
616251.680	-40.874	-16.333	51.415
616253.670	-48.406	-6.364	17.600
616255.680	-48.276	9.295	-18.854
616257.670	-41.237	19.220	-50.998
616259.670	-33.533	22.904	-73.059
616261.680	-30.967	23.257	-79.669
616263.670	-30.263	22.985	-81.974
616265.680	-31.693	22.373	-80.477
616267.670	-33.560	21.564	-76.187
616269.680	-35.575	20.626	-70.036
616271.670	-38.294	18.942	-63.095
616273.680	-41.853	16.294	-53.829
616275.680	-45.887	11.933	-38.683
616277.670	-48.756	6.480	-24.031
616279.680	-49.671	2.943	-16.726
	MAXIMUM LOAD FACTOR SECOND ENTRY		
616279.680	-49.671	2.943	-16.726
616281.670	-49.004	3.804	-18.212
616283.680	-47.860	5.696	-23.971
616285.670	-45.767	8.610	-33.934
616287.680	-41.876	12.480	-46.853
616289.680	-37.161	15.184	-61.200
616291.670	-32.276	16.384	-75.941
616293.680	-26.748	16.334	-90.904
616295.670	-22.037	14.966	-103.412
616297.680	-22.059	14.070	-109.546
616299.670	-22.963	13.327	-103.923
616301.680	-24.296	12.667	-103.211
616303.670	-25.770	12.000	-102.278
616305.670	-27.368	11.307	-100.680
616307.680	-29.036	10.563	-98.471
616309.670	-30.738	9.758	-95.804
616311.680	-32.437	8.886	-92.973
616313.670	-34.225	7.951	-90.012
616315.680	-36.170	6.936	-86.919
616317.670	-38.209	5.829	-83.855
616319.680	-40.302	4.623	-80.832
616321.680	-42.489	3.439	-77.967
616323.670	-48.339	2.021	-72.510
616325.680	-54.780	-3.561	-50.172
616327.670	-63.567	-16.214	-18.100
616329.680	-63.928	-32.438	18.293
616331.670	-53.900	-43.112	55.138
616333.680	-43.102	-46.231	82.286
616335.680	-38.758	-43.993	94.460
616337.670	-40.203	-42.483	94.518
616339.680	-41.837	-40.949	93.569
616341.670	-43.840	-39.458	92.404
616343.680	-46.534	-37.885	90.934
616345.670	-49.089	-36.213	89.678
616347.680	-51.187	-34.298	88.768
616349.670	-52.890	-32.373	88.139
616351.680	-55.133	-30.392	87.268
616353.680	-57.905	-28.214	86.213
616355.670	-59.954	-25.957	85.617
616357.680	-62.542	-23.644	82.367
616359.670	-74.038	-18.290	59.821
616361.680	-84.691	-5.786	26.555
616363.670	-87.143	10.374	-9.071
616365.680	-79.585	23.498	-48.799
616367.680	-68.303	27.267	-83.501
616369.670	-63.849	24.018	-100.622
616371.680	-67.627	20.620	-99.890
	TERMINATION OF AGC GUIDANCE		
616371.680	-67.627	20.620	-99.890
616373.670	-71.073	17.430	-97.827
616375.680	-74.657	15.060	-95.892
616377.670	-77.762	12.941	-94.864
616379.680	-79.900	11.028	-95.162
616381.680	-82.047	9.584	-95.835
616383.670	-84.538	8.211	-96.501
616385.680	-86.603	6.924	-97.313
616387.670	-88.220	5.668	-98.245
616389.680	-90.143	4.522	-99.167
616391.670	-92.349	3.536	-100.099
616393.680	-94.101	2.599	-101.129
616395.670	-95.331	1.637	-102.240
616397.680	-96.740	.789	-103.354
616399.680	-98.609	.150	-104.457
616401.670	-100.486	-.395	-104.941
616403.680	-101.879	-.974	-104.463
616405.670	-103.085	-1.561	-103.681
616407.680	-104.556	-1.966	-102.888
616409.670	-106.529	-2.238	-102.088
616411.680	-108.032	-2.530	-101.329
616413.680	-108.530	-2.939	-100.612
616415.670	-108.761	-3.333	-99.912

TABLE X.- Continued

(d) IMU gimbal angles - Concluded

TIME SECONDS	INNER DEGREES	MIDDLE DEGREES	OUTER DEGREES
616417.680	-110.014	-3.477	-99.200
616419.670	-111.425	-3.572	-98.496
616421.680	-112.235	-3.696	-97.817
616423.670	-112.069	-3.922	-97.172
616425.680	-111.979	-4.116	-96.527
616427.670	-112.810	-4.155	-95.860
616429.670	-114.038	-4.168	-95.173
616431.680	-114.236	-4.218	-94.984
616433.670	-113.394	-4.161	-95.271
616435.270	-113.520	-4.413	-95.488
	DROGUE PARACHUTES DEPLOYMENT		
616435.270	-113.520	-4.413	-95.488
616445.280	114.579	-7.415	156.452
616455.280	-114.397	-2.005	58.009
616465.280	-114.376	-.413	46.588
616475.280	-114.402	-.071	33.816
616485.280	-114.438	-.014	-140.665
616488.480	-114.450	-.013	103.007
	MAIN PARACHUTES DEPLOYMENT		
616488.480	-114.450	-.013	103.007
616518.480	-114.599	-.079	-62.135
616548.480	-114.712	-.135	30.809
616578.480	-114.824	-.190	94.749
616608.480	-114.936	-.246	122.303
616638.480	-115.048	-.302	125.461
616668.480	-115.160	-.357	109.331
616698.480	-115.272	-.413	56.961
616728.480	-115.384	-.469	-22.548
616758.480	-115.496	-.524	-115.197
	SPLASHDOWN		
616758.480	-115.496	-.524	-115.197
616758.320	-115.495	-.524	-92.760

TABLE X.- Continued

(e) Aerodynamic attitudes and load factors

TIME DAY	HR	MIN	SEC	AERODYNAMIC ANGLE OF ATTACK DEGREES	AERODYNAMIC ANGLE OF SIDESLIP DEGREES	TOTAL G-UNITS	LOAD FACTORS AT THE CENTER OF GRAVITY X COMPONENT G-UNITS	Y COMPONENT G-UNITS	Z COMPONENT G-UNITS
7.	3.	5.	31.680	163.00	-.00	.000	.000	-.000	.000
					ATMOSPHERIC ENTRY				
7.	3.	5.	31.680	163.00	-.00	.000	.000	-.000	.000
7.	3.	5.	33.672	159.87	-.44	.000	.000	-.000	.000
7.	3.	5.	35.672	156.31	-.98	.001	.000	-.000	.001
7.	3.	5.	37.672	154.96	-1.31	.001	.000	-.000	.001
7.	3.	5.	39.672	155.13	-1.55	.001	.000	-.000	.001
7.	3.	5.	41.672	155.36	-1.78	.001	.000	-.000	.001
7.	3.	5.	43.672	155.70	-1.97	.002	.000	-.000	.002
7.	3.	5.	45.672	156.14	-2.10	.003	.000	-.000	.003
7.	3.	5.	47.672	156.79	-2.15	.004	.000	-.000	.004
7.	3.	5.	49.672	157.61	-2.07	.006	.000	-.000	.006
7.	3.	5.	51.672	158.64	-1.82	.008	.000	-.001	.008
7.	3.	5.	53.672	159.83	-1.35	.012	.000	-.001	.012
7.	3.	5.	55.672	161.08	-.64	.018	.000	-.001	.018
7.	3.	5.	57.672	160.62	.01	.025	.000	-.001	.025
7.	3.	5.	59.672	160.06	.60	.037	-.000	-.002	.037
					ENTER S-BAND COMMUNICATION BLACKOUT				
7.	3.	5.	59.672	160.06	.60	.037	-.000	-.002	.037
7.	3.	6.	1.672	159.67	.80	.053	-.000	-.003	.053
7.	3.	6.	3.672	159.76	.33	.074	-.000	-.004	.074
					ENTER C-BAND COMMUNICATION BLACKOUT		LOAD FACTOR = 0.05 G		
7.	3.	6.	3.672	159.76	.33	.074	-.000	-.004	.074
7.	3.	6.	5.672	160.32	-.63	.104	.000	-.006	.105
7.	3.	6.	7.672	160.84	-.92	.146	.000	-.008	.146
7.	3.	6.	9.672	160.56	.24	.200	-.000	-.011	.200
7.	3.	6.	11.672	160.02	.94	.272	-.000	-.015	.272
7.	3.	6.	13.672	160.43	-.76	.367	.001	-.020	.368
7.	3.	6.	15.672	160.60	.55	.475	-.001	-.026	.476
7.	3.	6.	17.672	160.24	-.93	.602	.001	-.033	.603
7.	3.	6.	19.672	160.99	.27	.756	-.000	-.041	.757
7.	3.	6.	21.672	160.30	-.65	.934	.002	-.051	.935
7.	3.	6.	23.672	160.37	.52	1.140	-.002	-.062	1.142
7.	3.	6.	25.672	160.35	-.19	1.373	.001	-.075	1.375
7.	3.	6.	27.672	160.35	-.67	1.633	.003	-.089	1.636
7.	3.	6.	29.672	160.35	-.28	1.919	.001	-.106	1.922
7.	3.	6.	31.672	160.35	.10	2.228	-.001	-.122	2.231
7.	3.	6.	33.672	160.35	.23	2.555	-.002	-.140	2.559
7.	3.	6.	35.672	160.35	.17	2.894	-.002	-.159	2.899
7.	3.	6.	37.672	160.34	-.07	3.240	-.001	-.177	3.244
7.	3.	6.	39.672	160.34	-.44	3.583	.003	-.196	3.588
7.	3.	6.	41.672	160.35	-.81	3.918	.006	-.214	3.921
					MAXIMUM HEATING RATE				
7.	3.	6.	41.672	160.35	-.51	3.915	.006	-.214	3.921
7.	3.	6.	43.672	160.35	.10	4.255	.001	-.233	4.261
7.	3.	6.	45.672	160.34	.24	4.568	-.004	-.250	4.575
7.	3.	6.	47.672	160.34	-.53	4.846	.006	-.266	4.853
7.	3.	6.	49.672	160.34	.12	5.080	.001	-.278	5.088
7.	3.	6.	51.672	160.34	-.05	5.262	-.002	-.288	5.270
					GUIDANCE INITIATE AT RDOT = -700 FT/SEC				
7.	3.	6.	51.672	160.34	-.05	5.262	-.002	-.288	5.270
7.	3.	6.	53.672	160.35	-.24	5.389	.005	-.295	5.397
7.	3.	6.	55.672	160.32	.15	5.456	-.003	-.299	5.464
7.	3.	6.	57.672	160.26	-.40	5.463	.006	-.301	5.471
					MAXIMUM LOAD FACTOR FIRST ENTRY				
7.	3.	6.	57.672	160.26	-.40	5.463	.006	-.301	5.471
7.	3.	6.	59.672	160.21	.22	5.415	-.003	-.299	5.423
7.	3.	7.	1.672	160.15	-.34	5.316	.004	-.295	5.324
7.	3.	7.	3.672	160.12	-.01	5.175	-.005	-.288	5.183
7.	3.	7.	5.672	160.09	.01	4.994	-.009	-.280	5.001
7.	3.	7.	7.672	160.10	-.39	4.796	.006	-.268	4.803
7.	3.	7.	9.672	160.05	.15	4.592	-.000	-.256	4.599

TABLE X.- Continued

(c) Aerodynamic attitudes and load factors - Continued

TIME DAY	HR	MIN	SEC	AERODYNAMIC ANGLE OF ATTACK DEGREES	AERODYNAMIC ANGLE OF SIDESLIP DEGREES	TOTAL G-UNITS	LOAD FACTORS AT THE CENTER OF GRAVITY X COMPONENT G-UNITS	Y COMPONENT G-UNITS	Z COMPONENT G-UNITS
7.	3.	7.	11.672	159.93	.11	4.395	-.000	-.240	4.401
7.	3.	7.	13.672	159.91	-.10	4.229	.002	-.231	4.236
7.	3.	7.	15.672	159.80	-.20	4.085	.003	-.232	4.092
7.	3.	7.	17.672	159.77	.01	3.967	.001	-.226	3.974
7.	3.	7.	19.672	159.73	.06	3.869	-.001	-.221	3.876
7.	3.	7.	21.672	159.69	-.08	3.789	.000	-.217	3.796
7.	3.	7.	23.672	159.66	-.23	3.727	.002	-.214	3.733
7.	3.	7.	25.672	159.62	-.25	3.679	.003	-.212	3.685
7.	3.	7.	27.672	159.58	-.15	3.647	.002	-.210	3.653
7.	3.	7.	29.672	159.54	-.01	3.630	.001	-.210	3.636
7.	3.	7.	31.672	159.50	.04	3.626	-.001	-.210	3.632
7.	3.	7.	33.672	159.51	.04	3.640	-.001	-.211	3.646
7.	3.	7.	35.672	159.48	-.18	3.665	.000	-.213	3.671
7.	3.	7.	37.672	159.42	-.48	3.701	.004	-.216	3.708
7.	3.	7.	39.672	159.33	-.57	3.746	.006	-.219	3.753
7.	3.	7.	41.672	159.28	-.26	3.797	.005	-.224	3.804
7.	3.	7.	43.672	159.27	.21	3.851	-.001	-.227	3.857
7.	3.	7.	45.672	159.25	.36	3.897	-.012	-.230	3.904
7.	3.	7.	47.672	159.19	-.13	3.931	-.000	-.233	3.938
7.	3.	7.	49.672	159.14	-.47	3.955	.005	-.235	3.962
7.	3.	7.	51.672	159.12	-.38	3.968	.005	-.236	3.975
7.	3.	7.	53.672	159.08	.06	3.973	.001	-.237	3.980
7.	3.	7.	55.672	159.02	.33	3.969	-.003	-.238	3.976
7.	3.	7.	57.672	158.97	.13	3.960	-.003	-.238	3.967
7.	3.	7.	59.672	159.01	-.17	3.952	.001	-.229	3.959
7.	3.	8.	1.672	158.97	-.48	3.940	.006	-.229	3.947
7.	3.	8.	3.672	158.84	-.32	3.916	.005	-.237	3.923
7.	3.	8.	5.672	158.82	.07	3.882	.001	-.236	3.889
7.	3.	8.	7.672	158.80	.28	3.831	-.010	-.233	3.838
7.	3.	8.	9.672	158.75	.22	3.763	-.004	-.229	3.770
7.	3.	8.	11.672	158.71	-.12	3.681	-.000	-.225	3.688
7.	3.	8.	13.672	158.68	-.44	3.587	.003	-.220	3.594
7.	3.	8.	15.672	158.64	-.58	3.484	.005	-.214	3.490
7.	3.	8.	17.672	158.61	-.57	3.373	.006	-.207	3.380
7.	3.	8.	19.672	158.59	-.47	3.257	.005	-.201	3.264
7.	3.	8.	21.672	158.56	-.37	3.138	.005	-.194	3.144
7.	3.	8.	23.672	158.53	-.31	3.016	.004	-.186	3.021
7.	3.	8.	25.672	158.50	-.31	2.892	.003	-.179	2.898
7.	3.	8.	27.672	158.47	-.35	2.769	.003	-.172	2.774
7.	3.	8.	29.672	158.44	-.42	2.648	.004	-.165	2.653
7.	3.	8.	31.672	158.42	-.48	2.529	.004	-.157	2.534
7.	3.	8.	33.672	158.40	-.53	2.415	.003	-.150	2.419
7.	3.	8.	35.672	158.38	-.41	2.304	.002	-.144	2.309
					EXIT C-BAND COMMUNICATION BLACKOUT				
7.	3.	8.	35.672	158.38	-.41	2.304	.002	-.144	2.309
7.	3.	8.	37.672	158.35	-.08	2.198	-.001	-.137	2.202
7.	3.	8.	39.672	158.34	.31	2.096	-.002	-.131	2.100
7.	3.	8.	41.672	158.38	.48	1.999	-.003	-.125	2.003
7.	3.	8.	43.672	158.37	.08	1.905	.000	-.119	1.909
7.	3.	8.	45.672	158.32	-.51	1.814	.003	-.114	1.818
7.	3.	8.	47.672	158.30	-.37	1.729	.001	-.108	1.732
7.	3.	8.	49.672	158.29	.31	1.648	-.002	-.103	1.651
7.	3.	8.	51.672	158.25	.10	1.571	.000	-.099	1.575
7.	3.	8.	53.672	158.22	-.60	1.500	.003	-.095	1.503
7.	3.	8.	55.672	158.24	-.07	1.434	-.000	-.090	1.437
7.	3.	8.	57.672	158.22	.31	1.372	-.001	-.086	1.375
7.	3.	8.	59.672	158.19	-.53	1.314	.002	-.083	1.317
					EXIT S-BAND COMMUNICATION BLACKOUT				
7.	3.	8.	59.672	158.19	-.53	1.314	.002	-.083	1.317
7.	3.	9.	1.672	158.19	-.13	1.262	.000	-.080	1.264
7.	3.	9.	3.672	158.19	.23	1.213	-.001	-.077	1.215
7.	3.	9.	5.672	158.17	-.57	1.168	.002	-.074	1.171
7.	3.	9.	7.672	158.16	.21	1.127	-.001	-.071	1.129
7.	3.	9.	9.672	158.16	-.16	1.090	.001	-.069	1.092
7.	3.	9.	11.672	158.14	-.33	1.055	.001	-.067	1.058
7.	3.	9.	13.672	158.14	.29	1.025	-.001	-.065	1.027
7.	3.	9.	15.672	158.14	-.59	.998	.002	-.063	1.000
7.	3.	9.	17.672	158.15	.40	.973	-.001	-.062	.975
7.	3.	9.	19.672	158.13	-.48	.950	.002	-.060	.952
7.	3.	9.	21.672	158.13	.14	.929	-.001	-.059	.931
7.	3.	9.	23.672	158.10	-.21	.911	.001	-.058	.913
7.	3.	9.	25.672	158.10	-.16	.894	.000	-.057	.896
7.	3.	9.	27.672	158.09	.07	.880	.000	-.056	.882
7.	3.	9.	29.672	158.08	-.40	.867	.001	-.055	.869
7.	3.	9.	31.672	158.08	.27	.857	-.001	-.054	.859
7.	3.	9.	33.672	158.06	-.55	.848	.001	-.054	.850
7.	3.	9.	35.672	158.07	.38	.841	-.001	-.054	.843

TABLE X.- Continued

(e) Aerodynamic attitudes and load factors - Continued

TIME DAY	HR	MIN	SEC	AERODYNAMIC ANGLE OF ATTACK DEGREES	AERODYNAMIC ANGLE OF SIDESLIP DEGREES	TOTAL G-UNITS	LOAD FACTORS AT THE CENTER OF GRAVITY X COMPONENT G-UNITS	Y COMPONENT G-UNITS	Z COMPONENT G-UNITS
7.	3.	9.	37.672	158.04	-.44	.836	.001	-.053	.838
7.	3.	9.	39.672	158.05	.44	.833	-.001	-.053	.835
7.	3.	9.	41.672	158.02	-.46	.832	.002	-.053	.833
7.	3.	9.	43.672	158.03	.44	.832	-.001	-.053	.834
7.	3.	9.	45.672	158.00	-.46	.834	.002	-.053	.836
7.	3.	9.	47.672	158.01	.40	.839	-.001	-.054	.841
7.	3.	9.	49.672	157.98	-.59	.845	.002	-.054	.847
7.	3.	9.	51.672	157.98	.31	.853	-.001	-.055	.855
7.	3.	9.	53.672	157.96	-.46	.863	.001	-.055	.865
7.	3.	9.	55.672	157.96	.15	.876	-.001	-.056	.878
7.	3.	9.	57.672	157.93	-.25	.890	.001	-.057	.892
7.	3.	9.	59.672	157.92	-.11	.908	.000	-.058	.909
7.	3.	10.	1.672	157.91	.05	.928	.000	-.060	.930
7.	3.	10.	3.672	157.89	-.43	.952	.001	-.061	.954
7.	3.	10.	5.672	157.89	.35	.979	-.001	-.063	.981
7.	3.	10.	7.672	157.86	-.44	1.010	.002	-.065	1.012
7.	3.	10.	9.672	157.86	.39	1.044	-.001	-.067	1.046
7.	3.	10.	11.672	157.84	-.48	1.082	.002	-.070	1.084
7.	3.	10.	13.672	157.82	-.08	1.125	-.000	-.073	1.127
7.	3.	10.	15.672	157.81	.20	1.172	-.000	-.076	1.174
7.	3.	10.	17.672	157.80	-.64	1.224	.002	-.079	1.226
7.	3.	10.	19.672	157.77	.31	1.281	-.001	-.083	1.284
7.	3.	10.	21.672	157.77	-.09	1.344	.001	-.087	1.347
7.	3.	10.	23.672	157.74	-.58	1.413	.002	-.092	1.416
7.	3.	10.	25.672	157.72	.29	1.489	-.002	-.097	1.492
7.	3.	10.	27.672	157.71	.08	1.572	.000	-.102	1.574
7.	3.	10.	29.672	157.69	-.61	1.663	.003	-.108	1.666
7.	3.	10.	31.672	157.68	-.19	1.762	.000	-.115	1.765
7.	3.	10.	33.672	157.63	.36	1.869	-.002	-.122	1.873
7.	3.	10.	35.672	157.62	.11	1.986	.000	-.130	1.990
7.	3.	10.	37.672	157.61	-.43	2.112	.003	-.138	2.117
7.	3.	10.	39.672	157.57	-.58	2.248	.004	-.148	2.253
7.	3.	10.	41.672	157.54	-.36	2.405	.002	-.158	2.410
7.	3.	10.	43.672	157.51	-.06	2.575	-.000	-.170	2.581
7.	3.	10.	45.672	157.48	.14	2.759	-.002	-.182	2.765
7.	3.	10.	47.672	157.46	.23	2.954	-.003	-.195	2.960
7.	3.	10.	49.672	157.42	.12	3.161	-.010	-.210	3.168
7.	3.	10.	51.672	157.41	.08	3.378	-.009	-.224	3.385
7.	3.	10.	53.672	157.43	-.10	3.597	.000	-.238	3.605
7.	3.	10.	55.672	157.45	-.24	3.838	.002	-.254	3.846
7.	3.	10.	57.672	157.42	-.45	4.067	.007	-.262	4.076
7.	3.	10.	59.672	157.38	-.09	4.292	.005	-.277	4.301
7.	3.	11.	1.672	157.22	.22	4.510	-.001	-.302	4.520
7.	3.	11.	3.672	157.18	.26	4.735	-.005	-.318	4.746
7.	3.	11.	5.672	157.14	-.32	4.956	-.002	-.334	4.967
7.	3.	11.	7.672	157.09	-.39	5.184	.007	-.350	5.196
7.	3.	11.	9.672	157.04	.09	5.398	.000	-.366	5.411
7.	3.	11.	11.672	157.01	-.01	5.594	-.001	-.380	5.607
7.	3.	11.	13.672	156.98	-.35	5.743	.006	-.392	5.776
7.	3.	11.	15.672	156.90	-.06	5.885	.003	-.402	5.898
7.	3.	11.	17.672	156.90	.03	5.957	-.002	-.406	5.971
7.	3.	11.	19.672	156.85	-.38	5.961	.006	-.406	5.975
				MAXIMUM LOAD FACTOR SECOND ENTRY					
7.	3.	11.	19.672	156.85	-.38	5.961	.006	-.406	5.975
7.	3.	11.	21.672	156.82	.09	5.901	.001	-.402	5.915
7.	3.	11.	23.672	156.78	-.01	5.782	-.002	-.394	5.796
7.	3.	11.	25.672	156.77	-.38	5.619	.007	-.382	5.632
7.	3.	11.	27.672	156.73	.08	5.425	.001	-.369	5.438
7.	3.	11.	29.672	156.66	.10	5.213	-.003	-.355	5.225
7.	3.	11.	31.672	156.64	-.37	5.005	.004	-.341	5.016
7.	3.	11.	33.672	156.63	-.36	4.812	.006	-.327	4.824
7.	3.	11.	35.672	156.58	-.02	4.642	.004	-.308	4.652
7.	3.	11.	37.672	156.60	.23	4.499	-.001	-.307	4.510
7.	3.	11.	39.672	156.48	.30	4.384	-.004	-.299	4.394
7.	3.	11.	41.672	156.45	.00	4.290	-.002	-.292	4.300
7.	3.	11.	43.672	156.43	-.32	4.212	.003	-.287	4.222
7.	3.	11.	45.672	156.40	-.49	4.147	.005	-.283	4.157
7.	3.	11.	47.672	156.38	-.46	4.091	.006	-.279	4.101
7.	3.	11.	49.672	156.35	-.27	4.042	.005	-.275	4.051
7.	3.	11.	51.672	156.33	-.02	3.994	.002	-.272	4.003
7.	3.	11.	53.672	156.30	.19	3.945	-.001	-.269	3.954
7.	3.	11.	55.672	156.28	.31	3.881	-.003	-.264	3.890
7.	3.	11.	57.672	156.26	.31	3.805	-.004	-.259	3.814
7.	3.	11.	59.672	156.24	.23	3.722	-.003	-.253	3.730
7.	3.	12.	1.672	156.09	.02	3.637	-.001	-.249	3.646
7.	3.	12.	3.672	155.87	.23	3.551	-.002	-.238	3.559

TABLE X.- Continued

(e) Aerodynamic attitudes and load factors - Concluded

TIME DAY HR MIN SEC	AERODYNAMIC ANGLE OF ATTACK DEGREES	AERODYNAMIC ANGLE OF SIDESLIP DEGREES	TOTAL G-UNITS	LOAD FACTORS AT THE CENTER OF GRAVITY X COMPONENT G-UNITS	Y COMPONENT G-UNITS	Z COMPONENT G-UNITS
7. 3. 12. 5.672	155.66	.19	3.452	-.002	-.234	3.460
7. 3. 12. 7.672	155.39	.28	3.334	-.004	-.237	3.342
7. 3. 12. 9.672	154.91	.23	3.188	-.003	-.233	3.197
7. 3. 12. 11.672	154.37	.18	3.031	-.010	-.229	3.040
7. 3. 12. 13.672	154.10	.19	2.897	-.009	-.217	2.905
7. 3. 12. 15.672	153.90	.08	2.776	-.008	-.206	2.784
7. 3. 12. 17.672	153.78	-.01	2.669	.001	-.195	2.676
7. 3. 12. 19.672	153.65	-.40	2.574	.003	-.186	2.581
7. 3. 12. 21.672	153.44	-.54	2.491	.004	-.181	2.497
7. 3. 12. 23.672	153.26	-.19	2.413	.001	-.175	2.419
7. 3. 12. 25.672	153.10	.08	2.338	-.001	-.169	2.344
7. 3. 12. 27.672	153.14	.02	2.265	.000	-.153	2.260
7. 3. 12. 29.672	153.15	-.34	2.177	.002	-.139	2.181
7. 3. 12. 31.672	153.17	-.31	2.105	.001	-.126	2.109
7. 3. 12. 33.672	153.32	.12	2.043	-.001	-.112	2.046
7. 3. 12. 35.672	153.57	.00	1.986	.000	-.098	1.989
7. 3. 12. 37.672	153.83	-.77	1.931	-.005	-.086	1.933
7. 3. 12. 39.672	154.21	-.20	1.879	-.007	-.075	1.880
7. 3. 12. 41.672	154.90	-.11	1.742	.000	-.069	1.743
7. 3. 12. 43.672	155.43	-.08	1.622	.000	-.065	1.624
7. 3. 12. 45.672	155.62	-.17	1.566	.000	-.061	1.567
7. 3. 12. 47.672	155.17	-.03	1.538	.001	-.052	1.538
7. 3. 12. 49.672	156.07	.13	1.474	.001	-.048	1.475
7. 3. 12. 51.672	157.74	-.23	1.416	.000	-.050	1.417
		TERMINATION OF AGC GUIDANCE				
7. 3. 12. 51.672	157.74	-.23	1.416	.000	-.050	1.417
7. 3. 12. 53.672	159.37	.05	1.373	-.000	-.044	1.374
7. 3. 12. 55.672	160.38	-.13	1.339	.000	-.040	1.339
7. 3. 12. 57.672	161.22	-.29	1.311	.001	-.037	1.312
7. 3. 12. 59.672	161.92	-.00	1.295	-.000	-.033	1.296
7. 3. 13. 1.672	162.24	.07	1.290	-.000	-.031	1.290
7. 3. 13. 3.672	162.61	-.25	1.287	.000	-.028	1.287
7. 3. 13. 5.672	162.94	-.24	1.285	.000	-.026	1.285
7. 3. 13. 7.672	163.26	.10	1.283	-.000	-.023	1.283
7. 3. 13. 9.672	163.60	.08	1.281	-.000	-.021	1.281
7. 3. 13. 11.672	163.91	-.29	1.278	.000	-.018	1.278
7. 3. 13. 13.672	164.19	-.31	1.275	.000	-.016	1.275
7. 3. 13. 15.672	164.47	.09	1.271	-.000	-.013	1.271
7. 3. 13. 17.672	164.74	.23	1.267	-.000	-.007	1.267
7. 3. 13. 19.672	164.97	-.15	1.262	.000	-.000	1.262
7. 3. 13. 21.672	165.18	-.45	1.256	-.000	.006	1.256
7. 3. 13. 23.672	165.37	-.15	1.248	-.000	.012	1.248
7. 3. 13. 25.672	165.55	.34	1.239	.000	.017	1.239
7. 3. 13. 27.672	165.73	.25	1.230	.000	.022	1.231
7. 3. 13. 29.672	165.92	-.36	1.215	-.001	.026	1.215
7. 3. 13. 31.672	166.09	-.64	1.196	-.001	.030	1.196
7. 3. 13. 33.672	166.24	-.07	1.179	.000	.034	1.180
7. 3. 13. 35.672	166.39	.41	1.165	.002	.037	1.166
7. 3. 13. 37.672	166.52	.18	1.153	.000	.040	1.154
7. 3. 13. 39.672	166.65	-.47	1.142	-.002	.042	1.143
7. 3. 13. 41.672	166.75	-.61	1.133	-.002	.044	1.134
7. 3. 13. 43.672	166.84	.09	1.125	.001	.046	1.126
7. 3. 13. 45.672	166.95	.68	1.117	.002	.047	1.118
7. 3. 13. 47.672	167.04	.18	1.111	-.000	.049	1.112
7. 3. 13. 49.672	167.14	-.62	1.105	-.003	.050	1.106
7. 3. 13. 51.672	167.19	-.60	1.099	-.002	.051	1.100
7. 3. 13. 53.672	167.25	.29	1.094	.002	.053	1.096
7. 3. 13. 55.273	180.00	.00	1.091	.000	.053	1.092
		DROGUE PARACHUTES DEPLOYMENT				
7. 3. 13. 55.273	180.00	.00	1.091	.000	.053	1.092
7. 3. 14. 5.273	180.00	.00	1.197	-.011	-.006	1.197
7. 3. 14. 15.273	180.00	.00	1.070	.002	-.003	1.070
7. 3. 14. 25.273	180.00	.00	1.021	.001	-.001	1.021
7. 3. 14. 35.273	180.00	.00	1.017	.000	-.000	1.017
7. 3. 14. 45.273	180.00	.00	1.015	-.000	-.000	1.015
7. 3. 14. 48.477	180.00	.00	1.015	.000	-.000	1.015
		MAIN PARACHUTES DEPLOYMENT				
7. 3. 14. 48.477	180.00	.00	1.015	.000	-.000	1.015
7. 3. 15. 18.477	180.00	.00	.999	-.000	.000	.999
7. 3. 15. 48.477	180.00	.00	.999	.000	.000	.999
7. 3. 16. 18.477	180.00	.00	.999	.000	-.000	.999
7. 3. 16. 48.477	180.00	.00	.999	.000	-.000	.999
7. 3. 17. 18.477	180.00	.00	.999	.000	-.000	.999
7. 3. 17. 48.477	180.00	.00	.999	.000	-.000	.999
7. 3. 18. 18.477	180.00	.00	.999	.000	.000	.999
7. 3. 18. 48.477	180.00	.00	.999	.000	.000	.999
7. 3. 19. 18.477	180.00	.00	.999	-.000	.000	.999
		SPLASHDOWN				
7. 3. 19. 18.477	180.00	.00	.999	-.000	.000	.999
7. 3. 19. 18.312	180.00	.00	.999	-.000	.000	.999

TABLE X.- Continued

(f) Direction cosines

TIME FROM LIFTOFF DAY HR MIN SEC	ROLL AXIS L 11	L 21	L 31	PITCH AXIS L 12	L 22	L 32	YAW AXIS L 13	L 23	L 33
7. 3. 5. 31.680	.1492774	.8779536	.4548777	-.0080065	.4610903	-.8873171	-.9887629	.1288144	.0758597
ATMOSPHERIC ENTRY									
7. 3. 5. 31.680	.1492774	.8779536	.4548777	-.0080065	.4610903	-.8873171	-.9887629	.1288144	.0758597
7. 3. 5. 33.672	.0934195	.8801377	.4654358	-.0062979	.4679931	-.8887096	-.9956069	.0796244	.0492624
7. 3. 5. 35.672	.0299091	.8790703	.4757829	-.0048701	.4760883	-.8793639	-.9995407	.0239846	.0185205
7. 3. 5. 37.672	.0048629	.8763081	.4817265	-.0039961	.4817454	-.8763021	-.9999802	.0023364	.0058445
7. 3. 5. 39.672	.0061118	.8741644	.4855917	-.0031870	.4856153	-.8741668	-.9999762	.0037950	.0057538
7. 3. 5. 41.672	.0086324	.8722055	.4890834	-.0023721	.4890980	-.8722256	-.9999599	.0043693	.0062910
7. 3. 5. 43.672	.0128697	.8706556	.4919017	-.0018476	.4919892	-.8706169	-.9999160	.0104933	.0076786
7. 3. 5. 45.672	.0193416	.8693845	.4937574	-.0007144	.4938614	-.8695402	-.9998127	.0164656	.0101731
7. 3. 5. 47.672	.0286089	.8689145	.4941846	.0001136	.4943341	-.8692719	-.9995907	.0249251	.0140436
7. 3. 5. 49.672	.0411918	.8694202	.4923832	.0008939	.4927392	-.8701766	-.9991508	.0362843	.0195196
7. 3. 5. 51.672	.0573272	.8712003	.4875691	.0019335	.4882948	-.8726773	-.9983542	.0507758	.0266666
7. 3. 5. 53.672	.0769633	.8744894	.4789799	.0018746	.4802591	-.8771246	-.9970706	.0679667	.0360811
7. 3. 5. 55.672	.0964424	.8792737	.4664811	.0017683	.4684844	-.8834700	-.9953370	.0840241	.0436368
7. 3. 5. 57.672	.0867803	.8858627	.4557786	.0020379	.4573458	-.8892866	-.9962254	.0781014	.0378833
7. 3. 5. 59.672	.0759143	.8918276	.4460850	.0025444	.4471453	-.8944577	-.9971490	.0685898	.0314520
ENTER S-BAND COMMUNICATION BLACKOUT									
7. 3. 5. 59.672	.0759143	.8918276	.4460850	.0025444	.4471453	-.8944577	-.9971490	.0685898	.0314520
7. 3. 6. 1.672	.0671203	.8992069	.4328799	.0036697	.4333828	-.8963286	-.9977388	.0616773	.0266573
7. 3. 6. 3.672	.0468872	.8904755	.4500883	.0048607	.4508024	-.8926105	-.9977487	.0618920	.0258246
ENTER C-BAND COMMUNICATION BLACKOUT LOAD FACTOR = 0.05 G									
7. 3. 6. 3.672	.0468872	.8904755	.4500883	.0048607	.4508024	-.8926105	-.9977487	.0618920	.0258246
7. 3. 6. 5.672	.0748691	.8855468	.4584773	.0286752	.4574656	-.8886418	-.9967810	.0796803	.0088717
7. 3. 6. 7.672	.0823946	.8917080	.4450483	.0865271	.4385924	-.8946070	-.9929231	.1117745	-.0401274
7. 3. 6. 9.672	.0806399	.9108465	.4098811	.1468052	.3909209	-.9086413	-.9858729	.1327114	-.1021873
7. 3. 6. 11.672	.0750895	.9222776	.3791642	.2086777	.3572850	-.9103851	-.9750975	.1474835	-.1656304
7. 3. 6. 13.672	.0806571	.9215067	.3798944	.2709576	.3465120	-.8980598	-.9592061	.1753702	-.2217406
7. 3. 6. 15.672	.0934732	.9339857	.3448672	.3097250	.3019185	-.9016183	-.9462205	.1910911	-.2610575
7. 3. 6. 17.672	.0811229	.9301760	.3580386	.3161709	.3166540	-.8942965	-.9452275	.1857493	-.2684067
7. 3. 6. 19.672	.0857688	.9323980	.3511891	.3049226	.3109319	-.9001908	-.9485072	.1842694	-.2576410
7. 3. 6. 21.672	.0755789	.9254161	.3713392	.2914730	.3356358	-.8967634	-.9535886	.1759362	-.2443669
7. 3. 6. 23.672	.0801342	.9305412	.3573114	.2758391	.3237638	-.9050358	-.9578574	.1710848	-.2307351
7. 3. 6. 25.672	.0736426	.9242693	.3745665	.2619586	.3444657	-.9015104	-.9422637	.1645286	-.2167460
7. 3. 6. 27.672	.0690601	.9190793	.3879741	.2476960	.3609276	-.8990984	-.9663733	.1581915	-.2027266
7. 3. 6. 29.672	.0688279	.9196205	.3867310	.2326377	.3621681	-.9026150	-.9701249	.1520933	-.1890112
7. 3. 6. 31.672	.0685748	.9200451	.3857648	.2176436	.3635800	-.9058059	-.9736387	.1460361	-.1752175
7. 3. 6. 33.672	.0673893	.9187490	.3890587	.2025983	.3692104	-.9069937	-.9769409	.1399423	-.1612562
7. 3. 6. 35.672	.0657388	.9141626	.3953789	.1877366	.3778038	-.9066527	-.9800170	.1338294	-.1471610
7. 3. 6. 37.672	.0637740	.9121697	.4048801	.1729518	.3894055	-.9044828	-.9828634	.1277094	-.1329274
7. 3. 6. 39.672	.0622546	.9081701	.4139462	.1658909	.3995659	-.9015494	-.9841772	.1247966	-.1257819
7. 3. 6. 41.672	.0624296	.9074982	.4153909	.1663069	.4009250	-.9008891	-.9840958	.1253245	-.1258936
MAXIMUM HUNTING RATE									
7. 3. 6. 41.672	.0624296	.9074982	.4153909	.1663069	.4009250	-.9008891	-.9840958	.1253245	-.1258936
7. 3. 6. 43.672	.0650406	.9128345	.4037980	.1708660	.3884914	-.9054718	-.9831452	.1278872	-.1306534
7. 3. 6. 45.672	.0666557	.9146507	.3987118	.1803425	.3819751	-.9064058	-.9813427	.1323218	-.1394896
7. 3. 6. 47.672	.0655137	.9102104	.4089315	.1904799	.3908686	-.9005216	-.9795026	.1368897	-.1477695
7. 3. 6. 49.672	.0699420	.9158868	.3953898	.1995438	.3755790	-.9060540	-.9774252	.1417454	-.1566784
7. 3. 6. 51.672	.0704693	.9157325	.3955603	.2092206	.3741570	-.9034562	-.9753240	.1464253	-.1652236
GUIDANCE INITIATE AT RDOT = -700 FT/SEC									
7. 3. 6. 51.672	.0704693	.9157325	.3955603	.2092204	.3741570	-.9034562	-.9753240	.1464253	-.1652236
7. 3. 6. 53.672	.0718832	.9153889	.3941810	.2193933	.3728907	-.9035648	-.9729848	.1517093	-.1740256
7. 3. 6. 55.672	.0751247	.9193240	.3862590	.2304996	.3608534	-.9036895	-.9701681	.1569219	-.1847953
7. 3. 6. 57.672	.0740475	.9168859	.3922208	.2424231	.3649533	-.8989105	-.9673407	.1616455	-.1952505
MAXIMUM LOAD FACTOR FIRST ENTRY									
7. 3. 6. 57.672	.0740475	.9168859	.3922208	.2424231	.3649533	-.8989105	-.9673407	.1616455	-.1952505
7. 3. 6. 59.672	.0782186	.9223476	.3783605	.2532235	.3486952	-.9023799	-.9642405	.1663927	-.2062856
7. 3. 7. 1.672	.0795805	.9233904	.3755224	.2712548	.3387393	-.8946654	-.9533297	.1805706	-.2419849
7. 3. 7. 3.672	.0972808	.9384635	.3313949	.4018959	.2675774	-.8757180	-.9105032	.2183768	-.3511345
7. 3. 7. 5.672	.1567994	.9582203	.2392232	.6473869	.0832033	-.7576063	-.7458579	.2734622	-.4072931
7. 3. 7. 7.672	.2962413	.9453293	.1363581	.8913320	-.2223305	-.3950909	-.3431740	.2385825	-.9084657
7. 3. 7. 9.672	.5018294	.8578317	.1108692	.8401659	-.5138935	.1783051	.2056416	.0061789	-.9786079
7. 3. 7. 11.672	.6304455	.7530334	.1883590	.6275683	-.6936747	.6076364	.5693944	-.2837094	-.7715562
7. 3. 7. 13.672	.6664971	.7000627	.2563080	.2964729	-.5643429	.7704679	.6840215	-.4375263	-.5836826
7. 3. 7. 15.672	.6652271	.6999835	.2597998	.2856917	-.5601120	.7775955	.6898210	-.4430550	-.5725812
7. 3. 7. 17.672	.6616694	.7030997	.2604496	.2973426	-.5649574	.7696821	.6883175	-.4318264	-.5828765
7. 3. 7. 19.672	.6573086	.7077932	.2587938	.3109882	-.5675477	.7623490	.6864632	-.4206167	-.5931693
7. 3. 7. 21.672	.6528849	.7124826	.2571181	.3182226	-.5660431	.7684799	.6873686	-.4146851	-.5962891

TABLE X.- Continued

(f) Direction cosines - Continued

TIME FROM LIFTOFF DAY HR MIN SEC	ROLL AXIS L 11	L 21	L 31	PITCH AXIS L 12	L 22	L 32	YAW AXIS L 13	L 23	L 33
7. 3. 7. 23.672	.6499933	.7143730	.2591907	.3127562	-.5623111	.7684997	.6925982	-.4165062	-.5889230
7. 3. 7. 25.672	.6482601	.7141250	.2641670	.3019318	-.5595909	.7718129	.6989964	-.4205752	-.5783776
7. 3. 7. 27.672	.6471712	.7125555	.2709873	.2894376	-.5585119	.7773612	.7052625	-.4246519	-.5676932
7. 3. 7. 29.672	.6461530	.7106439	.2783371	.2764346	-.5578495	.7825521	.7113861	-.4287044	-.5569027
7. 3. 7. 31.672	.6431114	.7126660	.2802049	.2762494	-.5583751	.7815334	.7134318	-.4246443	-.5573963
7. 3. 7. 33.672	.6328608	.7271272	.2660322	.3324586	-.5685036	.7547695	.6992556	-.3892194	-.5996248
7. 3. 7. 35.672	.6033921	.7657329	.2224455	.4801967	-.5717987	.6651747	.6366545	-.2944476	-.7127213
7. 3. 7. 37.672	.5424523	.8230010	.1685668	.6764122	-.5474939	.4899054	.4954820	-.1513926	-.8553233
7. 3. 7. 39.672	.4520025	.8822347	.1317409	.8496406	-.4707882	.2376329	.2714701	.0045217	-.9623798
7. 3. 7. 41.672	.3504260	.9280472	.1260669	.9365895	-.3470485	-.0485644	-.0013104	.1350876	-.9900328
7. 3. 7. 43.672	.2482468	.9570566	.1497221	.9251621	-.1884258	-.3295007	-.2871393	.2203144	-.9322084
7. 3. 7. 45.672	.1871101	.9660336	.1782880	.8731258	-.0804015	-.4808189	-.4501667	.2455904	-.8585129
7. 3. 7. 47.672	.1757489	.9667571	.1857230	.8733037	-.0660325	-.4826803	-.4543709	.2470231	-.8558777
7. 3. 7. 49.672	.1721758	.9666947	.1893588	.8767892	-.0638833	-.4729148	-.4450673	.2478310	-.8605201
7. 3. 7. 51.672	.1820905	.9655656	.1858120	.8895877	-.0812656	-.4494771	-.4188995	.2471915	-.8737630
7. 3. 7. 53.672	.2062589	.9625577	.1758974	.9058451	-.1198597	-.4062982	-.3700025	.2431386	-.8966504
7. 3. 7. 55.672	.2356239	.9575801	.1658968	.9241712	-.1479686	-.3430658	-.3006475	.2341516	-.9246453
7. 3. 7. 57.672	.2608259	.9520316	.1600175	.9398939	-.2125863	-.2672198	-.2203842	.2200974	-.9502568
7. 3. 7. 59.672	.2687062	.9495422	.1617609	.9462263	-.2288076	-.2286960	-.1801442	.2145150	-.9599639
7. 3. 8. 1.672	.1705414	.9645267	.2015041	.8928263	-.0647456	-.4457232	-.4168654	.2559224	-.8721966
7. 3. 8. 3.672	.0319701	.9486400	.3147380	.6226592	.2274230	-.7487151	-.7818398	.2199111	-.5834087
7. 3. 8. 5.672	-.0406239	.8858394	.4622102	.1945002	.4607538	-.8659535	-.9800609	.0547216	-.1910136
7. 3. 8. 7.672	-.0445779	.8209167	.5700256	-.1467111	.5590300	-.8160445	-.9881744	-.1200075	.0954439
7. 3. 8. 9.672	-.0403631	.8058357	.5907818	-.2117680	.5709129	-.7992293	-.9764861	-.1571216	.1476064
7. 3. 8. 11.672	-.0365686	.7959715	.6042285	-.2409007	.5797806	-.7883452	-.9698606	-.1740220	.1705483
7. 3. 8. 13.672	-.0322372	.7864472	.6168166	-.2697084	.5873973	-.7830346	-.9624022	-.1909585	.1931754
7. 3. 8. 15.672	-.0282347	.7787505	.6266980	-.2980946	.5918726	-.7789034	-.9541342	-.2079270	.2153911
7. 3. 8. 17.672	-.0264258	.7756592	.6305986	-.3141506	.5924158	-.7418578	-.9490053	-.2177070	.2280187
7. 3. 8. 19.672	-.0277631	.7780264	.6276178	-.3112602	.5899174	-.7450600	-.9499191	-.2160376	.2267907
7. 3. 8. 21.672	-.0300299	.7818241	.6227754	-.3021926	.5867983	-.7512306	-.9527738	-.2107574	.2186399
7. 3. 8. 23.672	-.0304431	.7820101	.6225208	-.3063325	.5855351	-.7505391	-.9514370	-.2135621	.2217179
7. 3. 8. 25.672	-.0265038	.7744242	.6321113	-.3404191	.5874972	-.7340475	-.9398277	-.2347642	.2482128
7. 3. 8. 27.672	-.0177365	.7601954	.6494624	-.3988164	.5902648	-.7018069	-.9168593	-.2714598	.2927091
7. 3. 8. 29.672	-.0059380	.7440660	.6680797	-.4619980	.5904735	-.6617393	-.8868611	-.3125809	.3402508
7. 3. 8. 31.672	.0074554	.7283037	.6852139	-.5225927	.5870492	-.6182799	-.8525498	-.3534782	.3849829
7. 3. 8. 33.672	.0142344	.7208689	.6929252	-.5515560	.5836889	-.5968970	-.8340164	-.3737048	.4069080
7. 3. 8. 35.672	.0009086	.7343486	.6787718	-.5100915	.5841658	-.6313136	-.8601196	-.3456622	.3751158

EXIT C-BAND COMMUNICATION BLACKOUT

7. 3. 8. 35.672	.0009086	.7343486	.6787718	-.5100915	.5841658	-.6313136	-.8601196	-.3456622	.3751158
7. 3. 8. 37.672	-.0197432	.7579328	.6520337	-.4358144	.5804177	-.6878816	-.8998200	-.2977467	.3188568
7. 3. 8. 39.672	-.0353294	.7793725	.6255640	-.3689982	.5715509	-.7329187	-.9287584	-.2567255	.2673945
7. 3. 8. 41.672	-.0413263	.7892525	.6126766	-.3380265	.5669975	-.7519208	-.9402288	-.2381750	.2433977
7. 3. 8. 43.672	-.0368910	.7797121	.6250504	-.3618301	.5726146	-.7366571	-.9315138	-.2533012	.2609990
7. 3. 8. 45.672	-.0240753	.7583591	.6513922	-.4244836	.5821725	-.6934614	-.9051155	-.2932006	.3078950
7. 3. 8. 47.672	-.0103536	.7403842	.6721041	-.5032257	.5769648	-.6433316	-.8640930	-.3448808	.3666068
7. 3. 8. 49.672	.0012324	.7271306	.6864980	-.5822544	.5586495	-.5906696	-.8130057	-.3989865	.4240635
7. 3. 8. 51.672	.0240691	.7046383	.7091583	-.6558161	.5465253	-.5207833	-.7545368	-.4525427	.4752675
7. 3. 8. 53.672	.0569707	.6781836	.7326809	-.7222220	.5346446	-.4387570	-.6893111	-.5041419	.5202605
7. 3. 8. 55.672	.0708136	.6688892	.7399815	-.7723854	.5061956	-.3836493	-.6311942	-.5443834	.5524858
7. 3. 8. 57.672	.0830926	.6605189	.7461973	-.8107873	.4801711	-.3347529	-.5794131	-.5771918	.5754390
7. 3. 8. 59.672	.1148721	.6417516	.7582807	-.8433670	.4663492	-.2669280	-.5249157	-.6088294	.5948026

EXIT S-BAND COMMUNICATION BLACKOUT

7. 3. 8. 59.672	.1148721	.6417516	.7582807	-.8433670	.4663492	-.2669280	-.5249157	-.6088294	.5948026
7. 3. 9. 1.672	.1216082	.6384169	.7600232	-.8656070	.4429209	-.2335498	-.4857323	-.6294799	.6064810
7. 3. 9. 3.672	.1165910	.6407829	.7588173	-.8717900	.4320518	-.2308969	-.4758032	-.6346089	.6090015
7. 3. 9. 5.672	.1267711	.6354704	.7616471	-.8705409	.4393438	-.2216650	-.4754866	-.6349443	.6088991
7. 3. 9. 7.672	.1108521	.6430806	.7577329	-.8725851	.4279289	-.2365248	-.4757173	-.6350760	.6085794
7. 3. 9. 9.672	.1140614	.6413402	.7587140	-.8722697	.4302039	-.2325295	-.4755370	-.6352807	.6085088
7. 3. 9. 11.672	.1135692	.6411180	.7589925	-.8723672	.4299463	-.2326403	-.4754759	-.6356995	.6081190
7. 3. 9. 13.672	.1002614	.6473856	.7555392	-.8739047	.4203168	-.2441808	-.4756450	-.6357873	.6078949
7. 3. 9. 15.672	.1117046	.6414598	.7589805	-.8726885	.4286450	-.2338336	-.4753281	-.6362333	.6076762
7. 3. 9. 17.672	.0947270	.6495464	.7543635	-.8777176	.4120473	-.2495993	-.4697219	-.6389479	.6091854
7. 3. 9. 19.672	.1122331	.6407434	.7595075	-.8839561	.4136169	-.2182323	-.4539001	-.6466784	.6127993
7. 3. 9. 21.672	.1075556	.6426859	.7585424	-.8956034	.3938936	-.2087421	-.4314953	-.6571169	.6179572
7. 3. 9. 23.672	.1209748	.6365465	.7617371	-.9059797	.3841831	-.1777752	-.4058159	-.6687010	.6230188
7. 3. 9. 25.672	.1268459	.6339186	.7629268	-.9163496	.3693514	-.1545411	-.3797546	-.6795048	.6277417
7. 3. 9. 27.672	.1299521	.6325660	.7635264	-.9263719	.3519856	-.1339445	-.3534791	-.6899031	.6317327
7. 3. 9. 29.672	.1455529	.6266552	.7655831	-.9338529	.3425515	-.1028453	-.3267002	-.6999726	.6350612
7. 3. 9. 31.672	.1409859	.6284145	.7649955	-.9434506	.3194665	-.0885550	-.3000398	-.7092505	.6379184
7. 3. 9. 33.672	.1630577	.6209705	.7666862	-.9481866	.3134002	-.0521766	-.2726798	-.7184538	.6398983
7. 3. 9. 35.672	.1535994	.6243331	.7659082	-.9571067	.2867090	-.0417685	-.2456703	-.7266903	.6415917
7. 3. 9. 37.672	.1794789	.6166661	.7664921	-.9593339	.2822430	-.0024551	-.2178664	-.7348812	.6422490
7. 3. 9. 39.672	.1674448	.6205984	.7660916	-.9672907	.2535996	.0069844	-.1905539	-.7419870	.6427631
7. 3. 9. 41.672	.1950397	.6135520	.7651885	-.9672513	.2495319	.0464613	-.1624326	-.7491914	.6421276
7. 3. 9. 43.672	.1822276	.6174164	.7652885	-.9739619	.2201010	.0543474	-.1348748	-.7552168	.6414486
7. 3. 9. 45.672	.2098095	.6115187	.7629055	-.9719187	.2154760	.0945729	-.1065547	-.7613245	.6395554

TABLE X.- Continued

(f) Direction cosines - Continued

TIME FROM LIFTOFF DAY HR MIN SEC	ROLL AXIS L 11	L 21	L 31	PITCH AXIS L 12	L 22	L 32	YAW AXIS L 13	L 23	L 33
7. 3. 9. 47.672	.1978520	.6149109	.7633735	-.9770582	.1863293	.1031436	-.0788147	-.7662676	.6376493
7. 3. 9. 49.672	.2236292	.6105206	.7597727	-.9733696	.1882099	.1416897	-.0509141	-.7712256	.6345624
7. 3. 9. 51.672	.2494505	.6131576	.7602951	-.9764744	.1525612	.1523901	-.0225524	-.7750889	.6314496
7. 3. 9. 53.672	.2361221	.6105308	.7559751	-.9717060	.1437086	.1874462	.0058039	-.7788458	.6271885
7. 3. 9. 55.672	.2323180	.6122337	.7587765	-.9720546	.1191998	.2042433	.0337385	-.7816409	.6228157
7. 3. 9. 57.672	.2468437	.6114792	.7617921	-.9670785	.1058771	.2314196	.0619128	-.7841449	.6174816
7. 3. 9. 59.672	.2516123	.6122783	.7496378	-.9636464	.0865759	.2527649	.0898706	-.7858880	.6118033
7. 3. 10. 1.672	.2557879	.6132123	.7473575	-.9595362	.0668878	.2785255	.1177401	-.7870811	.6055085
7. 3. 10. 3.672	.2715670	.6135928	.7414648	-.9513290	.0545230	.3083154	.1464858	-.7877380	.5985353
7. 3. 10. 5.672	.2649683	.6155611	.7423087	-.9487223	.0278484	.3148817	.1731545	-.7875970	.5913615
7. 3. 10. 7.672	.2890643	.6143923	.7324632	-.9359800	.0213625	.3514043	.2009556	-.7871494	.5831060
7. 3. 10. 9.672	.2773875	.6184674	.7352869	-.9333038	-.0081630	.3589950	.2280354	-.7867521	.5749725
7. 3. 10. 11.672	.2952547	.6203603	.7266207	-.9233650	-.0100631	.3887912	.2459009	-.7842524	.5698479
7. 3. 10. 13.672	.2842052	.6220765	.7295534	-.9265353	-.0174299	.3758037	.2464947	-.7827824	.5714222
7. 3. 10. 15.672	.2716142	.6239279	.7327617	-.9323077	-.0183498	.3612004	.2388054	-.7812665	.5767101
7. 3. 10. 17.672	.2772398	.6258939	.7289684	-.9339459	-.0092931	.3586929	.2276329	-.7798964	.5830478
7. 3. 10. 19.672	.2510762	.6274373	.7370774	-.9436266	-.0110345	.3388277	.2157069	-.7785889	.5892960
7. 3. 10. 21.672	.2487103	.6296405	.7359629	-.9467843	-.0022379	.3218409	.2043101	-.7768672	.5955961
7. 3. 10. 23.672	.2481871	.6319424	.7346143	-.9493471	.0076761	.3191357	.1927259	-.7753684	.6013822
7. 3. 10. 25.672	.2230169	.6334384	.7407983	-.9579387	.0015864	.2869685	.1806013	-.7737915	.6071490
7. 3. 10. 27.672	.2159650	.6357589	.7410899	-.9622191	.0096897	.2721040	.1658119	-.7718269	.6138319
7. 3. 10. 29.672	.2164309	.6377497	.7391939	-.9650281	.0250254	.2689602	.1479338	-.7698204	.6208801
7. 3. 10. 31.672	.1956461	.6400539	.7430031	-.9723990	.0283945	.2315900	.1271329	-.7678051	.6279431
7. 3. 10. 33.672	.1697898	.6429980	.7468099	-.9803172	.0327322	.1996964	.1007446	-.7651481	.6358996
7. 3. 10. 35.672	.1565735	.6459595	.7471419	-.9852540	.0493138	.1688375	.0689880	-.7617771	.6441554
7. 3. 10. 37.672	.1476729	.6486460	.7466266	-.9884268	.0702895	.1394317	.0347186	-.7578378	.6515189
7. 3. 10. 39.672	.1316418	.6516737	.7469885	-.9912973	.0864782	.0992553	.0000861	-.7536539	.6573861
7. 3. 10. 41.672	.1075343	.6557409	.7472885	-.9936062	.0989799	.0561106	-.0371726	-.7484496	.6621264
7. 3. 10. 43.672	.0810364	.6606113	.7463816	-.9937911	.1113138	.0093711	-.0768875	-.7424297	.6659471
7. 3. 10. 45.672	.0564616	.6658567	.7439901	-.9915788	.1243800	-.0360490	-.1165481	-.7356388	.6672721
7. 3. 10. 47.672	.0341459	.6713170	.7403834	-.9871540	.1383487	-.0799160	-.1560801	-.7281436	.6674173
7. 3. 10. 49.672	-.0020714	.6795939	.7335856	-.9711932	.1734354	-.1634129	-.2382842	-.7127919	.6596577
7. 3. 10. 51.672	-.1418640	.7204559	.6788256	-.8093166	.3104555	-.4986221	-.5699836	-.6201295	.5390344
7. 3. 10. 53.672	-.2781604	.8099969	.5162471	-.3312387	.4236193	-.8431059	-.9016139	-.4055263	.1504682
7. 3. 10. 55.672	-.2778874	.9174206	.2848122	.3371087	.3707679	-.8663836	-.8995200	-.1444665	-.4123022
7. 3. 10. 57.672	-.1557398	.9797125	.1241805	.7900145	.2001875	-.5794843	-.5929774	.0093946	-.8061643
7. 3. 10. 59.672	-.0298627	.9974058	.0454978	.9544851	.0479094	-.2943856	-.2967598	.0537255	-.9534397
7. 3. 11. 1.672	.0112326	.9980081	.0587737	.9792921	.0009004	-.2024501	-.2021403	.0598306	-.9775273
7. 3. 11. 3.672	.0224489	.9977423	.0632238	.9856566	-.0117063	-.1683670	-.1672368	.0661301	-.9836944
7. 3. 11. 5.672	.0006781	.9972277	.0744078	.9829745	.0130070	-.1832809	-.1837406	.0732653	-.9802406
7. 3. 11. 7.672	-.0301683	.9955911	.0888155	.9691231	.0508895	-.2412686	-.2447247	.0787945	-.9663857
7. 3. 11. 9.672	-.0629426	.9922961	.1067082	.9399103	.0948885	-.3279708	-.3355695	.0796528	-.9386418
7. 3. 11. 11.672	-.1077822	.9852207	.1331283	.8950420	.1544509	-.4183834	-.4327618	.0740612	-.8984610
7. 3. 11. 13.672	-.1675832	.9700357	.1759165	.8109744	.2371054	-.5348846	-.5405679	.0530261	-.8264090
7. 3. 11. 15.672	-.2368822	.9401821	.2448364	.6324629	.3905266	-.6957247	-.7374809	-.0099556	-.6752946
7. 3. 11. 17.672	-.2869207	.8992068	.3303085	.4092685	.4262562	-.8092420	-.8684719	-.0986550	-.4858228
7. 3. 11. 19.672	-.3025759	.8716391	.3856073	.2729706	.4668723	-.8411404	-.9132003	-.1492494	-.3791962
MAXIMUM LOAD FACTOR SECOND ENTRY									
7. 3. 11. 19.672	-.3025759	.8716391	.3856073	.2729706	.4668723	-.8411404	-.9132003	-.1492494	-.3791962
7. 3. 11. 21.672	-.2914636	.8807808	.3731944	.3012679	.4547999	-.8380899	-.9079023	-.1318412	-.3979086
7. 3. 11. 23.672	-.2721735	.8983473	.3448898	.4001871	.4315546	-.8084620	-.8750839	-.0820534	-.4769647
7. 3. 11. 25.672	-.2363788	.9240095	.3005818	.5578148	.3823144	-.7366670	-.7955927	-.0064802	-.6057972
7. 3. 11. 27.672	-.1496804	.9856112	.2408646	.7327034	.2857779	-.6176380	-.6590556	.0716812	-.7486705
7. 3. 11. 29.672	-.0896484	.9760312	.1983087	.8760329	.1720025	-.4588346	-.4738454	.1333352	-.8704552
7. 3. 11. 31.672	-.0079823	.9839607	.1782865	.9661862	.0535197	-.2682297	-.2677217	.1701673	-.9511165
7. 3. 11. 33.672	.0844792	.9807961	.1757905	.9960682	-.0784023	-.0412445	-.0266701	.1785836	-.9835632
7. 3. 11. 35.672	.1641585	.9673173	.1932599	.9719113	-.1921016	.1359608	.1686426	.1655118	-.9714818
7. 3. 11. 37.672	.1647246	.9640423	.2085881	.9677792	-.1987940	.1545458	.1909448	.1763614	-.9657264
7. 3. 11. 39.672	.1503309	.9632680	.2225206	.9709625	-.1862228	.1501760	.1860982	.1934831	-.9632922
7. 3. 11. 41.672	.1284966	.9633353	.2355285	.9749790	-.1661555	.1476740	.1813958	.2106595	-.9605822
7. 3. 11. 43.672	.1040531	.9630137	.2485510	.9799426	-.1426425	.1426371	.1728154	.2285996	-.9580590
7. 3. 11. 45.672	.0773056	.9620154	.2618208	.9852729	-.1138872	.1275468	.1525190	.2481048	-.9566514
7. 3. 11. 47.672	.0491652	.9600122	.2756872	.9914353	-.0803352	.1029676	.1209911	.2681843	-.9557397
7. 3. 11. 49.672	.0202963	.9568045	.2900228	.9965450	-.0427274	.0772202	.0805357	.2875752	-.9543660
7. 3. 11. 51.672	-.0086914	.9522809	.3050992	.9993101	-.0027457	.0370372	.0361075	.3052106	-.9516001
7. 3. 11. 53.672	-.0393336	.9463417	.3207651	.9991613	.0409043	.0018427	-.0113769	.3205686	-.9471670
7. 3. 11. 55.672	-.0727551	.9386244	.3371807	.9954341	.0892836	-.0337531	-.0617862	.3331855	-.9408347
7. 3. 11. 57.672	-.1078485	.9288445	.3544242	.9877943	.1404180	-.0674175	-.1123880	.3428274	-.9326512
7. 3. 11. 59.672	-.1438116	.9168116	.3725299	.9760987	.1933957	-.0991429	-.1629401	.3493632	-.9227112
7. 3. 12. 1.672	-.1812647	.9030594	.3893930	.9605463	.2475034	-.1268570	-.2109355	.3510353	-.9122990
7. 3. 12. 3.672	-.2296939	.8835344	.4081760	.9255771	.3279670	-.1890623	-.3009113	.3343719	-.8931113
7. 3. 12. 5.672	-.3839847	.7922333	.4742595	.6822450	.5895373	-.4324209	-.6221716	.1575184	-.7668706
7. 3. 12. 7.672	-.4966628	.6028912	.6243782	.1108621	.7575498	-.6482945	-.8608343	-.2502806	-.4930847
7. 3. 12. 9.672	-.4361443	.3969319	.8076034	-.5488165	.5939022	-.5882861	-.7131470	-.6998037	-.0411843
7. 3. 12. 11.672	-.2596856	.2972678	.9188010	-.9138738	.2318320	-.3332996	-.3120867	-.9262212	.2114618
7. 3. 12. 13.672	-.1225602	.2985076	.9465052	-.9923550	-.0808041	-.1124744	.0145118	-.9530541	.3024521
7. 3. 12. 15.672	-.0718424	.3266119	.9424241	-.9828526	-.1840562	-.0111367	.1698216	-.9270442	.3342344
7. 3. 12. 17.672	-.0927072	.3489404	.9325481	-.9782646	-.2043913	-.0200246	.1854824	-.9141352	.3404900
7. 3. 12. 19.672	-.1168362	.3704899	.9214589	-.9757913	-.2155406	-.0370631	.1848802	-.9034819	.3867037
7. 3. 12. 21.672	-.1465323	.3894834	.9093824	-.9720437	-.2271793	-.0593347	.1834648	-.8925742	.4118840
7. 3. 12. 23.672	-.1865144	.4062815	.8945097	-.9653878	-.2447513	-.0981284	.1823149	-.8803591	.4378688
7. 3. 12. 25.672	-.2259270	.4229270	.8775575	-.9571763	-.2637821	-.1193000	.1810261	-.8669208	.4644112

TABLE X.- Continued

(f) Direction cosines - Concluded

TIME FROM LIFTOFF DAY HR MIN SEC	ROLL AXIS L 11	L 21	L 31	PITCH AXIS L 12	L 22	L 32	YAW AXIS L 13	L 23	L 33
7. 3. 12. 27.672	-.26077q1	.4430140	.8577487	-.9488456	-.2814436	-.1431138	.1780064	-.8511922	.4937444
7. 3. 12. 29.672	-.2908964	.4633191	.8370870	-.9408022	-.2976242	-.1622066	.1739839	-.8347187	.5224694
7. 3. 12. 31.672	-.3290984	.4800337	.8131801	-.9291323	-.3183156	-.1881179	.1685450	-.8174612	.5507719
7. 3. 12. 33.672	-.3757479	.4940644	.7840859	-.9126514	-.3441510	-.2205166	.1608769	-.7984100	.5802242
7. 3. 12. 35.672	-.4128428	.5109807	.7539626	-.8980961	-.3661727	-.2436000	.1516056	-.7776993	.6100815
7. 3. 12. 37.672	-.4574947	.5224506	.7195942	-.8833034	-.3801428	-.3001203	.1023406	-.7728793	.6262458
7. 3. 12. 39.672	-.6293527	.4856024	.6047170	-.7563253	-.2033449	-.6217900	-.1785699	-.8502007	.4952490
7. 3. 12. 41.672	-.7886138	.4888375	.3729962	-.3581432	.1279223	-.9248618	-.4998216	-.8629448	.0741925
7. 3. 12. 43.672	-.8092707	.5781716	.1039162	.2195931	.4618209	-.8593604	-.5448484	-.6726359	-.5007007
7. 3. 12. 45.672	-.6827922	.7271462	-.0682670	.6916279	.6134173	-.3812741	-.2354688	-.3075464	-.9219380
7. 3. 12. 47.672	-.5328821	.8424092	-.0798961	.8304062	.5387575	.1420061	.1626719	.0093263	-.9866361
7. 3. 12. 49.672	-.4876827	.8729828	-.0081588	.7988921	.4500223	.3990630	.3520468	.1880982	-.9168872
7. 3. 12. 51.672	-.5499496	.8344633	.0350214	.7690377	.4895835	.4109610	.3257860	.2529406	-.9109800
TERMINATION OF AGC GUIDANCE									
7. 3. 12. 51.672	-.5499496	.8344633	.0350214	.7690377	.4895835	.4109610	.3257860	.2529406	-.9109800
7. 3. 12. 53.672	-.6052569	.7925889	.0739384	.7464578	.5328453	.3985933	.2765229	.2964432	-.9141425
7. 3. 12. 55.672	-.6575955	.7471549	.0965806	.7160589	.5800243	.3983703	.2341537	.3245479	-.9164242
7. 3. 12. 57.672	-.7009397	.7037600	.1157819	.6838943	.6171309	.3891503	.2024158	.3519534	-.9138691
7. 3. 12. 59.672	-.7304380	.6693769	.1356276	.6574409	.6353262	.4051322	.1850183	.3850911	-.9041422
7. 3. 13. 1.672	-.7576464	.6358794	.1470692	.6284004	.6503181	.4265535	.1755948	.4156246	-.8924252
7. 3. 13. 3.672	-.7870317	.6971972	.1547146	.5944824	.6671680	.4468624	.1648388	.4452440	-.8801056
7. 3. 13. 5.672	-.8102898	.5629368	.1628886	.5652787	.6774889	.4706046	.1545654	.4734036	-.8671785
7. 3. 13. 7.672	-.8278549	.5336327	.1728944	.5420412	.6816774	.4914338	.1443870	.5005518	-.8535809
7. 3. 13. 9.672	-.8471584	.5003337	.1788541	.5142556	.6873999	.5128571	.1336554	.5264480	-.8396361
7. 3. 13. 11.672	-.8675885	.4635646	.1799945	.4818186	.6940480	.5349281	.1230489	.5508222	-.8255022
7. 3. 13. 13.672	-.8828184	.4325953	.1830109	.4558554	.6951175	.5558844	.1132590	.5741715	-.8108635
7. 3. 13. 15.672	-.8929440	.4082188	.1897587	.4380338	.6906994	.5793788	.1038142	.5969018	-.7955695
7. 3. 13. 17.672	-.9037672	.3818895	.1933008	.4174607	.6867398	.5950755	.0945057	.6185052	-.7800769
7. 3. 13. 19.672	-.9171372	.3502752	.1901753	.3893196	.6850857	.6157010	.0863785	.6387213	-.7644866
7. 3. 13. 21.672	-.9295140	.3188578	.1852928	.3616200	.6899402	.6275731	.0723509	.6503436	-.7561869
7. 3. 13. 23.672	-.9379009	.2939295	.1842481	.3426071	.7015071	.6249065	.0549271	.6492250	-.7586465
7. 3. 13. 25.672	-.9441270	.2727608	.1850019	.3276068	.7153152	.6172503 7757			
7. 3. 13. 27.672	-.9522917	.2464212	.1800476	.3046098	.7311149	.6104783	.0187993	.6361977	-.7712970
7. 3. 13. 29.672	-.9618136	.2147800	.1696588	.2736903	.7482207	.6093670	.0028638	.6277223	-.7784321
7. 3. 13. 31.672	-.9682437	.1896695	.1628789	.2497713	.7622178	.5971920	-.0108801	.6189099	-.7853866
7. 3. 13. 33.672	-.9698645	.1788470	.1654587	.2426099	.7714315	.5882463	-.0224340	.6106612	-.7916742
7. 3. 13. 35.672	-.9703165	.1721897	.1698133	.2396181	.7794570	.5788176	-.0326957	.6023266	-.7975799
7. 3. 13. 37.672	-.9749254	.1519702	.1625594	.2185769	.7910698	.5713429	-.0417688	.5925484	-.8044512
7. 3. 13. 39.672	-.9796391	.1296400	.1532995	.1944620	.8025633	.5639829	-.0499178	.5823106	-.8114324
7. 3. 13. 41.672	-.9819805	.1162166	.1490238	.1803788	.8116093	.5556561	-.0563726	.5725242	-.8179475
7. 3. 13. 43.672	-.9811577	.1169606	.1537849	.1830415	.8174969	.5460720	-.0618498	.5639317	-.8235020
7. 3. 13. 45.672	-.9803788	.1178672	.1580024	.1854385	.8233168	.5364345	-.0668580	.5552087	-.8290195
7. 3. 13. 47.672	-.9829665	.1037215	.1517193	.1693134	.8321576	.5280593	-.0714833	.5447527	-.8355445
7. 3. 13. 49.672	-.9861636	.0847049	.1425004	.1474035	.8413708	.5199687	-.0758518	.5337793	-.8422151
7. 3. 13. 51.672	-.9865631	.0812512	.1417447	.1438166	.8435442	.5174456	-.0775249	.5308779	-.8438949
7. 3. 13. 53.672	-.9842294	.0930948	.1504189	.1588939	.8389915	.5204286	-.0777510	.5361217	-.8405524
7. 3. 13. 55.273	-.9437129	-.0322288	.3291918	.2888012	-.5654552	.7725634	.1612444	.8241491	.5429351
DROGUE PARACHUTES DEPLOYMENT									
7. 3. 13. 55.273	-.9437129	-.0322288	.3291918	.2888012	-.5654552	.7725634	.1612444	.8241491	.5429351
7. 3. 14. 5.273	-.9816084	.0532940	.1833156	-.1829362	-.5371346	-.8294188	.0545823	-.8418099	.5370072
7. 3. 14. 15.273	-.9897491	.0972472	.1044037	.0270632	.8464164	-.5318334	-.1400883	-.5235668	-.8403887
7. 3. 14. 25.273	-.9906857	.1093353	.0811645	.0598997	.8852092	-.4613205	-.1222861	-.4521619	-.8835132
7. 3. 14. 35.273	-.9908643	.1114410	.0759524	.0341310	.7520675	-.6582018	-.1304720	-.6495963	-.7490004
7. 3. 14. 45.273	-.9909648	.1112824	.0748668	.0651215	-.0887706	.9939210	.1172519	.9898161	.0807217
7. 3. 14. 48.477	-.9909933	.1111009	.0747582	-.1323069	-.8984943	-.4185723	.0206661	-.4246934	.9051013
MAIN PARACHUTES DEPLOYMENT									
7. 3. 14. 48.477	-.9909933	.1111009	.0747582	-.1323069	-.8984943	-.4185723	.0206661	-.4246934	.9051013
7. 3. 15. 18.477	-.9913157	.1082636	.0746474	.1260872	.6212722	.7733840	.0373530	.7760797	-.6295275
7. 3. 15. 48.477	-.9915504	.1060921	.0746480	.0326098	.7600193	-.6481440	-.1255566	-.6402331	-.7578503
7. 3. 16. 18.477	-.9917802	.1039209	.0746488	-.0942362	-.1986000	-.9755396	-.0865537	-.9745555	.2067606
7. 3. 16. 48.477	-.9920053	.1017494	.0746496	-.1239517	-.6745360	-.7277617	-.0236955	-.7311964	.6817553
7. 3. 17. 18.477	-.9922257	.0995768	.0746502	-.1235309	-.7152063	-.6879099	-.0151095	-.6917835	.7219468
7. 3. 17. 48.477	-.9924412	.0974043	.0746511	-.1107941	-.4495663	-.8863491	-.0527736	-.8879203	.4569600
7. 3. 18. 18.477	-.9926520	.0952313	.0746518	-.0244405	-.4464295	-.8944849	-.1185097	-.8897368	-.4408217
7. 3. 18. 48.477	-.9928581	.0930579	.0746525	.1006606	.9893070	.1055415	-.0640327	.1123023	-.9916088
7. 3. 19. 18.477	-.9930594	.0908843	.0746534	.0379813	-.3529165	.9348836	.1113126	.9312303	.3470152
SPLASHDOWN									
7. 3. 19. 18.477	-.9930594	.0908843	.0746534	.0379813	-.3529165	.9348836	.1113126	.9312303	.3470152
7. 3. 19. 18.312	-.9930594	.0908843	.0746534	.0379813	-.3529165	.9348836	.1113126	.9312303	.3470152

TABLE X.- Continued

(g) Heating parameters

TIME SECONDS	HEATING RATE CONVECTIVE BTU/FT SQ-SEC	HEATING RATE RADIATIVE BTU/FT SQ-SEC	HEATING RATE TOTAL BTU/FT SQ-SEC	HEAT LOAD CONVECTIVE BTU/FT SQ-SEC	HEAT LOAD RADIATIVE BTU/FT SQ-SEC	HEAT LOAD TOTAL BTU/FT SQ-SEC
615931.680	1.9	.0	1.9	.0	.0	.0
		ATMOSPHERIC ENTRY				
615931.680	1.9	.0	1.9	.0	.0	.0
615933.680	2.6	.0	2.6	4.3	.0	4.3
615935.680	3.1	.0	3.1	9.9	.0	9.9
615937.670	3.7	.0	3.7	16.7	.0	16.7
615939.680	4.4	.0	4.4	24.8	.0	24.8
615941.670	5.2	.0	5.2	34.4	.0	34.4
615943.680	6.1	.0	6.1	45.7	.0	45.7
615945.670	7.2	.0	7.2	58.9	.0	58.9
615947.680	8.4	.0	8.4	74.6	.0	74.6
615949.680	9.9	.0	9.9	92.7	.0	92.7
615951.670	11.6	.0	11.6	114.1	.0	114.1
615953.680	13.4	.0	13.4	139.1	.0	139.1
615955.670	15.6	.0	15.6	168.0	.0	168.0
615957.680	18.9	.4	19.3	202.3	.6	202.9
615959.670	23.1	.2	23.3	244.2	1.1	245.3
		ENTER S-BAND COMMUNICATION BLACKOUT				
615959.670	23.1	.2	23.3	244.2	1.1	245.3
615961.680	28.0	.3	28.3	295.2	1.6	296.7
615963.680	33.2	.6	33.7	356.3	2.4	358.7
	ENTER C-BAND COMMUNICATION BLACKOUT			LOAD FACTOR = 0.05 G		
615963.680	33.2	.6	33.7	356.3	2.4	358.7
615965.670	38.6	1.1	39.8	428.0	4.1	432.1
615967.680	44.9	2.1	47.0	511.4	7.3	518.6
615969.670	53.0	4.2	57.2	608.9	13.3	622.2
615971.680	62.7	6.0	68.7	729.5	23.3	747.8
615973.670	71.7	9.1	80.8	859.3	38.1	897.5
615975.680	80.9	12.4	93.3	1011.6	60.0	1071.6
615977.670	91.8	16.1	107.9	1184.5	88.3	1272.7
615979.680	102.0	21.7	123.7	1378.2	125.7	1503.9
615981.680	113.3	27.7	141.0	1593.5	175.4	1768.9
615983.670	124.4	34.5	158.9	1831.1	237.2	2068.3
615985.680	135.9	41.6	177.4	2091.5	313.5	2405.0
615987.670	147.3	49.9	197.3	2374.6	404.7	2779.3
615989.680	158.5	61.1	219.6	2680.4	515.2	3195.6
615991.670	169.3	68.5	237.8	3008.2	646.0	3654.2
615993.680	179.5	75.0	254.6	3357.2	789.4	4146.6
615995.680	189.0	78.0	267.0	3725.8	943.0	4668.8
615997.670	197.5	79.5	277.0	4112.4	1100.8	5213.2
615999.680	204.8	79.7	284.5	4514.9	1260.3	5775.2
616001.670	211.0	76.1	287.0	4930.8	1417.5	6348.3
		MAXIMUM HEATING RATE				
616001.670	211.0	76.1	287.0	4930.8	1417.5	6348.3
616003.680	216.3	69.0	285.3	5358.3	1562.6	6920.9
616005.670	220.1	63.0	283.1	5794.9	1694.7	7489.6
616007.680	222.3	56.3	278.6	6237.6	1814.0	8051.6
616009.670	222.9	49.3	272.2	6683.1	1919.7	8602.7
616011.670	222.0	41.7	263.7	7128.2	2010.9	9139.1
		GUIDANCE INITIATE AT RDOT = -700 FT/SEC				
616011.670	222.0	41.7	263.7	7128.2	2010.9	9139.1
616013.680	219.5	34.2	253.7	7570.0	2084.7	9654.7
616015.670	216.0	27.4	243.5	8005.8	2148.1	10153.9
616017.680	211.4	22.7	234.1	8433.4	2197.7	10631.1
		MAXIMUM LOAD FACTOR FIRST ENTRY				
616017.680	211.4	22.7	234.1	8433.4	2197.7	10631.1
616019.670	205.9	19.1	225.0	8850.8	2239.4	11090.3
616021.680	199.5	15.9	215.4	9256.4	2274.3	11530.7
616023.670	192.4	13.6	206.0	9648.4	2303.6	11952.0
616025.680	185.1	11.8	197.0	10026.0	2329.0	12354.9
616027.680	177.2	10.3	187.4	10388.3	2351.1	12739.3
616029.670	169.8	9.0	178.8	10735.4	2370.2	13105.6

TABLE X.- Continued

(g) Heating parameters - Continued

TIME SECONDS	HEATING RATE CONVECTIVE BTU/FT SQ-SEC	HEATING RATE RADIATIVE BTU/FT SQ-SEC	HEATING RATE TOTAL BTU/FT SQ-SEC	HEAT LOAD CONVECTIVE BTU/FT SQ-SEC	HEAT LOAD RADIATIVE BTU/FT SQ-SEC	HEAT LOAD TOTAL BTU/FT SQ-SEC
616031.680	163.3	8.1	171.4	11068.4	2387.3	13455.7
616033.670	157.1	7.3	164.4	11388.6	2402.6	13791.3
616035.680	151.9	6.6	158.6	11697.5	2416.6	14114.1
616037.670	147.0	6.1	153.1	11996.3	2429.3	14425.6
616039.680	142.6	5.6	148.3	12285.9	2441.0	14726.9
616041.680	138.7	5.3	144.0	12567.2	2451.9	15019.1
616043.670	135.2	4.9	140.1	12841.0	2462.1	15303.1
616045.680	132.1	4.6	136.7	13106.3	2471.6	15579.9
616047.670	129.3	4.4	133.6	13369.6	2480.6	15850.2
616049.680	126.8	4.1	130.9	13625.6	2489.1	16114.7
616051.670	124.6	4.0	128.6	13876.9	2497.2	16374.1
616053.680	122.5	3.8	126.3	14124.0	2505.0	16628.9
616055.670	120.8	3.7	124.5	14367.4	2512.5	16879.8
616057.680	119.3	3.6	122.9	14607.5	2519.8	17127.3
616059.680	118.0	3.6	121.6	14844.8	2527.0	17371.8
616061.670	116.7	3.5	120.2	15079.3	2534.0	17613.4
616063.680	115.2	3.4	118.6	15311.1	2540.9	17852.0
616065.670	113.6	3.4	116.9	15539.9	2547.7	18087.6
616067.680	111.9	3.3	115.1	15765.3	2554.4	18319.7
616069.670	109.9	3.2	113.1	15987.2	2560.8	18548.0
616071.680	107.9	3.1	110.9	16205.0	2567.1	18772.1
616073.680	105.7	2.9	108.6	16418.6	2573.1	18991.6
616075.670	103.5	2.8	106.3	16627.7	2578.8	19206.5
616077.680	101.2	2.7	103.9	16832.4	2584.3	19416.6
616079.670	98.7	2.5	101.3	17032.3	2589.5	19621.7
616081.680	96.4	2.4	98.9	17227.4	2594.4	19821.8
616083.670	94.3	2.3	96.6	17418.1	2599.1	20017.2
616085.680	91.8	2.2	94.0	17604.0	2603.6	20207.6
616087.680	89.2	2.1	91.2	17784.9	2607.9	20392.8
616089.670	86.5	1.9	88.4	17960.6	2611.9	20572.5
616091.680	83.7	1.8	85.5	18130.8	2615.7	20746.5
616093.670	80.9	1.7	82.6	18295.4	2619.2	20914.6
616095.680	78.0	1.6	79.6	18454.3	2622.5	21076.8
616097.670	75.2	1.5	76.7	18607.5	2625.6	21233.1
616099.680	72.4	1.4	73.8	18755.1	2628.5	21383.6
616101.670	69.7	1.3	70.9	18897.1	2631.2	21528.3
616103.680	67.0	1.2	68.2	19033.7	2633.7	21667.5
616105.680	64.4	1.1	65.5	19165.1	2636.0	21801.1
616107.670	61.9	1.0	62.9	19291.3	2638.2	21929.5
616109.680	59.5	1.0	60.4	19412.6	2640.2	22052.8
616111.670	57.2	.9	58.0	19529.2	2642.0	22171.3
616113.680	54.9	.8	55.8	19641.3	2643.7	22285.0
616115.670	52.8	.8	53.6	19749.0	2645.3	22394.3
	EXIT C-BAND COMMUNICATION BLACKOUT					
616115.670	52.8	.8	53.6	19749.0	2645.3	22394.3
616117.680	50.8	.7	51.5	19852.6	2646.8	22499.4
616119.680	48.9	.7	49.6	19952.3	2648.2	22600.4
616121.670	47.0	.6	47.6	20048.2	2649.4	22697.6
616123.680	45.3	.6	45.9	20140.6	2650.6	22791.2
616125.670	43.7	.5	44.2	20229.6	2651.8	22881.4
616127.680	42.1	.5	42.6	20315.4	2652.8	22968.2
616129.670	40.6	.5	41.1	20398.2	2653.8	23052.0
616131.680	39.3	.5	39.7	20478.1	2654.7	23132.8
616133.670	38.0	.4	38.4	20555.3	2655.6	23210.9
616135.670	36.7	.4	37.1	20629.9	2656.5	23286.4
616137.680	35.5	.4	35.9	20702.1	2657.3	23359.4
616139.670	34.5	.4	34.9	20772.1	2658.1	23430.2
	EXIT S-BAND COMMUNICATION BLACKOUT					
616139.670	34.5	.4	34.9	20772.1	2658.1	23430.2
616141.680	33.4	.4	33.8	20840.0	2658.8	23498.8
616143.670	32.5	.4	32.8	20906.0	2659.5	23565.5
616145.680	31.6	.3	32.0	20970.1	2660.2	23630.3
616147.670	30.8	.3	31.1	21032.5	2660.9	23693.3
616149.680	30.0	.3	30.3	21093.3	2661.5	23754.8
616151.680	29.3	.3	29.6	21152.6	2662.2	23814.8
616153.670	28.7	.3	29.0	21210.6	2662.8	23873.4
616155.680	28.1	.3	28.4	21267.4	2663.4	23930.7
616157.670	27.5	.3	27.8	21323.0	2663.9	23986.9
616159.680	27.0	.3	27.3	21377.5	2664.5	24042.0
616161.670	26.5	.3	26.8	21431.0	2665.1	24096.1
616163.680	26.1	.3	26.3	21483.6	2665.6	24149.2
616165.680	25.7	.3	25.9	21535.3	2666.2	24201.5
616167.670	25.3	.3	25.5	21586.3	2666.7	24253.0
616169.680	24.9	.3	25.2	21636.5	2667.2	24303.7
616171.670	24.6	.3	24.9	21686.0	2667.7	24353.8
616173.680	24.4	.3	24.6	21735.0	2668.3	24403.3
616175.670	24.1	.3	24.3	21783.4	2668.8	24452.2

TABLE X.- Continued

(g) Heating parameters - Continued

TIME SECONDS	HEATING RATE CONVECTIVE BTU/FT SQ-SEC	HEATING RATE RADIATIVE BTU/FT SQ-SEC	HEATING RATE TOTAL BTU/FT SQ-SEC	HEAT LOAD CONVECTIVE BTU/FT SQ-SEC	HEAT LOAD RADIATIVE BTU/FT SQ-SEC	HEAT LOAD TOTAL BTU/FT SQ-SEC
616177.680	23.9	.2	24.1	21831.4	2669.3	24500.7
616179.670	23.7	.2	23.9	21879.0	2669.7	24548.7
616181.680	23.5	.2	23.8	21926.1	2670.2	24596.4
616183.680	23.4	.2	23.6	21973.0	2670.7	24643.7
616185.670	23.3	.2	23.5	22019.7	2671.2	24690.8
616187.680	23.2	.2	23.4	22066.1	2671.7	24737.8
616189.670	23.1	.2	23.4	22112.4	2672.1	24784.5
616191.680	23.1	.2	23.3	22158.6	2672.6	24831.2
616193.670	23.1	.2	23.3	22204.7	2673.0	24877.8
616195.680	23.1	.2	23.3	22250.9	2673.5	24924.4
616197.680	23.1	.2	23.4	22297.1	2673.9	24971.0
616199.670	23.2	.2	23.4	22343.4	2674.4	25017.8
616201.680	23.3	.2	23.5	22389.9	2674.8	25064.7
616203.670	23.4	.2	23.7	22436.6	2675.3	25111.9
616205.680	23.6	.2	23.8	22483.6	2675.7	25159.4
616207.670	23.8	.2	24.0	22531.0	2676.2	25207.2
616209.680	24.0	.2	24.2	22578.8	2676.6	25255.4
616211.680	24.2	.2	24.5	22627.0	2677.0	25304.0
616213.670	24.5	.2	24.7	22675.7	2677.5	25353.2
616215.680	24.8	.2	25.0	22725.0	2677.9	25402.9
616217.670	25.1	.2	25.3	22774.9	2678.4	25453.3
616219.680	25.4	.2	25.7	22825.4	2678.8	25504.2
616221.670	25.8	.2	26.0	22876.6	2679.3	25555.9
616223.680	26.2	.2	26.4	22928.6	2679.7	25608.3
616225.670	26.6	.2	26.8	22981.3	2680.2	25661.5
616227.680	26.9	.2	27.2	23034.8	2680.7	25715.5
616229.680	27.4	.2	27.6	23089.1	2681.2	25770.3
616231.670	27.8	.3	28.0	23144.3	2681.7	25826.9
616233.680	28.2	.3	28.5	23200.3	2682.2	25882.4
616235.670	28.6	.3	28.9	23257.1	2682.7	25939.8
616237.680	29.0	.3	29.3	23314.7	2683.3	25998.0
616239.670	29.4	.3	29.7	23373.2	2683.9	26057.1
616241.680	29.8	.3	30.2	23432.4	2684.5	26116.9
616243.680	30.2	.3	30.6	23492.5	2685.2	26177.7
616245.670	30.6	.4	30.9	23553.3	2685.9	26239.2
616247.680	30.9	.4	31.3	23614.7	2686.7	26301.4
616249.670	31.1	.0	31.1	23676.6	2686.8	26363.4
616251.680	31.2	.0	31.2	23738.8	2686.8	26425.6
616253.670	31.1	.0	31.1	23801.1	2686.8	26487.8
616255.680	31.0	.0	31.0	23863.2	2686.8	26549.9
616257.670	30.7	.0	30.7	23924.9	2686.8	26611.7
616259.670	30.3	.0	30.3	23986.0	2686.8	26672.8
616261.680	29.8	.0	29.8	24046.2	2686.8	26732.9
616263.670	29.2	.0	29.2	24105.2	2686.8	26791.9
616265.680	28.4	.0	28.4	24162.7	2686.8	26849.5
616267.670	27.5	.0	27.5	24218.6	2686.8	26905.3
616269.680	26.6	.0	26.5	24272.5	2686.8	26959.3
616271.670	25.3	.0	25.3	24324.3	2686.8	27011.0
616273.680	24.0	.0	24.0	24373.6	2686.8	27060.3
616275.680	22.6	.0	22.6	24420.2	2686.8	27107.0
616277.670	21.1	.0	21.1	24463.9	2686.8	27150.7
616279.680	19.5	.0	19.8	24504.5	2686.8	27191.3
	MAXIMUM LOAD FACTOR SECOND ENTRY					
616279.680	19.5	.0	19.5	24504.5	2686.8	27191.3
616281.670	17.9	.0	17.9	24541.9	2686.8	27228.7
616283.680	16.3	.0	16.3	24576.1	2686.8	27262.9
616285.670	14.8	.0	14.8	24607.1	2686.8	27293.9
616287.680	13.3	.0	13.3	24635.2	2686.8	27322.0
616289.680	12.0	.0	12.0	24660.5	2686.8	27347.3
616291.670	10.8	.0	10.8	24683.3	2686.8	27370.0
616293.680	9.7	.0	9.7	24703.8	2686.8	27390.5
616295.670	8.8	.0	8.8	24722.3	2686.8	27409.0
616297.680	7.9	.0	7.9	24738.9	2686.8	27425.7
616299.670	7.2	.0	7.2	24754.1	2686.8	27440.8
616301.680	6.5	.0	6.5	24767.8	2686.8	27454.5
616303.670	5.9	.0	5.9	24780.2	2686.8	27467.0
616305.670	5.4	.0	5.4	24791.5	2686.8	27478.3
616307.680	4.9	.0	4.9	24801.7	2686.8	27488.5
616309.670	4.4	.0	4.4	24810.9	2686.8	27497.7
616311.680	4.0	.0	4.0	24819.3	2686.8	27506.0
616313.670	3.6	.0	3.6	24826.8	2686.8	27513.5
616315.680	3.2	.0	3.2	24833.5	2686.8	27520.2
616317.670	2.8	.0	2.8	24839.4	2686.8	27526.2
616319.680	2.5	.0	2.5	24844.7	2686.8	27531.5
616321.680	2.2	.0	2.2	24849.4	2686.8	27536.2
616323.670	1.9	.0	1.9	24853.6	2686.8	27540.3

TABLE X.- Continued

(g) Heating parameters - Concluded

TIME SECONDS	HEATING RATE CONVECTIVE BTU/FT SQ-SEC	HEATING RATE RADIATIVE BTU/FT SQ-SEC	HEATING RATE TOTAL BTU/FT SQ-SEC	HEAT LOAD CONVECTIVE BTU/FT SQ-SEC	HEAT LOAD RADIATIVE BTU/FT SQ-SEC	HEAT LOAD TOTAL BTU/FT SQ-SEC
616325.680	1.7	.0	1.7	24857.2	2686.8	27544.0
616327.670	1.5	.0	1.5	24860.4	2686.8	27547.2
616329.680	1.3	.0	1.3	24863.2	2686.8	27550.0
616331.670	1.1	.0	1.1	24865.7	2686.8	27552.4
616333.680	1.0	.0	1.0	24867.8	2686.8	27554.5
616335.680	.9	.0	.9	24869.6	2686.8	27556.4
616337.670	.7	.0	.7	24871.2	2686.8	27558.0
616339.680	.6	.0	.6	24872.6	2686.8	27559.3
616341.670	.6	.0	.6	24873.8	2686.8	27560.5
616343.680	.5	.0	.5	24874.8	2686.8	27561.6
616345.670	.4	.0	.4	24875.7	2686.8	27562.5
616347.680	.4	.0	.4	24876.5	2686.8	27563.3
616349.670	.3	.0	.3	24877.2	2686.8	27563.9
616351.680	.3	.0	.3	24877.8	2686.8	27564.5
616353.680	.2	.0	.2	24878.3	2686.8	27565.0
616355.670	.2	.0	.2	24878.7	2686.8	27565.5
616357.680	.2	.0	.2	24879.1	2686.8	27565.9
616359.670	.2	.0	.2	24879.4	2686.8	27566.2
616361.680	.1	.0	.1	24879.7	2686.8	27566.5
616363.670	.1	.0	.1	24880.0	2686.8	27566.7
616365.680	.1	.0	.1	24880.2	2686.8	27567.0
616367.680	.1	.0	.1	24880.4	2686.8	27567.2
616369.670	.1	.0	.1	24880.6	2686.8	27567.3
616371.680	.1	.0	.1	24880.7	2686.8	27567.5
TERMINATION OF AGC GUIDANCE						
616371.680	.1	.0	.1	24880.7	2686.8	27567.5
616373.670	.1	.0	.1	24880.9	2686.8	27567.6
616375.680	.1	.0	.1	24881.0	2686.8	27567.8
616377.670	.1	.0	.1	24881.1	2686.8	27567.9
616379.680	.0	.0	.0	24881.2	2686.8	27568.0
616381.680	.0	.0	.0	24881.3	2686.8	27568.1
616383.670	.0	.0	.0	24881.4	2686.8	27568.2
616385.680	.0	.0	.0	24881.5	2686.8	27568.2
616387.670	.0	.0	.0	24881.6	2686.8	27568.3
616389.680	.0	.0	.0	24881.6	2686.8	27568.4
616391.670	.0	.0	.0	24881.7	2686.8	27568.5
616393.680	.0	.0	.0	24881.8	2686.8	27568.5
616395.670	.0	.0	.0	24881.8	2686.8	27568.6
616397.680	.0	.0	.0	24881.9	2686.8	27568.6
616399.680	.0	.0	.0	24881.9	2686.8	27568.7
616401.670	.0	.0	.0	24882.0	2686.8	27568.7
616403.680	.0	.0	.0	24882.0	2686.8	27568.8
616405.670	.0	.0	.0	24882.1	2686.8	27568.8
616407.680	.0	.0	.0	24882.1	2686.8	27568.9
616409.670	.0	.0	.0	24882.1	2686.8	27568.9
616411.680	.0	.0	.0	24882.2	2686.8	27568.9
616413.680	.0	.0	.0	24882.2	2686.8	27569.0
616415.670	.0	.0	.0	24882.2	2686.8	27569.0
616417.680	.0	.0	.0	24882.3	2686.8	27569.0
616419.670	.0	.0	.0	24882.3	2686.8	27569.1
616421.680	.0	.0	.0	24882.3	2686.8	27569.1
616423.670	.0	.0	.0	24882.3	2686.8	27569.1
616425.680	.0	.0	.0	24882.4	2686.8	27569.1
616427.670	.0	.0	.0	24882.4	2686.8	27569.2
616429.670	.0	.0	.0	24882.4	2686.8	27569.2
616431.680	.0	.0	.0	24882.4	2686.8	27569.2
616433.670	.0	.0	.0	24882.5	2686.8	27569.2
616435.270	.0	.0	.0	24882.5	2686.8	27569.2
DROGUE PARACHUTES DEPLOYMENT						
616435.270	.0	.0	.0	24882.5	2686.8	27569.2
616445.280	.0	.0	.0	24882.5	2686.8	27569.3
616455.280	.0	.0	.0	24882.6	2686.8	27569.3
616465.280	.0	.0	.0	24882.6	2686.8	27569.3
616475.280	.0	.0	.0	24882.6	2686.8	27569.3
616485.280	.0	.0	.0	24882.6	2686.8	27569.3
616488.480	.0	.0	.0	24882.6	2686.8	27569.3
MAIN PARACHUTES DEPLOYMENT						
616488.480	.0	.0	.0	24882.6	2686.8	27569.3
616518.480	.0	.0	.0	24882.6	2686.8	27569.4
616548.480	.0	.0	.0	24882.6	2686.8	27569.4
616578.480	.0	.0	.0	24882.6	2686.8	27569.4
616608.480	.0	.0	.0	24882.6	2686.8	27569.4
616638.480	.0	.0	.0	24882.6	2686.8	27569.4
616668.480	.0	.0	.0	24882.6	2686.8	27569.4
616698.480	.0	.0	.0	24882.6	2686.8	27569.4
616728.480	.0	.0	.0	24882.6	2686.8	27569.4
616758.480	.0	.0	.0	24882.6	2686.8	27569.4
SPLASHDOWN						
616758.480	.0	.0	.0	24882.6	2686.8	27569.4
616758.320	.0	.0	.0	24882.6	2686.8	27569.4

TABLE X.- Continued

(h) Aerodynamic and guidance parameters

TIME SECONDS	ALTITUDE FEET	ALTITUDE N.MI.	MACH NUMBER	DYNAMIC PRESSURE LB/SQ FT	RCS FUEL POUNDS	ROLL COMMAND DEGREES
615931.680	400049.0	65.84	39.2	.0	.0	.00
			ATMOSPHERIC ENTRY			
615931.680	400049.0	65.84	39.2	.0	.0	.00
615933.680	392197.2	64.55	39.3	.0	.2	.00
615935.680	384463.3	63.27	39.3	.0	.2	.00
615937.670	376846.5	62.02	39.3	.1	.3	.00
615939.680	369347.8	60.79	39.3	.1	.3	.00
615941.670	361967.3	59.57	39.3	.1	.3	.00
615943.680	354704.8	58.38	39.3	.2	.3	.00
615945.670	347560.8	57.20	39.3	.2	.3	.00
615947.680	340535.3	56.04	39.3	.3	.3	.00
615949.680	333628.6	54.91	39.3	.4	.3	.00
615951.670	326841.1	53.79	39.3	.6	.3	.00
615953.680	320172.9	52.69	39.3	.9	.3	.00
615955.670	313624.6	51.62	39.3	1.3	.3	.00
615957.680	307195.9	50.56	39.3	1.8	.4	.00
615959.670	300888.4	49.52	39.3	2.6	.4	.00
			ENTER S-BAND COMMUNICATION BLACKOUT			
615959.670	300888.4	49.52	39.3	2.6	.4	.00
615961.680	294701.7	48.50	39.3	3.8	.4	.00
615963.680	288637.2	47.50	39.3	5.3	.4	.00
			ENTER C-BAND COMMUNICATION BLACKOUT		LOAD FACTOR = 0.05 G	
615963.680	288637.2	47.50	39.3	5.3	.4	.00
615965.670	282695.9	46.53	39.3	7.4	.5	-15.20
615967.680	276879.4	45.57	39.3	10.3	.6	-15.20
615969.670	271189.2	44.63	39.3	14.1	.6	-15.20
615971.680	265628.2	43.72	39.3	19.3	.6	-15.20
615973.670	260199.2	42.82	39.2	26.0	.6	-15.20
615975.680	254906.5	41.95	38.5	33.5	.6	-15.20
615977.670	249753.5	41.10	37.8	42.6	.7	-15.20
615979.680	244745.5	40.28	37.2	53.4	.7	-15.20
615981.680	239889.3	39.48	36.6	66.0	.7	-15.20
615983.670	235191.3	38.71	36.1	80.4	.7	-15.20
615985.680	230659.5	37.96	35.6	96.8	.7	-15.20
615987.670	226303.3	37.24	35.0	115.1	.7	-15.20
615989.680	222132.0	36.56	34.6	135.2	.7	-15.20
615991.670	218156.5	35.90	34.1	156.8	.7	-15.20
615993.680	214388.3	35.28	33.6	179.6	.7	-15.20
615995.680	210838.0	34.70	33.1	203.3	.7	-15.20
615997.670	207517.6	34.15	32.7	227.4	.7	-15.20
615999.680	204438.6	33.65	32.2	251.3	.7	-15.20
616001.670	201610.3	33.18	31.8	274.3	.7	-15.20
			MAXIMUM HEATING RATE			
616001.670	201610.3	33.18	31.8	274.3	.7	-15.20
616003.680	199042.8	32.76	31.5	297.7	.8	-15.20
616005.670	196744.6	32.38	31.1	319.9	.8	-15.20
616007.680	194722.3	32.05	30.8	338.5	.8	-15.20
616009.670	192980.3	31.76	30.4	354.9	.8	-15.20
616011.670	191521.1	31.52	30.1	366.7	.8	-15.20
			GUIDANCE INITIATE AT RDOT = -700 FT/SEC			
616011.670	191521.1	31.52	30.1	366.7	.8	-15.20
616013.680	190344.8	31.33	29.7	375.1	.8	-15.20
616015.670	189448.8	31.18	29.4	379.5	.8	-15.20
616017.680	188828.1	31.08	29.0	379.9	.8	-15.20
			MAXIMUM LOAD FACTOR FIRST ENTRY			
616017.680	188828.1	31.08	29.0	379.9	.8	-15.20
616019.670	188476.1	31.02	28.7	376.4	.8	-15.20
616021.680	188383.3	31.00	28.4	369.4	.9	-34.55
616023.670	188538.4	31.03	28.1	359.3	1.3	-78.84
616025.680	188918.1	31.09	27.8	346.8	1.7	-116.32
616027.680	189479.4	31.18	27.5	332.7	2.0	-164.80
616029.670	190116.1	31.29	27.3	318.4	2.2	-164.80

TABLE X.- Continued

(h) Aerodynamic and guidance parameters - Continued

TIME SECONDS	ALTITUDE FEET	ALTITUDE N.MI.	MACH NUMBER	DYNAMIC PRESSURE LB/SQ FT	RCS FUEL POUNDS	ROLL COMMAND DEGREES
616031.680	190735.6	31.39	27.0	305.2	2.6	-164.80
616033.670	191263.9	31.48	26.8	293.8	3.2	-164.80
616035.680	191679.6	31.55	26.6	284.1	3.5	-164.80
616037.670	191983.9	31.60	26.3	276.0	3.5	-164.80
616039.680	192180.1	31.63	26.1	269.3	3.5	-164.80
616041.680	192270.6	31.64	25.9	263.8	3.5	-164.80
616043.670	192256.9	31.64	25.7	259.6	3.6	-164.80
616045.680	192137.9	31.62	25.5	256.4	3.6	-164.80
616047.670	191913.9	31.58	25.2	254.2	3.6	-164.80
616049.680	191583.4	31.53	25.0	253.1	3.6	-164.80
616051.670	191145.1	31.46	24.8	253.0	3.6	-155.20
616053.680	190597.1	31.37	24.6	253.9	3.8	-133.10
616055.670	189940.9	31.26	24.3	255.7	4.0	-116.03
616057.680	189184.6	31.14	24.1	258.4	4.2	-100.70
616059.680	188349.4	31.00	23.9	261.8	4.2	-86.87
616061.670	187468.9	30.85	23.6	265.5	4.2	-75.47
616063.680	186585.1	30.71	23.4	269.2	4.2	-67.92
616065.670	185741.6	30.57	23.1	272.4	4.7	-65.60
616067.680	184963.6	30.44	22.9	274.9	4.9	-68.52
616069.670	184251.6	30.32	22.7	276.6	4.9	-73.38
616071.680	183602.1	30.22	22.4	277.5	5.0	-78.69
616073.680	183007.9	30.12	22.2	277.9	5.0	-84.10
616075.670	182457.9	30.03	21.9	277.7	5.1	-89.09
616077.680	181938.1	29.94	21.7	277.1	5.1	-93.12
616079.670	181432.2	29.86	21.4	276.4	5.4	.00
616081.680	180934.4	29.78	21.2	276.6	6.1	.00
616083.670	180481.9	29.70	21.0	279.2	6.3	.00
616085.680	180129.4	29.65	20.7	271.8	6.3	15.20
616087.680	179904.9	29.61	20.5	268.2	6.9	15.20
616089.670	179806.9	29.59	20.3	263.4	7.2	15.20
616091.680	179827.2	29.60	20.1	257.7	7.2	15.20
616093.670	179958.7	29.62	19.9	251.1	7.2	15.20
616095.680	180193.4	29.66	19.7	243.9	7.2	15.20
616097.670	180524.2	29.71	19.5	236.2	7.3	15.20
616099.680	180943.2	29.78	19.3	228.1	7.3	15.20
616101.670	181444.2	29.86	19.1	219.7	7.3	15.20
616103.680	182020.9	29.96	19.0	211.1	7.4	26.63
616105.680	182666.4	30.06	18.8	202.5	7.5	33.19
616107.670	183373.7	30.18	18.7	193.9	7.5	35.73
616109.680	184132.7	30.30	18.5	185.5	7.5	34.86
616111.670	184934.7	30.44	18.4	177.2	7.5	30.32
616113.680	185769.9	30.57	18.3	169.2	7.7	20.20
616115.670	186631.9	30.72	18.1	161.4	7.8	15.20
			EXIT C-BAND COMMUNICATION BLACKOUT			
616115.670	186631.9	30.72	18.1	161.4	7.8	15.20
616117.680	187518.2	30.86	18.0	154.0	7.8	17.91
616119.680	188428.9	31.01	17.9	146.8	7.9	24.91
616121.670	189362.7	31.17	17.8	140.0	8.0	30.73
616123.680	190315.4	31.32	17.7	133.4	8.1	35.84
616125.670	191282.7	31.48	17.6	127.1	8.2	40.35
616127.680	192258.4	31.64	17.5	121.1	8.2	44.30
616129.670	193235.4	31.80	17.5	115.5	8.2	47.74
616131.680	194206.7	31.96	17.4	110.2	8.2	50.69
616133.670	195165.2	32.12	17.3	105.2	8.2	53.19
616135.670	196103.9	32.27	17.2	100.5	8.2	55.33
616137.680	197017.4	32.42	17.2	96.2	8.2	57.14
616139.670	197900.7	32.57	17.1	92.2	8.2	58.68
			EXIT S-BAND COMMUNICATION BLACKOUT			
616139.670	197900.7	32.57	17.1	92.2	8.2	58.68
616141.680	198748.4	32.71	17.1	88.5	8.3	60.04
616143.670	199557.7	32.84	17.0	85.1	8.4	61.25
616145.680	200326.9	32.97	16.9	82.0	8.4	62.39
616147.670	201054.7	33.09	16.9	79.1	8.4	63.62
616149.680	201740.9	33.20	16.8	76.5	8.4	64.93
616151.680	202384.9	33.31	16.8	74.1	8.4	66.25
616153.670	202984.4	33.41	16.8	72.0	8.4	67.69
616155.680	203540.7	33.50	16.7	70.1	8.4	69.09
616157.670	204051.9	33.58	16.7	68.3	8.4	70.58
616159.680	204517.4	33.66	16.6	66.7	8.4	72.11
616161.670	204936.2	33.73	16.6	65.3	8.4	73.64
616163.680	205306.7	33.79	16.6	64.0	8.4	75.20
616165.680	205627.4	33.84	16.5	62.8	8.4	76.68
616167.670	205896.9	33.89	16.5	61.8	8.4	78.20
616169.680	206113.7	33.92	16.4	61.0	8.4	79.62
616171.670	206276.7	33.95	16.4	60.2	8.4	81.08
616173.680	206384.4	33.97	16.3	59.6	8.4	82.79
616175.670	206435.7	33.97	16.3	59.2	8.4	84.72

TABLE X.- Continued

(h) Aerodynamic and guidance parameters - Continued

TIME SECONDS	ALTITUDE FEET	ALTITUDE N.MI.	MACH NUMBER	DYNAMIC PRESSURE LB/SQ FT	RCS FUEL POUNDS	ROLL COMMAND DEGREES
616177.680	206429.7	33.97	16.3	58.8	8.4	84.57
616179.670	206364.2	33.96	16.2	58.6	8.4	88.39
616181.680	206238.9	33.94	16.1	58.5	8.4	90.13
616183.680	206052.7	33.91	16.1	58.6	8.4	91.82
616185.670	205804.2	33.87	16.0	58.7	8.4	93.44
616187.680	205491.7	33.82	16.0	59.1	8.4	94.99
616189.670	205115.4	33.76	15.9	59.5	8.4	96.48
616191.680	204672.9	33.68	15.8	60.1	8.4	97.87
616193.670	204163.9	33.60	15.8	60.8	8.4	99.21
616195.680	203584.4	33.51	15.7	61.7	8.4	100.41
616197.680	202939.9	33.40	15.6	62.8	8.4	101.57
616199.670	202223.4	33.28	15.6	64.0	8.4	102.64
616201.680	201434.7	33.15	15.5	65.4	8.4	103.49
616203.670	200573.4	33.01	15.4	67.2	8.4	104.20
616205.680	199637.7	32.86	15.3	69.1	8.4	104.80
616207.670	198626.0	32.69	15.3	71.3	8.4	105.17
616209.680	197537.5	32.51	15.2	73.7	8.4	105.38
616211.680	196370.0	32.32	15.1	76.4	8.5	105.37
616213.670	195122.9	32.11	15.0	79.4	8.5	105.10
616215.680	193795.2	31.89	14.9	82.8	8.5	104.71
616217.670	192387.7	31.66	14.9	86.5	8.5	104.07
616219.680	190899.5	31.42	14.8	90.5	8.5	103.36
616221.670	189332.0	31.16	14.7	95.0	8.5	102.45
616223.680	187685.0	30.89	14.6	100.0	8.5	101.32
616225.670	185958.7	30.60	14.4	105.4	8.5	100.07
616227.680	184154.7	30.31	14.3	111.3	8.6	98.60
616229.680	182273.0	30.00	14.2	117.7	8.6	96.85
616231.670	180315.2	29.68	14.1	124.8	8.6	94.95
616233.680	178282.5	29.34	14.0	132.4	8.6	92.85
616235.670	176178.0	29.00	13.8	140.7	8.6	90.49
616237.680	174004.7	28.64	13.7	149.7	8.6	87.94
616239.670	171766.5	28.27	13.5	159.4	8.6	85.29
616241.680	169467.7	27.89	13.4	170.6	8.6	82.52
616243.680	167114.0	27.50	13.3	182.7	8.6	79.96
616245.670	164711.2	27.11	13.1	195.8	8.6	77.51
616247.680	162267.7	26.71	13.0	209.7	8.6	74.88
616249.670	159791.0	26.30	12.8	224.4	8.9	-72.10
616251.680	157298.5	25.89	12.6	239.8	9.6	-69.23
616253.670	154842.0	25.48	12.4	255.3	9.8	-68.33
616255.680	152476.0	25.09	12.3	272.2	9.9	-72.12
616257.670	150207.7	24.72	12.1	288.5	10.3	-78.11
616259.670	147994.5	24.36	11.9	304.9	10.8	-81.28
616261.680	145789.5	23.99	11.7	320.3	11.2	-79.34
616263.670	143575.5	23.63	11.5	336.9	11.3	-74.51
616265.680	141349.0	23.26	11.2	352.6	11.5	-68.88
616267.670	139118.5	22.90	11.0	368.6	11.6	-62.68
616269.680	136903.5	22.53	10.7	383.9	11.6	-56.89
616271.670	134730.7	22.17	10.5	397.9	11.6	-52.46
616273.680	132629.2	21.83	10.2	409.8	11.9	-15.20
616275.680	130636.5	21.50	9.9	418.7	11.9	-15.20
616277.670	128800.0	21.20	9.6	423.5	11.9	-15.20
616279.680	127152.5	20.93	9.2	423.7	12.4	-15.45
		MAXIMUM LOAD FACTOR SECOND ENTRY				
616279.680	127152.5	20.93	9.2	423.7	12.4	-15.45
616281.670	125701.2	20.69	8.9	419.3	12.6	-36.34
616283.680	124435.5	20.48	8.6	410.7	12.7	-49.44
616285.670	123333.7	20.30	8.3	399.0	12.9	-61.61
616287.680	122363.2	20.14	8.0	385.1	12.9	-72.83
616289.680	121476.2	19.99	7.7	370.3	12.9	-84.97
616291.670	120620.2	19.85	7.4	356.5	12.9	-94.69
616293.680	119739.5	19.71	7.1	341.9	12.9	-101.57
616295.670	118783.2	19.55	6.8	329.9	13.1	-105.10
616297.680	117715.2	19.37	6.6	320.1	13.4	-104.87
616299.670	116534.2	19.18	6.3	312.0	13.4	-102.34
616301.680	115248.7	18.97	6.1	305.3	13.4	-99.06
616303.670	113865.5	18.74	5.9	299.9	13.5	-95.89
616305.670	112393.2	18.50	5.6	295.3	13.5	-93.10
616307.680	110843.2	18.24	5.4	291.4	13.5	-89.88
616309.670	109227.5	17.98	5.2	287.9	13.5	-86.42
616311.680	107560.5	17.70	5.0	284.5	13.5	-82.93
616313.670	105856.0	17.42	4.8	281.0	13.5	-79.33
616315.680	104127.5	17.14	4.5	276.4	13.5	-75.46
616317.670	102389.5	16.85	4.3	271.0	13.5	-71.63
616319.680	100659.0	16.57	4.1	265.0	13.5	-68.34
616321.680	98931.7	16.28	3.9	258.4	13.6	-64.81
616323.670	97232.7	16.00	3.7	251.1	13.9	63.65

TABLE X.- Concluded

(h) Aerodynamic and guidance parameters - Concluded

TIME SECONDS	ALTITUDE FEET	ALTITUDE N.MI.	MACH NUMBER	DYNAMIC PRESSURE LB/SQ FT	RCS FUEL POUNDS	ROLL COMMAND DEGREES
616325.680	95576.2	15.73	3.5	242.9	14.6	66.70
616327.670	94007.0	15.47	3.3	233.6	14.8	73.07
616329.680	92548.5	15.23	3.1	223.2	14.8	83.06
616331.670	91165.2	15.00	3.0	212.4	15.3	93.21
616333.680	89793.5	14.78	2.8	202.0	15.7	100.28
616335.680	88385.2	14.55	2.6	192.5	16.1	102.16
616337.670	86924.6	14.31	2.5	184.0	16.4	101.28
616339.680	85415.5	14.06	2.4	176.3	16.4	99.23
616341.670	83865.7	13.80	2.2	169.2	16.4	97.00
616343.680	82282.5	13.54	2.1	162.6	16.4	93.93
616345.670	80673.5	13.28	2.0	156.4	16.4	92.47
616347.680	79046.2	13.01	1.9	150.7	16.4	90.49
616349.670	77406.2	12.74	1.8	145.5	16.4	91.06
616351.680	75759.7	12.47	1.7	140.6	16.4	90.86
616353.680	74111.5	12.20	1.6	136.0	16.4	93.73
616355.670	72468.7	11.93	1.5	131.7	16.4	91.59
616357.680	70835.7	11.66	1.4	127.6	16.7	-90.29
616359.670	69222.7	11.39	1.4	123.6	17.5	-90.39
616361.680	67656.0	11.13	1.3	120.0	17.8	-88.05
616363.670	66150.7	10.89	1.2	116.9	17.9	-95.99
616365.680	64697.2	10.65	1.2	114.1	17.9	-103.99
616367.680	63268.0	10.41	1.1	111.3	18.4	-108.22
616369.670	61838.0	10.18	1.1	109.2	19.1	-105.64
616371.680	60395.7	9.94	1.0	107.8	19.6	-100.13
			TERMINATION OF AGC GUIDANCE			
616371.680	60395.7	9.94	1.0	107.8	19.6	-100.13
616373.670	58946.2	9.70	1.0	107.0	19.6	-100.13
616375.680	57495.0	9.46	.9	106.8	19.6	-100.13
616377.670	56046.7	9.22	.9	107.1	19.7	-100.13
616379.680	54604.2	8.99	.9	107.7	19.7	-100.13
616381.680	53171.2	8.75	.9	108.5	19.7	-100.13
616383.670	51750.2	8.52	.8	109.4	19.7	-100.13
616385.680	50345.5	8.29	.8	110.4	19.7	-100.13
616387.670	48958.7	8.06	.8	111.3	19.7	-100.13
616389.680	47593.2	7.83	.8	112.2	19.7	-100.13
616391.670	46250.5	7.61	.7	113.0	19.7	-100.13
616393.680	44933.2	7.40	.7	113.7	19.7	-100.13
616395.670	43642.0	7.18	.7	114.3	19.7	-100.13
616397.680	42378.5	6.97	.7	114.8	19.7	-100.13
616399.680	41142.7	6.77	.7	115.2	19.7	-100.13
616401.670	39936.0	6.57	.6	115.4	19.7	-100.13
616403.680	38758.2	6.38	.6	115.6	19.8	-100.13
616405.670	37609.7	6.19	.6	115.7	19.8	-100.13
616407.680	36489.7	6.01	.6	115.8	19.8	-100.13
616409.670	35398.0	5.83	.6	115.2	19.8	-100.13
616411.680	34333.2	5.65	.6	114.3	19.8	-100.13
616413.680	33293.2	5.48	.5	113.6	19.8	-100.13
616415.670	32276.2	5.31	.5	113.0	19.8	-100.13
616417.680	31280.7	5.15	.5	112.6	19.8	-100.13
616419.670	30305.5	4.99	.5	112.2	19.8	-100.13
616421.680	29349.0	4.83	.5	111.9	19.8	-100.13
616423.670	28410.0	4.68	.5	111.7	19.8	-100.13
616425.680	27487.7	4.52	.5	111.6	19.8	-100.13
616427.670	26581.0	4.37	.5	111.4	19.8	-100.13
616429.670	25689.2	4.23	.5	111.4	19.9	-100.13
616431.680	24811.7	4.08	.4	111.3	19.9	-100.13
616433.670	23947.7	3.94	.4	111.3	19.9	-100.13
616435.270	23265.5	3.83	.4	111.3	19.9	-100.13
			DROGUE PARACHUTES DEPLOYMENT			
616435.270	23265.5	3.83	.4	111.3	19.9	-100.13
616445.280	19763.0	3.25	.3	50.7	19.9	-100.13
616455.280	17279.2	2.84	.2	34.2	19.9	-100.13
616465.280	15135.5	2.49	.2	32.6	19.9	-100.13
616475.280	13080.5	2.15	.2	32.5	19.9	-100.13
616485.280	11093.2	1.83	.2	32.4	19.9	-100.13
616488.480	10470.7	1.72	.2	32.4	19.9	-100.13
			MAIN PARACHUTES DEPLOYMENT			
616488.480	10470.7	1.72	.2	32.4	19.9	-100.13
616518.480	7014.0	1.15	.0	.9	19.9	-100.13
616548.480	6095.0	1.00	.0	.9	19.9	-100.13
616578.480	5188.7	.85	.0	.9	19.9	-100.13
616608.480	4294.7	.71	.0	.9	19.9	-100.13
616638.480	3412.5	.56	.0	.9	19.9	-100.13
616668.480	2541.7	.42	.0	.9	19.9	-100.13
616698.480	1682.5	.28	.0	.9	19.9	-100.13
616728.480	833.7	.14	.0	.9	19.9	-100.13
616758.480	-4.5	-.00	.0	.9	19.9	-100.13
			SPLASHDOWN			
616758.480	-4.5	-.00	.0	.9	19.9	-100.13
616758.320	.0	.00	.0	.9	19.9	-100.13

PERICYNTHION TO FREE
RETURN ENTRY INTERFACE

TABLE XI.- PERICYNTHION TO FREE RETURN ENTRY INTERFACE

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****** CSM   / MOON  REF.  /PHASE  21-  1
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS., 0 MINS., 29.133 SECS. G.M.T.

T        .6915817704485910+002  HRS. FROM LAUNCH       2 DAYS, 21 HRS., 9 MINS., 29.437 SECS. G.E.T.    RAGR  .2431156270390410+003

          PHASE ELAPSED TIME      .00000000     SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       .2571202838489842O+000      -.1000005356785261S+000      -.8930692377045212O-001
        RDXYZ      -.6668213500280731O+000     -.1070854856281287S+001      -.7207417969940994O+000

SELENOCENTRIC
   XL    8.8550516+02   YL   -3.4439520+02   ZL   -3.0756710+02  DXL   -3.8760357+03  DYL   -6.2245632+03  DZL   -4.1894593+03
   RL    9.9866159+02 DECL   -1.7937495+01  RAL   -2.1252307+01  VL    8.4451411+03 PTHL   -3.7997217-07  AZL   -1.2142783+02

SELENOGRAPHIC
   XS   -9.8196666+02   YS   -8.9590890+01   ZS   -1.5823996+02  DXS   -5.0687705+02  DYS    8.3013170+03  DZS   -1.5545119+03
 ALTS    6.0168054+01 LATS   -9.1170585+00 LONS   -1.7478698+02  VRS    8.4608093+03  PTR   -8.3755133-07  AZR   -1.0072421+02
  LTS   -1.5083657+00  LNS    1.2389686+02  LTE    3.1242815+00  LNE    7.7167727+00 DSMP    5.0275969+00 RSMP    1.1632912+02
  LIN    1.6594357+02  LAN    4.5076317+01  LAP    1.5436129+02  DR    -1.2368035-04  VT    8.4608093+03 SOLSV   2.8549588+01

GEOCENTRIC
    X    1.8681367+05    Y   -7.1787334+04    Z   -4.0659866+04  DX   -2.2794928+03  DY   -3.5608744+03  DZ   -2.7603021+03
    R    2.0422046+05  DEC   -1.1484211+01   RA   -2.1020389+01   V    5.0492753+03  PTH   -3.2233757+00  AZ   -1.2476187+02

GEOGRAPHIC
   XG   -2.0446932+04   YG    1.9908463+05   ZG   -4.0659862+04  DXG    9.2416672+04  DYG    8.6366408+03  DZG   -2.7603074+03
  ALT    2.0077698+05  LAT   -1.1485473+01  LON    9.5863985+01   VE    9.2860393+04  PTE   -1.7513950-01  AZE   -9.1773798+01

EARTH-MOON PLANE
  XMP   -9.9226404+02  YMP    5.3308690+01  ZMP   -9.9474666+01 DXMP    5.2605320+02 DYMP    8.3954625+03 DZMP   -7.4825530+02
  RMP    9.9866156+02 DEMP   -5.7165970+00 RAMP    1.7692477+02  VMP    8.4451409+03 PTMP   -7.9556677-07 AZMP   -9.5108660+01
  XME   -2.0422043+05  YME    5.3307102+01  ZME   -9.9474760+01 DXME    2.8558078+02 DYME    4.9853525+03 DZME   -7.4825525+02
  DIA    7.6111555+00  LIA   -5.1562788+01  DOA    2.3009840-02  LOA    4.4845203+01  DRP   -5.7165968+00  LRP    1.7692477+02

PLANETARY COORDINATES
   XM    1.8592817+05   YM   -7.1442939+04   ZM   -4.0352299+04  DXM    1.5965429+03  DYM    2.6636888+03  DZM    1.4291572+03
   RM    2.0322816+05  DEM   -1.1452567+01  RAM   -2.1019281+01  LOM    9.5865092+01   VM    3.4185783+03 ARGM   -2.4629505+01
 XSUN    3.7167608+06 YSUN   -7.2808260+07 ZSUN   -3.1572510+07  RAS   -8.7077665+01  LOS    2.9806709+01  DES   -2.3416239+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   -8.2534329+05  ECC    1.2467321+00  INC    1.4361812+02  RAN    1.7498629+02  APF   -1.5457934+02  RP    2.0363864+05
   VH    1.6753965+03 RNMP   -1.7982904+02 APMP   -1.7400365+02 INMP    1.7146267+02  APO   -1.8543252+06  TFP   7.6063108+01
   TA   -5.8083481+00   EA   -1.9266503+00   MA   -4.7581872-01  SLR    4.5752146+05  PER    5.2242070+03  MTA   1.4333081+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.9991438+03 ECCS    1.4995446+00 INCS    1.4427427+02 RANS   -1.7450418+02 APFS   -1.4816688+02  RPS   9.9866156+02
  VHS    3.7754056+03 RNMPS   4.5016269+01 APMPS  -1.3165329+02 INMPS   1.7233898+02 APOS   -4.9969492+03 TFPS  6.9158176+01
  TAS   -6.3730890-07  EAS    0.0000000    MAS   -4.2723425-07 SLRS    2.4961990+03 PERS    5.6154402+00 MTAS  1.3182587+02

SELENOCENTRIC UNIT VECTORS
   #X   -5.5922492-02   WY    5.8122162-01   WZ   -8.1182148-01   PX    8.8669191-01   PY   -3.4485676-01   PZ   -3.0797931-01
   QX   -4.5896635-01   QY   -7.3705850-01   QZ   -4.9607926-01  SXO   -9.3331763-01  SYO   -3.1926313-01  SZO   -1.6428389-01

****** CSM   / MOON  REF.  /PHASE  21-  2
                    MEAN-OF-EPOCH  1969        24  DEC. 1968, 10 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .6999999999999990+002  HRS. FROM LAUNCH       2 DAYS, 21 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .2557775424912430+003

          PHASE ELAPSED TIME      .30305626+04 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ       -.5153182659010197S+000     -.6182945982520503S+000      -.4071148806295564O+000
        RDXYZ      -.8760187022095099S+000     -.3873822762193081O+000      -.2169323828251195S+000

SELENOCENTRIC
   XL   -1.7747218+03   YL   -2.1293655+03   ZL   -1.4020766+03  DXL   -5.0920382+03  DYL   -2.2517388+03  DZL   -1.2609639+03
   RL    3.1063891+03 DECL   -2.6830494+01  RAL   -1.2980954+02  VL    5.7086960+03 PTHL    6.1603437+01  AZL   -6.5474081+01

SELENOGRAPHIC
   XS    2.4100868+02   YS    3.0560439+03   ZS   -5.0215922+02  DXS    3.1058242+03  DYS    4.8070722+03  DZS   -3.1969805+02
 ALTS    2.1678956+03 LATS   -9.3028942+00 LONS    8.5490816+01  VRS    5.7320410+03  PTR    6.1174767+01  AZR   -7.9604973+01
  LTS   -1.5087081+00  LNS    1.2346988+02  LTE    3.0760750+00  LNE    7.7321127+00 DSMP    5.0279151+00 RSMP    1.1588522+02
  LIN    1.6594400+02  LAN    4.4626234+01  LAP   -2.6157664+02  DR    5.0218092+03  VT    2.7636436+03 SOLSV   5.1430726+01

GEOCENTRIC
    X    1.8494323+05    Y   -7.2241352+04    Z   -4.1040201+04  DX   -3.5215702+03  DY    4.2167020+02  DZ    1.7371086+02
    R    2.0274888+05  DEC   -1.1678443+01   RA   -2.1336294+01   V    3.5509770+03  PTH   -7.3104770+01  AZ   -1.2057345+02

GEOGRAPHIC
   XG    2.4588864+04   YG    1.9702334+05   ZG   -4.1040198+04  DXG    8.7753037+04  DYG   -1.4411985+04  DZG   1.7377195+02
  ALT    1.9930542+05  LAT   -1.1679735+01  LON    8.2886165+01   VE    8.8928799+04  PTE   -2.1896292+00  AZE   -9.0338622+01

EARTH-MOON PLANE
  XMP    6.2209908+02  YMP    3.0345966+03  ZMP   -2.3209850+02 DXMP    3.6534330+03 DYMP    4.3858794+03 DZMP   -7.5493793+01
  RMP    3.1063891+03 DEMP   -4.2849328+00 RAMP    7.8414750+01  VMP    5.7086960+03 PTMP    6.1603437+01 AZMP   -8.3643907+01
  XME   -2.0272604+05  YME    3.0345945+03  ZME   -2.3209929+02 DXME    3.4128174+03 DYME    9.7796495+02 DZME   -7.5493793+01
  DIA    7.6104514+00  LIA   -5.2036863+01  DOA    2.8875373-02  LOA    4.4348224+01  DRP   -5.7191778+00  LRP   1.7643908+02

PLANETARY COORDINATES
   XM    1.8671795+05   YM   -7.0111988+04   ZM   -3.9638125+04  DXM    1.5704679+03  DYM    2.6734091+03  DZM    1.4346748+03
   RM    2.0334813+05  DEM   -1.1240482+01  RAM   -2.0580994+01  LOM    8.3641464+01   VM    3.4163982+03 ARGM   -2.4150068+01
 XSUN    3.7662570+06 YSUN   -7.2805979+07 ZSUN   -3.1571519+07  RAS   -8.7038723+01  LOS    1.7183734+01  DES   -2.3415509+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    2.2616373+05  ECC    9.5731076-01  INC    1.4747477+02  RAN    1.7757690+02  APF    3.4190837+00  RP    9.6547598+03
   VH   -1.2294939+03 RNMP    1.7999249+02 APMP   -1.7843711+01 INMP    1.7558783+02  APO    4.4267270+05  TFP   1.3091494+02
   TA   -1.6130367+02   EA   -8.3791474+01   MA   -2.9263309+01  SLR    1.8897360+04  PER    7.4938139+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -2.0006382+03 ECCS    1.4992015+00 INCS    1.4427536+02 RANS   -1.7449895+02 APFS   -1.4815601+02  RPS   9.9872158+02
  VHS    3.7739953+03 RNMPS   4.4562901+01 APMPS  -1.3162100+02 INMPS   1.7233937+02 APOS   -4.9999980+03 TFPS  6.9158170+01
  TAS    9.7531133+01  EAS    6.4469025+01  MAS    5.3908373+01 SLRS    2.4960064+03 PERS    5.6217378+00 MTAS  1.3183761+02
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SELENOCENTRIC UNIT VECTORS
   WX   -5.5973974-02   WY    5.8120115-01   WZ   -8.1183258-01   PX    8.8663681-01   PY   -3.4492160-01   PZ   -3.0806528-01
   QX   -4.5906649-01   QY   -7.3704427-01   QZ   -4.9600770-01   SXO  -9.3342812-01   SYO  -3.1905595-01   SZO  -1.6405845-01

****** CSM   / MOON  REF.  /PHASE  21-  3
                  MEAN-OF-EPOCH  1969       24  DEC. 1968, 15 HRS., 50 MINS., 59.695 SECS. G.M.T.

T       .7499999999999999+002  HRS. FROM LAUNCH      3 DAYS,  2 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .330982877383083+003

          PHASE ELAPSED TIME     .21030562+05 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.4165223199224419 7+001      -.1953609604414548 1+001      -.1111907236334175 9+001
        RDXYZ     -.6756081806639081 7+000      -.2333642238732593 7+000      -.1207580661938636 3+000

SELENOCENTRIC
   XL   -1.4344752+04   YL   -6.7281016+03   ZL   -3.8293346+03  DXL   -3.9271110+03  DYL   -1.3564774+03  DZL   -7.0193101+02
   RL    1.6300400+04  DECL   -1.3587068+01  RAL   -1.5487207+02  VL    4.2136610+03  PTHL   8.2834114+01  AZL   -5.6737649+01

SELENOGRAPHIC
   XS    9.0323979+03   YS    1.3531066+04   ZS   -1.0144444+03  DXS   2.9648028+03  DYS   3.0469849+03  DZS   -1.3765474+02
 ALTS    1.5361907+04 LATS   -3.5680698+00 LONS    5.6275684+01  VRS   4.2536010+03  PTR   7.9380513+01  AZR   -8.0989349+01
  LTS   -1.5107608+00  LNS    1.2093392+02  LTE   2.7866019+00  LNE   7.8102388+00 DSMP   5.0296950+00 RSMP   1.1326092+02
  LIN    1.6604055+02  LAN    4.1747899+01  LAP   -1.3784168+02  DR    4.1807484+03  VT    7.8387753+02 SOLSV   2.5383781+01

GEOCENTRIC
    X    1.7679484+05    Y   -6.8839198+04    Z   -3.9171178+04   DX   -2.5127588+03  DY    1.3705283+03  DZ    7.6327853+02
    R    1.9372566+05  DEC   -1.1665593+01   RA   -2.1274612+01    V    2.9622456+03  PTH  -8.2151493+01  AZ    6.4599659+01

GEOGRAPHIC
   XG    1.8799452+05   YG    2.5559906+04   ZG   -3.9171176+04  DXG   8.4627826+03  DYG   -8.3316495+04  DZG   7.6286466+02
  ALT    1.9028220+05  LAT   -1.1666943+01  LON    7.7425112+00   VE   8.3748668+04  PTE   -2.0080192+00  AZE   -8.9881510+01

EARTH-MOON PLANE
  XMP    1.0725308+04  YMP    1.2271777+04  ZMP   -2.7262505+02 DXMP   3.1439832+03 DYMP   2.8054066+03 DZMP   -1.3454884+00
  RMP    1.6300400+04 DEMP   -9.5831961-01 RAMP    4.8847137+01  VMP   4.2136610+03 PTMP   8.2834114+01 AZMP   -8.2502213+01
  XME   -1.9333639+05  YME    1.2271776+04  ZME   -2.7262539+02 DXME   2.9029866+03 DYME   -5.8954726+02 DZME   -1.3454829+00
  DIA    7.4932388+00  LIA   -5.5969140+01  DOA    3.3396856-02  LOA   4.1353262+01  DRP   -5.6869824+00  LRP   1.7297134+02

PLANETARY COORDINATES
   XM    1.9113959+05   YM   -6.2111098+04   ZM   -3.5341844+04  DXM   1.4143521+03  DYM   2.7270057+03  DZM   1.4652095+03
   RM    2.0406169+05  DEM   -9.9734582+00  RAM   -1.8001647+01  LOM   1.1015476+01   VM   3.4034969+03 ARGM   -2.1314655+01
 XSUN    4.0602167+06 YSUN   -7.2791857+07 ZSUN   -3.1565385+07  RAS  -8.6807436+01  LOS   3.0220968+02  DES   -2.3410967+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.5299395+05  ECC    9.9129947-01  INC    2.7788580+01  RAN   1.7908627+00  APF   1.4855012+02   RP   1.3311291+03
   VH   -1.9282891+03 RNMP   1.7043289+02 APMP   1.8902548-01 INMP   7.7971638-01  APO   3.0465677+05  TFP   1.3391499+02
   TA   -1.7425323+02   EA   -1.0557904+02   MA   -5.0868452+01  SLR   2.6506754+03  PER   4.1694602+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.9984432+03 ECCS    1.5129719+00 INCS    1.4436716+02 RANS  -1.7457697+02 APFS  -1.4759439+02  RPS   1.0251452+03
  VHS    3.7760673+03 RNMPS   4.1604958+01 APMPS  -1.3111853+02 INMPS   1.7244156+02 APOS  -5.0220317+03 TFPS   6.9154498+01
  TAS    1.2381356+02  EAS    1.4247421+02  MAS    3.7494602+02 SLRS   2.5761613+03 PERS   5.6124888+00 MTAS   1.3137242+02

SELENOCENTRIC UNIT VECTORS
   WX   -5.5059578-02   WY    5.7998125-01   WZ   -8.1276700-01   PX    8.8166147-01   PY   -3.5382870-01   PZ   -3.1221484-01
   QX   -4.6865904-01   QY   -7.3377576-01   QZ   -4.9186547-01   SXO  -9.3443029-01   SYO  -3.1678340-01   SZO  -1.6275156-01

****** CSM   / MOON  REF.  /PHASE  21-  4
                  MEAN-OF-EPOCH  1969       24  DEC. 1968, 20 HRS., 50 MINS., 59.695 SECS. G.M.T.

T       .7999999999999999+002  HRS. FROM LAUNCH      3 DAYS,  7 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .461882122749241+002

          PHASE ELAPSED TIME     .39030562+05 SECS.                                                                  .800

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ      -.7468487928766806+001      -.3075528535164096 0+001      -.1690403004201563 9+001
        RDXYZ     -.6511207711856794 1+000      -.2175119810856026 8+000      -.1118605187845389 8+000

SELENOCENTRIC
   XL   -2.5720976+04   YL   -1.0591916+04   ZL   -5.8216356+03  DXL   -3.7847728+03  DYL   -1.2643329+03  DZL   -6.5021219+02
   RL    2.8419161+04  DECL   -1.1820657+01  RAL   -1.5761810+02  VL    4.0429962+03  PTHL   8.5378885+01  AZL   -5.6644345+01

SELENOGRAPHIC
   XS    1.8091255+04   YS    2.1872213+04   ZS   -1.4005207+03  DXS   3.1658146+03  DYS   2.6095771+03  DZS   -1.2443144+02
 ALTS    2.7480666+04 LATS   -2.8247294+00 LONS    5.0404686+01  VRS   4.1046020+03  PTR   7.9048727+01  AZR   -8.4535727+01
  LTS   -1.5128475+00  LNS    1.1839823+02  LTE   2.4923633+00  LNE   7.8664365+00 DSMP   5.0312743+00 RSMP   1.1065748+02
  LIN    1.6653676+02  LAN    3.8510679+01  LAP   -1.1690757+02  DR    4.0298535+03  VT    7.7976799+02 SOLSV   2.2050665+01

GEOCENTRIC
    X    1.6937499+05    Y   -6.4553820+04    Z   -3.6782411+04   DX   -2.5283443+03  DY    1.5092001+03  DZ    8.4170594+02
    R    1.8495412+05  DEC   -1.1471071+01   RA   -2.0863323+01    V    3.0624628+03  PTH  -7.9330625+01  AZ    6.4045104+01

GEOGRAPHIC
   XG    7.0673709+04   YG   -1.6691408+05   ZG   -3.6782409+04  DXG   -7.4617128+04  DYG   -2.8444616+04  DZG   8.4172624+02
  ALT    1.8151065+05  LAT   -1.1472463+01  LON    2.9294846+02   VE   7.9859381+04  PTE   -2.1597199+00  AZE   -8.9822095+01

EARTH-MOON PLANE
  XMP    2.0833851+04  YMP    1.9326818+04  ZMP   -2.7116106+02 DXMP   3.1743930+03 DYMP   2.5038064+03 DZMP   1.4003759+00
  RMP    2.8419161+04 DEMP   -5.4669525-01 RAMP    4.2850976+01  VMP   4.0429962+03 PTMP   8.5378896+01 AZMP   -8.2972249+01
  XME   -1.8394137+05  YME    1.9326817+04  ZME   -2.7116137+02 DXME   2.9337970+03 DYME   -8.7835734+02 DZME   1.4003650+00
  DIA    6.8915130+00  LIA   -6.3763899+01  DOA    3.8404454-02  LOA   3.8114546+01  DRP   -5.4884830+00  LRP   1.6743128+02

PLANETARY COORDINATES
   XM    1.9509597+05   YM   -5.3961905+04   ZM   -3.0960775+04  DXM   1.2564285+03  DYM   2.7735330+03  DZM   1.4919181+03
   RM    2.0477523+05  DEM   -8.6961241+00  RAM   -1.5460995+01  LOM   2.9835079+02   VM   3.3907105+03 ARGM   -1.8500080+01
 XSUN    4.3541157+06 YSUN   -7.2776750+07 ZSUN   -3.1558824+07  RAS  -8.6576165+01  LOS   2.2723562+02  DES   -2.3406088+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4781529+05  ECC    9.8381223-01  INC    2.8215111+01  RAN   1.3599512+00  APF   1.4716550+02   RP   2.3928002+03
   VH   -1.9426964+03 RNMP   1.5857298+02 APMP   7.4697237+00 INMP   3.1574415-01  APO   2.9323778+05  TFP   1.3532103+02
   TA   -1.7204072+02   EA   -1.0479645+02   MA   -5.0297374+01  SLR   4.7468645+03  PER   3.9595651+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.9870459+03 ECCS    1.5853740+00 INCS    1.4484133+02 RANS  -1.7490391+02 APFS  -1.4517295+02  RPS   1.1631649+03
  VHS    3.7868813+03 RNMPS   3.8425151+01 APMPS  -1.2879370+02 INMPS   1.7295112+02 APOS  -5.1372566+03 TFPS   6.9140258+01
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  TAS    1.2433431+02  EAS    1.6945972+02  MAS    7.0257456+02 SLRS    3.0072162+03 PERS    5.5645440+00 MTAS    1.2910665+02

SELENOCENTRIC UNIT VECTORS
   WX   -5.1149990-02   WY    5.7356644-01   WZ   -8.1756054-01  PX    8.5910869-01  PY   -3.9214829-01  PZ   -3.2886429-01
   QX   -5.0923048-01   QY   -7.1919475-01   QZ   -4.7269753-01  SXO  -9.3704569-01  SYO  -3.1072198-01  SZO  -1.5936415-01

****** CSM   / EARTH REF.  /PHASE  21-  5
                    MEAN-OF-EPOCH  1969       25  DEC. 1968,  1 HRS.,  50 MINS.,  59.695 SECS. G.M.T.

T        .8499999999999999+002  HRS. FROM LAUNCH      3 DAYS,  12 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .1213935471667648+003

          PHASE ELAPSED TIME      .57030562+05 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .4695504418401192 3+002      -.1740226364894081 3+002      -.9931625549800789 4+001
       RDXYZ       -.4571851062404716 6+000       .2767289358912583 2+000       .1544587392365615 2+000

GEOCENTRIC
     X    1.6171005+05   Y   -5.9932240+04   Z   -3.4203858+04  DX   -2.6574821+03  DY    1.6085436+03  DZ    8.9782307+02
     R    1.7581785+05  DEC  -1.1217937+01   RA  -2.0335482+01   V    3.2335290+03  PTH  -7.8376856+01  AZ    6.3846517+01

GEOGRAPHIC
    XG   -1.3539567+05   YG   -1.0681772+05  ZG   -3.4203856+04  DXG  -4.4571112+04  DYG   6.1421297+04  DZG   8.9776841+02
   ALT    1.7237435+05  LAT   -1.1219371+01  LON   2.1827096+02  VE    7.5894441+04  PTE  -2.3917641+00  AZE  -8.9783180+01

EARTH-MOON PLANE
   XMP   -1.7401342+05  YMP    2.5123183+04  ZMP  -2.6487422+02 DXMP   3.0416301+03 DYMP  -1.0973560+03 DZMP   2.3823854+00
   RMP    1.7581785+05 DEMP   -8.6317636-02 RAMP   1.7178468+02  VMP   3.2335289+03 PTMP  -7.8376860+01 AZMP   9.0210173+01
   XME   -1.7401342+05  YME    2.5123183+04  ZME  -2.6487422+02 DXME   3.0416301+03 DYME  -1.0973560+03 DZME   2.3823854+00

PLANETARY COORDINATES
    XM    1.9858236+05   YM   -4.5685310+04   ZM  -2.6506235+04  DXM   1.0971203+03  DYM   2.8130264+03  DZM   1.5148155+03
    RM    2.0548645+05  DEM   -7.4113832+00  RAM   -1.2955878+01  LOM   2.2565057+02  VM    3.3780847+03 ARGM  -1.5706001+01
  XSUN    4.6479509+06 YSUN   -7.2760657+07 ZSUN   -3.1551836+07  RAS  -8.6344910+01  LOS   1.5226154+02  DES  -2.3400867+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.4572547+05  ECC    9.8037714-01  INC    2.8301257+01  RAN   1.2766033+00  APF   1.4658337+02  RP    2.8595509+03
    VH   -1.9000284+03 RNMP   -3.0548169+01 APMP   1.3140683+01 INMP   2.2717430-01  APO   2.8859139+05  TFP   1.3586917+02
    TA   -1.7080905+02  EA   -1.0215949+02  MA   -4.7248223+01  SLR   5.6629886+03  PER   3.8758920+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -1.9633771+03 ECCS    1.7759586+00 INCS    1.4580015+02 RANS  -1.7552531+02 APFS  -1.4014199+02  RPS   1.5234994+03
   VHS    3.8096385+03 RNMPS  -1.4497250+02 APMPS  -1.2385201+02 INMPS   1.7397179+02 APOS  -5.4502538+03 TFPS   6.9123324+01
   TAS    1.2026127+02  EAS    1.8252597+02  MAS    1.0457762+03 SLRS    4.2291719+03 PERS    5.4654177+00 MTAS    1.2426880+02

GEOCENTRIC    UNIT VECTORS
    WX    1.0562683-02   WY   -4.7398987-01   WZ    8.8046695-01  PX   -8.4528387-01  PY    4.6617693-01  PZ    2.6110192-01
    QX   -5.3421304-01   QY   -7.4700245-01   QZ   -3.9573192-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000

****** CSM   / EARTH REF.  /PHASE  21-  6
                    MEAN-OF-EPOCH  1969       25  DEC. 1968,  6 HRS.,  50 MINS.,  59.695 SECS. G.M.T.

T        .8999999999999999+002  HRS. FROM LAUNCH      3 DAYS,  17 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .1965988820586048+003

          PHASE ELAPSED TIME      .75030563+05 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .4459396923097000 8+002      -.1597870323873801 9+002      -.9136693724793870 7+001
       RDXYZ       -.4885127585873639 0+000       .2926644339940046 0+000       .1635038506627617 7+000

GEOCENTRIC
     X    1.5357866+05   Y   -5.5029592+04   Z   -3.1466166+04  DX   -2.8395805+03  DY    1.7011719+03  DZ    9.5039964+02
     R    1.6614687+05  DEC  -1.0917050+01   RA  -1.9713379+01   V    3.4439022+03  PTH  -7.7966062+01  AZ    6.3688880+01

GEOGRAPHIC
    XG   -1.3145847+05   YG    9.6609168+04  ZG   -3.1466164+04  DXG   4.5040634+04  DYG   5.5804788+04  DZG   9.5023338+02
   ALT    1.6270334+05  LAT   -1.0918529+01  LON   1.4368773+02  VE    7.1719845+04  PTE  -2.6918110+00  AZE  -8.9745697+01

EARTH-MOON PLANE
   XMP   -1.6346502+05  YMP    2.9730522+04  ZMP  -2.5622930+02 DXMP   3.1853719+03 DYMP  -1.3091444+03 DZMP   3.0381230+00
   RMP    1.6614687+05 DEMP   -8.8360758-02 RAMP   1.6969189+02  VMP   3.4439022+03 PTMP  -7.7966062+01 AZMP   9.0171890+01
   XME   -1.6346502+05  YME    2.9730522+04  ZME  -2.5622930+02 DXME   3.1853719+03 DYME  -1.3091444+03 DZME   3.0381230+00

PLANETARY COORDINATES
    XM    2.0159527+05   YM   -3.7302074+04   ZM  -2.1989477+04  DXM   9.3683642+02  DYM   2.8455387+03  DZM   1.5339267+03
    RM    2.0619319+05  DEM   -6.1219516+00  RAM   -1.0483126+01  LOM   1.5291799+02  VM    3.3656625+03 ARGM  -1.2932005+01
  XSUN    4.9417175+06 YSUN   -7.2743582+07 ZSUN   -3.1544422+07  RAS  -8.6113673+01  LOS   7.7287444+01  DES  -2.3395307+01

GEOCENTRIC    OSCULATING ELEMENTS
   SMA    1.4455061+05  ECC    9.7852018-01  INC    2.8336187+01  RAN   1.2439430+00  APF   1.4627397+02  RP    3.1049203+03
    VH   -1.8369478+03 RNMP   -3.7489852+01 APMP   1.7000192+01 INMP   1.9319467-01  APO   2.8599630+05  TFP   1.3613516+02
    TA   -1.6979026+02  EA   -9.8782404+01  MA   -4.3374673+01  SLR   6.1431461+03  PER   3.8291144+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
  SMAS   -1.9231947+03 ECCS    2.1754677+00 INCS    1.4702181+02 RANS  -1.7631523+02 APFS  -1.3288553+02  RPS   2.2606532+03
   VHS    3.8492313+03 RNMPS  -1.4857863+02 APMPS  -1.1676650+02 INMPS   1.7526789+02 APOS  -6.1070427+03 TFPS   6.9142906+01
   TAS    1.1334581+02  EAS    1.8615287+02  MAS    1.4171103+03 SLRS    7.1786314+03 PERS    5.2984961+00 MTAS    1.1736590+02

GEOCENTRIC    UNIT VECTORS
    WX    1.0304144-02   WY   -4.7453237-01   WZ    8.8017774-01  PX   -8.4211516-01  PY    4.7052349-01  PZ    2.6353302-01
    QX   -5.3919926-01   QY   -7.4392650-01   QZ   -3.9476256-01  SXO   0.0000000     SYO   0.0000000     SZO   0.0000000

****** CSM   / EARTH REF.  /PHASE  21-  7
                    MEAN-OF-EPOCH  1969       25  DEC. 1968,  11 HRS.,  50 MINS.,  59.695 SECS. G.M.T.

T        .9499999999999999+002  HRS. FROM LAUNCH      3 DAYS,  22 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .2718042169504453+003

          PHASE ELAPSED TIME      .93030563+05 SECS.

RESTART COORDINATES ( ER AND ER/HR )

        RXYZ        .4205783078058432 1+002      -.1447506792519513 3+002      -.8296203621945994 6+001
       RDXYZ       -.5271552442939464 4+000       .3089119916432470 2+000       .1727686043044123 0+000

GEOCENTRIC
     X    1.4484437+05   Y   -4.9851172+04   Z   -2.8571574+04  DX   -3.0641978+03  DY    1.7956142+03  DZ    1.0042529+03
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   R    1.5582479+05  DEC   -1.0565359+01   RA   -1.8991955+01    V   3.6908078+03  PTH   -7.7756494+01   AZ   6.3533931+01

GEOGRAPHIC
  XG    5.4386780+04  YG    1.4320303+05   ZG   -2.8571571+04  DXG   6.1558820+04  DYG   -2.7103688+04  DZG   1.0042802+03
  ALT   1.5238125+05  LAT  -1.0566887+01   LON   6.9203828+01   VE   6.7268915+04  PTE   -3.0735979+00  AZE  -8.9702521+01

EARTH-MOON PLANE
  XMP  -1.5226460+05  YMP   3.3117925+04   ZMP  -2.4579068+02 DXMP   3.3581079+03 DYMP   -1.5313918+03 DZMP   3.6217095+00
  RMP   1.5582479+05 DEMP  -9.0375700-02  RAMP   1.6772914+02  VMP   3.6908077+03 PTMP   -7.7756497+01 AZMP   9.0151468+01
  XME  -1.5226460+05  YME   3.3117925+04   ZME  -2.4579068+02 DXME   3.3581079+03 DYME   -1.5313918+03 DZME   3.6217095+00

PLANETARY COORDINATES
  XM    2.0413239+05  YM   -2.8832778+04   ZM   -1.7421672+04  DXM   7.7596977+02  DYM    2.8711387+03  DZM   1.5492848+03
  RM    2.0689339+05 DEM   -4.8303704+00  RAM   -8.0395873+00  LOM   8.0156197+01  VM     3.3534832+03 ARGM  -1.0177638+01
 XSUN   5.2354121+06 YSUN  -7.2725524+07 ZSUN   -3.1536580+07  RAS  -8.5882456+01  LOS    2.3133270+00  DES  -2.3389404+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   1.4378174+05  ECC   9.7741656-01   INC   2.8355029+01  RAN   1.2269672+00  APF    1.4608768+02  RP   3.2470864+03
  VH   -1.7621436+03 RNMP  -4.3112924+01 APMP   1.9645210+01 INMP   1.7624618-01  APO    2.8431641+05  TFP  1.3627829+02
  TA   -1.6879778+02  EA   -9.4915962+01   MA  -3.9120123+01  SLR   6.4208414+03  PER    3.7986045+02  MTA  3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS  -1.8613822+03 ECCS   2.9156727+00 INCS   1.4817844+02 RANS  -1.7707712+02 APFS   -1.2487620+02  RPS  3.5657990+03
  VHS   3.9126217+03 RNMPS -1.5237372+02 APMPS -1.0915230+02 INMPS  1.7649308+02 APOS   -7.2885635+03 TFPS 6.9293908+01
  TAS   1.0554609+02  EAS   1.8253337+02  MAS   1.8342876+03 SLRS   1.3962502+04 PERS    5.0451152+00 MTAS 1.1005817+02

GEOCENTRIC    UNIT VECTORS
  WX    1.0169746-02  WY   -4.7482478-01   WZ   8.8002161-01   PX  -8.4021550-01   PY    4.7310171-01   PZ   2.6497667-01
  QX   -5.4215722-01  QY   -7.4210253-01   QZ  -3.9414381-01  SXO   0.0000000      SYO   0.0000000      SZO  0.0000000

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****** CSM   / EARTH REF.  /PHASE  21-  8
                  MEAN-OF-EPOCH  1969        25  DEC. 1968, 16 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .9999999999999999+002  HRS. FROM LAUNCH       4 DAYS,  3 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .3470095518422B5+003

          PHASE ELAPSED TIME     .11103056+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ        .39309531836867277+002      -.12887827012257954+002      -.74079373841843279+001
         RDXYZ      -.57357069200354099+000       .32620988629971223+000       .18267386149450034+000

GEOCENTRIC
    X    1.3537941+05   Y   -4.4384819+04   Z   -2.5512443+04   DX   -3.3339971+03  DY    1.8961617+03   DZ   1.0618292+03
    R    1.4473590+05  DEC   -1.0152510+01  RA   -1.8151988+01    V   3.9797547+03  PTH   -7.7613393+01   AZ   6.3370147+01

GEOGRAPHIC
   XG    1.4189192+05  YG   -1.2817147+04   ZG   -2.5512442+04  DXG   -9.3539004+03  DYG   -6.1770903+04  DZG   1.0617962+03
  ALT    1.4129233+05  LAT  -1.0154094+01   LON   3.5483845+02   VE   6.2484138+04  PTE   -3.5666625+00  AZE  -8.9648546+01

EARTH-MOON PLANE
  XMP   -1.4038607+05  YMP   3.5216168+04   ZMP  -2.3367210+02 DXMP   3.5625847+03 DYMP   -1.7738152+03 DZMP   4.2198258+00
  RMP    1.4473590+05 DEMP  -9.2502487-02  RAMP   1.6591780+02  VMP   3.9797547+03 PTMP   -7.7613395+01 AZMP   9.0137946+01
  XME   -1.4038607+05  YME   3.5216168+04   ZME  -2.3367210+02 DXME   3.5625847+03 DYME   -1.7738152+03 DZME   4.2198258+00

PLANETARY COORDINATES
   XM    2.0619256+05  YM   -2.0297787+04   ZM   -1.2813882+04  DXM   6.1489901+02  DYM    2.8899095+03  DZM   1.5609315+03
   RM    2.0758508+05 DEM   -3.5390230+00  RAM   -5.6221358+00  LOM   7.3683123+00  VM     3.3415841+03 ARGM  -7.4423839+00
 XSUN    5.5290303+06 YSUN  -7.2706482+07 ZSUN   -3.1528312+07  RAS  -8.5651258+01  LOS    2.8733919+02  DES  -2.3383162+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   1.4323302+05  ECC   9.7672505-01   INC   2.8366817+01  RAN   1.2167958+00  APF    1.4596795+02  RP   3.3337427+03
  VH   -1.6782300+03 RNMP  -4.7920609+01 APMP   2.1609907+01 INMP   1.6595373-01  APO    2.8313231+05  TFP  1.3635931+02
  TA   -1.6774543+02  EA   -9.0615515+01   MA  -3.4656520+01  SLR   6.5898891+03  PER    3.7768804+02  MTA  3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS  -1.7721716+03 ECCS   4.1800939+00 INCS   1.4909369+02 RANS  -1.7768936+02 APFS   -1.1748144+02  RPS  5.6356719+03
  VHS   4.0098928+03 RNMPS -1.5632556+02 APMPS -1.0244990+02 INMPS  1.7746088+02 APOS   -9.1800150+03 TFPS 6.9737411+01
  TAS   9.8463295+01  EAS   1.7420254+02  MAS   2.3245139+03 SLRS   2.9193311+04 PERS    4.6867996+00 MTAS 1.0384104+02

GEOCENTRIC    UNIT VECTORS
  WX    1.0089297-02  WY   -4.7500758-01   WZ   8.7992387-01   PX  -8.3899524-01   PY    4.7474580-01   PZ   2.6590109-01
  QX   -5.4404519-01  QY   -7.4093469-01   QZ  -3.9373925-01  SXO   0.0000000      SYO   0.0000000      SZO  0.0000000

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****** CSM   / EARTH REF.  /PHASE  21-  9
                  MEAN-OF-EPOCH  1969        25  DEC. 1968, 21 HRS., 50 MINS., 59.695 SECS. G.M.T.

T        .1049999999999999+003  HRS. FROM LAUNCH       4 DAYS,  8 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .6221488673412S6+002

          PHASE ELAPSED TIME     .12903056+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

         RXYZ        .36306218459844706+002      -.11210215454787613+002      -.64678111629616613+001
         RDXYZ      -.62958078231573328+000       .34516260276960934+000       .19357333810113284+000

GEOCENTRIC
    X    1.2503620+05   Y   -3.8607237+04   Z   -2.2274712+04   DX   -3.6595673+03  DY    2.0063283+03   DZ   1.1251847+03
    R    1.3274311+05  DEC   -9.6601140+00  RA   -1.7159037+01    V   4.3224791+03  PTH   -7.7464006+01   AZ   6.3190778+01

GEOGRAPHIC
   XG    2.4130573+04  YG   -1.2861681+05   ZG   -2.2274711+04  DXG   -5.6918124+04  DYG   -6.5188133+03  DZG   1.1251498+03
  ALT    1.2929950+05  LAT  -9.6617603+00   LON   2.8062607+02   VE   5.7301256+04  PTE   -4.2228618+00  AZE  -8.9575826+01

EARTH-MOON PLANE
  XMP   -1.2778822+05  YMP   3.5928494+04   ZMP  -2.1978364+02 DXMP   3.8079992+03 DYMP   -2.0452249+03 DZMP   4.8851454+00
  RMP    1.3274311+05 DEMP  -9.4865044-02  RAMP   1.6429632+02  VMP   4.3224791+03 PTMP   -7.7464006+01 AZMP   9.0128395+01
  XME   -1.2778822+05  YME   3.5928494+04   ZME  -2.1978364+02 DXME   3.8079992+03 DYME   -2.0452249+03 DZME   4.8851454+00

PLANETARY COORDINATES
   XM    2.0777573+05  YM   -1.1717182+04   ZM   -8.1770238+03  DXM   4.5398630+02  DYM    2.9019464+03  DZM   1.5689149+03
   RM    2.0826643+05 DEM   -2.2501437+00  RAM   -3.2276858+00  LOM   2.9455742+02  VM     3.3299986+03 ARGM  -4.7256827+00
 XSUN    5.8225683+06 YSUN  -7.2686457+07 ZSUN   -3.1519619+07  RAS  -8.5420084+01  LOS    2.1236502+02  DES  -2.3376583+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA   1.4281938+05  ECC   9.7627996-01   INC   2.8374774+01  RAN   1.2102743+00  APF    1.4588859+02  RP   3.3876815+03
  VH   -1.5855674+03 RNMP  -5.2181377+01 APMP   2.3056420+01 INMP   1.5949038-01  APO    2.8225108+05  TFP  1.3640601+02
  TA   -1.6656525+02  EA   -8.5855809+01   MA  -3.0065344+01  SLR   6.6950064+03  PER    3.7605310+02  MTA  3.5999999+02
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SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.6496256+03 ECCS    6.2450045+00 INCS    1.4975411+02 RANS   -1.7813130+02 APFS   -1.1116528+02 RPS    8.6522937+03
  VHS    4.1561665+03 RNMPS  -1.6038772+02 APMPS  -9.7097906+01 INMPS   1.7815728+02 APOS   -1.1951545+04 TFPS   7.0692310+01
  TAS    9.2650084+01  EAS    1.6357456+02  MAS    2.9342569+03 SLRS    6.2685913+04 PERS    4.2091639+00 MTAS   9.9214324+01

GEOCENTRIC    UNIT VECTORS
   WX    1.0037812-02   WY   -4.7513089-01   WZ    8.7985788-01   PX   -8.3818600-01   PY    4.7582993-01   PZ   2.6651469-01
   QX   -5.4529207-01   QY   -7.4015977-01   QZ   -3.9347177-01  SXO    0.0000000     SYO    0.0000000     SZO   0.0000000

****** CSM   / EARTH REF.  /PHASE  21- 10
                  MEAN-OF-EPOCH  1969       26  DEC. 1968,  2 HRS.,  50 MINS.,  59.695 SECS. G.M.T.

T        .1099999999999999+003  HRS. FROM LAUNCH      4 DAYS,  13 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .1374202216259651+003

          PHASE ELAPSED TIME     .14703056+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ       .3299211505734571l+002      -.9432322542488971S+001      -.5469873043931999Z+001
      RDXYZ      -.6986447633294834G+000       .3664497216137011S+000       .2058763120540461Y+000

GEOCENTRIC
    X    1.1362265+05    Y   -3.2484292+04    Z   -1.8837879+04   DX   -4.0610158+03   DY    2.1300641+03   DZ   1.1966982+03
    R    1.1966705+05  DEC   -9.0571233+00   RA   -1.5955034+01    V    4.7393152+03  PTH   -7.7252177+01   AZ   6.2989092+01

GEOGRAPHIC
   XG   -1.0564383+05   YG   -5.2959570+04   ZG   -1.8837878+04  DXG   -1.9033676+04  DYG    4.7987691+04  DZG   1.1966985+03
  ALT    1.1622340+05  LAT   -9.0588395+00  LON    2.0662474+02   VE    5.1638471+04  PTE   -5.1358075+00  AZE  -8.9471113+01

EARTH-MOON PLANE
  XMP   -1.1439510+05  YMP    3.5127232+04  ZMP   -2.0387159+02 DXMP    4.1118743+03 DYMP   -2.3566008+03 DZMP   5.6728210+00
  RMP    1.1966704+05 DEMP   -9.7612401-02 RAMP    1.6292988+02  VMP    4.7393152+03 PTMP   -7.7252179+01 AZMP   9.0120737+01
  XME   -1.1439510+05  YME    3.5127232+04  ZME   -2.0387159+02 DXME    4.1118743+03 DYME   -2.3566008+03 DZME   5.6728210+00

PLANETARY COORDINATES
   XM    2.0888286+05   YM   -3.1107661+03   ZM   -3.5218766+03  DXM    2.9357923+02  DYM    2.9073563+03  DZM   1.5732900+03
   RM    2.0893570+05  DEM   -9.6583887-01  RAM   -8.5320834-01  LOM    2.2172657+02   VM    3.3187574+03 ARGM  -2.0269411+00
 XSUN    6.1160206+06 YSUN   -7.2665453+07 ZSUN   -3.1510500+07  RAS   -8.5188933+01  LOS    1.3739084+02  DES  -2.3369662+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4249609+05  ECC    9.7599116-01  INC    2.8380306+01  RAN    1.2060213+00  APF    1.4583573+02   RP   3.4211658+03
   VH   -1.4831522+03 RNMP   -5.6042378+01 APMP    2.4160182+01 INMP    1.5513699-01  APO    2.8157101+05  TFP   1.3643274+02
   TA   -1.6517640+02   EA   -8.0552183+01   MA   -2.5390537+01  SLR    6.7601918+03  PER    3.7477694+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.4885088+03 ECCS    9.5821372+00 INCS    1.5021309+02 RANS   -1.7843292+02 APFS   -1.0576426+02 RPS    1.2774587+04
  VHS    4.3753210+03 RNMPS  -1.6449894+02 APMPS  -9.2847729+01 INMPS   1.7863932+02 APOS   -1.5751604+04 TFPS   7.2432026+01
  TAS    8.7964446+01  EAS    1.5234506+02  MAS    3.7486544+03 SLRS    1.3518243+05 PERS    3.6078200+00 MTAS   9.5990342+01

GEOCENTRIC    UNIT VECTORS
   WX    1.0004331-02   WY   -4.7521655-01   WZ    8.7981200-01   PX   -8.3764666-01   PY    4.7654898-01   PZ   2.6692528-01
   QX   -5.4612081-01   QY   -7.3964199-01   QZ   -3.9329600-01  SXO    0.0000000     SYO    0.0000000     SZO   0.0000000

****** CSM   / EARTH REF.  /PHASE  21- 11
                  MEAN-OF-EPOCH  1969       26  DEC. 1968,  7 HRS.,  50 MINS.,  59.695 SECS. G.M.T.

T        .1149999999999999+003  HRS. FROM LAUNCH      4 DAYS,  18 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .2126255565178061+003

          PHASE ELAPSED TIME     .16503056+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ       .2928778919500848S+002      -.7540344281403174G+001      -.4405789205577454B+001
      RDXYZ      -.7870836304750504+000       .3909739944249762J+000       .2201435766056233+000

GEOCENTRIC
    X    1.0086520+05    Y   -2.5968444+04    Z   -1.5173245+04   DX   -4.5750848+03   DY    2.2726164+03   DZ   1.2796296+03
    R    1.0525386+05  DEC   -8.2885560+00   RA   -1.4437650+01    V    5.2662736+03  PTH   -7.6913068+01   AZ   6.2756238+01

GEOGRAPHIC
   XG   -7.0949084+04   YG    7.6252052+04   ZG   -1.5173245+04  DXG    3.6413472+04  DYG    2.7055265+04  DZG   1.2796341+03
  ALT    1.0181017+05  LAT   -8.2903465+00  LON    1.3293679+02   VE    4.5382440+04  PTE   -6.4899300+00  AZE  -8.9306540+01

EARTH-MOON PLANE
  XMP   -1.0006465+05  YMP    3.2640594+04  ZMP   -1.8547058+02 DXMP    4.5068157+03 DYMP   -2.7243727+03 DZMP   6.6658740+00
  RMP    1.0525386+05 DEMP   -1.0096244-01 RAMP    1.6193392+02  VMP    5.2662737+03 PTMP   -7.6913071+01 AZMP   9.0113855+01
  XME   -1.0006465+05  YME    3.2640594+04  ZME   -1.8547058+02 DXME    4.5068157+03 DYME   -2.7243727+03 DZME   6.6658740+00

PLANETARY COORDINATES
   XM    2.0951596+05   YM    5.5020019+03   ZM    1.1409592+03  DXM    1.3400985+02  DYM    2.9062556+03  DZM   1.5741166+03
   RM    2.0959129+05  DEM    3.1190451-01  RAM    1.5042723+00  LOM    1.4887871+02   VM    3.3078881+03 ARGM   6.5447183-01
 XSUN    6.4093839+06 YSUN   -7.2643468+07 ZSUN   -3.1500955+07  RAS   -8.4957808+01  LOS    6.2416634+01  DES  -2.3362401+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4223747+05  ECC    9.7580533-01  INC    2.8384120+01  RAN    1.2033225+00  APF    1.4580122+02   RP   3.4413891+03
   VH   -1.3685730+03 RNMP   -5.9590625+01 APMP    2.5012842+01 INMP    1.5211196-01  APO    2.8103355+05  TFP   1.3644753+02
   TA   -1.6345406+02   EA   -7.4546272+01   MA   -2.0658100+01  SLR    6.7995115+03  PER    3.7375715+02  MTA   3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.2855853+03 ECCS    1.5092271+01 INCS    1.5052927+02 RANS   -1.7863309+02 APFS   -1.0096854+02 RPS    1.8116817+04
  VHS    4.7079863+03 RNMPS  -1.6858216+02 APMPS  -8.9279589+01 INMPS   1.7896967+02 APOS   -2.0687988+04 TFPS   7.5293950+01
  TAS    8.4101605+01  EAS    1.4155081+02  MAS    4.9361695+03 SLRS    2.9154073+05 PERS    2.8958036+00 MTAS   9.3799147+01

GEOCENTRIC    UNIT VECTORS
   WX    9.9831773-03   WY   -4.7527560-01   WZ    8.7978035-01   PX   -8.3729477-01   PY    4.7701599-01   PZ   2.6719501-01
   QX   -5.4666056-01   QY   -7.3930293-01   QZ   -3.9318364-01  SXO    0.0000000     SYO    0.0000000     SZO   0.0000000

****** CSM   / EARTH REF.  /PHASE  21- 12
                  MEAN-OF-EPOCH  1969       26  DEC. 1968, 12 HRS.,  50 MINS.,  59.695 SECS. G.M.T.

T        .1199999999999999+003  HRS. FROM LAUNCH      4 DAYS,  23 HRS.,  59 MINS.,  59.999 SECS. G.E.T.    RAGR  .2878308914096461+003

          PHASE ELAPSED TIME     .18303056+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ       .2506888105200422B+002      -.5515077863649747B+001      -.3263794726117294O+001
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      RDXYZ      -.90743489035911613+000      .42001742701491362+000      .23721054381803781+000

GEOCENTRIC
    X    8.6335561+04    Y   -1.8993561+04    Z   -1.1240292+04    DX   -5.2746512+03    DY    2.4414373+03    DZ    1.3788348+03
    R    8.9111887+04  DEC   -7.2464117+00   RA   -1.2407252+01    V    5.9735874+03   PTH   -7.6339737+01   AZ    6.2479167+01

GEOGRAPHIC
   XG    4.4517884+04   YG    7.6372390+04   ZG   -1.1240292+04   DXG    2.9899570+04   DYG   -2.3998556+04   DZG    1.3788356+03
  ALT    8.5668137+04  LAT   -7.2482669+00  LON    5.9761856+01    VE    3.8364256+04   PTE   -8.7024560+00   AZE   -8.9015343+01

EARTH-MOON PLANE
  XMP   -8.4523940+04  YMP    2.8224204+04  ZMP   -1.6376250+02  DXMP    5.0589432+03  DYMP   -3.1765986+03  DZMP    8.0215993+00
  RMP    8.9111888+04 DEMP   -1.0529353-01 RAMP    1.6153482+02   VMP    5.9735874+03  PTMP   -7.6339740+01  AZMP    9.0107445+01
  XME   -8.4523940+04  YME    2.8224204+04  ZME   -1.6376250+02  DXME    5.0589432+03  DYME   -3.1765986+03  DZME    8.0215993+00

PLANETARY COORDINATES
   XM    2.0967799+05   YM    1.4102024+04   ZM    5.8010707+03   DXM   -2.4404614+01   DYM    2.8987692+03   DZM    1.5714597+03
   RM    2.1023172+05  DEM    1.5812032+00  RAM    3.8476689+00   LOM    7.6016777+01   VM     3.2974147+03  ARGM    3.3192167+00
 XSUN    6.7026549+06 YSUN   -7.2620501+07 ZSUN   -3.1490985+07   RAS   -8.4726709+01   LOS    3.4744240+02   DES   -2.3354800+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4202807+05   ECC    9.7568873-01   INC    2.8386627+01   RAN    1.2017435+00   APF    1.4577989+02    RP    3.4528835+03
   VH   -1.2371901+03 RNMP   -6.2884442+01 APMP    2.5605448+01  INMP    1.5033282-01   APO    2.8060327+05   TFP    1.3645516+02
   TA   -1.6116569+02    EA   -6.7551116+01    MA   -1.5884555+01   SLR    6.8218200+03   PER    3.7293210+02   MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.0411476+03 ECCS    2.4714497+01 INCS    1.5074709+02 RANS   -1.7876335+02 APFS   -9.6559668+01  RPS    2.4690292+04
  VHS    5.2315392+03 RNMPS  -1.7254128+02 APMPS  -8.6051270+01 INMPS    1.7919583+02 APOS   -2.6772587+04 TFPS    7.9702151+01
  TAS    8.0855135+01  EAS    1.3189906+02  MAS    6.8738199+03  SLRS    6.3489842+05 PERS    2.1105041+00 MTAS    9.2318938+01

GEOCENTRIC    UNIT VECTORS
   WX    9.9708861-03   WY   -4.7531434-01   WZ    8.7975955-01   PX   -8.3707771-01   PY    4.7730270-01   PZ    2.6736308-01
   QX   -5.4699311-01   QY   -7.3909295-01   QZ   -3.9311591-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE  21- 13
                MEAN-OF-EPOCH  1969       26  DEC. 1968, 17 HRS., 50 MINS., 59.695 SECS. G.M.T.

T       .1249999999999999+003  HRS. FROM LAUNCH      5 DAYS,  4 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .303622630148685+001

        PHASE ELAPSED TIME     .20103056+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ      .20113833973881476+002      -.3329875433917742 7+001      -.2026998564959872 1+001
      RDXYZ      -.10891442907387231+001      .45520780925305853+000      .25829058146872200+000

GEOCENTRIC
    X    6.9270707+04    Y   -1.1467870+04    Z   -6.9808483+03    DX   -6.3308743+03    DY    2.6459886+03    DZ    1.5013669+03
    R    7.0559728+04  DEC   -5.6778640+00   RA   -9.4001436+00    V    7.0239112+03   PTH   -7.5293539+01   AZ    6.2139094+01

GEOGRAPHIC
   XG    6.8566044+04   YG   -1.5120857+04   ZG   -6.9808481+03   DXG   -1.2881545+04   DYG   -2.7402455+04   DZG    1.5013573+03
  ALT    6.7115907+04  LAT   -5.6797074+00  LON    3.4756362+02    VE    3.0316380+04   PTE   -1.2949821+01   AZE   -8.8384219+01

EARTH-MOON PLANE
  XMP   -6.7204668+04  YMP    2.1498582+04  ZMP   -1.3718649+02  DXMP    5.9274695+03  DYMP   -3.7683329+03  DZMP    1.0112500+01
  RMP    7.0559728+04 DEMP   -1.1139800-01 RAMP    1.6226067+02   VMP    7.0239113+03  PTMP   -7.5293539+01  AZMP    9.0099404+01
  XME   -6.7204668+04  YME    2.1498582+04  ZME   -1.3718649+02  DXME    5.9274695+03  DYME   -3.7683329+03  DZME    1.0112500+01

PLANETARY COORDINATES
   XM    2.0937280+05   YM    2.2670566+04   ZM    1.0448233+04   DXM   -1.8136101+02   DYM    2.8850296+03   DZM    1.5653884+03
   RM    2.1085562+05  DEM    2.8402606+00  RAM    6.1798228+00   LOM    3.1435965+00   VM     3.2873589+03  ARGM    5.9679715+00
 XSUN    6.9958295+06 YSUN   -7.2596554+07 ZSUN   -3.1480590+07   RAS   -8.4495638+01   LOS    2.7246813+02   DES   -2.3346861+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4185879+05   ECC    9.7561880-01   INC    2.8388105+01   RAN    1.2009679+00   APF    1.4576814+02    RP    3.4586881+03
   VH   -1.0795669+03 RNMP   -6.5969856+01 APMP    2.6041926+01  INMP    1.4918958-01   APO    2.8025888+05   TFP    1.3645862+02
   TA   -1.5777866+02    EA   -5.8991432+01    MA   -1.1081080+01   SLR    6.8330453+03   PER    3.7226552+02   MTA    3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -7.6016731+02 ECCS    4.3401954+01 INCS    1.5089430+02 RANS   -1.7884464+02 APFS   -9.2511499+01  RPS    3.2232579+04
  VHS    6.1225317+03 RNMPS  -1.7624646+02 APMPS  -8.2988833+01 INMPS    1.7934769+02 APOS   -3.3752914+04 TFPS    8.6244131+01
  TAS    7.8230072+01  EAS    1.2419005+02  MAS    1.0596402+04  SLRS    1.4311894+06 PERS    1.3166839+00 MTAS    9.1320234+01

GEOCENTRIC    UNIT VECTORS
   WX    9.9649273-03   WY   -4.7533717-01   WZ    8.7974729-01   PX   -8.3695891-01   PY    4.7745870-01   PZ    2.6745647-01
   QX   -5.4717500-01   QY   -7.3897751-01   QZ   -3.9307984-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000

****** CSM   / EARTH REF.  /PHASE  21- 14
                MEAN-OF-EPOCH  1969       26  DEC. 1968, 22 HRS., 50 MINS., 59.695 SECS. G.M.T.

T       .1299999999999999+003  HRS. FROM LAUNCH      5 DAYS,  9 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .782415611933271+002

        PHASE ELAPSED TIME     .21903056+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ      .13930349327116199+002      -.9539596105171760 5+000      -.6732110398206226 2+000
      RDXYZ      -.14280654987167194+001      .49484096151789250+000      .28354855288027255+000

GEOCENTRIC
    X    4.7975197+04    Y   -3.2853734+03    Z   -2.3184940+03    DX   -8.3009233+03    DY    2.8763644+03    DZ    1.6481841+03
    R    4.8143417+04  DEC   -2.7603219+00   RA   -3.9175369+00    V    8.9384176+03   PTH   -7.2994029+01   AZ    6.1734603+01

GEOGRAPHIC
   XG    6.5602399+03   YG   -4.7637971+04   ZG   -2.3184940+03   DXG   -1.9982910+04   DYG    5.8062012+03   DZG    1.6481853+03
  ALT    4.4699510+04  LAT   -2.7616421+00  LON    2.7784090+02    VE    2.0874511+04   PTE   -2.4171910+01   AZE   -8.6273415+01

EARTH-MOON PLANE
  XMP   -4.6677286+04  YMP    1.1790216+04  ZMP   -1.0208508+02  DXMP    7.6470643+03  DYMP   -4.6279065+03  DZMP    1.4202326+01
  RMP    4.8143417+04 DEMP   -1.2149218-01 RAMP    1.6582417+02   VMP    8.9384177+03  PTMP   -7.2994029+01  AZMP    9.0085946+01
  XME   -4.6677286+04  YME    1.1790216+04  ZME   -1.0208508+02  DXME    7.6470643+03  DYME   -4.6279065+03  DZME    1.4202326+01

PLANETARY COORDINATES
   XM    2.0860518+05   YM    3.1189317+04   ZM    1.5072443+04   DXM   -3.3657057+02   DYM    2.8651755+03   DZM    1.5559755+03
   RM    2.1146175+05  DEM    4.0873600+00  RAM    8.5035099+00   LOM    2.9026195+02   VM     3.2777385+03  ARGM    8.6014386+00
 XSUN    7.2889043+06 YSUN   -7.2571628+07 ZSUN   -3.1469771+07   RAS   -8.4264594+01   LOS    1.9749384+02   DES   -2.3338584+01
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GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4172620+05  ECC     9.7557992-01  INC     2.8388791+01  RAN     1.2007190+00  APF     1.4576323+02  RP      3.4609655+03
   VH   -8.7186360+02 RNMP   -6.8893682+01 APMP    2.6318648+01 INMP    1.4869694-01  APO     2.7999144+05  TFP     1.3645941+02
   TA   -1.5157664+02   EA   -4.7403169+01   MA   -6.2557431+00  SLR     6.8374129+03  PER     3.7174376+02  MTA     3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -4.5162633+02 ECCS    8.8109308+01 INCS    1.5097526+02 RANS   -1.7888490+02 APFS   -8.9264002+01  RPS     3.9340857+04
  VHS    7.9432094+03 RNMPS  -1.7947142+02 APMPS  -8.0297502+01 INMPS   1.7943049+02 APOS   -4.0244110+04  TFPS    9.6032933+01
  TAS    7.6733206+01  EAS    1.2058716+02  MAS    2.0280278+04 SLRS    3.5056365+06 PERS    6.0295739-01  MTAS    9.0650293+01

GEOCENTRIC    UNIT VECTORS
   WX    9.9630832-03   WY   -4.7534771-01   WZ    8.7974160-01   PX   -8.3690999-01   PY    4.7752231-01   PZ    2.6749597-01
   QX   -5.4724984-01   QY   -7.3892961-01   QZ   -3.9306565-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000
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****** CSM   / EARTH REF.  /PHASE  21- 15
                  MEAN-OF-EPOCH  1969       27  DEC. 1968, 3 HRS., 50 MINS., 59.695 SECS. G.M.T.

T       .134999999999999+003  HRS. FROM LAUNCH      5 DAYS, 14 HRS., 59 MINS., 59.999 SECS. G.E.T.    RAGR  .1534468960851 67+003

        PHASE ELAPSED TIME     .23703056+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ      .458110772296990 64+001      .144890993641210 78+001      .731004826574652 12+000
      RDXYZ     -.274750426954048 20+001      .338436114388844 47+000      .213975279032164 67+000

GEOCENTRIC
     X    1.5777030+04    Y    4.9899495+03    Z    2.5175320+03   DX   -1.5970432+04   DY    1.9672292+03   DZ    1.2437751+03
     R    1.6737749+04  DEC    8.6507120+00   RA    1.7551088+01   V    1.6139134+04  PTH   -6.2229140+01   AZ    6.2856498+01

GEOGRAPHIC
    XG   -1.1882233+04   YG   -1.1516372+04   ZG    2.5175319+03  DXG   1.0062638+04  DYG    1.0644236+04  DZG    1.2437752+03
   ALT    1.3294077+04   LAT    8.6624622+00   LON   2.2410419+02   VE   1.4700457+04  PTE   -7.6255262+01  AZE   -1.0560194+01

EARTH-MOON PLANE
   XMP   -1.6595972+04   YMP   -2.1735048+03   ZMP  -4.2651665+01 DXMP   1.5135746+04 DYMP   -5.6017645+03 DZMP    3.2680117+01
   RMP    1.6737749+04  DEMP   -1.4600308-01  RAMP  -1.7253868+02  VMP   1.6139134+04 PTMP   -6.2229140+01 AZMP    9.0027976+01
   XME   -1.6595972+04   YME   -2.1735048+03   ZME  -4.2651665+01 DXME   1.5135746+04 DYME   -5.6017645+03 DZME    3.2680117+01

PLANETARY COORDINATES
    XM    2.0738068+05    YM    3.9640374+04    ZM    1.9663911+04  DXM   -4.8975772+02  DYM    2.8393516+03  DZM    1.5432967+03
    RM    2.1204899+05   DEM    5.3208468+00   RAM    1.0821428+01  LOM    2.1737453+02   VM    3.2685692+03 ARGM    1.1220332+01
  XSUN    7.5818751+06  YSUN   -7.2545722+07  ZSUN   -3.1458526+07  RAS   -8.4033580+01  LOS    1.2251952+02  DES   -2.3329967+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4167917+05  ECC     9.7556905-01  INC     2.8388592+01  RAN     1.2005461+00  APF     1.4576253+02  RP      3.4613581+03
   VH   -4.9887607+02 RNMP   -7.1583664+01 APMP    2.6377953+01 INMP    1.4853235-01  APO     2.7989697+05  TFP     1.3645998+02
   TA   -1.2731994+02   EA   -2.5318319+01   MA   -1.4145724+00  SLR     6.8381484+03  PER     3.7155872+02  MTA     3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.1862608+02 ECCS    2.3056649+02 INCS    1.5059967+02 RANS   -1.7874020+02 APFS   -9.2500824+01  RPS     2.7232574+04
  VHS    1.5498710+04 RNMPS  1.7861050+02 APMPS  -8.2959785+01 INMPS   1.7904796+02 APOS   -2.7469826+04  TFPS    1.1394452+02
  TAS    8.2207315+01  EAS    1.5214608+02  MAS    9.3385514+04 SLRS    6.3061514+06 PERS    8.1168593-02  MTAS    9.0248498+01

GEOCENTRIC    UNIT VECTORS
   WX    9.9615846-03   WY   -4.7534470-01   WZ    8.7974326-01   PX   -8.3690186-01   PY    4.7753481-01   PZ    2.6749907-01
   QX   -5.4726229-01   QY   -7.3892347-01   QZ   -3.9305985-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000
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****** CSM   / EARTH REF.  /PHASE  21- 16
                  MEAN-OF-EPOCH  1969       27  DEC. 1968, 5 HRS., 16 MINS., 17.860 SECS. G.M.T.

T       .136421712438762+003  HRS. FROM LAUNCH      5 DAYS, 16 HRS., 25 MINS., 18.165 SECS. G.E.T.    RAGR  .1748309681005 80+003

        PHASE ELAPSED TIME     .24214873+06 SECS.

RESTART COORDINATES ( ER AND ER/HR )

       RXYZ     -.698830388187143 16+000      .648986728959052 42+000      .358052868963731 33+000
      RDXYZ     -.399439547943853 09+001     -.420560171857307 34+001     -.223033540798906 76+001

GEOCENTRIC
     X   -2.4067254+03    Y    2.2350671+03    Z    1.2331103+03   DX   -2.3218242+04   DY   -2.4445921+04   DZ   -1.2964281+04
     R    3.5083347+03  DEC    2.0577877+01   RA    1.3711789+02   V    3.6121495+04  PTH   -6.6815550+00   AZ    1.0999932+02

GEOGRAPHIC
    XG    2.5983046+03   YG   -2.0091452+03   ZG    1.2331101+03  DXG   2.0031172+04  DYG    2.5287087+04  DZG   -1.2964242+04
   ALT    6.5833615+01   LAT    2.0702422+01   LON   3.2228692+02   VE   3.4767187+04  PTE   -6.9873469+00  AZE    1.1081142+02

EARTH-MOON PLANE
   XMP    1.7825828+03   YMP   -3.0217233+03   ZMP   4.5365650-01 DXMP   2.8764589+04 DYMP    2.1848471+04 DZMP    7.2002712+01
   RMP    3.5083348+03  DEMP    7.4088147-03  RAMP  -5.9462684+01  VMP   3.6121495+04 PTMP   -6.6815571+00 AZMP    8.9884014+01
   XME    1.7825828+03   YME   -3.0217233+03   ZME   4.5365650-01 DXME   2.8764589+04 DYME    2.1848471+04 DZME    7.2002712+01

PLANETARY COORDINATES
    XM    2.0694993+05    YM    4.2028634+04    ZM    2.0962184+04  DXM   -5.3291041+02  DYM    2.8309390+03  DZM    1.5391061+03
    RM    2.1221238+05   DEM    5.6688797+00   RAM    1.1479844+01  LOM    1.9664887+02   VM    3.2660460+03 ARGM    1.1962453+01
  XSUN    7.6651619+06  YSUN   -7.2538176+07  ZSUN   -3.1455251+07  RAS   -8.3967897+01  LOS    1.0120113+02  DES   -2.3327455+01

GEOCENTRIC    OSCULATING ELEMENTS
  SMA    1.4551044+05  ECC     9.7621983-01  INC     2.8389028+01  RAN     1.1188024+00  APF     1.4585916+02  RP      3.4602626+03
   VH   -2.1971582+02 RNMP   -6.3121565+01 APMP    1.7189046+01 INMP    1.1598427-01  APO     2.8756063+05  TFP     1.3645997+02
   TA   -1.3526639+01   EA   -1.4906610+00   MA   -3.5612311-02  SLR     6.8382379+03  PER     3.8673164+02  MTA     3.5999999+02

SELENOCENTRIC OSCULATING ELEMENTS
 SMAS   -1.9401187+01 ECCS    7.3442440+03 INCS    2.8303203+01 RANS    8.6295740-01 APFS    1.4294270+02  RPS     1.4246766+05
  VHS    3.8324057+04 RNMPS  1.7914793+02 APMPS  -4.8225380+01 INMPS   1.6132016-01 APOS   -1.4250646+05  TFPS    1.2938863+02
  TAS    4.8268516+01  EAS    5.5252407+01  MAS    4.7161514+05 SLRS    1.0464897+09 PERS    5.3685898-03  MTAS    9.0007800+01

GEOCENTRIC    UNIT VECTORS
   WX    9.2835338-03   WY   -4.7536515-01   WZ    8.7973962-01   PX   -8.3714315-01   PY    4.7748083-01   PZ    2.6683963-01
   QX   -5.4690506-01   QY   -7.3894520-01   QZ   -3.9351597-01  SXO    0.0000000     SYO    0.0000000     SZO    0.0000000
EARTH ENTRY RANGE AND TOUCHDOWN
  ENTRG    1.4600000+03  ENTDT    1.4233299-01  LATTD    1.0910157+01  LONTD    3.4332549+02  AZTD    1.1638527+02

ENTRY  TERMINATION
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MISSION RADAR TIMELINE

MISSION SHADOW TIMELINE

MISSION RADAR TIMELINE

TABLE XII.- MISSION RADAR TIMELINE

(a) 0° minimum elevation.

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELv DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELv DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	20 BERMUDA SB	0	0	11	19.7	0	0	12	39.8	0	1	20.1	6.6	85.16	541.00	.00
RDR	6 BERMUDA CB	0	0	11	19.7	0	0	12	39.9	0	1	20.1	6.6	85.13	540.80	.00
RDR	32 INSERTION SHIP	0	0	11	19.7	0	0	15	31.5	0	4	11.8	6.2	-30.25	555.19	.00
RDR	22 GRAND CANARY SB	0	0	16	27.0	0	0	23	33.9	0	7	6.9	.0	-72.63	848.37	.00
RDR	8 GRAND CANARY CB	0	0	16	27.0	0	0	23	33.9	0	7	6.9	.0	-72.63	848.38	.00
RDR	17 KANO NIGERIA TLM	0	0	23	39.0	0	0	30	24.8	0	6	45.8	.0	-43.77	838.49	.00
RDR	16 TANANARIVE TLM	0	0	36	59.0	0	0	42	31.2	0	5	32.2	.0	-19.43	829.20	.01
RDR	11 CARNARVON CB	0	0	52	10.2	0	0	58	.5	0	5	50.3	.0	-120.81	834.08	.01
RDR	24 CARNARVON SB	0	0	52	10.2	0	0	58	.7	0	5	50.5	.0	-120.76	834.09	.01
RDR	30 CANBERRA DS	0	0	59	28.2	0	1	5	31.4	0	6	3.2	.0	-78.01	832.47	.01
RDR	27 GUAYMAS SB	0	1	28	12.4	0	1	35	16.5	0	7	4.1	-.0	-118.20	840.40	.00
RDR	13 PT ARGUELLO CB	0	1	28	19.1	0	1	32	33.8	0	4	14.7	-.0	-169.43	837.91	.00
RDR	31 GOLDSTONE DS	0	1	28	54.9	0	1	33	33.4	0	4	38.5	-.0	-163.58	838.34	.00
RDR	14 WHITE SANDS CB	0	1	29	40.7	0	1	36	24.4	0	6	43.6	.0	-127.84	839.28	.00
RDR	28 CORPUS TEX SB	0	1	31	5.5	0	1	38	8.6	0	7	3.1	.0	-95.16	844.27	.00
RDR	15 EGLIN AFB CB	0	1	33	32.5	0	1	40	40.1	0	7	7.6	.0	-92.77	847.01	.00
RDR	18 MERRITT ISLAND SB	0	1	34	58.5	0	1	41	51.8	0	6	53.3	.0	-78.85	848.21	.00

TABLE XII.- MISSION RADAR TIMELINE - Continued

(a) 0° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

			SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
			DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	1	MERRITT ISLAND CB	0	1	34	59.1	0	1	41	51.7	0	6	52.6	.0	-78.47	848.21	.00
RDR	3	CAPE KENNEDY CB	0	1	35	.2	0	1	41	53.2	0	6	53.0	.0	-78.63	848.22	.00
RDR	2	PATRICK AFB CB	0	1	35	.7	0	1	41	51.4	0	6	50.7	.0	-77.57	848.21	.00
RDR	4	GRAND BAHAMA CB	0	1	35	41.6	0	1	42	11.9	0	6	30.3	.0	-68.62	848.52	.00
RDR	19	GRAND BAHAMA SB	0	1	35	42.0	0	1	42	12.2	0	6	30.2	.0	-68.58	848.54	.00
RDR	20	BERMUDA SB	0	1	38	24.8	0	1	45	34.5	0	7	9.7	.0	-85.19	849.76	.00
RDR	6	BERMUDA CB	0	1	38	24.9	0	1	45	34.6	0	7	9.7	.0	-85.17	849.77	.00
RDR	5	GRAND TURK CB	0	1	38	30.7	0	1	42	46.3	0	4	15.6	-.0	-35.62	848.51	.00
RDR	32	INSERTION SHIP	0	1	42	28.4	0	1	49	10.0	0	6	41.6	.0	-55.58	849.25	.00
RDR	8	GRAND CANARY CB	0	1	50	.0	0	1	56	19.6	0	5	19.6	.0	-100.64	842.88	.00
RDR	22	GRAND CANARY SB	0	1	50	.1	0	1	56	19.6	0	5	19.5	.0	-100.65	842.87	.00
RDR	17	KANO NIGERIA TLM	0	1	57	.8	0	2	2	36.5	0	5	35.7	.0	-91.55	833.37	.00
RDR	10	PRETORIA CB	0	2	7	56.8	0	2	10	59.8	0	3	3.0	-.0	7.12	823.76	-.00
RDR	16	TANANARIVE TLM	0	2	9	4.6	0	2	15	55.6	0	6	51.0	.0	-74.16	826.62	.00
RDR	24	CARNARVON SB	0	2	25	17.8	0	2	31	34.4	0	6	16.6	.0	-127.23	834.30	.00
RDR	11	CARNARVON CB	0	2	25	17.8	0	2	31	34.2	0	6	16.4	.0	-127.28	834.29	.00
						TLI IGNITION				0 day 2 hr 50 min 31.199 sec							
						TLI CUTOFF				0 day 2 hr 55 min 42.661 sec							
RDR	12	HAWAII CB	0	2	55	42.7	0	2	57	23.7	0	1	41.1	4.1	91.14	887.14	.01

TABLE XII.- MISSION RADAR TIMELINE - Continued

(a) 0° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV	ACQ AZI	ACQ RANGE	TERM ELV
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC	DEG	DEG	N MI	DEG
RDR	26 HAWAII SB	0	2	55	42.7	0	2	57	23.8	0	1	41.1	4.1	91.16	887.12	.01
RDR	13 PT ARGUELLO CB	0	2	56	39.7	0	5	20	57.3	2	24	17.6	.0	-119.73	1263.46	14.50
RDR	31 GOLDSTONE DS	0	2	57	3.8	0	16	25	6.4	13	28	2.5	.0	-117.27	1336.29	.00
RDR	27 GUAYMAS SB	0	2	57	28.0	0	16	3	54.1	13	6	26.1	.0	-93.24	1414.75	.00
RDR	14 WHITE SANDS CB	0	2	58	1.3	0	5	26	54.1	2	28	52.8	.0	-100.17	1522.62	-.00
RDR	28 CORPUS TEX SB	0	2	59	1.4	0	15	8	36.8	12	9	35.4	.0	-84.77	1730.35	-.00
RDR	18 MERRITT ISLAND SB	0	3	1	3.8	0	13	58	30.4	10	57	26.6	.0	-80.22	2170.75	-.00
RDR	1 MERRITT ISLAND CB	0	3	1	4.2	0	5	35	38.6	2	34	34.4	.0	-80.08	2172.03	-.00
RDR	2 PATRICK AFB CB	0	3	1	5.0	0	5	35	41.8	2	34	36.8	.0	-79.76	2174.99	-.00
RDR	4 GRAND BAHAMA CB	0	3	1	26.2	0	5	36	30.6	2	35	4.4	.0	-76.74	2252.36	-.00
RDR	19 GRAND BAHAMA SB	0	3	1	26.4	0	13	49	2.7	10	47	36.3	.0	-76.72	2253.25	-.00
RDR	5 GRAND TURK CB	0	3	2	39.6	0	5	38	40.8	2	36	1.1	.0	-68.36	2523.31	-.00
RDR	20 BERMUDA SB	0	3	3	7.0	0	12	49	20.1	9	46	13.1	.0	-81.48	2625.63	-.00
RDR	6 BERMUDA CB	0	3	3	7.0	0	5	37	8.2	2	34	1.2	.0	-81.48	2625.79	-.00
RDR	7 ANTIGUA ISLAND CB	0	3	4	22.0	0	5	40	13.9	2	35	51.9	.0	-62.90	2902.20	-.00
RDR	21 ANTIGUA ISLAND SB	0	3	4	23.1	0	12	42	49.8	9	38	26.7	.0	-62.76	2905.95	-.00
RDR	32 INSERTION SHIP	0	3	5	53.4	0	5	38	56.1	2	33	2.6	.0	-71.16	3242.04	-.00

TABLE XII.- MISSION RADAR TIMELINE - Continued

(a) 0° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV	ACQ AZI	ACQ RANGE	TERM ELV
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC	DEG	DEG	N MI	DEG
RDR	22 GRAND CANARY SB	0	3	13	7.8	0	9	19	29.2	6	6	21.4	-.0	-73.02	4812.66	-.00
RDR	29 MADRID DS	0	3	15	41.7	0	8	24	29.0	5	8	47.3	-.0	-79.70	5349.64	-.00
RDR	9 ASCENSION CB	0	3	20	6.5	0	5	32	10.9	2	12	4.3	-.0	-54.59	6240.65	-.00
RDR	23 ASCENSION SB	0	3	20	8.1	0	9	17	6.4	5	56	58.3	-.0	-54.63	6245.76	-.00
RDR	26 HAWAII SB	0	7	18	21.2	0	19	28	55.8	12	10	34.6	.0	89.97	36716.60	-.00
RDR	30 CANBERRA DS	0	11	1	37.9	0	23	27	12.9	12	25	35.0	.0	89.75	56219.15	.00
RDR	25 GUAM SB	0	11	24	14.0	0	23	21	23.7	11	57	9.7	.0	92.94	57956.43	.00
RDR	24 CARNARVON SB	0	13	26	49.0	1	1	46	52.5	12	20	3.5	.0	92.20	66892.01	.01
RDR	29 MADRID DS	0	22	0	28.6	1	9	5	.5	11	4	31.9	-.0	99.65	98204.67	-.00
RDR	23 ASCENSION SB	0	22	14	50.8	1	10	20	13.4	12	5	22.5	.0	95.86	98980.23	.00
RDR	22 GRAND CANARY SB	0	22	37	52.6	1	10	2	59.3	11	25	6.7	-.0	98.01	100209.89	.00
RDR	21 ANTIGUA ISLAND SB	1	1	39	54.7	1	13	17	2.3	11	37	7.6	-.0	97.62	109569.59	-.00
RDR	20 BERMUDA SB	1	2	1	56.3	1	13	16	47.4	11	14	51.1	-.0	99.22	110659.90	-.00
RDR	19 GRAND BAHAMA SB	1	2	53	9.4	1	14	16	24.4	11	23	15.0	-.0	98.68	113165.28	-.01
RDR	18 MERRITT ISLAND SB	1	3	4	31.0	1	14	24	43.8	11	20	12.8	-.0	98.92	113714.77	-.00
RDR	28 CORPUS TEX SB	1	4	11	54.3	1	15	32	16.2	11	20	21.9	-.0	99.01	116933.11	-.00
RDR	27 GUAYMAS SB	1	5	6	28.5	1	16	26	6.8	11	19	38.3	-.0	99.19	119487.53	-.00

TABLE XII.- MISSION RADAR TIMELINE - Continued

(a) 0° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	31 GOLDSTONE DS	1	5	37	34.7	1	16	44	2.1	11	6	27.5	-.0	100.26	120923.31	-.01
RDR	26 HAWAII SB	1	8	21	8.3	1	19	47	54.4	11	26	46.1	-.0	99.04	128253.56	-.00
RDR	30 CANBERRA DS	1	11	12	53.0	1	23	56	35.9	12	43	42.8	.0	98.98	135582.54	.00
RDR	25 GUAM SB	1	12	0	23.7	1	23	38	15.8	11	37	52.1	-.0	98.81	137545.70	.00
RDR	24 CARNARVON SB	1	13	42	5.8	2	2	9	55.5	12	27	49.7	.0	98.65	141670.84	.00
RDR	29 MADRID DS	1	22	25	59.0	2	9	10	7.0	10	44	8.0	-.0	103.30	161313.63	-.00
RDR	23 ASCENSION SB	1	22	27	48.7	2	10	33	30.2	12	5	41.5	.0	99.20	161380.94	-.00
RDR	22 GRAND CANARY SB	1	22	58	53.2	2	10	10	21.5	11	11	28.3	-.0	101.20	162469.25	-.00
RDR	21 ANTIGUA ISLAND SB	2	1	55	48.2	2	13	24	42.9	11	28	54.7	-.0	100.38	168540.08	-.00
RDR	20 BERMUDA SB	2	2	20	58.6	2	13	21	59.7	11	1	1.1	-.0	102.14	169384.72	-.00
RDR	19 GRAND BAHAMA SB	2	3	10	11.9	2	14	22	10.9	11	11	59.0	-.0	101.42	171025.21	-.00
RDR	18 MERRITT ISLAND SB	2	3	21	49.7	2	14	29	45.9	11	7	56.3	-.0	101.67	171410.30	-.00
RDR	28 CORPUS TEX SB	2	4	28	15.0	2	15	37	39.0	11	9	24.0	-.0	101.66	173592.87	-.00
RDR	27 GUAYMAS SB	2	5	22	15.6	2	16	30	15.0	11	7	59.4	-.0	101.77	175346.99	-.00
RDR	31 GOLDSTONE DS	2	5	54	41.9	2	16	47	16.1	10	52	34.3	-.0	102.96	176391.18	-.01
RDR	26 HAWAII SB	2	8	34	45.5	2	19	50	40.1	11	15	54.5	.0	101.22	181638.75	.01
RDR	30 CANBERRA DS	2	11	14	5.9	2	20	56	57.3	9	42	51.5	.0	101.91	186384.20	38.23

TABLE XII.- MISSION RADAR TIMELINE - Continued

(a) 0° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

	SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV	ACQ AZI	ACQ RANGE	TERM ELV
	DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC	DEG	DEG	N MI	DEG
RDR 25 GUAM SB	2	12	10	11.2	2	20	57	2.6	8	46	51.4	.0	100.88	188104.05	37.70
RDR 24 CARNARVON SB	2	13	44	55.0	2	20	56	53.9	7	11	58.9	.0	101.09	190927.87	37.70
LOI IGNITION									2 day 21 hr 7 min 29.166 sec						
LOI CUTOFF									2 day 21 hr 11 min 35.001 sec						
RDR 24 CARNARVON SB	2	21	30	17.8	2	22	55	4.8	1	24	46.9	63.9	-62.70	200562.83	46.15
RDR 30 CANBERRA DS	2	21	30	19.3	2	22	55	6.3	1	24	47.0	31.4	-80.70	201843.05	14.74
RDR 25 GUAM SB	2	21	30	30.9	2	22	55	13.5	1	24	42.6	30.0	-112.31	201914.29	11.56
RDR 23 ASCENSION SB	2	22	31	36.3	2	22	54	37.3	0	23	1.1	.0	100.93	202731.15	11.56
RDR 29 MADRID DS	2	22	36	35.4	2	22	54	48.8	0	18	13.4	-.0	105.29	202951.34	11.56
RDR 23 ASCENSION SB	2	23	38	18.9	3	1	2	59.0	1	24	40.1	16.2	99.07	202994.21	35.98
RDR 22 GRAND CANARY SB	2	23	38	27.2	3	1	3	5.3	1	24	38.1	6.7	106.68	203544.43	23.51
RDR 29 MADRID DS	2	23	38	33.2	3	1	3	11.2	1	24	38.0	11.0	115.83	203281.27	24.24
RDR 30 CANBERRA DS	2	23	38	43.8	3	0	8	34.3	0	29	50.5	5.8	-98.63	203585.08	24.24
RDR 24 CARNARVON SB	2	23	38	44.1	3	1	3	25.5	1	24	41.5	36.2	-85.01	201911.17	17.62
RDR 25 GUAM SB	2	23	38	54.9	2	23	43	26.3	0	4	31.3	1.1	-101.76	203858.90	17.62
CIRCULARIZATION BURN IGNITION									3 day 1 hr 30 min 52.789 sec						
CIRCULARIZATION BURN CUTOFF									3 day 1 hr 31 min 2.510 sec						
RDR 23 ASCENSION SB	3	1	47	52.4	3	2	59	23.4	1	11	31.1	47.3	96.75	201683.50	64.08
RDR 22 GRAND CANARY SB	3	1	47	59.8	3	2	59	28.6	1	11	28.8	32.1	125.72	202366.03	43.49
RDR 29 MADRID DS	3	1	48	2.6	3	2	59	32.7	1	11	30.1	30.1	142.08	202460.71	36.92
RDR 24 CARNARVON SB	3	1	48	12.1	3	2	22	30.9	0	34	18.9	7.4	-97.65	203738.33	36.92

TABLE XII.- MISSION RADAR TIMELINE - Continued

(a) 0° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	21 ANTIGUA ISLAND SB	3	2	5	29.9	3	2	59	14.6	0	53	44.7	.0	101.07	203351.35	36.92
RDR	20 BERMUDA SB	3	2	32	39.2	3	2	59	21.3	0	26	42.2	.0	102.49	203087.44	36.92
RDR	19 GRAND BAHAMA SB	3	3	45	55.4	3	4	57	46.2	1	11	50.9	5.2	104.35	204170.38	19.89
RDR	21 ANTIGUA ISLAND SB	3	3	45	55.4	3	4	57	45.4	1	11	50.0	22.7	109.28	203157.89	19.89
RDR	18 MERRITT ISLAND SB	3	3	45	56.2	3	4	57	45.7	1	11	49.4	2.6	103.33	204323.09	19.89
RDR	20 BERMUDA SB	3	3	45	57.2	3	4	57	49.2	1	11	52.0	14.6	112.84	203611.03	27.67
RDR	23 ASCENSION SB	3	3	46	.8	3	4	57	52.8	1	11	52.0	75.8	99.15	201167.95	86.73
RDR	22 GRAND CANARY SB	3	3	46	8.5	3	4	57	58.0	1	11	49.5	48.9	156.42	201899.13	52.28
RDR	29 MADRID DS	3	3	46	15.8	3	4	57	59.5	1	11	43.7	38.8	175.17	202324.37	38.00
RDR	28 CORPUS TEX SB	3	4	41	57.8	3	4	57	42.8	0	15	45.0	-.0	101.14	203790.62	38.00
RDR	27 GUAYMAS SB	3	5	44	24.2	3	6	55	55.1	1	11	30.8	1.8	102.20	204645.69	16.47
RDR	28 CORPUS TEX SB	3	5	44	26.3	3	6	55	56.8	1	11	30.4	13.3	108.88	203962.01	27.42
RDR	19 GRAND BAHAMA SB	3	5	44	27.9	3	6	56	1.8	1	11	33.9	29.4	120.22	203071.64	41.93
RDR	18 MERRITT ISLAND SB	3	5	44	28.5	3	6	55	58.4	1	11	29.9	26.5	119.38	203220.67	41.93
RDR	21 ANTIGUA ISLAND SB	3	5	44	29.8	3	6	56	2.2	1	11	32.4	47.6	126.82	202225.41	59.28
RDR	20 BERMUDA SB	3	5	44	32.4	3	6	56	3.9	1	11	31.5	35.4	134.64	202763.59	44.41
RDR	23 ASCENSION SB	3	5	44	39.5	3	6	56	13.9	1	11	34.3	75.1	-96.78	201444.86	58.20

TABLE XII.- MISSION RADAR TIMELINE - Continued

(a) 0° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV	ACQ AZI	ACQ RANGE	TERM ELV
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC	DEG	DEG	N MI	DEG
RDR	22 GRAND CANARY SB	3	5	44	42.1	3	6	56	16.7	1	11	34.7	50.0	-158.79	202119.10	42.38
RDR	29 MADRID DS	3	5	44	45.6	3	6	56	21.0	1	11	35.4	34.3	-149.45	202804.87	26.57
RDR	31 GOLDSTONE DS	3	6	8	8.7	3	6	55	53.8	0	47	45.1	-.0	102.05	203688.32	26.57
RDR	27 GUAYMAS SB	3	7	42	30.8	3	8	54	17.3	1	11	46.4	26.0	117.69	203546.42	38.86
RDR	28 CORPUS TEX SB	3	7	42	31.0	3	8	54	21.9	1	11	51.0	36.2	127.75	203026.23	47.14
RDR	31 GOLDSTONE DS	3	7	42	32.4	3	8	54	18.0	1	11	45.6	17.9	116.22	203990.80	47.14
RDR	19 GRAND BAHAMA SB	3	7	42	39.1	3	8	54	26.4	1	11	47.2	48.6	147.84	202474.05	54.31
RDR	21 ANTIGUA ISLAND SB	3	7	42	42.0	3	8	54	29.3	1	11	47.3	63.3	170.81	201985.37	61.19
RDR	18 MERRITT ISLAND SB	3	7	42	43.1	3	8	54	25.4	1	11	42.2	45.8	145.85	202582.88	61.19
RDR	20 BERMUDA SB	3	7	42	48.2	3	8	54	31.3	1	11	43.1	47.6	169.62	202506.24	47.59
RDR	23 ASCENSION SB	3	7	42	51.6	3	8	54	35.4	1	11	43.8	46.5	-94.53	202553.27	29.54
RDR	22 GRAND CANARY SB	3	7	42	58.0	3	8	54	35.9	1	11	38.0	34.4	-125.84	203087.77	21.67
RDR	29 MADRID DS	3	7	43	.3	3	8	54	39.0	1	11	38.8	19.3	-122.09	203885.17	8.13
RDR	26 HAWAII SB	3	8	52	30.5	3	8	54	11.5	0	1	41.0	-.0	99.39	205104.75	8.13
RDR	26 HAWAII SB	3	9	40	55.3	3	10	52	25.9	1	11	30.6	11.0	104.33	204660.59	26.24
RDR	27 GUAYMAS SB	3	9	41	3.7	3	10	52	37.4	1	11	33.7	46.0	143.49	202847.59	52.91
RDR	31 GOLDSTONE DS	3	9	41	4.4	3	10	52	38.7	1	11	34.3	36.9	140.62	203252.45	44.27

TABLE XII.- MISSION RADAR TIMELINE - Continued

(a) 0° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV	ACQ AZI	ACQ RANGE	TERM ELV
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC	DEG	DEG	N MI	DEG
RDR	28 CORPUS TEX SB	3	9	41	6.1	3	10	52	45.7	1	11	39.5	51.8	161.95	202619.11	53.50
RDR	18 MERRITT ISLAND SB	3	9	41	10.5	3	10	52	47.0	1	11	36.5	52.1	-170.70	202604.79	46.98
RDR	19 GRAND BAHAMA SB	3	9	41	12.6	3	10	52	48.7	1	11	36.0	53.5	-166.17	202552.50	47.19
RDR	21 ANTIGUA ISLAND SB	3	9	41	13.5	3	10	52	52.3	1	11	38.7	54.2	-134.33	202528.25	41.28
RDR	20 BERMUDA SB	3	9	41	13.6	3	10	52	53.4	1	11	39.9	43.6	-149.22	202940.75	34.72
RDR	23 ASCENSION SB	3	9	41	15.4	3	10	52	54.9	1	11	39.4	17.9	-96.22	204250.81	1.12
RDR	22 GRAND CANARY SB	3	9	41	20.9	3	10	40	46.5	0	59	25.7	11.8	-106.73	204596.00	1.12
RDR	26 HAWAII SB	3	11	39	8.0	3	12	50	49.9	1	11	41.8	36.1	119.36	203584.81	49.28
RDR	27 GUAYMAS SB	3	11	39	24.2	3	12	51	2.7	1	11	38.4	53.3	-172.77	202846.37	48.57
RDR	31 GOLDSTONE DS	3	11	39	25.0	3	12	51	1.0	1	11	36.0	46.1	177.32	203122.96	48.57
RDR	28 CORPUS TEX SB	3	11	39	26.3	3	12	51	4.1	1	11	37.8	50.0	-151.79	202969.28	40.92
RDR	19 GRAND BAHAMA SB	3	11	39	30.7	3	12	51	8.2	1	11	37.5	39.6	-128.86	203401.71	27.03
RDR	18 MERRITT ISLAND SB	3	11	39	32.3	3	12	51	8.5	1	11	36.1	40.0	-132.42	203380.36	28.15
RDR	21 ANTIGUA ISLAND SB	3	11	39	34.6	3	12	51	8.8	1	11	34.2	30.9	-110.97	203822.93	15.58
RDR	20 BERMUDA SB	3	11	39	35.6	3	12	51	9.4	1	11	33.8	26.5	-120.73	204049.18	13.86
RDR	30 CANBERRA DS	3	11	45	31.9	3	12	50	36.8	1	5	5.0	-.0	99.01	205288.16	13.86
RDR	25 GUAM SB	3	12	34	43.2	3	12	50	40.6	0	15	57.4	-.0	97.82	204899.44	13.86

TABLE XII.- MISSION RADAR TIMELINE - Continued

(a) 0° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	30 CANBERRA DS	3	13	37	17.6	3	14	48	54.1	1	11	36.5	21.7	82.72	204617.38	34.84
RDR	25 GUAM SB	3	13	37	25.0	3	14	48	56.2	1	11	31.2	15.0	101.83	204991.36	31.22
RDR	26 HAWAII SB	3	13	37	34.9	3	14	49	15.8	1	11	41.0	56.0	150.26	203033.77	60.58
RDR	31 GOLDSTONE DS	3	13	37	44.4	3	14	49	29.5	1	11	45.2	39.6	-144.02	203677.35	30.25
RDR	27 GUAYMAS SB	3	13	37	45.6	3	14	49	29.8	1	11	44.2	41.7	-133.00	203584.09	29.75
RDR	28 CORPUS TEX SB	3	13	37	47.0	3	14	49	33.9	1	11	46.9	32.3	-121.03	204027.37	18.98
RDR	18 MERRITT ISLAND SB	3	13	37	48.8	3	14	49	35.4	1	11	46.6	18.6	-110.33	204765.12	4.50
RDR	19 GRAND BAHAMA SB	3	13	37	48.8	3	14	49	35.3	1	11	46.5	17.1	-108.35	204847.37	4.50
RDR	20 BERMUDA SB	3	13	37	50.0	3	13	59	21.5	0	21	31.5	4.2	-102.12	205607.13	4.50
RDR	21 ANTIGUA ISLAND SB	3	13	37	50.0	3	13	57	45.7	0	19	55.8	4.5	-99.45	205591.90	4.50
RDR	24 CARNARVON SB	3	14	21	53.4	3	14	48	47.6	0	26	54.2	.0	97.24	204764.32	4.50
RDR	24 CARNARVON SB	3	15	35	31.6	3	16	47	4.1	1	11	32.5	16.4	89.61	205201.31	31.56
RDR	30 CANBERRA DS	3	15	35	36.8	3	16	47	10.7	1	11	33.9	43.7	60.39	203801.99	53.93
RDR	25 GUAM SB	3	15	35	43.7	3	16	47	16.7	1	11	33.0	42.1	112.74	203866.09	57.01
RDR	26 HAWAII SB	3	15	36	.3	3	16	47	30.6	1	11	30.3	57.9	-155.34	203248.01	48.78
RDR	31 GOLDSTONE DS	3	15	36	9.6	3	16	47	36.6	1	11	27.1	22.0	-117.31	204851.20	9.52
RDR	28 CORPUS TEX SB	3	15	36	10.4	3	16	20	43.8	0	44	33.4	8.9	-103.20	205604.63	9.52

TABLE XII.- MISSION RADAR TIMELINE - Continued

(a) 0° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV	ACQ AZI	ACQ RANGE	TERM ELV
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC	DEG	DEG	N MI	DEG
RDR	27 GUAYMAS SB	3	15	36	11.7	3	16	47	37.5	1	11	25.8	20.2	-110.48	204952.49	6.09
					TEI IGNITION				3 day 17 hr 4 min 1.855 sec							
					TEI CUTOFF				3 day 17 hr 6 min 53.160 sec							
RDR	24 CARNARVON SB	3	17	21	14.1	4	2	40	38.9	9	19	24.7	39.5	76.66	204889.66	-.00
RDR	30 CANBERRA DS	3	17	21	18.1	4	0	25	50.7	7	4	32.6	58.0	25.55	204166.34	-.00
RDR	25 GUAM SB	3	17	21	24.3	4	0	18	29.6	6	57	5.3	63.4	137.89	204009.32	-.00
RDR	26 HAWAII SB	3	17	21	34.6	3	20	31	39.7	3	10	5.1	42.1	-122.84	204763.99	-.00
RDR	31 GOLDSTONE DS	3	17	21	38.8	3	17	33	39.7	0	12	1.3	2.5	-100.90	206911.56	-.00
RDR	29 MADRID DS	3	22	52	23.4	4	9	58	5.2	11	5	41.9	.0	99.60	200648.72	-.00
RDR	23 ASCENSION SB	3	23	5	19.1	4	11	5	28.8	12	0	9.7	.0	96.57	200402.46	.00
RDR	22 GRAND CANARY SB	3	23	28	34.9	4	10	53	19.6	11	24	44.7	-.0	98.06	199953.47	.00
RDR	21 ANTIGUA ISLAND SB	4	2	27	.6	4	14	4	33.5	11	37	32.9	.0	97.21	196490.61	-.00
RDR	20 BERMUDA SB	4	2	48	6.5	4	14	7	30.8	11	19	24.2	.0	98.40	196066.06	-.00
RDR	19 GRAND BAHAMA SB	4	3	38	36.2	4	15	5	40.9	11	27	4.7	.0	97.83	195070.21	-.00
RDR	18 MERRITT ISLAND SB	4	3	49	42.9	4	15	14	27.7	11	24	44.8	.0	97.98	194843.70	-.00
RDR	28 CORPUS TEX SB	4	4	55	53.5	4	16	22	4.8	11	26	11.3	.0	97.88	193470.85	.01
RDR	27 GUAYMAS SB	4	5	49	39.7	4	17	15	35.5	11	25	55.8	.0	97.86	192417.20	-.00
RDR	31 GOLDSTONE DS	4	6	19	20.6	4	17	35	36.9	11	16	16.2	.0	98.63	191806.24	-.00
RDR	26 HAWAII SB	4	9	2	9.7	4	20	35	45.6	11	33	35.9	-.0	97.31	188411.52	-.00

TABLE XII.- MISSION RADAR TIMELINE - Continued

(a) 0° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	30 CANBERRA DS	4	12	0	37.0	5	0	27	1.0	12	26	23.9	.0	96.91	184513.11	.00
RDR	25 GUAM SB	4	12	40	43.5	5	0	23	42.6	11	42	59.0	-.0	96.63	183617.12	.00
RDR	24 CARNARVON SB	4	14	28	17.0	5	2	43	28.4	12	15	11.5	.0	96.24	181148.41	.00
RDR	29 MADRID DS	4	22	54	31.1	6	10	10	11.2	11	15	40.1	-.0	98.44	168557.32	-.00
RDR	23 ASCENSION SB	4	23	11	19.1	5	11	12	8.1	12	0	49.0	.0	95.52	168110.79	.00
RDR	22 GRAND CANARY SB	4	23	32	16.0	5	11	3	56.0	11	31	40.0	-.0	96.96	167547.75	.00
RDR	21 ANTIGUA ISLAND SB	5	2	32	24.1	5	14	14	58.2	11	42	34.1	-.0	96.03	162579.62	.00
RDR	20 BERMUDA SB	5	2	51	54.3	5	14	19	59.6	11	28	5.3	-.0	97.16	162025.97	-.00
RDR	19 GRAND BAHAMA SB	5	3	43	18.9	5	15	17	44.0	11	34	25.1	-.0	96.58	160553.44	-.00
RDR	18 MERRITT ISLAND SB	5	3	54	11.5	5	15	26	49.3	11	32	37.7	-.0	96.73	160238.91	-.00
RDR	28 CORPUS TEX SB	5	5	0	50.9	5	16	34	48.2	11	33	57.3	-.0	96.57	158291.08	-.00
RDR	27 GUAYMAS SB	5	5	54	41.1	5	17	28	44.4	11	34	3.3	-.0	96.53	156690.53	-.00
RDR	31 GOLDSTONE DS	5	6	23	37.5	5	17	50	7.9	11	26	30.4	-.0	97.21	155819.62	-.00
RDR	26 HAWAII SB	5	9	9	2.3	5	20	49	35.7	11	40	33.4	-.0	95.83	150763.64	-.00
RDR	30 CANBERRA DS	5	12	15	39.9	6	0	32	23.2	12	16	43.3	.0	94.76	144617.82	.00
RDR	25 GUAM SB	5	12	49	37.5	6	0	38	10.2	11	48	32.6	.0	95.07	143472.24	.00
RDR	24 CARNARVON SB	5	14	42	44.7	6	2	52	13.9	12	9	29.2	.0	94.24	139574.19	.00

TABLE XII.- MISSION RADAR TIMELINE - Continued

(a) 0° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	29 MADRID DS	5	23	3	3.0	6	10	40	15.1	11	37	12.1	0.0	96.01	120526.46	0.00
RDR	23 ASCENSION SB	5	23	28	10.7	6	11	30	33.5	12	2	22.7	.0	93.26	119483.48	.00
RDR	22 GRAND CANARY SB	5	23	43	37.9	6	11	31	24.6	11	47	46.6	-.0	94.74	118835.81	.00
RDR	21 ANTIGUA ISLAND SB	6	2	47	31.0	6	14	44	48.5	11	57	17.5	.0	93.66	110853.04	.01
RDR	20 BERMUDA SB	6	3	4	16.9	6	14	55	10.5	11	50	53.6	-.0	94.61	110097.12	.00
RDR	19 GRAND BAHAMA SB	6	3	57	28.0	6	15	53	10.4	11	55	42.4	-.0	94.05	107667.57	.00
RDR	18 MERRITT ISLAND SB	6	4	8	4.6	6	16	3	21.7	11	55	17.1	-.0	94.15	107176.74	.00
RDR	28 CORPUS TEX SB	6	5	15	44.2	6	17	14	15.8	11	58	31.5	-.0	93.90	103997.55	.01
RDR	27 GUAYMAS SB	6	6	10	14.7	6	18	11	24.7	12	1	10.0	.0	93.76	101371.66	.00
RDR	31 GOLDSTONE DS	6	6	37	48.3	6	18	37	45.5	11	59	57.2	-.0	94.25	100020.87	.00
RDR	26 HAWAII SB	6	9	29	8.1	6	21	47	3.7	12	17	55.6	.0	92.75	91248.98	.00
RDR	30 CANBERRA DS	6	12	59	1.6	7	1	2	23.7	12	3	22.1	-.0	89.24	79476.57	.00
RDR	25 GUAM SB	6	13	17	52.9	7	3	3	19.7	13	45	26.8	.0	91.33	78353.92	.00
RDR	24 CARNARVON SB	6	15	29	1.8	7	2	49	44.2	11	20	42.4	-.0	88.66	70195.82	.00
RDR	29 MADRID DS	7	0	26	51.2	7	2	11	45.5	1	44	54.3	-.0	85.29	25674.49	.00
RDR	16 TANANARIVE TLM	7	0	28	20.0	7	2	38	49.9	2	10	29.9	39.5	54.95	23399.90	.00
RDR	11 CARNARVON CB	7	0	28	32.2	7	2	49	44.6	2	21	12.4	39.0	-45.95	23399.91	.00

TABLE XII.- MISSION RADAR TIMELINE - Continued

(a) 0° minimum elevation - Concluded

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	10 PRETORIA CB	7	0	36	21.3	7	2	23	44.9	1	47	23.7	20.1	63.30	23399.98	.00

ENTRY INTERFACE 7 day 3 hr 5 min 31.682 sec

TABLE XII.- MISSION RADAR TIMELINE - Continued

(b) 5° minimum elevation

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV	ACQ AZI	ACQ RANGE	TERM ELV
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC	DEG	DEG	N MI	DEG
RDR	20 BERMUDA SB	0	0	11	19.7	0	0	11	35.4	0	0	15.7	6.6	85.16	541.00	5.00
RDR	6 BERMUDA CB	0	0	11	19.7	0	0	11	35.5	0	0	15.6	6.6	85.13	540.80	5.00
RDR	32 INSERTION SHIP	0	0	11	19.7	0	0	14	4.2	0	2	44.5	6.2	-30.25	555.19	5.00
RDR	22 GRAND CANARY SB	0	0	17	31.5	0	0	22	30.0	0	4	58.5	5.0	-73.45	598.84	5.01
RDR	8 GRAND CANARY CB	0	0	17	31.5	0	0	22	30.0	0	4	58.5	5.0	-73.44	598.85	5.01
RDR	17 KANO NIGERIA TLM	0	0	24	47.2	0	0	29	17.1	0	4	29.8	5.0	-36.13	589.88	5.00
RDR	16 TANANARIVE TLM	0	0	38	34.1	0	0	46	56.0	0	2	21.9	5.0	4.25	577.83	5.00
RDR	24 CARNARVON SB	0	0	53	38.8	0	0	56	32.2	0	2	53.4	5.0	-140.97	586.55	5.00
RDR	11 CARNARVON CB	0	0	53	38.9	0	0	56	31.9	0	2	53.0	5.0	-141.07	586.54	5.00
RDR	30 CANBERRA DS	0	1	0	48.3	0	1	4	11.9	0	3	23.6	5.0	-62.13	583.98	4.99
RDR	27 GUAYMAS SB	0	1	29	16.8	0	1	34	11.5	0	4	54.7	5.0	-120.99	593.59	5.00
RDR	14 WHITE SANDS CB	0	1	30	49.6	0	1	35	14.7	0	4	25.1	5.0	-136.39	592.57	5.00
RDR	28 CORPUS TEX SB	0	1	32	10.8	0	1	37	2.7	0	4	51.9	5.0	-90.74	597.05	5.00
RDR	15 EGLIN AFB CB	0	1	34	37.1	0	1	39	29.3	0	4	52.2	5.0	-90.01	599.19	5.00
RDR	18 MERRITT ISLAND SB	0	1	36	6.9	0	1	40	43.3	0	4	36.4	5.0	-71.19	600.10	5.00
RDR	1 MERRITT ISLAND CB	0	1	36	7.8	0	1	40	43.0	0	4	35.2	5.0	-70.62	600.09	5.00
RDR	3 CAPE KENNEDY CB	0	1	36	8.7	0	1	40	44.6	0	4	35.9	5.0	-70.89	600.09	5.00

TABLE XII.- MISSION RADAR TIMELINE - Continued

(b) 5° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	2 PATRICK AFB CB	0	1	36	9.9	0	1	40	42.2	0	4	32.3	5.0	-69.28	600.08	5.00
RDR	4 GRAND BAHAMA CB	0	1	36	56.8	0	1	40	56.5	0	3	59.7	5.0	-55.96	600.35	5.00
RDR	19 GRAND BAHAMA SB	0	1	36	57.3	0	1	40	56.9	0	3	59.6	5.0	-55.91	600.37	5.00
RDR	32 INSERTION SHIP	0	1	43	48.0	0	1	47	56.6	0	4	18.6	5.0	-45.51	600.01	5.01
RDR	8 GRAND CANARY CB	0	1	51	50.5	0	1	53	30.0	0	1	39.5	5.0	-130.00	592.22	5.00
RDR	22 GRAND CANARY SB	0	1	51	50.6	0	1	53	29.9	0	1	39.4	5.0	-130.02	592.21	5.00
RDR	17 KANO NIGERIA TLM	0	1	58	35.6	0	2	1	2.3	0	2	26.7	5.0	-114.59	584.34	5.00
RDR	16 TANANARIVE TLM	0	2	10	10.1	0	2	14	50.0	0	4	39.9	5.0	-79.26	579.63	5.00
RDR	24 CARNARVON SB	0	2	26	34.9	0	2	30	17.4	0	3	42.4	5.0	-141.42	586.42	5.00
RDR	11 CARNARVON CB	0	2	26	35.0	0	2	30	17.1	0	3	42.1	5.0	-141.51	586.41	5.00
	TLI IGNITION					0 day 2 hr 50 min 31.199 sec										
	TLI CUTOFF					0 day 2 hr 55 min 42.661 sec										
RDR	13 PT ARGUELLO CB	0	2	57	15.5	0	5	20	57.3	2	23	41.8	5.0	-122.81	1105.39	14.50
RDR	31 GOLDSTONE DS	0	2	57	39.8	0	15	59	31.8	13	1	52.0	5.0	-120.06	1181.21	5.00
RDR	27 GUAYMAS SB	0	2	58	3.3	0	15	40	15.5	12	42	12.2	5.0	-92.42	1259.52	5.00
RDR	14 WHITE SANDS CB	0	2	58	37.3	0	5	26	54.1	2	28	16.8	5.0	-100.83	1371.76	5.00
RDR	28 CORPUS TEX SB	0	2	59	39.2	0	14	44	57.7	11	45	18.5	5.0	-83.88	1587.78	5.00
RDR	18 MERRITT ISLAND SB	0	3	1	46.2	0	13	34	31.0	10	32	44.7	5.0	-79.97	2045.59	5.00
RDR	1 MERRITT ISLAND CB	0	3	1	46.6	0	5	35	38.6	2	33	52.0	5.0	-79.82	2046.93	5.00

TABLE XII.- MISSION RADAR TIMELINE - Continued

(b) 5° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

			SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV	ACQ AZI	ACQ RANGE	TERM ELV
			DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC	DEG	DEG	N MI	DEG
RDR	2	PATRICK AFB CB	0	3	1	47.5	0	5	35	41.8	2	33	54.4	5.0	-79.46	2050.05	5.00
RDR	4	GRAND BAHAMA CB	0	3	2	9.7	0	5	36	30.6	2	34	20.9	5.0	-76.23	2131.20	5.00
RDR	19	GRAND BAHAMA SB	0	3	2	10.0	0	13	25	25.4	10	23	15.4	5.0	-76.22	2132.16	5.00
RDR	5	GRAND TURK CB	0	3	3	27.4	0	5	38	40.8	2	35	13.3	5.0	-67.35	2416.99	5.00
RDR	20	BERMUDA SB	0	3	3	56.3	0	12	24	13.1	9	20	16.9	5.0	-82.30	2523.77	5.00
RDR	6	BERMUDA CB	0	3	3	56.3	0	5	37	8.2	2	33	11.9	5.0	-82.29	2523.93	5.00
RDR	7	ANTIGUA ISLAND CB	0	3	5	16.3	0	5	40	13.9	2	34	57.6	5.0	-61.84	2817.66	5.00
RDR	21	ANTIGUA ISLAND SB	0	3	5	17.4	0	12	20	28.6	9	15	11.2	5.0	-61.69	2821.72	5.00
RDR	32	INSERTION SHIP	0	3	6	53.4	0	5	38	56.1	2	32	2.7	5.0	-71.57	3175.72	5.00
RDR	22	GRAND CANARY SB	0	3	14	57.5	0	8	54	7.1	5	39	9.6	5.0	-74.90	4903.82	5.00
RDR	29	MADRID DS	0	3	18	1.7	0	7	54	33.0	4	36	16.2	5.0	-83.11	5585.63	5.00
RDR	9	ASCENSION CB	0	3	22	46.5	0	5	32	10.9	2	9	24.4	5.0	-54.23	6474.62	5.00
RDR	23	ASCENSION SB	0	3	22	48.3	0	8	53	21.8	5	30	33.5	5.0	-54.27	6480.39	5.00
RDR	26	HAWAII SB	0	7	43	43.0	0	19	6	34.2	11	22	51.2	5.0	92.57	39058.85	5.00
RDR	30	CANBERRA DS	0	11	26	38.4	0	23	1	39.5	11	35	1.0	5.0	86.59	57840.47	5.00
RDR	25	GUAM SB	0	11	46	9.0	0	23	0	13.8	11	14	4.8	5.0	94.38	59312.69	5.00
RDR	24	CARNARVON SB	0	13	49	22.4	1	1	24	9.5	11	34	47.2	5.0	90.12	68156.68	5.00

TABLE XII.- MISSION RADAR TIMELINE - Continued

(b) 5° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	29 MADRID DS	0	22	28	8.3	1	8	37	46.7	10	9	38.3	5.0	104.20	99390.05	5.00
RDR	23 ASCENSION SB	0	22	35	25.4	1	9	59	35.5	11	24	9.9	5.0	95.27	99781.03	5.00
RDR	22 GRAND CANARY SB	0	23	1	20.7	1	9	39	46.4	10	38	25.7	5.0	100.82	101152.78	5.00
RDR	21 ANTIGUA ISLAND SB	1	2	1	25.5	1	12	55	37.2	10	54	11.7	5.0	99.29	110335.45	5.00
RDR	20 BERMUDA SB	1	2	26	32.6	1	12	52	23.2	10	25	50.6	5.0	102.59	111568.77	5.00
RDR	19 GRAND BAHAMA SB	1	3	16	16.3	1	13	53	24.8	10	37	8.5	5.0	101.35	113981.85	5.00
RDR	18 MERRITT ISLAND SB	1	3	28	4.9	1	14	1	19.6	10	33	14.7	5.0	101.82	114548.36	5.00
RDR	28 CORPUS TEX SB	1	4	35	15.8	1	15	9	27.6	10	34	11.8	5.0	101.80	117731.98	5.00
RDR	27 GUAYMAS SB	1	5	29	53.6	1	16	2	50.2	10	32	56.6	5.0	102.01	120270.09	5.00
RDR	31 GOLDSTONE DS	1	6	3	6.4	1	16	18	42.8	10	15	36.4	5.0	104.03	121791.39	4.99
RDR	26 HAWAII SB	1	8	43	20.7	1	19	25	45.7	10	42	24.9	5.0	101.21	128921.42	5.00
RDR	30 CANBERRA DS	1	11	37	41.6	1	23	31	26.4	11	53	44.8	5.0	95.49	136312.12	5.00
RDR	25 GUAM SB	1	12	21	25.4	1	25	17	15.7	10	55	50.4	5.0	100.10	13M107.65	5.00
RDR	24 CARNARVON SB	1	14	4	23.8	2	1	47	24.0	11	43	.2	5.0	96.40	142260.42	5.01
RDR	23 ASCENSION SB	1	22	48	20.4	2	10	12	35.5	11	24	15.1	5.0	98.57	161802.11	5.00
RDR	29 MADRID DS	1	22	53	30.9	2	8	43	21.0	9	49	50.1	5.0	107.86	161980.48	5.00
RDR	22 GRAND CANARY SB	1	23	22	12.1	2	9	47	30.3	10	25	18.2	5.0	104.00	162982.71	5.00

TABLE XII.- MISSION RADAR TIMELINE - Continued

(b) 5° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	21 ANTIGUA ISLAND SB	2	2	17	13.3	2	13	3	35.7	10	46	22.5	5.0	102.03	168959.90	4.99
RDR	20 BERMUDA SB	2	2	45	33.7	2	12	57	16.4	10	11	42.8	5.0	105.52	169905.54	4.99
RDR	19 GRAND BAHAMA SB	2	3	33	17.6	2	13	58	51.6	10	25	33.9	5.0	104.10	171488.97	5.00
RDR	18 MERRITT ISLAND SB	2	3	45	19.4	2	14	6	44.2	10	21	24.8	5.0	104.57	171885.89	5.00
RDR	28 CORPUS TEX SB	2	4	51	32.8	2	15	14	7.2	10	22	34.4	5.0	104.46	174072.78	5.00
RDR	27 GUAYMAS SB	2	5	45	37.5	2	16	7	21.0	10	21	43.5	5.0	104.60	175800.42	5.00
RDR	31 GOLDSTONE DS	2	6	20	11.9	2	16	21	40.4	10	1	28.5	5.0	106.74	176908.17	5.00
RDR	26 HAWAII SB	2	8	56	16.9	2	19	28	42.7	10	32	25.8	5.0	103.51	181863.30	5.00
RDR	30 CANBERRA DS	2	11	39	16.7	2	20	56	57.3	9	17	40.6	5.0	98.35	186877.07	38.23
RDR	25 GUAM SB	2	12	31	.6	2	20	57	2.6	8	26	2.0	5.0	102.21	188399.85	37.70
RDR	24 CARNARVON SB	2	14	7	36.2	2	20	56	53.9	6	49	17.7	5.0	98.79	191342.90	37.70
	LOI IGNITION					2 day 21 hr 7 min 29.166 sec										
	LOI CUTOFF					2 day 21 hr 11 min 35.001 sec										
RDR	24 CARNARVON SB	2	21	30	17.8	2	22	55	4.8	1	24	46.9	63.9	-62.70	200562.83	46.15
RDR	30 CANBERRA DS	2	21	30	19.3	2	22	55	6.3	1	24	47.0	31.4	-80.70	201843.05	14.79
RDR	25 GUAM SB	2	21	30	30.9	2	22	55	13.5	1	24	42.6	30.0	-112.31	201914.29	11.56
RDR	23 ASCENSION SB	2	22	53	2.9	2	22	54	37.3	0	1	34.4	5.0	100.19	203509.92	11.56
RDR	23 ASCENSION SB	2	23	38	18.9	3	1	2	59.0	1	24	40.1	16.2	99.07	202994.21	35.98
RDR	22 GRAND CANARY SB	2	23	38	27.2	3	1	3	5.3	1	24	38.1	6.7	106.68	203544.43	23.51

TABLE XII.- MISSION RADAR TIMELINE - Continued

(b) 5° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV	ACQ AZI	ACQ RANGE	TERM ELV
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC	DEG	DEG	N MI	DEG
RDR	29 MADRID DS	2	23	38	33.2	3	1	3	11.2	1	24	38.0	11.0	115.83	203281.27	24.24
RDR	30 CANBERRA DS	2	23	38	43.8	2	23	42	54.0	0	4	10.2	5.8	-98.63	203585.08	24.24
RDR	24 CARNARVON SB	2	23	38	44.1	3	1	3	25.5	1	24	41.5	30.2	-85.01	201911.17	17.62
	CIRCULARIZATION BURN IGNITION									3 day	1 hr	30 min	52.789 sec			
	CIRCULARIZATION BURN CUTOFF									3 day	1 hr	31 min	2.510 sec			
RDR	23 ASCENSION SB	3	1	47	52.4	3	2	59	23.4	1	11	31.1	47.3	96.75	201683.50	64.08
RDR	22 GRAND CANARY SB	3	1	47	59.8	3	2	59	28.6	1	11	28.8	32.1	125.72	202366.03	43.49
RDR	29 MADRID DS	3	1	48	2.6	3	2	59	32.7	1	11	30.1	30.1	142.08	202460.71	36.92
RDR	24 CARNARVON SB	3	1	48	12.1	3	1	59	5.8	0	10	53.7	7.4	-97.65	203738.33	36.92
RDR	21 ANTIGUA ISLAND SB	3	2	28	15.2	3	2	59	14.6	0	30	59.4	5.0	102.43	202698.66	36.92
RDR	20 BERMUDA SB	3	2	57	56.9	3	2	59	21.3	0	1	22.5	5.0	105.63	203978.57	36.92
RDR	19 GRAND BAHAMA SB	3	3	45	55.4	3	4	57	46.2	1	11	50.9	5.2	104.35	204170.38	19.89
RDR	21 ANTIGUA ISLAND SB	3	3	45	55.4	3	4	57	45.4	1	11	50.0	22.7	109.28	203157.89	19.89
RDR	20 BERMUDA SB	3	3	45	57.2	3	4	57	49.2	1	11	52.0	14.6	112.84	203611.03	27.67
RDR	23 ASCENSION SB	3	3	46	.8	3	4	57	52.8	1	11	52.0	75.8	99.15	201167.95	86.73
RDR	22 GRAND CANARY SB	3	3	46	8.5	3	4	57	58.0	1	11	49.5	48.9	156.42	201899.13	52.28
RDR	29 MADRID DS	3	3	46	15.8	3	4	57	59.5	1	11	43.7	38.8	175.17	202324.37	38.00
RDR	18 MERRITT ISLAND SB	3	3	57	11.2	3	4	57	45.7	1	0	34.5	5.0	104.63	203624.69	38.00
RDR	28 CORPUS TEX SB	3	5	44	26.3	3	6	55	56.8	1	11	30.4	13.3	108.08	203962.01	27.42

TABLE XII.- MISSION RADAR TIMELINE - Continued

(b) 5° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

			SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV	ACQ AZI	ACQ RANGE	TERM ELV
			DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC	DEG	DEG	N MI	DEG
RDR	19	GRAND BAHAMA SB	3	5	44	27.9	3	6	56	1.8	1	11	33.9	29.4	120.22	203071.64	41.93
RDR	18	MERRITT ISLAND SB	3	5	44	28.5	3	6	55	58.4	1	11	29.9	26.5	119.38	203220.67	41.93
RDR	21	ANTIGUA ISLAND SB	3	5	44	29.8	3	6	56	2.2	1	11	32.4	47.6	126.82	202225.41	59.28
RDR	20	BERMUDA SB	3	5	44	32.4	3	6	56	3.9	1	11	31.5	35.4	134.64	202763.59	44.41
RDR	23	ASCENSION SB	3	5	44	39.5	3	6	56	13.9	1	11	34.3	75.1	-96.78	201444.86	58.20
RDR	22	GRAND CANARY SB	3	5	44	42.1	3	6	56	16.7	1	11	34.7	50.0	-158.79	202119.10	42.38
RDR	29	MADRID DS	3	5	44	45.6	3	6	56	21.0	1	11	35.4	34.3	-149.45	202804.87	26.57
RDR	27	GUAYMAS SB	3	5	59	17.1	3	6	55	55.1	0	56	38.0	5.0	103.87	203729.61	26.57
RDR	31	GOLDSTONE DS	3	6	34	33.9	3	6	55	53.9	0	21	19.9	5.0	105.41	203522.07	26.57
RDR	27	GUAYMAS SB	3	7	42	30.8	3	8	54	17.3	1	11	46.4	26.0	117.69	203546.42	38.86
RDR	28	CORPUS TEX SB	3	7	42	31.0	3	8	54	21.9	1	11	51.0	36.2	127.75	203026.23	47.14
RDR	31	GOLDSTONE DS	3	7	42	32.4	3	8	54	18.0	1	11	45.6	17.9	116.22	203990.80	47.14
RDR	19	GRAND BAHAMA SB	3	7	42	39.1	3	8	54	26.4	1	11	47.2	48.6	147.84	202474.05	54.31
RDR	21	ANTIGUA ISLAND SB	3	7	42	42.0	3	8	54	29.3	1	11	47.3	63.3	170.81	201985.37	61.19
RDR	18	MERRITT ISLAND SB	3	7	42	43.1	3	8	54	25.4	1	11	42.2	45.8	145.85	202582.88	61.19
RDR	20	BERMUDA SB	3	7	42	48.2	3	8	54	31.3	1	11	43.1	47.6	169.62	202506.24	47.59
RDR	23	ASCENSION SB	3	7	42	51.6	3	8	54	35.4	1	11	43.8	46.5	-94.53	202553.27	29.54

TABLE XII.- MISSION RADAR TIMELINE - Continued

(b) 5° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV	ACQ AZI	ACQ RANGE	TERM ELV
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC	DEG	DEG	N MI	DEG
RDR	22 GRAND CANARY SB	3	7	42	58.0	3	8	54	35.9	1	11	38.0	34.4	-125.84	203087.77	21.67
RDR	29 MADRID DS	3	7	43	.3	3	8	54	39.0	1	11	38.8	19.3	-122.09	203865.17	8.13
RDR	26 HAWAII SB	3	9	40	55.3	3	10	52	25.9	1	11	30.6	11.0	104.33	204660.59	26.24
RDR	27 GUAYMAS SB	3	9	41	3.7	3	10	52	37.4	1	11	33.7	46.0	143.49	202847.59	52.91
RDR	31 GOLDSTONE DS	3	9	41	4.4	3	10	52	38.7	1	11	34.3	36.9	140.62	203252.45	44.27
RDR	28 CORPUS TEX SB	3	9	41	6.1	3	10	52	45.7	1	11	39.5	51.8	161.95	202619.11	53.60
RDR	18 MERRITT ISLAND SB	3	9	41	11.5	3	10	52	47.0	1	11	36.5	52.1	-170.70	202604.79	46.98
RDR	19 GRAND BAHAMA SB	3	9	41	12.6	3	10	52	48.7	1	11	36.0	53.5	-166.17	202552.50	47.19
RDR	21 ANTIGUA ISLAND SB	3	9	41	13.5	3	10	52	52.3	1	11	38.7	54.2	-134.33	202528.25	41.28
RDR	20 BERMUDA SB	3	9	41	13.6	3	10	52	53.4	1	11	39.9	43.6	-149.22	202940.75	34.72
RDR	23 ASCENSION SB	3	9	41	15.4	3	10	36	33.6	0	55	18.2	17.9	-96.22	204250.81	34.72
RDR	22 GRAND CANARY SB	3	9	41	20.9	3	10	15	20.1	0	33	59.2	11.8	-106.73	204596.00	34.72
RDR	26 HAWAII SB	3	11	38	8.0	3	12	50	49.9	1	11	41.8	36.1	119.36	203564.81	49.28
RDR	27 GUAYMAS SB	3	11	39	24.2	3	12	51	2.7	1	11	38.4	53.3	-172.77	202846.37	48.57
RDR	31 GOLDSTONE DS	3	11	39	25.0	3	12	51	1.0	1	11	36.0	46.1	177.32	203122.96	48.57
RDR	28 CORPUS TEX SB	3	11	39	26.3	3	12	51	4.1	1	11	37.8	50.0	-151.79	202969.28	40.92
RDR	19 GRAND BAHAMA SB	3	11	39	30.7	3	12	51	8.2	1	11	37.5	39.6	-128.86	203401.71	27.03

TABLE XII.- MISSION RADAR TIMELINE - Continued

(b) 5° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	18 MERRITT ISLAND SB	3	11	39	32.3	3	12	51	3.5	1	11	36.1	40.0	-132.42	203380.36	28.15
RDR	21 ANTIGUA ISLAND SB	3	11	39	34.6	3	12	51	8.8	1	11	34.2	30.9	-110.97	203822.93	15.58
RDR	20 BERMUDA SF	3	11	39	35.6	3	12	51	9.4	1	11	33.8	26.5	-120.73	204049.18	13.86
RDR	30 CANBERRA DS	3	12	12	51.9	3	12	50	36.8	0	37	44.9	5.0	95.09	204069.49	13.86
RDR	30 CANBERRA DS	3	13	37	17.6	3	14	48	54.1	1	11	36.5	21.7	82.72	204617.38	34.84
RDR	25 GUAM SB	3	13	37	25.0	3	14	48	56.2	1	11	31.2	15.0	101.83	204991.36	31.22
RDR	26 HAWAII SB	3	13	37	34.9	3	14	49	15.8	1	11	41.0	56.0	150.26	203033.77	60.58
RDR	31 GOLDSTONE DS	3	13	37	44.4	3	14	49	29.5	1	11	45.2	39.6	-144.02	203677.35	30.25
RDR	27 GUAYMAS SB	3	13	37	45.6	3	14	49	29.8	1	11	44.2	41.7	-133.00	203684.09	29.75
RDR	28 CORPUS TEX SB	3	13	37	47.0	3	14	49	33.9	1	11	46.9	32.3	-121.03	204027.37	18.98
RDR	18 MERRITT ISLAND SB	3	13	37	48.8	3	14	47	19.4	1	9	30.7	18.6	-110.33	204765.12	18.98
RDR	19 GRAND BAHAMA SB	3	13	37	48.8	3	14	38	49.9	1	1	1.1	17.1	-108.35	204847.37	18.98
RDR	24 CARNARVON SB	3	14	45	32.8	3	14	48	47.6	0	3	14.9	5.0	94.77	205550.39	18.98
RDR	24 CARNARVON SB	3	15	35	31.6	3	16	47	4.1	1	11	32.5	16.4	89.61	205201.31	31.56
RDR	30 CANBERRA DS	3	15	35	36.8	3	16	47	10.7	1	11	33.9	43.7	60.39	203801.99	53.93
RDR	25 GUAM SB	3	15	35	43.7	3	16	47	16.7	1	11	33.0	42.1	112.74	203866.09	57.01
RDR	26 HAWAII SB	3	15	36	.3	3	16	47	30.6	1	11	30.3	57.9	-155.34	203248.01	48.78

TABLE XII.- MISSION RADAR TIMELINE - Continued

(b) 5° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	31 GOLDSTONE DS	3	15	36	9.6	3	16	47	36.6	1	11	27.1	22.0	-117.31	204851.20	9.52
RDR	26 CORPUS TEX SB	3	15	36	10.4	3	15	55	15.8	0	19	5.4	8.9	-103.20	205604.63	9.52
RDR	27 GUAYMAS SB	3	15	36	11.7	3	14	47	37.5	1	11	25.8	20.2	-110.48	204952.49	6.09
					TEI IGNITION				3 day 17 hr 4 min 1.855 sec							
					TEI CUTOFF				3 day 17 hr 6 min 53.160 sec							
RDR	24 CARNARVON SB	3	17	21	14.1	4	2	18	41.2	8	57	27.0	39.5	76.66	204889.66	5.00
RDR	30 CANBERRA DS	3	17	21	18.1	4	0	1	22.5	6	40	4.3	58.0	25.55	204166.34	5.00
RDR	25 GUAM SB	3	17	21	24.3	3	23	57	24.4	6	36	.1	63.4	137.89	204009.32	5.00
RDR	26 HAWAII SB	3	17	21	34.6	3	23	7	35.6	2	48	1.0	42.1	-122.64	204763.99	5.00
RDR	29 MADRID DS	3	23	19	16.2	4	9	31	8.6	10	11	52.4	5.0	104.00	199831.62	5.00
RDR	23 ASCENSION SB	3	23	25	26.2	4	13	45	7.8	11	19	41.6	5.0	95.92	199715.30	5.00
RDR	22 GRAND CANARY SB	3	23	51	43.1	4	13	30	20.9	10	38	40.8	5.0	100.74	199208.19	5.00
RDR	21 ANTIGUA ISLAND SB	4	2	48	23.8	4	13	43	23.5	10	54	59.7	5.0	98.75	195761.24	5.00
RDR	20 BERMUDA SB	4	3	11	57.2	4	13	43	25.2	10	31	28.0	5.0	101.70	195302.93	4.99
RDR	19 GRAND BAHAMA SB	4	4	1	27.7	4	14	42	58.2	10	41	30.5	5.0	100.37	194304.45	4.99
RDR	18 MERRITT ISLAND SB	4	4	12	33.3	4	14	51	18.1	10	38	44.8	5.0	100.80	194097.19	5.00
RDR	28 CORPUS TEX SB	4	5	18	55.5	4	15	59	6.9	10	40	11.5	5.0	100.55	192743.50	5.00
RDR	27 GUAYMAS SB	4	5	12	25.7	4	16	52	33.3	10	40	7.6	5.0	100.62	191664.07	5.00
RDR	31 GOLDSTONE DS	4	5	44	4.5	4	17	10	36.0	10	26	31.5	5.0	102.33	191014.19	4.99

TABLE XII.- MISSION RADAR TIMELINE - Continued

(b) 5° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	26 HAWAII SB	4	9	24	1.2	4	20	13	52.3	10	49	51.1	5.0	99.39	187642.88	4.99
RDR	30 CANBERRA DS	4	12	25	27.6	5	0	2	19.5	11	36	51.9	5.0	93.32	183655.72	5.00
RDR	25 GUAM SB	4	13	1	30.3	5	0	2	54.4	11	1	24.1	5.0	97.85	182839.51	5.00
RDR	24 CARNARVON SB	4	14	50	33.3	5	2	21	19.1	11	30	45.8	5.0	93.72	180329.50	5.00
RDR	29 MADRID DS	4	23	21	18.7	5	9	43	12.1	10	21	53.4	5.0	102.80	167541.35	5.00
RDR	23 ASCENSION SB	4	23	31	42.9	5	10	51	46.3	11	20	3.4	5.0	94.83	167264.05	5.00
RDR	22 GRAND CANARY SB	4	23	55	11.5	5	10	40	56.1	10	45	44.6	5.0	99.65	166629.10	5.00
RDR	21 ANTIGUA ISLAND SB	5	2	53	34.4	5	13	53	44.6	11	0	10.2	5.0	97.59	161679.04	5.00
RDR	20 BERMUDA SB	5	3	15	55.4	5	13	55	48.9	10	39	53.6	5.0	100.38	161040.78	5.00
RDR	19 GRAND BAHAMA SB	5	4	6	.7	5	14	54	56.5	10	48	55.8	5.0	99.13	159596.24	5.00
RDR	18 MERRITT ISLAND SB	5	4	17	15.9	5	15	3	37.3	10	46	21.4	5.0	99.48	159269.04	5.00
RDR	28 CORPUS TEX SB	5	5	23	45.0	5	16	11	48.3	10	48	3.4	5.0	99.23	157313.22	5.00
RDR	27 GUAYMAS SB	5	6	17	38.4	5	17	5	39.3	10	48	.9	5.0	99.22	155700.68	5.00
RDR	31 GOLDSTONE DS	5	6	48	32.0	5	17	25	1.9	10	36	29.9	5.0	100.81	154764.41	5.00
RDR	26 HAWAII SB	5	9	30	49.1	5	20	27	36.3	10	56	47.3	5.0	97.91	149707.83	5.00
RDR	30 CANBERRA DS	5	12	40	38.2	6	0	7	39.8	11	27	1.6	5.0	91.15	143477.37	5.00
RDR	25 GUAM SB	5	13	10	27.2	6	0	17	15.4	11	6	48.3	5.0	96.26	142464.65	5.00

TABLE XII.- MISSION RADAR TIMELINE - Continued

(b) 5° minimum elevation - Continued

RADAR QUANTITIES FOR VEH. 1

		SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACQ ELV DEG	ACQ AZI DEG	ACQ RANGE N MI	TERM ELV DEG
		DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR	24 CARNARVON SB	5	15	5	7.0	6	2	29	59.2	11	24	52.3	5.0	91.89	138487.05	5.00
RDR	29 MADRID DS	5	23	29	51.1	6	10	12	52.7	10	43	1.6	5.0	100.31	119112.14	4.99
RDR	23 ASCENSION SB	5	23	48	46.0	6	11	9	55.9	11	21	7.9	5.0	92.53	114321.07	5.00
RDR	22 GRAND CANARY SB	6	0	6	38.3	6	11	7	56.6	11	1	20.5	5.0	97.37	117566.27	5.00
RDR	21 ANTIGUA ISLAND SB	6	3	8	50.8	6	14	23	2.2	11	14	11.4	5.0	95.17	109591.02	5.00
RDR	20 BERMUDA SB	6	3	28	26.0	6	14	30	17.0	11	1	51.1	5.0	97.77	108700.02	5.00
RDR	19 GRAND BAHAMA SB	6	4	20	17.8	6	15	29	37.1	11	9	19.3	5.0	96.54	106309.07	5.00
RDR	18 MERRITT ISLAND SB	6	4	31	18.6	6	15	39	20.6	11	8	2.0	5.0	96.85	105794.83	5.00
RDR	28 CORPUS TEX SB	6	5	38	48.7	6	16	50	16.9	11	11	28.2	5.0	96.50	102593.26	5.00
RDR	27 GUAYMAS SB	6	6	33	24.2	6	17	47	8.6	11	13	44.4	5.0	96.39	99937.85	5.00
RDR	31 GOLDSTONE DS	6	7	2	53.5	6	18	11	12.2	11	8	18.8	5.0	97.77	98477.49	5.00
RDR	26 HAWAII SB	6	7	51	20.5	6	21	24	5.6	11	32	45.0	5.0	94.73	89760.98	5.00
RDR	30 CANBERRA DS	6	13	25	14.1	7	0	34	35.2	11	9	21.1	5.0	85.44	77613.11	5.00
RDR	25 GUAM SB	6	13	39	18.6	7	3	2	44.2	13	23	25.6	5.0	92.42	76764.08	5.00
RDR	24 CARNARVON SB	6	15	52	48.9	7	2	45	46.6	10	52	57.7	5.0	86.11	68344.51	5.00
RDR	16 TANANARIVE TLM	7	0	28	20.0	7	2	35	40.4	2	7	20.4	39.5	54.95	23399.90	5.00
RDR	11 CARNARVON CB	7	0	28	32.2	7	2	45	47.3	2	17	15.1	39.0	-45.95	23399.91	5.00

TABLE XII.- MISSION RADAR TIMELINE - Concluded

(b) 5° minimum elevation - Concluded

RADAR QUANTITIES FOR VEH. 1

	SIGNAL ACQUISITION				SIGNAL LOSS				COVERAGE DURATION			ACW ELV DEG	ACW AZI DEG	ACW RANGE N MI	TERM ELV DEG
	DAY	HRS	MIN	SEC	DAY	HRS	MIN	SEC	HRS	MIN	SEC				
RDR 10 PRETORIA C3	7	0	36	21.3	7	2	16	55.5	1	40	34.2	20.1	63.30	23399.98	5.00

ENTRY INTERFACE 7 day 3 hr 5 min 31.682 sec

MISSION SHADOW TIMELINE

TABLE XIII.- MISSION SHADOW TIMELINE

(a) Earth orbit phase

[Insertion occurs at 0:00:11:19.741]

Lighting	Enter, g.e.t., day:hr:min:sec	Exit, g.e.t., day:hr:min:sec
Earth penumbra	0:00:51:33.8	0:00:51:46.1
Earth umbra	0:00:51:46.1	0:01:25:32.3
Earth penumbra	0:01:25:32.3	0:01:25:45.0
Sunlight	0:01:25:45.0	0:02:19:42.4
Earth penumbra	0:02:19:42.4	0:02:19:54.5
Earth umbra	0:02:19:54.5	--

(b) Translunar phase

[TLI cutoff occurs at 0:02:55:42.661]

Vehicle is in sunlight throughout translunar phase.

TABLE XIII.- MISSION SHADOW TIMELINE - Continued

(c) Lunar orbit phase; LOI to circularization burn

[LOI ignition occurs at 2:21:07:29.166; cutoff at 2:21:11:35.001; circularization burn ignition occurs at 3:01:30:52.789; cutoff at 3:01:31:02.510]

Lighting	Enter, g.e.t., day:hr:min:sec	Exit, g.e.t., day:hr:min:sec
Lunar penumbra	2:22:13:59.3	2:22:14:12.7
Lunar umbra	2:22:14:12.7	2:23:00:13.9
Lunar penumbra	2:23:00:13.9	2:23:00:26.9
Sunlight	2:23:00:26.9	3:00:22:31.4
Lunar penumbra	3:00:22:31.4	3:00:22:46.7
Lunar umbra	3:00:22:46.7	3:01:08:46.3
Lunar penumbra	3:01:08:46.3	3:01:08:59.3
Sunlight	3:01:08:59.3	--

TABLE XIII.- MISSION SHADOW TIMELINE - Continued

(d) Lunar orbit phase; circularization burn to TEI

[Circularization burn ignition occurs at 3:01:30:52.789; cutoff at 3:01:31:02.510; TEI ignition occurs at 3:17:04:01.855; cutoff at 3:17:06:53.160]

Lighting	Enter, g.e.t., day:hr:min:sec	Exit, g.e.t., day:hr:min:sec
Lunar penumbra	3:02:22:45.0	3:02:22:56.1
Lunar umbra	3:02:22:56.1	3:03:08:53.4
Lunar penumbra	3:03:08:53.4	3:03:08:56.9
Sunlight	3:03:08:56.9	3:04:21:18.1
Lunar penumbra	3:04:21:18.1	3:04:21:29.3
Lunar umbra	3:04:21:29.3	3:05:07:25.4
Lunar penumbra	3:05:07:25.4	3:05:07:36.4
Sunlight	3:05:07:36.4	3:06:19:53.6
Lunar penumbra	3:06:19:53.6	3:06:20:02.3
Lunar umbra	3:06:20:02.3	3:07:05:59.0
Lunar penumbra	3:07:05:59.0	3:07:06:10.4
Sunlight	3:07:06:10.4	3:08:18:32.4
Lunar penumbra	3:08:18:32.4	3:08:18:43.8
Lunar umbra	3:08:18:43.8	3:09:04:38.7
Lunar penumbra	3:09:04:38.7	3:09:04:47.4
Sunlight	3:09:04:47.4	3:10:17:06.1
Lunar penumbra	3:10:17:06.1	3:10:17:17.0
Lunar umbra	3:10:17:17.0	3:11:03:13.3
Lunar penumbra	3:11:03:13.3	3:11:03:24.5

TABLE XIII.- MISSION SHADOW TIMELINE - Concluded

(d) Lunar orbit phase; circularization burn to TEI - Concluded

[Circularization burn ignition occurs at 3:01:30:52.789; cutoff at 3:01:31:02.510; TEI ignition occurs at 3:17:04:01.855; cutoff at 3:17:06:53.160]

Lighting	Enter, g.e.t., day:hr:min:sec	Exit, g.e.t., day:hr:min:sec
Sunlight	3:11:03:24.5	3:12:15:37.2
Lunar penumbra	3:12:15:37.2	3:12:15:51.4
Lunar umbra	3:12:15:51.4	3:13:01:46.5
Lunar penumbra	3:13:01:46.5	3:13:01:57.7
Sunlight	3:13:01:57.7	3:14:14:19.6
Lunar penumbra	3:14:14:19.6	3:14:14:30.9
Lunar umbra	3:14:14:30.9	3:15:00:25.9
Lunar penumbra	3:15:00:25.9	3:15:00:40.9
Sunlight	3:15:00:40.9	3:16:12:54.5
Lunar penumbra	3:16:12:54.5	3:16:13:05.2
Lunar umbra	3:16:13:05.2	3:16:59:00.8
Lunar penumbra	3:16:59:00.8	3:16:59:12.1
Sunlight	3:16:59:12.1	--

(e) Transearth phase

[TEI ignition occurs at 3:17:04:01.855; cutoff at 3:17:06:53.160
Entry interface occurs at 7:03:05:31.682]

Earth penumbra	7:02:40:25.2	7:02:40:40.2
Earth umbra	7:02:40:40.2	--