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MSC INTERNAL NOTE NO. 68-FM-200

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APOLLO MISSION G SPACECRAFT REFERENCE TRAJECTORY VOLUME V - MISSION SUMMARIES: SEPTEMBER 1969 LAUNCH WINDOW

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(NASA-TM-X-69747) APOLLO MISSION G SPACECRAFT REFERENCE TRAJECTORY. VOLUME 5: MISSION SUMMARIES: SEPTEMBER 1969 LAUNCH WINDOW (NASA) 333 p

N74-71199

Unclas
00/99 16332

MSC INTERNAL NOTE NO. 68-FM-200

PROJECT APOLLO

APOLLO MISSION G SPACECRAFT REFERENCE TRAJECTORY
VOLUME V - MISSION SUMMARIES: SEPTEMBER 1969 LAUNCH WINDOW

By Lunar Mission Analysis Branch

August 16, 1968

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

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FOREWORD

The spacecraft reference trajectory for Mission G is composed of five volumes which summarize the lunar landing missions for a three-month launch period (July, August, and September, 1969). The contents of each volume are briefly described below:

1. Volume I - Reference Mission Profile (launched August 14, 1969): Detailed mission description of the first launch opportunity, first injection opportunity in the August 1969 launch window. MSC IN 68-FM-196, August 9, 1968.

2. Volume II - Reference Mission Profile Trajectory Parameters (launched August 14, 1969): Listing of significant trajectory parameters computed at selected time points during each phase of the same typical mission described in Volume I. MSC IN 68-FM-197, August 16, 1968.

3. Volume III - Mission Summaries: July 1969 Launch Window: Summaries of CSM trajectory parameters at selected time points for each launch date in the July 1969 window. The LM trajectory phases were not simulated for this month. MSC IN 68-FM-198, August 16, 1968.

4. Volume IV - Mission Summaries: August 1969 Launch Window: Summaries of CSM trajectory parameters at selected time points for each launch date in the August 1969 window. This volume also contains LM trajectory summaries for the first launch opportunity, first injection opportunity on each day. MSC IN 68-FM-199, August 16, 1968.

5. Volume V - Mission Summaries: September 1969 Launch Window: Summaries of CSM trajectory parameters at selected time points for each launch date in the September 1969 window. The LM trajectory phases were not simulated for this month. MSC IN 68-FM-200, August 16, 1968.

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APOLLO MISSION G SPACECRAFT REFERENCE TRAJECTORY

VOLUME V - MISSION SUMMARIES: SEPTEMBER 1969 LAUNCH WINDOW

By Lunar Mission Analysis Branch

SUMMARY

This is the fifth volume of the G mission reference trajectory. Volumes I and II provide a detailed description of one typical lunar landing mission, the first opportunity in the August 1969 launch window.

This volume, Volume V, and Volumes III and IV summarize the lunar missions for the three monthly launch windows; July, August and September 1969, respectively. These volumes contain summaries of discrete missions throughout the monthly windows and summaries of significant trajectory parameters as a function of launch azimuth for each daily window.

This volume summarizes the missions for the September 1969 launch window. However, to show the variation of particular mission characteristics from one month to the next, certain parameters are presented for each monthly window. The three monthly windows are also discussed jointly in the evaluation section.

Volume IV (August Mission Summaries) includes the LM trajectory data for the first mission for each August launch date. Only these four missions are presented since the LM trajectory is most dependent upon lunar site longitude and is essentially independent of launch month and launch azimuth.

In evaluating the missions over the three-month period, there are several significant points of interest. Based on spacecraft performance, the July window was designed for Pacific injections and the August and September windows were designed for Atlantic injections resulting in night launches for these last two months. Besides the night launch implication associated with the Atlantic injection window, the operational support for Atlantic injections is limited. These considerations are covered in more detail in the reference trajectory evaluation section.

INTRODUCTION

Ten discrete missions were generated for each launch date; they consist of two injection opportunities for five selected launch azimuths within the azimuth ranges shown in table I. The mission constraints and guidelines, spacecraft weights and ΔV budget used in generating the missions are consistent with those used in Volume I.

Guided entry trajectories were not computed for these missions. The touchdown points presented were predicted using a fixed entry range of 2000 n. mi. and a fixed time from entry to touchdown of 15 minutes.

LAUNCH WINDOW DESCRIPTION

Table I summarizes the launch window configuration for each monthly window; table II gives the selenographic coordinates of the lunar landing sites. The sun elevation angles at time of lunar landing for each mission are given in table III.

For the transposition and docking phase, a standard local horizontal attitude was selected for each launch day to meet the communications, tracking, and lighting constraints.

Since the decision has been made to jettison the spacecraft LM adapter (SLA) panels on the S-IVB prior to T&D, the lighting constraint as presented in the AS-504 and Subsequent Missions Joint Reference Constraints was assumed to be invalid. For this reference trajectory, the lighting constraint was assumed to be that the angle between the +X-axis of the S-IVB and the sun should not be greater than 90° or less than 30°. There was no conflict between the attitude requirements for the communication and lighting constraints.

The local horizontal maneuvers and the vehicle-sun look angles are given in tables IV through VII. The launch vehicle IU gimbal angles are also presented for information only. These gimbal angles were computed using an approximation of the launch vehicle phase of the mission and do not accurately represent the proper launch vehicle IU alignment.

This approximation of the launch vehicle trajectory should be kept in mind for all parameters associated with launch vehicle mission phases. These parameters are presented only to show typical variations and are not official.

The symbols and terms used in this volume are defined in table VIII.

Tables IX through XII present the mission summaries which provide chronological trajectory data for each mission. These data are presented in parameter "blocks" for selected points during a particular mission. Each parameter block of a specific mission begins with an identification number for that mission. The first digit designates the month of launch; the following digits give the launch day, launch azimuth, and injection opportunity, respectively.

Tables XIII through XVI present trajectory parameters as a function of launch azimuth at selected points during all missions for a particular launch date. The first column of each parameter block lists the launch azimuth, followed by the injection opportunity; subsequent columns list parameters corresponding to this launch azimuth. This allows one to quickly trace the value of a given parameter throughout the daily launch window.

In cases where more parameters are included for a specific point in the mission than there are columns available in one print block, parameters for that point have been divided into two print blocks.

Figures 1 through 4 show the behavior of significant trajectory parameters as a function of launch azimuth for the 4 daily launch windows in the month. The significance of most of the data is evident.

Figures (g) through (j) for each launch date show the nodal target parameters as a function of launch azimuth. These parameters are currently being considered as targets for the midcourse correction processor in the Real Time Computer Complex.

The SPS propellant reserve figures [figure (o) for each day] are provided to show the typical variation across each launch window. These values do not represent realistic reserves since the total SPS ΔV budget was not taken into account. The only off-nominal fuel allowances made were for the translunar and transearth midcourse ΔV's (120 and 62 fps respectively). These reserves do not reflect guidance dispersions, LM rescue requirements, changes in lunar orbit stay time, etc.

EVALUATION

The reference trajectory demonstrates the capability of the launch vehicle and spacecraft to meet all objectives of mission G without any serious violation of mission constraints and guidelines. The nominal fuel reserves for each day are within the SPS ΔV budget including contingency allowances. The length of each daily launch window is well above the minimum requirement (2.5 hours).

A 26° launch azimuth range was chosen for each launch date except September 16, 1969. On this date the declination of the moon exceeds the earth parking orbit inclination for launch azimuths around 90°. No coplanar TLI free return solutions exist for this situation; therefore, the launch window was limited to a 14° range (72-86°). This provides a window duration of over 3.5 hours, well above the 2.5 hour minimum requirement as mentioned earlier.

Although the launch window could have been extended to 98° by performing a plane change at TLI, this would have resulted in the irregular behavior of many trajectory parameters and would have required a complete alteration of the present MSC/MSFC launch vehicle targeting scheme. Also, this increase in the window (from 86 to 98°) would have extended the launch window duration by only about 45 minutes.

Although none of the missions violate any "hard" mission constraints, there are some missions during this period which have some undesirable features and some interesting characteristics which should be noted. There are also some areas which need further investigation, such as the vehicle attitudes during some mission phases and how these attitudes affect the communications.

One undesirable feature of the August and September windows is the necessity of night launch. Pacific injection would have resulted in daylight launch for these missions, but the Atlantic injection was chosen for spacecraft performance considerations. Particular attention should be given to the Atlantic injections since the ground support facilities in this region are somewhat limited as compared to those in the Pacific injection area. The necessity of moving the injection ships from the Pacific to the Atlantic between the July and August launch windows also presents a problem. The missions presented in both the preliminary mission profile and preliminary reference trajectory documents were designed for Pacific injections.

Also, the total time in earth parking orbit for first injection opportunity missions in August and September is generally short. For two of these missions, the mission launched August 21, 1969 along an

azimuth of 98° and the mission launched September 16, 1969 along an azimuth of 86°, this time is slightly less than the minimum requirement of 1.4 hours. The times are 1.39 hours and 1.38 hours, respectively.

For missions targeted for the two eastern lunar landing sites, II-P-2 and II-P-6, earth landing occurs before sunrise. This occurs on the first two launch days of each month. These dates and the approximate times between landing and sunrise are as follows:

July 15, 1969:	2 hr
July 16, 1969:	1 hr
August 14, 1969:	2 hr
August 15, 1969:	1 hr
September 13, 1969:	1.3 hr
September 14, 1969:	0.3 hr

The night landing is unavoidable because the local time at a given landing longitude is dictated by the sun-earth-moon geometry associated with missions to the more eastern lunar landing sites.

TABLE I.- LAUNCH WINDOW CONFIGURATION FOR MISSION G REFERENCE TRAJECTORY

Launch date 1969	LLS	Range of launch azimuth deg	Time at opening of window, g.m.t. hr:min:sec	Window duration, hr:min:sec	Selenographic approach azimuth to LLS, deg	Range of sun elevation angles at landing deg
July 15	II-P-2	75 - 101	13:50:42.2	03:18:46.6	-93.5	7.43 - 9.72
16	II-P-6	80 - 106	14:27:26.6	03:14:42.4	-93.0	9.71 - 11.88
18	II-P-8	82 - 108	14:37:34.4	03:33:04.7	-90.0	8.10 - 10.18
22	II-P-13	82 - 108	14:39:06.1	04:15:23.6	-91.0	12.62 - 14.87
Aug 14	II-P-2	72 - 98	01:06:46.1	03:30:20.1	-98.75	7.45 - 9.83
15	II-P-6	72 - 98	02:28:33.2	03:36:23.3	-97.30	9.85 - 12.24
17	II-P-8	72 - 98	05:24:46.9	03:54:33.5	-93.20	9.11 - 11.50
21	II-P-13	72 - 98	10:05:25.7	03:59:45.6	-90.13	15.80 - 18.25
Sept 13	II-P-2	72 - 98	03:09:29.6	03:51:29.6	-93.32	12.57 - 14.98
14	II-P-6	72 - 98	04:41:51.5	04:04:23.8	-90.92	14.93 - 17.35
16	II-P-8	72 - 86	07:23:29.8	03:35:44.9	-86.00	14.06 - 15.75
19	II-P-13	72 - 98	08:45:09.0	03:36:42.1	-88.20	9.16 - 11.57

TABLE II.- LUNAR LANDING SITE COORDINATES

Lunar landing site number	Selenographic latitude	Selenographic longitude	Altitude above mean lunar radius, n. mi.
II-P-2	2° 45' N	34° 00' E	-0.8180
II-P-6	0° 45' N	24° 10' E	-1.6630
II-P-8	0° 05' N	1° 00' W	-0.5075
II-P-13	1° 30' N	42° 20' W	-1.3283

TABLE III.- LANDING SITE SUN ELEVATION ANGLE AT CSM FIRST PASS OVER THE SITE

July 1969			
Launch day	Launch azimuth, deg	Injection opportunity	Sun elevation angle, deg
15	75	1	7.433
		2	8.171
	81	1	7.798
		2	8.528
	87	1	8.180
		2	8.909
	93	1	8.553
		2	9.274
	101	1	8.994
		2	9.716
16	80	1	9.711
		2	10.424
	86	1	10.093
		2	10.789
	92	1	10.458
		2	11.154
	98	1	10.798
		2	11.503
	106	1	11.189
		2	11.885
18	82	1	8.100
		2	8.779
	88	1	8.448
		2	9.126
	94	1	8.804
		2	9.483
	100	1	9.143
		2	9.813
	108	1	9.525
		2	10.178
22	82	1	12.622
		2	13.324
	88	1	12.918
		2	13.620
	94	1	13.299
		2	14.001
	100	1	13.722
		2	14.407
	108	1	14.213
		2	14.873

August 1969			
Launch day	Launch azimuth, deg	Injection opportunity	Sun elevation angle, deg
14	72	1	7.447
		2	8.380
	78	1	7.702
		2	8.618
	84	1	8.015
		2	8.923
	90	1	8.380
		2	9.296
	98	1	8.914
		2	9.830
15	72	1	9.855
		2	10.789
	78	1	10.126
		2	11.043
	84	1	10.449
		2	11.357
	90	1	10.814
		2	11.722
	98	1	11.332
		2	12.239
17	72	1	9.110
		2	9.975
	78	1	9.441
		2	10.288
	84	1	9.814
		2	10.661
	90	1	10.195
		2	11.034
	98	1	10.661
		2	11.500
21	72	1	15.797
		2	16.558
	78	1	16.228
		2	16.989
	84	1	16.685
		2	17.437
	90	1	17.099
		2	17.843
	98	1	17.497
		2	18.249

September 1969			
Launch day	Launch azimuth, deg	Injection opportunity	Sun elevation angle, deg
13	72	1	12.571
		2	13.434
	78	1	12.901
		2	13.756
	84	1	13.281
		2	14.120
	90	1	13.663
		2	14.502
	98	1	14.137
		2	14.984
14	72	1	14.930
		2	15.777
	78	1	15.294
		2	16.116
	84	1	15.693
		2	16.506
	90	1	16.082
		2	16.888
	98	1	16.540
		2	17.353
16	72	1	14.057
		2	14.853
	76	1	14.311
		2	15.098
	80	1	14.582
		2	15.353
	83	1	14.786
		2	15.555
	86	1	14.997
		2	15.751
19	72	1	9.163
		2	9.940
	78	1	9.546
		2	10.312
	84	1	9.940
		2	10.709
	90	1	10.346
		2	11.106
	98	1	10.810
		2	11.571

TABLE IV.- VARIATIONS OF SUN LOOK ANGLES AND S-IVB IU GIMBAL ANGLES

ACROSS THE LAUNCH WINDOW FOR SEPTEMBER 13, 1969

[Local horizontal T&D attitude at TLI + 15 min; pitch = 120°, yaw = 0°, roll = 180°]

Launch azimuth, deg	Injection opportunity	Gimbal angles			Sun look angles	
		IGA, deg	MGA, deg	OGA, deg	ALS, deg	BTS, deg
(a) Prior to maneuver						
72	2	113.91724	-.7327219	1.68600	51.037443	-51.867808
72	1	114.15736	-1.9996973	-1.73416	49.971201	-47.901744
78	2	126.45465	-.4734139	1.64147	50.875233	-47.914566
78	1	126.71011	-1.6441683	-1.51475	49.913380	-44.214443
84	2	139.32052	-.1899823	1.54412	50.940569	-45.132745
84	1	139.59999	-1.3010985	-1.44301	50.032783	-41.615792
90	2	151.04633	.0564603	1.36448	51.203185	-43.962248
90	1	151.32242	-1.0287960	-1.55091	50.326104	-40.523933
98	2	162.91559	.3008021	1.08654	51.842944	-45.262986
98	1	163.15833	-.8122848	-1.91346	50.946875	-41.745286
(b) After maneuver						
72	2	-126.09021	1.8288677	179.79560	84.182025	37.932725
72	1	-125.80106	-.4997650	-177.39911	82.936540	34.923420
78	2	-113.54617	1.6594425	179.59103	82.254369	35.522065
78	1	-113.25884	-.4890688	-177.81878	81.204106	32.674748
84	2	-100.67443	1.4324902	179.39262	80.831747	33.879783
84	1	-100.37396	-.5995471	-178.15312	79.918482	31.131329
90	2	-88.94566	1.1533273	179.26836	80.063719	33.317057
90	1	-88.65158	-.8295619	-178.33550	79.193904	30.608856
98	2	-77.07600	.7909696	179.19668	80.189383	34.530282
98	1	-76.80997	-1.2512597	-178.34067	79.236070	31.757638

TABLE V.- VARIATIONS OF SUN LOOK ANGLES AND S-IVB IU GIMBAL ANGLES

ACROSS THE LAUNCH WINDOW FOR SEPTEMBER 14, 1969

[Local horizontal T&D attitude at TLI + 15 min; pitch = 120°, yaw = 0°, roll = 180°]

Launch azimuth, deg	Injection opportunity	Gimbal angles			Sun look angles	
		IGA, deg	MGA, deg	OGA, deg	ALS, deg	BTS, deg
(a) Prior to maneuver						
72	2	123.86943	-.8242184	1.51624	62.249889	-39.289162
72	1	124.17119	-1.8624341	-1.32160	61.435802	-36.088683
78	2	138.12665	-.5636758	1.36173	62.130917	-34.391728
78	1	138.44054	-1.4674206	-1.11025	61.435339	-31.585315
84	2	152.67437	-.3194370	1.10138	62.211669	-30.643571
84	1	152.98139	-1.1210227	-1.09013	61.609364	-28.143600
90	2	165.08161	-.1303524	.81006	62.489337	-29.031724
90	1	165.36694	-.8927811	-1.27303	61.937362	-26.650613
98	2	175.39122	.0628437	.55979	63.138779	-31.108712
98	1	175.66431	-.7578813	-1.68701	62.546483	-28.555822
(b) After maneuver						
72	2	-116.14082	1.7244620	179.95413	68.876561	36.926277
72	1	-115.80305	-.2144993	-177.72937	67.938522	33.934406
78	2	-101.87761	1.4587646	179.80316	66.543730	32.980839
78	1	-101.54151	-.2308147	-178.17973	65.865099	30.274078
84	2	-87.32606	1.1099025	179.71953	64.780430	29.900177
84	1	-87.00276	-.3879048	-178.49175	64.273160	27.431757
90	2	-74.91739	.7624539	179.70063	63.853763	28.656563
90	1	-74.61495	-.6608576	-178.59871	63.395105	26.281224
98	2	-64.60717	.4500933	179.65986	64.177191	30.804220
98	1	-64.31027	-1.0859216	-178.50703	63.606850	28.269283

TABLE VI.- VARIATIONS OF SUN LOOK ANGLES AND S-IVB IU GIMBAL ANGLES

ACROSS THE LAUNCH WINDOW FOR SEPTEMBER 16, 1969

[Local horizontal T&D attitude at TLI + 15 min; pitch = 120°, yaw = 0°, roll = 180°]

Launch azimuth, deg	Injection opportunity	Gimbal angles			Sun look angles	
		IGA, deg	MGA, deg	OGA, deg	AIS, deg	BTS, deg
(a) Prior to maneuver						
72	2	134.63283	-1.1224398	.77541	86.263861	-16.188136
72	1	135.01512	-1.6274243	-.77263	85.820448	-14.596010
76	2	145.81116	-.8442304	.82635	86.447872	-12.153954
76	1	146.37041	-1.2294925	-.39484	85.883229	-10.897152
80	2	158.21805	-.5696542	.81220	86.709835	-8.063080
80	1	158.91919	-.8311535	-.06924	86.040720	-7.155427
83	2	168.33748	-.3813062	.75492	86.950890	-4.891982
83	1	169.11697	-.5473355	.13759	86.220905	-4.255833
86	2	179.88808	-.2141466	.66112	87.237499	-1.149708
86	1	-179.28322	-.2706069	.35068	86.467639	-.827389
(b) After maneuver						
72	2	-105.38100	1.2284163	-179.42294	37.121136	27.451073
72	1	-104.97602	.1398616	-178.21266	36.924538	24.731951
76	2	-94.19805	1.1319355	-179.69193	35.508408	21.211226
76	1	-93.62822	.2664407	-178.74850	35.674676	18.865725
80	2	-81.78673	.9809741	-179.92434	34.170249	14.438609
80	1	-81.08255	.3478328	-179.25873	34.641667	12.628733
83	2	-71.66470	.8359324	179.93862	33.377295	8.905832
83	1	-70.88502	.3840913	-179.60982	34.022667	7.606749
86	2	-60.11254	.6697834	179.83807	32.780553	2.122688
86	1	-59.28428	.4287633	-179.95922	33.541425	1.496520

TABLE VII.- VARIATIONS OF SUN LOOK ANGLES AND S-IVB IU GIMBAL ANGLES

ACROSS THE LAUNCH WINDOW FOR SEPTEMBER 19, 1969

[Local horizontal T&D attitude at TLI + 15 min; pitch = 120°, yaw = 35°, roll = 180°]

Launch azimuth, deg	Injection opportunity	Gimbal angles			Sun look angles	
		IGA, deg	MGA, deg	OGA, deg	ALS, deg	BTS, deg
(a) Prior to maneuver						
72	2	112.09246	-1.331722	.30599	125.83026	-5.35108
72	1	112.69613	-1.611971	-.87506	125.26368	-4.30771
78	2	123.60853	-1.011460	.42226	126.25725	-2.66548
78	1	124.31367	-1.201132	-.51988	125.60477	-1.81959
84	2	135.31669	-.694212	.42699	126.71995	-.95145
84	1	136.07511	-.826314	-.36295	126.01994	-.23679
90	2	146.00927	-.422544	.31122	127.16410	-.44878
90	1	146.78113	-.539630	-.43930	126.45152	.22858
98	2	157.21112	-.169131	.01211	127.66337	-1.71708
98	1	157.94059	-.333917	-.86767	126.98877	-.93727
(b) After maneuver						
72	2	-128.63067	35.927207	-178.75983	39.73510	99.30361
72	1	-128.57874	35.029624	-177.75694	38.84370	98.51699
78	2	-116.87258	35.870366	-179.17668	37.61551	100.32803
78	1	-116.59560	35.140987	-178.40814	36.85794	99.39050
84	2	-104.96328	35.717054	-179.52080	36.31246	101.40210
84	1	-104.55232	35.094381	-178.90286	35.63871	100.36947
90	2	-94.14191	35.481433	-179.74018	35.98722	102.25470
90	1	-93.69686	34.886862	-179.16184	35.33385	101.20327
98	2	-82.88973	35.095499	-179.82444	37.06449	102.79992
98	1	-82.55710	34.413463	-179.12154	36.34314	101.85329

TABLE VIII.- DEFINITION OF SYMBOLS AND TERMS

ACLE	earth-LM-CSM angle
ACLS	CSM-LM-sun angle
ALLH	angle between the local horizontal X-axis and the line of sight to the vehicle
ALLS	angle between the line of sight to the landing site and the X-axis of the vehicle
ALT	geographic altitude
ALTS	selenographic altitude (measured from mean sphere)
APF	argument of periapsis, geocentric
APFS	argument of periapsis, selenocentric
APOS	radius of apoapsis, selenocentric
ATH	angle between the projection of the LM position vector into the flight plane of the CSM and the position vector of the CSM. The angle is positive when the CSM is ahead of the LM.
AZ	inertial azimuth
AZE	rotational geographic azimuth
AZR	selenographic azimuth
AZTD	azimuth at earth landing
BARC	burn arc
BETA	angle between the projection of the thrust acceleration vector and the velocity vector into the local horizontal plane

TABLE VIII.- DEFINITION OF SYMBOLS AND TERMS - Continued

BTLH	angle between the projection of the line of sight to the other vehicle into the Y-Z plane and the local horizontal negative Z-axis. The angle is measured positively from the negative Z-axis toward the positive Y-axis.
BTLS	angle between the projection of the line of sight to the landing site into the Y-Z plane and the negative Z-axis of the vehicle. Angle is measured positively from the negative Z-axis toward the positive Y-axis.
C3TLI	vis-viva energy at translunar injection cutoff (C3), $(e.r.)^2/hr^2$
DAZTLI	plane change during translunar injection - the angle between the earth parking orbit plane and the initial translunar trajectory plane
DEC	geocentric declination of vehicle
DELV	characteristic velocity gained during thrust
DEM	geocentric declination of the moon
DEMP	earth-moon plane latitude of the intersection of the lunar approach hyperbola with the lunar parking orbit plane
DES	geocentric declination of the sun
DRNL	range rate of RANG
DTBURN	burn time, sec
DX, DY, DZ	components of vehicle velocity in inertial geocentric Cartesian coordinates
DXL, DYL, DZL	components of vehicle velocity in inertial selenocentric Cartesian coordinates

TABLE VIII.- DEFINITION OF SYMBOLS AND TERMS - Continued

DXS, DYS, DZS	components of vehicle velocity in rotational selenographic Cartesian coordinates
ECC	eccentricity, geocentric
ECCS	eccentricity, selenocentric
ENERGY	vis-viva energy at translunar injection cutoff (C3), $(e.r.)^2/hr^2$
ENTDT	time from entry to earth landing
ENTRG	entry range - range from entry to touchdown
EPOI	earth parking orbit insertion
FUEL	fuel used, lb
FUEL RESERVE	usable SPS fuel reserve after transearth injection, lb
g.e.t.	ground elapsed time (time since lift-off)
G.m.t.	Greenwich mean time
HRS	hours
ID	mission indentification number. The first digit indicates the month of launch, the following two digits indicate the day of launch (G.m.t.), the next three digits indicate the launch azimuth, and the digit following the decimal indicates the translunar injection opportunity. (e.g., 204 072.2 signifies a February 4 mission with a 72° launch azimuth designed to inject on the second opportunity.)
INC	inclination of the vehicle flight plane to the earth equatorial plane

TABLE VIII.- DEFINITION OF SYMBOLS AND TERMS - Continued

INCS	selenocentric inclination of the vehicle flight plane
INJECTION OPPORTUNITY	an indicator: if = 1, indicates a mission designed for a translunar injection over the Pacific during the second earth orbit; if = 2, indicates a Pacific injection during the third earth orbit.
INMP	inclination of the vehicle flight plane to the earth-moon plane
LAN	selenographic longitude of the ascending node
LAP	selenographic argument of periapsis
LAT	geodetic latitude
LATS	selenographic latitude
LATTD	geodedic latitude of earth landing
LAZ	inertial azimuth of launch
LIN	selenographic inclination of the vehicle flight plane
LNE	selenographic longitude of the earth
LNS	selenographic longitude of the sun
LOI	lunar orbit insertion
LON	geographic longitude
LONS	selenographic longitude
LONTD	geographic longitude of earth landing
LOS	geographic longitude of the sun
LTE	selenographic latitude of the earth

TABLE VIII.- DEFINITION OF SYMBOLS AND TERMS - Continued

LTS	selenographic latitude of the sun
MASS	instantaneous mass of the vehicle,lb
MINS	minutes
MONTH	month of the year
OPP	same as INJECTION OPPORTUNITY
PERS	period of the orbit, hours
PLCHNG	total orbital plane change since thrust initiation
PTE	rotational geographic flight-path angle
PTH	inertial geocentric flight-path angle
PTR	selenographic flight-path angle
R	inertial geocentric radius vector magnitude
RA	inertial geocentric right ascension
RAM	inertial geocentric right ascension of the moon
RAMP	earth-moon plane longitude of the intersection of the lunar approach hyperbola with the lunar parking orbit plane
RAN	inertial geocentric right ascension of the ascending node
RANG	range from vehicle to lunar landing site
RANGE	distance between LM and CSM
RANS	right ascension of ascending node in selenocentric reference
RAS	inertial geocentric right ascension of the sun

TABLE VIII.- DEFINITION OF SYMBOLS AND TERMS - Continued

RCX, RCY, RCZ	RCX is the angle from the LM radius vector to the CSM flight plane. RCY is the required LM altitude increment to be gained for rendezvous with the CSM. RCZ is the angle from the projection of the LM radius vector in the CSM flight plane to the CSM radius vector.
RMP	selenocentric radius of the intersection of the lunar approach hyperbola with the lunar parking orbit plane
RP	radius of periapsis
RPS	radius of periapsis in selenocentric reference
R RATE	time rate of change of RANGE
SECS	seconds
SMA	semimajor axis
SMAS	semimajor axis, selenocentric
SPSFR	service propulsion system fuel reserve at entry
SRANG	surface range from vehicle to lunar landing site
TAS	true anamoly in selenocentric reference
TEI	transearth injection
THETA	angle between the thrust acceleration vector and the local horizontal plane
TLI	translunar injection
V	inertial geocentric velocity vector magnitude

TABLE VIII.- DEFINITION OF SYMBOLS AND TERMS - Concluded

VE	rotational geographic velocity vector magnitude
VRS	rotational selenographic velocity vector magnitude
X, Y, Z	components of vehicle position in inertial geocentric Cartesian coordiantes
XL, YL, ZL	components of vehicle position in inertial selenocentric Cartesian coordinates
XS, YS, ZS	components of vehicle position in rotational selenographic Cartesian coordiantes
YEAR	calendar year

TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969

(a) 72° launch azimuth; first injection opportunity

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ID      913072.1
LAUNCH TIME      13  SEPT. 1969    3 HRS,    9 MINS,  29.338 SECS   G.M.T.
LAUNCH AZIMUTH   72.                          INJECTION OPPORTUNITY    1
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ID      913072.1
EARTH PARKING ORBIT INSERTION
   13  SEPT. 1969   3 HRS,  20 MINS,  49.079 SECS  G.M.T. ****   0. HRS,   11. MINS,  19.741 SECS  G.E.T.
X       2.9216632+03  Y      -6.3081060+02  Z       1.9040553+03  DX      4.8830558+03  DY      2.5083784+04  DZ      8.1745141+02
ALT     1.0334399+02  LAT     3.2667610+01  LON     3.0566189+02  V       2.5567727+04  PTH     1.7683546-07  AZ      8.7827504+01
R       3.5439334+03  DEC     3.2498104+01  RA     -1.2183598+01  RAS     1.7097021+02  DES     3.8934285+00  RAN    -9.8144800+01
INC     3.2562694+01  MASS    2.8296469+05
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ID      913072.1
3.5 MINS PRIOR TO TLI INITIATION
   13  SEPT. 1969   4 HRS,  57 MINS,    .222 SECS  G.M.T. ****   1. HRS,   47. MINS,  30.884 SECS  G.E.T.
X       2.8233065+03  Y       1.3640236+03  Z       1.6513754+03  DX     -7.3273923+03  DY      2.3508286+04  DZ     -6.8967675+03
ALT     1.0240310+02  LAT     2.7923483+01  LON     3.1951980+02  V       2.5571381+04  PTH    -6.8084002-03  AZ      1.0774387+02
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ID      913072.1
TRANSLUNAR INJECTION INITIATION
   13  SEPT. 1969   5 HRS,   0 MINS,  30.222 SECS  G.M.T. ****   1. HRS,   51. MINS,    .884 SECS  G.E.T.
X       2.4853496+03  Y       2.1259213+03  Z       1.3642478+03  DX     -1.2128481+04  DY      2.0351952+04  DZ     -9.6324999+03
ALT     1.0146577+02  LAT     2.2775624+01  LON     3.3339888+02  V       2.5575125+04  PTH    -1.1368465-02  AZ      1.1407965+02
R       3.5436811+03  DEC     2.2642523+01  RA      4.0543056+01  RAS     1.7103235+02  DES     3.8669313+00  RAN    -9.8713522+01
INC     3.2583124+01  MASS    2.8076138+05
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ID      913072.1
TRANSLUNAR INJECTION TERMINATION
   13  SEPT. 1969   5 HRS,   5 MINS,  39.140 SECS  G.M.T. ****   1. HRS,   56. MINS,   9.802 SECS  G.E.T.
X       1.5866697+03  Y       3.1639382+03  Z       7.1608980+02  DX     -2.4210067+04  DY      2.0768663+04  DZ     -1.5783574+04
ALT     1.6772866+02  LAT     1.1508878+01  LON     3.5493203+02  V       3.5589126+04  PTH     7.1492896+00  AZ      1.1877697+02
R       3.6112062+03  DEC     1.1437363+01  RA      6.3366888+01  RAS     1.7103557+02  DES     3.8655625+00  DEM    -3.8419517+00
RAN    -9.6781307+01  INC     3.0784902+01  ECC     9.7472095-01  SMA     1.4061237+05  RP      3.5545465+03  APF     1.4271989+02
INMP    4.2946247+01  C3TLI  -4.8762640-01  DAZTLI-2.0646404+00   MASS    1.3097598+05  FUEL    1.4978541+05
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ID      913072.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   13  SEPT. 1969   7 HRS,   5 MINS,  39.140 SECS  G.M.T. ****   3. HRS,   56. MINS,   9.802 SECS  G.E.T.
X      -1.8359812+04  Y      -1.7283390+02  Z      -1.0845236+04  DX     -1.1185269+04  DY     -6.0722426+03  DZ     -6.1857749+03
ALT     1.7883490+04  LAT    -3.0596613+01  LON     8.2022364+01  V       1.4150836+04  PTH     6.5003993+01  AZ      8.6246753+01
R       2.1324439+04  DEC    -3.0569454+01  RA     -1.7946064+02  RAS     1.7111038+02  DES     3.8336577+00
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ID      913072.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   16  SEPT. 1969   3 HRS,  29 MINS,  10.842 SECS  G.M.T. ****  72. HRS,   19. MINS,  41.504 SECS  G.E.T.
RMP     9.9920067+02  DEMP    6.3047479+00  RAMP    1.7901402+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(a) 72° launch azimuth; first injection opportunity - Continued

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ID      913072.1
LUNAR ORBIT INSERTION BURN INITIATION
   16  SEPT. 1969   3 HRS,  25 MINS,  51.475 SECS  G.M.T. ****  72. HRS,   16. MINS,  22.137 SECS  G.E.T.
XL     -5.1312282+02  YL     -8.1588876+02  ZL     -3.4696911+02  DXL    -6.3417457+03  DYL     4.5244099+03  DZL     2.9617251+03
XS     -1.0087039+03  YS     -1.7753787+02  ZS     -1.8809909+01  DXS    -2.5391313+01  DYS     8.2863539+03  DZS     1.0323589+03
ALTS    8.5887747+01  LATS   -1.0521366+00  LONS   -1.7001784+02  VRS     8.3504531+03  PTR    -9.8609610+00  AZR    -8.2974461+01
LIN     1.7288253+02  LAN    -1.7847557+02  LAP     1.9298633+02  LTS    -1.9527185-02  LNS     1.2303318+02  DEM    -2.0445131+01
THETA   1.5397213+01  BETA   -1.7459074+02  MASS    9.4833024+04
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ID      913072.1
LUNAR ORBIT INSERTION BURN TERMINATION
   16  SEPT. 1969   3 HRS,  32 MINS,  11.534 SECS  G.M.T. ****  72. HRS,   22. MINS,  42.195 SECS  G.E.T.
XL     -8.1483836+02  YL     -5.4373041+02  ZL     -1.8676896+02  DXL    -3.1039834+03  DYL     4.0292066+03  DZL     2.0519308+03
XS     -9.6358259+02  YS      2.5548022+02  ZS      2.6932377+01  DXS     1.4596565+03  DYS     5.2893227+03  DZS     3.8570107+02
ALTS    5.8746131+01  LATS    1.5475711+00  LONS    1.6515050+02  VRS     5.5005724+03  PTR    -4.6788977-01  AZR    -8.5964824+01
LIN     1.7566765+02  LAN    -1.7395680+02  LAP     5.8615156+00  SMAS    1.0527078+03  ECCS    5.3321917-02  PERS    2.1457519+00
RPS     9.9657544+02  APOS    1.1088402+03  RANS   -1.7083800+02  INCS    1.5535265+02  LTS    -1.9658484-02  LNS     1.2297943+02
LTE     5.4904083+00  LNE    -4.9529422+00  THETA  -9.3586902+00  BETA   -1.7185624+02  FUEL    2.4161553+04  BARC    2.4907380+01
DELV    2.9765986+03  MASS    7.0671471+04  PLCHNG  2.8200603+00  DRTX   -2.8569850+03  DRTY   -2.7052993+02  DRTZ   -7.9031464+02
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ID      913072.1
CIRCULARIZATION BURN INITIATION
   16  SEPT. 1969   7 HRS,  52 MINS,  33.282 SECS  G.M.T. ****  76. HRS,   43. MINS,   3.943 SECS  G.E.T.
XL     -8.9713683+02  YL     -4.1614818+02  ZL     -1.2279913+02  DXL    -2.3609629+03  DYL     4.4459959+03  DZL     2.1856764+03
XS     -8.8968010+02  YS      4.4734597+02  ZS      3.8265777+01  DXS     2.4800476+03  DYS     4.9007182+03  DZS     3.5663416+02
ALTS    5.8057217+01  LATS    2.2005971+00  LONS    1.5330599+02  VRS     5.5040769+03  PTR    -5.0716465-03  AZR    -8.6281993+01
LIN     1.7567098+02  LAN    -1.7618866+02  LAP     2.5163871+00  LTS    -2.5077561-02  LNS     1.2077021+02  DEM    -2.1305735+01
THETA   6.8301891-06  BETA    1.7999999+02  MASS    7.0651471+04
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ID      913072.1
CIRCULARIZATION BURN TERMINATION
   16  SEPT. 1969   7 HRS,  52 MINS,  48.397 SECS  G.M.T. ****  76. HRS,   43. MINS,  19.056 SECS  G.E.T.
XL     -9.0285582+02  YL     -4.0519093+02  ZL     -1.1741977+02  DXL    -2.2368336+03  DYL     4.3631276+03  DZL     2.1390758+03
XS     -8.8350860+02  YS      4.5934346+02  ZS      3.9138310+01  DXS     2.4815091+03  DYS     4.7446120+03  DZS     3.4485118+02
ALTS    5.8058371+01  LATS    2.2507979+00  LONS    1.5252970+02  VRS     5.3654592+03  PTR     5.0225826-03  AZR    -8.6312264+01
LIN     1.7567100+02  LAN    -1.7619087+02  LAP    -2.5118246+00  SMAS    9.9732579+02  ECCS    7.8090561-04  PERS    1.9786697+00
RPS     9.9654698+02  APOS    9.9810459+02  RANS   -1.7082345+02  INCS    1.5536217+02  LTS    -2.5082796-02  LNS     1.2076806+02
LTE     5.6562917+00  LNE    -4.8849879+00  THETA  -7.7500021-01  BETA    1.7999300+02  FUEL    9.6091992+02  BARC    7.7510903-01
DELV    1.3861003+02  MASS    6.9690551+04  PLCHNG  1.5966936-05  DRTX   -1.3860781+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      913072.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   17  SEPT. 1969   2 HRS,  16 MINS,  16.357 SECS  G.M.T. ****  95. HRS,    6. MINS,  47.016 SECS  G.E.T.
XL     -1.1249685+02  YL      8.9986540+02  ZL      4.1476449+02  DXL     5.2992971+03  DYL     6.9918648+02  DZL    -7.4398641+01
XS      8.2577740+02  YS      5.5699482+02  ZS      4.7867455+01  DXS     3.0074159+03  DYS    -4.4281482+03  DZS    -3.0999921+02
ALTS    5.8724033+01  LATS    2.7513129+00  LONS    3.4000042+01  VRS     5.3618231+03  PTR     2.3162974-02  AZR    -9.3319406+01
LIN     1.7568188+02  LAN     1.7447332+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(a) 72° launch azimuth; first injection opportunity - Continued

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ID      913072.1
CSM PLANE CHANGE BURN INITIATION
   17  SEPT. 1969  23 HRS,  27 MINS,   3.470 SECS  G.M.T. **** 116. HRS,   17. MINS,  34.131 SECS  G.E.T.
XL     -9.3084099+02  YL     -3.4520582+02  ZL     -8.6415800+01  DXL    -1.8761417+03  DYL     4.5134490+03  DZL     2.1730682+03
XS     -5.9373610+02  YS      7.9908086+02  ZS      4.5242586+01  DXS     4.3072125+03  DYS     3.1828810+03  DZS     3.2052884+02
ALTS    5.8050353+01  LATS    2.6020937+00  LONS    1.2661323+02  VRS     5.3652166+03  PTR     5.7147811-03  AZR    -8.6571715+01
LIN     1.7568880+02  LAN     1.6368670+02  LAP    -2.3851788+01  LTS    -7.6563336-02  LNS     1.0063207+02  DEM    -2.7117837+01
THETA  -8.5377364-07  BETA   -9.0000024+01  MASS    3.6336551+04
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ID      913072.1
CSM PLANE CHANGE BURN TERMINATION
   17  SEPT. 1969  23 HRS,  27 MINS,   7.008 SECS  G.M.T. **** 116. HRS,   17. MINS,  37.668 SECS  G.E.T.
XL     -9.3193009+02  YL     -3.4256862+02  ZL     -8.5166703+01  DXL    -1.8647686+03  DYL     4.5449736+03  DZL     2.1173374+03
XS     -5.9122467+02  YS      8.0093169+02  ZS      4.5410765+01  DXS     4.3185336+03  DYS     3.1739169+03  DZS     2.5709871+02
ALTS    5.8050673+01  LATS    2.6117723+00  LONS    1.2643367+02  VRS     5.3655922+03  PTR     5.8074682-03  AZR    -8.7250959+01
LIN     1.7620280+02  LAN     1.6984913+02  LAP    -4.8073218+01  SMAS    9.9735611+02  ECCS    8.2039620-04  PERS    1.9787600+00
RPS     9.9653789+02  APOS    9.9817432+02  RANS   -1.7098497+02  INCS    1.5611324+02  LTS    -7.6564634-02  LNS     1.0063156+02
LTE     6.6640551+00  LNE    -3.9152541+00  THETA   1.0305048-03  BETA   -8.9327218+01  FUEL    2.2492090+02  BARC    1.7954615-01
DELV    6.2847905+01  MASS    3.6111630+04  PLCHNG  6.7314354-01  DRTX    0.0000000     DRTY   -6.2847821+01  DRTZ    0.0000000
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ID      913072.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   3 HRS,  54 MINS,   3.533 SECS  G.M.T. **** 120. HRS,   44. MINS,  34.192 SECS  G.E.T.
XL     -3.4972070+02  YL      8.4655304+02  ZL      3.9437565+02  DXL     4.9938248+03  DYL     1.8513715+03  DZL     4.6230775+02
XS      8.2579765+02  YS      5.5700699+02  ZS      4.7855879+01  DXS     3.0076635+03  DYS    -4.4324406+03  DZS    -2.4360541+02
ALTS    5.8747054+01  LATS    2.7505834+00  LONS    3.3999971+01  VRS     5.3620810+03  PTR     3.3891588-02  AZR    -9.2608524+01
LIN     1.7620447+02  LAN     1.6759876+02
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ID      913072.1
TRANSEARTH INJECTION BURN INITIATION
   18  SEPT. 1969  20 HRS,  38 MINS,  33.527 SECS  G.M.T. **** 137. HRS,   29. MINS,   4.183 SECS  G.E.T.
XL      5.4754362+02  YL     -7.4913212+02  ZL     -3.6511522+02  DXL    -4.4568864+03  DYL    -2.8080771+03  DZL    -9.1384141+02
XS     -7.8850917+02  YS     -6.0778171+02  ZS     -5.6273504+01  DXS    -3.2776446+03  DYS     4.2402372+03  DZS     1.8438134+02
ALTS    5.8658440+01  LATS   -3.2351620+00  LONS   -1.4237501+02  VRS     5.3625144+03  PTR    -3.2804503-02  AZR    -8.8028298+01
LIN     1.7620879+02  LAN     1.5908603+02  LAP    -5.8343536+01  LTS    -1.0567767-01  LNS     8.9856528+01  DEM    -2.8507414+01
THETA  -3.6519680+00  BETA   -5.9667888-01  MASS    3.6521630+04
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ID      913072.1
TRANSEARTH INJECTION BURN TERMINATION
   18  SEPT. 1969  20 HRS,  40 MINS,  48.946 SECS  G.M.T. **** 137. HRS,   31. MINS,  19.603 SECS  G.E.T.
XL      4.1945329+02  YL     -8.1989817+02  ZL     -3.8737135+02  DXL    -7.1293815+03  DYL    -3.5926940+03  DZL    -1.1002980+03
XS     -8.7191475+02  YS     -4.8517724+02  ZS     -5.0973482+01  DXS    -4.2661944+03  DYS     6.8497603+03  DZS     2.9398490+02
ALTS    6.0621390+01  LATS   -2.9244222+00  LONS   -1.5090623+02  VRS     8.0750266+03  PTR     2.7097788+00  AZR    -8.7769891+01
LIN     1.7632016+02  LAN     1.5650356+02  LAP     1.3496286+02  SMAS   -3.6045399+03  ECCS    1.2766277+00  PERS    1.3595416+01
RPS     9.9711566+02  APOS   -8.2061955+03  RANS   -1.7136342+02  INCS    1.5608629+02  LTS    -1.0573033-01  LNS     8.9837400+01
LTE     6.7820376+00  LNE    -3.1543020+00  THETA   4.8516694+00  BETA   -3.9614186-01  FUEL    8.6090308+03  BARC    8.5039206+00
DELV    2.7210414+03  MASS    2.7912600+04  PLCHNG  2.0060888-01  DRTX    2.7153617+03  DRTY   -2.8274503+01  DRTZ    1.7331826+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(a) 72° launch azimuth; first injection opportunity - Concluded

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ID      913072.1
ENTRY AND TOUCHDOWN
   22  SEPT. 1969  17 HRS,  12 MINS,  22.233 SECS  G.M.T. **** 230. HRS,    2. MINS,  52.890 SECS  G.E.T.
X       1.4924294+03  Y       2.6940862+03  Z       1.6771442+03  DX     -3.3420765+04  DY      1.3512571+04  DZ     -3.6885394+02
R       3.5068873+03  DEC     2.8570709+01  RA      6.1015081+01  V       3.6050979+04  PTH    -6.4000327+00  AZ      8.7170804+01
ALT     6.5604324+01  LAT     2.8729579+01  LON     1.6153280+02  VE      3.4696925+04  PTE    -6.6427244+00  AZE     8.7040337+01
SMA     1.0747547+05  ECC     9.6778253-01  INC     2.8698691+01  RAN    -2.3085230+01  APF     9.7834891+01  RP      3.4625880+03
INMP    1.0220591+01  RAM    -3.8746076+01  DEM    -1.8235095+01  RAS     1.7956226+02  DES     1.8977348-01  SPSFR   3.5471486+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.5137439+01  LONTD   1.9499617+02  AZTD    1.0445658+02
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ID      913072.1
CIRCUMLUNAR PERICYNTHION
   16  SEPT. 1969   3 HRS,  29 MINS,  22.920 SECS  G.M.T. ****  72. HRS,   19. MINS,  53.582 SECS  G.E.T.
XL     -7.2404041+02  YL     -6.4576694+02  ZL     -2.3871590+02  DXL    -5.7386875+03  DYL     5.2343652+03  DZL     3.2459579+03
XS     -9.9265384+02  YS      1.1214418+02  ZS      1.7225903+01  DXS     9.5740483+02  DYS     8.3158917+03  DZS     1.0329056+03
ALTS    6.0623442+01  LATS    9.8789277-01  LONS    1.7355438+02  VRS     8.4343092+03  PTR     2.4164055-07  AZR    -8.2964572+01
LIN     1.7288256+02  LAN    -1.7850780+02  LAP    -3.3828270+01  LTS    -1.9600261-02  LNS     1.2300327+02  DEM    -2.0456728+01
SMAS   -2.0608885+03  ECCS    1.4847991+00  INCS    1.5302449+02  RANS   -1.6717927+02  APFS   -3.1784352+01  RPS     9.9911696+02
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ID      913072.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   18  SEPT. 1969  20 HRS,  24 MINS,  45.363 SECS  G.M.T. **** 137. HRS,   15. MINS,  16.019 SECS  G.E.T.
X       3.2656336+03  Y       1.2333111+03  Z       3.6355130+02  DX     -1.6267534+04  DY      2.3782080+04  DZ      2.1815193+04
R       3.5096422+03  DEC     5.9457307+00  RA      2.0689730+01  V       3.6140319+04  PTH    -7.1840383+00  AZ      5.1331099+01
ALT     6.5833154+01  LAT     5.9847553+00  LON     7.6921832+01  VE      3.4955887+04  PTE    -7.4035856+00  AZE     4.9729601+01
SMA     1.6466736+05  ECC     9.7902337-01  INC     3.9052454+01  RAN     1.3314320+01  APF     2.3986072+01  RP      3.4541667+03
INMP    1.3266898+01  RAM    -9.8551424+01  DEM    -2.8499810+01  RAS     1.7609350+02  DES     1.6920612+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.5387147+01  LONTD   1.0144631+02  AZTD    5.9209941+01
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(b) 78° launch azimuth; first injection opportunity

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ID      913078.1
LAUNCH TIME      13  SEPT. 1969    4 HRS,    9 MINS,  29.140 SECS   G.M.T.
LAUNCH AZIMUTH   78.                          INJECTION OPPORTUNITY    1
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ID      913078.1
EARTH PARKING ORBIT INSERTION
   13  SEPT. 1969   4 HRS,   20 MINS,  47.204 SECS  G.M.T. ****   0. HRS,   11. MINS,  18.064 SECS  G.E.T.
X       3.0611163+03  Y       1.4732504+02  Z       1.7796984+03  DX     -5.5809548+02  DY      2.5535577+04  DZ     -1.1539228+03
ALT     1.0292198+02  LAT     3.0306946+01  LON     3.0556765+02  V       2.5567727+04  PTH    -2.3578062-08  AZ      9.2991634+01
R       3.5439334+03  DEC     3.0144441+01  RA      2.7553982+00  RAS     1.7100760+02  DES     3.8774888+00  RAN    -9.3185902+01
INC     3.0278632+01  MASS    2.8388933+05
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ID      913078.1
3.5 MINS PRIOR TO TLI INITIATION
   13  SEPT. 1969   5 HRS,   53 MINS,  50.991 SECS  G.M.T. ****   1. HRS,   44. MINS,  21.851 SECS  G.E.T.
X       2.8465410+03  Y       1.3685410+03  Z       1.6072403+03  DX     -8.1505907+03  DY      2.3570484+04  DZ     -5.6417874+03
ALT     1.0230703+02  LAT     2.7121624+01  LON     3.0515978+02  V       2.5570092+04  PTH    -7.2867553-03  AZ      1.0432963+02
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ID      913078.1
TRANSLUNAR INJECTION INITIATION
   13  SEPT. 1969   5 HRS,   57 MINS,  20.991 SECS  G.M.T. ****   1. HRS,   47. MINS,  51.851 SECS  G.E.T.
X       2.4797059+03  Y       2.1324255+03  Z       1.3644054+03  DX     -1.2967674+04  DY      2.0404163+04  DZ     -8.3376617+03
ALT     1.0148111+02  LAT     2.2778296+01  LON     3.1929930+02  V       2.5573561+04  PTH    -1.3662228-02  AZ      1.1068078+02
R       3.5436961+03  DEC     2.2645183+01  RA      4.0693915+01  RAS     1.7106780+02  DES     3.8518185+00  RAN    -9.3739692+01
INC     3.0295282+01  MASS    2.8172138+05
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ID      913078.1
TRANSLUNAR INJECTION TERMINATION
   13  SEPT. 1969   6 HRS,    2 MINS,  30.804 SECS  G.M.T. ****   1. HRS,   53. MINS,   1.663 SECS  G.E.T.
X       1.5295743+03  Y       3.1739680+03  Z       7.8913795+02  DX     -2.5281603+04  DY      2.0696104+04  DZ     -1.4120362+04
ALT     1.6721711+02  LAT     1.2703048+01  LON     3.4158097+02  V       3.5593156+04  PTH     7.0961492+00  AZ      1.1594863+02
R       3.6105967+03  DEC     1.2624565+01  RA      6.4270008+01  RAS     1.7107102+02  DES     3.8504455+00  DEM    -4.0844203+00
RAN    -9.1543267+01  INC     2.8664061+01  ECC     9.7482707-01  SMA     1.4121462+05  RP      3.5547863+03  APF     1.3851691+02
INMP    3.9603426+01  C3TLI  -4.8554575-01  DAZTLI-1.9566024+00  MASS    1.3150232+05  FUEL    1.5021905+05
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ID      913078.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   13  SEPT. 1969   8 HRS,    2 MINS,  30.804 SECS  G.M.T. ****   3. HRS,   53. MINS,   1.663 SECS  G.E.T.
X      -1.8713759+04  Y      -2.7259245+02  Z      -1.0219699+04  DX     -1.1228762+04  DY     -6.1430740+03  DZ     -6.0425086+03
ALT     1.7882912+04  LAT    -2.8662756+01  LON     6.8063366+01  V       1.4153952+04  PTH     6.5007282+01  AZ      8.8846675+01
R       2.1324195+04  DEC    -2.8636668+01  RA     -1.7916546+02  RAS     1.7114582+02  DES     3.8185369+00
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ID      913078.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   16  SEPT. 1969   4 HRS,    8 MINS,  11.402 SECS  G.M.T. ****  71. HRS,   58. MINS,  42.261 SECS  G.E.T.
RMP     9.9900408+02  DEMP    6.3277502+00  RAMP    1.7953501+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(b) 78° launch azimuth; first injection opportunity - Continued

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ID      913078.1
LUNAR ORBIT INSERTION BURN INITIATION
   16  SEPT. 1969   4 HRS,   4 MINS,  52.790 SECS  G.M.T. ****  71. HRS,   55. MINS,  23.649 SECS  G.E.T.
XL     -5.0018313+02  YL     -8.2367457+02  ZL     -3.4753595+02  DXL    -6.4183722+03  DYL     4.4821478+03  DZL     2.8470533+03
XS     -1.0072536+03  YS     -1.8594632+02  ZS     -1.6376300+01  DXS    -8.5854167+01  DYS     8.2926191+03  DZS     9.4147521+02
ALTS    8.5910764+01  LATS   -9.1597907-01  LONS   -1.6954054+02  VRS     8.3463331+03  PTR    -9.9062981+00  AZR    -8.3584902+01
LIN     1.7350732+02  LAN    -1.7761653+02  LAP     1.9563672+02  LTS    -2.0336443-02  LNS     1.2270206+02  DEM    -2.0573186+01
THETA   1.5759477+01  BETA   -1.7578019+02  MASS    9.4833024+04
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ID      913078.1
LUNAR ORBIT INSERTION BURN TERMINATION
   16  SEPT. 1969   4 HRS,  11 MINS,  11.516 SECS  G.M.T. ****  72. HRS,    1. MINS,  42.372 SECS  G.E.T.
XL     -9.0567344+02  YL     -5.5541859+02  ZL     -1.9225283+02  DXL    -3.1811804+03  DYL     3.9777184+03  DZL     2.0332427+03
XS     -9.6605390+02  YS      2.4619403+02  ZS      2.6248025+01  DXS     1.4009207+03  DYS     5.3047435+03  DZS     3.8730147+02
ALTS    5.8783080+01  LATS    1.5081822+00  LONS    1.6570278+02  VRS     5.5002622+03  PTR    -3.8859967-01  AZR    -8.5950430+01
LIN     1.7566799+02  LAN    -1.7395874+02  LAP     5.5051652+00  SMAS    1.0526575+03  ECCS    5.3047294-02  PERS    2.1455982+00
RPS     9.9681692+02  APOS    1.1084981+03  RANS   -1.7079508+02  INCS    1.5537256+02  LTS    -2.0467333-02  LNS     1.2264850+02
LTE     5.5158522+00  LNE    -4.9432739+00  THETA  -8.9644396+00  BETA   -1.7367377+02  FUEL    2.4076807+04  BARC    2.4815427+01
DELV    2.9644682+03  MASS    7.0756217+04  PLCHNG  2.1877497+00  DRTX   -2.8453012+03  DRTY   -2.0993458+02  DRTZ   -8.0514870+02
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ID      913078.1
CIRCULARIZATION BURN INITIATION
   16  SEPT. 1969   8 HRS,  31 MINS,   2.873 SECS  G.M.T. ****  76. HRS,   21. MINS,  33.733 SECS  G.E.T.
XL     -8.7833128+02  YL     -4.5029216+02  ZL     -1.3918420+02  DXL    -2.5679766+03  DYL     4.3441446+03  DZL     2.1533564+03
XS     -9.0560798+02  YS      4.1495360+02  ZS      3.5899545+01  DXS     2.2993762+03  DYS     4.9859924+03  DZS     3.6392666+02
ALTS    5.8301891+01  LATS    2.0639514+00  LONS    1.5538254+02  VRS     5.5026987+03  PTR    -3.2716691-03  AZR    -8.6205330+01
LIN     1.7567130+02  LAN    -1.7618614+02  LAP    -1.7214913+02  LTS    -2.5882488-02  LNS     1.2044361+02  DEM    -2.1427057+01
THETA   1.7075473-06  BETA   -1.7959999+02  MASS    7.0736217+04
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ID      913078.1
CIRCULARIZATION BURN TERMINATION
   16  SEPT. 1969   8 HRS,  31 MINS,  17.948 SECS  G.M.T. ****  76. HRS,   21. MINS,  48.805 SECS  G.E.T.
XL     -8.8454449+02  YL     -4.3960998+02  ZL     -1.3389658+02  DXL    -2.4403997+03  DYL     4.2665929+03  DZL     2.1089128+03
XS     -8.9989394+02  YS      4.2713194+02  ZS      3.6787895+01  DXS     2.3065396+03  DYS     4.8306257+03  DZS     3.5217071+02
ALTS    5.8303431+01  LATS    2.1150445+00  LONS    1.5460879+02  VRS     5.3646149+03  PTR     6.7403942-03  AZR    -8.6233679+01
LIN     1.7567132+02  LAN    -1.7618835+02  LAP    -2.2713972+01  SMAS    9.9749980+02  ECCS    7.1440858-04  PERS    1.9791876+00
RPS     9.9678718+02  APOS    9.9821242+02  RANS   -1.7078064+02  INCS    1.5538210+02  LTS    -2.5887798-02  LNS     1.2044146+02
LTE     5.6799550+00  LNE    -4.8742865+00  THETA  -7.7262501-01  BETA    1.7999011+02  FUEL    9.5837890+02  BARC    7.7273846-01
DELV    1.3807426+02  MASS    6.9777838+04  PLCHNG  1.5294192-05  DRTX   -1.3807227+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      913078.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   17  SEPT. 1969   2 HRS,  55 MINS,  43.827 SECS  G.M.T. ****  94. HRS,   46. MINS,  14.686 SECS  G.E.T.
XL     -1.1875171+02  YL      8.9934261+02  ZL      4.1459406+02  DXL     5.2948156+03  DYL     7.2961351+02  DZL    -6.2066373+01
XS      8.2592892+02  YS      5.5709640+02  ZS      4.7878164+01  DXS     3.0067103+03  DYS    -4.4279912+03  DZS    -3.0993772+02
ALTS    5.8906758+01  LATS    2.7514244+00  LONS    3.4000013+01  VRS     5.3612941+03  PTR     1.7912391-02  AZR    -9.3318827+01
LIN     1.7568226+02  LAN     1.7446721+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(b) 78° launch azimuth; first injection opportunity - Continued

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ID      913078.1
CSM PLANE CHANGE BURN INITIATION
   18  SEPT. 1969   0 HRS,   6 MINS,  49.748 SECS  G.M.T. **** 115. HRS,   57. MINS,  20.606 SECS  G.E.T.
XL     -9.2881856+02  YL     -3.5076434+02  ZL     -3.8664857+01  DXL    -1.9077235+03  DYL     4.5014063+03  DZL     2.1683268+03
XS     -5.9388573+02  YS      7.9928346+02  ZS      4.5240375+01  DXS     4.3063668+03  DYS     3.1825159+03  DZS     3.2049332+02
ALTS    5.8301853+01  LATS    2.6013095+00  LONS    1.2661318+02  VRS     5.3643189+03  PTR     7.0481080-03  AZR    -8.6571622+01
LIN     1.7558913+02  LAN     1.6367760+02  LAP    -2.3898923+01  LTS    -7.7457625-02  LNS     1.0029492+02  DEM    -2.7181609+01
THETA   8.5377364-07  BETA   -9.0000035+01  MASS    3.6423838+04
*****************************************************************************************************************************

ID      913078.1
CSM PLANE CHANGE BURN TERMINATION
   18  SEPT. 1969   0 HRS,   6 MINS,  53.295 SECS  G.M.T. **** 115. HRS,   57. MINS,  24.152 SECS  G.E.T.
XL     -9.2992876+02  YL     -3.4812769+02  ZL     -8.7415459+01  DXL    -1.8963733+03  DYL     4.5330122+03  DZL     2.1126243+03
XS     -5.9136883+02  YS      8.0113837+02  ZS      4.5408946+01  DXS     4.3177070+03  DYS     3.1735264+03  DZS     2.5705888+02
ALTS    5.8302263+01  LATS    2.6110078+00  LONS    1.2643328+02  VRS     5.3646941+03  PTR     8.0246698-03  AZR    -8.7251022+01
LIN     1.7620337+02  LAN     1.6984106+02  LAP    -3.7687820+01  SMAS    9.9752308+02  ECCS    7.4250083-04  PERS    1.9792569+00
RPS     9.9678241+02  APOS    9.9826373+02  RANS   -1.7095300+02  INCS    1.5613292+02  LTS    -7.7459015-02  LNS     1.0029442+02
LTE     6.6724591+00  LNE    -3.8938763+00  THETA   9.0926892-04  BETA   -8.9327153+01  FUEL    2.2547163+02  BARC    1.7954615-01
DELV    6.2850771+01  MASS    3.6198366+04  PLCHNG  6.7328893-01  DRTX    0.0000000     DRTY   -6.2850709+01  DRTZ    0.0000000
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ID      913078.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   4 HRS,  33 MINS,  54.106 SECS  G.M.T. **** 120. HRS,   24. MINS,  24.965 SECS  G.E.T.
XL     -3.5572065+02  YL      8.4463560+02  ZL      3.9364184+02  DXL     4.9812510+03  DYL     1.8801527+03  DZL     4.7404025+02
XS      8.2596857+02  YS      5.5712222+02  ZS      4.7865473+01  DXS     3.0069201+03  DYS    -4.4321571+03  DZS    -2.4352108+02
ALTS    5.8953407+01  LATS    2.7505657+00  LONS    3.3999968+01  VRS     5.3614259+03  PTR     2.9057410-02  AZR    -9.2607716+01
LIN     1.7620505+02  LAN     1.6759000+02
*****************************************************************************************************************************

ID      913078.1
TRANSEARTH INJECTION BURN INITIATION
   18  SEPT. 1969  21 HRS,  18 MINS,  52.232 SECS  G.M.T. **** 137. HRS,    9. MINS,  23.091 SECS  G.E.T.
XL      5.4310213+02  YL     -7.5212857+02  ZL     -3.6586999+02  DXL    -4.4723055+03  DYL    -2.7872375+03  DZL    -9.0165108+02
XS     -7.9576009+02  YS     -5.9846704+02  ZS     -5.5867840+01  DXS    -3.2274222+03  DYS     4.2783163+03  DZS     1.8781932+02
ALTS    5.8761796+01  LATS   -3.2114827+00  LONS   -1.4305428+02  VRS     5.3624174+03  PTR    -2.8613381-02  AZR    -8.7991253+01
LIN     1.7620938+02  LAN     1.5907311+02  LAP    -1.1701729+02  LTS    -1.0661825-01  LNS     8.9514990+01  DEM    -2.8528653+01
THETA  -3.5360883+00  BETA   -7.1258087-01  MASS    3.6608366+04
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ID      913078.1
TRANSEARTH INJECTION BURN TERMINATION
   18  SEPT. 1969  21 HRS,  21 MINS,   9.058 SECS  G.M.T. **** 137. HRS,   11. MINS,  38.916 SECS  G.E.T.
XL      4.1423703+02  YL     -8.2251834+02  ZL     -3.8791938+02  DXL    -7.1490549+03  DYL    -3.5605486+03  DZL    -1.0880901+03
XS     -8.7800030+02  YS     -4.7452436+02  ZS     -5.0520303+01  DXS    -4.1889435+03  DYS     6.8990717+03  DZS     2.9318538+02
ALTS    6.0811345+01  LATS   -2.8978490+00  LONS   -1.5161053+02  VRS     8.0765335+03  PTR     2.7647592+00  AZR    -8.7774397+01
LIN     1.7634398+02  LAN     1.5599565+02  LAP     1.5023009+02  SMAS   -3.5886118+03  ECCS    1.2778858+00  PERS    1.3505400+01
RPS     9.9722423+02  APOS   -8.1744478+03  RANS   -1.7142345+02  INCS    1.5609287+02  LTS    -1.0667122-01  LNS     8.9495816+01
LTE     6.7805855+00  LNE    -3.1277616+00  THETA   4.9926531+00  BETA   -4.7322949-01  FUEL    8.6349180+03  BARC    8.5291558+00
DELV    2.7230103+03  MASS    2.7973448+04  PLCHNG  2.3973210-01  DRTX    2.7176080+03  DRTY   -3.3800032+01  DRTZ    1.6794727+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(b) 78° launch azimuth; first injection opportunity - Concluded

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ID      913078.1
ENTRY AND TOUCHDOWN
   22  SEPT. 1969  17 HRS,  13 MINS,  47.569 SECS  G.M.T. **** 229. HRS,    4. MINS,  18.426 SECS  G.E.T.
X       1.4757345+03  Y       2.7023730+03  Z       1.6792335+03  DX     -3.3503770+04  DY      1.3302608+04  DZ     -3.5698995+02
R       3.5071979+03  DEC     2.8606818+01  RA      6.1361557+01  V       3.6049818+04  PTH    -6.4000395+00  AZ      8.7144155+01
ALT     6.5921062+01  LAT     2.8765802+01  LON     1.6152274+02  VE      3.4696142+04  PTE    -6.6425844+00  AZE     8.7012642+01
SMA     1.0764182+05  ECC     9.6782947-01  INC     2.8737023+01  RAN    -2.2690319+01  APF     9.7793896+01  RP      3.4628949+03
INMP    1.0039864+01  RAM    -3.8732164+01  DEM    -1.8229618+01  RAS     1.7956315+02  DES     1.8938894-01  SPSFR   3.6076260+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.5180440+01  LONTD   1.9500037+02  AZTD    1.0446013+02
*****************************************************************************************************************************

ID      913078.1
CIRCUMLUNAR PERICYNTHION
   16  SEPT. 1969   4 HRS,   8 MINS,  25.419 SECS  G.M.T. ****  71. HRS,   58. MINS,  56.276 SECS  G.E.T.
XL     -7.1510076+02  YL     -6.5386996+02  ZL     -2.4262972+02  DXL    -5.8223279+03  DYL     5.2041768+03  DZL     3.1352163+03
XS     -9.9314179+02  YS      1.0571696+02  ZS      1.6657574+01  DXS     9.0245014+02  DYS     8.3296340+03  DZS     9.4112816+02
ALTS    6.0397948+01  LATS    9.5551220-01  LONS    1.7392391+02  VRS     8.4310699+03  PTR    -3.1581074-06  AZR    -8.3590037+01
LIN     1.7350737+02  LAN    -1.7764892+02  LAP     4.7653172+00  LTS    -2.0409890-02  LNS     1.2267198+02  DEM    -2.0584783+01
SMAS   -2.0710280+03  ECCS    1.4823167+00  INCS    1.5359203+02  RANS   -1.6784240+02  APFS   -3.3102271+01  RPS     9.9889147+02
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ID      913078.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   18  SEPT. 1969  21 HRS,  17 MINS,  56.770 SECS  G.M.T. **** 137. HRS,    8. MINS,  27.623 SECS  G.E.T.
X       3.2272263+03  Y       1.3313968+03  Z       3.6053848+02  DX     -1.6470619+04  DY      2.2506545+04  DZ      2.2981936+04
R       3.5096432+03  DEC     5.8962803+00  RA      2.2418665+01  V       3.6138557+04  PTH    -6.7480556+00  AZ      4.9004368+01
ALT     6.5832075+01  LAT     5.9349851+00  LON     6.5316835+01  VE      3.4994153+04  PTE    -6.9435792+00  AZE     4.7326904+01
SMA     1.6319381+05  ECC     9.7879416-01  INC     4.1343175+01  RAN     1.5677967+01  APF     2.2589658+01  RP      3.4606622+03
INMP    1.6017705+01  RAM    -9.7962839+01  DEM    -2.8528183+01  RAS     1.7612663+02  DES     1.6777419+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.6428851+01  LONTD   8.9079873+01  AZTD    5.6911930+01
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(c) 84° launch azimuth; first injection opportunity

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ID      913084.1
LAUNCH TIME      13  SEPT. 1969    5 HRS,   10 MINS,   7.309 SECS   G.M.T.
LAUNCH AZIMUTH   84.                          INJECTION OPPORTUNITY    1
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ID      913084.1
EARTH PARKING ORBIT INSERTION
   13  SEPT. 1969   5 HRS,  21 MINS,  24.339 SECS  G.M.T. ****   0. HRS,   11. MINS,  17.030 SECS  G.E.T.
X       2.9868894+03  Y       9.5009562+02  Z       1.6538664+03  DX     -6.0797349+03  DY      2.4631230+04  DZ     -3.1698617+03
ALT     1.0252380+02  LAT     2.7973203+01  LON     3.0526131+02  V       2.5567727+04  PTH    -3.7724900-07  AZ      9.8058250+01
R       3.5439334+03  DEC     2.7818703+01  RA      1.7645276+01  RAS     1.7104539+02  DES     3.8613743+00  RAN    -8.9231215+01
INC     2.8872555+01  MASS    2.8445841+05
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ID      913084.1
3.5 MINS PRIOR TO TLI INITIATION
   13  SEPT. 1969   6 HRS,  51 MINS,  16.483 SECS  G.M.T. ****   1. HRS,   41. MINS,   9.174 SECS  G.E.T.
X       2.8564968+03  Y       1.3809370+03  Z       1.5788716+03  DX     -8.7511401+03  DY      2.3546845+04  DZ     -4.7656171+03
ALT     1.0229076+02  LAT     2.6605631+01  LON     2.9088811+02  V       2.5568486+04  PTH    -3.2830623-03  AZ      1.0201458+02
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ID      913084.1
TRANSLUNAR INJECTION INITIATION
   13  SEPT. 1969   6 HRS,  54 MINS,  46.483 SECS  G.M.T. ****   1. HRS,   44. MINS,  39.174 SECS  G.E.T.
X       2.4688153+03  Y       2.1436320+03  Z       1.3668871+03  DX     -1.3567102+04  DY      2.0359389+04  DZ     -7.4378400+03
ALT     1.0160120+02  LAT     2.2821201+01  LON     3.0517710+02  V       2.5571320+04  PTH    -1.1585224-02  AZ      1.0837150+02
R       3.5438100+03  DEC     2.2687896+01  RA      4.0967240+01  RAS     1.7110359+02  DES     3.8365503+00  RAN    -8.9761724+01
INC     2.8884367+01  MASS    2.8232662+05
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ID      913084.1
TRANSLUNAR INJECTION TERMINATION
   13  SEPT. 1969   6 HRS,  59 MINS,  56.844 SECS  G.M.T. ****   1. HRS,   49. MINS,  49.535 SECS  G.E.T.
X       1.4824922+03  Y       3.1821980+03  Z       8.4235886+02  DX     -2.6027448+04  DY      2.0522243+04  DZ     -1.2979316+04
ALT     1.6692429+02  LAT     1.3576446+01  LON     3.2793372+02  V       3.5595690+04  PTH     7.0565404+00  AZ      1.1405078+02
R       3.6102264+03  DEC     1.3492952+01  RA      6.5020575+01  RAS     1.7110682+02  DES     3.8351748+00  DEM    -4.3292320+00
RAN    -8.7378366+01  INC     2.7379558+01  ECC     9.7490014-01  SMA     1.4163587+05  RP      3.5550403+03  APF     1.3521621+02
INMP    3.7277260+01  C3TLI  -4.8410182-01  DA7TLI-1.8778509+00   MASS    1.3184161+05  FUEL    1.5048502+05
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ID      913084.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   13  SEPT. 1969   8 HRS,  59 MINS,  56.844 SECS  G.M.T. ****   3. HRS,   49. MINS,  49.535 SECS  G.E.T.
X      -1.8932652+04  Y      -4.1189741+02  Z      -9.8028194+03  DX     -1.1232203+04  DY     -6.2260217+03  DZ     -5.9559657+03
ALT     1.7882441+04  LAT    -2.7393693+01  LON     5.4077346+01  V       1.4156245+04  PTH     6.5009364+01  AZ      9.0620048+01
R       2.1323936+04  DEC    -2.7368373+01  RA     -1.7875367+02  RAS     1.7118162+02  DES     3.8032626+00
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ID      913084.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   16  SEPT. 1969   4 HRS,  52 MINS,  12.969 SECS  G.M.T. ****  71. HRS,   42. MINS,   5.661 SECS  G.E.T.
RMP     9.9864216+02  DEMP    6.3534073+00  RAMP    1.7991131+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(c) 84° launch azimuth; first injection opportunity - Continued

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ID      913084.1
LUNAR ORBIT INSERTION BURN INITIATION
   16  SEPT. 1969   4 HRS,  48 MINS,  54.809 SECS  G.M.T. ****  71. HRS,   38. MINS,  47.498 SECS  G.E.T.
XL     -4.8816448+02  YL     -8.3034740+02  ZL     -3.4828632+02  DXL    -6.4874741+03  DYL     4.4372532+03  DZL     2.7544855+03
XS     -1.0059386+03  YS     -1.9225261+02  ZS     -1.4532153+01  DXS    -1.3035366+02  DYS     8.2979941+03  DZS     8.7210168+02
ALTS    8.5754819+01  LATS   -8.1294642-01  LONS   -1.6918024+02  VRS     8.3447143+03  PTR    -9.9501457+00  AZR    -8.4051938+01
LIN     1.7398497+02  LAN    -1.7691946+02  LAP     1.9572060+02  LTS    -2.1250737-02  LNS     1.2232842+02  DEM    -2.0716821+01
THETA   1.6002629+01  BETA   -1.7669977+02  MASS    9.4833024+04
*****************************************************************************************************************

ID      913084.1
LUNAR ORBIT INSERTION BURN TERMINATION
   16  SEPT. 1969   4 HRS,  55 MINS,  12.711 SECS  G.M.T. ****  71. HRS,   45. MINS,   5.400 SECS  G.E.T.
XL     -7.9723145+02  YL     -5.6544684+02  ZL     -1.9686618+02  DXL    -3.2468250+03  DYL     3.9344381+03  DZL     2.0173757+03
XS     -9.6750069+02  YS      2.3946566+02  ZS      2.5748028+01  DXS     1.3607521+03  DYS     5.3165371+03  DZS     3.8849141+02
ALTS    5.8534236+01  LATS    1.4798158+00  LONS    1.6609813+02  VRS     5.5016486+03  PTR    -3.4885130-01  AZR    -8.5940298+01
LIN     1.7566824+02  LAN    -1.7396130+02  LAP    -3.6853312+00  SMAS    1.0526960+03  ECCS    5.3232009-02  PERS    2.1457158+00
RPS     9.9665891+02  APOS    1.1087331+03  RANS   -1.7074674+02  INCS    1.5539505+02  LTS    -2.1381552-02  LNS     1.2227497+02
LTE     5.5443121+00  LNE    -4.9321491+00  THETA  -8.7099332+00  BETA   -1.7506640+02  FUEL    2.4024471+04  BARC    2.4768265+01
DELV    2.9569843+03  MASS    7.0808553+04  PLCHNG  1.7044887+00  DRTX   -2.8376859+03  DRTY   -1.6363125+02  DRTZ   -8.1518619+02
*****************************************************************************************************************

ID      913084.1
CIRCULARIZATION BURN INITIATION
   16  SEPT. 1969   9 HRS,  14 MINS,  40.638 SECS  G.M.T. ****  76. HRS,    4. MINS,  33.326 SECS  G.E.T.
XL     -8.6087895+02  YL     -4.7840730+02  ZL     -1.5266594+02  DXL    -2.7383585+03  DYL     4.2547609+03  DZL     2.1240111+03
XS     -9.1712230+02  YS      3.8862041+02  ZS      3.3967861+01  DXS     2.1562168+03  DYS     5.0501397+03  DZS     3.6945310+02
ALTS    5.8147319+01  LATS    1.9531530+00  LONS    1.5703573+02  VRS     5.5036058+03  PTR    -2.4835666-02  AZR    -8.6147792+01
LIN     1.7567153+02  LAN    -1.7618526+02  LAP    -1.6506217+02  LTS    -2.6796082-02  LNS     1.2007342+02  DEM    -2.1563666+01
THETA   4.2688681-06  BETA    1.7959999+02  MASS    7.0788553+04
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ID      913084.1
CIRCULARIZATION BURN TERMINATION
   16  SEPT. 1969   9 HRS,  14 MINS,  55.733 SECS  G.M.T. ****  76. HRS,    4. MINS,  48.422 SECS  G.E.T.
XL     -8.6751954+02  YL     -4.6792790+02  ZL     -1.4744219+02  DXL    -2.6075418+03  DYL     4.1815162+03  DZL     2.0812769+03
XS     -9.1175092+02  YS      4.0097391+02  ZS      3.4871087+01  DXS     2.1679538+03  DYS     4.8949278+03  DZS     3.5768567+02
ALTS    5.8143740+01  LATS    2.0051167+00  LONS    1.5626085+02  VRS     5.3654712+03  PTR    -1.5242779-02  AZR    -8.6174703+01
LIN     1.7567155+02  LAN    -1.7618746+02  LAP    -1.5997914+02  SMAS    9.9750074+02  ECCS    9.0581932-04  PERS    1.9791904+00
RPS     9.9659719+02  APOS    9.9840428+02  RANS   -1.7073242+02  INCS    1.5540459+02  LTS    -2.6801354-02  LNS     1.2007129+02
LTE     5.7065099+00  LNE    -4.8619504+00  THETA  -7.7379981-01  BETA    1.7999300+02  FUEL    9.5963086+02  BARC    7.7390885-01
DELV    1.3815276+02  MASS    6.9828922+04  PLCHNG  1.4384882-05  DRTX   -1.3815077+02  DRTY    0.0000000     DRTZ    0.0000000
*****************************************************************************************************************

ID      913084.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   17  SEPT. 1969   3 HRS,  39 MINS,  52.290 SECS  G.M.T. ****  94. HRS,   29. MINS,  44.980 SECS  G.E.T.
XL     -1.2568129+02  YL      8.9826197+02  ZL      4.1417511+02  DXL     5.2914658+03  DYL     7.6576332+02  DZL    -4.7485264+01
XS      8.2568263+02  YS      5.5692780+02  ZS      4.7863968+01  DXS     3.0088177+03  DYS    -4.4284800+03  DZS    -3.0992378+02
ALTS    5.8607955+01  LATS    2.7514328+00  LONS    3.3999895+01  VRS     5.3628790+03  PTR     3.3758352-02  AZR    -9.3318459+01
LIN     1.7568254+02  LAN     1.7446384+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(c) 84° launch azimuth; first injection opportunity - Continued

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ID      913084.1
CSM PLANE CHANGE BURN INITIATION
   18  SEPT. 1969   0 HRS,   50 MINS,   59.121 SECS  G.M.T. **** 115. HRS,   40. MINS,   51.812 SECS  G.E.T.
XL     -9.2608665+02  YL     -3.5675628+02  ZL     -9.1105562+01  DXL    -1.9414352+03  DYL     4.4903020+03  DZL     2.1639778+03
XS     -5.9376903+02  YS      7.9912751+02  ZS      4.5224924+01  DXS     4.3083312+03  DYS     3.1816000+03  DZS     3.2046055+02
ALTS    5.8106572+01  LATS    2.6009303+00  LONS    1.2661315+02  VRS     5.3653510+03  PTR    -1.2396166-02  AZR    -8.6571701+01
LIN     1.7568949+02  LAN     1.6367427+02  LAP     6.6951202+00  LTS    -7.8451822-02  LNS     9.9920625+01  DEM    -2.7250940+01
THETA   3.4150945-06  BETA   -9.0000018+01  MASS    3.6474922+04
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ID      913084.1
CSM PLANE CHANGE BURN TERMINATION
   18  SEPT. 1969   0 HRS,   51 MINS,    2.673 SECS  G.M.T. **** 115. HRS,   40. MINS,   55.362 SECS  G.E.T.
XL     -9.2721818+02  YL     -3.5412224+02  ZL     -8.9856974+01  DXL    -1.9301163+03  DYL     4.5219960+03  DZL     2.1083057+03
XS     -5.9124736+02  YS      8.0098460+02  ZS      4.5393718+01  DXS     4.3196901+03  DYS     3.1725853+03  DZS     2.5702129+02
ALTS    5.8105893+01  LATS    2.6106464+00  LONS    1.2643291+02  VRS     5.3657319+03  PTR    -1.2281894-02  AZR    -8.7251040+01
LIN     1.7620363+02  LAN     1.6983685+02  LAP    -7.6756421+00  SMAS    9.9751861+02  ECCS    9.4622416-04  PERS    1.9792436+00
RPS     9.9657474+02  APOS    9.9846248+02  RANS   -1.7091659+02  INCS    1.5615491+02  LTS    -7.8453157-02  LNS     9.9920128+01
LTE     6.6814408+00  LNE    -3.8699537+00  THETA   8.1193873-04  BETA   -8.9327194+01  FUEL    2.2580077+02  BARC    1.7995436-01
DELV    6.2854090+01  MASS    3.6249121+04  PLCHNG  6.7319655-01  DRTX    0.0000000     DRTY   -6.2853941+01  DRTZ    0.0000000
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ID      913084.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   5 HRS,   18 MINS,    2.136 SECS  G.M.T. **** 120. HRS,    7. MINS,   54.826 SECS  G.E.T.
XL     -3.6213855+02  YL      8.4197238+02  ZL      3.9258036+02  DXL     4.9690063+03  DYL     1.9141904+03  DZL     4.8779302+02
XS      8.2567027+02  YS      5.5692035+02  ZS      4.7848008+01  DXS     3.0088320+03  DYS    -4.4331765+03  DZS    -2.4352574+02
ALTS    5.8592791+01  LATS    2.7505565+00  LONS    3.3999937+01  VRS     5.3633411+03  PTR     3.9906416-02  AZR    -9.2607369+01
LIN     1.7620530+02  LAN     1.6758605+02
*****************************************************************************************************************

ID      913084.1
TRANSEARTH INJECTION BURN INITIATION
   18  SEPT. 1969  22 HRS,    3 MINS,   15.733 SECS  G.M.T. **** 136. HRS,   53. MINS,    8.425 SECS  G.E.T.
XL      5.3798820+02  YL     -7.5581697+02  ZL     -3.6684768+02  DXL    -4.4892688+03  DYL    -2.7607316+03  DZL    -8.8665891+02
XS     -8.0407167+02  YS     -5.8793364+02  ZS     -5.5412615+01  DXS    -3.1678722+03  DYS     4.3199269+03  DZS     1.9174788+02
ALTS    5.9137563+01  LATS   -3.1840866+00  LONS   -1.4382589+02  VRS     5.3604058+03  PTR    -3.4920749-02  AZR    -8.7948793+01
LIN     1.7620963+02  LAN     1.5906724+02  LAP    -8.2467940+01  LTS    -1.0765537-01  LNS     8.9138897+01  DEM    -2.8550360+01
THETA  -3.3723418+00  BETA   -7.9561564-01  MASS    3.6659121+04
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ID      913084.1
TRANSEARTH INJECTION BURN TERMINATION
   18  SEPT. 1969  22 HRS,    5 MINS,   31.894 SECS  G.M.T. **** 136. HRS,   55. MINS,   24.580 SECS  G.E.T.
XL      4.0837879+02  YL     -8.2567661+02  ZL     -3.8860069+02  DXL    -7.1706580+03  DYL    -3.5240853+03  DZL    -1.0718435+03
XS     -8.8487318+02  YS     -4.6262924+02  ZS     -4.9991900+01  DXS    -4.1013104+03  DYS     6.9526245+03  DZS     2.9450640+02
ALTS    6.1269248+01  LATS   -2.8661999+00  LONS   -1.5239853+02  VRS     8.0775286+03  PTR     2.8244180+00  AZR    -8.7763741+01
LIN     1.7636244+02  LAN     1.5564488+02  LAP     2.6824401+00  SMAS   -3.5697078+03  ECCS    1.2794603+00  PERS    1.3398826+01
RPS     9.9759165+02  APOS   -8.1370072+03  RANS   -1.7145481+02  INCS    1.5610639+02  LTS    -1.0770841-01  LNS     8.9119675+01
LTE     6.7786121+00  LNE    -3.0983721+00  THETA   5.1729888+00  BETA   -5.2841630-01  FUEL    8.6561191+03  BARC    8.5458547+00
DELV    2.7263460+03  MASS    2.8003002+04  PLCHNG  2.6807117-01  DRTX    2.7213549+03  DRTY   -3.7791794+01  DRTZ    1.6037552+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(c) 84° launch azimuth; first injection opportunity - Concluded

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ID      913084.1
ENTRY AND TOUCHDOWN
   22  SEPT. 1969  17 HRS,  15 MINS,  21.877 SECS  G.M.T. **** 228. HRS,    5. MINS,  14.566 SECS  G.E.T.
X       1.4570670+03  Y       2.7108966+03  Z       1.6819301+03  DX     -3.3590137+04  DY      1.3083259+04  DZ     -3.6751623+02
R       3.5072623+03  DEC     2.8656428+01  RA      6.1742623+01  V       3.6050021+04  PTH    -6.4000314+00  AZ      8.7156431+01
ALT     6.5994499+01  LAT     2.8815585+01  LON     1.6150978+02  VE      3.4696944+04  PTE    -6.6424858+00  AZE     8.7025447+01
SMA     1.0783774+05  ECC     9.6788730-01  INC     2.8785252+01  RAN    -2.2344018+01  APF     9.7826426+01  RP      3.4629612+03
INMP    9.8837075+00  RAM    -3.8716804+01  DEM    -1.8223569+01  RAS     1.7956413+02  DES     1.8896428-01  SPSFR   3.6369992+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.5213476+01  LONTD   1.9499962+02  AZTD    1.0450277+02
*****************************************************************************************************************

ID      913084.1
CIRCUMLUNAR PERICYNTHION
   16  SEPT. 1969   4 HRS,  52 MINS,  28.430 SECS  G.M.T. ****  71. HRS,   42. MINS,  21.121 SECS  G.E.T.
XL     -7.0664499+02  YL     -6.6114015+02  ZL     -2.4608766+02  DXL    -5.8981199+03  DYL     5.1701996+03  DZL     3.0463511+03
XS     -9.9324497+02  YS      1.0106699+02  ZS      1.6199078+01  DXS     8.6292134+02  DYS     8.3406317+03  DZS     8.7108275+02
ALTS    6.0011622+01  LATS    9.2956910-01  LONS    1.7418990+02  VRS     8.4302761+03  PTR    -1.2934741-04  AZR    -8.4068375+01
LIN     1.7398502+02  LAN    -1.7695200+02  LAP     1.4013201+01  LTS    -2.1324778-02  LNS     1.2229820+02  DEM    -2.0728398+01
SMAS   -2.0763969+03  ECCS    1.4808836+00  INCS    1.5402547+02  RANS   -1.6837074+02  APFS   -3.4244014+01  RPS     9.9850516+02
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ID      913084.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   18  SEPT. 1969  22 HRS,  11 MINS,  30.513 SECS  G.M.T. **** 137. HRS,    1. MINS,  23.201 SECS  G.E.T.
X       3.1912808+03  Y       1.4134069+03  Z       3.6820149+02  DX     -1.6672678+04  DY      2.1466672+04  DZ      2.3814104+04
R       3.5096388+03  DEC     6.0220680+00  RA      2.3888382+01  V       3.6137346+04  PTH    -6.3818948+00  AZ      4.7267476+01
ALT     6.5832897+01  LAT     6.0615862+00  LON     5.3359295+01  VE      3.5024416+04  PTE    -6.5578882+00  AZE     4.5535880+01
SMA     1.6217557+05  ECC     9.7862931-01  INC     4.3073677+01  RAN     1.7409509+01  APF     2.1740394+01  RP      3.4658045+03
INMP    1.8099741+01  RAM    -9.7369549+01  DEM    -2.8554200+01  RAS     1.7615999+02  DES     1.6633216+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.7333257+01  LONTD   7.6555724+01  AZTD    5.5255630+01
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(d) 90° launch azimuth; first injection opportunity

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ID      913090.1
LAUNCH TIME      13  SEPT. 1969     6 HRS,     5 MINS,   1.196 SECS   G.M.T.
LAUNCH AZIMUTH   90.                                INJECTION OPPORTUNITY    1
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ID      913090.1
EARTH PARKING ORBIT INSERTION
   13  SEPT. 1969    6 HRS,   16 MINS,  17.838 SECS  G.M.T. ****   0. HRS,   11. MINS,  16.641 SECS  G.E.T.
X       2.7438978+03  Y       1.6426249+03  Z       1.5271779+03  DX     -1.0660098+04  DY      2.2648472+04  DZ     -5.2074657+03
ALT     1.0215220+02  LAT     2.5672035+01  LON     3.0476225+02  V       2.5567727+04  PTH    -4.7156125-07  AZ      1.0304435+02
R       3.5439334+03  DEC     2.5526427+01  RA      3.0906700+01  RAS     1.7107961+02  DES     3.8467807+00  RAN    -8.7357539+01
INC     2.8465879+01  MASS    2.8467194+05
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ID      913090.1
3.5 MINS PRIOR TO TLI INITIATION
   13  SEPT. 1969    7 HRS,   43 MINS,  16.319 SECS  G.M.T. ****   1. HRS,   38. MINS,  15.123 SECS  G.E.T.
X       2.8510246+03  Y       1.3985526+C3  Z       1.5732627+03  DX     -9.0731764+03  DY      2.3488244+04  DZ     -4.4340621+03
ALT     1.0228132+02  LAT     2.6503932+01  LON     2.7818233+02  V       2.5567187+04  PTH     3.6374672-03  AZ      1.0116156+02
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ID      913090.1
TRANSLUNAR INJECTION INITIATION
   13  SEPT. 1969    7 HRS,   46 MINS,  46.319 SECS  G.M.T. ****   1. HRS,   41. MINS,  45.123 SECS  G.E.T.
X       2.4525007+03  Y       2.1587002+03  Z       1.3727943+03  DX     -1.3869185+04  DY      2.0271411+04  DZ     -7.1064053+03
ALT     1.0171769+02  LAT     2.2924533+01  LON     2.9252931+02  V       2.5569227+04  PTH    -6.2722366-03  AZ      1.0754284+02
R       3.5439117+03  DEC     2.2790763+01  RA      4.1354351+01  RAS     1.7113601+02  DES     3.8227233+00  RAN    -8.7862705+01
INC     2.8472193+01  MASS    2.8257292+05
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ID      913090.1
TRANSLUNAR INJECTION TERMINATION
   13  SEPT. 1969    7 HRS,   51 MINS,  56.915 SECS  G.M.T. ****   1. HRS,   46. MINS,  55.719 SECS  G.E.T.
X       1.4487028+03  Y       3.1912283+03  Z       8.6654581+02  DX     -2.6376919+04  DY      2.0328031+04  DZ     -1.2574121+04
ALT     1.6693943+02  LAT     1.3973865+01  LON     3.1546092+02  V       3.5596056+04  PTH     7.0456868+00  AZ      1.1340390+02
R       3.6102049+03  DEC     1.3888120+C1  RA      6.5583659+01  RAS     1.7113923+02  DES     3.8213467+00  DEM    -4.5507999+00
RAN    -8.5405096+01  INC     2.7013566+C1  ECC     9.7492730-01  SMA     1.4179522+05  RP      3.5551902+03  APF     1.3382509+02
INMP    3.6337280+01  C3TLI  -4.8356003-01  DAZTLI-1.8534878+00   MASS    1.3197409+05  FUEL    1.5059882+05
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ID      913090.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   13  SEPT. 1969    9 HRS,   51 MINS,  56.915 SECS  G.M.T. ****   3. HRS,   46. MINS,  55.719 SECS  G.E.T.
X      -1.8995380+04  Y      -5.5034880+02  Z      -9.6741405+03  DX     -1.1194813+04  DY     -6.3060240+03  DZ     -5.9442650+03
ALT     1.7882521+04  LAT    -2.7004604+01  LON     4.1454685+01  V       1.4157121+04  PTH     6.5010264+01  AZ      9.1320690+01
R       2.1324079+04  DEC    -2.6979530+01  RA     -1.7834044+02  RAS     1.7121404+02  DES     3.7894310+00
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ID      913090.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   16  SEPT. 1969    5 HRS,   37 MINS,  23.376 SECS  G.M.T. ****  71. HRS,   32. MINS,  22.177 SECS  G.E.T.
RMP     9.9905906+02  DEMP    6.3786841+0C  RAMP   -1.7969304+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(d) 90° launch azimuth; first injection opportunity - Continued

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ID      913090.1
LUNAR ORBIT INSERTION BURN INITIATION
   16  SEPT. 1969   5 HRS,   34 MINS,   5.314 SECS  G.M.T. ****  71. HRS,   29. MINS,   4.117 SECS  G.E.T.
XL     -4.7619279+02  YL     -8.3768135+02  ZL     -3.5058598+02  DXL    -6.5447054+03  DYL     4.3820287+03  DZL     2.6943772+03
XS     -1.0057532+03  YS     -1.9911770+02  ZS     -1.3877944+01  DXS    -1.6391779+02  DYS     8.2969093+03  DZS     8.3673937+02
ALTS    8.6874745+01  LATS   -7.7549884-01  LONS   -1.6880146+02  VRS     8.3406057+03  PTR    -1.0093487+01  AZR    -8.4289725+01
LIN     1.7422606+02  LAN    -1.7649437+02  LAP     1.9277114+02  LTS    -2.2190047-02  LNS     1.2194509+02  DEM    -2.0863219+01
THETA   1.6307538+01  BETA   -1.7716911+02  MASS    9.4833024+04
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ID      913090.1
LUNAR ORBIT INSERTION BURN TERMINATION
   16  SEPT. 1969   5 HRS,   40 MINS,  23.036 SECS  G.M.T. ****  71. HRS,   35. MINS,  21.838 SECS  G.E.T.
XL     -7.8872479+02  YL     -5.7596561+02  ZL     -2.0168440+02  DXL    -3.3037994+03  DYL     3.8931607+03  DZL     2.0018186+03
XS     -9.6942047+02  YS      2.3256517+02  ZS      2.5241659+01  DXS     1.3287695+03  DYS     5.3233995+03  DZS     3.8925200+02
ALTS    5.8752558+01  LATS    1.4503893+00  LONS    1.6650961+02  VRS     5.5005206+03  PTR    -4.2067074-01  AZR    -8.5929909+01
LIN     1.7566835+02  LAN    -1.7396227+02  LAP     1.0839850+01  SMAS    1.0526999+03  ECCS    5.3188502-02  PERS    2.1457279+00
RPS     9.9670844+02  APOS    1.1086915+03  RANS   -1.7069697+02  INCS    1.5541825+02  LTS    -2.2321045-02  LNS     1.2189168+02
LTE     5.5732276+00  LNE    -4.9204997+00  THETA  -8.3813328+00  BETA   -1.7577831+02  FUEL    2.4013017+04  BARC    2.4729703+01
DELV    2.9553472+03  MASS    7.0820006+04  PLCHNG  1.4598203+00  DRTX   -2.8329892+03  DRTY   -1.4008673+02  DRTZ   -8.2984129+02
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ID      913090.1
CIRCULARIZATION BURN INITIATION
   16  SEPT. 1969  10 HRS,    0 MINS,  34.540 SECS  G.M.T. ****  75. HRS,   55. MINS,  33.341 SECS  G.E.T.
XL     -8.7305826+02  YL     -4.5916597+02  ZL     -1.4255172+02  DXL    -2.6223607+03  DYL     4.3178278+03  DZL     2.1423984+03
XS     -9.0408648+02  YS      4.1798176+02  ZS      3.6109861+01  DXS     2.3150367+03  DYS     4.9795102+03  DZS     3.6334952+02
ALTS    5.8193519+01  LATS    2.0762742+00  LONS    1.5518772+02  VRS     5.5033571+03  PTR     1.5371740-02  AZR    -8.6212449+01
LIN     1.7567170+02  LAN    -1.7619257+02  LAP    -1.6222533+02  LTS    -2.7758413-02  LNS     1.1968399+02  DEM    -2.1706326+01
THETA   4.2688681-06  BETA    1.7999999+02  MASS    7.0800006+04
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ID      913090.1
CIRCULARIZATION BURN TERMINATION
   16  SEPT. 1969  10 HRS,    0 MINS,  49.637 SECS  G.M.T. ****  75. HRS,   55. MINS,  48.441 SECS  G.E.T.
XL     -8.7941432+02  YL     -4.4853197+02  ZL     -1.3728297+02  DXL    -2.4936853+03  DYL     4.2415625+03  DZL     2.0984591+03
XS     -8.9832591+02  YS      4.3016131+02  ZS      3.6998069+01  DXS     2.3217431+03  DYS     4.8239984+03  DZS     3.5158599+02
ALTS    5.8199549+01  LATS    2.1273553+00  LONS    1.5441267+02  VRS     5.3651714+03  PTR     2.5967143-02  AZR    -8.6241014+01
LIN     1.7567170+02  LAN    -1.7619476+02  LAP    -3.3637933+01  SMAS    9.9750023+02  ECCS    9.2811114-04  PERS    1.9791889+00
RPS     9.9657445+02  APOS    9.9842602+02  RANS   -1.7068283+02  INCS    1.5542787+02  LTS    -2.7763686-02  LNS     1.1968186+02
LTE     5.7341415+00  LNE    -4.8487359+00  THETA  -7.7386982-01  BETA   -1.7999999+02  FUEL    9.5978125+02  BARC    7.7400368-01
DELV    1.3815201+02  MASS    6.9840225+04  PLCHNG  1.5312426-05  DRTX   -1.3815013+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      913090.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   17  SEPT. 1969   4 HRS,   25 MINS,  12.530 SECS  G.M.T. ****  94. HRS,   20. MINS,  11.332 SECS  G.E.T.
XL     -1.3291913+02  YL      8.9796542+02  ZL      4.1412330+02  DXL     5.2830894+03  DYL     7.9938224+02  DZL    -3.3759210+01
XS      8.2621973+02  YS      5.5729204+02  ZS      4.7895888+01  DXS     3.0056097+03  DYS    -4.4264828+03  DZS    -3.0977581+02
ALTS    5.9257700+01  LATS    2.7514748+00  LONS    3.3999989+01  VRS     5.3594217+03  PTR     1.7287944-02  AZR    -9.3318208+01
LIN     1.7568269+02  LAN     1.7446160+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(d) 90° launch azimuth; first injection opportunity - Continued

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ID      913090.1
CSM PLANE CHANGE BURN INITIATION
   18  SEPT. 1969   1 HRS,  36 MINS,  17.772 SECS  G.M.T. **** 115. HRS,   31. MINS,  16.575 SECS  G.E.T.
XL     -9.2352825+02  YL     -3.6300137+02  ZL     -9.3629304+01  DXL    -1.9806026+03  DYL     4.4752236+03  DZL     2.1582245+03
XS     -5.9383746+02  YS      7.9921992+02  ZS      4.5226567+01  DXS     4.3056291+03  DYS     3.1842323+03  DZS     3.2058894+02
ALTS    5.8221526+01  LATS    2.6007248+00  LONS    1.2661313+02  VRS     5.3647511+03  PTR     2.7400452-02  AZR    -8.6571758+01
LIN     1.7568964+02  LAN     1.6367249+02  LAP    -4.3988262+01  LTS    -7.9473336-02  LNS     9.9536540+01  DEM    -2.7320468+01
THETA   2.5613209-06  BETA   -9.0000027+01  MASS    3.6486225+04
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ID      913090.1
CSM PLANE CHANGE BURN TERMINATION
   18  SEPT. 1969   1 HRS,  36 MINS,  21.324 SECS  G.M.T. **** 115. HRS,   31. MINS,  20.128 SECS  G.E.T.
XL     -9.2468287+02  YL     -3.6037576+02  ZL     -9.2383795+01  DXL    -1.9693469+03  DYL     4.5069901+03  DZL     2.1025935+03
XS     -5.9131704+02  YS      8.0107880+02  ZS      4.5395464+01  DXS     4.3169869+03  DYS     3.1752179+03  DZS     2.5716054+02
ALTS    5.8223014+01  LATS    2.6104399+00  LONS    1.2643292+02  VRS     5.3651202+03  PTR     2.7490640-02  AZR    -8.7251049+01
LIN     1.7620378+02  LAN     1.6983470+02  LAP    -4.9717728+01  SMAS    9.9752405+02  ECCS    9.4175296-04  PERS    1.9792598+00
RPS     9.9658464+02  APOS    9.9846345+02  RANS   -1.7087913+02  INCS    1.5617763+02  LTS    -7.9474673-02  LNS     9.9536043+01
LTE     6.6902749+00  LNE    -3.8452011+00  THETA   9.8866986-04  BETA   -8.9327329+01  FUEL    2.2583203+02  BARC    1.7995436-01
DELV    6.2843230+01  MASS    3.6260393+04  PLCHNG  6.7315767-01  DRTX    0.0000000     DRTY   -6.2843166+01  DRTZ    0.0000000
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ID      913090.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   6 HRS,   3 MINS,  22.737 SECS  G.M.T. **** 119. HRS,   58. MINS,  21.538 SECS  G.E.T.
XL     -3.6910560+02  YL      8.4009525+02  ZL      3.9189338+02  DXL     4.9514453+03  DYL     1.9456523+03  DZL     5.0071117+02
XS      8.2625069+02  YS      5.5731183+02  ZS      4.7881654+01  DXS     3.0062638+03  DYS    -4.4304148+03  DZS    -2.4336226+02
ALTS    5.9293713+01  LATS    2.7505571+00  LONS    3.3999936+01  VRS     5.3596102+03  PTR     3.3774917-02  AZR    -9.2607124+01
LIN     1.7620546+02  LAN     1.6758362+02
*****************************************************************************************************************

ID      913090.1
TRANSEARTH INJECTION BURN INITIATION
   18  SEPT. 1969  22 HRS,  48 MINS,  52.441 SECS  G.M.T. **** 136. HRS,   43. MINS,  51.239 SECS  G.E.T.
XL      5.3201751+02  YL     -7.5881546+02  ZL     -3.6744948+02  DXL    -4.5115890+03  DYL    -2.7362864+03  DZL    -8.7209591+02
XS     -8.1165244+02  YS     -5.7625706+02  ZS     -5.4870190+01  DXS    -3.1092933+03  DYS     4.3667460+03  DZS     1.9598900+02
ALTS    5.8433075+01  LATS   -3.1551167+00  LONS   -1.4462601+02  VRS     5.3641949+03  PTR    -3.7035545-02  AZR    -8.7905007+01
LIN     1.7620979+02  LAN     1.5906281+02  LAP    -1.3178945+02  LTS    -1.0872228-01  LNS     8.8752476+01  DEM    -2.8570828+01
THETA  -3.1958924+00  BETA   -8.7971134-01  MASS    3.6670393+04
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ID      913090.1
TRANSEARTH INJECTION BURN TERMINATION
   18  SEPT. 1969  22 HRS,  51 MINS,   8.715 SECS  G.M.T. **** 136. HRS,   46. MINS,   7.518 SECS  G.E.T.
XL      4.0176634+02  YL     -8.2805926+02  ZL     -3.8887436+02  DXL    -7.1961811+03  DYL    -3.4882214+03  DZL    -1.0555512+03
XS     -8.9087817+02  YS     -4.4968813+02  ZS     -4.9378489+01  DXS    -4.0125027+03  DYS     7.0099330+03  DZS     2.9607677+02
ALTS    6.0666922+01  LATS   -2.8327102+00  LONS   -1.5321675+02  VRS     8.0825119+03  PTR     2.8941236+00  AZR    -8.7752002+01
LIN     1.7638145+02  LAN     1.5529992+02  LAP    -2.1145507+00  SMAS   -3.5491779+03  ECCS    1.2808773+00  PERS    1.3283404+01
RPS     9.9688341+02  APOS   -8.0952390+03  RANS   -1.7148581+02  INCS    1.5612106+02  LTS    -1.0877540-01  LNS     8.8733242+01
LTE     6.7761774+00  LNE    -3.0679990+00  THETA   5.3677525+00  BETA   -5.8437737-01  FUEL    8.6633208+03  BARC    8.5643081+00
DELV    2.7279864+03  MASS    2.8007072+04  PLCHNG  2.9642703-01  DRTX    2.7234148+03  DRTY   -4.1815276+01  DRTZ    1.5208463+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(d) 90° launch azimuth; first injection opportunity - Concluded

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ID      913090.1
ENTRY AND TOUCHDOWN
   22  SEPT. 1969  17 HRS,  16 MINS,  58.333 SECS  G.M.T. **** 227. HRS,   11. MINS,  57.133 SECS  G.E.T.
X       1.4378465+03  Y       2.7194981+03  Z       1.6845538+03  DX     -3.3677911+04  DY      1.2857225+04  DZ     -3.7731300+02
R       3.5072487+03  DEC     2.8705411+01  RA      6.2133803+01  V       3.6050690+04  PTH    -6.4000367+00  AZ      8.7167463+01
ALT     6.5988649+01  LAT     2.8864741+01  LON     1.6149796+02  VE      3.4698237+04  PTE    -6.6423891+00  AZE     8.7036954+01
SMA     1.0805357+05  ECC     9.6795156-01  INC     2.8832983+01  RAN    -2.1984798+01  APF     9.7856426+01  RP      3.4629491+03
INMP    9.7212442+00  RAM    -3.8701086+01  DEM    -1.8217376+01  RAS     1.7956513+02  DES     1.8852971-01  SPSFR   3.6410444+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.5246675+01  LONTD   1.9500005+02  AZTD    1.0454405+02
*****************************************************************************************************************

ID      913090.1
CIRCUMLUNAR PERICYNTHION
   16  SEPT. 1969   5 HRS,  37 MINS,  42.242 SECS  G.M.T. ****  71. HRS,   32. MINS,  41.046 SECS  G.E.T.
XL     -7.0014603+02  YL     -6.6752401+02  ZL     -2.4883549+02  DXL    -5.9563889+03  DYL     5.1318572+03  DZL     2.9927570+03
XS     -9.9382529+02  YS      9.8818813+01  ZS      1.6060671+01  DXS     8.4323067+02  DYS     8.3446264+03  DZS     8.3544844+02
ALTS    6.0361730+01  LATS    9.2130305-01  LONS    1.7432158+02  VRS     8.4286296+03  PTR    -2.1312027-07  AZR    -8.4310748+01
LIN     1.7422611+02  LAN    -1.7652740+02  LAP     1.6490195+02  LTS    -2.2265312-02  LNS     1.2191441+02  DEM    -2.0874897+01
SMAS   -2.0775941+03  ECCS    1.4807750+00  INCS    1.5425910+02  RANS   -1.6860934+02  APFS   -3.5002450+01  RPS     9.9885527+02
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ID      913090.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   18  SEPT. 1969  23 HRS,   0 MINS,  23.952 SECS  G.M.T. **** 136. HRS,   55. MINS,  22.753 SECS  G.E.T.
X       3.1982218+03  Y       1.4097793+03  Z       3.1888557+02  DX     -1.6484223+04  DY      2.1087871+04  DZ      2.4278152+04
R       3.5096707+03  DEC     5.2130332+00  RA      2.3787931+01  V       3.6136638+04  PTH    -6.9056091+00  AZ      4.6321321+01
ALT     6.5832943+01  LAT     5.2473063+00  LON     4.1002718+01  VE      3.5041345+04  PTE    -7.0981392+00  AZE     4.4555712+01
SMA     1.6173212+05  ECC     9.7861662-01  INC     4.3926295+01  RAN     1.8352629+01  APF     2.1488598+01  RP      3.4583810+03
INMP    1.9163251+01  RAM    -9.6827503+01  DEM    -2.8575704+01  RAS     1.7619044+02  DES     1.6501582+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.7032878+01  LONTD   6.3675138+01  AZTD    5.3902300+01
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(e) 98° launch azimuth; first injection opportunity

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ID      913098.1
LAUNCH TIME      13  SEPT. 1969     7 HRS,     0 MINS,  56.864 SECS   G.M.T.
LAUNCH AZIMUTH   98.                                INJECTION OPPORTUNITY    1
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ID      913098.1
EARTH PARKING ORBIT INSERTION
   13  SEPT. 1969    7 HRS,  12 MINS,  13.989 SECS  G.M.T. ****   0. HRS,   11. MINS,  17.125 SECS  G.E.T.
X       2.3548072+03  Y       2.2737945+03  Z       1.3580155+03  DX     -1.4367389+04  DY      1.9609914+04  DZ     -7.9207372+03
ALT     1.0170214+02  LAT     2.2664276+01  LON     3.0383058+02  V       2.5567727+04  PTH    -9.4312249-08  AZ      1.0959661+02
R       3.5439334+03  DEC     2.2531693+01  RA      4.3997273+01  RAS     1.7111447+02  DES     3.8319079+00  RAN    -8.8897195+01
INC     2.9522020+01  MASS    2.8440356+05
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ID      913098.1
3.5 MINS PRIOR TO TLI INITIATION
   13  SEPT. 1969    8 HRS,  36 MINS,  17.693 SECS  G.M.T. ****   1. HRS,   35. MINS,  20.819 SECS  G.E.T.
X       2.8199647+03  Y       1.4244778+03  Z       1.6054093+03  DX     -9.0034185+03  DY      2.3411769+04  DZ     -4.9449711+03
ALT     1.0226726+02  LAT     2.7088572+01  LON     2.6556056+02  V       2.5566094+04  PTH     1.3609893-02  AZ      1.0253754+02
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ID      913098.1
TRANSLUNAR INJECTION INITIATION
   13  SEPT. 1969    8 HRS,  39 MINS,  47.683 SECS  G.M.T. ****   1. HRS,   38. MINS,  50.819 SECS  G.E.T.
X       2.4247879+03  Y       2.1812078+03  Z       1.3864692+03  DX     -1.3746195+04  DY      2.0151192+04  DZ     -7.6588219+03
ALT     1.0178779+02  LAT     2.3165398+01  LON     2.7985581+02  V       2.5567283+04  PTH     2.2836134-03  AZ      1.0899683+02
R       3.5439470+03  DEC     2.3030540+01  RA      4.1972829+01  RAS     1.7116906+02  DES     3.8086224+00  RAN    -8.9374175+01
INC     2.9521140+01  MASS    2.8236175+05
*****************************************************************************************************************

ID      913098.1
TRANSLUNAR INJECTION TERMINATION
   13  SEPT. 1969    8 HRS,  44 MINS,  58.106 SECS  G.M.T. ****   1. HRS,   44. MINS,   1.242 SECS  G.E.T.
X       1.4304757+03  Y       3.2049737+03  Z       8.4734062+02  DX     -2.6152617+04  DY      2.0131885+04  DZ     -1.3329308+04
ALT     1.6725951+02  LAT     1.3656960+01  LON     3.0253337+02  V       3.5593855+04  PTH     7.0696963+00  AZ      1.1471694+02
R       3.6105544+03  DEC     1.3573017+01  RA      6.5947361+01  RAS     1.7117228+02  DES     3.8072462+00  DEM    -4.7766007+00
RAN    -8.7038178+01  INC     2.7991782+01  ECC     9.7487781-01  SMA     1.4151465+05  RP      3.5551587+03  APF     1.3567578+02
INMP    3.7530141+01  C3TLI  -4.8451751-01  DAZTLI-1.8975202+00   MASS    1.3184634+05  FUEL    1.5051540+05
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ID      913098.1
SPACECRAFT SEPARATION              INJECTION + 2HR
   13  SEPT. 1969   10 HRS,  44 MINS,  58.106 SECS  G.M.T. ****   3. HRS,   44. MINS,   1.242 SECS  G.E.T.
X      -1.8818323+04  Y      -6.8988343+02  Z      -1.0005927+04  DX     -1.1084389+04  DY     -6.3907949+03  DZ     -6.0565462+03
ALT     1.7882860+04  LAT    -2.8009865+01  LON     2.8603414+01  V       1.4155835+04  PTH     6.5008720+01  AZ      9.0392110+01
R       2.1324253+04  DEC    -2.7984166+01  RA     -1.7790046+02  RAS     1.7124709+02  DES     3.7753271+00
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ID      913098.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   16  SEPT. 1969    6 HRS,  33 MINS,  56.380 SECS  G.M.T. ****  71. HRS,   32. MINS,  59.513 SECS  G.E.T.
RMP     9.9891520+02  DEMP   6.4151320+00  RAMP  -1.7995102+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(e) 98° launch azimuth; first injection opportunity - Continued

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ID      913098.1
LUNAR ORBIT INSERTION BURN INITIATION
   16  SEPT. 1969   6 HRS,  30 MINS,  38.180 SECS  G.M.T. ****  71. HRS,   29. MINS,  41.313 SECS  G.E.T.
XL     -4.7135963+02  YL     -8.3939227+02  ZL     -3.5168696+02  DXL    -6.5768398+03  DYL     4.3370491+03  DZL     2.6981436+03
XS     -1.0060777+03  YS     -1.9505852+02  ZS     -1.4239981+01  DXS    -1.4066634+02  DYS     8.2982782+03  DZS     8.5687836+02
ALTS    8.6417676+01  LATS   -7.9608560-01  LONS   -1.6902761+02  VRS     8.3435871+03  PTR    -1.0029864+01  AZR    -8.4154550+01
LIN     1.7408910+02  LAN    -1.7674063+02  LAP    -1.4980035+02  LTS    -2.3367760-02  LNS     1.2146527+02  DEM    -2.1045080+01
THETA   1.6152965+01  BETA   -1.7690378+02  MASS    9.4833024+04
*****************************************************************************************************************

ID      913098.1
LUNAR ORBIT INSERTION BURN TERMINATION
   16  SEPT. 1969   6 HRS,  36 MINS,  56.155 SECS  G.M.T. ****  71. HRS,   35. MINS,  59.291 SECS  G.E.T.
XL     -7.8583546+02  YL     -5.7941502+02  ZL     -2.0274844+02  DXL    -3.3262086+03  DYL     3.8778982+03  DZL     1.9952235+03
XS     -9.6831386+02  YS      2.3681483+02  ZS      2.5553989+01  DXS     1.3497878+03  DYS     5.3184864+03  DZS     3.8872559+02
ALTS    5.8685511+01  LATS    1.4684385+00  LONS    1.6625725+02  VRS     5.5008482+03  PTR    -3.9262258-01  AZR    -8.5936214+01
LIN     1.7566824+02  LAN    -1.7396197+02  LAP     9.6712171+00  SMAS    1.0526907+03  ECCS    5.3177899-02  PERS    2.1456998+00
RPS     9.9671090+02  APOS    1.1086706+03  RANS   -1.7063446+02  INCS    1.5544739+02  LTS    -2.3499054-02  LNS     1.2141183+02
LTE     5.6090128+00  LNE    -4.9055818+00  THETA  -8.5572698+00  BETA   -1.7537583+02  FUEL    2.4029123+04  BARC    2.4759223+01
DELV    2.9576495+03  MASS    7.0803901+04  PLCHNG  1.5988050+00  DRTX   -2.8367431+03  DRTY   -1.5344488+02  DRTZ   -8.2282656+02
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ID      913098.1
CIRCULARIZATION BURN INITIATION
   16  SEPT. 1969  10 HRS,  56 MINS,  55.869 SECS  G.M.T. ****  75. HRS,   55. MINS,  59.005 SECS  G.E.T.
XL     -8.6573628+02  YL     -4.7119956+02  ZL     -1.4786109+02  DXL    -2.6945332+03  DYL     4.2799342+03  DZL     2.1287484+03
XS     -9.0663874+02  YS      4.1245876+02  ZS      3.5709002+01  DXS     2.2845992+03  DYS     4.9934237+03  DZS     3.6455194+02
ALTS    5.8196598+01  LATS    2.0532089+00  LONS    1.5553770+02  VRS     5.5033237+03  PTR     1.3505651-02  AZR    -8.6199860+01
LIN     1.7567158+02  LAN    -1.7619044+02  LAP    -1.7255510+02  LTS    -2.8941937-02  LNS     1.1920586+02  DEM    -2.1879989+01
THETA   0.0000000     BETA    1.7999999+02  MASS    7.0783900+04
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ID      913098.1
CIRCULARIZATION BURN TERMINATION
   16  SEPT. 1969  10 HRS,  57 MINS,  10.961 SECS  G.M.T. ****  75. HRS,   56. MINS,  14.097 SECS  G.E.T.
XL     -8.7226782+02  YL     -4.6066112+02  ZL     -1.4262717+02  DXL    -2.5645837+03  DYL     4.2054896+03  DZL     2.0855369+03
XS     -9.0095448+02  YS      4.2466902+02  ZS      3.6599891+01  DXS     2.2922453+03  DYS     4.8379813+03  DZS     3.5278852+02
ALTS    5.8202179+01  LATS    2.1044446+00  LONS    1.5476293+02  VRS     5.3651571+03  PTR     2.4044406-02  AZR    -8.6228102+01
LIN     1.7567160+02  LAN    -1.7619266+02  LAP    -3.4703345+01  SMAS    9.9750014+02  ECCS    9.0968372-04  PERS    1.9791886+00
RPS     9.9659274+02  APOS    9.9840753+02  RANS   -1.7062051+02  INCS    1.5545706+02  LTS    -2.8947246-02  LNS     1.1920372+02
LTE     5.7676359+00  LNE    -4.8321801+00  THETA  -7.7371784-01  BETA   -1.7999300+02  FUEL    9.5944922+02  BARC    7.7368758-01
DELV    1.3813557+02  MASS    6.9824451+04  PLCHNG  1.5287302-05  DRTX   -1.3813336+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      913098.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   17  SEPT. 1969   5 HRS,  21 MINS,  40.561 SECS  G.M.T. ****  94. HRS,   20. MINS,  43.697 SECS  G.E.T.
XL     -1.4181446+02  YL      8.9677164+02  ZL      4.1368088+02  DXL     5.2764666+03  DYL     8.4359857+02  DZL    -1.5955618+01
XS      8.2619306+02  YS      5.5727351+02  ZS      4.7893762+01  DXS     3.0057216+03  DYS    -4.4266117+03  DZS    -3.0979684+02
ALTS    5.9225151+01  LATS    2.7514423+00  LONS    3.3999962+01  VRS     5.3595921+03  PTR     1.7523544-02  AZR    -9.3318341+01
LIN     1.7568261+02  LAN     1.7446301+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(e) 98° launch azimuth; first injection opportunity - Continued

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ID      913098.1
CSM PLANE CHANGE BURN INITIATION
   18  SEPT. 1969   2 HRS,  32 MINS,  45.738 SECS  G.M.T. **** 115. HRS,   31. MINS,  48.871 SECS  G.E.T.
XL     -9.2014153+02  YL     -3.7071109+02  ZL     -9.6745333+01  DXL    -2.0250626+03  DYL     4.4584334+03  DZL     2.1516578+03
XS     -5.9333934+02  YS      7.9922210+02  ZS      4.5229016+01  DXS     4.3057130+03  DYS     3.1840875+03  DZS     3.2057741+02
ALTS    5.8224503+01  LATS    2.6008579+00  LONS    1.2661315+02  VRS     5.3647317+03  PTR     2.5616923-02  AZR    -8.6571787+01
LIN     1.7568959+02  LAN     1.6367415+02  LAP    -4.4020478+01  LTS    -8.0748234-02  LNS     9.9057913+01  DEM    -2.7404809+01
THETA  -8.5377364-07  BETA   -9.0000032+01  MASS    3.6470451+04
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ID      913098.1
CSM PLANE CHANGE BURN TERMINATION
   18  SEPT. 1969   2 HRS,  32 MINS,  49.288 SECS  G.M.T. **** 115. HRS,   31. MINS,  52.424 SECS  G.E.T.
XL     -9.2132160+02  YL     -3.6809652+02  ZL     -9.5504241+01  DXL    -2.0138931+03  DYL     4.4902917+03  DZL     2.0960674+03
XS     -5.9132005+02  YS      8.0108002+02  ZS      4.5397831+01  DXS     4.3170658+03  DYS     3.1750795+03  DZS     2.5715198+02
ALTS    5.8225888+01  LATS    2.6105686+00  LONS    1.2643302+02  VRS     5.3651014+03  PTR     2.5706379-02  AZR    -8.7251049+01
LIN     1.7620369+02  LAN     1.6983620+02  LAP    -4.9869713+01  SMAS    9.9752276+02  ECCS    9.2252965-04  PERS    1.9792559+00
RPS     9.9660252+02  APOS    9.9844298+02  RANS   -1.7083199+02  INCS    1.5620615+02  LTS    -8.0749606-02  LNS     9.9057416+01
LTE     6.7007384+00  LNE    -3.8140676+00  THETA   1.0723397-03  BETA   -8.9327101+01  FUEL    2.2572461+02  BARC    1.8009023-01
DELV    6.2840816+01  MASS    3.6244726+04  PLCHNG  6.7313122-01  DRTX    0.0000000     DRTY   -6.2840748+01  DRTZ    0.0000000
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ID      913098.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   6 HRS,  59 MINS,  50.612 SECS  G.M.T. **** 119. HRS,   58. MINS,  53.746 SECS  G.E.T.
XL     -3.7742489+02  YL      8.3693072+02  ZL      3.9065598+02  DXL     4.9334487+03  DYL     1.9870239+03  DZL     5.1742294+02
XS      8.2622384+02  YS      5.5729373+02  ZS      4.7879922+01  DXS     3.0063402+03  DYS    -4.4305673+03  DZS    -2.4338365+02
ALTS    5.9261293+01  LATS    2.7505470+00  LONS    3.3999937+01  VRS     5.3597801+03  PTR     3.3528391-02  AZR    -9.2607274+01
LIN     1.7620537+02  LAN     1.6758520+02
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ID      913098.1
TRANSEARTH INJECTION BURN INITIATION
   18  SEPT. 1969  23 HRS,  45 MINS,  39.985 SECS  G.M.T. **** 136. HRS,   44. MINS,  43.115 SECS  G.E.T.
XL      5.2488401+02  YL     -7.6327223+02  ZL     -3.6852320+02  DXL    -4.5353685+03  DYL    -2.7026577+03  DZL    -8.5288610+02
XS     -8.2169101+02  YS     -5.6194367+02  ZS     -5.4224069+01  DXS    -3.0321661+03  DYS     4.4203168+03  DZS     2.0111439+02
ALTS    5.8450355+01  LATS   -3.1178728+00  LONS   -1.4563229+02  VRS     5.3641102+03  PTR    -3.6112963-02  AZR    -8.7850115+01
LIN     1.7620970+02  LAN     1.5906194+02  LAP     2.0981663+01  LTS    -1.1005259-01  LNS     8.8271350+01  DEM    -2.8593701+01
THETA  -3.0181623+00  BETA   -9.9038970-01  MASS    3.6654726+04
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ID      913098.1
TRANSEARTH INJECTION BURN TERMINATION
   18  SEPT. 1969  23 HRS,  47 MINS,  56.373 SECS  G.M.T. **** 136. HRS,   46. MINS,  59.504 SECS  G.E.T.
XL      3.9392604+02  YL     -8.3166173+02  ZL     -3.8951173+02  DXL    -7.2261475+03  DYL    -3.4402195+03  DZL    -1.0342994+03
XS     -8.9883973+02  YS     -4.3391081+02  ZS     -4.8650564+01  DXS    -3.8975310+03  DYS     7.0783447+03  DZS     2.9768322+02
ALTS    6.0785391+01  LATS   -2.7905867+00  LONS   -1.5423128+02  VRS     8.0859338+03  PTR     2.9611105+00  AZR    -8.7740270+01
LIN     1.7640693+02  LAN     1.5484985+02  LAP    -1.3690055+00  SMAS   -3.5219994+03  ECCS    1.2830485+00  PERS    1.3131117+01
RPS     9.9689680+02  APOS   -8.0408956+03  RANS   -1.7153007+02  INCS    1.5613928+02  LTS    -1.1010589-01  LNS     8.8252085+01
LTE     6.7725667+00  LNE    -3.0299289+00  THETA   5.5540186+00  BETA   -6.5789658-01  FUEL    8.6706162+03  BARC    8.5730034+00
DELV    2.7319625+03  MASS    2.7984110+04  PLCHNG  3.3413085-01  DRTX    2.7277584+03  DRTY   -4.7153584+01  DRTZ    1.4384439+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(e) 98° launch azimuth; first injection opportunity - Concluded

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ID      913098.1
ENTRY AND TOUCHDOWN
   22  SEPT. 1969  17 HRS,  18 MINS,  57.919 SECS  G.M.T. **** 226. HRS,   18. MINS,   1.055 SECS  G.E.T.
X       1.4139044+03  Y       2.7301160+03  Z       1.6874821+03  DX     -3.3786786+04  DY      1.2571683+04  DZ     -3.8224158+02
R       3.5071719+03  DEC     2.8760655+01  RA      6.2620735+01  V       3.6051909+04  PTH    -6.4000002+00  AZ      8.7168761+01
ALT     6.5921267+01  LAT     2.8920185+01  LON     1.6148525+02  VE      3.4700199+04  PTE    -6.6421929+00  AZE     8.7038351+01
SMA     1.0835154+05  ECC     9.6804037-01  INC     2.8887819+01  RAN    -2.1510798+01  APF     9.7869796+01  RP      3.4628760+03
INMP    9.5053331+00  RAM    -3.8681593+01  DEM    -1.8209696+01  RAS     1.7956638+02  DES     1.8799073-01  SPSFR   3.6182231+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.5290043+01  LONTD   1.9500288+02  AZTD    1.0458202+02
*****************************************************************************************************************************

ID      913098.1
CIRCUMLUNAR PERICYNTHION
   16  SEPT. 1969   6 HRS,  34 MINS,  13.573 SECS  G.M.T. ****  71. HRS,   33. MINS,  16.707 SECS  G.E.T.
XL     -6.9501352+02  YL     -6.7207263+02  ZL     -2.5053498+02  DXL    -5.9972809+03  DYL     5.0851716+03  DZL     2.9959975+03
XS     -9.9351910+02  YS      1.0074905+02  ZS      1.6203610+01  DXS     8.5997685+02  DYS     8.3427335+03  DZS     8.5570373+02
ALTS    6.0252268+01  LATS    9.2960515-01  LONS    1.7420964+02  VRS     8.4304797+03  PTR    -1.0500818-04  AZR    -8.4173603+01
LIN     1.7408914+02  LAN    -1.7677341+02  LAP     2.3953002+01  LTS    -2.3442541-02  LNS     1.2143482+02  DEM    -2.1056569+01
SMAS   -2.0738179+03  ECCS    1.4815976+00  INCS    1.5417993+02  RANS   -1.6834383+02  APFS   -3.5165472+01  RPS     9.9874578+02
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ID      913098.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   18  SEPT. 1969  23 HRS,  50 MINS,  28.135 SECS  G.M.T. **** 136. HRS,   49. MINS,  31.266 SECS  G.E.T.
X       3.1759404+03  Y       1.4456722+03  Z       3.6695235+02  DX     -1.6995506+04  DY      2.1163851+04  DZ      2.3856758+04
R       3.5096399+03  DEC     6.0015608+00  RA      2.4467991+01  V       3.6137248+04  PTH    -6.6300581+00  AZ      4.7117395+01
ALT     6.5833154+01  LAT     6.0409465+00  LON     2.9131077+01  VE      3.5027673+04  PTE    -6.8134038+00  AZE     4.5379981+01
SMA     1.6209961+05  ECC     9.7864064-01  INC     4.3219683+01  RAN     1.3044467+01  APF     2.2187816+01  RP      3.4623452+03
INMP    1.8446444+01  RAM    -9.6271916+01  DEM    -2.8595503+01  RAS     1.7622162+02  DES     1.6366767+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.7382664+01  LONTD   5.2269812+01  AZTD    5.5095455+01
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity

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ID      913072.2
LAUNCH TIME      13  SEPT. 1969     3 HRS,     9 MINS,  29.338 SECS    G.M.T.
LAUNCH AZIMUTH    72.                          INJECTION OPPORTUNITY     2
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ID      913072.2
EARTH PARKING ORBIT INSERTION
   13  SEPT. 1969    3 HRS,   20 MINS,   49.079 SECS  G.M.T. ****    0. HRS,    11. MINS,   19.741 SECS  G.E.T.
X       2.9216632+03  Y      -6.3081060+02  Z       1.9040553+03  DX      4.8830558+03  DY      2.5083784+04  DZ      8.1745141+02
ALT     1.0334398+02  LAT     3.2667610+01  LON     3.0566189+02  V       2.5567727+04  PTH     1.7683546-07  AZ      8.7827504+01
R       3.5439334+03  DEC     3.2498104+01  RA     -1.2183598+01  RAS     1.7097021+02  DES     3.8934285+00  RAN    -9.8144800+01
INC     3.2562694+01  MASS    2.8296469+05
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ID      913072.2
3.5 MINS PRIOR TO TLI INITIATION
   13  SEPT. 1969    6 HRS,   25 MINS,    5.147 SECS  G.M.T. ****    3. HRS,    15. MINS,   35.809 SECS  G.E.T.
X       2.8287654+03  Y       1.3590756+03  Z       1.6461302+03  DX     -7.2487243+03  DY      2.3513188+04  DZ     -6.9624314+03
ALT     1.0239884+02  LAT     2.7832225+01  LON     2.9731429+02  V       2.5571262+04  PTH    -6.2017653-03  AZ      1.0790268+02
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ID      913072.2
TRANSLUNAR INJECTION INITIATION
   13  SEPT. 1969    6 HRS,   28 MINS,   35.147 SECS  G.M.T. ****    3. HRS,    19. MINS,    5.809 SECS  G.E.T.
X       2.4933308+03  Y       2.1212948+03  Z       1.3569201+03  DX     -1.2061946+04  DY      2.0365567+04  DZ     -9.6867189+03
ALT     1.0146797+02  LAT     2.2646584+01  LON     3.1116574+02  V       2.5574975+04  PTH    -1.0844864-02  AZ      1.1420029+02
R       3.5437017+03  DEC     2.2514074+01  RA      4.0390720+01  RAS     1.7108727+02  DES     3.8435134+00  RAN    -9.9178193+01
INC     3.2584143+01  MASS    2.7976859+05
*****************************************************************************************************************

ID      913072.2
TRANSLUNAR INJECTION TERMINATION
   13  SEPT. 1969    6 HRS,   33 MINS,   42.019 SECS  G.M.T. ****    3. HRS,    24. MINS,   12.682 SECS  G.E.T.
X       1.6166626+03  Y       3.1487300+03  Z       6.8565110+02  DX     -2.3093949+04  DY      2.0507013+04  DZ     -1.7740653+04
ALT     1.6178976+02  LAT     1.1032013+01  LON     3.3231541+02  V       3.5617395+04  PTH     6.7405052+00  AZ      1.2226088+02
R       3.6053038+03  DEC     1.0963198+01  RA      6.2822527+01  RAS     1.7109045+02  DES     3.8421536+00  DEM    -4.2173677+00
RAN    -1.0041056+02  INC     3.3881390+01  ECC     9.7458334-01  SMA     1.3986839+05  RP      3.5549892+03  APF     1.4639587+02
INMP    4.6537665+01  C3TLI  -4.9021956-01  DAZTLI  1.4624718+00  MASS    1.3097487+05  FUEL    1.4879373+05
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ID      913072.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   13  SEPT. 1969    8 HRS,   33 MINS,   42.019 SECS  G.M.T. ****    5. HRS,    24. MINS,   12.682 SECS  G.E.T.
X      -1.7800201+04  Y      -4.7330602+02  Z      -1.1693064+04  DX     -1.0939919+04  DY     -6.2385489+03  DZ     -6.4629905+03
ALT     1.7862099+04  LAT    -3.3320358+01  LON     6.0933886+01  V       1.4155266+04  PTH     6.4984972+01  AZ      8.3365528+01
R       2.1302555+04  DEC    -3.3291870+01  RA     -1.7847686+02  RAS     1.7116526+02  DES     3.8102431+00
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ID      913072.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   16  SEPT. 1969    5 HRS,   11 MINS,   13.642 SECS  G.M.T. ****   74. HRS,     1. MINS,   44.301 SECS  G.E.T.
RMP     9.9900444+02  DEMP    6.3742581+00  RAMP    1.7770440+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity - Continued

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ID      913072.2
LUNAR ORBIT INSERTION BURN INITIATION
   16  SEPT. 1969   5 HRS,   7 MINS,  53.649 SECS  G.M.T. ****  73. HRS,   58. MINS,  24.309 SECS  G.E.T.
XL     -5.1582246+02  YL     -8.1140430+02  ZL     -3.4593755+02  DXL    -6.3668172+03  DYL     4.4784828+03  DZL     3.0175179+03
XS     -1.0096374+03  YS     -1.5611891+02  ZS     -1.9536847+01  DXS     7.6859701+01  DYS     8.2915848+03  DZS     1.1010978+03
ALTS    8.3329605+01  LATS   -1.0955390+00  LONS   -1.7121004+02  VRS     8.3647296+03  PTR    -9.3836512+00  AZR    -8.2513916+01
LIN     1.7241982+02  LAN    -1.7947205+02  LAP     7.5142116+01  LTS    -2.1645147-02  LNS     1.2216736+02  DEM    -2.0778450+01
THETA   1.4140448+01  BETA   -1.7374217+02  MASS    9.4833024+04
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ID      913072.2
LUNAR ORBIT INSERTION BURN TERMINATION
   16  SEPT. 1969   5 HRS,  14 MINS,  15.263 SECS  G.M.T. ****  74. HRS,    4. MINS,  45.923 SECS  G.E.T.
XL     -8.1887692+02  YL     -5.3910207+02  ZL     -1.8310594+02  DXL    -3.3805137+03  DYL     4.0446009+03  DZL     2.0544259+03
XS     -9.5744199+02  YS      2.7785972+02  ZS      2.8583077+01  DXS     1.5723864+03  DYS     5.2561513+03  DZS     3.8229682+02
ALTS    5.8862072+01  LATS    1.6422568+00  LONS    1.6381671+02  VRS     5.4996069+03  PTR    -3.5587724-01  AZR    -8.6002007+01
LIN     1.7566751+02  LAN    -1.7394637+02  LAP    -1.7025812+02  SMAS    1.0525535+03  ECCS    5.2809608-02  PERS    2.1452802+00
RPS     9.9696864+02  APOS    1.1081385+03  RANS   -1.7072246+02  INCS    1.5540516+02  LTS    -2.1777483-02  LNS     1.2211339+02
LTE     5.5565375+00  LNE    -4.9272668+00  THETA  -1.0715541+01  BETA   -1.7047073+02  FUEL    2.4260426+04  BARC    2.5062358+01
DELV    2.9907697+03  MASS    7.0572598+04  PLCHNG  3.2951300+00  DRTX   -2.8828702+03  DRTY   -3.1612366+02  DRTZ   -7.3064444+02
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ID      913072.2
CIRCULARIZATION BURN INITIATION
   16  SEPT. 1969   9 HRS,  33 MINS,  49.256 SECS  G.M.T. ****  78. HRS,   24. MINS,  19.918 SECS  G.E.T.
XL     -8.8266058+02  YL     -4.4338552+02  ZL     -1.3499315+02  DXL    -2.5225400+03  DYL     4.3670190+03  DZL     2.1581503+03
XS     -8.9759738+02  YS      4.3224946+02  ZS      3.7186994+01  DXS     2.3949784+03  DYS     4.9399219+03  DZS     3.5996333+02
ALTS    5.8453589+01  LATS    2.1376783+00  LONS    1.5428627+02  VRS     5.5016655+03  PTR    -1.1091452-02  AZR    -8.6245538+01
LIN     1.7567082+02  LAN    -1.7617103+02  LAP    -5.1069813+00  LTS    -2.7197256-02  LNS     1.1991100+02  DEM    -2.1623299+01
THETA  -2.5613209-06  BETA    1.7999300+02  MASS    7.0552598+04
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ID      913072.2
CIRCULARIZATION BURN TERMINATION
   16  SEPT. 1969   9 HRS,  34 MINS,   4.268 SECS  G.M.T. ****  78. HRS,   24. MINS,  34.928 SECS  G.E.T.
XL     -8.8873696+02  YL     -4.3269296+02  ZL     -1.2971635+02  DXL    -2.3961705+03  DYL     4.2884175+03  DZL     2.1133231+03
XS     -8.9167511+02  YS      4.4426306+02  ZS      3.8061864+01  DXS     2.3989628+03  DYS     4.7847899+03  DZS     3.4824038+02
ALTS    5.8453269+01  LATS    2.1879947+00  LONS    1.5351593+02  VRS     5.3638146+03  PTR    -1.4496619-03  AZR    -8.6274730+01
LIN     1.7567082+02  LAN    -1.7617322+02  LAP     2.3163175+01  SMAS    9.9750005+02  ECCS    5.5521820-04  PERS    1.9791883+00
RPS     9.9694622+02  APOS    9.9805386+02  RANS   -1.7070821+02  INCS    1.5541475+02  LTS    -2.7202528-02  LNS     1.1990887+02
LTE     5.7180728+00  LNE    -4.8564687+00  THETA  -7.6905966-01  BETA    1.7999999+02  FUEL    9.5435742+02  BARC    7.6921663-01
DELV    1.3785110+02  MASS    6.9598240+04  PLCHNG  1.5407155-05  DRTX   -1.3784916+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      913072.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   17  SEPT. 1969   3 HRS,  58 MINS,   8.848 SECS  G.M.T. ****  96. HRS,   48. MINS,  39.507 SECS  G.E.T.
XL     -1.2858038+02  YL      8.9802291+02  ZL      4.1408328+02  DXL     5.2890715+03  DYL     7.7829747+02  DZL    -4.2658553+01
XS      8.2577870+02  YS      5.5699402+02  ZS      4.7855792+01  DXS     3.0068606+03  DYS    -4.4290704+03  DZS    -3.1013495+02
ALTS    5.8724102+01  LATS    2.7506418+00  LONS    3.3999962+01  VRS     5.3622811+03  PTR     1.2792764-02  AZR    -9.3320069+01
LIN     1.7568179+02  LAN     1.7448577+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity - Continued

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ID      913072.2
CSM PLANE CHANGE BURN INITIATION
   18  SEPT. 1969   1 HRS,   9 MINS,  15.383 SECS  G.M.T. **** 117. HRS,   59. MINS,  46.044 SECS  G.E.T.
XL     -9.2532666+02  YL     -3.5939294+02  ZL     -9.2121176+01  DXL    -1.9562789+03  DYL     4.4831479+03  DZL     2.1610605+03
XS     -5.9396859+02  YS      7.9939407+02  ZS      4.5270737+01  DXS     4.3062802+03  DYS     3.1814072+03  DZS     3.2036357+02
ALTS    5.8441293+01  LATS    2.6026921+00  LONS    1.2661322+02  VRS     5.3635840+03  PTR    -1.0079090-03  AZR    -8.6572137+01
LIN     1.7568875+02  LAN     1.6369633+02  LAP    -6.3101742+00  LTS    -7.8863571-02  LNS     9.9765756+01  DEM    -2.7279173+01
THETA   6.8301891-06  BETA   -9.0000013+01  MASS    3.6244240+04
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ID      913072.2
CSM PLANE CHANGE BURN TERMINATION
   18  SEPT. 1969   1 HRS,   9 MINS,  18.909 SECS  G.M.T. **** 117. HRS,   59. MINS,  49.570 SECS  G.E.T.
XL     -9.2645862+02  YL     -3.5678224+02  ZL     -9.0883256+01  DXL    -1.9451067+03  DYL     4.5147998+03  DZL     2.1054433+03
XS     -5.9146645+02  YS      8.0123758+02  ZS      4.5438267+01  DXS     4.3175569+03  DYS     3.1724969+03  DZS     2.5699051+02
ALTS    5.8441234+01  LATS    2.6123306+00  LONS    1.2643441+02  VRS     5.3639611+03  PTR    -9.5492589-04  AZR    -8.7250969+01
LIN     1.7620241+02  LAN     1.6985604+02  LAP    -1.7881696+01  SMAS    9.9752579+02  ECCS    5.9373459-04  PERS    1.9792679+00
RPS     9.9693454+02  APOS    9.9811904+02  RANS   -1.7089701+02  INCS    1.5616447+02  LTS    -7.8864907-02  LNS     9.9765260+01
LTE     6.6850495+00  LNE    -3.8599978+00  THETA   8.4182081-04  BETA   -8.9327712+01  FUEL    2.2415625+02  BARC    1.7845301-01
DELV    6.2792400+01  MASS    3.6020084+04  PLCHNG  6.7276873-01  DRTX    0.0000000     DRTY   -6.2792332+01  DRTZ    0.0000000
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ID      913072.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   5 HRS,  36 MINS,  19.786 SECS  G.M.T. **** 122. HRS,   26. MINS,  50.445 SECS  G.E.T.
XL     -3.6492407+02  YL      8.4115791+02  ZL      3.9227641+02  DXL     4.9628762+03  DYL     1.9258445+03  DZL     4.9229940+02
XS      8.2584252+02  YS      5.5703741+02  ZS      4.7858211+01  DXS     3.0067798+03  DYS    -4.4332369+03  DZS    -2.4372165+02
ALTS    5.8801293+01  LATS    2.7505679+00  LONS    3.3999979+01  VRS     5.3622489+03  PTR     2.1253970-02  AZR    -9.2609096+01
LIN     1.7620409+02  LAN     1.6760504+02
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ID      913072.2
TRANSEARTH INJECTION BURN INITIATION
   18  SEPT. 1969  22 HRS,  21 MINS,  33.962 SECS  G.M.T. **** 139. HRS,   12. MINS,   4.617 SECS  G.E.T.
XL      5.3941690+02  YL     -7.5469951+02  ZL     -3.6635517+02  DXL    -4.4841940+03  DYL    -2.7705830+03  DZL    -8.9015374+02
XS     -8.0448598+02  YS     -5.8693688+02  ZS     -5.5366412+01  DXS    -3.1653416+03  DYS     4.3234840+03  DZS     1.9218655+02
ALTS    5.8882048+01  LATS   -3.1822450+00  LONS   -1.4388625+02  VRS     5.3617942+03  PTR    -1.9070385-02  AZR    -8.7943763+01
LIN     1.7620843+02  LAN     1.5908622+02  LAP    -1.1992812+02  LTS    -1.0808334-01  LNS     8.8983831+01  DEM    -2.8558798+01
THETA  -3.7807718+00  BETA   -9.2386861-01  MASS    3.6430084+04
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ID      913072.2
TRANSEARTH INJECTION BURN TERMINATION
   18  SEPT. 1969  22 HRS,  23 MINS,  49.299 SECS  G.M.T. **** 139. HRS,   14. MINS,  19.955 SECS  G.E.T.
XL      4.1062764+02  YL     -8.2425138+02  ZL     -3.8806953+02  DXL    -7.1730021+03  DYL    -3.5240006+03  DZL    -1.0766686+03
XS     -8.8457407+02  YS     -4.6220108+02  ZS     -5.0021768+01  DXS    -4.0828760+03  DYS     6.9667712+03  DZS     2.8998023+02
ALTS    6.0807894+01  LATS   -2.8692389+00  LONS   -1.5241236+02  VRS     8.0802145+03  PTR     2.6764686+00  AZR    -8.7804177+01
LIN     1.7638482+02  LAN     1.5509495+02  LAP     4.1645257+00  SMAS   -3.5620873+03  ECCS    1.2799911+00  PERS    1.3355944+01
RPS     9.9735283+02  APOS   -8.1215274+03  RANS   -1.7153435+02  INCS    1.5609983+02  LTS    -1.0813612-01  LNS     8.8964719+01
LTE     6.7776859+00  LNE    -3.0862146+00  THETA   4.7178540+00  BETA   -6.1277669-01  FUEL    8.6037939+03  BARC    8.4993426+00
DELV    2.7269845+03  MASS    2.7826290+04  PLCHNG  3.1116326-01  DRTX    2.7206890+03  DRTY   -4.3874057+01  DRTZ    1.7981435+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity - Concluded

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ID      913072.2
ENTRY AND TOUCHDOWN
   22  SEPT. 1969  17 HRS,  16 MINS,   2.440 SECS  G.M.T. **** 230. HRS,    6. MINS,  33.098 SECS  G.E.T.
X       1.4495530+03  Y       2.7149069+03  Z       1.6817620+03  DX     -3.3635537+04  DY      1.2969237+04  DZ     -3.2558949+02
R       3.5071707+03  DEC     2.8654120+01  RA      6.1901186+01  V       3.6050747+04  PTH    -6.4000387+00  AZ      8.7080235+01
ALT     6.5901920+01  LAT     2.8813273+01  LON     1.6149887+02  VE      3.4697770+04  PTE    -6.6422493+00  AZE     8.6946249+01
SMA     1.0792640+05  ECC     9.6791452-01  INC     2.8789940+01  RAN    -2.2027443+01  APE     9.7687654+01  RP      3.4628701+03
INMP    9.7342127+00  RAM    -3.8710179+01  DEM    -1.8220960+01  RAS     1.7956455+02  DES     1.8878113-01  SPSFR   3.4613664+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.5252205+01  LONTD   1.9499959+02  AZTD    1.0444243+02
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ID      913072.2
CIRCUMLUNAR PERICYNTHION
   16  SEPT. 1969   5 HRS,  11 MINS,  14.198 SECS  G.M.T. ****  74. HRS,    1. MINS,  44.858 SECS  G.E.T.
XL     -7.1715431+02  YL     -6.5215310+02  ZL     -2.4165186+02  DXL    -5.7955293+03  DYL     5.1545375+03  DZL     3.2887276+03
XS     -9.9180669+02  YS      1.1850289+02  ZS      1.6914998+01  DXS     1.0113149+03  DYS     8.3069752+03  DZS     1.1021157+03
ALTS    6.0510772+01  LATS    9.7017035-01  LONS    1.7318649+02  VRS     8.4405717+03  PTR     9.5480987-05  AZR    -8.2496178+01
LIN     1.7241935+02  LAN    -1.7950262+02  LAP     2.2767597+00  LTS    -2.1714694-02  LNS     1.2213899+02  DEM    -2.0789289+01
SMAS   -2.0461849+03  ECCS    1.4832278+00  INCS    1.5266172+02  RANS   -1.6654774+02  APES   -3.1784288+01  RPS     9.9900430+02
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ID      913072.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   18  SEPT. 1969  21 HRS,  48 MINS,   2.067 SECS  G.M.T. **** 138. HRS,   38. MINS,  32.725 SECS  G.E.T.
X       3.2480021+03  Y       1.2540463+03  Z       4.4161023+02  DX     -1.7016569+04  DY      2.4416857+04  DZ      2.0506401+04
R       3.5095824+03  DEC     7.2286819+00  RA      2.1111461+01  V       3.6142205+04  PTH    -7.0617799+00  AZ      5.3700149+01
ALT     6.5832537+01  LAT     7.2759624+00  LON     5.6466966+01  VE      3.4920643+04  PTE    -7.2811473+00  AZE     5.2184471+01
SMA     1.6601105+05  ECC     9.7918226-01  INC     3.6915310+01  RAN     1.1391177+01  APE     2.6367248+01  RP      3.4559752+03
INMP    1.0833622+01  RAM    -9.7629637+01  DEM    -2.8543113+01  RAS     1.7614537+02  DES     1.6696416+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.5378248+01  LONTD   8.1987335+01  AZTD    6.2174900+01
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(g) 78° launch azimuth; second injection opportunity

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ID      913078.2
LAUNCH TIME      13  SEPT. 1969     4 HRS,     9 MINS,  29.140 SECS   G.M.T.
LAUNCH AZIMUTH    78.                              INJECTION OPPORTUNITY     2
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ID      913078.2
EARTH PARKING ORBIT INSERTION
   13  SEPT. 1969    4 HRS,   20 MINS,  47.204 SECS  G.M.T. ****   0. HRS,   11. MINS,  18.064 SECS  G.E.T.
X       3.0611163+03  Y       1.4732504+02  Z       1.7796984+03  DX     -5.5809549+02  DY      2.5535577+04  DZ     -1.1539228+03
ALT     1.0292193+02  LAT     3.0306946+01  LON     3.0556765+02  V       2.5567727+04  PTH    -2.3578062-08  AZ      9.2991619+01
R       3.5439334+03  DEC     3.0144441+01  RA      2.7553982+00  RAS     1.7100760+02  DES     3.8774888+00  RAN    -9.3185902+01
INC     3.0278631+01  MASS    2.8388933+05
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ID      913078.2
3.5 MINS PRIOR TO TLI INITIATION
   13  SEPT. 1969    7 HRS,   21 MINS,  54.391 SECS  G.M.T. ****   3. HRS,   12. MINS,  25.250 SECS  G.E.T.
X       2.8515732+03  Y       1.3632183+03  Z       1.6028630+03  DX     -8.0697119+03  DY      2.3582511+04  DZ     -5.7068060+03
ALT     1.0230575+02  LAT     2.7041847+01  LON     2.8295886+02  V       2.5569957+04  PTH    -6.6341742-03  AZ      1.0448840+02
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ID      913078.2
TRANSLUNAR INJECTION INITIATION
   13  SEPT. 1969    7 HRS,   25 MINS,  24.391 SECS  G.M.T. ****   3. HRS,   15. MINS,  55.250 SECS  G.E.T.
X       2.4873497+03  Y       2.1276795+03  Z       1.3579410+03  DX     -1.2898207+04  DY      2.0425345+04  DZ     -8.3927906+03
ALT     1.0148609+02  LAT     2.2664431+01  LON     2.9707463+02  V       2.5573373+04  PTH    -1.3073172-02  AZ      1.1080642+02
R       3.5437173+03  DEC     2.2531839+01  RA      4.0543684+01  RAS     1.7112269+02  DES     3.8284045+00  RAN    -9.4215772+01
INC     3.0296015+01  MASS    2.8072706+05
*****************************************************************************************************************

ID      913078.2
TRANSLUNAR INJECTION TERMINATION
   13  SEPT. 1969    7 HRS,   30 MINS,  32.121 SECS  G.M.T. ****   3. HRS,   21. MINS,   2.981 SECS  G.E.T.
X       1.5575457+03  Y       3.1601443+03  Z       7.6060364+02  DX     -2.4322657+04  DY      2.0547294+04  DZ     -1.5976492+04
ALT     1.6088286+02  LAT     1.2258569+01  LON     3.1900784+02  V       3.5623464+04  PTH     6.6625904+00  AZ      1.1915359+02
R       3.6042999+03  DEC     1.2182528+01  RA      6.3762616+01  RAS     1.7112589+02  DES     3.8270407+00  DEM    -4.4595785+00
RAN    -9.5515396+01  INC     3.1389073+01  ECC     9.7469645-01  SMA     1.4050014+05  RP      3.5551535+03  APF     1.4259984+02
INMP    4.2917334+01  C3TLI  -4.8801606-01  DAZTLI  1.2800665+00  MASS    1.3151734+05  FUEL    1.4920972+05
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ID      913078.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   13  SEPT. 1969    9 HRS,   30 MINS,  32.121 SECS  G.M.T. ****   5. HRS,   21. MINS,   2.981 SECS  G.E.T.
X      -1.8216741+04  Y      -5.3272643+02  Z      -1.1027922+04  DX     -1.1001184+04  DY     -6.2979019+03  DZ     -6.3076271+03
ALT     1.7860532+04  LAT    -3.1206229+01  LON     4.6838161+01  V       1.4158947+04  PTH     6.4988234+01  AZ      8.6247826+01
R       2.1301372+04  DEC    -3.1178727+01  RA     -1.7832493+02  RAS     1.7120069+02  DES     3.7951265+00
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ID      913078.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   16  SEPT. 1969    5 HRS,   48 MINS,  43.179 SECS  G.M.T. ****  73. HRS,   39. MINS,  14.037 SECS  G.E.T.
RMP     9.9882434+02  DEMP    6.3971402+00  RAMP    1.7816656+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(g) 78° launch azimuth; second injection opportunity - Continued

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ID      913078.2
LUNAR ORBIT INSERTION BURN INITIATION
   16  SEPT. 1969   5 HRS,  45 MINS,  24.322 SECS  G.M.T. ****  73. HRS,   35. MINS,  55.181 SECS  G.E.T.
XL     -5.0430162+02  YL     -8.1825825+02  ZL     -3.4588302+02  DXL    -6.4415002+03  DYL     4.4398508+03  DZL     2.9023062+03
XS     -1.0082878+03  YS     -1.6301071+02  ZS     -1.6880483+01  DXS     1.8262897+01  DYS     8.2995033+03  DZS     1.0083651+03
ALTS    8.3025773+01  LATS   -9.4684897-01  LONS   -1.7081640+02  VRS     8.3605554+03  PTR    -9.3555551+00  AZR    -8.3135051+01
LIN     1.7305676+02  LAN    -1.7861632+02  LAP     1.9050151+02  LTS    -2.2425606-02  LNS     1.2184906+02  DEM    -2.0899743+01
THETA   1.4160503+01  BETA   -1.7494417+02  MASS    9.4833024+04
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ID      913078.2
LUNAR ORBIT INSERTION BURN TERMINATION
   16  SEPT. 1969   5 HRS,  51 MINS,  44.317 SECS  G.M.T. ****  73. HRS,   42. MINS,  15.174 SECS  G.E.T.
XL     -8.1049113+02  YL     -5.4965821+02  ZL     -1.8802551+02  DXL    -3.1458302+03  DYL     4.0029147+03  DZL     2.0393727+03
XS     -9.5959119+02  YS      2.6976775+02  ZS      2.7996121+01  DXS     1.5281860+03  DYS     5.2699830+03  DZS     3.8365043+02
ALTS    5.8689360+01  LATS    1.6088026+00  LONS    1.6429785+02  VRS     5.5004783+03  PTR    -3.5538940-01  AZR    -8.5988785+01
LIN     1.7566775+02  LAN    -1.7394056+02  LAP    -1.6823953+02  SMAS    1.0525414+03  ECCS    5.2960765-02  PERS    2.1452434+00
RPS     9.9679809+02  APOS    1.1082848+03  RANS   -1.7068074+02  INCS    1.5542493+02  LTS    -2.2557384-02  LNS     1.2179533+02
LTE     5.5804494+00  LNE    -4.9175339+00  THETA  -1.0661912+01  BETA   -1.7231566+02  FUEL    2.4157533+04  BARC    2.4956522+01
DELV    2.9750231+03  MASS    7.0675491+04  PLCHNG  2.6498474+00  DRTX   -2.8743693+03  DRTY   -2.5429649+02  DRTZ   -7.2805193+02
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ID      913078.2
CIRCULARIZATION BURN INITIATION
   16  SEPT. 1969  10 HRS,  11 MINS,  22.415 SECS  G.M.T. ****  78. HRS,    1. MINS,  53.272 SECS  G.E.T.
XL     -8.7768567+02  YL     -4.5166832+02  ZL     -1.3866178+02  DXL    -2.5742959+03  DYL     4.3421500+03  DZL     2.1493893+03
XS     -8.9933432+02  YS      4.2825203+02  ZS      3.6897651+01  DXS     2.3725223+03  DYS     4.9516322+03  DZS     3.6091874+02
ALTS    5.8283019+01  LATS    2.1214011+00  LONS    1.5453678+02  VRS     5.5025253+03  PTR     1.8061275-03  AZR    -8.6236676+01
LIN     1.7567109+02  LAN    -1.7616578+02  LAP    -4.6063698+00  LTS    -2.7984969-02  LNS     1.1959238+02  DEM    -2.1739727+01
THETA   3.4150945-06  BETA   -1.7999999+02  MASS    7.0655490+04
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ID      913078.2
CIRCULARIZATION BURN TERMINATION
   16  SEPT. 1969  10 HRS,  11 MINS,  37.443 SECS  G.M.T. ****  78. HRS,    2. MINS,   8.300 SECS  G.E.T.
XL     -8.8389540+02  YL     -4.4102410+02  ZL     -1.3340030+02  DXL    -2.4469372+03  DYL     4.2648593+03  DZL     2.1050838+03
XS     -8.9346036+02  YS      4.4030729+02  ZS      3.7775828+01  DXS     2.3772996+03  DYS     4.7965226+03  DZS     3.4919401+02
ALTS    5.8285764+01  LATS    2.1719091+00  LONS    1.5376540+02  VRS     5.3647104+03  PTR     1.1914838-02  AZR    -8.6265695+01
LIN     1.7567109+02  LAN    -1.7616796+02  LAP    -2.1247990+01  SMAS    9.9750021+02  ECCS    7.5221077-04  PERS    1.9791888+00
RPS     9.9674987+02  APOS    9.9825054+02  RANS   -1.7066662+02  INCS    1.5543456+02  LTS    -2.7990204-02  LNS     1.1959027+02
LTE     5.7405949+00  LNE    -4.8455928+00  THETA  -7.7014395-01  BETA    1.7999011+02  FUEL    9.5538867+02  BARC    7.7029710-01
DELV    1.3779892+02  MASS    6.9700102+04  PLCHNG  1.5664841-05  DRTX   -1.3779660+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      913078.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   17  SEPT. 1969   4 HRS,  35 MINS,  47.208 SECS  G.M.T. ****  96. HRS,   26. MINS,  18.066 SECS  G.E.T.
XL     -1.3455145+02  YL      8.9752864+02  ZL      4.1391724+02  DXL     5.2832187+03  DYL     8.0795633+02  DZL    -3.0581185+01
XS      8.2600611+02  YS      5.5714668+02  ZS      4.7861056+01  DXS     3.0064052+03  DYS    -4.4276126+03  DZS    -3.1002899+02
ALTS    5.8997933+01  LATS    2.7501888+00  LONS    3.3999927+01  VRS     5.3608155+03  PTR     1.7584368-02  AZR    -9.3320069+01
LIN     1.7568207+02  LAN     1.7449043+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(g) 78° launch azimuth; second injection opportunity - Continued

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ID      913078.2
CSM PLANE CHANGE BURN INITIATION
   18  SEPT. 1969   1 HRS,  46 MINS,  53.291 SECS  G.M.T. **** 117. HRS,   37. MINS,  24.150 SECS  G.E.T.
XL     -9.2295753+02  YL     -3.6448675+02  ZL     -9.4187570+01  DXL    -1.9875935+03  DYL     4.4723352+03  DZL     2.1569216+03
XS     -5.9387626+02  YS      7.9927121+02  ZS      4.5265758+01  DXS     4.3061675+03  DYS     3.1829352+03  DZS     3.2042859+02
ALTS    5.8287543+01  LATS    2.6028074+00  LONS    1.2661317+02  VRS     5.3644039+03  PTR     1.2882300-02  AZR    -8.6572594+01
LIN     1.7568905+02  LAN     1.6370124+02  LAP    -2.8947980+01  LTS    -7.9712310-02  LNS     9.9446768+01  DEM    -2.7336483+01
THETA   1.3660379-05  BETA   -9.0000028+01  MASS    3.6346102+04
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ID      913078.2
CSM PLANE CHANGE BURN TERMINATION
   18  SEPT. 1969   1 HRS,  46 MINS,  56.825 SECS  G.M.T. **** 117. HRS,   37. MINS,  27.683 SECS  G.E.T.
XL     -9.2411032+02  YL     -3.6187632+02  ZL     -9.2949193+01  DXL    -1.9764306+03  DYL     4.5040529+03  DZL     2.1013631+03
XS     -5.9136821+02  YS      8.0112004+02  ZS      4.5433721+01  DXS     4.3174699+03  DYS     3.1739862+03  DZS     2.5708525+02
ALTS    5.8288253+01  LATS    2.6124702+00  LONS    1.2643388+02  VRS     5.3647765+03  PTR     1.2962247-02  AZR    -8.7251014+01
LIN     1.7620235+02  LAN     1.6985748+02  LAP    -3.5764129+01  SMAS    9.9752589+02  ECCS    7.7971337-04  PERS    1.9792653+00
RPS     9.9674810+02  APOS    9.9830366+02  RANS   -1.7086532+02  INCS    1.5618344+02  LTS    -7.9713737-02  LNS     9.9446256+01
LTE     6.6922836+00  LNE    -3.8393848+00  THETA   9.7757081-04  BETA   -8.9327816+01  FUEL    2.2467285+02  BARC    1.7913701-01
DELV    6.2761631+01  MASS    3.6121429+04  PLCHNG  6.7232454-01  DRTX    0.0000000     DRTY   -6.2761566+01  DRTZ    0.0000000
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ID      913078.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   6 HRS,  13 MINS,  57.871 SECS  G.M.T. **** 122. HRS,    4. MINS,  28.729 SECS  G.E.T.
XL     -3.7057690+02  YL      8.3930077+02  ZL      3.9156704+02  DXL     4.9494393+03  DYL     1.9536916+03  DZL     5.0366411+02
XS      8.2604225+02  YS      5.5717194+02  ZS      4.7869408+01  DXS     3.0067369+03  DYS    -4.4317098+03  DZS    -2.4363371+02
ALTS    5.9042316+01  LATS    2.7505466+00  LONS    3.3999965+01  VRS     5.3609585+03  PTR     3.0055381-02  AZR    -9.2609200+01
LIN     1.7620403+02  LAN     1.6760649+02
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ID      913078.2
TRANSEARTH INJECTION BURN INITIATION
   18  SEPT. 1969  22 HRS,  59 MINS,  26.531 SECS  G.M.T. **** 138. HRS,   49. MINS,  57.386 SECS  G.E.T.
XL      5.3416510+02  YL     -7.5778967+02  ZL     -3.6709479+02  DXL    -4.5032911+03  DYL    -2.7461436+03  DZL    -8.7621091+02
XS     -8.1143066+02  YS     -5.7697548+02  ZS     -5.4915226+01  DXS    -3.1121916+03  DYS     4.3631309+03  DZS     1.9588900+02
ALTS    5.8670513+01  LATS   -3.1569564+00  LONS   -1.4458491+02  VRS     5.3629301+03  PTR    -3.0525775-02  AZR    -8.7905217+01
LIN     1.7620837+02  LAN     1.5908585+02  LAP    -1.2505780+02  LTS    -1.0896963-01  LNS     8.8662940+01  DEM    -2.8575305+01
THETA  -3.5667563+00  BETA   -9.7706222-01  MASS    3.6531429+04
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ID      913078.2
TRANSEARTH INJECTION BURN TERMINATION
   18  SEPT. 1969  23 HRS,   1 MINS,  42.334 SECS  G.M.T. **** 138. HRS,   52. MINS,  13.191 SECS  G.E.T.
XL      4.0447755+02  YL     -8.2693810+02  ZL     -3.8854971+02  DXL    -7.1947464+03  DYL    -3.4907736+03  DZL    -1.0607234+03
XS     -8.9033692+02  YS     -4.5083368+02  ZS     -4.9484850+01  DXS    -4.0049379+03  DYS     7.0150014+03  DZS     2.9223435+02
ALTS    6.0705950+01  LATS   -2.8387059+00  LONS   -1.5314403+02  VRS     8.0830175+03  PTR     2.7584264+00  AZR    -8.7786155+01
LIN     1.7639790+02  LAN     1.5488702+02  LAP    -1.5665228+00  SMAS   -3.5446134+03  ECCS    1.2813088+00  PERS    1.3257788+01
RPS     9.9713101+02  APOS   -8.0863579+03  RANS   -1.7154739+02  INCS    1.5611447+02  LTS    -1.0902265-01  LNS     8.8643766+01
LTE     6.7755546+00  LNE    -3.0609405+00  THETA   4.9650788+00  BETA   -6.4827140-01  FUEL    8.6334209+03  BARC    8.5326389+00
DELV    2.7290501+03  MASS    2.7898008+04  PLCHNG  3.2926363-01  DRTX    2.7233603+03  DRTY   -4.6444041+01  DRTZ    1.6977764+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(g) 78° launch azimuth; second injection opportunity - Concluded

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ID      913078.2
ENTRY AND TOUCHDOWN
   22  SEPT. 1969  17 HRS,  17 MINS,  22.226 SECS  G.M.T. **** 229. HRS,    7. MINS,  53.085 SECS  G.E.T.
X       1.4335407+03  Y       2.7219119+03  Z       1.6841269+03  DX     -3.3706224+04  DY      1.2785638+04  DZ     -3.4205659+02
R       3.5071535+03  DEC     2.8698310+01  RA      6.2225711+01  V       3.6051340+04  PTH    -6.4000310+00  AZ      8.7104090+01
ALT     6.5892323+01  LAT     2.8857620+01  LON     1.6149005+02  VE      3.4698909+04  PTE    -6.6421923+00  AZE     8.6971065+01
SMA     1.0810887+05  ECC     9.6796881-01  INC     2.8831681+01  RAN    -2.1760572+01  APF     9.7740113+01  RP      3.4628561+03
INMP    9.6145181+00  RAM    -3.8697183+01  DEM    -1.8215840+01  RAS     1.7956538+02  DES     1.8842185-01  SPSFR   3.5326464+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.5274745+01  LONTD   1.9499974+02  AZTD    1.0449041+02
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ID      913078.2
CIRCUMLUNAR PERICYNTHION
   16  SEPT. 1969   5 HRS,  48 MINS,  44.496 SECS  G.M.T. ****  73. HRS,   39. MINS,  15.355 SECS  G.E.T.
XL     -7.0788918+02  YL     -6.6048042+02  ZL     -2.4557412+02  DXL    -5.8805064+03  DYL     5.1221055+03  DZL     3.1749945+03
XS     -9.9244873+02  YS      1.1146225+02  ZS      1.6424020+01  DXS     9.5126539+02  DYS     8.3213841+03  DZS     1.0083981+03
ALTS    6.0329822+01  LATS    9.4217810-01  LONS    1.7359194+02  VRS     8.4360657+03  PTR     9.1118178-08  AZR    -8.3133845+01
LIN     1.7305680+02  LAN    -1.7864681+02  LAP     1.6326715+00  LTS    -2.2495041-02  LNS     1.2182075+02  DEM    -2.0910497+01
SMAS   -2.0589843+03  ECCS    1.4851049+00  INCS    1.5324666+02  RANS   -1.6719344+02  APFS   -3.3105373+01  RPS     9.9882335+02
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ID      913078.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   18  SEPT. 1969  22 HRS,  40 MINS,  53.641 SECS  G.M.T. **** 138. HRS,   31. MINS,  24.499 SECS  G.E.T.
X       3.2242549+03  Y       1.3244217+03  Z       4.0919571+02  DX     -1.7070977+04  DY      2.3240609+04  DZ      2.1784610+04
R       3.5096087+03  DEC     6.6955135+00  RA      2.2331303+01  V       3.6140190+04  PTH    -6.9494814+00  AZ      5.1264872+01
ALT     6.5832949+01  LAT     6.7393737+00  LON     4.4435734+01  VE      3.4957983+04  PTE    -7.1573299+00  AZE     4.9664036+01
SMA     1.6441160+05  ECC     9.7896938-01  INC     3.9219722+01  RAN     1.4061327+01  APF     2.4674942+01  RP      3.4576780+03
INMP    1.3664754+01  RAM    -9.7043799+01  DEM    -2.8567383+01  RAS     1.7617829+02  DES     1.6554097+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.6079661+01  LONTD   6.9110762+01  AZTD    5.9540795+01
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity

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ID      913084.2
LAUNCH TIME      13  SEPT. 1969     5 HRS,   10 MINS,   7.309 SECS   G.M.T.
LAUNCH AZIMUTH   84.                          INJECTION OPPORTUNITY    2
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ID      913084.2
EARTH PARKING ORBIT INSERTION
   13  SEPT. 1969    5 HRS,   21 MINS,   24.339 SECS  G.M.T. ****   0. HRS,    11. MINS,  17.030 SECS  G.E.T.
X       2.9868894+03  Y       9.5003562+02  Z       1.6538664+03  DX     -6.0797349+03  DY      2.4631230+04  DZ     -3.1698617+03
ALT     1.0252380+02  LAT     2.7973203+01  LON     3.0526131+02  V       2.5567727+04  PTH    -3.7724900-07  AZ      9.8058250+01
R       3.5439334+03  DEC     2.7818703+01  RA      1.7645276+01  RAS     1.7104539+02  DES     3.8613743+00  RAN    -8.9231215+01
INC     2.8872555+01  MASS    2.8445841+05
*****************************************************************************************************************

ID      913084.2
2.5 MINS PRIOR TO TLI INITIATION
   13  SEPT. 1969    8 HRS,   19 MINS,   19.091 SECS  G.M.T. ****   3. HRS,     9. MINS,  11.783 SECS  G.E.T.
X       2.8606521+03  Y       1.3770287+03  Z       1.5747798+03  DX     -8.6797813+03  DY      2.3558804+04  DZ     -4.8358813+03
ALT     1.0228923+02  LAT     2.6531389+01  LON     2.6872084+02  V       2.5568371+04  PTH    -2.6143163-03  AZ      1.0218691+02
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ID      913084.2
TRANSLUNAR INJECTION INITIATION
   13  SEPT. 1969    8 HRS,   22 MINS,   49.091 SECS  G.M.T. ****   3. HRS,    12. MINS,  41.783 SECS  G.E.T.
X       2.4752845+03  Y       2.1402539+03  Z       1.3605198+03  DX     -1.3505288+04  DY      2.0377967+04  DZ     -7.4985636+03
ALT     1.0160555+02  LAT     2.2709017+01  LON     2.9298705+02  V       2.5571132+04  PTH    -1.0969259-02  AZ      1.0851180+02
R       3.5438304+03  DEC     2.2576225+01  RA      4.0848320+01  RAS     1.7115848+02  DES     3.8131371+00  RAN    -9.0244590+01
INC     2.8884780+01  MASS    2.8133061+05
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ID      913084.2
TRANSLUNAR INJECTION TERMINATION
   13  SEPT. 1969    8 HRS,   27 MINS,   57.380 SECS  G.M.T. ****   3. HRS,    17. MINS,  50.071 SECS  G.E.T.
X       1.5078118+03  Y       3.1703648+03  Z       8.1435066+02  DX     -2.5171511+04  DY      2.0434197+04  DZ     -1.4767185+04
ALT     1.6052825+02  LAT     1.3140817+01  LON     3.0541512+02  V       3.5626269+04  PTH     6.6212173+00  AZ      1.1708371+02
P       3.6038696+03  DEC     1.3059666+01  RA      6.4564440+01  RAS     1.7116168+02  DES     3.8117706+00  DEM    -4.7041612+00
RAN    -9.1595633+01  INC     2.9852028+01  ECC     9.7476631-01  SMA     1.4089641+05  RP      3.5553358+03  APF     1.3958710+02
INMP    4.0413154+01  C3TLI  -4.8664363-01  DAZTLI  1.1723743+00  MASS    1.3185049+05  FUEL    1.4948012+05
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ID      913084.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   13  SEPT. 1969   10 HRS,   27 MINS,   57.380 SECS  G.M.T. ****   5. HRS,    17. MINS,  50.071 SECS  G.E.T.
X      -1.8473747+04  Y      -6.4821246+02  Z      -1.0584666+04  DX     -1.1013982+04  DY     -6.3741063+03  DZ     -6.2131950+03
ALT     1.7859963+04  LAT    -2.9822435+01  LON     3.2778135+01  V       1.4161244+04  PTH     6.4990444+01  AZ      8.8192766+01
P       2.1301049+04  DEC    -2.9795661+01  RA     -1.7799041+02  RAS     1.7123649+02  DES     3.7798528+00
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ID      913084.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   16  SEPT. 1969    6 HRS,   32 MINS,   35.941 SECS  G.M.T. ****  73. HRS,    22. MINS,  28.630 SECS  G.E.T.
RMP     9.9916135+02  DEMP    6.4248755+00  RAMP    1.7818807+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity - Continued

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ID      913084.2
LUNAR ORBIT INSERTION BURN INITIATION
   16  SEPT. 1969   6 HRS,  29 MINS,  18.150 SECS  G.M.T. ****  73. HRS,   19. MINS,  10.838 SECS  G.E.T.
XL     -4.9833490+02  YL     -8.2162651+02  ZL     -3.4464152+02  DXL    -6.4976738+03  DYL     4.4115787+03  DZL     2.8159451+03
XS     -1.0077937+03  YS     -1.6226096+02  ZS     -1.4446615+01  DXS    -4.2320468+00  DYS     8.3066785+03  DZS     9.3858430+02
ALTS    8.2381352+01  LATS   -8.1083170-01  LONS   -1.7085352+02  VRS     8.3595373+03  PTR    -9.1504307+00  AZR    -8.3600742+01
LIN     1.7353710+02  LAN    -1.7803054+02  LAP     1.9116198+02  LTS    -2.3339950-02  LNS     1.2147660+02  DEM    -2.1040805+01
THETA   1.3593559+01  BETA   -1.7587282+02  MASS    9.4833024+04
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ID      913084.2
LUNAR ORBIT INSERTION BURN TERMINATION
   16  SEPT. 1969   6 HRS,  35 MINS,  37.379 SECS  G.M.T. ****  73. HRS,   25. MINS,  30.069 SECS  G.E.T.
XL     -8.0659212+02  YL     -5.5511033+02  ZL     -1.9021004+02  DXL    -3.1742423+03  DYL     3.9823289+03  DZL     2.0309656+03
XS     -9.5986898+02  YS      2.6978595+02  ZS      2.8021622+01  DXS     1.5299132+03  DYS     5.2576916+03  DZS     3.8341726+02
ALTS    5.8962323+01  LATS    1.6098276+00  LONS    1.6430116+02  VRS     5.4987469+03  PTR    -3.8258085-01  AZR    -8.5989182+01
LIN     1.7566773+02  LAN    -1.7392281+02  LAP    -1.6668458+02  SMAS    1.0524095+03  ECCS    5.2643485-02  PERS    2.1448398+00
RPS     9.9700698+02  APOS    1.1078119+03  RANS   -1.7063031+02  INCS    1.5544862+02  LTS    -2.3471688-02  LNS     1.2142297+02
LTE     5.6081873+00  LNE    -4.9059328+00  THETA  -1.1219871+01  BETA   -1.7370411+02  FUEL    2.4108808+04  BARC    2.4902941+01
DELV    2.9690472+03  MASS    7.0724215+04  PLCHNG  2.1649370+00  DRTX   -2.8783952+03  DRTY   -2.0769840+02  DRTZ   -6.9782421+02
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ID      913084.2
CIRCULARIZATION BURN INITIATION
   16  SEPT. 1969  10 HRS,  55 MINS,  13.711 SECS  G.M.T. ****  77. HRS,   45. MINS,   6.400 SECS  G.E.T.
XL     -8.7497551+02  YL     -4.5675396+02  ZL     -1.4062628+02  DXL    -2.6008212+03  DYL     4.3276042+03  DZL     2.1431921+03
XS     -8.9913690+02  YS      4.2914677+02  ZS      3.6985202+01  DXS     2.3786898+03  DYS     4.9471430+03  DZS     3.6048559+02
ALTS    5.8492950+01  LATS    2.1259891+00  LONS    1.5448544+02  VRS     5.5011216+03  PTR    -2.4912195-02  AZR    -8.6239226+01
LIN     1.7567106+02  LAN    -1.7614764+02  LAP    -3.3957132+00  LTS    -2.8906071-02  LNS     1.1922031+02  DEM    -2.1874763+01
THETA  -2.5613209-06  BETA   -1.7999999+02  MASS    7.0704215+04
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ID      913084.2
CIRCULARIZATION BURN TERMINATION
   16  SEPT. 1969  10 HRS,  55 MINS,  28.719 SECS  G.M.T. ****  77. HRS,   45. MINS,  21.410 SECS  G.E.T.
XL     -8.8124207+02  YL     -4.4615883+02  ZL     -1.3538669+02  DXL    -2.4731698+03  DYL     4.2512030+03  DZL     2.0992687+03
XS     -8.9325557+02  YS      4.4117550+02  ZS      3.7861165+01  DXS     2.3833383+03  DYS     4.7923364+03  DZS     3.4878460+02
ALTS    5.8489332+01  LATS    2.1763732+00  LONS    1.5371540+02  VRS     5.3636219+03  PTR    -1.5679733-02  AZR    -8.6268245+01
LIN     1.7567107+02  LAN    -1.7614983+02  LAP     2.4767106+01  SMAS    9.9750008+02  ECCS    5.8668733-04  PERS    1.9791884+00
RPS     9.9691486+02  APOS    9.9808528+02  RANS   -1.7061633+02  INCS    1.5545829+02  LTS    -2.8911455-02  LNS     1.1921818+02
LTE     5.7666296+00  LNE    -4.8326862+00  THETA  -7.6880865-01  BETA    1.7999999+02  FUEL    9.5410938+02  BARC    7.6896220-01
DELV    1.3751747+02  MASS    6.9750106+04  PLCHNG  1.5623343-05  DRTX   -1.3751538+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      913084.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   17  SEPT. 1969   5 HRS,  19 MINS,  36.514 SECS  G.M.T. ****  96. HRS,    9. MINS,  29.202 SECS  G.E.T.
XL     -1.4138247+02  YL      8.9616051+02  ZL      4.1334992+02  DXL     5.2807067+03  DYL     8.4251480+02  DZL    -1.6934724+01
XS      8.2557581+02  YS      5.5685627+02  ZS      4.7817060+01  DXS     3.0077854+03  DYS    -4.4300278+03  DZS    -3.1028422+02
ALTS    5.8477293+01  LATS    2.7490947+00  LONS    3.3999920+01  VRS     5.3635991+03  PTR     1.5313503-02  AZR    -9.3320978+01
LIN     1.7558209+02  LAN     1.7450913+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity - Continued

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ID      913084.2
CSM PLANE CHANGE BURN INITIATION
   18  SEPT. 1969   2 HRS,  30 MINS,  43.642 SECS  G.M.T. **** 117. HRS,   20. MINS,  36.333 SECS  G.E.T.
XL     -9.2048245+02  YL     -3.7054092+02  ZL     -9.6606610+01  DXL    -2.0194403+03  DYL     4.4594834+03  DZL     2.1516173+03
XS     -5.9397955+02  YS      7.9941115+02  ZS      4.5292829+01  DXS     4.3069924+03  DYS     3.1802682+03  DZS     3.2017034+02
ALTS    5.8462518+01  LATS    2.6039077+00  LONS    1.2661314+02  VRS     5.3634688+03  PTR    -1.5238408-02  AZR    -8.6573475+01
LIN     1.7558909+02  LAN     1.6371995+02  LAP     2.1499438+01  LTS    -8.0702291-02  LNS     9.9075171+01  DEM    -2.7401814+01
THETA  -4.2688681-06  BETA   -8.9999998+01  MASS    3.6396106+04
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ID      913084.2
CSM PLANE CHANGE BURN TERMINATION
   18  SEPT. 1969   2 HRS,  30 MINS,  47.176 SECS  G.M.T. **** 117. HRS,   20. MINS,  39.865 SECS  G.E.T.
XL     -9.2165362+02  YL     -3.6793830+02  ZL     -9.5371454+01  DXL    -2.0083401+03  DYL     4.4912322+03  DZL     2.0961738+03
XS     -5.9147137+02  YS      8.0125815+02  ZS      4.5460647+01  DXS     4.3182863+03  DYS     3.1713192+03  DZS     2.5692191+02
ALTS    5.8461685+01  LATS    2.6135646+00  LONS    1.2643394+02  VRS     5.3638484+03  PTR    -1.5187827-02  AZR    -8.7250987+01
LIN     1.7620159+02  LAN     1.6986930+02  LAP     4.5457327+00  SMAS    9.9752557+02  ECCS    6.3056431-04  PERS    1.9792643+00
RPS     9.9689656+02  APOS    9.9815456+02  RANS   -1.7082635+02  INCS    1.5620583+02  LTS    -8.0703682-02  LNS     9.9074659+01
LTE     6.7003722+00  LNE    -3.8151948+00  THETA   8.0766986-04  BETA   -8.9329087+01  FUEL    2.2464160+02  BARC    1.7900041-01
DELV    6.2666307+01  MASS    3.6171464+04  PLCHNG  6.7142230-01  DRTX    0.0000000     DRTY   -6.2666202+01  DRTZ    0.0000000
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ID      913084.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   6 HRS,  57 MINS,  47.504 SECS  G.M.T. **** 121. HRS,   47. MINS,  40.194 SECS  G.E.T.
XL     -3.7685465+02  YL      8.3645057+02  ZL      3.9042317+02  DXL     4.9380983+03  DYL     1.9859863+03  DZL     5.1642676+02
XS      8.2563607+02  YS      5.5689767+02  ZS      4.7845965+01  DXS     3.0074222+03  DYS    -4.4344010+03  DZS    -2.4390177+02
ALTS    5.8551723+01  LATS    2.7505524+00  LONS    3.3999956+01  VRS     5.3635798+03  PTR     1.9916859-02  AZR    -9.2610317+01
LIN     1.7620327+02  LAN     1.6761848+02
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ID      913084.2
TRANSEARTH INJECTION BURN INITIATION
   18  SEPT. 1969  23 HRS,  43 MINS,  30.763 SECS  G.M.T. **** 138. HRS,   33. MINS,  23.453 SECS  G.E.T.
XL      5.2868901+02  YL     -7.6169779+02  ZL     -3.6813092+02  DXL    -4.5197740+03  DYL    -2.7191699+03  DZL    -8.6095869+02
XS     -8.1972303+02  YS     -5.6595679+02  ZS     -5.4433636+01  DXS    -3.0513670+03  DYS     4.4028449+03  DZS     1.9986644+02
ALTS    5.9111596+01  LATS   -3.1278581+00  LONS   -1.4537785+02  VRS     5.3605811+03  PTR    -1.5253371-02  AZR    -8.7860891+01
LIN     1.7620759+02  LAN     1.5909604+02  LAP    -6.0279251+01  LTS    -1.1000213-01  LNS     8.8289592+01  DEM    -2.8592888+01
THETA  -3.4460635+00  BETA   -1.0534361+00  MASS    3.6581464+04
*****************************************************************************************************************

ID      913084.2
TRANSEARTH INJECTION BURN TERMINATION
   18  SEPT. 1969  23 HRS,  45 MINS,  46.920 SECS  G.M.T. **** 138. HRS,   35. MINS,  39.608 SECS  G.E.T.
XL      3.9822821+02  YL     -8.3028687+02  ZL     -3.8926955+02  DXL    -7.2175230+03  DYL    -3.4514414+03  DZL    -1.0427319+03
XS     -8.9713573+02  YS     -4.3845949+02  ZS     -4.8922671+01  DXS    -3.9132060+03  DYS     7.0677461+03  DZS     2.9409538+02
ALTS    6.1252826+01  LATS   -2.8048940+00  LONS   -1.5395373+02  VRS     8.0841021+03  PTR     2.8181883+00  AZR    -8.7771836+01
LIN     1.7641557+02  LAN     1.5459056+02  LAP    -1.8772729+00  SMAS   -3.5233286+03  ECCS    1.2831378+00  PERS    1.3138551+01
RPS     9.9758756+02  APOS   -8.0442446+03  RANS   -1.7157259+02  INCS    1.5613011+02  LTS    -1.1005529-01  LNS     8.8270373+01
LTE     6.7727157+00  LNE    -3.0313811+00  THETA   5.1027233+00  BETA   -6.9875093-01  FUEL    8.6559697+03  BARC    8.5497349+00
DELV    2.7329359+03  MASS    2.7925494+04  PLCHNG  3.5549157-01  DRTX    2.7275265+03  DRTY   -5.0150854+01  DRTZ    1.6427336+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity - Concluded

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ID      913084.2
ENTRY AND TOUCHDOWN
   22  SEPT. 1969  17 HRS,  18 MINS,  55.069 SECS  G.M.T. **** 228. HRS,    8. MINS,  47.756 SECS  G.E.T.
X       1.4149353+03  Y       2.7300809+03  Z       1.6865653+03  DX     -3.3789055+04  DY      1.2567179+04  DZ     -3.5229162+02
R       3.5071193+03  DEC     2.8744042+01  RA      6.2603377+01  V       3.6052161+04  PTH    -6.4000135+00  AZ      8.7116365+01
ALT     6.5865844+01  LAT     2.8903515+01  LON     1.6147980+02  VE      3.4700320+04  PTF    -6.6420819+00  AZF     8.6983874+01
SMA     1.0834302+05  ECC     9.6803834-01  INC     2.8876037+01  RAN    -2.1417022+01  APF     9.7771697+01  RP      3.4628231+03
INMP    9.4586843+00  RAM    -3.8682058+01  DEM    -1.8209878+01  RAS     1.7956635+02  DES     1.8800366-01  SPSFR   3.5599648+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.5304677+01  LONTD   1.9500067+02  AZTD    1.0453050+02
*****************************************************************************************************************

ID      913084.2
CIRCUMLUNAR PERICYNTHION
   16  SEPT. 1969   6 HRS,  32 MINS,  34.073 SECS  G.M.T. ****  73. HRS,   22. MINS,  26.762 SECS  G.E.T.
XL     -6.9958385+02  YL     -6.6827615+02  ZL     -2.4933700+02  DXL    -5.9551378+03  DYL     5.0843482+03  DZL     3.0839883+03
XS     -9.9332843+02  YS      1.0661045+02  ZS      1.5878266+01  DXS     9.0901432+02  DYS     8.3300669+03  DZS     9.3778426+02
ALTS    6.0665831+01  LATS    9.1056142-01  LONS    1.7387409+02  VRS     8.4318300+03  PTR     8.6673702-05  AZR    -8.3613563+01
LIN     1.7353714+02  LAN    -1.7806039+02  LAP     2.6231310+00  LTS    -2.3407973-02  LNS     1.2144889+02  DEM    -2.1051265+01
SMAS   -2.0668213+03  ECCS    1.4834280+00  INCS    1.5368198+02  RANS   -1.6771482+02  APFS   -3.4254131+01  RPS     9.9915935+02
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ID      913084.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   18  SEPT. 1969  23 HRS,  35 MINS,  16.922 SECS  G.M.T. **** 138. HRS,   25. MINS,   9.611 SECS  G.E.T.
X       3.1940527+03  Y       1.3969455+03  Z       4.0489776+02  DX     -1.7244892+04  DY      2.2273068+04  DZ      2.2639336+04
R       3.5096113+03  DEC     6.6248663+00  RA      2.3622563+01  V       3.6138835+04  PTH    -6.7011300+00  AZ      4.9560118+01
ALT     6.5832178+01  LAT     6.6682722+00  LON     3.2092766+01  VE      3.4985875+04  PTF    -6.8939316+00  AZE     4.7903084+01
SMA     1.6328732+05  ECC     9.7880236-01  INC     4.0886728+01  RAN     1.5913509+01  APF     2.3699572+01  RP      3.4613070+03
INMP    1.5711752+01  RAM    -9.6440479+01  DEM    -2.8589735+01  RAS     1.7621216+02  DES     1.6407659+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.6817928+01  LONTD   5.6208772+01  AZTD    5.7837290+01
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(i) 90° launch azimuth; second injection opportunity

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ID      913090.2
LAUNCH TIME      13  SEPT. 1969     6 HRS,     5 MINS,    1.196 SECS    G.M.T.
LAUNCH AZIMUTH   90.                                INJECTION OPPORTUNITY     2
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ID      913090.2
EARTH PARKING ORBIT INSERTION
   13  SEPT. 1969    6 HRS,   16 MINS,   17.838 SECS  G.M.T. ****    0. HRS,    11. MINS,   15.641 SECS  G.E.T.
X       2.7438978+03  Y       1.6426249+03  Z       1.5271779+03  DX     -1.0660098+04  DY      2.2648472+04  DZ     -5.2074657+03
ALT     1.0215226+02  LAT     2.5672035+01  LON     3.0476225+02  V       2.5567727+04  PTH    -2.8293674-07  AZ      1.0304435+02
R       3.5439334+03  DEC     2.5526427+01  RA      3.0906700+01  RAS     1.7107961+02  DES     3.8467807+00  RAN    -8.7357538+01
INC     2.8465879+01  MASS    2.8467194+05
*****************************************************************************************************************

ID      913090.2
3.5 MINS PRIOR TO TLI INITIATION
   13  SEPT. 1969    9 HRS,   11 MINS,   17.891 SECS  G.M.T. ****    3. HRS,     6. MINS,   16.695 SECS  G.E.T.
X       2.8553065+03  Y       1.3940245+03  Z       1.5695332+03  DX     -8.9979964+03  DY      2.3504101+04  DZ     -4.5022370+03
ALT     1.0228019+02  LAT     2.6436321+01  LON     2.5600822+02  V       2.5567104+04  PTH     4.3281332-03  AZ      1.0132910+02
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ID      913090.2
TRANSLUNAR INJECTION INITIATION
   13  SEPT. 1969    9 HRS,   14 MINS,   47.891 SECS  G.M.T. ****    3. HRS,     9. MINS,   46.695 SECS  G.E.T.
X       2.4592227+03  Y       2.1548545+03  Z       1.3668494+03  DX     -1.3803890+04  DY      2.0294850+04  DZ     -7.1657602+03
ALT     1.0172262+02  LAT     2.2819708+01  LON     2.7033409+02  V       2.5569052+04  PTH    -5.6317555-03  AZ      1.0768067+02
R       3.5439317+03  DEC     2.2686415+01  RA      4.1225941+01  RAS     1.7119088+02  DES     3.7993124+00  RAN    -8.8347657+01
INC     2.8472237+01  MASS    2.8157628+05
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ID      913090.2
TRANSLUNAR INJECTION TERMINATION
   13  SEPT. 1969    9 HRS,   19 MINS,   56.395 SECS  G.M.T. ****    3. HRS,    14. MINS,   55.199 SECS  G.E.T.
X       1.4740875+03  Y       3.1794536+03  Z       8.3938992+02  DX     -2.5556289+04  DY      2.0271672+04  DZ     -1.4326755+04
ALT     1.6036526+02  LAT     1.3552935+01  LON     2.9294538+02  V       3.5627525+04  PTH     6.5991636+00  AZ      1.1635725+02
R       3.6036695+03  DEC     1.3469423+01  RA      6.5126183+01  RAS     1.7119408+02  DES     3.7979449+00  DEM    -4.9254718+00
RAN    -8.9695239+01  INC     2.9378609+01  FCC     9.7479305-01  SMA     1.4105082+05  RP      3.5554615+03  APF     1.3828394+02
INMP    3.9396599+01  C3TLI  -4.8611026-01  DAZTLI  1.1163440+00  MASS    1.3199178+05  FUEL    1.4958450+05
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ID      913090.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   13  SEPT. 1969   11 HRS,   19 MINS,   56.395 SECS  G.M.T. ****    5. HRS,    14. MINS,   55.198 SECS  G.E.T.
X      -1.8549322+04  Y      -7.7565919+02  Z      -1.0442275+04  DX     -1.0979728+04  DY     -6.4506103+03  DZ     -6.1973060+03
ALT     1.7859545+04  LAT    -2.9382319+01  LON     2.0131562+01  V       1.4162323+04  PTH     6.4991169+01  AZ      8.8961580+01
R       2.1300705+04  DEC    -2.9355789+01  RA     -1.7760551+02  RAS     1.7126889+02  DES     3.7660235+00
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ID      913090.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   16  SEPT. 1969    7 HRS,   17 MINS,   31.251 SECS  G.M.T. ****   73. HRS,    12. MINS,   30.054 SECS  G.E.T.
RMP     9.9907575+02  DEMP    6.4526746+00  RAMP    1.7830259+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(i) 90° launch azimuth; second injection opportunity - Continued

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ID      913090.2
LUNAR ORBIT INSERTION BURN INITIATION
   16  SEPT. 1969    7 HRS,  14 MINS,  14.302 SECS  G.M.T. ****  73. HRS,    9. MINS,  13.103 SECS  G.E.T.
XL     -4.9074356+02  YL     -8.2563776+02  ZL     -3.4507170+02  DXL    -6.5471598+03  DYL     4.3725435+03  DZL     2.7621548+03
XS     -1.0073263+03  YS     -1.6339447+02  ZS     -1.3316759+01  DXS    -1.9512483+01  DYS     8.3107551+03  DZS     9.0306051+02
ALTS    8.2085423+01  LATS   -7.4763031-01  LONS   -1.7078651+02  VRS     8.3596978+03  PTR    -9.1063911+00  AZR    -8.3839033+01
LIN     1.7378178+02  LAN    -1.7766515+02  LAP     1.9238447+02  LTS    -2.4277265-02  LNS     1.2109532+02  DEM    -2.1184231+01
THETA   1.3513980+01  BETA   -1.7634301+02  MASS    9.4833024+04
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ID      913090.2
LUNAR ORBIT INSERTION BURN TERMINATION
   16  SEPT. 1969    7 HRS,  20 MINS,  33.188 SECS  G.M.T. ****  73. HRS,   15. MINS,  31.991 SECS  G.E.T.
XL     -8.0152665+02  YL     -5.6142443+02  ZL     -1.9285636+02  DXL    -3.2132696+03  DYL     3.9561443+03  DZL     2.0208359+03
XS     -9.6019895+02  YS      2.6846403+02  ZS      2.7945288+01  DXS     1.5214123+03  DYS     5.2701723+03  DZS     3.8363837+02
ALTS    5.8921101+01  LATS    1.6055075+00  LONS    1.6437943+02  VRS     5.4987807+03  PTR    -3.6862565-01  AZR    -8.5987328+01
LIN     1.7566761+02  LAN    -1.7390663+02  LAP    -1.6020460+02  SMAS    1.0523323+03  ECCS    5.2582984-02  PERS    2.1446040+00
RPS     9.9699756+02  APOS    1.1076671+03  RANS   -1.7057908+02  INCS    1.5547283+02  LTS    -2.4409150-02  LNS     1.2104173+02
LTE     5.6362957+00  LNE    -4.8938244+00  THETA  -1.1301006+01  BETA   -1.7441995+02  FUEL    2.4087066+04  BARC    2.4885320+01
DELV    2.9659360+03  MASS    7.0745958+04  PLCHNG  1.9171198+00  DRTX   -2.8779482+03  DRTY   -1.8393869+02  DRTZ   -6.9308823+02
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ID      913090.2
CIRCULARIZATION BURN INITIATION
   16  SEPT. 1969   11 HRS,  39 MINS,  53.235 SECS  G.M.T. ****  77. HRS,   34. MINS,  52.037 SECS  G.E.T.
XL     -8.6445504+02  YL     -4.7393036+02  ZL     -1.4860203+02  DXL    -2.7028415+03  DYL     4.2735882+03  DZL     2.1248727+03
XS     -9.0533109+02  YS      4.1599438+02  ZS      3.6045977+01  DXS     2.3079629+03  DYS     4.9801568+03  DZS     3.6327611+02
ALTS    5.8439448+01  LATS    2.0719838+00  LONS    1.5532149+02  VRS     5.5009656+03  PTR    -4.8669899-02  AZR    -8.6209270+01
LIN     1.7567093+02  LAN    -1.7612899+02  LAP    -1.6068786+02  LTS    -2.9845393-02  LNS     1.1884141+02  DEM    -2.2011245+01
THETA   3.4150945-06  BETA   -1.7999300+02  MASS    7.0725957+04
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ID      913090.2
CIRCULARIZATION BURN TERMINATION
   16  SEPT. 1969   11 HRS,  40 MINS,   8.239 SECS  G.M.T. ****  77. HRS,   35. MINS,   7.040 SECS  G.E.T.
XL     -8.7096970+02  YL     -4.6346804+02  ZL     -1.4340770+02  DXL    -2.5733728+03  DYL     4.1998446+03  DZL     2.0820122+03
XS     -8.9962307+02  YS      4.2810178+02  ZS      3.6928603+01  DXS     2.3148967+03  DYS     4.8255132+03  DZS     3.5157517+02
ALTS    5.8480172+01  LATS    2.1227614+00  LONS    1.5455171+02  VRS     5.3635743+03  PTR    -4.0079186-02  AZR    -8.6237569+01
LIN     1.7567094+02  LAN    -1.7613119+02  LAP     5.0367291+01  SMAS    9.9746402+02  ECCS    8.5668164-04  PERS    1.9790811+00
RPS     9.9660951+02  APOS    9.9831852+02  RANS   -1.7056524+02  INCS    1.5548253+02  LTS    -2.9850701-02  LNS     1.1883928+02
LTE     5.7928432+00  LNE    -4.8193166+00  THETA  -7.6849958-01  BETA    1.7999999+02  FUEL    9.5386524+02  BARC    7.6877129-01
DELV    1.3743957+02  MASS    6.9772092+04  PLCHNG  1.5225526-05  DRTX   -1.3743764+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      913090.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   17  SEPT. 1969    6 HRS,   4 MINS,  27.454 SECS  G.M.T. ****  95. HRS,   59. MINS,  26.255 SECS  G.E.T.
XL     -1.4837304+02  YL      8.9479099+02  ZL      4.1273934+02  DXL     5.2771807+03  DYL     8.7855105+02  DZL    -2.6147509+00
XS      8.2520615+02  YS      5.5660798+02  ZS      4.7779135+01  DXS     3.0095814+03  DYS    -4.4315609+03  DZS    -3.1047088+02
ALTS    5.8030685+01  LATS    2.7481447+00  LONS    3.3999968+01  VRS     5.3658833+03  PTR     2.1954704-02  AZR    -9.3321884+01
LIN     1.7568200+02  LAN     1.7452645+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(i) 90° launch azimuth; second injection opportunity - Continued

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ID      913090.2
CSM PLANE CHANGE BURN INITIATION
   18  SEPT. 1969    3 HRS,   15 MINS,   31.359 SECS  G.M.T. **** 117. HRS,    10. MINS,   30.162 SECS  G.E.T.
XL     -9.1769990+02  YL     -3.7662729+02  ZL     -9.9050315+01  DXL    -2.0526930+03  DYL     4.4468998+03  DZL     2.1465255+03
XS     -5.9395213+02  YS      7.9937477+02  ZS      4.5310260+01  DXS     4.3084564+03  DYS     3.1785288+03  DZS     3.2000279+02
ALTS    5.8417794+01  LATS    2.6050274+00  LONS    1.2661312+02  VRS     5.3536037+03  PTR    -3.9450692-02  AZR    -8.6574255+01
LIN     1.7568903+02  LAN     1.6373802+02  LAP     4.2892715+01  LTS    -8.1715179-02  LNS     9.8695464+01  DEM    -2.7466968+01
THETA  -4.2688681-06  BETA   -9.0000004+01  MASS    3.6418092+04
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ID      913090.2
CSM PLANE CHANGE BURN TERMINATION
   18  SEPT. 1969    3 HRS,   15 MINS,   34.890 SECS  G.M.T. **** 117. HRS,    10. MINS,   33.691 SECS  G.E.T.
XL     -9.1888978+02  YL     -3.7403341+02  ZL     -9.7818768+01  DXL    -2.0416586+03  DYL     4.4786903+03  DZL     2.0911770+03
XS     -5.9144470+02  YS      8.0121958+02  ZS      4.5477910+01  DXS     4.3197419+03  DYS     3.1695826+03  DZS     2.5682671+02
ALTS    5.8415651+01  LATS    2.6146784+00  LONS    1.2643402+02  VRS     5.3639895+03  PTR    -3.9396920-02  AZR    -8.7250977+01
LIN     1.7620081+02  LAN     1.6988138+02  LAP     2.4000578+01  SMAS    9.9748638+02  ECCS    9.0026984-04  PERS    1.9791477+00
RPS     9.9658837+02  APOS    9.9833439+02  RANS   -1.7078687+02  INCS    1.5622880+02  LTS    -8.1716534-02  LNS     9.8694967+01
LTE     6.7082601+00  LNE    -3.7902790+00  THETA   7.9913212-04  BETA   -8.9329702+01  FUEL    2.2451855+02  BARC    1.7900041-01
DELV    6.2593759+01  MASS    3.6193573+04  PLCHNG  6.7062861-01  DRTX    0.0000000     DRTY   -5.2593570+01  DRTZ    0.0000000
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ID      913090.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969    7 HRS,   42 MINS,   33.311 SECS  G.M.T. **** 121. HRS,    37. MINS,   32.115 SECS  G.E.T.
XL     -3.8325597+02  YL      8.3353163+02  ZL      3.8925349+02  DXL     4.9255945+03  DYL     2.0196209+03  DZL     5.2979400+02
XS      8.2525381+02  YS      5.5663937+02  ZS      4.7823696+01  DXS     3.0087645+03  DYS    -4.4363397+03  DZS    -2.4411459+02
ALTS    5.8089829+01  LATS    2.7505463+00  LONS    3.3999934+01  VRS     5.3659450+03  PTR     2.0127136-02  AZR    -9.2611434+01
LIN     1.7620250+02  LAN     1.6763092+02
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ID      913090.2
TRANSEARTH INJECTION BURN INITIATION
   19  SEPT. 1969    0 HRS,   28 MINS,   29.069 SECS  G.M.T. **** 138. HRS,    23. MINS,   27.870 SECS  G.E.T.
XL      5.2285289+02  YL     -7.6570292+02  ZL     -3.6916783+02  DXL    -4.5378123+03  DYL    -2.6899766+03  DZL    -8.4461424+02
XS     -8.2808392+02  YS     -5.5437429+02  ZS     -5.3917928+01  DXS    -2.9870958+03  DYS     4.4439980+03  DZS     2.0401994+02
ALTS    5.9484926+01  LATS   -3.0970355+00  LONS   -1.4619902+02  VRS     5.3584908+03  PTR    -1.1580259-02  AZR    -8.7815434+01
LIN     1.7620682+02  LAN     1.5910704+02  LAP     1.4768596+02  LTS    -1.1105700-01  LNS     8.7908604+01  DEM    -2.8609028+01
THETA  -3.2983897+00  BETA   -1.1389646+00  MASS    3.5603573+04
*****************************************************************************************************************

ID      913090.2
TRANSEARTH INJECTION BURN TERMINATION
   19  SEPT. 1969    0 HRS,   30 MINS,   45.487 SECS  G.M.T. **** 138. HRS,    25. MINS,   44.286 SECS  G.E.T.
XL      3.9167570+02  YL     -8.3363584+02  ZL     -3.8995655+02  DXL    -7.2415204+03  DYL    -3.4102254+03  DZL    -1.0243115+03
XS     -9.0386479+02  YS     -4.2557866+02  ZS     -4.8331195+01  DXS    -3.8180419+03  DYS     7.1213846+03  DZS     2.9564364+02
ALTS    6.1718737+01  LATS   -2.7696637+00  LONS   -1.5478691+02  VRS     8.0857261+03  PTR     2.8774988+00  AZR    -8.7760065+01
LIN     1.7643565+02  LAN     1.5425831+02  LAP     5.7121242+00  SMAS   -3.5005403+03  ECCS    1.2850880+00  PERS    1.3011290+01
RPS     9.9796220+02  APOS   -7.9990428+03  RANS   -1.7160523+02  INCS    1.5614571+02  LTS    -1.1111032-01  LNS     8.7889355+01
LTE     6.7694201+00  LNE    -3.0010460+00  THETA   5.2626419+00  BETA   -7.5536976-01  FUEL    8.6725669+03  BARC    8.5621045+00
DELV    2.7370536+03  MASS    2.7931006+04  PLCHNG  3.8492570-01  DRTX    2.7319731+03  DRTY   -5.4314709+01  DRTZ    1.5747864+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(i) 90° launch azimuth; second injection opportunity - Concluded

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ID      913090.2
ENTRY AND TOUCHDOWN
   22  SEPT. 1969  17 HRS,  20 MINS,  29.635 SECS  G.M.T. **** 227. HRS,   15. MINS,  28.434 SECS  G.E.T.
X       1.3960090+03  Y       2.7384452+03  Z       1.6887965+03  DX     -3.3873264+04  DY      1.2340202+04  DZ     -3.5524074+02
R       3.5071294+03  DEC     2.8785535+01  RA      6.2988348+01  V       3.6052805+04  PTH    -6.4000016+00  AZ      8.7115940+01
ALT     6.5832984+01  LAT     2.8945154+01  LON     1.6146968+02  VE      3.4701498+04  PTE    -6.6419531+00  AZE     8.6983477+01
SMA     1.0859826+05  ECC     9.6811335-01  INC     2.8917342+01  RAN    -2.1038999+01  APF     9.7779332+01  RP      3.4628348+03
INMP    9.2858897+00  RAM    -3.8666648+01  DEM    -1.8203803+01  RAS     1.7956733+02  DES     1.8757748-01  SPSFR   3.5654431+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.5337986+01  LONTD   1.9500247+02  AZTD    1.0455796+02
*****************************************************************************************************************

ID      913090.2
CIRCUMLUNAR PERICYNTHION
   16  SEPT. 1969   7 HRS,  17 MINS,  29.278 SECS  G.M.T. ****  73. HRS,   12. MINS,  28.080 SECS  G.E.T.
XL     -6.9234802+02  YL     -6.7426091+02  ZL     -2.5195591+02  DXL    -6.0135052+03  DYL     5.0468744+03  DZL     3.0304079+03
XS     -9.9348723+02  YS      1.0432718+02  ZS      1.5711641+01  DXS     8.8958847+02  DYS     8.3356153+03  DZS     9.0183779+02
ALTS    6.0580001+01  LATS    9.0108266-01  LONS    1.7400528+02  VRS     8.4313202+03  PTR     3.9392187-05  AZR    -8.3858968+01
LIN     1.7378183+02  LAN    -1.7769486+02  LAP     5.7339422+00  LTS    -2.4345139-02  LNS     1.2106774+02  DEM    -2.1194565+01
SMAS   -2.0688604+03  ECCS    1.4829101+00  INCS    1.5391947+02  RANS   -1.6794910+02  APFS   -3.5004181+01  RPS     9.9907352+02
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ID      913090.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   19  SEPT. 1969   0 HRS,  23 MINS,  56.314 SECS  G.M.T. **** 138. HRS,   18. MINS,  55.114 SECS  G.E.T.
X       3.1809493+03  Y       1.4294475+03  Z       3.9455955+02  DX     -1.7331466+04  DY      2.1769499+04  DZ      2.3058187+04
R       3.5096205+03  DEC     6.4549686+00  RA      2.4198085+01  V       3.6138218+04  PTH    -6.7531358+00  AZ      4.8699392+01
ALT     6.5833615+01  LAT     6.4972805+00  LON     2.0470850+01  VE      3.5000575+04  PTE    -6.9443613+00  AZE     4.7013471+01
SMA     1.6281550+05  ECC     9.7874549-01  INC     4.1712365+01  RAN     1.6905870+01  APF     2.3380787+01  RP      3.4605637+03
INMP    1.6759483+01  RAM    -9.5900279+01  DEM    -2.8607479+01  RAS     1.7624246+02  DES     1.6276644+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.7065699+01  LONTD   4.4261391+01  AZTD    5.6900109+01
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(j) 98° launch azimuth; second injection opportunity

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ID      913098.2
LAUNCH TIME      13  SEPT. 1969     7 HRS,     0 MINS,  58.949 SECS   G.M.T.
LAUNCH AZIMUTH   98.                                INJECTION OPPORTUNITY    2
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ID      913098.2
EARTH PARKING ORBIT INSERTION
   13  SEPT. 1969   7 HRS,  12 MINS,  16.074 SECS  G.M.T. ****   0. HRS,   11. MINS,  17.125 SECS  G.E.T.
X       2.3544613+03  Y       2.2741525+03  Z       1.3580156+03  DX     -1.4370371+04  DY      1.9607729+04  DZ     -7.9207368+03
ALT     1.0170214+02  LAT     2.2664277+01  LON     3.0383058+02  V       2.5567727+04  PTH    -7.5449799-07  AZ      1.0959661+02
R       3.5439334+03  DEC     2.2531694+01  RA      4.4005986+01  RAS     1.7111450+02  DES     3.8318986+00  RAN    -8.8888481+01
INC     2.9522020+01  MASS    2.8440356+05
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ID      913098.2
3.5 MINS PRIOR TO TLI INITIATION
   13  SEPT. 1969  10 HRS,   4 MINS,  20.126 SECS  G.M.T. ****   3. HRS,    3. MINS,  21.177 SECS  G.E.T.
X       2.8250676+03  Y       1.4185423+03  Z       1.6017112+03  DX     -8.9188563+03  DY      2.3431017+04  DZ     -5.0064395+03
ALT     1.0226639+02  LAT     2.7021185+01  LON     2.4335240+02  V       2.5566051+04  PTH     1.4322474-02  AZ      1.0268860+02
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ID      913098.2
TRANSLUNAR INJECTION INITIATION
   13  SEPT. 1969  10 HRS,   7 MINS,  50.126 SECS  G.M.T. ****   3. HRS,    6. MINS,  51.177 SECS  G.E.T.
X       2.4326263+03  Y       2.1761140+03  Z       1.3807838+03  DX     -1.3673274+04  DY      2.0180406+04  DZ     -7.7117479+03
ALT     1.0179380+02  LAT     2.3064964+01  LON     2.5762637+02  V       2.5567133+04  PTH     2.9380552-03  AZ      1.0911889+02
R       3.5439676+03  DEC     2.2930560+01  RA      4.1814329+01  RAS     1.7122394+02  DES     3.7852053+00  RAN    -8.9845957+01
INC     2.9520729+01  MASS    2.8134111+05
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ID      913098.2
TRANSLUNAR INJECTION TERMINATION
   13  SEPT. 1969  10 HRS,  12 MINS,  58.407 SECS  G.M.T. ****   3. HRS,   11. MINS,  59.458 SECS  G.E.T.
X       1.4582142+03  Y       3.1919446+03  Z       8.2059249+02  DX     -2.5268221+04  DY      2.0061617+04  DZ     -1.5107832+04
ALT     1.6059209+02  LAT     1.3243090+01  LON     2.7997161+02  V       3.5625806+04  PTH     6.6155549+00  AZ      1.1774575+02
R       3.6039244+03  DEC     1.3161354+01  RA      6.5447089+01  RAS     1.7122714+02  DES     3.7838385+00  DEM    -5.1511227+00
RAN    -9.1147380+01  INC     3.0483530+01  ECC     9.7474457-01  SMA     1.4078050+05  RP      3.5554716+03  APF     1.3992717+02
INMP    4.0672941+01  C3TLI  -4.8704400-01  DA7TLI  1.1620488+00  MASS    1.3186474+05  FUEL    1.4947637+05
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ID      913098.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   13  SEPT. 1969  12 HRS,  12 MINS,  58.407 SECS  G.M.T. ****   5. HRS,   11. MINS,  59.458 SECS  G.E.T.
X      -1.8346275+04  Y      -9.2089938+02  Z      -1.0783294+04  DX     -1.0861847+04  DY     -6.5360642+03  DZ     -6.3118806+03
ALT     1.7859571+04  LAT    -3.0441134+01  LON     7.3159692+00  V       1.4161204+04  PTH     6.4989401+01  AZ      8.7947612+01
R       2.1300547+04  DEC    -3.0414026+01  RA     -1.7712642+02  RAS     1.7130195+02  DES     3.7519137+00
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ID      913098.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   16  SEPT. 1969   8 HRS,  13 MINS,  56.352 SECS  G.M.T. ****  73. HRS,   12. MINS,  57.399 SECS  G.E.T.
RMP     9.9853623+02  DEMP    6.4873703+00  RAMP    1.7840825+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(j) 98° launch azimuth; second injection opportunity - Continued

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ID      913098.2
LUNAR ORBIT INSERTION BURN INITIATION
   16  SEPT. 1969   8 HRS,  10 MINS,  38.815 SECS  G.M.T. ****  73. HRS,    9. MINS,  39.865 SECS  G.E.T.
XL     -4.8024265+02  YL     -8.3083389+02  ZL     -3.4817044+02  DXL    -6.5913425+03  DYL     4.3102836+03  DZL     2.7584000+03
XS     -1.0071131+03  YS     -1.6628810+02  ZS     -1.4207910+01  DXS    -1.8709730+01  DYS     8.3097550+03  DZS     9.2263684+02
ALTS    8.2359323+01  LATS   -7.9745045-01  LONS   -1.7062432+02  VRS     8.3608393+03  PTR    -9.2779645+00  AZR    -8.3710513+01
LIN     1.7364738+02  LAN    -1.7780705+02  LAP     1.9237369+02  LTS    -2.5455688-02  LNS     1.2061670+02  DEM    -2.1362855+01
THETA   1.4061845+01  BETA   -1.7607599+02  MASS    9.4833024+04
*****************************************************************************************************************

ID      913098.2
LUNAR ORBIT INSERTION BURN TERMINATION
   16  SEPT. 1969   8 HRS,  16 MINS,  57.832 SECS  G.M.T. ****  73. HRS,   15. MINS,  58.880 SECS  G.E.T.
XL     -7.9430922+02  YL     -5.6965640+02  ZL     -1.9642489+02  DXL    -3.2694881+03  DYL     3.9201280+03  DZL     2.0073705+03
XS     -9.6048640+02  YS      2.6592234+02  ZS      2.7738369+01  DXS     1.5039700+03  DYS     5.2776383+03  DZS     3.8436967+02
ALTS    5.8511104+01  LATS    1.5942720+00  LONS    1.6452460+02  VRS     5.5011936+03  PTR    -3.1798138-01  AZR    -8.5982989+01
LIN     1.7566771+02  LAN    -1.7392062+02  LAP     1.3480218+02  SMAS    1.0524505+03  ECCS    5.2975050-02  PERS    2.1449653+00
RPS     9.9669692+02  APOS    1.1082041+03  RANS   -1.7051972+02  INCS    1.5550160+02  LTS    -2.5587905-02  LNS     1.2056310+02
LTF     5.6711679+00  LNF    -4.8782922+00  THETA  -1.0763554+01  BETA   -1.7403743+02  FUEL    2.4095342+04  BARC    2.4905962+01
DELV    2.9671200+03  MASS    7.0737682+04  PLCHNG  2.0517179+00  DRTX   -2.8714631+03  DRTY   -1.9696447+02  DRTZ   -7.2091913+02
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ID      913098.2
CIRCULARIZATION BURN INITIATION
   16  SEPT. 1969  12 HRS,  36 MINS,  21.018 SECS  G.M.T. ****  77. HRS,   35. MINS,  22.068 SECS  G.E.T.
XL     -8.5871916+02  YL     -4.8248240+02  ZL     -1.5223920+02  DXL    -2.7603167+03  DYL     4.2444570+03  DZL     2.1141969+03
XS     -9.0586315+02  YS      4.1411176+02  ZS      3.5889948+01  DXS     2.2942383+03  DYS     4.9885061+03  DZS     3.6401711+02
ALTS    5.8183268+01  LATS    2.0635877+00  LONS    1.5543267+02  VRS     5.5028383+03  PTR     6.2397104-03  AZR    -8.6204827+01
LIN     1.7567103+02  LAN    -1.7614342+02  LAP     1.4027780+02  LTS    -3.1034912-02  LNS     1.1836239+02  DEM    -2.2182281+01
THETA  -8.5377364-07  BETA   -1.7999999+02  MASS    7.0717682+04
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ID      913098.2
CIRCULARIZATION BURN TERMINATION
   16  SEPT. 1969  12 HRS,  36 MINS,  36.035 SECS  G.M.T. ****  77. HRS,   35. MINS,  37.085 SECS  G.E.T.
XL     -8.6538025+02  YL     -4.7208131+02  ZL     -1.4706609+02  DXL    -2.6297696+03  DYL     4.1719803+03  DZL     2.0718274+03
XS     -9.0018365+02  YS      4.2625018+02  ZS      3.6774169+01  DXS     2.3015113+03  DYS     4.8337067+03  DZS     3.5230280+02
ALTS    5.8187053+01  LATS    2.1145020+00  LONS    1.5466175+02  VRS     5.3652392+03  PTR     1.6513363-02  AZR    -8.6233068+01
LIN     1.7567105+02  LAN    -1.7614561+02  LAP    -2.8951915+01  SMAS    9.9750057+02  ECCS    8.7139104-04  PERS    1.9791899+00
RPS     9.9663135+02  APOS    9.9836978+02  RANS   -1.7050606+02  INCS    1.5551136+02  LTS    -3.1040241-02  LNS     1.1836026+02
LTF     5.8255506+00  LNF    -4.8020867+00  THETA  -7.6978195-01  BETA   -1.7999999+02  FUEL    9.5470507+02  BARC    7.6994770-01
DELV    1.3757773+02  MASS    6.9762976+04  PLCHNG  1.5196136-05  DRTX   -1.3757560+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      913098.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   17  SEPT. 1969   7 HRS,   1 MINS,   3.278 SECS  G.M.T. ****  96. HRS,    0. MINS,   4.326 SECS  G.E.T.
XL     -1.5743181+02  YL      8.9445297+02  ZL      4.1276594+02  DXL     5.2640375+03  DYL     9.2167529+02  DZL     1.5233654+01
XS      8.2609680+02  YS      5.5720870+02  ZS      4.7844993+01  DXS     3.0063343+03  DYS    -4.4269443+03  DZS    -3.1006765+02
ALTS    5.9106901+01  LATS    2.7489646+00  LONS    3.3999968+01  VRS     5.3602260+03  PTR     2.0958564-02  AZR    -9.3321013+01
LIN     1.7568213+02  LAN     1.7451096+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Continued

(j) 98° launch azimuth; second injection opportunity - Continued

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ID      913098.2
CSM PLANE CHANGE BURN INITIATION
   18  SEPT. 1969    4 HRS,  12 MINS,   8.977 SECS  G.M.T. **** 117. HRS,   11. MINS,  10.025 SECS  G.E.T.
XL     -9.1396822+02  YL     -3.8421623+02  ZL     -1.0215167+02  DXL    -2.1026080+03  DYL     4.4283616+03  DZL     2.1396971+03
XS     -5.9382209+02  YS      7.9919947+02  ZS      4.5282610+01  DXS     4.3062574+03  DYS     3.1836084+03  DZS     3.2037994+02
ALTS    5.8198510+01  LATS    2.6040099+00  LONS    1.2661313+02  VRS     5.3648726+03  PTR     1.8161402-02  AZR    -8.6573646+01
LIN     1.7568919+02  LAN     1.6372247+02  LAP    -7.5920291+01  LTS    -8.2997425-02  LNS     9.8215505+01  DEM    -2.7546997+01
THETA  -2.5613209-06  BETA   -9.0000025+01  MASS    3.6408976+04
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ID      913098.2
CSM PLANE CHANGE BURN TERMINATION
   18  SEPT. 1969    4 HRS,  12 MINS,  12.511 SECS  G.M.T. **** 117. HRS,   11. MINS,  13.561 SECS  G.E.T.
XL     -9.1518827+02  YL     -3.8163067+02  ZL     -1.0092295+02  DXL    -2.0916372+03  DYL     4.4602862+03  DZL     2.0843221+03
XS     -5.9131336+02  YS      8.0104912+02  ZS      4.5450613+01  DXS     4.3175603+03  DYS     3.1746472+03  DZS     2.5712878+02
ALTS    5.8199485+01  LATS    2.6136751+00  LONS    1.2643376+02  VRS     5.3652425+03  PTR     1.8256082-02  AZR    -8.7251022+01
LIN     1.7620152+02  LAN     1.6987069+02  LAP    -7.1610897+01  SMAS    9.9752276+02  ECCS    8.9107832-04  PERS    1.9792559+00
RPS     9.9663389+02  APOS    9.9341162+02  RANS   -1.7074332+02  INCS    1.5625747+02  LTS    -8.2998835-02  LNS     9.8214992+01
LTE     6.7176834+00  LNE    -3.7584978+00  THETA   9.0073118-04  BETA   -8.9329493+01  FUEL    2.2472851+02  BARC    1.7886372-01
DELV    6.2668569+01  MASS    3.6184248+04  PLCHNG  6.7126817-01  DRTX    0.0000000     DRTY   -4.2668515+01  DRTZ    0.0000000
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ID      913098.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969    8 HRS,  39 MINS,  13.494 SECS  G.M.T. **** 121. HRS,   38. MINS,  14.543 SECS  G.E.T.
XL     -3.9196243+02  YL      8.3113176+02  ZL      3.8838144+02  DXL     4.9010754+03  DYL     2.0598806+03  DZL     5.4655480+02
XS      8.2611584+02  YS      5.5722115+02  ZS      4.7873247+01  DXS     3.0068496+03  DYS    -4.4310465+03  DZS    -2.4370120+02
ALTS    5.9130982+01  LATS    2.7505227+00  LONS    3.3999950+01  VRS     5.3604764+03  PTR     3.4996714-02  AZR    -9.2610392+01
LIN     1.7620322+02  LAN     1.6761986+02
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ID      913098.2
TRANSEARTH INJECTION BURN INITIATION
   19  SEPT. 1969    1 HRS,  25 MINS,  34.407 SECS  G.M.T. **** 138. HRS,   24. MINS,  35.457 SECS  G.E.T.
XL      5.1485077+02  YL     -7.6956711+02  ZL     -3.6989410+02  DXL    -4.5678012+03  DYL    -2.6551959+03  DZL    -8.2465529+02
XS     -8.3718335+02  YS     -5.3890903+02  ZS     -5.3174803+01  DXS    -2.9074613+03  DYS     4.5022322+03  DZS     2.0938294+02
ALTS    5.8565386+01  LATS   -3.0571293+00  LONS   -1.4722993+02  VRS     5.3635126+03  PTR    -3.5884410-02  AZR    -8.7761421+01
LIN     1.7620753+02  LAN     1.5909266+02  LAP     3.9449367+01  LTS    -1.1239790-01  LNS     8.7424985+01  DEM    -2.8626888+01
THETA  -3.0693290+00  BETA   -1.2461550+00  MASS    3.6594248+04
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ID      913098.2
TRANSEARTH INJECTION BURN TERMINATION
   19  SEPT. 1969    1 HRS,  27 MINS,  50.910 SECS  G.M.T. **** 138. HRS,   26. MINS,  51.955 SECS  G.E.T.
XL      3.8287248+02  YL     -8.3659693+02  ZL     -3.9022209+02  DXL    -7.2759942+03  DYL    -3.3605257+03  DZL    -1.0021328+03
XS     -9.1079701+02  YS     -4.0859684+02  ZS     -4.7502316+01  DXS    -3.6994107+03  DYS     7.1919318+03  DZS     2.9745502+02
ALTS    6.0885809+01  LATS   -2.7243991+00  LONS   -1.5583830+02  VRS     8.0930836+03  PTR     2.9530792+00  AZR    -8.7747726+01
LIN     1.7646282+02  LAN     1.5382392+02  LAP     1.6732187+02  SMAS   -3.4700463+03  ECCS    1.2873199+00  PERS    1.2841645+01
RPS     9.9701335+02  APOS   -7.9371060+03  RANS   -1.7165137+02  INCS    1.5616578+02  LTS    -1.1245142-01  LNS     8.7405720+01
LTE     6.7646571+00  LNE    -2.9622927+00  THETA   5.5123750+00  BETA   -8.2694098-01  FUEL    8.6779321+03  BARC    8.5830557+00
DELV    2.7398001+03  MASS    2.7916316+04  PLCHNG  4.2127319-01  DRTX    2.7352142+03  DRTY   -5.9498932+01  DRTZ    1.4670020+02
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TABLE IX.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 13, 1969 - Concluded

(j) 98° launch azimuth; second injection opportunity - Concluded

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ID      913098.2
ENTRY AND TOUCHDOWN
   22  SEPT. 1969  17 HRS,  22 MINS,  29.644 SECS  G.M.T. **** 226. HRS,   21. MINS,  30.694 SECS  G.E.T.
X       1.3720709+03  Y       2.7490694+03  Z       1.6913716+03  DX     -3.3978622+04  DY      1.2048308+04  DZ     -3.5211104+02
R       3.5072353+03  DEC     2.8832595+01  RA      6.3476041+01  V       3.6053188+04  PTH    -6.4000368+00  AZ      8.7103599+01
ALT     6.5996911+01  LAT     2.8992374+01  LON     1.6145596+02  VE      3.4702466+04  PTE    -6.6418306+00  AZE     8.6970677+01
SMA     1.0894303+05  ECC     9.6821328-01  INC     2.8965273+01  RAN    -2.0534786+01  APF     9.7766632+01  RP      3.4629422+03
INMP    9.0540124+00  RAM    -3.8647103+01  DEM    -1.8196096+01  RAS     1.7956857+02  DES     1.8703705-01  SPSFR   3.5508425+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.5382065+01  LONTD   1.9500410+02  AZTD    1.0457999+02
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ID      913098.2
CIRCUMLUNAR PERICYNTHION
   16  SEPT. 1969   8 HRS,  13 MINS,  57.320 SECS  G.M.T. ****  73. HRS,   12. MINS,  58.368 SECS  G.E.T.
XL     -6.8742596+02  YL     -6.7847081+02  ZL     -2.5337037+02  DXL    -6.0547831+03  DYL     5.0017139+03  DZL     3.0337966+03
XS     -9.9273450+02  YS      1.0628258+02  ZS      1.5993505+01  DXS     9.0721931+02  DYS     8.3354346+03  DZS     9.2165913+02
ALTS    6.0042195+01  LATS    9.1774340-01  LONS    1.7388916+02  VRS     8.4351627+03  PTR     1.6419840-04  AZR    -8.3726306+01
LIN     1.7364793+02  LAN    -1.7783728+02  LAP     9.0600512+00  LTS    -2.5525008-02  LNS     1.2058862+02  DEM    -2.1373281+01
SMAS   -2.0637390+03  ECCS    1.4838479+00  INCS    1.5385010+02  RANS   -1.6767200+02  APFS   -3.5151938+01  RPS     9.9853572+02
*****************************************************************************************************************************

ID      913098.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   19  SEPT. 1969   1 HRS,  13 MINS,  23.893 SECS  G.M.T. **** 138. HRS,   12. MINS,  24.942 SECS  G.E.T.
X       3.1641266+03  Y       1.4562969+03  Z       4.2981552+02  DX     -1.7749023+04  DY      2.1844209+04  DZ      2.2667643+04
R       3.5095925+03  DEC     7.0346044+00  RA      2.4714364+01  V       3.6138890+04  PTH    -6.6126440+00  AZ      4.9418271+01
ALT     6.5832949+01  LAT     7.0806417+00  LON     8.5883640+00  VE      3.4989239+04  PTE    -6.7999880+00  AZE     4.7758175+01
SMA     1.6325155+05  ECC     9.7879010-01  INC     4.1082706+01  RAN     1.6577418+01  APF     2.4109916+01  RP      3.4625483+03
INMP    1.6111609+01  RAM    -9.5350756+01  DEM    -2.8623325+01  RAS     1.7627327+02  DES     1.6143464+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.7246788+01  LONTD   3.2755445+01  AZTD    5.7912758+01
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969

(a) 72° launch azimuth; first injection opportunity

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ID      914072.1
LAUNCH TIME      14  SEPT. 1969     4 HRS,   41 MINS,  51.517 SECS    G.M.T.
LAUNCH AZIMUTH   72.                                INJECTION OPPORTUNITY    1
*****************************************************************************************************************

ID      914072.1
EARTH PARKING ORBIT INSERTION
   14  SEPT. 1969    4 HRS,   53 MINS,  11.259 SECS  G.M.T. ****   0. HRS,   11. MINS,  19.741 SECS  G.E.T.
X       2.9241282+03  Y       6.1928374+02  Z       1.9040553+03  DX     -5.8029698+03  DY      2.4887065+04  DZ      8.1745141+02
ALT     1.0334398+02  LAT     3.2667610+01  LON     3.0566189+02  V       2.5567728+04  PTH     8.2523216-08  AZ      8.7827504+01
R       3.5439334+03  DEC     3.2498104+01  RA      1.1957645+01  RAS     1.7192534+02  DES     3.4855226+00  RAN    -7.4003554+01
INC     3.2562694+01  MASS    2.8296469+05
*****************************************************************************************************************

ID      914072.1
3.5 MINS PRIOR TO TLI INITIATION
   14  SEPT. 1969    6 HRS,   26 MINS,  53.034 SECS  G.M.T. ****   1. HRS,   45. MINS,   1.516 SECS  G.E.T.
X       2.3854853+03  Y       1.9104799+03  Z       1.7940486+03  DX     -1.3476856+04  DY      2.1219362+04  DZ     -4.6804111+03
ALT     1.0291572+02  LAT     3.0576968+01  LON     3.0890647+02  V       2.5569381+04  PTH    -4.1503350-03  AZ      1.0225205+02
*****************************************************************************************************************

ID      914072.1
TRANSLUNAR INJECTION INITIATION
   14  SEPT. 1969    6 HRS,   30 MINS,  23.034 SECS  G.M.T. ****   1. HRS,   48. MINS,  31.516 SECS  G.E.T.
X       1.8507588+03  Y       2.5772107+03  Z       1.5783230+03  DX     -1.7306445+04  DY      1.7162427+04  DZ     -7.7384838+03
ALT     1.0215262+02  LAT     2.6596796+01  LON     3.2365559+02  V       2.5572369+04  PTH    -8.0238093-03  AZ      1.0974982+02
R       3.5437871+03  DEC     2.6447492+01  RA      5.4316936+01  RAS     1.7198591+02  DES     3.4596088+00  RAN    -7.4556475+01
INC     3.2576191+01  MASS    2.8078958+05
*****************************************************************************************************************

ID      914072.1
TRANSLUNAR INJECTION TERMINATION
   14  SEPT. 1969    6 HRS,   35 MINS,  31.604 SECS  G.M.T. ****   1. HRS,   53. MINS,  40.086 SECS  G.E.T.
X       6.9696025+02  Y       3.3900499+03  Z       1.0232898+03  DX     -2.9135807+04  DY      1.4849844+04  DZ     -1.4071959+04
ALT     1.6605860+02  LAT     1.6571280+01  LON     3.4643187+02  V       3.5601027+04  PTH     6.9896613+00  AZ      1.1684117+02
R       3.6090600+03  DEC     1.6471213+01  RA      7.8382438+01  RAS     1.7198911+02  DES     3.4582373+00  DEM    -1.0286641+01
RAN    -7.2355636+01  INC     3.1168907+01  ECC     9.7484750-01  SMA     1.4133491+05  RP      3.5549269+03  APF     1.3262150+02
INMP    3.3594445+01  C3TLI  -4.3513395-01  DAZTLI-1.8248971+00   MASS    1.3117307+05  FUEL    1.4961651+05
*****************************************************************************************************************

ID      914072.1
SPACECRAFT SEPARATION              INJECTION + 2HR
   14  SEPT. 1969    8 HRS,   35 MINS,  31.604 SECS  G.M.T. ****   3. HRS,   53. MINS,  40.086 SECS  G.E.T.
X      -1.7777802+04  Y      -4.1637316+03  Z      -1.1009648+04  DX     -9.2162740+03  DY     -9.2966073+03  DZ     -6.8312387+03
ALT     1.7880476+04  LAT    -3.1116346+01  LON     7.1148922+01  V       1.4157656+04  PTH     6.5009572+01  AZ      9.2294970+01
R       2.1321332+04  DEC    -3.1088916+01  RA     -1.6681837+02  RAS     1.7206389+02  DES     3.4262367+00
*****************************************************************************************************************

ID      914072.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   17  SEPT. 1969    3 HRS,   22 MINS,  43.500 SECS  G.M.T. ****  70. HRS,   40. MINS,  51.980 SECS  G.E.T.
RMP     9.9851914+02  DEMP    6.2870722+00  RAMP    1.7957108+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(a) 72° launch azimuth; first injection opportunity - Continued

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ID      914072.1
LUNAR ORBIT INSERTION BURN INITIATION
   17  SEPT. 1969   3 HRS,  19 MINS,  24.356 SECS  G.M.T. ****  70. HRS,   37. MINS,  32.846 SECS  G.E.T.
XL     -2.8157698+02  YL     -9.0470824+02  ZL     -3.8387824+02  DXL    -7.5019240+03  DYL     3.0950344+03  DZL     1.9108564+03
XS     -1.0035702+03  YS     -1.9399421+02  ZS     -1.8923490+01  DXS    -2.0513650+02  DYS     8.3303624+03  DZS     5.8641158+02
ALTS    8.3829845+01  LATS   -1.0606214+00  LONS   -1.6905943+02  VRS     8.3534960+03  PTR    -9.5800593+00  AZR    -8.6096282+01
LIN     1.7594741+02  LAN     1.7579285+02  LAP     1.9354041+02  LTS    -4.9910744-02  LNS     1.1087183+02  DEM    -2.4619710+01
THETA   1.4838121+01  BETA   -1.7453549+02  MASS    9.4833024+04
*****************************************************************************************************************

ID      914072.1
LUNAR ORBIT INSERTION BURN TERMINATION
   17  SEPT. 1969   3 HRS,  25 MINS,  43.976 SECS  G.M.T. ****  70. HRS,   43. MINS,  52.458 SECS  G.E.T.
XL     -6.5230580+02  YL     -7.0157360+02  ZL     -2.7589282+02  DXL    -4.1252314+03  DYL     3.3041228+03  DZL     1.4707039+03
XS     -9.6728068+02  YS      2.4120184+02  ZS      3.8673799+00  DXS     1.3634519+03  DYS     5.3294539+03  DZS     1.1300963+02
ALTS    5.8414304+01  LATS    2.2227241-01  LONS    1.6599823+02  VRS     5.5022587+03  PTR    -3.4396559-01  AZR    -8.8821786+01
LIN     1.7879759+02  LAN     1.7664949+02  LAP     6.5503103+00  SMAS    1.0526716+03  ECCS    5.3313707-02  PERS    2.1456412+00
RPS     9.9654980+02  APOS    1.1087934+03  RANS   -1.7671949+02  INCS    1.5740938+02  LTS    -5.0047940-02  LNS     1.1081816+02
LTE     6.2738708+00  LNF    -4.4832144+00  THETA  -9.9229201+00  BETA   -1.7174371+02  FUEL    2.4133053+04  BARC    2.4916286+01
DELV    2.9725176+03  MASS    7.0699971+04  PLCHNG  2.8503589+00  DRTX   -2.8603390+03  DRTY   -2.7363049+02  DRTZ   -7.6122990+02
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ID      914072.1
CIRCULARIZATION BURN INITIATION
   17  SEPT. 1969   7 HRS,  45 MINS,  16.835 SECS  G.M.T. ****  75. HRS,    3. MINS,  25.317 SECS  G.E.T.
XL     -7.3886895+02  YL     -6.2359656+02  ZL     -2.4139436+02  DXL    -3.6802338+03  DYL     3.7280320+03  DZL     1.6359738+03
XS     -9.1479802+02  YS      3.9519000+02  ZS      6.3755000+00  DXS     2.1834771+03  DYS     5.0513691+03  DZS     1.0940563+02
ALTS    5.8036061+01  LATS    3.6656387-01  LONS    1.5663580+02  VRS     5.5041686+03  PTR    -5.1435300-03  AZR    -8.8860999+01
LIN     1.7880030+02  LAN     1.7442457+02  LAP    -1.7953104+02  LTS    -5.5695071-02  LNS     1.0861703+02  DEM    -2.5258380+01
THETA   5.1226418-06  BETA    1.7959999+02  MASS    7.0679971+04
*****************************************************************************************************************

ID      914072.1
CIRCULARIZATION BURN TERMINATION
   17  SEPT. 1969   7 HRS,  45 MINS,  31.952 SECS  G.M.T. ****  75. HRS,    3. MINS,  40.434 SECS  G.E.T.
XL     -7.4784367+02  YL     -6.1438295+02  ZL     -2.3735403+02  DXL    -3.5340212+03  DYL     3.6782625+03  DZL     1.6118208+03
XS     -9.0935194+02  YS      4.0756395+02  ZS      6.6436815+00  DXS     2.1942760+03  DYS     4.8952446+03  DZS     1.0617597+02
ALTS    5.8037189+01  LATS    3.8198294-01  LONS    1.5585847+02  VRS     5.3655884+03  PTR     4.9454468-03  AZR    -8.8866123+01
LIN     1.7880034+02  LAN     1.7442232+02  LAP    -1.8549751+02  SMAS    9.9731596+02  ECCS    7.9208736-04  PERS    1.9786405+00
RPS     9.9652600+02  APOS    9.9810591+02  RANS   -1.7671797+02  INCS    1.5741261+02  LTS    -5.5700675-02  LNS     1.0861489+02
LTE     6.3800336+00  LNF    -4.3734589+00  THETA  -7.7515389-01  BETA    1.7999999+02  FUEL    9.6105273+02  BARC    7.7517215-01
DELV    1.3857282+02  MASS    6.9718918+04  PLCHNG  3.8634141-06  DRTX   -1.3857082+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      914072.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   2 HRS,  13 MINS,  20.139 SECS  G.M.T. ****  93. HRS,   31. MINS,  28.618 SECS  G.E.T.
XL     -1.6975451+02  YL      9.0622116+02  ZL      3.8014212+02  DXL     5.2658264+03  DYL     8.8678937+02  DZL     2.4222101+02
XS      9.0984347+02  YS      4.0813662+02  ZS      1.3066180+01  DXS     2.1968244+03  DYS    -4.8901134+03  DZS    -8.6035676+01
ALTS    5.8783465+01  LATS    7.5070255-01  LONS    2.4159998+01  VRS     5.3615901+03  PTR     1.9371464-02  AZR    -9.0919733+01
LIN     1.7881062+02  LAN     1.6502730+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(a) 72° launch azimuth; first injection opportunity - Continued

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ID      914072.1
CSM PLANE CHANGE BURN INITIATION
   18  SEPT. 1969  23 HRS,  24 MINS,    3.570 SECS  G.M.T. **** 114. HRS,    42. MINS,  12.050 SECS  G.E.T.
XL     -9.1075294+02  YL     -3.8095148+02  ZL     -1.3612778+02  DXL    -2.1690711+03  DYL     4.4978295+03  DZL     1.9171721+03
XS     -4.4712050+02  YS      8.9053527+02  ZS      1.2486137+01  DXS     4.7940125+03  DYS     2.4069385+03  DZS     8.7306961+01
ALTS    5.8063413+01  LATS    7.1789341-01  LONS    1.1666034+02  VRS     5.3650284+03  PTR     1.1280037-02  AZR    -8.9067639+01
LIN     1.7882112+02  LAN     1.5416951+02  LAP    -7.0521525+01  LTS    -1.0954619-01  LNS     8.8454393+01  DEM    -2.8585340+01
THETA   2.7320756-05  BETA   -9.0000092+01  MASS    3.6364918+04
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ID      914072.1
CSM PLANE CHANGE BURN TERMINATION
   18  SEPT. 1969  23 HRS,  24 MINS,    4.520 SECS  G.M.T. **** 114. HRS,    42. MINS,  13.001 SECS  G.E.T.
XL     -9.1109174+02  YL     -3.8024770+02  ZL     -1.3582924+02  DXL    -2.1653427+03  DYL     4.5059846+03  DZL     1.9022490+03
XS     -4.4637079+02  YS      8.9091130+02  ZS      1.2498468+01  DXS     4.7961863+03  DYS     2.4032153+03  DZS     7.0432357+01
ALTS    5.8063580+01  LATS    7.1860231-01  LONS    1.1661212+02  VRS     5.3650542+03  PTR     1.1300616-02  AZR    -8.9247923+01
LIN     1.7895819+02  LAN     1.6021883+02  LAP    -4.5432959+01  SMAS    9.9716881+02  ECCS    6.4456032-04  PERS    1.9782026+00
RPS     9.9652608+02  APOS    9.9781153+02  RANS   -1.7685801+02  INCS    1.5761176+02  LTS    -1.0954660-01  LNS     8.8454254+01
LTE     6.7741618+00  LNE    -3.0459587+00  THETA  -1.8356133-04  BETA   -8.9820103+01  FUEL    6.0387695+01  BARC    4.9947969-02
DELV    1.6822096+01  MASS    3.6304531+04  PLCHNG  1.8019041-01  DRTX    0.0000000     DRTY   -1.6821987+01  DRTZ    0.0000000
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ID      914072.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   19  SEPT. 1969   3 HRS,  51 MINS,     .647 SECS  G.M.T. **** 119. HRS,     9. MINS,   9.128 SECS  G.E.T.
XL     -4.0349406+02  YL      8.4013255+02  ZL      3.5461389+02  DXL     4.9865947+03  DYL     2.0417672+03  DZL     7.2928324+02
XS      9.0976105+02  YS      4.0809973+02  ZS      1.3061490+01  DXS     2.1973295+03  DYS    -4.8907444+03  DZS    -6.7086249+01
ALTS    5.8693106+01  LATS    7.5050113-01  LONS    2.4160003+01  VRS     5.3621020+03  PTR     2.4185640-02  AZR    -9.0717214+01
LIN     1.7896040+02  LAN     1.5795044+02
*****************************************************************************************************************

ID      914072.1
TRANSEARTH INJECTION BURN INITIATION
   19  SEPT. 1969  20 HRS,  31 MINS,   16.684 SECS  G.M.T. **** 135. HRS,    49. MINS,  25.162 SECS  G.E.T.
XL      7.4996712+02  YL     -6.0142341+02  ZL     -2.6416346+02  DXL    -3.5230453+03  DYL    -3.7476718+03  DZL    -1.4606299+03
XS     -7.5432936+02  YS     -6.3988847+02  ZS     -1.6925319+01  DXS    -3.4412523+03  DYS     4.1133614+03  DZS     3.2085966+01
ALTS    5.8473436+01  LATS   -9.7274636-01  LONS   -1.4006428+02  VRS     5.3631137+03  PTR    -2.5561517-02  AZR    -8.9657641+01
LIN     1.7896841+02  LAN     1.4938340+02  LAP     5.7901505+01  LTS    -1.3975251-01  LNS     7.7721849+01  DEM    -2.8355772+01
THETA  -3.8802398+00  BETA   -1.0098090+00  MASS    3.6714530+04
*****************************************************************************************************************

ID      914072.1
TRANSEARTH INJECTION BURN TERMINATION
   19  SEPT. 1969  20 HRS,  33 MINS,   32.872 SECS  G.M.T. **** 135. HRS,    51. MINS,  41.351 SECS  G.E.T.
XL      6.4516532+02  YL     -6.9985833+02  ZL     -3.0280366+02  DXL    -5.9032965+03  DYL    -5.1049883+03  DZL    -2.0162886+03
XS     -8.5284416+02  YS     -5.1972897+02  ZS     -1.6389733+01  DXS    -4.5191455+03  DYS     6.6942307+03  DZS     1.4345798+01
ALTS    6.0370839+01  LATS   -9.4017238-01  LONS   -1.4864159+02  VRS     8.0768561+03  PTR     2.6620785+00  AZR    -8.9854629+01
LIN     1.7904857+02  LAN     1.3018034+02  LAP    -7.0286401+01  SMAS   -3.5978317+03  ECCS    1.2770935+00  PERS    1.3557481+01
RPS     9.9693561+02  APOS   -8.1925988+03  RANS   -1.7750275+02  INCS    1.5739523+02  LTS    -1.3980754-01  LNS     7.7702625+01
LTE     6.5315042+00  LNE    -2.1300202+00  THETA   4.6743441+00  BETA   -6.6998003-01  FUEL    8.6579189+03  BARC    8.5554010+00
DELV    2.7222747+03  MASS    2.3056611+04  PLCHNG  3.3970430-01  DRTX    2.7156051+03  DRTY   -4.7864759+01  DRTZ    1.8421914+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(a) 72° launch azimuth; first injection opportunity - Concluded

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*****************************************************************************************************************

ID      914072.1
ENTRY AND TOUCHDOWN
   23  SEPT. 1969  18 HRS,  12 MINS,   6.239 SECS  G.M.T. **** 229. HRS,   30. MINS,  14.715 SECS  G.E.T.
X       6.7960325+02  Y       2.9772780+03  Z       1.7242210+03  DX     -3.5724603+04  DY      4.4600098+03  DZ     -1.7929816+03
R       3.5069906+03  DEC     2.9449260+01  RA      7.7141777+01  V       3.6046549+04  PTH    -6.4000131+00  AZ      8.9664716+01
ALT     6.5858197+01  LAT     2.9611176+01  LON     1.6169965+02  VE      3.4702238+04  PTE    -6.6480261+00  AZE     8.9632822+01
SMA     1.0609495+05  ECC     9.6736244-01  INC     2.9450998+01  RAN    -1.2176366+01  APF     1.0242315+02  RP      3.4626810+03
INMP    5.1458083+00  RAM    -2.4539846+01  DEM    -1.1985399+01  RAS    -1.7950254+02  DES    -2.1571094-01  SPSFR   3.6902810+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.4519307+01  LONTD   1.9499978+02  AZTD    1.0695517+02
*****************************************************************************************************************

ID      914072.1
CIRCUMLUNAR PERICYNTHION
   17  SEPT. 1969   3 HRS,  22 MINS,  49.660 SECS  G.M.T. ****  70. HRS,   40. MINS,  58.139 SECS  G.E.T.
XL     -5.2926492+02  YL     -7.8645921+02  ZL     -3.1362021+02  DXL    -7.1164262+03  DYL     3.8955476+03  DZL     2.2408997+03
XS     -9.9452104+02  YS      8.9015453+01  ZS      1.0818925+00  DXS     7.5055388+02  DYS     8.3782332+03  DZS     5.9475227+02
ALTS    6.0003860+01  LATS    6.2081171-02  LONS    1.7488532+02  VRS     8.4327843+03  PTR    -4.0489265-05  AZR    -8.5955653+01
LIN     1.7594742+02  LAN     1.7576160+02  LAP     1.7989136+02  LTS    -4.9984917-02  LNS     1.1084280+02  DEM    -2.4628229+01
SMAS   -2.0702176+03  ECCS    1.4823152+00  INCS    1.5568502+02  RANS   -1.7101122+02  APFS   -4.9713149+01  RPS     9.9849738+02
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ID      914072.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   19  SEPT. 1969  20 HRS,  21 MINS,  38.753 SECS  G.M.T. **** 135. HRS,   39. MINS,  47.233 SECS  G.E.T.
X       2.8078306+03  Y       2.0099811+03  Z       6.2604733+02  DX     -2.2491736+04  DY      1.7007295+04  DZ      2.2595470+04
R       3.5093975+03  DEC     1.0276094+01  RA      3.5596919+01  V       3.6134215+04  PTH    -6.7126797+00  AZ      4.8605509+01
ALT     6.5833154+01  LAT     1.0342571+01  LON     9.1623086+01  VE      3.5009200+04  PTE    -6.8840391+00  AZE     4.6931479+01
SMA     1.5865509+05  ECC     9.7818593-01  INC     4.2426653+01  RAN     2.4155660+01  APF     2.8908419+01  RP      3.4609146+03
INMP    2.0129567+01  RAM    -8.2531420+01  DEM    -2.8363074+01  RAS     1.7698845+02  DES     1.3049704+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.0488901+01  LONTD   1.1636561+02  AZTD    5.8853246+01
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(b) 78° launch azimuth; first injection opportunity

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ID      914078.1
LAUNCH TIME      14  SEPT. 1969     5 HRS,    50 MINS,  15.070 SECS   G.M.T.
LAUNCH AZIMUTH    78.                              INJECTION OPPORTUNITY     1
*****************************************************************************************************************

ID      914078.1
EARTH PARKING ORBIT INSERTION
   14  SEPT. 1969    6 HRS,    1 MINS,  33.134 SECS  G.M.T. ****   0. HRS,    11. MINS,  18.064 SECS  G.E.T.
X       2.6803767+03  Y       1.4858394+03  Z       1.7796984+03  DX     -1.1793035+04  DY      2.2656157+04  DZ     -1.1539228+03
ALT     1.0292204+02  LAT     3.0306945+01  LON     3.0556765+02  V       2.5567727+04  PTH    -2.3578062-07  AZ      9.2991634+01
P       3.5439335+03  DEC     3.0144440+01  RA      2.9001346+01  RAS     1.7196794+02  DES     3.4672964+00  RAN    -6.6939951+01
INC     3.0278632+01  MASS    2.8388933+05
*****************************************************************************************************************

ID      914078.1
3.5 MINS PRIOR TO TLI INITIATION
   14  SEPT. 1969    7 HRS,   31 MINS,  42.107 SECS  G.M.T. ****   1. HRS,    41. MINS,  27.037 SECS  G.E.T.
X       2.4126222+03  Y       1.9319900+03  Z       1.7337908+03  DX     -1.4457581+04  DY      2.0855612+04  DZ     -3.1238328+03
ALT     1.0275895+02  LAT     2.9449658+01  LON     2.9265441+02  V       2.5568272+04  PTH    -2.4778229-03  AZ      9.8051383+01
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ID      914078.1
TRANSLUNAR INJECTION INITIATION
   14  SEPT. 1969    7 HRS,   35 MINS,  12.107 SECS  G.M.T. ****   1. HRS,    44. MINS,  57.037 SECS  G.E.T.
X       1.8435079+03  Y       2.5856113+03  Z       1.5731723+03  DX     -1.8305260+04  DY      1.6771564+04  DZ     -6.1226575+03
ALT     1.0218705+02  LAT     2.6503056+01  LON     3.0760144+02  V       2.5570586+04  PTH    -8.3102348-03  AZ      1.0549425+02
R       3.5438365+03  DEC     2.6354122+01  RA      5.4511613+01  RAS     1.7202630+02  DES     3.4423248+00  RAN    -6.7472222+01
INC     3.0287914+01  MASS    2.8175436+05
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ID      914078.1
TRANSLUNAR INJECTION TERMINATION
   14  SEPT. 1969    7 HRS,   40 MINS,  21.559 SECS  G.M.T. ****   1. HRS,    50. MINS,   6.489 SECS  G.E.T.
X       6.2899698+02  Y       3.3752286+03  Z       1.1099770+03  DX     -3.0371991+04  DY      1.4193820+04  DZ     -1.1994778+04
ALT     1.6546715+02  LAT     1.8023433+01  LON     3.3124053+02  V       3.5606137+04  PTH     6.9245543+00  AZ      1.1332250+02
R       3.6083035+03  DEC     1.7915703+01  RA      7.9443630+01  RAS     1.7202952+02  DES     3.4409494+00  DEM    -1.0553688+01
RAN    -6.5048201+01  INC     2.9101067+01  ECC     9.7499111-01  SMA     1.4215681+05  RP      3.5551835+03  APF     1.2673756+02
INMP    2.9391249+01  C3TLI  -4.8232907-01  DAZTLI-1.6881498+00   MASS    1.3170978+05  FUEL    1.5004458+05
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ID      914078.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   14  SEPT. 1969    9 HRS,   40 MINS,  21.559 SECS  G.M.T. ****   3. HRS,    50. MINS,   6.489 SECS  G.E.T.
X      -1.8166842+04  Y      -4.4833803+03  Z      -1.0221292+04  DX     -9.2504998+03  DY     -8.4171836+03  DZ     -6.6436733+03
ALT     1.7880295+04  LAT    -2.8671487+01  LON     5.5577740+01  V       1.4161890+04  PTH     6.5015100+01  AZ      9.5355503+01
R       2.1321577+04  DEC    -2.8645390+01  RA     -1.6613702+02  RAS     1.7210429+02  DES     3.4089450+00
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ID      914078.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   17  SEPT. 1969    4 HRS,    5 MINS,  18.241 SECS  G.M.T. ****  70. HRS,    15. MINS,   3.169 SECS  G.E.T.
RMP     9.9879799+02  DEMP    6.3068790+00  RAMP    1.7966826+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(b) 78° launch azimuth; first injection opportunity - Continued

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ID      914078.1
LUNAR ORBIT INSERTION BURN INITIATION
   17  SEPT. 1969    4 HRS,    1 MINS,  59.725 SECS  G.M.T. ****  70. HRS,    11. MINS,   44.653 SECS  G.E.T.
XL     -2.7317301+02  YL     -9.0764413+02  ZL     -3.8046964+02  DXL    -7.5547385+03  DYL     3.0606453+03  DZL     1.7573015+03
XS     -1.0024153+03  YS     -1.9531518+02  ZS     -1.4630720+01  DXS    -2.5186903+02  DYS     8.3384338+03  DZS     4.5660910+02
ALTS    8.2877359+01  LATS   -8.2076672-01  LONS   -1.6897437+02  VRS     8.3547236+03  PTR    -9.3259686+00  AZR    -8.6959711+01
LIN     1.7684510+02  LAN     1.7596085+02  LAP    -1.5018906+02  LTS    -5.0834160-02  LNS     1.1051061+02  DEM    -2.4725167+01
THETA   1.4178196+01  BETA   -1.7625667+02  MASS    9.4833024+04
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ID      914078.1
LUNAR ORBIT INSERTION BURN TERMINATION
   17  SEPT. 1969    4 HRS,    8 MINS,  18.139 SECS  G.M.T. ****  70. HRS,    18. MINS,    3.067 SECS  G.E.T.
XL     -6.4539222+02  YL     -7.0734716+02  ZL     -2.7831713+02  DXL    -4.1569322+03  DYL     3.2680717+03  DZL     1.4563218+03
XS     -9.6814031+02  YS      2.3879147+02  ZS      3.8034531+00  DXS     1.3506278+03  DYS     5.3311728+03  DZS     1.1300251+02
ALTS    5.8668203+01  LATS    2.1854262-01  LONS    1.6614456+02  VRS     5.5007606+03  PTR    -3.5649929-01  AZR    -8.8821515+01
LIN     1.7879802+02  LAN     1.7661869+02  LAP     6.5882520+00  SMAS    1.0525968+03  ECCS    5.3032480-02  PERS    2.1454126+00
RPS     9.9677502+02  APOS    1.1084186+03  RANS   -1.7670921+02  INCS    1.5741577+02  LTS    -5.0971020-02  LNS     1.1045713+02
LTE     6.2920613+00  LNE    -4.4657372+00  THETA  -1.0593264+01  BETA   -1.7432123+02  FUEL    2.4057008+04  BARC    2.4844420+01
DELV    2.9616363+03  MASS    7.0776016+04  PLCHNG  1.9530269+00  DRTX   -2.8652975+03  DRTY   -1.8746615+02  DRTZ   -7.2541934+02
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ID      914078.1
CIRCULARIZATION BURN INITIATION
   17  SEPT. 1969    8 HRS,   27 MINS,  56.558 SECS  G.M.T. ****  74. HRS,    37. MINS,   41.488 SECS  G.E.T.
XL     -7.3710386+02  YL     -6.2573258+02  ZL     -2.4219013+02  DXL    -3.6913323+03  DYL     3.7170468+03  DZL     1.6314202+03
XS     -9.1344351+02  YS      3.9387197+02  ZS      6.4418261+00  DXS     2.2024143+03  DYS     5.0416721+03  DZS     1.0922384+02
ALTS    5.8260926+01  LATS    3.7029383-01  LONS    1.5641062+02  VRS     5.5023190+03  PTR    -1.0005883-03  AZR    -8.8862653+01
LIN     1.7880075+02  LAN     1.7439304+02  LAP    -1.7959397+02  LTS    -5.6627691-02  LNS     1.0825524+02  DEM    -2.5356437+01
THETA  -2.5613209-06  BETA    1.7999999+02  MASS    7.0756016+04
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ID      914078.1
CIRCULARIZATION BURN TERMINATION
   17  SEPT. 1969    8 HRS,   28 MINS,  11.622 SECS  G.M.T. ****  74. HRS,    37. MINS,   56.549 SECS  G.E.T.
XL     -7.4607514+02  YL     -6.1657780+02  ZL     -2.3817495+02  DXL    -3.5456043+03  DYL     3.6679273+03  DZL     1.6075458+03
XS     -9.0797046+02  YS      4.1117906+02  ZS      6.7086284+00  DXS     2.2125953+03  DYS     4.8862109+03  DZS     1.0600812+02
ALTS    5.8263017+01  LATS    3.8562977-01  LONS    1.5563636+02  VRS     5.3648739+03  PTR     9.0806988-03  AZR    -8.8867828+01
LIN     1.7880075+02  LAN     1.7439081+02  LAP    -1.9114146+02  SMAS    9.9750004+02  ECCS    7.6211222-04  PERS    1.9791883+00
RPS     9.9673983+02  APOS    9.9826023+02  RANS   -1.7670775+02  INCS    1.5741900+02  LTS    -5.6633202-02  LNS     1.0825311+02
LTE     6.3963475+00  LNE    -4.3547336+00  THETA  -7.7208372-01  BETA    1.7999999+02  FUEL    9.5767383+02  BARC    7.7210510-01
DELV    1.3793308+02  MASS    6.9798342+04  PLCHNG  4.2514905-06  DRTX   -1.3793070+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      914078.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969    2 HRS,   56 MINS,  14.190 SECS  G.M.T. ****  93. HRS,     5. MINS,   59.119 SECS  G.E.T.
XL     -1.7652231+02  YL      9.0531232+02  ZL      3.7981568+02  DXL     5.2588163+03  DYL     9.1973459+02  DZL     2.5559824+02
XS      9.1004880+02  YS      4.0822873+02  ZS      1.3073810+01  DXS     2.1961877+03  DYS    -4.8896249+03  DZS    -8.5956657+01
ALTS    5.9008586+01  LATS    7.5097145-01  LONS    2.4159998+01  VRS     5.3608825+03  PTR     1.5308993-02  AZR    -9.0918960+01
LIN     1.7881110+02  LAN     1.6499359+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(b) 78° launch azimuth; first injection opportunity - Continued

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ID      914078.1
CSM PLANE CHANGE BURN INITIATION
   19  SEPT. 1969   0 HRS,   7 MINS,  18.480 SECS  G.M.T. **** 114. HRS,   17. MINS,   3.407 SECS  G.E.T.
XL     -9.0816093+02  YL     -3.8686202+02  ZL     -1.3853204+02  DXL    -2.2027276+03  DYL     4.4829680+03  DZL     1.9113465+03
XS     -4.4722949+02  YS      8.9075233+02  ZS      1.2473993+01  DXS     4.7931565+03  DYS     2.4068531+03  DZS     8.7307867+01
ALTS    5.8306176+01  LATS    7.1702053-01  LONS    1.1666034+02  VRS     5.3642253+03  PTR     1.4554635-02  AZR    -8.9067533+01
LIN     1.7882157+02  LAN     1.5413260+02  LAP     3.6851776+01  LTS    -1.1056003-01  LNS     8.8088014+01  DEM    -2.8601655+01
THETA  -3.5004719-05  BETA   -9.0000018+01  MASS    3.6444341+04
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ID      914078.1
CSM PLANE CHANGE BURN TERMINATION
   19  SEPT. 1969   0 HRS,   7 MINS,  19.432 SECS  G.M.T. **** 114. HRS,   17. MINS,   4.362 SECS  G.E.T.
XL     -9.0850560+02  YL     -3.8615932+02  ZL     -1.3823388+02  DXL    -2.1990074+03  DYL     4.4911470+03  DZL     1.8964405+03
XS     -4.4647860+02  YS      8.9112907+02  ZS      1.2486345+01  DXS     4.7953331+03  DYS     2.4031244+03  DZS     7.0440149+01
ALTS    5.8306395+01  LATS    7.1773040-01  LONS    1.1661205+02  VRS     5.3642509+03  PTR     1.4572335-02  AZR    -8.9247759+01
LIN     1.7895868+02  LAN     1.6017810+02  LAP     2.7303959+01  SMAS    9.9735358+02  ECCS    6.1095535-04  PERS    1.9787525+00
RPS     9.9674425+02  APOS    9.9796291+02  RANS   -1.7685134+02  INCS    1.5761771+02  LTS    -1.1056044-01  LNS     8.8087875+01
LTE     6.7711876+00  LNE    -3.0168729+00  THETA   1.1952831-04  BETA   -8.9820056+01  FUEL    6.0494141+01  BARC    4.9947969-02
DELV    1.6815158+01  MASS    3.6383848+04  PLCHNG  1.8014335-01  DRTX    0.0000000     DRTY   -1.6815083+01  DRTZ    0.0000000
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ID      914078.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   19  SEPT. 1969   4 HRS,  34 MINS,  20.261 SECS  G.M.T. **** 118. HRS,   44. MINS,   5.189 SECS  G.E.T.
XL     -4.0989222+02  YL      8.3771434+02  ZL      3.5367692+02  DXL     4.8708864+03  DYL     2.0724579+03  DZL     7.4180406+02
XS      9.0998205+02  YS      4.0819868+02  ZS      1.3067562+01  DXS     2.1967182+03  DYS    -4.8901439+03  DZS    -6.6997998+01
ALTS    5.8935304+01  LATS    7.5066769-01  LONS    2.4159993+01  VRS     5.3613027+03  PTR     2.0874587-02  AZR    -9.0716325+01
LIN     1.7896089+02  LAN     1.5790899+02
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ID      914078.1
TRANSEARTH INJECTION BURN INITIATION
   19  SEPT. 1969  21 HRS,  15 MINS,   6.894 SECS  G.M.T. **** 135. HRS,   24. MINS,  51.820 SECS  G.E.T.
XL      7.4640888+02  YL     -6.0535224+02  ZL     -2.6565227+02  DXL    -3.5450327+03  DYL    -3.7300658+03  DZL    -1.4522938+03
XS     -7.7236282+02  YS     -6.3033362+02  ZS     -1.6847861+01  DXS    -3.3895710+03  DYS     4.1559824+03  DZS     3.3128916+01
ALTS    5.8576523+01  LATS   -9.6819403-01  LONS   -1.4078175+02  VRS     5.3630661+03  PTR    -2.3947640-02  AZR    -8.9646532+01
LIN     1.7896891+02  LAN     1.4933757+02  LAP     4.8734225+01  LTS    -1.4081549-01  LNS     7.7350681+01  DEM    -2.8321465+01
THETA  -3.7520662+00  BETA   -1.0501337+00  MASS    3.6793847+04
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ID      914078.1
TRANSEARTH INJECTION BURN TERMINATION
   19  SEPT. 1969  21 HRS,  17 MINS,  23.458 SECS  G.M.T. **** 135. HRS,   27. MINS,   8.387 SECS  G.E.T.
XL      6.4075794+02  YL     -7.0356668+02  ZL     -3.0419040+02  DXL    -5.9314321+03  DYL    -5.0786719+03  DZL    -2.0060748+03
XS     -8.5965667+02  YS     -5.0875648+02  ZS     -1.6303998+01  DXS    -4.4396882+03  DYS     6.7489678+03  DZS     1.3837694+01
ALTS    6.0560320+01  LATS   -9.3507653-01  LONS   -1.4938238+02  VRS     8.0783407+03  PTR     2.7186131+00  AZR    -8.9857345+01
LIN     1.7905409+02  LAN     1.2931087+02  LAP    -1.8205497+02  SMAS   -3.5821287+03  ECCS    1.2783381+00  PERS    1.3468819+01
RPS     9.9704288+02  APOS   -8.1613003+03  RANS   -1.7752633+02  INCS    1.5739431+02  LTS    -1.4087067-01  LNS     7.7331410+01
LTE     6.5173909+00  LNE    -2.0962669+00  THETA   4.8257855+00  BETA   -6.9692832-01  FUEL    8.6817812+03  BARC    8.5786891+00
DELV    2.7241318+03  MASS    2.8112067+04  PLCHNG  3.5347850-01  DRTX    2.7178291+03  DRTY   -4.9816550+01  DRTZ    1.7826433+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(b) 78° launch azimuth; first injection opportunity - Concluded

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ID      914078.1
ENTRY AND TOUCHDOWN
   23  SEPT. 1969  18 HRS,  13 MINS,  38.539 SECS  G.M.T. **** 228. HRS,   23. MINS,  23.462 SECS  G.E.T.
X       6.5887822+02  Y       2.9814997+03  Z       1.7247112+03  DX     -3.5750893+04  DY      4.2356473+03  DZ     -1.8347148+03
R       3.5068632+03  DEC     2.9459631+01  RA      7.7538549+01  V       3.6047652+04  PTH    -6.4000009+00  AZ      8.9739989+01
ALT     6.5732569+01  LAT     2.9621588+01  LON     1.6171079+02  VE      3.4703518+04  PTE    -6.6481926+00  AZE     8.9711115+01
SMA     1.0624819+05  ECC     9.6741068-01  INC     2.9460675+01  RAN    -1.1933047+01  APF     1.0255647+02  RP      3.4625557+03
INMP    5.0316586+00  RAM    -2.4525712+01  DEM    -1.1978584+01  RAS    -1.7950158+02  DES    -2.1612689-01  SPSFR   3.7453977+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.4487969+01  LONTD   1.9500048+02  AZTD    1.0701956+02
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ID      914078.1
CIRCUMLUNAR PERICYNTHION
   17  SEPT. 1969   4 HRS,   5 MINS,  19.599 SECS  G.M.T. ****  70. HRS,   15. MINS,   4.528 SECS  G.E.T.
XL     -5.1635396+02  YL     -7.9392118+02  ZL     -3.1727447+02  DXL    -7.1892712+03  DYL     3.8450336+03  DZL     2.0788640+03
XS     -9.9554675+02  YS      8.0508747+01  ZS      5.3212907-01  DXS     6.7873389+02  DYS     8.3897656+03  DZS     4.6303400+02
ALTS    6.0303406+01  LATS    3.0525476-02  LONS    1.7537661+02  VRS     8.4299018+03  PTR    -1.0493365-04  AZR    -8.6851280+01
LIN     1.7684511+02  LAN     1.7593043+02  LAP     1.7993087+02  LTS    -5.0906478-02  LNS     1.1048237+02  DEM    -2.4733364+01
SMAS   -2.0750034+03  ECCS    1.4813471+00  INCS    1.5626955+02  RANS   -1.7268631+02  APFS   -5.2123511+01  RPS     9.9879695+02
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ID      914078.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   19  SEPT. 1969  21 HRS,  22 MINS,  47.664 SECS  G.M.T. **** 135. HRS,   32. MINS,  32.593 SECS  G.E.T.
X       2.7719945+03  Y       2.0778443+03  Z       5.6124172+02  DX     -2.1906137+04  DY      1.5383984+04  DZ      2.4268518+04
R       3.5094704+03  DEC     9.2023720+00  RA      3.6854659+01  V       3.6131796+04  PTH    -6.8562609+00  AZ      4.5186264+01
ALT     6.5833563+01  LAT     9.2621606+00  LON     7.7551845+01  VE      3.5067616+04  PTE    -7.0219304+00  AZE     4.3399791+01
SMA     1.5706944+05  ECC     9.7797857-01  INC     4.5551202+01  RAN     2.7710467+01  APF     2.6812880+01  RP      3.4588932+03
INMP    2.4108481+01  RAM    -8.1848581+01  DEM    -2.8315272+01  RAS     1.7702653+02  DES     1.2884859+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.1109810+01  LONTD   1.0080346+02  AZTD    5.4802752+01
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(c) 84° launch azimuth; first injection opportunity

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ID      914084.1
LAUNCH TIME      14  SEPT. 1969     6 HRS,   58 MINS,  54.570 SECS   G.M.T.
LAUNCH AZIMUTH   84.                          INJECTION OPPORTUNITY    1
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ID      914084.1
EARTH PARKING ORBIT INSERTION
   14  SEPT. 1969    7 HRS,  10 MINS,  11.600 SECS  G.M.T. ****   0. HRS,   11. MINS,  17.030 SECS  G.E.T.
X       2.1811497+03  Y       2.2509500+03  Z       1.6538664+03  DX     -1.7016323+04  DY      1.8817689+04  DZ     -3.1698617+03
ALT     1.0252380+02  LAT     2.7973203+01  LON     3.0526131+02  V       2.5567727+04  PTH    -5.6587348-07  AZ      9.8058252+01
R       3.5439334+03  DEC     2.7818703+01  RA      4.5902264+01  RAS     1.7201071+02  DES     3.4489938+00  RAN    -6.0974225+01
INC     2.8872556+01  MASS    2.8445841+05
*****************************************************************************************************************

ID      914084.1
3.5 MINS PRIOR TO TLI INITIATION
   14  SEPT. 1969    8 HRS,  36 MINS,  44.670 SECS  G.M.T. ****   1. HRS,   37. MINS,  50.100 SECS  G.E.T.
X       2.4225967+03  Y       1.9585443+03  Z       1.6895227+03  DX     -1.5185762+04  DY      2.0475597+04  DZ     -1.9574608+03
ALT     1.0261864+02  LAT     2.8629468+01  LON     2.7661576+02  V       2.5567344+04  PTH     3.9289352-03  AZ      9.4998681+01
*****************************************************************************************************************

ID      914084.1
TRANSLUNAR INJECTION INITIATION
   14  SEPT. 1969    8 HRS,  40 MINS,  14.670 SECS  G.M.T. ****   1. HRS,   41. MINS,  20.100 SECS  G.E.T.
X       1.8282645+03  Y       2.5983442+03  Z       1.5701698+03  DX     -1.9028711+04  DY      1.6356024+04  DZ     -4.9134243+03
ALT     1.0226264+02  LAT     2.6448000+01  LON     2.9165337+02  V       2.5568595+04  PTH    -3.6981063-03  AZ      1.0237574+02
R       3.5439210+03  DEC     2.6299286+01  RA      5.4868753+01  RAS     1.7206683+02  DES     3.4249788+00  RAN    -6.1477636+01
INC     2.8876784+01  MASS    2.8236419+05
*****************************************************************************************************************

ID      914084.1
TRANSLUNAR INJECTION TERMINATION
   14  SEPT. 1969    8 HRS,  45 MINS,  24.702 SECS  G.M.T. ****   1. HRS,   46. MINS,  30.132 SECS  G.E.T.
X       5.7045102+02  Y       3.3628047+03  Z       1.1762734+03  DX     -3.1241363+04  DY      1.3532457+04  DZ     -1.0432639+04
ALT     1.6527434+02  LAT     1.9140838+01  LON     3.1586154+02  V       3.5608849+04  PTH     6.8905757+00  AZ      1.1072247+02
R       3.6079756+03  DEC     1.9027402+01  RA      8.0372252+01  RAS     1.7207005+02  DES     3.4236007+00  DEM    -1.0820921+01
RAN    -5.8874118+01  INC     2.7846419+01  ECC     9.7510689-01  SMA     1.4282591+05  RP      3.5553826+03  APF     1.2177832+02
INMP    2.6199050+01  C3TLI  -4.8006977-01  DAZTLI-1.6095239+00   MASS    1.3203862+05  FUEL    1.5032557+05
*****************************************************************************************************************

ID      914084.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   14  SEPT. 1969   10 HRS,  45 MINS,  24.702 SECS  G.M.T. ****   3. HRS,   46. MINS,  30.132 SECS  G.E.T.
X      -1.8405875+04  Y      -4.7993352+03  Z      -9.6357831+03  DX     -9.2408169+03  DY     -8.5368416+03  DZ     -6.5098328+03
ALT     1.7881137+04  LAT    -2.6890799+01  LON     4.0021622+01  V       1.4165037+04  PTH     6.5020336+01  AZ      9.7617941+01
R       2.1322715+04  DEC    -2.6865796+01  RA     -1.6538552+02  RAS     1.7214483+02  DES     3.3915925+00
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ID      914084.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   17  SEPT. 1969    4 HRS,  52 MINS,   7.272 SECS  G.M.T. ****  69. HRS,   53. MINS,  12.699 SECS  G.E.T.
RMP     9.9910311+02  DEMP    6.3312607+00  RAMP    1.7990781+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(c) 84° launch azimuth; first injection opportunity - Continued

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ID      914084.1
LUNAR ORBIT INSERTION BURN INITIATION
   17  SEPT. 1969   4 HRS,  48 MINS,  48.885 SECS  G.M.T. ****  69. HRS,   49. MINS,  54.313 SECS  G.E.T.
XL     -2.6142695+02  YL     -9.1176886+02  ZL     -3.7847711+02  DXL    -7.6060044+03  DYL     3.0093308+03  DZL     1.6214552+03
XS     -1.0014507+03  YS     -1.9970630+02  ZS     -1.1193836+01  DXS    -3.0042745+02  DYS     8.3424179+03  DZS     3.4956110+02
ALTS    8.2736810+01  LATS   -6.2803895-01  LONS   -1.6872218+02  VRS     8.3551411+03  PTR    -9.2332868+00  AZR    -8.7672714+01
LIN     1.7758500+02  LAN     1.7621283+02  LAP    -1.6336375+02  LTS    -5.1850718-02  LNS     1.1011354+02  DEM    -2.4839725+01
THETA   1.3905433+01  BETA   -1.7767504+02  MASS    9.4833024+04
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ID      914084.1
LUNAR ORBIT INSERTION BURN TERMINATION
   17  SEPT. 1969   4 HRS,  55 MINS,   6.793 SECS  G.M.T. ****  69. HRS,   56. MINS,  12.223 SECS  G.E.T.
XL     -6.3607129+02  YL     -7.1482527+02  ZL     -2.8149137+02  DXL    -4.1981929+03  DYL     3.2209646+03  DZL     1.4375823+03
XS     -9.6953180+02  YS      2.3408047+02  ZS      3.6904976+00  DXS     1.3265826+03  DYS     5.3357841+03  DZS     1.1304785+02
ALTS    5.8902691+01  LATS    2.1200243-01  LONS    1.6642646+02  VRS     5.4993811+03  PTR    -3.8382237-01  AZR    -8.8820685+01
LIN     1.7879838+02  LAN     1.7658674+02  LAP     8.4621733+00  SMAS    1.0525294+03  ECCS    5.2809535-02  PERS    2.1452064+00
RPS     9.9694581+02  APOS    1.1081129+03  RANS   -1.7669775+02  INCS    1.5742279+02  LTS    -5.1987537-02  LNS     1.1006014+02
LTE     6.3117062+00  LNE    -4.4462878+00  THETA  -1.0874014+01  BETA   -1.7646673+02  FUEL    2.4024869+04  BARC    2.4807571+01
DELV    2.9570413+03  MASS    7.0808154+04  PLCHNG  1.2133890+00  DRTX   -2.8680191+03  DRTY   -1.1644262+02  DRTZ   -7.1063661+02
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ID      914084.1
CIRCULARIZATION BURN INITIATION
   17  SEPT. 1969   9 HRS,  14 MINS,  51.637 SECS  G.M.T. ****  74. HRS,   15. MINS,  57.064 SECS  G.E.T.
XL     -7.3367577+02  YL     -6.2944850+02  ZL     -2.4366689+02  DXL    -3.7113789+03  DYL     3.6987288+03  DZL     1.6240207+03
XS     -9.1271494+02  YS      4.0095960+02  ZS      6.4735346+00  DXS     2.2139072+03  DYS     5.0354933+03  DZS     1.0910688+02
ALTS    5.8431291+01  LATS    3.7205295-01  LONS    1.5628391+02  VRS     5.5017708+03  PTR    -9.7207792-03  AZR    -8.8863622+01
LIN     1.7880109+02  LAN     1.7436023+02  LAP    -1.7936486+02  LTS    -5.7654558-02  LNS     1.0785738+02  DEM    -2.5462824+01
THETA  -7.6839627-06  BETA   -1.7999300+02  MASS    7.0788155+04
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ID      914084.1
CIRCULARIZATION BURN TERMINATION
   17  SEPT. 1969   9 HRS,  15 MINS,   6.693 SECS  G.M.T. ****  74. HRS,   16. MINS,  12.122 SECS  G.E.T.
XL     -7.4269173+02  YL     -6.2034306+02  ZL     -2.3967180+02  DXL    -3.5655046+03  DYL     3.6503783+03  DZL     1.6004583+03
XS     -9.0721676+02  YS      4.1324493+02  ZS      6.7399102+00  DXS     2.2237426+03  DYS     4.8801614+03  DZS     1.0589443+02
ALTS    5.8431291+01  LATS    3.8736258-01  LONS    1.5551033+02  VRS     5.3639742+03  PTR    -9.1984803-06  AZR    -8.8868780+01
LIN     1.7880113+02  LAN     1.7435801+02  LAP    -1.7900050+02  SMAS    9.9749999+02  ECCS    5.7659664-04  PERS    1.9791881+00
RPS     9.9692483+02  APOS    9.9807513+02  RANS   -1.7669635+02  INCS    1.5742603+02  LTS    -5.7660124-02  LNS     1.0785525+02
LTE     6.4139205+00  LNE    -4.3339130+00  THETA  -7.7137168-01  BETA   -1.7999999+02  FUEL    9.5716015+02  BARC    7.7147119-01
DELV    1.3779590+02  MASS    6.9830994+04  PLCHNG  4.2171956-06  DRTX   -1.3779361+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      914084.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   3 HRS,  43 MINS,   6.610 SECS  G.M.T. ****  92. HRS,   44. MINS,  12.038 SECS  G.E.T.
XL     -1.8382423+02  YL      9.0384647+02  ZL      3.7926123+02  DXL     5.2528008+03  DYL     9.5609138+02  DZL     2.7030497+02
XS      9.0984686+02  YS      4.0813790+02  ZS      1.3075837+01  DXS     2.1963564+03  DYS    -4.8908485+03  DZS    -8.5914665+01
ALTS    5.8787198+01  LATS    7.5125463-01  LONS    2.4159986+01  VRS     5.3620669+03  PTR     1.1613491-02  AZR    -9.0918294+01
LIN     1.7881145+02  LAN     1.6496158+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(c) 84° launch azimuth; first injection opportunity - Continued

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ID      914084.1
CSM PLANE CHANGE BURN INITIATION
   19  SEPT. 1969    0 HRS,   54 MINS,   11.255 SECS  G.M.T. **** 113. HRS,    55. MINS,   16.683 SECS  G.E.T.
XL     -9.0517211+02  YL     -3.9319872+02  ZL     -1.4110801+02  DXL    -2.2379117+03  DYL     4.4573523+03  DZL     1.9052087+03
XS     -4.4728356+02  YS      8.9086121+02  ZS      1.2462594+01  DXS     4.7930513+03  DYS     2.4055187+03  DZS     8.7293353+01
ALTS    5.8427596+01  LATS    7.1627799-01  LONS    1.1666031+02  VRS     5.3635774+03  PTR     3.2875115-03  AZR    -8.9067402+01
LIN     1.7882183+02  LAN     1.5410098+02  LAP     2.0493899+01  LTS    -1.1166045-01  LNS     8.7690867+01  DEM    -2.8617432+01
THETA  -1.7929246-05  BETA   -9.0000049+01  MASS    3.6476994+04
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ID      914084.1
CSM PLANE CHANGE BURN TERMINATION
   19  SEPT. 1969    0 HRS,   54 MINS,   12.207 SECS  G.M.T. **** 113. HRS,    55. MINS,   17.634 SECS  G.E.T.
XL     -9.0552250+02  YL     -3.9249604+02  ZL     -1.4081062+02  DXL    -2.2342051+03  DYL     4.4755565+03  DZL     1.8903180+03
XS     -4.4653260+02  YS      8.9123777+02  ZS      1.2474951+01  DXS     4.7952280+03  DYS     2.4018898+03  DZS     7.0430399+01
ALTS    5.8427621+01  LATS    7.1698820-01  LONS    1.1661202+02  VRS     5.3636038+03  PTR     3.2991765-03  AZR    -8.9247598+01
LIN     1.7895908+02  LAN     1.5014359+02  LAP     8.0069639+00  SMAS    9.9735399+02  ECCS    4.3781776-04  PERS    1.9787537+00
RPS     9.9691734+02  APOS    9.9779064+02  RANS   -1.7684376+02  INCS    1.5762429+02  LTS    -1.1166084-01  LNS     8.7690743+01
LTE     6.7675429+00  LNE    -2.9851647+00  THETA  -1.7929246-05  BETA   -8.9819936+01  FUEL    5.0531250+01  BARC    4.8456647-02
DELV    1.6810331+01  MASS    3.6416463+04  PLCHNG  1.8011469-01  DRTX    0.0000000     DRTY   -1.6810223+01  DRTZ    0.0000000
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ID      914084.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   19  SEPT. 1969    5 HRS,   21 MINS,   12.877 SECS  G.M.T. **** 118. HRS,    22. MINS,   18.306 SECS  G.E.T.
XL     -4.1660463+02  YL      8.3466819+02  ZL      3.5248153+02  DXL     4.8555138+03  DYL     2.1060432+03  DZL     7.5544494+02
XS      9.0980344+02  YS      4.0811829+02  ZS      1.3067235+01  DXS     2.1965513+03  DYS    -4.8913687+03  DZS    -6.6950738+01
ALTS    5.8739460+01  LATS    7.5079632-01  LONS    2.4159979+01  VRS     5.3623509+03  PTR     1.3908907-02  AZR    -9.0715608+01
LIN     1.7896131+02  LAN     1.5787461+02
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ID      914084.1
TRANSEARTH INJECTION BURN INITIATION
   19  SEPT. 1969   22 HRS,    2 MINS,   14.556 SECS  G.M.T. **** 135. HRS,     3. MINS,   19.986 SECS  G.E.T.
XL      7.4226656+02  YL     -5.0987710+02  ZL     -2.6736756+02  DXL    -3.5592973+03  DYL    -3.7096623+03  DZL    -1.4426897+03
XS     -7.8115579+02  YS     -5.1960459+02  ZS     -1.6759750+01  DXS    -3.3318366+03  DYS     4.2015704+03  DZS     3.4290726+01
ALTS    5.8700097+01  LATS   -9.6301075-01  LONS   -1.4157891+02  VRS     5.3624160+03  PTR    -1.2895437-02  AZR    -8.9633755+01
LIN     1.7896931+02  LAN     1.4930166+02  LAP     4.2363297+01  LTS    -1.4195958-01  LNS     7.6951660+01  DEM    -2.8282621+01
THETA  -3.6114411+00  BETA   -1.0922634+00  MASS    3.5826463+04
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ID      914084.1
TRANSEARTH INJECTION BURN TERMINATION
   19  SEPT. 1969   22 HRS,    4 MINS,   31.361 SECS  G.M.T. **** 135. HRS,     5. MINS,   36.736 SECS  G.E.T.
XL      6.3580681+02  YL     -7.0770302+02  ZL     -3.0573437+02  DXL    -5.9628419+03  DYL    -5.0490362+03  DZL    -1.9944439+03
XS     -8.6697534+02  YS     -4.9664634+02  ZS     -1.6206098+01  DXS    -4.3519951+03  DYS     6.8078319+03  DZS     1.3386736+01
ALTS    6.0789894+01  LATS   -9.2924768-01  LONS   -1.5019380+02  VRS     8.0800132+03  PTR     2.7811651+00  AZR    -8.9859767+01
LIN     1.7906019+02  LAN     1.2840355+02  LAP    -1.8380877+02  SMAS   -3.5641931+03  ECCS    1.2797771+00  PERS    1.3367789+01
RPS     9.9717943+02  APOS   -8.1255656+03  RANS   -1.7755127+02  INCS    1.5739285+02  LTS    -1.4201503-01  LNS     7.6932359+01
LTE     6.5017953+00  LNE    -2.0598390+00  THETA   4.9804381+00  BETA   -7.2483261-01  FUEL    8.6971020+03  BARC    8.5929257+00
DELV    2.7268746+03  MASS    2.8129361+04  PLCHNG  3.6801206-01  DRTX    2.7209575+03  DRTY   -5.1877506+01  DRTZ    1.7176487+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(c) 84° launch azimuth; first injection opportunity - Concluded

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ID      914084.1
ENTRY AND TOUCHDOWN
   23  SEPT. 1969  18 HRS,  15 MINS,  17.846 SECS  G.M.T. **** 227. HRS,   16. MINS,  23.270 SECS  G.E.T.
X       6.3669460+02  Y       2.9861780+03  Z       1.7252494+03  DX     -3.5776231+04  DY      3.9937437+03  DZ     -1.8775927+03
R       3.5070107+03  DEC     2.9468371+01  RA      7.7963970+01  V       3.6047385+04  PTH    -6.4000346+00  AZ      8.9818016+01
ALT     6.5881599+01  LAT     2.9630351+01  LON     1.6172130+02  VE      3.4703302+04  PTE    -6.6484483+00  AZE     8.9791930+01
SMA     1.0642577+05  ECC     9.6746369-01  INC     2.9468883+01  RAN    -1.1665861+01  APF     1.0269397+02  RP      3.4627022+03
INMP    4.9058536+00  RAM    -2.4510501+01  DEM    -1.1971248+01  RAS    -1.7950054+02  DES    -2.1657453-01  SPSFR   3.7625866+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.4454074+01  LONTD   1.9499964+02  AZTD    1.0708468+02
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ID      914084.1
CIRCUMLUNAR PERICYNTHION
   17  SEPT. 1969   4 HRS,  52 MINS,   6.798 SECS  G.M.T. ****  69. HRS,   53. MINS,  12.225 SECS  G.E.T.
XL     -5.0412062+02  YL     -8.0088878+02  ZL     -3.2038466+02  DXL    -7.2552894+03  DYL     3.7907052+03  DZL     1.9402366+03
XS     -9.9638803+02  YS      7.3604053+01  ZS      2.9970709-01  DXS     6.2052370+02  DYS     8.3984744+03  DZS     3.5447551+02
ALTS    6.0609458+01  LATS    1.7187369-02  LONS    1.7577518+02  VRS     8.4288238+03  PTR    -9.7847808-05  AZR    -8.7589685+01
LIN     1.7758501+02  LAN     1.7618272+02  LAP    -1.7994719+02  LTS    -5.1922348-02  LNS     1.1008557+02  DEM    -2.4847739+01
SMAS   -2.0751412+03  ECCS    1.4814626+00  INCS    1.5673427+02  RANS   -1.7413193+02  APFS   -5.4275637+01  RPS     9.9910297+02
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ID      914084.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   19  SEPT. 1969  22 HRS,  24 MINS,  17.852 SECS  G.M.T. **** 135. HRS,   25. MINS,  23.275 SECS  G.E.T.
X       2.7303176+03  Y       2.1441840+03  Z       5.1434112+02  DX     -2.1363562+04  DY      1.3928899+04  DZ      2.5592128+04
R       3.5095164+03  DEC     8.4274010+00  RA      3.8143397+01  V       3.6129947+04  PTH    -6.9304582+00  AZ      4.2324196+01
ALT     6.5832075+01  LAT     8.4823091+00  LON     6.3422704+01  VE      3.5120448+04  PTE    -7.0889051+00  AZE     4.0449623+01
SMA     1.5583985+05  ECC     9.7781159-01  INC     4.8236722+01  RAN     3.0541117+01  APF     2.5350258+01  RP      3.4578384+03
INMP    2.7491599+01  RAM    -8.1162078+01  DEM    -2.8263743+01  RAS     1.7706484+02  DES     1.2719047+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.1672186+01  LONTD   8.5362172+01  AZTD    5.1433916+01
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(d) 90° launch azimuth; first injection opportunity

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ID      914090.1
LAUNCH TIME      14  SEPT. 1969     7 HRS,   57 MINS,  11.620 SECS   G.M.T.
LAUNCH AZIMUTH   90.                                INJECTION OPPORTUNITY    1
*****************************************************************************************************************

ID      914090.1
EARTH PARKING ORBIT INSERTION
   14  SEPT. 1969    8 HRS,    8 MINS,  28.262 SECS  G.M.T. ****   0. HRS,   11. MINS,  16.641 SECS  G.E.T.
X       1.5983938+03  Y       2.7698969+03  Z       1.5271779+03  DX     -2.0330734+04  DY      1.4603159+04  DZ     -5.2074657+03
ALT     1.0215226+02  LAT     2.5672035+01  LON     3.0476225+02  V       2.5567727+04  PTH    -2.8293674-07  AZ      1.0304435+02
R       3.5439334+03  DEC     2.5526427+01  RA      6.0012518+01  RAS     1.7204703+02  DES     3.4334529+00  RAN    -5.8251721+01
INC     2.8465879+01  MASS    2.8467194+05
*****************************************************************************************************************

ID      914090.1
3.5 MINS PRIOR TO TLI INITIATION
   14  SEPT. 1969    9 HRS,   31 MINS,  58.040 SECS  G.M.T. ****   1. HRS,   34. MINS,  46.419 SECS  G.E.T.
X       2.4133562+03  Y       1.9814030+03  Z       1.6758034+03  DX     -1.5557574+04  DY      2.0232790+04  DZ     -1.5059617+03
ALT     1.0246412+02  LAT     2.8377526+01  LON     2.6320504+02  V       2.5567006+04  PTH     1.2424997-02  AZ      9.3839717+01
*****************************************************************************************************************

ID      914090.1
TRANSLUNAR INJECTION INITIATION
   14  SEPT. 1969    9 HRS,   35 MINS,  28.040 SECS  G.M.T. ****   1. HRS,   38. MINS,  16.419 SECS  G.E.T.
X       1.8065872+03  Y       2.6121859+03  Z       1.5723152+03  DX     -1.9372763+04  DY      1.6079833+04  DZ     -4.4515673+03
ALT     1.0227896+02  LAT     2.6486769+01  LON     2.7827339+02  V       2.5567194+04  PTH     3.5795097-03  AZ      1.0120447+02
R       3.5439311+03  DEC     2.6337902+01  RA      5.5332274+01  RAS     1.7210124+02  DES     3.4102500+00  RAN    -5.8727463+01
INC     2.8464609+01  MASS    2.8264214+05
*****************************************************************************************************************

ID      914090.1
TRANSLUNAR INJECTION TERMINATION
   14  SEPT. 1969    9 HRS,   40 MINS,  38.385 SECS  G.M.T. ****   1. HRS,   43. MINS,  26.765 SECS  G.E.T.
X       5.2886466+02  Y       3.3596303+03  Z       1.2047850+03  DX     -3.1620550+04  DY      1.3094624+04  DZ     -9.8314288+03
ALT     1.6545006+02  LAT     1.9622225+01  LON     3.0269852+02  V       3.5608782+04  PTH     6.8955965+00  AZ      1.0974789+02
R       3.6080910+03  DEC     1.9506393+01  RA      8.1054051+01  RAS     1.7210446+02  DES     3.4088703+00  DEM    -1.1047213+01
RAN    -5.6019133+01  INC     2.7480460+01  ECC     9.7516233-01  SMA     1.4314627+05  RP      3.5554201+03  APF     1.1967805+02
INMP    2.4835940+01  C3TLI  -4.7899532-01  DAZTLI-1.6067396+00   MASS    1.3216458+05  FUEL    1.5047757+05
*****************************************************************************************************************

ID      914090.1
SPACECRAFT SEPARATION              INJECTION + 2HR
   14  SEPT. 1969   11 HRS,   40 MINS,  38.385 SECS  G.M.T. ****   3. HRS,   43. MINS,  26.765 SECS  G.E.T.
X      -1.8460831+04  Y      -5.0145233+03  Z      -9.4222207+03  DX     -9.1879144+03  DY     -8.6253944+03  DZ     -6.4703839+03
ALT     1.7882624+04  LAT    -2.6246790+01  LON     2.6758946+01  V       1.4166194+04  PTH     6.5023728+01  AZ      9.8534724+01
R       2.1324304+04  DEC    -2.6222207+01  RA     -1.6480339+02  RAS     1.7217924+02  DES     3.3768589+00
*****************************************************************************************************************

ID      914090.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   17  SEPT. 1969    5 HRS,   37 MINS,  32.722 SECS  G.M.T. ****  69. HRS,   40. MINS,  21.102 SECS  G.E.T.
RMP     9.9880556+02  DEMP    6.3676503+00  RAMP   -1.7921899+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(d) 90° launch azimuth; first injection opportunity - Continued

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ID      914090.1
LUNAR ORBIT INSERTION BURN INITIATION
   17  SEPT. 1969   5 HRS,  34 MINS,  14.572 SECS  G.M.T. ****  69. HRS,   37. MINS,   2.950 SECS  G.E.T.
XL     -2.3999791+02  YL     -9.1883419+02  ZL     -3.7984327+02  DXL    -7.6547175+03  DYL     2.9211972+03  DZL     1.5280770+03
XS     -9.9995026+02  YS     -2.1480411+02  ZS     -9.7353710+00  DXS    -3.6640970+02  DYS     8.3374676+03  DZS     2.9567697+02
ALTS    8.4314433+01  LATS   -5.4536543-01  LONS   -1.6787626+02  VRS     8.3507512+03  PTR    -9.6204229+00  AZR    -8.8034341+01
LIN     1.7795631+02  LAN     1.7665288+02  LAP    -1.2143109+02  LTS    -5.2838385-02  LNS     1.0972829+02  DEM    -2.4949491+01
THETA   1.5097945+01  BETA   -1.7837559+02  MASS    9.4833024+04
*****************************************************************************************************************

ID      914090.1
LUNAR ORBIT INSERTION BURN TERMINATION
   17  SEPT. 1969   5 HRS,  40 MINS,  32.136 SECS  G.M.T. ****  69. HRS,   43. MINS,  20.515 SECS  G.E.T.
XL     -6.1840103+02  YL     -7.2773071+02  ZL     -2.8710946+02  DXL    -4.2803293+03  DYL     3.1293650+03  DZL     1.4013888+03
XS     -9.7284780+02  YS      2.1908771+02  ZS      3.3721586+00  DXS     1.2405658+03  DYS     5.3575455+03  DZS     1.1338055+02
ALTS    5.8724423+01  LATS    1.9374985-01  LONS    1.6730858+02  VRS     5.5004683+03  PTR    -3.4185446-01  AZR    -8.8817723+01
LIN     1.7879850+02  LAN     1.7658718+02  LAP     7.2055595+00  SMAS    1.0525970+03  ECCS    5.2950138-02  PERS    2.1454132+00
RPS     9.9686190+02  APOS    1.1083321+03  RANS   -1.7668542+02  INCS    1.5743009+02  LTS    -5.2975314-02  LNS     1.0967492+02
LTE     6.3304092+00  LNE    -4.4271857+00  THETA  -9.6567749+00  BETA   -1.7755486+02  FUEL    2.4002918+04  BARC    2.4768318+01
DELV    2.9539038+03  MASS    7.0830106+04  PLCHNG  8.4216806-01  DRTX   -2.8507935+03  DRTY   -8.0844907+01  DRTZ   -7.6940265+02
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ID      914090.1
CIRCULARIZATION BURN INITIATION
   17  SEPT. 1969  10 HRS,   0 MINS,   4.872 SECS  G.M.T. ****  74. HRS,    2. MINS,  53.251 SECS  G.E.T.
XL     -7.0963464+02  YL     -6.5251209+02  ZL     -2.5365748+02  DXL    -3.8509597+03  DYL     3.5756315+03  DZL     1.5760320+03
XS     -9.2338435+02  YS      3.7552857+02  ZS      5.9219847+00  DXS     2.0731982+03  DYS     5.0956611+03  DZS     1.1005234+02
ALTS    5.8349220+01  LATS    3.4038140-01  LONS    1.5786905+02  VRS     5.5023653+03  PTR    -1.4697982-03  AZR    -8.8853954+01
LIN     1.7880125+02  LAN     1.7436253+02  LAP     1.7882974+02  LTS    -5.8645780-02  LNS     1.0747391+02  DEM    -2.5563924+01
THETA  -2.5613209-06  BETA    1.7959999+02  MASS    7.0810106+04
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ID      914090.1
CIRCULARIZATION BURN TERMINATION
   17  SEPT. 1969  10 HRS,   0 MINS,  19.949 SECS  G.M.T. ****  74. HRS,    3. MINS,   8.326 SECS  G.E.T.
XL     -7.1900743+02  YL     -6.4369322+02  ZL     -2.4977339+02  DXL    -3.7031106+03  DYL     3.5320015+03  DZL     1.5543763+03
XS     -9.1822210+02  YS      3.8798095+02  ZS      6.1911026+00  DXS     2.0873750+03  DYS     4.9404722+03  DZS     1.0685194+02
ALTS    5.8351196+01  LATS    3.5584914-01  LONS    1.5709424+02  VRS     5.3644028+03  PTR     8.5370611-03  AZR    -8.8858724+01
LIN     1.7880128+02  LAN     1.7436030+02  LAP     1.6135863+02  SMAS    9.9750011+02  ECCS    6.7381106-04  PERS    1.9791885+00
RPS     9.9682800+02  APOS    9.9817222+02  RANS   -1.7668409+02  INCS    1.5743332+02  LTS    -5.8651289-02  LNS     1.0747178+02
LTE     6.4304911+00  LNE    -4.3136204+00  THETA  -7.7285895-01  BETA   -1.7999300+02  FUEL    9.5853125+02  BARC    7.7270682-01
DELV    1.3795140+02  MASS    6.9851574+04  PLCHNG  4.0862010-06  DRTX   -1.3794913+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      914090.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   4 HRS,  28 MINS,  50.996 SECS  G.M.T. ****  92. HRS,   31. MINS,  39.375 SECS  G.E.T.
XL     -1.9100990+02  YL      9.0271580+02  ZL      3.7883990+02  DXL     5.2445769+03  DYL     9.9139164+02  DZL     2.8458127+02
XS      9.0999848+02  YS      4.0820584+02  ZS      1.3076504+01  DXS     2.1959005+03  DYS    -4.8900659+03  DZS    -8.5886238+01
ALTS    5.8953355+01  LATS    7.5116782-01  LONS    2.4159984+01  VRS     5.3611659+03  PTR     1.0602100-02  AZR    -9.0918109+01
LIN     1.7881163+02  LAN     1.6495987+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(d) 90° launch azimuth; first injection opportunity - Continued

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ID      914090.1
CSM PLANE CHANGE BURN INITIATION
   19  SEPT. 1969    1 HRS,   39 MINS,   54.660 SECS  G.M.T. **** 113. HRS,    42. MINS,   43.038 SECS  G.E.T.
XL     -9.0207030+02  YL     -3.9929890+02  ZL     -1.4358144+02  DXL    -2.2741959+03  DYL     4.4517919+03  DZL     1.8991143+03
XS     -4.4726873+02  YS      8.9083191+02  ZS      1.2459913+01  DXS     4.7927900+03  DYS     2.4065021+03  DZS     8.7294236+01
ALTS    5.8394675+01  LATS    7.1614753-01  LONS    1.1666030+02  VRS     5.3637402+03  PTR     1.2981021-02  AZR    -8.9067560+01
LIN     1.7882209+02  LAN     1.5410009+02  LAP    -7.4775022+00  LTS    -1.1273502-01  LNS     8.7303533+01  DEM    -2.8630911+01
THETA  -3.3297171-05  BETA   -9.0000056+01  MASS    3.6497574+04
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ID      914090.1
CSM PLANE CHANGE BURN TERMINATION
   19  SEPT. 1969    1 HRS,   39 MINS,   55.611 SECS  G.M.T. **** 113. HRS,    42. MINS,   43.989 SECS  G.E.T.
XL     -9.0242619+02  YL     -3.9860103+02  ZL     -1.4328517+02  DXL    -2.2705057+03  DYL     4.4600137+03  DZL     1.8842506+03
XS     -4.4651783+02  YS      8.9120857+02  ZS      1.2472266+01  DXS     4.7949664+03  DYS     2.4027731+03  DZS     7.0449579+01
ALTS    5.8394868+01  LATS    7.1585746-01  LONS    1.1661202+02  VRS     5.3637658+03  PTR     1.2994366-02  AZR    -8.9247532+01
LIN     1.7895913+02  LAN     1.6013606+02  LAP    -1.6384374+01  SMAS    9.9734909+02  ECCS    5.1489923-04  PERS    1.9787391+00
RPS     9.9683557+02  APOS    9.9786261+02  RANS   -1.7683511+02  INCS    1.5763099+02  LTS    -1.1273543-01  LNS     8.7303392+01
LTE     6.7635657+00  LNE    -2.9540577+00  THETA  -1.2721227-04  BETA   -8.9820164+01  FUEL    6.0500000+01  BARC    4.9947969-02
DELV    1.6792232+01  MASS    3.6437074+04  PLCHNG  1.7991354-01  DRTX    0.0000000     DRTY   -1.6792093+01  DRTZ    0.0000000
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ID      914090.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   19  SEPT. 1969    6 HRS,    6 MINS,   56.482 SECS  G.M.T. **** 118. HRS,     9. MINS,   44.861 SECS  G.E.T.
XL     -4.2327850+02  YL      8.3194914+02  ZL      3.5142160+02  DXL     4.8381841+03  DYL     2.1386218+03  DZL     7.6866557+02
XS      9.0995319+02  YS      4.0818565+02  ZS      1.3070413+01  DXS     2.1963271+03  DYS    -4.8904931+03  DZS    -6.6925465+01
ALTS    5.8903679+01  LATS    7.5085530-01  LONS    2.4159988+01  VRS     5.3614601+03  PTR     1.5546806-02  AZR    -9.0715472+01
LIN     1.7896137+02  LAN     1.5786722+02
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ID      914090.1
TRANSEARTH INJECTION BURN INITIATION
   19  SEPT. 1969   22 HRS,   48 MINS,   13.698 SECS  G.M.T. **** 134. HRS,    51. MINS,    2.075 SECS  G.E.T.
XL      7.3777833+02  YL     -6.1432189+02  ZL     -2.6904392+02  DXL    -3.5961945+03  DYL    -3.6886477+03  DZL    -1.4327389+03
XS     -7.8957146+02  YS     -6.0859837+02  ZS     -1.6667075+01  DXS    -3.2732312+03  DYS     4.2483936+03  DZS     3.5534346+01
ALTS    5.8548541+01  LATS   -9.5783074-01  LONS   -1.4237511+02  VRS     5.3632221+03  PTR    -1.8297330-02  AZR    -8.9620697+01
LIN     1.7896936+02  LAN     1.4929287+02  LAP     2.0575819+02  LTS    -1.4307714-01  LNS     7.6562323+01  DEM    -2.8242761+01
THETA  -3.4255473+00  BETA   -1.1314662+00  MASS    3.6847074+04
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ID      914090.1
TRANSEARTH INJECTION BURN TERMINATION
   19  SEPT. 1969   22 HRS,   50 MINS,   30.683 SECS  G.M.T. **** 134. HRS,    53. MINS,   19.061 SECS  G.E.T.
XL      6.3051215+02  YL     -7.1170877+02  ZL     -3.0721579+02  DXL    -5.9953571+03  DYL    -5.0195714+03  DZL    -1.9826481+03
XS     -8.7387006+02  YS     -4.8430190+02  ZS     -1.6100607+01  DXS    -4.2648177+03  DYS     6.8660817+03  DZS     1.3147923+01
ALTS    6.0734405+01  LATS   -9.2324959-01  LONS   -1.5100462+02  VRS     8.0828162+03  PTR     2.8489346+00  AZR    -8.9860816+01
LIN     1.7906630+02  LAN     1.2759183+02  LAP    -1.8382668+02  SMAS   -3.5455339+03  ECCS    1.2812049+00  PERS    1.3262952+01
RPS     9.9702147+02  APOS   -8.0880892+03  RANS   -1.7757350+02  INCS    1.5739246+02  LTS    -1.4313275-01  LNS     7.6542991+01
LTE     6.4861545+00  LNE    -2.0241538+00  THETA   5.1808820+00  BETA   -7.5101817-01  FUEL    8.7085552+03  BARC    8.6075262+00
DELV    2.7292436+03  MASS    2.8138519+04  PLCHNG  3.8147627-01  DRTX    2.7238287+03  DRTY   -5.3796532+01  DRTZ    1.6307589+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(d) 90° launch azimuth; first injection opportunity - Concluded

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ID      914090.1
ENTRY AND TOUCHDOWN
   23  SEPT. 1969  18 HRS,  16 MINS,  54.163 SECS  G.M.T. **** 226. HRS,   19. MINS,  42.541 SECS  G.E.T.
X       6.1504195+02  Y       2.9905426+03  Z       1.7256434+03  DX     -3.5799827+04  DY      3.7579891+03  DZ     -1.9193776+03
R       3.5070595+03  DEC     2.9475312+01  RA      7.8378460+01  V       3.6047664+04  PTH    -6.4000376+00  AZ      8.9893927+01
ALT     6.5931582+01  LAT     2.9637313+01  LON     1.6173337+02  VE      3.4703651+04  PTE    -6.6486593+00  AZE     8.9871033+01
SMA     1.0661435+05  ECC     9.6752077-01  INC     2.9475485+01  RAN    -1.1405798+01  APF     1.0282805+02  RP      3.4627517+03
INMP    4.7831892+00  RAM    -2.4495766+01  DEM    -1.1964141+01  RAS    -1.7949954+02  DES    -2.1700832-01  SPSFR   3.7716887+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.4419716+01  LONTD   1.9500013+02  AZTD    1.0714722+02
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ID      914090.1
CIRCUMLUNAR PERICYNTHION
   17  SEPT. 1969   5 HRS,  37 MINS,  40.897 SECS  G.M.T. ****  69. HRS,   40. MINS,  29.276 SECS  G.E.T.
XL     -4.9472066+02  YL     -8.0558797+02  ZL     -3.2220423+02  DXL    -7.3038279+03  DYL     3.7407749+03  DZL     1.8616785+03
XS     -9.9629718+02  YS      7.0198169+01  ZS      4.0544587-01  DXS     5.9230733+02  DYS     8.4045349+03  DZS     3.0005486+02
ALTS    6.0273719+01  LATS    2.3259011-02  LONS    1.7596965+02  VRS     8.4307215+03  PTR    -6.4534167-05  AZR    -8.7960353+01
LIN     1.7795634+02  LAN     1.7662147+02  LAP    -1.7997147+02  LTS    -5.2913186-02  LNS     1.0969913+02  DEM    -2.4957744+01
SMAS   -2.0732111+03  ECCS    1.4817489+00  INCS    1.5697212+02  RANS   -1.7486136+02  APFS   -5.5557124+01  RPS     9.9876726+02
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ID      914090.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   19  SEPT. 1969  23 HRS,  16 MINS,   1.823 SECS  G.M.T. **** 135. HRS,   18. MINS,  50.198 SECS  G.E.T.
X       2.6862499+03  Y       2.1986685+03  Z       5.1634908+02  DX     -2.1236588+04  DY      1.3027938+04  DZ      2.6164806+04
R       3.5095153+03  DEC     8.4605447+00  RA      3.9299979+01  V       3.6129169+04  PTH    -6.7451013+00  AZ      4.0986414+01
ALT     6.5832845+01  LAT     8.5156623+00  LON     5.1610664+01  VE      3.5146748+04  PTE    -6.8917660+00  AZE     3.9075203+01
SMA     1.5524929+05  ECC     9.7770973-01  INC     4.9553146+01  RAN     3.2015058+01  APF     2.4792104+01  RP      3.4605493+03
INMP    2.9201856+01  RAM    -8.0584905+01  DEM    -2.8217725+01  RAS     1.7709706+02  DES     1.2579571+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.2271279+01  LONTD   7.3011957+01  AZTD    5.0043236+01
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(e) 98° launch azimuth; first injection opportunity

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ID      914098.1
LAUNCH TIME      14  SEPT. 1969     8 HRS,   46 MINS,  15.321 SECS   G.M.T.
LAUNCH AZIMUTH   98.                              INJECTION OPPORTUNITY    1
*****************************************************************************************************************

ID      914098.1
EARTH PARKING ORBIT INSERTION
   14  SEPT. 1969    8 HRS,   57 MINS,  32.446 SECS  G.M.T. ****   0. HRS,   11. MINS,  17.125 SECS  G.E.T.
X       1.0450686+03  Y       3.1021105+03  Z       1.3580156+03  DX     -2.1777163+04  DY      1.0803971+04  DZ     -7.9207368+03
ALT     1.0170219+02  LAT     2.2664276+01  LON     3.0383058+02  V       2.5567727+04  PTH    -1.8862449-07  AZ      1.0959661+02
R       3.5439335+03  DEC     2.2531693+01  RA      7.1381866+01  RAS     1.7207761+02  DES     3.4203658+00  RAN    -6.1512602+01
INC     2.9522020+01  MASS    2.8440356+05
*****************************************************************************************************************

ID      914098.1
3.5 MINS PRIOR TO TLI INITIATION
   14  SEPT. 1969  10 HRS,   18 MINS,  30.021 SECS  G.M.T. ****   1. HRS,   32. MINS,  14.700 SECS  G.E.T.
X       2.3738616+03  Y       1.9938387+03  Z       1.7164850+03  DX     -1.5383051+04  DY      2.0293583+04  DZ     -2.2778334+03
ALT     1.0236169+02  LAT     2.9131358+01  LON     2.5218076+02  V       2.5566703+04  PTH     2.2153813-02  AZ      9.5857397+01
*****************************************************************************************************************

ID      914098.1
TRANSLUNAR INJECTION INITIATION
   14  SEPT. 1969  10 HRS,   22 MINS,    .021 SECS  G.M.T. ****   1. HRS,   35. MINS,  44.700 SECS  G.E.T.
X       1.7742778+03  Y       2.6263104+03  Z       1.5853298+03  DX     -1.9133602+04  DY      1.6116288+04  DZ     -5.2723576+03
ALT     1.0223098+02  LAT     2.6723416+01  LON     2.6723391+02  V       2.5566134+04  PTH     1.2409038-02  AZ      1.0333777+02
R       3.5438451+03  DEC     2.6573622+01  RA      5.5957901+01  RAS     1.7213024+02  DES     3.3978379+00  RAN    -6.1964902+01
INC     2.9513842+01  MASS    2.8242769+05
*****************************************************************************************************************

ID      914098.1
TRANSLUNAR INJECTION TERMINATION
   14  SEPT. 1969  10 HRS,   27 MINS,  10.188 SECS  G.M.T. ****   1. HRS,   40. MINS,  54.867 SECS  G.E.T.
X       5.1322874+02  Y       3.3748506+03  Z       1.1692201+03  DX     -3.1240162+04  DY      1.3126651+04  DZ     -1.0935592+04
ALT     1.6562075+02  LAT     1.9019812+01  LON     2.9133313+02  V       3.5606794+04  PTH     6.9205224+00  AZ      1.1162882+02
R       3.6083370+03  DEC     1.8906997+01  RA      8.1353023+01  RAS     1.7213346+02  DES     3.3964585+00  DEM    -1.1237438+01
RAN    -5.9390841+01  INC     2.8425612+01  ECC     9.7508048-01  SMA     1.4267052+05  RP      3.5552816+03  APF     1.2308152+02
INMP    2.6662417+01  C3TLI  -4.8059186-01  DAZTLI-1.6546608+00   MASS    1.3203688+05  FUEL    1.5039081+05
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ID      914098.1
SPACECRAFT SEPARATION              INJECTION + 2HR
   14  SEPT. 1969  12 HRS,   27 MINS,  10.188 SECS  G.M.T. ****   3. HRS,   40. MINS,  54.866 SECS  G.E.T.
X      -1.8213837+04  Y      -5.0422058+03  Z      -9.8759434+03  DX     -9.0518979+03  DY     -8.6642881+03  DZ     -6.6042465+03
ALT     1.7882283+04  LAT    -2.7615569+01  LON     1.5371867+01  V       1.4164138+04  PTH     6.5020538+01  AZ      9.7128464+01
R       2.1323741+04  DEC    -2.7590110+01  RA     -1.6452610+02  RAS     1.7220823+02  DES     3.3644443+00
*****************************************************************************************************************

ID      914098.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   17  SEPT. 1969   6 HRS,   31 MINS,  58.515 SECS  G.M.T. ****  69. HRS,   45. MINS,  43.193 SECS  G.E.T.
RMP     9.9903625+02  DEMP    6.3700910+00  RAMP    1.7986491+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(e) 98° launch azimuth; first injection opportunity - Continued

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ID      914098.1
LUNAR ORBIT INSERTION BURN INITIATION
   17  SEPT. 1969   6 HRS,  28 MINS,  40.065 SECS  G.M.T. ****  69. HRS,   42. MINS,  24.743 SECS  G.E.T.
XL     -2.4567050+02  YL     -9.1549907+02  ZL     -3.7983302+02  DXL    -7.6602373+03  DYL     2.8993659+03  DZL     1.5708673+03
XS     -1.0013898+03  YS     -1.9965794+02  ZS     -1.0992613+01  DXS    -3.0010173+02  DYS     8.3436847+03  DZS     3.4346116+02
ALTS    8.2665439+01  LATS   -6.1679182-01  LONS   -1.6872418+02  VRS     8.3561414+03  PTR    -9.2332073+00  AZR    -8.7713589+01
LIN     1.7762747+02  LAN     1.7621558+02  LAP    -1.6367553+02  LTS    -5.4023566-02  LNS     1.0926672+02  DEM    -2.5079192+01
THETA   1.3923139+01  BETA   -1.7775648+02  MASS    9.4833024+04
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ID      914098.1
LUNAR ORBIT INSERTION BURN TERMINATION
   17  SEPT. 1969   6 HRS,  34 MINS,  58.016 SECS  G.M.T. ****  69. HRS,   48. MINS,  42.693 SECS  G.E.T.
XL     -6.2384531+02  YL     -7.2401138+02  ZL     -2.8524157+02  DXL    -4.2542187+03  DYL     3.1581600+03  DZL     1.4125679+03
XS     -9.6946476+02  YS      2.3422766+02  ZS      3.6928197+00  DXS     1.3262504+03  DYS     5.3360183+03  DZS     1.1305627+02
ALTS    5.8872104+01  LATS    2.1214233-01  LONS    1.6641734+02  VRS     5.4995283+03  PTR    -3.7075070-01  AZR    -8.8820665+01
LIN     1.7879834+02  LAN     1.7658412+02  LAP     7.6618518+00  SMAS    1.0525242+03  ECCS    5.2805230-02  PERS    2.1451906+00
RPS     9.9694545+02  APOS    1.1081029+03  RANS   -1.7667010+02  INCS    1.5743862+02  LTS    -5.4160864-02  LNS     1.0921330+02
LTE     6.3523523+00  LNE    -4.4039986+00  THETA  -1.0864912+01  BETA   -1.7659080+02  FUEL    2.4027535+04  BARC    2.4814319+01
DELV    2.9574224+03  MASS    7.0805489+04  PLCHNG  1.1708841+00  DRTX   -2.8683300+03  DRTY   -1.1237144+02  DRTZ   -7.1161483+02
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ID      914098.1
CIRCULARIZATION BURN INITIATION
   17  SEPT. 1969  10 HRS,  54 MINS,  37.467 SECS  G.M.T. ****  74. HRS,    8. MINS,  22.144 SECS  G.E.T.
XL     -7.1964470+02  YL     -6.4325463+02  ZL     -2.4938766+02  DXL    -3.7935773+03  DYL     3.6269626+03  DZL     1.5956729+03
XS     -9.1456259+02  YS      3.9672878+02  ZS      6.3812284+00  DXS     2.1905904+03  DYS     5.0456658+03  DZS     1.0927326+02
ALTS    5.8431355+01  LATS    3.6674776-01  LONS    1.5654925+02  VRS     5.5017607+03  PTR    -1.0172679-02  AZR    -8.8861858+01
LIN     1.7880105+02  LAN     1.7435876+02  LAP     1.6388244+02  LTS    -5.9843107-02  LNS     1.0701141+02  DEM    -2.5683960+01
THETA  -2.5613209-06  BETA   -1.7999999+02  MASS    7.0785488+04
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ID      914098.1
CIRCULARIZATION BURN TERMINATION
   17  SEPT. 1969  10 HRS,  54 MINS,  52.521 SECS  G.M.T. ****  74. HRS,    8. MINS,  37.199 SECS  G.E.T.
XL     -7.2886197+02  YL     -6.3432458+02  ZL     -2.4546188+02  DXL    -3.6466438+03  DYL     3.5814081+03  DZL     1.5732343+03
XS     -9.0912192+02  YS      4.0903801+02  ZS      6.6479858+00  DXS     2.2011420+03  DYS     4.8903940+03  DZS     1.0606346+02
ALTS    5.8431239+01  LATS    3.8207934-01  LONS    1.5577576+02  VRS     5.3639752+03  PTR    -4.7480680-04  AZR    -8.8866986+01
LIN     1.7880109+02  LAN     1.7435652+02  LAP    -1.7828072+02  SMAS    9.9750021+02  ECCS    5.7695010-04  PERS    1.9791889+00
RPS     9.9692471+02  APOS    9.9807572+02  RANS   -1.7666885+02  INCS    1.5744187+02  LTS    -5.9848600-02  LNS     1.0700928+02
LTE     6.4499955+00  LNE    -4.2888533+00  THETA  -7.7138875-01  BETA   -1.7999999+02  FUEL    9.5705078+02  BARC    7.7131264-01
DELV    1.3778504+02  MASS    6.9828438+04  PLCHNG  4.0994194-06  DRTX   -1.3778304+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      914098.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   5 HRS,  22 MINS,  57.588 SECS  G.M.T. ****  92. HRS,   36. MINS,  42.264 SECS  G.E.T.
XL     -1.9942652+02  YL      9.0097971+02  ZL      3.7817896+02  DXL     5.2364143+03  DYL     1.0336734+03  DZL     3.0160876+02
XS      9.0984037+02  YS      4.0813500+02  ZS      1.3075863+01  DXS     2.1963871+03  DYS    -4.8908747+03  DZS    -8.5913017+01
ALTS    5.8780103+01  LATS    7.5126147-01  LONS    2.4159987+01  VRS     5.3621033+03  PTR     1.1797280-02  AZR    -9.0918267+01
LIN     1.7881145+02  LAN     1.6496067+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(e) 98° launch azimuth; first injection opportunity - Continued

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ID      914098.1
CSM PLANE CHANGE BURN INITIATION
   19  SEPT. 1969   2 HRS,  34 MINS,   2.188 SECS  G.M.T. **** 113. HRS,   47. MINS,  46.865 SECS  G.E.T.
XL     -8.9839935+02  YL     -4.0652526+02  ZL     -1.4650450+02  DXL    -2.3150168+03  DYL     4.4335722+03  DZL     1.8919656+03
XS     -4.4728266+02  YS      8.9085951+02  ZS      1.2462375+01  DXS     4.7930765+03  DYS     2.4055883+03  DZS     8.7289834+01
ALTS    5.8425620+01  LATS    7.1626678-01  LONS    1.1666031+02  VRS     5.3635861+03  PTR     2.8818937-03  AZR    -8.9067508+01
LIN     1.7882193+02  LAN     1.5410155+02  LAP     9.2853955+00  LTS    -1.1400896-01  LNS     8.6845024+01  DEM    -2.8644417+01
THETA  -1.4514152-05  BETA   -9.0000109+01  MASS    3.6474437+04
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ID      914098.1
CSM PLANE CHANGE BURN TERMINATION
   19  SEPT. 1969   2 HRS,  34 MINS,   3.140 SECS  G.M.T. **** 113. HRS,   47. MINS,  47.816 SECS  G.E.T.
XL     -8.9876177+02  YL     -4.0582998+02  ZL     -1.4620924+02  DXL    -2.3113439+03  DYL     4.4418311+03  DZL     1.8770988+03
XS     -4.4653171+02  YS      8.9123603+02  ZS      1.2474728+01  DXS     4.7952528+03  DYS     2.4018598+03  DZS     7.0428417+01
ALTS    5.8425653+01  LATS    7.1697681-01  LONS    1.1661202+02  VRS     5.3636125+03  PTR     2.8948019-03  AZR    -8.9247663+01
LIN     1.7895913+02  LAN     1.6014379+02  LAP     1.3082164+00  SMAS    9.9735332+02  ECCS    4.3824328-04  PERS    1.9787517+00
RPS     9.9691623+02  APOS    9.9779040+02  RANS   -1.7682451+02  INCS    1.5763921+02  LTS    -1.1400926-01  LNS     8.6844901+01
LTF     6.7563188+00  LNE    -2.9170094+00  THETA   2.2368869-04  BETA   -3.9820220+01  FUEL    6.0521484+01  BARC    4.9455859-02
DELV    1.6808672+01  MASS    3.6413916+04  PLCHNG  1.8009809-01  DRTX    0.0000000     DRTY   -1.6808682+01  DRTZ    0.0000000
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ID      914098.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   19  SEPT. 1969   7 HRS,   1 MINS,   3.775 SECS  G.M.T. **** 118. HRS,   14. MINS,  48.451 SECS  G.E.T.
XL     -4.3099256+02  YL      8.2836890+02  ZL      3.5001231+02  DXL     4.8192809+03  DYL     2.1775673+03  DZL     7.8440275+02
XS      9.0979644+02  YS      4.0811505+02  ZS      1.3066725+01  DXS     2.1965738+03  DYS    -4.8914020+03  DZS    -6.6950430+01
ALTS    5.8731735+01  LATS    7.5077283-01  LONS    2.4159974+01  VRS     5.3623905+03  PTR     1.3987426-02  AZR    -9.0715642+01
LIN     1.7896131+02  LAN     1.5787521+02
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ID      914098.1
TRANSEARTH INJECTION BURN INITIATION
   19  SEPT. 1969  23 HRS,  42 MINS,  39.685 SECS  G.M.T. **** 134. HRS,   56. MINS,  24.359 SECS  G.E.T.
XL      7.3266825+02  YL     -6.1975535+02  ZL     -2.7109927+02  DXL    -3.6258478+03  DYL    -3.6630481+03  DZL    -1.4206880+03
XS     -7.9959878+02  YS     -5.9561891+02  ZS     -1.6558074+01  DXS    -3.2028496+03  DYS     4.3007103+03  DZS     3.6996510+01
ALTS    5.8699687+01  LATS   -9.5142183-01  LONS   -1.4331768+02  VRS     5.3624363+03  PTR    -1.2883837-02  AZR    -8.9604843+01
LIN     1.7896936+02  LAN     1.4929925+02  LAP     2.1810848+02  LTS    -1.4440187-01  LNS     7.6101464+01  DEM    -2.8193086+01
THETA  -3.2658899+00  BETA   -1.1735944+00  MASS    3.6823916+04
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ID      914098.1
TRANSEARTH INJECTION BURN TERMINATION
   19  SEPT. 1969  23 HRS,  44 MINS,  56.743 SECS  G.M.T. **** 134. HRS,   58. MINS,  41.420 SECS  G.E.T.
XL      6.2458576+02  YL     -7.1649970+02  ZL     -3.0898964+02  DXL    -6.0335308+03  DYL    -4.9834402+03  DZL    -1.9679441+03
XS     -8.8197181+02  YS     -4.6991947+02  ZS     -1.5974748+01  DXS    -4.1594761+03  DYS     6.9332758+03  DZS     1.3084618+01
ALTS    6.0983237+01  LATS   -9.1580383-01  LONS   -1.5195106+02  VRS     8.0852783+03  PTR     2.9099850+00  AZR    -8.9860465+01
LIN     1.7907364+02  LAN     1.2672249+02  LAP    -1.7801553+01  SMAS   -3.5219254+03  ECCS    1.2831337+00  PERS    1.3130703+01
RPS     9.9717575+02  APOS   -8.0410264+03  RANS   -1.7759729+02  INCS    1.5739326+02  LTS    -1.4445747-01  LNS     7.6092117+01
LTF     6.4671035+00  LNE    -1.9817366+00  THETA   5.3443899+00  BETA   -7.7896313-01  FUEL    8.7132309+03  BARC    8.6114138+00
DELV    2.7328966+03  MASS    2.8110685+04  PLCHNG  3.9613990-01  DRTX    2.7278779+03  DRTY   -5.5883318+01  DRTZ    1.5569177+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(e) 98° launch azimuth; first injection opportunity - Concluded

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ID      914098.1
ENTRY AND TOUCHDOWN
   23  SEPT. 1969  18 HRS,  18 MINS,  47.650 SECS  G.M.T. **** 225. HRS,   32. MINS,  32.325 SECS  G.E.T.
X       5.8941962+02  Y       2.9955034+03  Z       1.7259570+03  DX     -3.5826106+04  DY      3.4790878+03  DZ     -1.9683833+03
R       3.5070477+03  DEC     2.9481308+01  RA      7.8868227+01  V       3.6048417+04  PTH    -6.4000184+00  AZ      8.9986009+01
ALT     6.5920806+01  LAT     2.9643330+01  LON     1.6174898+02  VE      3.4704485+04  PTE    -6.6488802+00  AZE     8.9964335+01
SMA     1.0685930+05  ECC     9.6759532-01  INC     2.9481310+01  RAN    -1.1097514+01  APF     1.0298549+02  RP      3.4627426+03
INMP    4.6374346+00  RAM    -2.4478388+01  DEM    -1.1955759+01  RAS    -1.7949837+02  DES    -2.1751983-01  SPSFR   3.7440249+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.4377605+01  LONTD   1.9500149+02  AZTD    1.0721929+02
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ID      914098.1
CIRCUMLUNAR PERICYNTHION
   17  SEPT. 1969   6 HRS,  31 MINS,  57.918 SECS  G.M.T. ****  69. HRS,   45. MINS,  42.596 SECS  G.E.T.
XL     -4.9027865+02  YL     -8.0816243+02  ZL     -3.2337803+02  DXL    -7.3230609+03  DYL     3.6857013+03  DZL     1.8916097+03
XS     -9.9632050+02  YS      7.3609385+01  ZS      2.9683325-01  DXS     6.2069485+02  DYS     8.3997110+03  DZS     3.4828549+02
ALTS    6.0542513+01  LATS    1.7023703-02  LONS    1.7577459+02  VRS     8.4298106+03  PTR    -6.8377180-05  AZR    -8.7632077+01
LIN     1.7762750+02  LAN     1.7618548+02  LAP    -1.7998205+02  LTS    -5.4095306-02  LNS     1.0923877+02  DEM    -2.5086982+01
SMAS   -2.0732102+03  ECCS    1.4818788+00  INCS    1.5678959+02  RANS   -1.7416377+02  APFS   -5.5217198+01  RPS     9.9903603+02
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ID      914098.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   20  SEPT. 1969   0 HRS,   0 MINS,  23.973 SECS  G.M.T. **** 135. HRS,   14. MINS,   8.646 SECS  G.E.T.
X       2.6867939+03  Y       2.1896698+03  Z       5.5040444+02  DX     -2.1863174+04  DY      1.3617348+04  DZ      2.5336757+04
R       3.5094815+03  DEC     9.0231516+00  RA      3.9179172+01  V       3.6130068+04  PTH    -6.7843106+00  AZ      4.2781398+01
ALT     6.5833256+01  LAT     9.0818154+00  LON     4.0367196+01  VE      3.5112612+04  PTE    -6.9375403+00  AZE     4.0923392+01
SMA     1.5579399+05  ECC     9.7779150-01  INC     4.7871316+01  RAN     3.0921213+01  APF     2.5931887+01  RP      3.4599505+03
INMP    2.7346524+01  RAM    -8.0090112+01  DEM    -2.8176314+01  RAS     1.7712470+02  DES     1.2459944+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.2011546+01  LONTD   6.2649889+01  AZTD    5.2217843+01
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity

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*****************************************************************************************************************

ID      914072.2
LAUNCH TIME      14  SEPT. 1969    4 HRS,   41 MINS,  51.518 SECS   G.M.T.
LAUNCH AZIMUTH   72.                          INJECTION OPPORTUNITY    2
*****************************************************************************************************************

ID      914072.2
EARTH PARKING ORBIT INSERTION
   14  SEPT. 1969   4 HRS,   53 MINS,  11.259 SECS  G.M.T. ****   0. HRS,   11. MINS,  19.741 SECS  G.E.T.
X       2.9241282+03  Y       6.1928375+02  Z       1.9040553+03  DX     -5.8029698+03  DY      2.4887066+04  DZ      8.1745141+02
ALT     1.0334398+02  LAT     3.2667610+01  LON     3.0566189+02  V       2.5567728+04  PTH     8.2523216-03  AZ      8.7827504+01
R       3.5439334+03  DEC     3.2498104+01  RA      1.1957645+01  RAS     1.7192534+02  DES     3.4855226+00  RAN    -7.4003554+01
INC     3.2562694+01  MASS    2.8296469+05
*****************************************************************************************************************

ID      914072.2
3.5 MINS PRIOR TO TLI INITIATION
   14  SEPT. 1969   7 HRS,   54 MINS,  57.948 SECS  G.M.T. ****   3. HRS,   13. MINS,   6.431 SECS  G.E.T.
X       2.3906981+03  Y       1.9072994+03  Z       1.7905002+03  DX     -1.3399041+04  DY      2.1252686+04  DZ     -4.7515972+03
ALT     1.0290890+02  LAT     3.0510209+01  LON     2.8671815+02  V       2.5569290+04  PTH    -3.5171615-03  AZ      1.0243322+02
*****************************************************************************************************************

ID      914072.2
TRANSLUNAR INJECTION INITIATION
   14  SEPT. 1969   7 HRS,   58 MINS,  27.948 SECS  G.M.T. ****   3. HRS,   16. MINS,  36.431 SECS  G.E.T.
X       1.8584723+03  Y       2.5752689+03  Z       1.5724505+03  DX     -1.7240307+04  DY      1.7200416+04  DZ     -7.8010876+03
ALT     1.0214995+02  LAT     2.6490265+01  LON     3.0144136+02  V       2.5572240+04  PTH    -7.4350137-03  AZ      1.0989773+02
R       3.5438016+03  DEC     2.6341379+01  RA      5.4183468+01  RAS     1.7204080+02  DES     3.4361211+00  RAN    -7.5021340+01
INC     3.2577217+01  MASS    2.7979535+05
*****************************************************************************************************************

ID      914072.2
TRANSLUNAR INJECTION TERMINATION
   14  SEPT. 1969   8 HRS,    3 MINS,  34.415 SECS  G.M.T. ****   3. HRS,   21. MINS,  42.897 SECS  G.E.T.
X       7.2562901+02  Y       3.3844817+03  Z       9.9771690+02  DX     -2.8240070+04  DY      1.5001354+04  DZ     -1.5722993+04
ALT     1.5927361+02  LAT     1.6177297+01  LON     3.2387649+02  V       3.5633618+04  PTH     6.5277310+00  AZ      1.1968184+02
R       3.6023177+03  DEC     1.6079165+01  RA      7.7899044+01  RAS     1.7204398+02  DES     3.4347587+00  DEM    -1.0649137+01
RAN    -7.6184461+01  INC     3.3404827+01  ECC     9.7472106-01  SMA     1.4063713+05  RP      3.5551577+03  APF     1.3657121+02
INMP    3.6573716+01  C3TLI  -4.8754071-01  DA7TLI  1.0420977+00  MASS    1.3119871+05  FUEL    1.4859664+05
*****************************************************************************************************************

ID      914072.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   14  SEPT. 1969  10 HRS,    3 MINS,  34.415 SECS  G.M.T. ****   5. HRS,   21. MINS,  42.897 SECS  G.E.T.
X      -1.7255274+04  Y      -4.2843311+03  Z      -1.1723478+04  DX     -8.9616475+03  DY     -8.3945156+03  DZ     -7.0579556+03
ALT     1.7856850+04  LAT    -3.3427674+01  LON     4.9838595+01  V       1.4163112+04  PTH     6.4990281+01  AZ      8.9915199+01
R       2.1297287+04  DEC    -3.3399133+01  RA     -1.6605672+02  RAS     1.7211876+02  DES     3.4027530+00
*****************************************************************************************************************

ID      914072.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   17  SEPT. 1969   5 HRS,    2 MINS,  17.846 SECS  G.M.T. ****  72. HRS,   20. MINS,  26.328 SECS  G.E.T.
RMP     9.9894225+02  DEMP    6.3063313+00  RAMP    1.7863894+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity - Continued

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ID      914072.2
LUNAR ORBIT INSERTION BURN INITIATION
   17  SEPT. 1969    4 HRS,  58 MINS,  58.161 SECS  G.M.T. ****  72. HRS,   17. MINS,   6.641 SECS  G.E.T.
XL     -2.8004903+02  YL     -9.0324368+02  ZL     -3.8543132+02  DXL    -7.5278967+03  DYL     3.0213692+03  DZL     1.9545293+03
XS     -1.0051552+03  YS     -1.7905276+02  ZS     -2.0902265+01  DXS    -1.3091636+02  DYS     8.3333240+03  DZS     6.5427643+02
ALTS    8.2698847+01  LATS   -1.1728399+00  LONS   -1.6989959+02  VRS     8.3599941+03  PTR    -9.2629464+00  AZR    -8.5642774+01
LIN     1.7547955+02  LAN     1.7509260+02  LAP     1.9229914+02  LTS    -5.2071341-02  LNS     1.1002743+02  DEM    -2.4864378+01
THETA   1.3875012+01  BETA   -1.7369059+02  MASS    9.4833024+04
*****************************************************************************************************************

ID      914072.2
LUNAR ORBIT INSERTION BURN TERMINATION
   17  SEPT. 1969    5 HRS,   5 MINS,  19.085 SECS  G.M.T. ****  72. HRS,   23. MINS,  27.565 SECS  G.E.T.
XL     -6.5284688+02  YL     -7.0179015+02  ZL     -2.7560464+02  DXL    -4.1221511+03  DYL     3.3040284+03  DZL     1.4702342+03
XS     -9.6364372+02  YS      2.5700068+02  ZS      4.2126131+00  DXS     1.4491521+03  DYS     5.3042176+03  DZS     1.1256821+02
ALTS    5.8841095+01  LATS    2.4201072-01  LONS    1.6506696+02  VRS     5.4997670+03  PTR    -3.4266820-01  AZR    -8.8825759+01
LIN     1.7879769+02  LAN     1.7667744+02  LAP     6.1089890+00  SMAS    1.0525571+03  ECCS    5.2805916-02  PERS    2.1452912+00
RPS     9.9697589+02  APOS    1.1081383+03  RANS   -1.7669073+02  INCS    1.5742564+02  LTS    -5.2209406-02  LNS     1.0997358+02
LTE     6.3159395+00  LNE    -4.4420151+00  THETA  -1.0929097+01  BETA   -1.7038209+02  FUEL    2.4216533+04  BARC    2.5013906+01
DELV    2.9844762+03  MASS    7.0616490+04  PLCHNG  3.3187448+00  DRTX   -2.3798467+03  DRTY   -3.1841673+02  DRTZ   -7.1569224+02
*****************************************************************************************************************

ID      914072.2
CIRCULARIZATION BURN INITIATION
   17  SEPT. 1969    9 HRS,  24 MINS,  47.706 SECS  G.M.T. ****  76. HRS,   42. MINS,  56.188 SECS  G.E.T.
XL     -7.3827305+02  YL     -6.2490300+02  ZL     -2.4159693+02  DXL    -3.6835957+03  DYL     3.7223012+03  DZL     1.6330843+03
XS     -9.0934425+02  YS      4.0861762+02  ZS      6.6760090+00  DXS     2.2562531+03  DYS     5.0165690+03  DZS     1.0880334+02
ALTS    5.8461799+01  LATS    3.8367818-01  LONS    1.5580303+02  VRS     5.5016799+03  PTR    -1.1761418-02  AZR    -8.8866726+01
LIN     1.7880040+02  LAN     1.7445361+02  LAP    -1.7917998+02  LTS    -5.7872245-02  LNS     1.0777313+02  DEM    -2.5485159+01
THETA  -4.2688681-06  BETA    1.7999999+02  MASS    7.0596491+04
*****************************************************************************************************************

ID      914072.2
CIRCULARIZATION BURN TERMINATION
   17  SEPT. 1969    9 HRS,  25 MINS,   2.729 SECS  G.M.T. ****  76. HRS,   43. MINS,  11.211 SECS  G.E.T.
XL     -7.4720110+02  YL     -6.1576055+02  ZL     -2.3758873+02  DXL    -3.5381620+03  DYL     3.6728848+03  DZL     1.6090862+03
XS     -9.0375534+02  YS      4.2082896+02  ZS      6.9410407+00  DXS     2.2646073+03  DYS     4.8611630+03  DZS     1.0558375+02
ALTS    5.8461312+01  LATS    3.9891031-01  LONS    1.5503120+02  VRS     5.3638139+03  PTR    -2.1410814-03  AZR    -8.8872072+01
LIN     1.7880040+02  LAN     1.7445140+02  LAP    -8.4291174+00  SMAS    9.9750004+02  ECCS    5.4784905-04  PERS    1.9791883+00
RPS     9.9695355+02  APOS    9.9804650+02  RANS   -1.7668936+02  INCS    1.5742889+02  LTS    -5.7877701-02  LNS     1.0777102+02
LTE     6.4175914+00  LNE    -4.3294748+00  THETA  -7.6998173-01  BETA    1.7999999+02  FUEL    9.5506250+02  BARC    7.6972527-01
DELV    1.3786747+02  MASS    6.9641428+04  PLCHNG  4.1009084-06  DRTX   -1.3786551+02  DRTY    0.0000000     DRTZ    0.0000000
*****************************************************************************************************************

ID      914072.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969    3 HRS,  52 MINS,  53.287 SECS  G.M.T. ****  95. HRS,   11. MINS,   1.768 SECS  G.E.T.
XL     -1.8534607+02  YL      9.0354215+02  ZL      3.7912417+02  DXL     5.2515013+03  DYL     9.6377961+02  DZL     2.7322210+02
XS      9.0980487+02  YS      4.0811925+02  ZS      1.3055877+01  DXS     2.1964334+03  DYS    -4.8910864+03  DZS    -8.6084817+01
ALTS    5.8740999+01  LATS    7.5014257-01  LONS    2.4159996+01  VRS     5.3623182+03  PTR     1.1308218-02  AZR    -9.0920051+01
LIN     1.7881075+02  LAN     1.6505719+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity - Continued

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ID      914072.2
CSM PLANE CHANGE BURN INITIATION
   19  SEPT. 1969    1 HRS,    3 MINS,  53.207 SECS  G.M.T. **** 116. HRS,    22. MINS,    6.688 SECS  G.E.T.
XL     -9.0453579+02  YL      -3.9452773+02  ZL      -1.4160946+02  DXL    -2.2452359+03  DYL     4.4641272+03  DZL     1.9038706+03
XS     -4.4729265+02  YS       8.9087790+02  ZS       1.2497151+01  DXS     4.7930706+03  DYS     2.4053614+03  DZS     8.7224709+01
ALTS    5.8446969+01  LATS     7.1825025-01  LONS     1.1666035+02  VRS     5.3634780+03  PTR     7.2975305-04  AZR    -8.9068137+01
LIN     1.7882127+02  LAN      1.5419739+02  LAP      2.3622298+01  LTS    -1.1189023-01  LNS     8.7608005+01  DEM    -2.8620476+01
THETA   4.2688681-06  BETA    -9.0000062+01  MASS     3.6287428+04
*****************************************************************************************************************

ID      914072.2
CSM PLANE CHANGE BURN TERMINATION
   19  SEPT. 1969    1 HRS,    3 MINS,  59.152 SECS  G.M.T. **** 116. HRS,    22. MINS,    7.633 SECS  G.E.T.
XL     -9.0488464+02  YL      -3.9383291+02  ZL      -1.4131455+02  DXL    -2.2415633+03  DYL     4.4723070+03  DZL     1.8890154+03
XS     -4.4654705+02  YS       8.9125171+02  ZS       1.2509407+01  DXS     4.7952316+03  DYS     2.4016616+03  DZS     7.0403547+01
ALTS    5.8446982+01  LATS     7.1895466-01  LONS     1.1661241+02  VRS     5.3635045+03  PTR     7.4070332-04  AZR    -8.9247923+01
LIN     1.7895789+02  LAN      1.6023149+02  LAP      1.1961712+01  SMAS    9.9735556+02  ECCS    4.1635872-04  PERS    1.9787584+00
RPS     9.9694030+02  APOS     9.9777081+02  RANS    -1.7683728+02  INCS    1.5762670+02  LTS    -1.1189054-01  LNS     8.7607866+01
LTE     6.7657271+00  LNE     -2.9785241+00  THETA    5.8056607-05  BETA   -8.9820525+01  FUEL    6.0068359+01  BARC    4.8456647-02
DELV    1.6768779+01  MASS     3.6227360+04  PLCHNG   1.7967329-01  DRTX    0.0000000     DRTY   -1.6768630+01  DRTZ    0.0000000
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ID      914072.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   19  SEPT. 1969    5 HRS,   30 MINS,  59.806 SECS  G.M.T. **** 120. HRS,    49. MINS,    8.288 SECS  G.E.T.
XL     -4.1800171+02  YL       8.3402662+02  ZL       3.5222439+02  DXL     4.8522640+03  DYL     2.1131558+03  DZL     7.5812040+02
XS      9.0976413+02  YS       4.0810096+02  ZS       1.3062263+01  DXS     2.1965617+03  DYS    -4.8916180+03  DZS    -6.7138702+01
ALTS    5.3696441+01  LATS     7.5054303-01  LONS     2.4159996+01  VRS     5.3625850+03  PTR     1.2879180-02  AZR    -9.0717556+01
LIN     1.7896014+02  LAN      1.5796272+02
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ID      914072.2
TRANSEARTH INJECTION BURN INITIATION
   19  SEPT. 1969   22 HRS,   12 MINS,    .660 SECS  G.M.T. **** 137. HRS,    30. MINS,    9.139 SECS  G.E.T.
XL      7.4382873+02  YL      -6.0829747+02  ZL      -2.6675425+02  DXL    -3.5598250+03  DYL    -3.7173188+03  DZL    -1.4457021+03
XS     -7.8071728+02  YS      -6.2021282+02  ZS      -1.6774244+01  DXS    -3.3350258+03  DYS     4.1988049+03  DZS     3.4397510+01
ALTS    5.8735046+01  LATS    -9.6380988-01  LONS    -1.4153587+02  VRS     5.3622329+03  PTR    -1.0900337-02  AZR    -8.9632621+01
LIN     1.7896815+02  LAN      1.4939068+02  LAP      4.1426904+01  LTS    -1.4219688-01  LNS     7.6868954+01  DEM    -2.8274314+01
THETA  -3.9430041+00  BETA    -1.1183982+00  MASS     3.6637359+04
*****************************************************************************************************************

ID      914072.2
TRANSEARTH INJECTION BURN TERMINATION
   19  SEPT. 1969   22 HRS,   14 MINS,   16.790 SECS  G.M.T. **** 137. HRS,    32. MINS,   25.267 SECS  G.E.T.
XL      6.3804348+02  YL      -7.0578063+02  ZL      -3.0499721+02  DXL    -5.9594955+03  DYL    -5.0536489+03  DZL    -1.9972242+03
XS     -8.6610124+02  YS      -4.9784962+02  ZS      -1.6231152+01  DXS    -4.3472336+03  DYS     6.8121832+03  DZS     1.2542594+01
ALTS    6.0630627+01  LATS    -9.3083270-01  LONS    -1.5010898+02  VRS     8.0811160+03  PTR     2.6513992+00  AZR    -8.9868033+01
LIN     1.7905983+02  LAN      1.2798778+02  LAP     -1.8336453+02  SMAS   -3.5603148+03  ECCS    1.2800910+00  PERS    1.3345976+01
RPS     9.9721231+02  APOS    -8.1178419+03  RANS    -1.7756012+02  INCS    1.5738873+02  LTS    -1.4225201-01  LNS     7.6849745+01
LTE     6.4985114+00  LNE     -2.0522792+00  THETA    4.6073058+00  BETA   -7.4141421-01  FUEL    8.6541948+03  BARC    8.5512445+00
DELV    2.7275085+03  MASS     2.7983165+04  PLCHNG   3.7674309-01  DRTX    2.7205260+03  DRTY   -5.3110421+01  DRTZ    1.8755407+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity - Concluded

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ID      914072.2
ENTRY AND TOUCHDOWN
   23  SEPT. 1969  18 HRS,  15 MINS,  38.566 SECS  G.M.T. **** 229. HRS,   33. MINS,  47.046 SECS  G.E.T.
X       6.3206513+02  Y       2.9870986+03  Z       1.7252566+03  DX     -3.5781967+04  DY      3.9422020+03  DZ     -1.8843334+03
R       3.5069609+03  DEC     2.9468964+01  RA      7.8052536+01  V       3.6047757+04  PTH    -6.4000274+00  AZ      8.9830111+01
ALT     6.5831871+01  LAT     2.9630949+01  LON     1.6172339+02  VE      3.4703701+04  PTE    -6.6484688+00  AZE     8.9804412+01
SMA     1.0646490+05  ECC     9.6747611-01  INC     2.9469410+01  RAN    -1.1602270+01  APF     1.0271562+02  RP      3.4626538+03
INMP    4.8755953+00  RAM    -2.4507339+01  DEM    -1.1969724+01  RAS    -1.7950033+02  DES    -2.1666764-01  SPSFR   3.6172830+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.4448093+01  LONTD   1.9499962+02  AZTD    1.0709445+02
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ID      914072.2
CIRCUMLUNAR PERICYNTHION
   17  SEPT. 1969   5 HRS,   2 MINS,  16.427 SECS  G.M.T. ****  72. HRS,   20. MINS,  24.907 SECS  G.E.T.
XL     -5.2035297+02  YL     -7.9187451+02  ZL     -3.1630823+02  DXL    -7.1604793+03  DYL     3.7963951+03  DZL     2.2752595+03
XS     -9.9449471+02  YS      9.4144227+01  ZS      6.4816686-01  DXS     7.9280040+02  DYS     8.3704606+03  DZS     6.6343582+02
ALTS    6.0447574+01  LATS    3.7175594-02  LONS    1.7459218+02  VRS     8.4340554+03  PTR     1.6836897-04  AZR    -8.5488359+01
LIN     1.7547956+02  LAN     1.7506242+02  LAP     1.7983693+02  LTS    -5.2143157-02  LNS     1.0999940+02  DEM    -2.4872387+01
SMAS   -2.0632035+03  ECCS    1.4841699+00  INCS    1.5539782+02  RANS   -1.7011665+02  APFS   -4.9516138+01  RPS     9.9894109+02
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ID      914072.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   19  SEPT. 1969  21 HRS,  45 MINS,  32.494 SECS  G.M.T. **** 137. HRS,    3. MINS,  40.976 SECS  G.E.T.
X       2.7947454+03  Y       2.0086850+03  Z       6.8552320+02  DX     -2.3273477+04  DY      1.7685483+04  DZ      2.1245120+04
R       3.5093246+03  DEC     1.1264780+01  RA      3.5706172+01  V       3.6135663+04  PTH    -6.7726258+00  AZ      5.1145671+01
ALT     6.5833718+01  LAT     1.1337332+01  LON     7.0700994+01  VE      3.4969776+04  PTE    -6.9524787+00  AZE     4.9559509+01
SMA     1.5949776+05  ECC     9.7830704-01  INC     4.0204890+01  RAN     2.2075786+01  APF     3.1310740+01  RP      3.4599787+03
INMP    1.7537159+01  RAM    -8.1594639+01  DEM    -2.8296617+01  RAS     1.7704070+02  DES     1.2823534+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.0141095+01  LONTD   9.6520074+01  AZTD    6.1933838+01
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(g) 78° launch azimuth; second injection opportunity

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ID      914078.2
LAUNCH TIME      14  SEPT. 1969     5 HRS,    50 MINS,  15.070 SECS   G.M.T.
LAUNCH AZIMUTH   78.                                INJECTION OPPORTUNITY    2
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ID      914078.2
EARTH PARKING ORBIT INSERTION
   14  SEPT. 1969    6 HRS,    1 MINS,  33.134 SECS  G.M.T. ****   0. HRS,    11. MINS,  18.064 SECS  G.E.T.
X       2.6903767+03  Y       1.4853394+03  Z       1.7796984+03  DX     -1.1793035+04  DY      2.2656157+04  DZ     -1.1539228+03
ALT     1.0292204+02  LAT     3.0306945+01  LON     3.0556765+02  V       2.5567727+04  PTH    -2.3578062-07  AZ      9.2991634+01
R       3.5439335+03  DEC     3.0144440+01  RA      2.9001346+01  RAS     1.7196794+02  DES     3.4672964+00  RAN    -6.6939951+01
INC     3.0278632+01  MASS    2.8388933+05
*****************************************************************************************************************

ID      914078.2
3.5 MINS PRIOR TO TLI INITIATION
   14  SEPT. 1969    8 HRS,   59 MINS,  45.432 SECS  G.M.T. ****   3. HRS,     9. MINS,  30.362 SECS  G.E.T.
X       2.4175991+03  Y       1.9279100+03  Z       1.7314045+03  DX     -1.4380076+04  DY      2.0898593+04  DZ     -3.1929025+03
ALT     1.0275443+02  LAT     2.9405254+01  LON     2.7046364+02  V       2.5568191+04  PTH    -1.8074200-03  AZ      9.8227478+01
*****************************************************************************************************************

ID      914078.2
TRANSLUNAR INJECTION INITIATION
   14  SEPT. 1969    9 HRS,    3 MINS,  15.432 SECS  G.M.T. ****   3. HRS,    13. MINS,    .362 SECS  G.E.T.
X       1.8509825+03  Y       2.5831278+03  Z       1.5694983+03  DX     -1.8238978+04  DY      1.6820504+04  DZ     -6.1852790+03
ALT     1.0218685+02  LAT     2.6418316+01  LON     2.8539158+02  V       2.5570439+04  PTH    -7.6628982-03  AZ      1.0564555+02
R       3.5438499+03  DEC     2.6269715+01  RA      5.4375888+01  RAS     1.7208117+02  DES     3.4188411+00  RAN    -6.7948516+01
INC     3.0283633+01  MASS    2.8075838+05
*****************************************************************************************************************

ID      914078.2
TRANSLUNAR INJECTION TERMINATION
   14  SEPT. 1969    9 HRS,    8 MINS,  22.769 SECS  G.M.T. ****   3. HRS,    18. MINS,   7.699 SECS  G.E.T.
X       6.5506642+02  Y       3.3699822+03  Z       1.0871764+03  DX     -2.9691280+04  DY      1.4389997+04  DZ     -1.3477813+04
ALT     1.5821255+02  LAT     1.7678031+01  LON     3.0873148+02  V       3.5641206+04  PTH     6.4380913+00  AZ      1.1577976+02
R       3.6010893+03  DEC     1.7571882+01  RA      7.8999864+01  RAS     1.7208436+02  DES     3.4174751+00  DEM    -1.0915093+01
RAN    -6.8991537+01  INC     3.0856393+01  ECC     9.7487723-01  SMA     1.4151423+05  RP      3.5552303+03  APF     1.3089722+02
INMP    3.1985443+01  C3TLI  -4.8451870-01  DAZTLI  7.7702594-01  MASS    1.3173953+05  FUEL    1.4901885+05
*****************************************************************************************************************

ID      914078.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   14  SEPT. 1969   11 HRS,    8 MINS,  22.769 SECS  G.M.T. ****   5. HRS,    18. MINS,   7.699 SECS  G.E.T.
X      -1.7728902+04  Y      -4.5901020+03  Z      -1.0870584+04  DX     -9.0196580+03  DY     -8.5107853+03  DZ     -6.8515576+03
ALT     1.7855846+04  LAT    -3.0719956+01  LON     3.4164923+01  V       1.4167975+04  PTH     6.4996499+01  AZ      9.3311945+01
R       2.1296774+04  DEC    -3.0692697+01  RA     -1.6548456+02  RAS     1.7215914+02  DES     3.3854657+00
*****************************************************************************************************************

ID      914078.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   17  SEPT. 1969    5 HRS,   42 MINS,  40.252 SECS  G.M.T. ****  71. HRS,    52. MINS,  25.180 SECS  G.E.T.
RMP     9.9871105+02  DEMP    6.3348448+00  RAMP    1.7914608+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(g) 78° launch azimuth; second injection opportunity - Continued

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ID      914078.2
LUNAR ORBIT INSERTION BURN INITIATION
   17  SEPT. 1969    5 HRS,   39 MINS,  21.807 SECS  G.M.T. ****  71. HRS,    49. MINS,    6.736 SECS  G.E.T.
XL     -2.6599108+02  YL     -9.0805996+02  ZL     -3.8255856+02  DXL    -7.5882774+03  DYL     2.9716782+03  DZL     1.7848793+03
XS     -1.0032713+03  YS     -1.8669098+02  ZS     -1.6381720+01  DXS    -2.0200721+02  DYS     8.3405004+03  DZS     5.1523902+02
ALTS    8.2131366+01  LATS   -9.1967557-01  LONS   -1.6945833+02  VRS     8.3588409+03  PTR    -9.1924053+00  AZR    -8.6568677+01
LIN     1.7644107+02  LAN     1.7558362+02  LAP    -1.6262820+02  LTS    -5.2949836-02  LNS     1.0968486+02  DEM    -2.4961779+01
THETA   1.3808551+01  BETA   -1.7549715+02  MASS    9.4833024+04
*****************************************************************************************************************

ID      914078.2
LUNAR ORBIT INSERTION BURN TERMINATION
   17  SEPT. 1969    5 HRS,   45 MINS,  40.925 SECS  G.M.T. ****  71. HRS,    55. MINS,   25.853 SECS  G.E.T.
XL     -6.4073985+02  YL     -7.1105824+02  ZL     -2.7959913+02  DXL    -4.1804619+03  DYL     3.2423617+03  DZL     1.4458569+03
XS     -9.6583750+02  YS      2.4792893+02  ZS      4.0188532+00  DXS     1.3980750+03  DYS     5.3187834+03  DZS     1.1276514+02
ALTS    5.8665945+01  LATS    2.3091989-01  LONS    1.6560311+02  VRS     5.5006168+03  PTR    -3.2570327-01  AZR    -8.8824010+01
LIN     1.7879816+02  LAN     1.7667906+02  LAP     2.6648138+00  SMAS    1.0525305+03  ECCS    5.2914687-02  PERS    2.1452098+00
RPS     9.9683617+02  APOS    1.1082248+03  RANS   -1.7668053+02  INCS    1.5743235+02  LTS    -5.3087358-02  LNS     1.0963127+02
LTE     6.3325064+00  LNE    -4.4250071+00  THETA  -1.0991034+01  BETA   -1.7314485+02  FUEL    2.4101777+04  BARC    2.4905947+01
DELV    2.9680409+03  MASS    7.0731246+04  PLCHNG  2.3574137+00  DRTX   -2.8733658+03  DRTY   -2.2628185+02  DRTZ   -7.0840757+02
*****************************************************************************************************************

ID      914078.2
CIRCULARIZATION BURN INITIATION
   17  SEPT. 1969   10 HRS,    5 MINS,   7.135 SECS  G.M.T. ****  76. HRS,    14. MINS,   52.062 SECS  G.E.T.
XL     -7.2640876+02  YL     -6.3653401+02  ZL     -2.4657080+02  DXL    -3.7550982+03  DYL     3.6616737+03  DZL     1.6093702+03
XS     -9.1364030+02  YS      3.9857507+02  ZS      6.4561504+00  DXS     2.2002415+03  DYS     5.0421044+03  DZS     1.0917588+02
ALTS    5.8322598+01  LATS    3.7109429-01  LONS    1.5643079+02  VRS     5.5023448+03  PTR     1.3856099-03  AZR    -8.8863084+01
LIN     1.7880091+02  LAN     1.7445573+02  LAP    -1.7928831+02  LTS    -5.8756255-02  LNS     1.0743119+02  DEM    -2.5575098+01
THETA   1.7075473-06  BETA    1.7999300+02  MASS    7.0711246+04
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ID      914078.2
CIRCULARIZATION BURN TERMINATION
   17  SEPT. 1969   10 HRS,    5 MINS,  22.173 SECS  G.M.T. ****  76. HRS,    15. MINS,    7.103 SECS  G.E.T.
XL     -7.3552196+02  YL     -6.2752900+02  ZL     -2.4261586+02  DXL    -3.6087183+03  DYL     3.6147239+03  DZL     1.5863701+03
XS     -9.0818180+02  YS      4.1086282+02  ZS      6.7223914+00  DXS     2.2104181+03  DYS     4.8868332+03  DZS     1.0596395+02
ALTS    5.8325241+01  LATS    3.8639680-01  LONS    1.5565793+02  VRS     5.3645424+03  PTR     1.1453100-02  AZR    -8.8868260+01
LIN     1.7880091+02  LAN     1.7445350+02  LAP    -1.9562399+02  SMAS    9.9750049+02  ECCS    7.1222473-04  PERS    1.9791897+00
RPS     9.9679005+02  APOS    9.9821092+02  RANS   -1.7667922+02  INCS    1.5743560+02  LTS    -5.8761709-02  LNS     1.0742907+02
LTE     6.4323144+00  LNE    -4.3113466+00  THETA  -7.7085941-01  BETA    1.7999999+02  FUEL    9.5606250+02  BARC    7.7077330-01
DELV    1.3778716+02  MASS    6.9755184+04  PLCHNG  3.9212058-06  DRTX   -1.3778511+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      914078.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969    4 HRS,   33 MINS,  25.475 SECS  G.M.T. ****  94. HRS,    43. MINS,   10.405 SECS  G.E.T.
XL     -1.9173685+02  YL      9.0264841+02  ZL      3.7879159+02  DXL     5.2435116+03  DYL     9.9497912+02  DZL     2.8587904+02
XS      9.1005350+02  YS      4.0823084+02  ZS      1.3053725+01  DXS     2.1958119+03  DYS    -4.8897652+03  DZS    -8.6026283+01
ALTS    5.9013475+01  LATS    7.4981402-01  LONS    2.4159998+01  VRS     5.3608575+03  PTR     1.1040517-02  AZR    -9.0919679+01
LIN     1.7881128+02  LAN     1.6505798+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(g) 78° launch azimuth; second injection opportunity - Continued

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ID      914078.2
CSM PLANE CHANGE BURN INITIATION
   19  SEPT. 1969    1 HRS,  44 MINS,  29.593 SECS  G.M.T. **** 115. HRS,   54. MINS,  14.521 SECS  G.E.T.
XL     -9.0174367+02  YL     -3.9991565+02  ZL     -1.4379738+02  DXL    -2.2780299+03  DYL     4.4502532+03  DZL     1.8984208+03
XS     -4.4726119+02  YS      8.9081605+02  ZS      1.2491283+01  DXS     4.7927615+03  DYS     2.4067955+03  DZS     8.7208984+01
ALTS    5.8377509+01  LATS    7.1796302-01  LONS    1.1666033+02  VRS     5.3638449+03  PTR     1.5914835-02  AZR    -8.9068557+01
LIN     1.7882176+02  LAN     1.5419885+02  LAP    -1.1659060+01  LTS    -1.1284285-01  LNS     8.7264723+01  DEM    -2.8632157+01
THETA  -3.8419814-05  BETA   -9.0000044+01  MASS    3.6401184+04
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ID      914078.2
CSM PLANE CHANGE BURN TERMINATION
   19  SEPT. 1969    1 HRS,  44 MINS,  30.538 SECS  G.M.T. **** 115. HRS,   54. MINS,  15.465 SECS  G.E.T.
XL     -9.0209761+02  YL     -3.9922300+02  ZL     -1.4350332+02  DXL    -2.2743689+03  DYL     4.4584355+03  DZL     1.8836232+03
XS     -4.4651565+02  YS      8.9119005+02  ZS      1.2503542+01  DXS     4.7949222+03  DYS     2.4030941+03  DZS     7.0440333+01
ALTS    5.8377740+01  LATS    7.1866748-01  LONS    1.1661238+02  VRS     5.3638700+03  PTR     1.5928809-02  AZR    -8.9247727+01
LIN     1.7895798+02  LAN     1.6021429+02  LAP    -2.0355131+01  SMAS    9.9735384+02  ECCS    5.5845597-04  PERS    1.9787532+00
RPS     9.9679687+02  APOS    9.9791081+02  RANS   -1.7682996+02  INCS    1.5763251+02  LTS    -1.1284319-01  LNS     8.7264583+01
LTE     6.7631445+00  LNE    -2.9509314+00  THETA   2.6381605-04  BETA   -8.9821317+01  FUEL    6.0067382+01  BARC    4.9455859-02
DELV    1.6716139+01  MASS    3.6341116+04  PLCHNG  1.7909820-01  DRTX    0.0000000     DRTY   -1.6716255+01  DRTZ    0.0000000
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ID      914078.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   19  SEPT. 1969    6 HRS,  11 MINS,  31.596 SECS  G.M.T. **** 120. HRS,   21. MINS,  16.525 SECS  G.E.T.
XL     -4.2396339+02  YL      8.3170797+02  ZL      3.5132550+02  DXL     4.8362065+03  DYL     2.1419532+03  DZL     7.6983885+02
XS      9.1000418+02  YS      4.0820861+02  ZS      1.3068341+01  DXS     2.1963192+03  DYS    -4.8901808+03  DZS    -6.7089408+01
ALTS    5.8959565+01  LATS    7.5069421-01  LONS    2.4159993+01  VRS     5.3611740+03  PTR     1.6811334-02  AZR    -9.0717248+01
LIN     1.7896023+02  LAN     1.5794557+02
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ID      914078.2
TRANSEARTH INJECTION BURN INITIATION
   19  SEPT. 1969   22 HRS,  52 MINS,  47.370 SECS  G.M.T. **** 137. HRS,    2. MINS,  32.298 SECS  G.E.T.
XL      7.3943375+02  YL     -6.1257160+02  ZL     -2.6836806+02  DXL    -3.5865405+03  DYL    -3.6969878+03  DZL    -1.4361357+03
XS     -7.8845999+02  YS     -6.0998361+02  ZS     -1.6687448+01  DXS    -3.2807346+03  DYS     4.2428374+03  DZS     3.5542496+01
ALTS    5.8515825+01  LATS   -9.5903316-01  LONS   -1.4227305+02  VRS     5.3634086+03  PTR    -2.0641342-02  AZR    -8.9620697+01
LIN     1.7896824+02  LAN     1.4937206+02  LAP     9.7470635+01  LTS    -1.4318812-01  LNS     7.6523705+01  DEM    -2.8238702+01
THETA  -3.7112473+00  BETA   -1.1506307+00  MASS    3.6751116+04
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ID      914078.2
TRANSEARTH INJECTION BURN TERMINATION
   19  SEPT. 1969   22 HRS,  55 MINS,   4.006 SECS  G.M.T. **** 137. HRS,    4. MINS,  48.934 SECS  G.E.T.
XL      6.3260468+02  YL     -7.0987239+02  ZL     -3.0651641+02  DXL    -5.9907461+03  DYL    -5.0254103+03  DZL    -1.9857446+03
XS     -8.7265835+02  YS     -4.8607307+02  ZS     -1.6129554+01  DXS    -4.2671457+03  DYS     6.8657777+03  DZS     1.2476992+01
ALTS    6.0535906+01  LATS   -9.2509342-01  LONS   -1.5088207+02  VRS     8.0837857+03  PTR     2.7416252+00  AZR    -8.9867110+01
LIN     1.7906538+02  LAN     1.2730715+02  LAP    -1.8367863+02  SMAS   -3.5436211+03  ECCS    1.2813468+00  PERS    1.3252221+01
RPS     9.9698645+02  APOS   -8.0842287+03  RANS   -1.7757904+02  INCS    1.5738901+02  LTS    -1.4324352-01  LNS     7.6504420+01
LTE     6.4845826+00  LNE    -2.0206112+00  THETA   4.8747998+00  BETA   -7.6316569-01  FUEL    3.6863935+03  BARC    8.5870812+00
DELV    2.7294306+03  MASS    2.8064723+04  PLCHNG  3.8782880-01  DRTX    2.7231506+03  DRTY   -5.4694816+01  DRTZ    1.7667073+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(g) 78° launch azimuth; second injection opportunity - Concluded

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ID      914C78.2
ENTRY AND TOUCHDOWN
   23  SEPT. 1969  18 HRS,  17 MINS,   3.989 SECS  G.M.T. **** 228. HRS,   26. MINS,  48.913 SECS  G.E.T.
X       6.1287602+02  Y       2.9909866+03  Z       1.7256232+03  DX     -3.5802396+04  DY      3.7333450+03  DZ     -1.9216403+03
R       3.5070490+03  DEC     2.9475029+01  RA      7.8419951+01  V       3.6047775+04  PTH    -6.4000101+00  AZ      8.9898402+01
ALT     6.5921062+01  LAT     2.9637030+01  LON     1.6173381+02  VE      3.4703761+04  PTE    -6.6486420+00  AZE     8.9875276+01
SMA     1.0663418+05  ECC     9.6752691-01  INC     2.9475188+01  RAN    -1.1372828+01  APF     1.0283537+02  RP      3.4627425+03
INMP    4.7673697+00  RAM    -2.4494250+01  DEM    -1.1963411+01  RAS    -1.7949944+02  DES    -2.1705288-01  SPSFR   3.6983430+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.4417287+01  LONTD   1.9499975+02  AZTD    1.0715023+02
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ID      914078.2
CIRCUMLUNAR PERICYNTHION
   17  SEPT. 1969   5 HRS,  42 MINS,  38.627 SECS  G.M.T. ****  71. HRS,   52. MINS,  23.556 SECS  G.E.T.
XL     -5.0673369+02  YL     -7.9910855+02  ZL     -3.1947968+02  DXL    -7.2357807+03  DYL     3.7473101+03  DZL     2.1037541+03
XS     -9.9509775+02  YS      8.4858759+01  ZS      4.6386249-01  DXS     7.1530759+02  DYS     8.3852054+03  DZS     5.2239258+02
ALTS    6.0216024+01  LATS    2.6611705-02  LONS    1.7512579+02  VRS     8.4318579+03  PTR    -3.4505687-06  AZR    -8.6447971+01
LIN     1.7644107+02  LAN     1.7555366+02  LAP    -1.7975087+02  LTS    -5.3021166-02  LNS     1.0965704+02  DEM    -2.4969640+01
SMAS   -2.0707716+03  ECCS    1.4822886+00  INCS    1.5604738+02  RANS   -1.7184652+02  APFS   -5.1994304+01  RPS     9.9870953+02
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ID      914078.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   19  SEPT. 1969  22 HRS,  46 MINS,   9.935 SECS  G.M.T. **** 136. HRS,   55. MINS,  54.861 SECS  G.E.T.
X       2.7479145+03  Y       2.0907889+03  Z       6.2723600+02  DX     -2.2783010+04  DY      1.5901744+04  DZ      2.3101281+04
R       3.5093955+03  DEC     1.0295823+01  RA      3.7266195+01  V       3.6133090+04  PTH    -6.7337354+00  AZ      4.7486540+01
ALT     6.5832486+01  LAT     1.0362422+01  LON     5.7063521+01  VE      3.5028663+04  PTE    -6.9006279+00  AZE     4.5776938+01
SMA     1.5776773+05  ECC     9.7806519-01  INC     4.3510383+01  RAN     2.6234297+01  APF     2.8665494+01  RP      3.4606046+03
INMP    2.1850155+01  RAM    -8.0918065+01  DEM    -2.8244589+01  RAS     1.7707846+02  DES     1.2660089+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.1029425+01  LONTD   8.1436483+01  AZTD    5.7737219+01
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity

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ID      914084.2
LAUNCH TIME      14  SEPT. 1969     6 HRS,    58 MINS,  54.570 SECS   G.M.T.
LAUNCH AZIMUTH   84.                                INJECTION OPPORTUNITY    2
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ID      914084.2
EARTH PARKING ORBIT INSERTION
   14  SEPT. 1969    7 HRS,   10 MINS,  11.600 SECS  G.M.T. ****   0. HRS,    11. MINS,  17.030 SECS  G.E.T.
X       2.1811497+03  Y       2.2509500+03  Z       1.6538664+03  DX     -1.7016323+04  DY      1.3817689+04  DZ     -3.1698617+03
ALT     1.0252375+02  LAT     2.7973203+01  LON     3.0526131+02  V       2.5567727+04  PTH    -5.6587350-07  AZ      9.8058250+01
R       3.5439334+03  DEC     2.7818703+01  RA      4.5902264+01  RAS     1.7201071+02  DES     3.4489938+00  RAN    -6.0974225+01
INC     2.8872555+01  MASS    2.8445841+05
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ID      914084.2
3.5 MINS PRIOR TO TLI INITIATION
   14  SEPT. 1969   10 HRS,    4 MINS,  46.280 SECS  G.M.T. ****   3. HRS,     5. MINS,  51.710 SECS  G.E.T.
X       2.4285827+03  Y       1.9522970+03  Z       1.6881591+03  DX     -1.5100119+04  DY      2.0532910+04  DZ     -2.0182381+03
ALT     1.0261454+02  LAT     2.8604302+01  LON     2.5439028+02  V       2.5567308+04  PTH     4.6438187-03  AZ      9.5153401+01
*****************************************************************************************************************

ID      914084.2
TRANSLUNAR INJECTION INITIATION
   14  SEPT. 1969   10 HRS,    8 MINS,  16.280 SECS  G.M.T. ****   3. HRS,     9. MINS,  21.710 SECS  G.E.T.
X       1.8369956+03  Y       2.5942503+03  Z       1.5667701+03  DX     -1.8956328+04  DY      1.6422688+04  DZ     -4.9698471+03
ALT     1.0226403+02  LAT     2.6386376+01  LON     2.6941525+02  V       2.5568466+04  PTH    -2.9930552-03  AZ      1.0251387+02
R       3.5439322+03  DEC     2.6237904+01  RA      5.4697587+01  RAS     1.7212168+02  DES     3.4015002+00  RAN    -6.1960592+01
INC     2.8877125+01  MASS    2.8136755+05
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ID      914084.2
TRANSLUNAR INJECTION TERMINATION
   14  SEPT. 1969   10 HRS,   13 MINS,  24.169 SECS  G.M.T. ****   3. HRS,    14. MINS,  29.599 SECS  G.E.T.
X       5.9652255+02  Y       3.3568408+03  Z       1.1562645+03  DX     -3.0707719+04  DY      1.3754654+04  DZ     -1.1770884+04
ALT     1.5742445+02  LAT     1.8845896+01  LON     2.9335480+02  V       3.5646994+04  PTH     6.3724703+00  AZ      1.1287503+02
R       3.6001620+03  DEC     1.8733704+01  RA      7.9923524+01  RAS     1.7212489+02  DES     3.4001310+00  DEM    -1.1181195+01
RAN    -6.2796580+01  INC     2.9244500+01  ECC     9.7500189-01  SMA     1.4222045+05  RP      3.5552429+03  APF     1.2598822+02
INMP    2.8497445+01  C3TLI  -4.8211302-01  DAZTLI  5.4758517-01  MASS    1.3208116+05  FUEL    1.4928639+05
*****************************************************************************************************************

ID      914084.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   14  SEPT. 1969   12 HRS,   13 MINS,  24.169 SECS  G.M.T. ****   5. HRS,    14. MINS,  29.599 SECS  G.E.T.
X      -1.8024095+04  Y      -4.9008820+03  Z      -1.0230571+04  DX     -9.0259858+03  DY     -8.6285435+03  DZ     -6.7022020+03
ALT     1.7855472+04  LAT    -2.8736516+01  LON     1.8560527+01  V       1.4171792+04  PTH     6.5002051+01  AZ      9.5813915+01
R       2.1296743+04  DEC    -2.8710352+01  RA     -1.6478862+02  RAS     1.7219966+02  DES     3.3681176+00
*****************************************************************************************************************

ID      914084.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   17  SEPT. 1969    6 HRS,   27 MINS,  56.585 SECS  G.M.T. ****  71. HRS,    29. MINS,   2.013 SECS  G.E.T.
RMP     9.9859747+02  DFMP    6.3680650+00  RAMP    1.7985018+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity - Continued

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ID      914084.2
LUNAR ORBIT INSERTION BURN INITIATION
   17  SEPT. 1969   6 HRS,  24 MINS,  39.485 SECS  G.M.T. ****  71. HRS,   25. MINS,  44.915 SECS  G.E.T.
XL     -2.4856172+02  YL     -9.1427472+02  ZL     -3.8124093+02  DXL    -7.6450936+03  DYL     2.9038192+03  DZL     1.6337120+03
XS     -1.0019401+03  YS     -1.9743028+02  ZS     -1.2767451+01  DXS    -2.7404775+02  DYS     8.3417766+03  DZS     4.0014576+02
ALTS    8.2792825+01  LATS   -7.1629287-01  LONS   -1.6885279+02  VRS     8.3558634+03  PTR    -9.2888799+00  AZR    -8.7335749+01
LIN     1.7723604+02  LAN     1.7613840+02  LAP    -1.6355968+02  LTS    -5.3936128-02  LNS     1.0930073+02  DEM    -2.5069703+01
THETA   1.4027339+01  BETA   -1.7700635+02  MASS    9.4833024+04
*****************************************************************************************************************

ID      914084.2
LUNAR ORBIT INSERTION BURN TERMINATION
   17  SEPT. 1969   6 HRS,  30 MINS,  57.716 SECS  G.M.T. ****  71. HRS,   32. MINS,   3.143 SECS  G.E.T.
XL     -6.2618247+02  YL     -7.2207378+02  ZL     -2.8434157+02  DXL    -4.2427474+03  DYL     3.1725056+03  DZL     1.4181723+03
XS     -9.6867776+02  YS      2.3663073+02  ZS      3.7941996+00  DXS     1.3417042+03  DYS     5.3330188+03  DZS     1.1293785+02
ALTS    5.8675029+01  LATS    2.1800943-01  LONS    1.6627250+02  VRS     5.5003650+03  PTR    -3.8959163-01  AZR    -8.8821951+01
LIN     1.7879859+02  LAN     1.7672564+02  LAP     8.0458113+00  SMAS    1.0524432+03  ECCS    5.2960078-02  PERS    2.1449432+00
RPS     9.9670582+02  APOS    1.1081807+03  RANS   -1.7666766+02  INCS    1.5744063+02  LTS    -5.4073612-02  LNS     1.0924727+02
LTE     6.3507558+00  LNE    -4.4057155+00  THETA  -1.0759972+01  BETA   -1.7545348+02  FUEL    2.4045388+04  BARC    2.4834089+01
DELV    2.9599749+03  MASS    7.0787635+04  PLCHNG  1.5626169+00  DRTX   -2.8677931+03  DRTY   -1.4997544+02  DRTZ   -7.1745379+02
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ID      914084.2
CIRCULARIZATION BURN INITIATION
   17  SEPT. 1969  10 HRS,  50 MINS,  48.898 SECS  G.M.T. ****  75. HRS,   51. MINS,  54.325 SECS  G.E.T.
XL     -7.3003978+02  YL     -6.3285209+02  ZL     -2.4478509+02  DXL    -3.7338351+03  DYL     3.6809330+03  DZL     1.6165131+03
XS     -9.0835108+02  YS      4.1016182+02  ZS      6.7207363+00  DXS     2.2642255+03  DYS     5.0142284+03  DZS     1.0865948+02
ALTS    5.8190773+01  LATS    3.8635379-01  LONS    1.5569866+02  VRS     5.5028183+03  PTR     6.9332380-03  AZR    -8.8868564+01
LIN     1.7880134+02  LAN     1.7449890+02  LAP    -1.7924471+02  LTS    -5.9759408-02  LNS     1.0704371+02  DEM    -2.5675647+01
THETA  -7.6839627-06  BETA    1.7999999+02  MASS    7.0767635+04
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ID      914084.2
CIRCULARIZATION BURN TERMINATION
   17  SEPT. 1969  10 HRS,  51 MINS,   3.923 SECS  G.M.T. ****  75. HRS,   52. MINS,   3.353 SECS  G.E.T.
XL     -7.3909314+02  YL     -6.2380797+02  ZL     -2.4081620+02  DXL    -3.5879318+03  DYL     3.6333683+03  DZL     1.5932658+03
XS     -9.0274143+02  YS      4.2237020+02  ZS      6.9854730+00  DXS     2.2724722+03  DYS     4.8590677+03  DZS     1.0544688+02
ALTS    5.8194738+01  LATS    4.0157130-01  LONS    1.5492628+02  VRS     5.3652389+03  PTR     1.7220072-02  AZR    -8.8873960+01
LIN     1.7880132+02  LAN     1.7449668+02  LAP    -2.3124582+01  SMAS    9.9750001+02  ECCS    8.6781172-04  PERS    1.9791882+00
RPS     9.9663438+02  APOS    9.9836563+02  RANS   -1.7666644+02  INCS    1.5744388+02  LTS    -5.9764919-02  LNS     1.0704158+02
LTE     6.4486508+00  LNE    -4.2905928+00  THETA  -7.7043252-01  BETA   -1.7999999+02  FUEL    9.5524023+02  BARC    7.7023359-01
DELV    1.3755722+02  MASS    6.9812395+04  PLCHNG  4.1174389-06  DRTX   -1.3755475+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      914084.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   5 HRS,  18 MINS,  53.044 SECS  G.M.T. ****  94. HRS,   19. MINS,  58.471 SECS  G.E.T.
XL     -1.9886772+02  YL      9.0146609+02  ZL      3.7833146+02  DXL     5.2350283+03  DYL     1.0304443+03  DZL     3.0018564+02
XS      9.1019277+02  YS      4.0829311+02  ZS      1.3037910+01  DXS     2.1958181+03  DYS    -4.8888750+03  DZS    -8.6032726+01
ALTS    5.9165814+01  LATS    7.4879114-01  LONS    2.4159988+01  VRS     5.3600483+03  PTR     1.5022375-02  AZR    -9.0919945+01
LIN     1.7881171+02  LAN     1.6510418+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity - Continued

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ID      914084.2
CSM PLANE CHANGE BURN INITIATION
   19  SEPT. 1969   2 HRS,  29 MINS,  57.237 SECS  G.M.T. **** 115. HRS,   31. MINS,   2.667 SECS  G.E.T.
XL     -8.9854205+02  YL     -4.0593357+02  ZL     -1.4622673+02  DXL    -2.3139449+03  DYL     4.4349641+03  DZL     1.8923562+03
XS     -4.4721350+02  YS      8.9072218+02  ZS      1.2498431+01  DXS     4.7929653+03  DYS     2.4075561+03  DZS     8.7137499+01
ALTS    5.8272306+01  LATS    7.1844970-01  LONS    1.1666030+02  VRS     5.3644121+03  PTR     2.3176946-02  AZR    -8.9069530+01
LIN     1.7882222+02  LAN     1.5424595+02  LAP    -1.8739032+01  LTS    -1.1391277-01  LNS     8.6879613+01  DEM    -2.8643492+01
THETA  -2.8174530-05  BETA   -9.0000025+01  MASS    3.6458395+04
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ID      914084.2
CSM PLANE CHANGE BURN TERMINATION
   19  SEPT. 1969   2 HRS,  29 MINS,  58.178 SECS  G.M.T. **** 115. HRS,   31. MINS,   3.607 SECS  G.E.T.
XL     -8.9890000+02  YL     -4.0524635+02  ZL     -1.4593492+02  DXL    -2.3103137+03  DYL     4.4431251+03  DZL     1.8776587+03
XS     -4.4647121+02  YS      8.9109468+02  ZS      1.2510630+01  DXS     4.7951165+03  DYS     2.4039697+03  DZS     7.0469496+01
ALTS    5.8272652+01  LATS    7.1915074-01  LONS    1.1661255+02  VRS     5.3644364+03  PTR     2.3196447-02  AZR    -8.9247598+01
LIN     1.7895753+02  LAN     1.6022836+02  LAP    -2.6444586+01  SMAS    9.9735554+02  ECCS    7.1698522-04  PERS    1.9787582+00
RPS     9.9664044+02  APOS    9.9807062+02  RANS   -1.7681994+02  INCS    1.5763938+02  LTS    -1.1391317-01  LNS     8.6879475+01
LTE     6.7587343+00  LNE    -2.9198115+00  THETA   1.5026416-04  BETA   -8.9822341+01  FUEL    5.9801757+01  BARC    4.9455859-02
DELV    1.6615839+01  MASS    3.6398593+04  PLCHNG  1.7800301-01  DRTX    0.0000000     DRTY   -1.6615653+01  DRTZ    0.0000000
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ID      914084.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   19  SEPT. 1969   6 HRS,  56 MINS,  59.324 SECS  G.M.T. **** 119. HRS,   58. MINS,   4.753 SECS  G.E.T.
XL     -4.3056117+02  YL      8.2892521+02  ZL      3.5024047+02  DXL     4.8187022+03  DYL     2.1746614+03  DZL     7.8305387+02
XS      9.1012117+02  YS      4.0826079+02  ZS      1.3072357+01  DXS     2.1965543+03  DYS    -4.8893246+03  DZS    -6.7118781+01
ALTS    5.9087707+01  LATS    7.5082843-01  LONS    2.4159978+01  VRS     5.3604939+03  PTR     2.2958630-02  AZR    -9.0717759+01
LIN     1.7895979+02  LAN     1.5795984+02
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ID      914084.2
TRANSEARTH INJECTION BURN INITIATION
   19  SEPT. 1969  23 HRS,  38 MINS,  31.976 SECS  G.M.T. **** 136. HRS,   39. MINS,  37.400 SECS  G.E.T.
XL      7.3468430+02  YL     -6.1734492+02  ZL     -2.7017614+02  DXL    -3.6150322+03  DYL    -3.6739933+03  DZL    -1.4252888+03
XS     -7.9703915+02  YS     -5.9860177+02  ZS     -1.6595229+01  DXS    -3.2193800+03  DYS     4.2901097+03  DZS     3.6869700+01
ALTS    5.8437219+01  LATS   -9.5380800-01  LONS   -1.4309228+02  VRS     5.3638425+03  PTR    -2.9007283-02  AZR    -8.9606579+01
LIN     1.7896779+02  LAN     1.4938491+02  LAP     2.2178563+02  LTS    -1.4430127-01  LNS     7.6136422+01  DEM    -2.8196947+01
THETA  -3.4963951+00  BETA   -1.1878475+00  MASS    3.6808593+04
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ID      914084.2
TRANSEARTH INJECTION BURN TERMINATION
   19  SEPT. 1969  23 HRS,  40 MINS,  48.943 SECS  G.M.T. **** 136. HRS,   41. MINS,  54.372 SECS  G.E.T.
XL      6.2689207+02  YL     -7.1426499+02  ZL     -3.0814830+02  DXL    -6.0250929+03  DYL    -4.9936660+03  DZL    -1.9728076+03
XS     -8.7973946+02  YS     -4.7320747+02  ZS     -1.6020778+01  DXS    -4.1767550+03  DYS     6.9242819+03  DZS     1.2435881+01
ALTS    6.0567800+01  LATS   -9.1882481-01  LONS   -1.5172441+02  VRS     8.0864774+03  PTR     2.8211835+00  AZR    -8.9866558+01
LIN     1.7907150+02  LAN     1.2656050+02  LAP    -1.7887393+02  SMAS   -3.5237849+03  ECCS    1.2829058+00  PERS    1.3141103+01
RPS     9.9689924+02  APOS   -8.0444690+03  RANS   -1.7759941+02  INCS    1.5738948+02  LTS    -1.4435689-01  LNS     7.6117090+01
LTE     6.4685694+00  LNE    -1.9849620+00  THETA   5.1126031+00  BETA   -7.8807864-01  FUEL    8.7073896+03  BARC    8.6101653+00
DELV    2.7320988+03  MASS    2.8101204+04  PLCHNG  4.0069144-01  DRTX    2.7264200+03  DRTY   -5.6530561+01  DRTZ    1.6661861+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity - Concluded

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ID      914084.2
ENTRY AND TOUCHDOWN
   23  SEPT. 1969  18 HRS,  18 MINS,  39.413 SECS  G.M.T. **** 227. HRS,   19. MINS,  44.841 SECS  G.E.T.
X       5.9135178+02  Y       2.9951528+03  Z       1.7258783+03  DX     -3.5824507+04  DY      3.4988976+03  DZ     -1.9625796+03
R       3.5070348+03  DEC     2.9479948+01  RA      7.8831377+01  V       3.6048429+04  PTH    -6.4000358+00  AZ      8.9973828+01
ALT     6.5907668+01  LAT     2.9641967+01  LON     1.6174654+02  VE      3.4704485+04  PTE    -6.6488700+00  AZE     8.9953081+01
SMA     1.0683981+05  ECC     9.6758953-01  INC     2.9479959+01  RAN    -1.1112981+01  APF     1.0296695+02  RP      3.4627287+03
INMP    4.6444833+00  RAM    -2.4479649+01  DEM    -1.1956366+01  RAS    -1.7949845+02  DES    -2.1748270-01  SPSFR   3.7346008+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.4382047+01  LONTD   1.9500057+02  AZTD    1.0721037+02
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ID      914084.2
CIRCUMLUNAR PERICYNTHION
   17  SEPT. 1969   6 HRS,  27 MINS,  58.518 SECS  G.M.T. ****  71. HRS,   29. MINS,   3.946 SECS  G.E.T.
XL     -4.9405665+02  YL     -8.0609591+02  ZL     -3.2234966+02  DXL    -7.3027582+03  DYL     3.6934721+03  DZL     1.9565876+03
XS     -9.9589406+02  YS      7.7373380+01  ZS      4.6345515-01  DXS     6.5246477+02  DYS     8.3953398+03  DZS     4.0572835+02
ALTS    6.0401784+01  LATS    2.6583391-02  LONS    1.7555747+02  VRS     8.4304243+03  PTR    -1.4913748-04  AZR    -8.7241478+01
LIN     1.7723607+02  LAN     1.7610812+02  LAP    -1.7996711+02  LTS    -5.4008389-02  LNS     1.0927261+02  DEM    -2.5077552+01
SMAS   -2.0728462+03  ECCS    1.4818955+00  INCS    1.5656203+02  RANS   -1.7335933+02  APFS   -5.4224551+01  RPS     9.9889531+02
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ID      914084.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   19  SEPT. 1969  23 HRS,  47 MINS,  35.557 SECS  G.M.T. **** 136. HRS,   48. MINS,  40.983 SECS  G.E.T.
X       2.7023857+03  Y       2.1625424+03  Z       5.8030269+02  DX     -2.2264527+04  DY      1.4343036+04  DZ      2.4576886+04
R       3.5094485+03  DEC     9.5178217+00  RA      3.8668001+01  V       3.6131083+04  PTH    -6.7427737+00  AZ      4.4411244+01
ALT     6.5832229+01  LAT     9.5795844+00  LON     4.3066524+01  VE      3.5082655+04  PTE    -6.8997971+00  AZE     4.2603561+01
SMA     1.5643545+05  ECC     9.7787891-01  INC     4.6356413+01  RAN     2.9466554+01  APF     2.6847669+01  RP      3.4605222+03
INMP    2.5494356+01  RAM    -8.0232908+01  DEM    -2.8188451+01  RAS     1.7711672+02  DES     1.2494473+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.1738175+01  LONTD   6.6115896+01  AZTD    5.4171543+01
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(i) 90° launch azimuth; second injection opportunity

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ID      914090.2
LAUNCH TIME      14  SEPT. 1969    7 HRS,   57 MINS,  11.620 SECS   G.M.T.
LAUNCH AZIMUTH   90.                          INJECTION OPPORTUNITY    2
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ID      914090.2
EARTH PARKING ORBIT INSERTION
   14  SEPT. 1969   8 HRS,   8 MINS,  28.262 SECS  G.M.T. ****   0. HRS,   11. MINS,  16.641 SECS  G.E.T.
X       1.5983939+03  Y       2.7698969+03  Z       1.5271779+03  DX     -2.0330734+04  DY      1.4603159+04  DZ     -5.2074657+03
ALT     1.0215226+02  LAT     2.5572035+01  LON     3.0474225+02  V       2.5567727+04  PTH    -2.8293674-07  AZ      1.0304435+02
R       3.5439334+03  DEC     2.5526427+01  RA      6.0012518+01  RAS     1.7204703+02  DES     3.4334529+00  RAN    -5.8251721+01
INC     2.8465879+01  MASS    2.8467194+05
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ID      914090.2
3.5 MINS PRIOR TO TLI INITIATION
   14  SEPT. 1969  10 HRS,  59 MINS,  58.025 SECS  G.M.T. ****   3. HRS,    2. MINS,  46.405 SECS  G.E.T.
X       2.4211895+03  Y       1.9725730+03  Z       1.6749153+03  DX     -1.5458010+04  DY      2.0305225+04  DZ     -1.5558451+03
ALT     1.0245883+02  LAT     2.8361195+01  LON     2.4092847+02  V       2.5567027+04  PTH     1.3192039-02  AZ      9.3966696+01
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ID      914090.2
TRANSLUNAR INJECTION INITIATION
   14  SEPT. 1969  11 HRS,   3 MINS,  28.025 SECS  G.M.T. ****   3. HRS,    6. MINS,  16.405 SECS  G.E.T.
X       1.8175844+03  Y       2.6061062+03  Z       1.5697486+03  DX     -1.9290184+04  DY      1.6165730+04  DZ     -4.4983029+03
ALT     1.0228076+02  LAT     2.6440220+01  LON     2.5598776+02  V       2.5567102+04  PTH     4.3407716-03  AZ      1.0131947+02
R       3.5439403+03  DEC     2.6291537+01  RA      5.5106809+01  RAS     1.7215608+02  DES     3.3867757+00  RAN    -5.9212373+01
INC     2.8464550+01  MASS    2.8161597+05
*****************************************************************************************************************

ID      914090.2
TRANSLUNAR INJECTION TERMINATION
   14  SEPT. 1969  11 HRS,   8 MINS,  36.144 SECS  G.M.T. ****   3. HRS,   11. MINS,  24.524 SECS  G.E.T.
X       5.5738144+02  Y       3.3525006+03  Z       1.1865535+03  DX     -3.1139417+04  DY      1.3337766+04  DZ     -1.1106288+04
ALT     1.5702657+02  LAT     1.9360854+01  LON     2.8015403+02  V       3.5549809+04  PTH     6.3440567+00  AZ      1.1176686+02
R       3.5997004+03  DEC     1.9246054+01  RA      8.0560436+01  RAS     1.7215928+02  DES     3.3854061+00  DFM    -1.1406474+01
RAN    -5.9899636+01  INC     2.8741628+01  ECC     9.7505701-01  SMA     1.4253246+05  RP      3.5551862+03  APF     1.2397468+02
INMP    2.7018957+01  C3TLI  -4.8105859-01  DAZTLI  4.3014034-01  MASS    1.3221797+05  FUEL    1.4939800+05
*****************************************************************************************************************

ID      914090.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   14  SEPT. 1969  13 HRS,   8 MINS,  36.144 SECS  G.M.T. ****   5. HRS,   11. MINS,  24.524 SECS  G.E.T.
X      -1.8097462+04  Y      -5.1135442+03  Z      -9.9944451+03  DX     -8.9781279+03  DY     -8.7161352+03  DZ     -6.6565748+03
ALT     1.7855443+04  LAT    -2.8014108+01  LON     5.2894180+00  V       1.4173488+04  PTH     6.5004923+01  AZ      9.6820152+01
R       2.1296839+04  DEC    -2.7988373+01  RA     -1.6422205+02  RAS     1.7223406+02  DES     3.3533894+00
*****************************************************************************************************************

ID      914090.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   17  SEPT. 1969   7 HRS,  13 MINS,  20.998 SECS  G.M.T. ****  71. HRS,   16. MINS,   9.375 SECS  G.E.T.
RMP     9.9862292+02  DEMP    6.3864495+00  RAMP    1.7989794+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(i) 90° launch azimuth; second injection opportunity - Continued

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ID      914090.2
LUNAR ORBIT INSERTION BURN INITIATION
   17  SEPT. 1969   7 HRS,  10 MINS,   5.971 SECS  G.M.T. ****  71. HRS,   12. MINS,  54.347 SECS  G.E.T.
XL     -2.4247532+02  YL     -9.1533639+02  ZL     -3.7967943+02  DXL    -7.6796475+03  DYL     2.8643578+03  DZL     1.5595641+03
XS     -1.0011589+03  YS     -1.9594048+02  ZS     -1.0897170+01  DXS    -2.8639339+02  DYS     8.3476900+03  DZS     3.4595691+02
ALTS    8.1698340+01  LATS   -6.1201598-01  LONS   -1.6893191+02  VRS     8.3597627+03  PTR    -9.1204081+00  AZR    -8.7696030+01
LIN     1.7761172+02  LAN     1.7622817+02  LAP    -1.6394127+02  LTS    -5.4927063-02  LNS     1.0891537+02  DEM    -2.5176591+01
THETA   1.3672646+01  BETA   -1.7772777+02  MASS    9.4833024+04
*****************************************************************************************************************

ID      914090.2
LUNAR ORBIT INSERTION BURN TERMINATION
   17  SEPT. 1969   7 HRS,  16 MINS,  24.023 SECS  G.M.T. ****  71. HRS,   19. MINS,  12.401 SECS  G.E.T.
XL     -6.2174891+02  YL     -7.2529728+02  ZL     -2.8557868+02  DXL    -4.2660628+03  DYL     3.1456902+03  DZL     1.4074035+03
XS     -9.6821353+02  YS      2.3818179+02  ZS      3.8686758+00  DXS     1.3442726+03  DYS     5.3322345+03  DZS     1.1286025+02
ALTS    5.8593727+01  LATS    2.2230688-01  LONS    1.6617958+02  VRS     5.5002300+03  PTR    -3.2455197-01  AZR    -8.8822970+01
LIN     1.7879881+02  LAN     1.7684305+02  LAP     6.7443375+00  SMAS    1.0522052+03  ECCS    5.2689584-02  PERS    2.1442154+00
RPS     9.9676494+02  APOS    1.1076454+03  RANS   -1.7665247+02  INCS    1.5745013+02  LTS    -5.5064544-02  LNS     1.0886194+02
LTE     6.3687108+00  LNE    -4.3861318+00  THETA  -1.1144892+01  BETA   -1.7654027+02  FUEL    2.4033979+04  BARC    2.4844494+01
DELV    2.9583433+03  MASS    7.0799045+04  PLCHNG  1.1871837+00  DRTX   -2.8722491+03  DRTY   -1.1396662+02  DRTZ   -6.9927609+02
*****************************************************************************************************************

ID      914090.2
CIRCULARIZATION BURN INITIATION
   17  SEPT. 1969  11 HRS,  35 MINS,  29.146 SECS  G.M.T. ****  75. HRS,   38. MINS,  17.523 SECS  G.E.T.
XL     -7.0052112+02  YL     -6.6088606+02  ZL     -2.5692129+02  DXL    -3.8982447+03  DYL     3.5313171+03  DZL     1.5581181+03
XS     -9.2239470+02  YS      3.7770366+02  ZS      6.0589668+00  DXS     2.0881931+03  DYS     5.0890795+03  DZS     1.0977069+02
ALTS    5.8255576+01  LATS    3.4828761-01  LONS    1.5773180+02  VRS     5.5019388+03  PTR    -3.4574235-02  AZR    -8.8856561+01
LIN     1.7880150+02  LAN     1.7462362+02  LAP     1.8000384+02  LTS    -6.0741410-02  LNS     1.0666492+02  DEM    -2.5772518+01
THETA  -8.5377364-07  BETA    1.7999999+02  MASS    7.0779045+04
*****************************************************************************************************************

ID      914090.2
CIRCULARIZATION BURN TERMINATION
   17  SEPT. 1969  11 HRS,  35 MINS,  44.116 SECS  G.M.T. ****  75. HRS,   38. MINS,  32.495 SECS  G.E.T.
XL     -7.0994414+02  YL     -6.5223669+02  ZL     -2.5310797+02  DXL    -3.7507964+03  DYL     3.4897289+03  DZL     1.5373053+03
XS     -9.1723288+02  YS      3.9005236+02  ZS      6.3254996+00  DXS     2.1018929+03  DYS     4.9349106+03  DZS     1.0658859+02
ALTS    5.8249687+01  LATS    3.6361109-01  LONS    1.5696242+02  VRS     5.3649470+03  PTR    -2.5474177-02  AZR    -8.8861407+01
LIN     1.7880152+02  LAN     1.7462142+02  LAP     2.0992204+02  SMAS    9.9750074+02  ECCS    8.8068787-04  PERS    1.9791904+00
RPS     9.9662226+02  APOS    9.9837921+02  RANS   -1.7665132+02  INCS    1.5745340+02  LTS    -6.0746863-02  LNS     1.0666281+02
LTE     6.4642613+00  LNE    -4.2700896+00  THETA  -7.6718135-01  BETA   -1.7999300+02  FUEL    9.5170312+02  BARC    7.6724245-01
DELV    1.3702245+02  MASS    6.9827342+04  PLCHNG  4.1600936-06  DRTX   -1.3702054+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      914090.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   6 HRS,   4 MINS,  10.406 SECS  G.M.T. ****  94. HRS,    6. MINS,  58.785 SECS  G.E.T.
XL     -2.0579533+02  YL      8.9951280+02  ZL      3.7752792+02  DXL     5.2302676+03  DYL     1.0678440+03  DZL     3.1508685+02
XS      9.0958881+02  YS      4.0802167+02  ZS      1.2992653+01  DXS     2.1988382+03  DYS    -4.8913824+03  DZS    -8.6196396+01
ALTS    5.8503124+01  LATS    7.4668782-01  LONS    2.4159962+01  VRS     5.3635754+03  PTR     3.3522970-02  AZR    -9.0921327+01
LIN     1.7881194+02  LAN     1.6522500+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(i) 90° launch azimuth; second injection opportunity - Continued

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ID      914090.2
CSM PLANE CHANGE BURN INITIATION
   19  SEPT. 1969    3 HRS,  15 MINS,  16.307 SECS  G.M.T. **** 115. HRS,   18. MINS,   4.687 SECS  G.E.T.
XL     -8.9526739+02  YL     -4.1190271+02  ZL     -1.4861246+02  DXL    -2.3456571+03  DYL     4.4215350+03  DZL     1.8868852+03
XS     -4.4714839+02  YS      8.9059224+02  ZS      1.2528149+01  DXS     4.7953709+03  DYS     2.4045645+03  DZS     8.6938059+01
ALTS    5.8127369+01  LATS    7.2026282-01  LONS    1.1666030+02  VRS     5.3651720+03  PTR    -1.7859071-02  AZR    -8.9071213+01
LIN     1.7882249+02  LAN     1.5436789+02  LAP     3.9779345+01  LTS    -1.1498069-01  LNS     8.6495723+01  DEM    -2.8652926+01
THETA  -9.3915100-06  BETA   -5.0000049+01  MASS    3.6473342+04
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ID      914090.2
CSM PLANE CHANGE BURN TERMINATION
   19  SEPT. 1969    3 HRS,  15 MINS,  17.239 SECS  G.M.T. **** 115. HRS,   18. MINS,   5.617 SECS  G.E.T.
XL     -3.9562672+02  YL     -4.1122423+02  ZL     -1.4832430+02  DXL    -2.3420750+03  DYL     4.4296386+03  DZL     1.8723464+03
XS     -4.4641317+02  YS      8.9096053+02  ZS      1.2540212+01  DXS     4.7975004+03  DYS     2.4009141+03  DZS     7.0438524+01
ALTS    5.8127100+01  LATS    7.2095659-01  LONS    1.1661302+02  VRS     5.3651989+03  PTR    -1.7833158-02  AZR    -8.9247500+01
LIN     1.7895622+02  LAN     1.6029764+02  LAP     3.1197026+01  SMAS    9.9734969+02  ECCS    7.9487336-04  PERS    1.9787409+00
RPS     9.9655693+02  APOS    9.9814246+02  RANS   -1.7680692+02  INCS    1.5764685+02  LTS    -1.1498108-01  LNS     8.6495597+01
LTE     6.7539290+00  LNE    -2.8886191+00  THETA   1.9124530-04  BETA   -8.9824219+01  FUEL    5.9220703+01  BARC    4.8456647-02
DELV    1.6447588+01  MASS    3.6414121+04  PLCHNG  1.7617704-01  DRTX    0.0000000     DRTY   -1.6447501+01  DRTZ    0.0000000
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ID      914090.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   19  SEPT. 1969    7 HRS,  42 MINS,  16.319 SECS  G.M.T. **** 119. HRS,   45. MINS,   4.697 SECS  G.E.T.
XL     -4.3673929+02  YL      8.2540533+02  ZL      3.4884294+02  DXL     4.8050180+03  DYL     2.2091692+03  DZL     7.9678456+02
XS      9.0946165+02  YS      4.0796484+02  ZS      1.3063909+01  DXS     2.1988098+03  DYS    -4.8925323+03  DZS    -6.7327352+01
ALTS    5.8364803+01  LATS    7.5088732-01  LONS    2.4159972+01  VRS     5.3643424+03  PTR     3.0777409-02  AZR    -9.0719598+01
LIN     1.7895850+02  LAN     1.5802980+02
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ID      914090.2
TRANSEARTH INJECTION BURN INITIATION
   20  SEPT. 1969    0 HRS,  24 MINS,   4.548 SECS  G.M.T. **** 136. HRS,   26. MINS,  52.923 SECS  G.E.T.
XL      7.3045681+02  YL     -6.2257683+02  ZL     -2.7218913+02  DXL    -3.6393633+03  DYL    -3.6489311+03  DZL    -1.4135684+03
XS     -8.0606940+02  YS     -5.8757965+02  ZS     -1.6519363+01  DXS    -3.1562469+03  DYS     4.3321077+03  DZS     3.8251050+01
ALTS    5.9138987+01  LATS   -9.4877934-01  LONS   -1.4391004+02  VRS     5.3600853+03  PTR    -2.0745412-02  AZR    -8.9591451+01
LIN     1.7896651+02  LAN     1.4945403+02  LAP     2.9312529+02  LTS    -1.4541080-01  LNS     7.5750835+01  DEM    -2.8153481+01
THETA  -3.3535913+00  BETA   -1.2253314+00  MASS    3.6824121+04
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ID      914090.2
TRANSEARTH INJECTION BURN TERMINATION
   20  SEPT. 1969    0 HRS,  26 MINS,  21.762 SECS  G.M.T. **** 136. HRS,   29. MINS,  10.136 SECS  G.E.T.
XL      6.2184121+02  YL     -7.1900485+02  ZL     -3.0993909+02  DXL    -6.0579240+03  DYL    -4.9596142+03  DZL    -1.9588246+03
XS     -8.8716510+02  YS     -4.6086993+02  ZS     -1.5926775+01  DXS    -4.0837785+03  DYS     6.9797358+03  DZS     1.2508019+01
ALTS    6.1364803+01  LATS   -9.1270490-01  LONS   -1.5254875+02  VRS     8.0866627+03  PTR     2.8784741+00  AZR    -8.9865281+01
LIN     1.7907742+02  LAN     1.2586035+02  LAP    -6.7803161+00  SMAS   -3.5028765+03  ECCS    1.2847966+00  PERS    1.3024318+01
RPS     9.9760726+02  APOS   -8.0033603+03  RANS   -1.7761797+02  INCS    1.5739038+02  LTS    -1.4546654-01  LNS     7.5731473+01
LTE     6.4522170+00  LNE    -1.9493362+00  THETA   5.2619103+00  BETA   -8.1261928-01  FUEL    8.7230854+03  BARC    8.6167294+00
DELV    2.7364285+03  MASS    2.8101036+04  PLCHNG  4.1402148-01  DRTX    2.7311109+03  DRTY   -5.8414415+01  DRTZ    1.6007469+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(i) 90° launch azimuth; second injection opportunity - Concluded

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ID      914090.2
ENTRY AND TOUCHDOWN
   23  SEPT. 1969  18 HRS,  20 MINS,  14.214 SECS  G.M.T. **** 226. HRS,   23. MINS,   2.588 SECS  G.E.T.
X       5.6996960+02  Y       2.9993091+03  Z       1.7261029+03  DX     -3.5844306+04  DY      3.2654825+03  DZ     -2.0026691+03
R       3.5071571+03  DEC     2.9483034+01  RA      7.9240171+01  V       3.6048415+04  PTH    -6.4000238+00  AZ      9.0045863+01
ALT     6.6030576+01  LAT     2.9645056+01  LON     1.6175925+02  VE      3.4704465+04  PTE    -6.6490741+00  AZE     9.0028837+01
SMA     1.0706236+05  ECC     9.6765576-01  INC     2.9483066+01  RAN    -1.0853163+01  APF     1.0309616+02  RP      3.4628517+03
INMP    4.5213188+00  RAM    -2.4465133+01  DEM    -1.1949362+01  RAS    -1.7949747+02  DES    -2.1791010-01  SPSFR   3.7344343+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.4346012+01  LONTD   1.9500104+02  AZTD    1.0726833+02
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ID      914090.2
CIRCUMLUNAR PERICYNTHION
   17  SEPT. 1969   7 HRS,  13 MINS,  21.214 SECS  G.M.T. ****  71. HRS,   16. MINS,   9.592 SECS  G.E.T.
XL     -4.8459228+02  YL     -8.1067302+02  ZL     -3.2438761+02  DXL    -7.3503967+03  DYL     3.6427378+03  DZL     1.8770174+03
XS     -9.9588501+02  YS      7.3896158+01  ZS      3.2138278-01  DXS     6.2350428+02  DYS     3.4012611+03  DZS     3.5067329+02
ALTS    6.0129385+01  LATS    1.8439270-02  LONS    1.7575634+02  VRS     8.4316615+03  PTR    -3.3658258-05  AZR    -8.7616359+01
LIN     1.7761173+02  LAN     1.7619846+02  LAP    -1.7998135+02  LTS    -5.4998096-02  LNS     1.0888777+02  DEM    -2.5184190+01
SMAS   -2.0720549+03  ECCS    1.4819481+00  INCS    1.5679404+02  RANS   -1.7410705+02  APFS   -5.5525208+01  RPS     9.9862291+02
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ID      914090.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   20  SEPT. 1969   0 HRS,  39 MINS,  12.131 SECS  G.M.T. **** 136. HRS,   42. MINS,    .511 SECS  G.E.T.
X       2.6722001+03  Y       2.2039635+03  Z       5.6413969+02  DX     -2.2085875+04  DY      1.3562322+04  DZ      2.5172829+04
R       3.5094675+03  DEC     9.2503122+00  RA      3.9514953+01  V       3.6130233+04  PTH    -6.7602525+00  AZ      4.3100780+01
ALT     6.5833713+01  LAT     9.3104013+00  LON     3.0975758+01  VE      3.5106964+04  PTE    -6.9130818+00  AZE     4.1253217+01
SMA     1.5586387+05  ECC     9.7779930-01  INC     4.7592581+01  RAN     3.0960129+01  APF     2.6249129+01  RP      3.4602875+03
INMP    2.7132897+01  RAM    -7.9657555+01  DEM    -2.8138627+01  RAS     1.7714887+02  DES     1.2355318+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.2076664+01  LONTD   5.3446767+01  AZTD    5.2669444+01
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(j) 98° launch azimuth; second injection opportunity

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ID      914098.2
LAUNCH TIME      14  SEPT. 1969     8 HRS,   46 MINS,  15.321 SECS   G.M.T.
LAUNCH AZIMUTH   98.                                INJECTION OPPORTUNITY     2
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ID      914098.2
EARTH PARKING ORBIT INSERTION
   14  SEPT. 1969    8 HRS,   57 MINS,  32.446 SECS  G.M.T. ****    0. HRS,    11. MINS,  17.125 SECS  G.E.T.
X       1.0450686+03  Y       3.1021105+03  Z       1.3580156+03  DX     -2.1777163+04  DY      1.0903971+04  DZ     -7.9207368+03
ALT     1.0170219+02  LAT     2.2664276+01  LON     3.0383058+02  V       2.5567727+04  PTH    -1.8862449-07  AZ      1.0959661+02
R       3.5439335+03  DEC     2.2531693+01  RA      7.1381866+01  RAS     1.7207761+02  DES     3.4203658+00  RAN    -6.1512602+01
INC     2.9522020+01  MASS    2.8440356+05
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ID      914098.2
3.5 MINS PRIOR TO TLI INITIATION
   14  SEPT. 1969   11 HRS,   46 MINS,  29.345 SECS  G.M.T. ****    3. HRS,     0. MINS,  14.024 SECS  G.E.T.
X       2.3818423+03  Y       1.9854558+03  Z       1.7151424+03  DX     -1.5282768+04  DY      2.0363566+04  DZ     -2.3284078+03
ALT     1.0235584+02  LAT     2.9106474+01  LON     2.2990990+02  V       2.5566761+04  PTH     2.2934716-02  AZ      9.5986616+01
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ID      914098.2
TRANSLUNAR INJECTION INITIATION
   14  SEPT. 1969   11 HRS,   49 MINS,  59.345 SECS  G.M.T. ****    3. HRS,     3. MINS,  44.024 SECS  G.E.T.
X       1.7854421+03  Y       2.6205797+03  Z       1.5822989+03  DX     -1.9050600+04  DY      1.6198998+04  DZ     -5.3189686+03
ALT     1.0223242+02  LAT     2.6668338+01  LON     2.4495138+02  V       2.5566076+04  PTH     1.3169535-02  AZ      1.0345169+02
R       3.5438554+03  DEC     2.6518758+01  RA      5.5732781+01  RAS     1.7218507+02  DES     3.3743645+00  RAN    -6.2445382+01
INC     2.9513346+01  MASS    2.8137644+05
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ID      914098.2
TRANSLUNAR INJECTION TERMINATION
   14  SEPT. 1969   11 HRS,   55 MINS,   7.247 SECS  G.M.T. ****    3. HRS,     8. MINS,  51.926 SECS  G.E.T.
X       5.4305395+02  Y       3.3680330+03  Z       1.1500149+03  DX     -3.0671915+04  DY      1.3373970+04  DZ     -1.2290820+04
ALT     1.5740069+02  LAT     1.8740425+01  LON     2.6877275+02  V       3.5646790+04  PTH     6.3764620+00  AZ      1.1381557+02
R       3.6001512+03  DEC     1.8628769+01  RA      8.0840588+01  RAS     1.7218827+02  DES     3.3729956+00  DEM    -1.1595871+01
RAN    -6.3265255+01  INC     2.9897411+01  ECC     9.7497403-01  SMA     1.4205944+05  RP      3.5551764+03  APF     1.2722680+02
INMP    2.9015757+01  C3TLI  -4.8265930-01  DAZTLI  5.5907308-01  MASS    1.3208360+05  FUEL    1.4929283+05
*****************************************************************************************************************************

ID      914098.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   14  SEPT. 1969   13 HRS,   55 MINS,   7.247 SECS  G.M.T. ****    5. HRS,     8. MINS,  51.926 SECS  G.E.T.
X      -1.7815330+04  Y      -5.1367154+03  Z      -1.0477137+04  DX     -8.8319221+03  DY     -8.7528411+03  DZ     -6.7978591+03
ALT     1.7855390+04  LAT    -2.9496383+01  LON     3.5393395+02  V       1.4171307+04  PTH     6.5001413+01  AZ      9.5273485+01
R       2.1296531+04  DEC    -2.9469784+01  RA     -1.6391607+02  RAS     1.7226304+02  DES     3.3409765+00
*****************************************************************************************************************************

ID      914098.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   17  SEPT. 1969    8 HRS,    7 MINS,  58.037 SECS  G.M.T. ****   71. HRS,    21. MINS,  42.714 SECS  G.E.T.
RMP     9.3861941+02  DEMP    6.4024567+00  RAMP    1.7964789+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(j) 98° launch azimuth; second injection opportunity - Continued

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ID      914098.2
LUNAR ORBIT INSERTION BURN INITIATION
   17  SEPT. 1969   8 HRS,   4 MINS,  41.025 SECS  G.M.T. ****  71. HRS,   18. MINS,  25.702 SECS  G.E.T.
XL     -2.3531967+02  YL     -9.1663650+02  ZL     -3.8203269+02  DXL    -7.6962302+03  DYL     2.8015342+03  DZL     1.5883640+03
XS     -1.0017793+03  YS     -1.9449190+02  ZS     -1.2564133+01  DXS    -2.6393347+02  DYS     8.3455826+03  DZS     3.9604669+02
ALTS    8.2068462+01  LATS   -7.0538585-01  LONS   -1.6901290+02  VRS     8.3591423+03  PTR    -9.1984427+00  AZR    -8.7363122+01
LIN     1.7726537+02  LAN     1.7604974+02  LAP    -1.6340465+02  LTS    -5.6119104-02  LNS     1.0845248+02  DEM    -2.5303132+01
THETA   1.3866602+01  BETA   -1.7706423+02  MASS    9.4833024+04
*****************************************************************************************************************

ID      914098.2
LUNAR ORBIT INSERTION BURN TERMINATION
   17  SEPT. 1969   8 HRS,  10 MINS,  59.306 SECS  G.M.T. ****  71. HRS,   24. MINS,  43.982 SECS  G.E.T.
XL     -6.1613265+02  YL     -7.2938214+02  ZL     -2.8725368+02  DXL    -4.2908116+03  DYL     3.1178959+03  DZL     1.3963770+03
XS     -9.6781795+02  YS      2.3967864+02  ZS      3.8635888+00  DXS     1.3531625+03  DYS     5.3306206+03  DZS     1.1289906+02
ALTS    5.8568350+01  LATS    2.2202021-01  LONS    1.6609063+02  VRS     5.5008463+03  PTR    -3.2951507-01  AZR    -8.8822658+01
LIN     1.7879856+02  LAN     1.7673809+02  LAP     6.8186386+00  SMAS    1.0524115+03  ECCS    5.2907638-02  PERS    2.1448461+00
RPS     9.9673093+02  APOS    1.1080921+03  RANS   -1.7664026+02  INCS    1.5745693+02  LTS    -5.6256860-02  LNS     1.0839902+02
LTE     6.3898064+00  LNE    -4.3623096+00  THETA  -1.0943859+01  BETA   -1.7553581+02  FUEL    2.4048524+04  BARC    2.4855583+01
DELV    2.9604229+03  MASS    7.0784500+04  PLCHNG  1.5333165+00  DRTX   -2.8703769+03  DRTY   -1.4720353+02  DRTZ   -7.0950226+02
*****************************************************************************************************************

ID      914098.2
CIRCULARIZATION BURN INITIATION
   17  SEPT. 1969  12 HRS,  30 MINS,  26.875 SECS  G.M.T. ****  75. HRS,   44. MINS,  11.550 SECS  G.E.T.
XL     -7.0689057+02  YL     -6.5507124+02  ZL     -2.5420616+02  DXL    -3.8664633+03  DYL     3.5619765+03  DZL     1.5698488+03
XS     -9.1547221+02  YS      3.9408543+02  ZS      6.3773827+00  DXS     2.1752183+03  DYS     5.0532389+03  DZS     1.0928348+02
ALTS    5.8217754+01  LATS    3.6660528-01  LONS    1.5670945+02  VRS     5.5026121+03  PTR     7.8651419-03  AZR    -8.8862052+01
LIN     1.7880130+02  LAN     1.7451522+02  LAP     1.7942037+02  LTS    -6.1951457-02  LNS     1.0619887+02  DEM    -2.5889765+01
THETA   0.0000000     BETA   -1.7999999+02  MASS    7.0764500+04
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ID      914098.2
CIRCULARIZATION BURN TERMINATION
   17  SEPT. 1969  12 HRS,  30 MINS,  41.893 SECS  G.M.T. ****  75. HRS,   44. MINS,  26.571 SECS  G.E.T.
XL     -7.1626527+02  YL     -6.4631998+02  ZL     -2.5035229+02  DXL    -3.7189422+03  DYL     3.5189959+03  DZL     1.5484517+03
XS     -9.1008209+02  YS      4.0638424+02  ZS      6.6435371+00  DXS     2.1861897+03  DYS     4.8983218+03  DZS     1.0608102+02
ALTS    5.8221936+01  LATS    3.8190385-01  LONS    1.5593752+02  VRS     5.3650941+03  PTR     1.8143959-02  AZR    -8.8867137+01
LIN     1.7880129+02  LAN     1.7451300+02  LAP     1.5622586+02  SMAS    9.9750023+02  ECCS    8.4842580-04  PERS    1.9791889+00
RPS     9.9665393+02  APOS    9.9834651+02  RANS   -1.7663919+02  INCS    1.5746020+02  LTS    -6.1956986-02  LNS     1.0619676+02
LTE     6.4829811+00  LNE    -4.2445686+00  THETA  -7.6973072-01  BETA   -1.7999999+02  FUEL    9.5476563+02  BARC    7.6988417-01
DELV    1.3749462+02  MASS    6.9809735+04  PLCHNG  4.3330852-06  DRTX   -1.3749264+02  DRTY    0.0000000     DRTZ    0.0000000
*****************************************************************************************************************

ID      914098.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   18  SEPT. 1969   6 HRS,  58 MINS,  50.791 SECS  G.M.T. ****  94. HRS,   12. MINS,  35.468 SECS  G.E.T.
XL     -2.1444624+02  YL      8.9838126+02  ZL      3.7715659+02  DXL     5.2173571+03  DYL     1.1076158+03  DZL     3.3130719+02
XS      9.1019239+02  YS      4.0829285+02  ZS      1.3033503+01  DXS     2.1956062+03  DYS    -4.8889642+03  DZS    -8.6052290+01
ALTS    5.9165301+01  LATS    7.4853842-01  LONS    2.4159984+01  VRS     5.3600430+03  PTR     1.2572090-02  AZR    -9.0920105+01
LIN     1.7881171+02  LAN     1.6511907+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Continued

(j) 98° launch azimuth; second injection opportunity - Continued

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ID      914098.2
CSM PLANE CHANGE BURN INITIATION
   19  SEPT. 1969    4 HRS,    9 MINS,  54.514 SECS  G.M.T. **** 115. HRS,    23. MINS,   39.190 SECS  G.E.T.
XL     -8.9157914+02  YL     -4.1919440+02  ZL     -1.5159160+02  DXL    -2.3905676+03  DYL     4.3998076+03  DZL     1.8785338+03
XS     -4.4723029+02  YS      8.9075589+02  ZS      1.2503138+01  DXS     4.7927458+03  DYS     2.4076266+03  DZS     8.7112432+01
ALTS    5.8310033+01  LATS    7.1869307-01  LONS    1.1666029+02  VRS     5.3642022+03  PTR     2.3955536-02  AZR    -8.9069714+01
LIN     1.7982223+02  LAN     1.5426250+02  LAP    -1.7489979+01  LTS    -1.1626996-01  LNS     8.6032905+01  DEM    -2.8661819+01
THETA   2.0490567-05  BETA   -9.0000106+01  MASS    3.6455734+04
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ID      914098.2
CSM PLANE CHANGE BURN TERMINATION
   19  SEPT. 1969    4 HRS,    9 MINS,  55.453 SECS  G.M.T. **** 115. HRS,    23. MINS,   40.131 SECS  G.E.T.
XL     -8.9194845+02  YL     -4.1851353+02  ZL     -1.5130230+02  DXL    -2.3869751+03  DYL     4.4080125+03  DZL     1.8638764+03
XS     -4.4648930+02  YS      8.9112774+02  ZS      1.2515318+01  DXS     4.7948930+03  DYS     2.4039467+03  DZS     7.0465130+01
ALTS    5.8310372+01  LATS    7.1939299-01  LONS    1.1661263+02  VRS     5.3642263+03  PTR     2.3971558-02  AZR    -8.9247565+01
LIN     1.7895739+02  LAN     1.6023909+02  LAP    -2.7533010+01  SMAS    9.9735243+02  ECCS    6.9180314-04  PERS    1.9787490+00
RPS     9.9666245+02  APOS    9.9804240+02  RANS   -1.7680067+02  INCS    1.5765458+02  LTS    -1.1627040-01  LNS     8.6032782+01
LTE     6.7475893+00  LNE    -2.8507859+00  THETA  -6.5740570-05  BETA   -8.9822467+01  FUEL    5.9722656+01  BARC    4.7949233-02
DELV    1.6595174+01  MASS    3.6396012+04  PLCHNG  1.7778864-01  DRTX    0.0000000     DRTY   -1.6595068+01  DRTZ    0.0000000
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ID      914098.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   19  SEPT. 1969    8 HRS,   36 MINS,  56.650 SECS  G.M.T. **** 119. HRS,    50. MINS,   41.328 SECS  G.E.T.
XL     -4.4487220+02  YL      8.2242861+02  ZL      3.4769160+02  DXL     4.7812602+03  DYL     2.2454848+03  DZL     8.1170791+02
XS      9.1013093+02  YS      4.0826499+02  ZS      1.3071905+01  DXS     2.1963381+03  DYS    -4.8893547+03  DZS    -6.7143863+01
ALTS    5.9098343+01  LATS    7.5079445-01  LONS    2.4159969+01  VRS     5.3604289+03  PTR     2.0627502-02  AZR    -9.0717964+01
LIN     1.7895965+02  LAN     1.5797096+02
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ID      914098.2
TRANSEARTH INJECTION BURN INITIATION
   20  SEPT. 1969    1 HRS,   19 MINS,   4.029 SECS  G.M.T. **** 136. HRS,    32. MINS,   48.702 SECS  G.E.T.
XL      7.2440693+02  YL     -6.2762489+02  ZL     -2.7404551+02  DXL    -3.6740452+03  DYL    -3.6244472+03  DZL    -1.4020227+03
XS     -8.1525805+02  YS     -5.7346800+02  ZS     -1.6374023+01  DXS    -3.0845717+03  DYS     4.3883272+03  DZS     3.9639570+01
ALTS    5.8391301+01  LATS   -9.4113644-01  LONS   -1.4487672+02  VRS     5.3641000+03  PTR    -2.6705804-02  AZR    -8.9576980+01
LIN     1.7896765+02  LAN     1.4939303+02  LAP    -1.1692187+02  LTS    -1.4675207-01  LNS     7.5285283+01  DEM    -2.8098484+01
THETA  -3.1735902+00  BETA   -1.2599175+00  MASS    3.6806012+04
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ID      914098.2
TRANSEARTH INJECTION BURN TERMINATION
   20  SEPT. 1969    1 HRS,   21 MINS,  21.287 SECS  G.M.T. **** 136. HRS,    35. MINS,    5.962 SECS  G.E.T.
XL      6.1487629+02  YL     -7.2339739+02  ZL     -3.1150687+02  DXL    -6.1006913+03  DYL    -4.9230783+03  DZL    -1.9437063+03
XS     -8.9435329+02  YS     -4.4530536+02  ZS     -1.5763255+01  DXS    -3.9749176+03  DYS     7.0493911+03  DZS     1.2656470+01
ALTS    6.0712750+01  LATS   -9.0392292-01  LONS   -1.5353093+02  VRS     8.0928391+03  PTR     2.9463555+00  AZR    -8.9863837+01
LIN     1.7908584+02  LAN     1.2505940+02  LAP    -6.7835843+00  SMAS   -3.4760757+03  ECCS    1.2867748+00  PERS    1.2875128+01
RPS     9.9685100+02  APOS   -7.9490023+03  RANS   -1.7764141+02  INCS    1.5739298+02  LTS    -1.4680794-01  LNS     7.5265905+01
LTE     6.4319319+00  LNE    -1.9061478+00  THETA   5.4573032+00  BETA   -8.3597226-01  FUEL    8.7259170+03  BARC    8.6322343+00
DELV    2.7389952+03  MASS    2.8080095+04  PLCHNG  4.2584570-01  DRTX    2.7341256+03  DRTY   -6.0131159+01  DRTZ    1.5163384+02
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TABLE X.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 14, 1969 - Concluded

(j) 98° launch azimuth; second injection opportunity - Concluded

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ID      914098.2
ENTRY AND TOUCHDOWN
   23  SEPT. 1969  18 HRS,  22 MINS,   8.901 SECS  G.M.T. **** 225. HRS,   35. MINS,  53.574 SECS  G.E.T.
X       5.4412102+02  Y       3.0039120+03  Z       1.7259919+03  DX     -3.5868425+04  DY      2.9822008+03  DZ     -2.0475956+03
R       3.5069364+03  DEC     2.9482989+01  RA      7.9732911+01  V       3.6050382+04  PTH    -6.4000056+00  AZ      9.0128395+01
ALT     6.5809854+01  LAT     2.9645021+01  LON     1.6177282+02  VE      3.4706518+04  PTE    -6.6492664+00  AZE     9.0114284+01
SMA     1.0735309+05  ECC     9.6774536-01  INC     2.9483245+01  RAN    -1.0527753+01  APF     1.0324117+02  RP      3.4626364+03
INMP    4.3662855+00  RAM    -2.4447571+01  DEM    -1.1940887+01  RAS    -1.7949627+02  DES    -2.1842706-01  SPSFR   3.7136213+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   2.4302743+01  LONTD   1.9499985+02  AZTD    1.0733110+02
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ID      914098.2
CIRCUMLUNAR PERICYNTHION
   17  SEPT. 1969   8 HRS,   7 MINS,  57.949 SECS  G.M.T. ****  71. HRS,   21. MINS,  42.625 SECS  G.E.T.
XL     -4.8011125+02  YL     -8.1298120+02  ZL     -3.2526218+02  DXL    -7.3695105+03  DYL     3.5880051+03  DZL     1.9099063+03
XS     -9.9560908+02  YS      7.7479561+01  ZS      3.9096120-01  DXS     6.5366176+02  DYS     9.3972918+03  DZS     4.0151995+02
ALTS    6.0125870+01  LATS    2.2431396-02  LONS    1.7555013+02  VRS     8.4322595+03  PTR    -1.0967821-04  AZR    -8.7270697+01
LIN     1.7726539+02  LAN     1.7601977+02  LAP    -1.7997444+02  LTS    -5.6190821-02  LNS     1.0842464+02  DEM    -2.5310678+01
SMAS   -2.0705578+03  ECCS    1.4822948+00  INCS    1.5661096+02  RANS   -1.7336189+02  APFS   -5.5133704+01  RPS     9.9861939+02
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ID      914098.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   20  SEPT. 1969   1 HRS,  23 MINS,  17.401 SECS  G.M.T. **** 136. HRS,   37. MINS,   2.074 SECS  G.E.T.
X       2.6668600+03  Y       2.1993364+03  Z       6.0565343+02  DX     -2.2718644+04  DY      1.4102541+04  DZ      2.4299176+04
R       3.5094214+03  DEC     9.9378178+00  RA      3.9512105+01  V       3.6131266+04  PTH    -6.7275275+00  AZ      4.4913716+01
ALT     6.5833358+01  LAT     1.0002197+01  LON     1.9920775+01  VE      3.5074333+04  PTE    -6.8842480+00  AZE     4.3123228+01
SMA     1.5646758+05  ECC     9.7788222-01  INC     4.5937114+01  RAN     2.9749369+01  APF     2.7504407+01  RP      3.4607153+03
INMP    2.5271887+01  RAM    -7.9166310+01  DEM    -2.8094144+01  RAS     1.7717633+02  DES     1.2236441+00  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.1889194+01  LONTD   4.3275896+01  AZTD    5.4914398+01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969

(a) 72° launch azimuth; first injection opportunity

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*****************************************************************************************************************

ID      916072.1
LAUNCH TIME      16  SEPT. 1969     7 HRS,   23 MINS,  24.138 SECS   G.M.T.
LAUNCH AZIMUTH   72.                                INJECTION OPPORTUNITY    1
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ID      916072.1
EARTH PARKING ORBIT INSERTION
   16  SEPT. 1969    7 HRS,   34 MINS,  43.879 SECS  G.M.T. ****   0. HRS,   11. MINS,  19.741 SECS  G.E.T.
X       1.7388821+03  Y       2.4311163+03  Z       1.9040553+03  DX     -2.1083719+04  DY      1.4440127+04  DZ      8.1745141+02
ALT     1.0334398+02  LAT     3.2667610+01  LON     3.0566189+02  V       2.5567727+04  PTH    -2.0041353-07  AZ      8.7827504+01
R       3.5439334+03  DEC     3.2498104+01  RA      5.4425345+01  RAS     1.7382025+02  DES     2.6725176+00  RAN    -3.1535853+01
INC     3.2562594+01  MASS    2.8296469+05
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ID      916072.1
3.5 MINS PRIOR TO TLI INITIATION
   16  SEPT. 1969    9 HRS,    5 MINS,  43.122 SECS  G.M.T. ****   1. HRS,   42. MINS,  18.984 SECS  G.E.T.
X       1.1061858+03  Y       2.7896520+03  Z       1.8850791+03  DX     -2.3168134+04  DY      1.0608145+04  DZ     -2.1046630+03
ALT     1.0325869+02  LAT     3.2303778+01  LON     2.9679751+02  V       2.5568042+04  PTH    -1.6977031-03  AZ      9.5577402+01
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ID      916072.1
TRANSLUNAR INJECTION INITIATION
   16  SEPT. 1969    9 HRS,    9 MINS,  13.122 SECS  G.M.T. ****   1. HRS,   45. MINS,  48.984 SECS  G.E.T.
X       2.7953442+02  Y       3.0662751+03  Z       1.7546478+03  DX     -2.4420422+04  DY      5.3161319+03  DZ     -5.4040487+03
ALT     1.0277101+02  LAT     2.9838833+01  LON     3.1234110+02  V       2.5569943+04  PTH    -4.9491279-03  AZ      1.0407571+02
R       3.5438639+03  DEC     2.9677846+01  RA      8.4791075+01  RAS     1.7387910+02  DES     2.6471970+00  RAN    -3.2066736+01
INC     3.2569741+01  MASS    2.8082024+05
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ID      916072.1
TRANSLUNAR INJECTION TERMINATION
   16  SEPT. 1969    9 HRS,   14 MINS,  21.277 SECS  G.M.T. ****   1. HRS,   50. MINS,  57.139 SECS  G.E.T.
X      -1.1689978+03  Y       3.1456765+03  Z       1.3194398+03  DX     -3.3512563+04  DY     -2.7089883+03  DZ     -1.1766315+04
ALT     1.6355225+02  LAT     2.1588840+01  LON     3.3664863+02  V       3.5621294+04  PTH     6.7644281+00  AZ      1.1383190+02
R       3.6059337+03  DEC     2.1463469+01  RA      1.1038610+02  RAS     1.7388230+02  DES     2.6458205+00  DEM    -2.1562660+01
RAN    -2.9976403+01  INC     3.1646765+01  ECC     9.7535209-01  SMA     1.4424238+05  RP      3.5552747+03  APF     1.2208129+02
INMP    1.4393063+01  C3TLI  -4.7535378-01  DAZTLI-1.4443018+00  MASS    1.3140461+05  FUEL    1.4941563+05
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ID      916072.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   16  SEPT. 1969   11 HRS,   14 MINS,  21.277 SECS  G.M.T. ****   3. HRS,   50. MINS,  57.139 SECS  G.E.T.
X      -1.3379254+04  Y      -1.2578341+04  Z      -1.0837317+04  DX     -3.6759762+03  DY     -1.1571922+04  DZ     -7.3097704+03
ALT     1.7881958+04  LAT    -3.0574316+01  LON     5.9413116+01  V       1.4172330+04  PTH     6.5033092+01  AZ      9.8706336+01
R       2.1322911+04  DEC    -3.0547166+01  RA     -1.3676728+02  RAS     1.7395704+02  DES     2.6136579+00
*****************************************************************************************************************

ID      916072.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   19  SEPT. 1969    3 HRS,    0 MINS,  13.760 SECS  G.M.T. ****  67. HRS,   36. MINS,  49.622 SECS  G.E.T.
RMP     9.9868786+02  DEMP    5.7805587+00  RAMP   -1.7903962+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(a) 72° launch azimuth; first injection opportunity - Continued

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ID      916072.1
LUNAR ORBIT INSERTION BURN INITIATION
   19  SEPT. 1969   2 HRS,  56 MINS,  53.032 SECS  G.M.T. ****  67. HRS,   33. MINS,  28.891 SECS  G.E.T.
XL      2.2905954+02  YL     -9.2131001+02  ZL     -3.7597775+02  DXL    -8.3275463+03  DYL    -3.4662860+02  DZL    -5.4959155+02
XS     -9.9184819+02  YS     -2.4262381+02  ZS     -3.2380855+00  DXS    -6.4442085+02  DYS     8.3339973+03  DZS    -4.1423638+02
ALTS    8.2603754+01  LATS   -1.8169566-01  LONS   -1.6625435+02  VRS     8.3691324+03  PTR    -9.3033953+00  AZR    -9.2904729+01
LIN     1.7708390+02  LAN     1.7314735+01  LAP     1.5870447+01  LTS    -1.1454724-01  LNS     8.6651494+01  DEM    -2.8649323+01
THETA   1.4062444+01  BETA   -1.7784134+02  MASS    9.4833024+04
*****************************************************************************************************************

ID      916072.1
LUNAR ORBIT INSERTION BURN TERMINATION
   19  SEPT. 1969   3 HRS,   3 MINS,  12.332 SECS  G.M.T. ****  67. HRS,   39. MINS,  48.194 SECS  G.E.T.
XL     -2.0627823+02  YL     -8.9477516+02  ZL     -3.8928676+02  DXL    -5.3473216+03  DYL     1.2115388+03  DZL     1.3386831+02
XS     -9.7767945+02  YS      1.9[illegible]3684+02  ZS     -2.7400964+01  DXS     1.1092330+03  DYS     5.3761351+03  DZS    -3.5082172+02
ALTS    5.8592559+01  LATS   -1.5747460+00  LONS    1.6878584+02  VRS     5.5005729+03  PTR    -3.4232637-01  AZR    -9.3667627+01
LIN     1.7599910+02  LAN     1.1930738+01  LAP     1.8369768+02  SMAS    1.0523639+03  ECCS    5.2867056-02  PERS    2.1447006+00
RPS     9.9672856+02  APOS    1.1079993+03  RANS    1.7052838+02  INCS    1.5698029+02  LTS    -1.1469622-01  LNS     8.6597937+01
LTF     6.7552502+00  LNE    -2.8969516+00  THETA  -1.0850422+01  BETA   -1.7671762+02  FUEL    2.4113330+04  BARC    2.4937304+01
DELV    2.9696943+03  MASS    7.0719694+04  PLCHNG  1.1300955+00  DRTX   -2.8786556+03  DRTY   -1.0850641+02  DRTZ   -7.2157478+02
*****************************************************************************************************************

ID      916072.1
CIRCULARIZATION BURN INITIATION
   19  SEPT. 1969   7 HRS,  22 MINS,  43.909 SECS  G.M.T. ****  71. HRS,   59. MINS,  19.769 SECS  G.E.T.
XL     -3.2774570+02  YL     -8.5967863+02  ZL     -3.8335989+02  DXL    -5.1695179+03  DYL     1.7953859+03  DZL     3.9148290+02
XS     -9.3083613+02  YS      3.5456908+02  ZS     -3.5414770+01  DXS     1.9654113+03  DYS     5.1289165+03  DZS    -3.2964059+02
ALTS    5.8215740+01  LATS   -2.0362448+00  LONS    1.5914743+02  VRS     5.5024803+03  PTR     7.8718569-03  AZR    -9.3436412+01
LIN     1.7599756+02  LAN     9.6871594+00  LAP    -3.5467542+00  LTS    -1.2083560-01  LNS     8.4399637+01  DEM    -2.8671451+01
THETA  -2.5613209-06  BETA   -1.7959999+02  MASS    7.0699693+04
*****************************************************************************************************************

ID      916072.1
CIRCULARIZATION BURN TERMINATION
   19  SEPT. 1969   7 HRS,  22 MINS,  58.901 SECS  G.M.T. ****  71. HRS,   59. MINS,  34.762 SECS  G.E.T.
XL     -3.4031303+02  YL     -8.5522867+02  ZL     -3.8237242+02  DXL    -5.0163365+03  DYL     1.8113197+03  DZL     4.0887088+02
XS     -9.2596503+02  YS      3.6703525+02  ZS     -3.6214872+01  DXS     1.9826689+03  DYS     4.9750715+03  DZS    -3.1884095+02
ALTS    5.8219910+01  LATS   -2.0822597+00  LONS    1.5837754+02  VRS     5.3650696+03  PTR     1.8121738-02  AZR    -9.3408631+01
LIN     1.7599756+02  LAN     9.6849592+00  LAP    -4.1407178+01  SMAS    9.9750040+02  ECCS    8.5030293-04  PERS    1.9791894+00
RPS     9.9665223+02  APOS    9.9834855+02  RANS    1.7053645+02  INCS    1.5697092+02  LTS    -1.2084143-01  LNS     8.4397528+01
LTF     6.7204135+00  LNE    -2.7151556+00  THETA  -7.6848592-01  BETA    1.7999999+02  FUEL    9.5315625+02  BARC    7.6848486-01
DELV    1.3738836+02  MASS    6.9746538+04  PLCHNG  1.1635603-05  DRTX   -1.3738579+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      916072.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   20  SEPT. 1969   2 HRS,   0 MINS,  11.131 SECS  G.M.T. ****  90. HRS,   36. MINS,  46.992 SECS  G.E.T.
XL     -1.8823210+02  YL      9.0784282+02  ZL      3.6847642+02  DXL     5.2367019+03  DYL     8.0057562+02  DZL     7.0193532+02
XS      9.9753675+02  YS     -1.7411026+01  ZS      1.4239727+00  DXS    -9.4116502+01  DYS    -5.3460640+03  DZS     3.7377859+02
ALTS    5.9196195+01  LATS    8.1776594-02  LONS   -9.9994015-01  VRS     5.3599411+03  PTR    -2.9138488-03  AZR    -8.6001191+01
LIN     1.7598830+02  LAN     1.6617854-01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(a) 72° launch azimuth; first injection opportunity - Continued

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ID      916072.1
CSM PLANE CHANGE BURN INITIATION
   20  SEPT. 1969  23 HRS,  11 MINS,  14.888 SECS  G.M.T. **** 111. HRS,   47. MINS,  50.748 SECS  G.E.T.
XL     -9.0214438+02  YL     -3.6499266+02  ZL     -2.1677470+02  DXL    -2.2531245+03  DYL     4.5221797+03  DZL     1.7494100+03
XS     -2.5071808+01  YS      9.9436291+02  ZS     -6.8477292+01  DXS     5.3605600+03  DYS     1.3261367+02  DZS    -7.8656664+01
ALTS    5.8539753+01  LATS   -3.9382347+00  LONS    9.1444345+01  VRS     5.3627769+03  PTR     3.0576088-02  AZR    -9.0840256+01
LIN     1.7597273+02  LAN    -1.0645440+01  LAP     9.9012914+01  LTS    -1.7926561-01  LNS     6.4179456+01  DEM    -2.5991613+01
THETA  -9.3915100-06  BETA    9.0000003+01  MASS    3.6392537+04
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ID      916072.1
CSM PLANE CHANGE BURN TERMINATION
   20  SEPT. 1969  23 HRS,  11 MINS,  19.681 SECS  G.M.T. **** 111. HRS,   47. MINS,  55.541 SECS  G.E.T.
XL     -9.0391555+02  YL     -3.6143563+02  ZL     -2.1536215+02  DXL    -2.2381005+03  DYL     4.4974275+03  DZL     1.8325602+03
XS     -2.0843039+01  YS      9.9446087+02  ZS     -6.8505298+01  DXS     5.3621877+03  DYS     1.1579793+02  DZS     7.7813523+00
ALTS    5.8541998+01  LATS   -3.9398389+00  LONS    9.1200694+01  VRS     5.3634435+03  PTR     3.0634177-02  AZR    -8.9914624+01
LIN     1.7605923+02  LAN     2.4473836+00  LAP     8.6966879+01  SMAS    9.9753569+02  ECCS    7.3414364-04  PERS    1.9792944+00
RPS     9.9680336+02  APOS    9.9826801+02  RANS    1.7185084+02  INCS    1.5609669+02  LTS    -1.7926763-01  LNS     6.4178775+01
LTE     5.7772034+00  LNE    -8.2836846-01  THETA   1.4744671-03  BETA    8.9087834+01  FUEL    3.0467285+02  BARC    2.4258658-01
DELV    8.5094335+01  MASS    3.6087864+04  PLCHNG  9.1180854-01  DRTX    0.0000000     DRTY    8.5094175+01  DRTZ    0.0000000
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ID      916072.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   21  SEPT. 1969   3 HRS,  38 MINS,  22.114 SECS  G.M.T. **** 116. HRS,   14. MINS,  57.974 SECS  G.E.T.
XL     -4.2093726+02  YL      8.3792637+02  ZL      3.4141370+02  DXL     4.8341048+03  DYL     1.9570365+03  DZL     1.1624923+03
XS      9.9778091+02  YS     -1.7415461+01  ZS      1.4059407+00  DXS    -9.1933747+01  DYS    -5.3459144+03  DZS     3.6745293+02
ALTS    5.9440369+01  LATS    8.0721272-02  LONS   -9.9995010-01  VRS     5.3593165+03  PTR     2.0230912-02  AZR    -8.6068556+01
LIN     1.7605586+02  LAN     1.7090326-01
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ID      916072.1
TRANSEARTH INJECTION BURN INITIATION
   21  SEPT. 1969  20 HRS,   9 MINS,  46.543 SECS  G.M.T. **** 132. HRS,   46. MINS,  22.404 SECS  G.E.T.
XL      9.7654592+02  YL     -2.0091612+02  ZL     -2.7366339+01  DXL    -1.0463812+03  DYL    -4.7742982+03  DZL    -2.1655612+03
XS     -7.2125773+02  YS     -6.8674038+02  ZS      5.4155642+01  DXS    -3.7006256+03  DYS     3.8735490+03  DZS    -2.2757769+02
ALTS    5.8881997+01  LATS    3.1125855+00  LONS   -1.3640434+02  VRS     5.3619774+03  PTR    -3.5807776-02  AZR    -9.2434172+01
LIN     1.7604486+02  LAN    -8.2634250+00  LAP     2.3716329+02  LTS    -2.1124081-01  LNS     5.3533259+01  DEM    -2.2652039+01
THETA  -4.3091620+00  BETA   -4.8218963-01  MASS    3.6497864+04
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ID      916072.1
TRANSEARTH INJECTION BURN TERMINATION
   21  SEPT. 1969  20 HRS,  12 MINS,   2.300 SECS  G.M.T. **** 132. HRS,   48. MINS,  38.161 SECS  G.E.T.
XL      9.3843816+02  YL     -3.3127674+02  ZL     -8.7359580+01  DXL    -2.3932021+03  DYL    -6.9880137+03  DZL    -3.2485502+03
XS     -8.1699974+02  YS     -5.7300549+02  ZS      4.7098383+01  DXS    -4.9370950+03  DYS     6.3898215+03  DZS    -4.1012920+02
ALTS    6.0527066+01  LATS    2.7021858+00  LONS   -1.4495597+02  VRS     8.0853529+03  PTR     2.5039300+00  AZR    -9.3032014+01
LIN     1.7593493+02  LAN    -6.5700074+00  LAP    -1.7477277+02  SMAS   -3.5324823+03  ECCS    1.2823275+00  PERS    1.3189785+01
RPS     9.9731690+02  APOS   -8.0622814+03  RANS    1.7186432+02  INCS    1.5588275+02  LTS    -2.1129891-01  LNS     5.3514118+01
LTE     4.8570097+00  LNE     2.6944346-01  THETA   4.2204370+00  BETA   -3.1913438-01  FUEL    8.6305112+03  BARC    8.5297960+00
DELV    2.7308742+03  MASS    2.7867353+04  PLCHNG  1.6262659-01  DRTX    2.7230499+03  DRTY   -2.2916989+01  DRTZ    2.0519232+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(a) 72° launch azimuth; first injection opportunity - Concluded

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ID      916072.1
ENTRY AND TOUCHDOWN
   25  SEPT. 1969  20 HRS,   4 MINS,  43.763 SECS  G.M.T. **** 228. HRS,   41. MINS,  19.621 SECS  G.E.T.
X      -1.0602189+03  Y       2.9563577+03  Z       1.5611477+03  DX     -3.2923980+04  DY     -1.3148357+04  DZ     -6.4861291+03
R       3.3073204+03  DEC     2.6430455+01  RA      1.0972902+02  V       3.6040777+04  PTH    -6.4000101+00  AZ      9.8422895+01
ALT     6.5683354+01  LAT     2.6581249+01  LON     1.6408224+02  VE      3.4573723+04  PTE    -6.6764046+00  AZE     9.8744591+01
SMA     1.0469575+05  ECC     9.6692324-01  INC     2.7647820+01  RAN     1.3282471+00  APE     1.1943938+02  RP      3.4629966+03
INMP    1.7484004+00  RAM     1.8150441+00  DEM     1.3145484+00  RAS    -1.7763465+02  DES    -1.0252065+00  SPSFR   3.5021784+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   1.7523409+01  LONTD   1.9499943+02  AZTD    1.1177583+02
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ID      916072.1
CIRCUMLUNAR PERICYNTHION
   19  SEPT. 1969   3 HRS,   0 MINS,  11.633 SECS  G.M.T. ****  67. HRS,   36. MINS,  47.493 SECS  G.E.T.
XL     -4.5151699+01  YL     -9.1899490+02  ZL     -3.8830653+02  DXL    -8.4105130+03  DYL     4.9730712+02  DZL    -1.9903138+02
XS     -9.9803326+02  YS      3.2003222+01  ZS     -1.6662180+01  DXS     2.7705067+02  DYS     8.4294119+03  DZS    -4.0504107+02
ALTS    6.0191724+01  LATS   -9.5597381-01  LONS    1.7816336+02  VRS     8.4436838+03  PTR     7.7631263-05  AZR    -9.2749903+01
LIN     1.7708382+02  LAN     1.7284353+01  LAP    -1.5058174+00  LTS    -1.1462527-01  LNS     8.6623452+01  DEM    -2.8649994+01
SMAS   -2.0414517+03  ECCS    1.4892035+00  INCS    1.5707447+02  RANS    1.7341417+02  APES   -9.3475922+01  RPS     9.9868524+02
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ID      916072.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   21  SEPT. 1969  20 HRS,  19 MINS,  22.528 SECS  G.M.T. **** 132. HRS,   55. MINS,  58.390 SECS  G.E.T.
X       1.3636684+03  Y       3.1094278+03  Z       8.9607897+02  DX     -2.7980571+04  DY     1.0541693+03  DZ      2.2820442+04
R       3.5090267+03  DEC     1.4626337+01  RA      6.6319700+01  V       3.6121963+04  PTH   -6.6405107+00  AZ      4.6550717+01
ALT     6.5832742+01  LAT     1.4718850+01  LON     1.2094381+02  VE      3.5052630+04  PTE   -6.7784490+00  AZE     4.4839444+01
SMA     1.4824990+05  ECC     9.7665063-01  INC     4.5375564+01  RAN     5.1393636+01  APE    3.4221154+01  RP      3.4615425+03
INMP    3.4775530+01  RAM    -5.1342913+01  DEM    -2.2622152+01  RAS     1.7878128+02  DES    5.2835327-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.5273910+01  LONTD   1.4634870+02  AZTD    5.9257180+01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(b) 76° launch azimuth; first injection opportunity

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ID      916076.1
LAUNCH TIME      16  SEPT. 1969     8 HRS,   17 MINS,  40.730 SECS   G.M.T.
LAUNCH AZIMUTH   76.                          INJECTION OPPORTUNITY    1
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ID      916076.1
EARTH PARKING ORBIT INSERTION
   16  SEPT. 1969   8 HRS,  28 MINS,  59.281 SECS  G.M.T. ****   0. HRS,   11. MINS,  18.551 SECS  G.E.T.
X       1.1394116+03  Y       2.8184941+03  Z       1.8213446+03  DX     -2.3537926+04  DY      9.8527992+03  DZ     -4.9068064+02
ALT     1.0306013+02  LAT     3.1091121+01  LON     3.0562358+02  V       2.5567727+04  PTH     1.6504643-07  AZ      9.1281939+01
R       3.5439334+03  DEC     3.0926166+01  RA      6.7988359+01  RAS     1.7385405+02  DES     2.6579782+00  RAN    -2.4504831+01
INC     3.0950093+01  MASS    2.8362063+05
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ID      916076.1
3.5 MINS PRIOR TO TLI INITIATION
   16  SEPT. 1969   9 HRS,  57 MINS,   7.599 SECS  G.M.T. ****   1. HRS,   39. MINS,  26.869 SECS  G.E.T.
X       1.1272205+03  Y       2.8238947+03  Z       1.8205485+03  DX     -2.3595145+04  DY      9.8272716+03  DZ     -6.3346194+02
ALT     1.0304835+02  LAT     3.1076153+01  LON     2.8377973+02  V       2.5567702+04  PTH     6.3241292-04  AZ      9.1655163+01
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ID      916076.1
TRANSLUNAR INJECTION INITIATION
   16  SEPT. 1969  10 HRS,   0 MINS,  37.599 SECS  G.M.T. ****   1. HRS,   42. MINS,  56.869 SECS  G.E.T.
X       2.8531069+02  Y       3.0727423+03  Z       1.7424338+03  DX     -2.4871761+04  DY      4.4981511+03  DZ     -3.8634664+03
ALT     1.0276700+02  LAT     2.9610721+01  LON     2.9935803+02  V       2.5568814+04  PTH    -4.0180884-03  AZ      9.9990430+01
R       3.5438994+03  DEC     2.9450493+01  RA      8.4695173+01  RAS     1.7391112+02  DES     2.63[illegible]4196+00  RAN    -2.5016280+01
INC     3.0954392+01  MASS    2.8150842+05
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ID      916076.1
TRANSLUNAR INJECTION TERMINATION
   16  SEPT. 1969  10 HRS,   5 MINS,  46.142 SECS  G.M.T. ****   1. HRS,   48. MINS,   5.412 SECS  G.E.T.
X      -1.1901509+03  Y       3.1026652+03  Z       1.3937447+03  DX     -3.4009596+04  DY     -3.8358206+03  DZ     -9.9240443+03
ALT     1.6134252+02  LAT     2.2885096+01  LON     3.2436004+02  V       3.5634993+04  PTH     6.5929791+00  AZ      1.1063907+02
R       3.6035420+03  DEC     2.2753716+01  RA      1.1098631+02  RAS     1.7391433+02  DES     2.6320410+00  DEM    -2.1722399+01
RAN    -2.3254437+01  INC     3.0346011+01  ECC     9.7554019-01  SMA     1.4535858+05  RP      3.5554432+03  APE     1.1669221+02
INMP    1.0697177+01  C3TLI  -4.7170240-01  DAZTLI-1.0847807+00   MASS    1.3190502+05  FUEL    1.4960340+05
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ID      916076.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   16  SEPT. 1969  12 HRS,   5 MINS,  46.142 SECS  G.M.T. ****   3. HRS,   48. MINS,   5.412 SECS  G.E.T.
X      -1.3473342+04  Y      -1.3047874+04  Z      -1.0135616+04  DX     -3.6432280+03  DY     -1.1698775+04  DZ     -7.1352733+03
ALT     1.7877883+04  LAT    -2.9412760+01  LON     4.7372511+01  V       1.4179089+04  PTH     6.5038577+01  AZ      1.0121558+02
R       2.1319208+04  DEC    -2.8386813+01  RA     -1.3591909+02  RAS     1.7398906+02  DES     2.5998761+00
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ID      916076.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   19  SEPT. 1969   3 HRS,  29 MINS,  35.222 SECS  G.M.T. ****  67. HRS,   11. MINS,  54.489 SECS  G.E.T.
RMP     9.9908029+02  DEMP    5.8705378+00  RAMP   -1.7726018+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(b) 76° launch azimuth; first injection opportunity - Continued

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ID      916076.1
LUNAR ORBIT INSERTION BURN INITIATION
   1°  SEPT. 1969   3 HRS,  26 MINS,  11.935 SECS  G.M.T. ****  67. HRS,    8. MINS,  31.204 SECS  G.E.T.
XL      2.6793955+02  YL     -9.1920878+02  ZL     -3.6802591+02  DXL    -8.2968491+03  DYL    -4.7503530+02  DZL    -7.4335855+02
XS     -9.8770298+02  YS     -2.7678490+02  ZS      3.5121302+00  DXS    -7.9728916+02  DYS     8.3038850+03  DZS    -5.4582344+02
ALTS    8.7264446+01  LATS    1.9617749-01  LONS   -1.6434548+02  VRS     8.3599100+03  PTR    -1.0161151+01  AZR    -9.3768056+01
LIN     1.7621924+02  LAN     1.2684495+01  LAP     1.9634624+02  LTS    -1.1523845-01  LNS     8.6403170+01  DEM    -2.8654921+01
THETA   1.6281334+01  BETA   -1.7956472+02  MASS    9.4833024+04
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ID      916076.1
LUNAR ORBIT INSERTION BURN TERMINATION
   19  SEPT. 1969   3 HRS,  32 MINS,  31.437 SECS  G.M.T. ****  67. HRS,   14. MINS,  50.706 SECS  G.E.T.
XL     -1.6785896+02  YL     -9.0223980+02  ZL     -3.9017897+02  DXL    -5.3867505+03  DYL     1.0274903+03  DZL     5.4647104+01
XS     -9.8399071+02  YS      1.5994306+02  ZS     -2.5166883+01  DXS     9.3314242+02  DYS     5.4088150+03  DZS    -3.5564824+02
ALTS    5.8729054+01  LATS   -1.4461258+00  LONS    1.7076758+02  VRS     5.5002291+03  PTR    -4.6120036-01  AZR    -9.3720338+01
LIN     1.7599865+02  LAN     1.1923027+01  LAP     1.0449818+02  SMAS    1.0525206+03  ECCS    5.3153600-02  PERS    2.1451797+00
RPS     9.9657539+02  APOS    1.1084659+03  RANS    1.7054369+02  INCS    1.5696304+02  LTS    -1.1538763-01  LNS     8.6349581+01
LTE     6.7519937+00  LNE    -2.8767095+00  THETA  -8.5986506+00  BETA   -1.7934934+02  FUEL    2.4126191+04  BARC    2.4880952+01
DELV    2.9715353+03  MASS    7.0706832+04  PLCHNG  2.2565767-01  DRTX   -2.8522829+03  DRTY   -2.1665347+01  DRTZ   -8.3308132+02
*****************************************************************************************************************************

ID      916076.1
CIRCULARIZATION BURN INITIATION
   19  SEPT. 1969   7 HRS,  52 MINS,  44.338 SECS  G.M.T. ****  71. HRS,   35. MINS,   3.607 SECS  G.E.T.
XL     -3.2304725+02  YL     -8.6103431+02  ZL     -3.8390031+02  DXL    -5.1788906+03  DYL     1.7737289+03  DZL     3.8268621+02
XS     -9.3074287+02  YS      3.5437874+02  ZS     -3.5389723+01  DXS     1.9668435+03  DYS     5.1296173+03  DZS    -3.2975550+02
ALTS    5.8060052+01  LATS   -2.0351221+00  LONS    1.5915575+02  VRS     5.5036519+03  PTR    -1.1787030-02  AZR    -9.3437567+01
LIN     1.7599712+02  LAN     9.6731772+00  LAP    -4.4114845+00  LTS    -1.2154826-01  LNS     8.4145478+01  DEM    -2.8669894+01
THETA   5.1226418-06  BETA    1.7999300+02  MASS    7.0686832+04
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ID      916076.1
CIRCULARIZATION BURN TERMINATION
   19  SEPT. 1969   7 HRS,  52 MINS,  59.407 SECS  G.M.T. ****  71. HRS,   35. MINS,  18.676 SECS  G.E.T.
XL     -3.3570085+02  YL     -8.5661446+02  ZL     -3.8292916+02  DXL    -5.0249995+03  DYL     1.7904565+03  DZL     4.0045444+02
XS     -9.2584327+02  YS      3.6690912+02  ZS     -3.6194100+01  DXS     1.9842213+03  DYS     4.9749535+03  DZS    -3.1889675+02
ALTS    5.8059577+01  LATS   -2.0813998+00  LONS    1.5838171+02  VRS     5.3655374+03  PTR    -1.9283685-03  AZR    -9.3409652+01
LIN     1.7599712+02  LAN     9.6709569+00  LAP    -1.6270046+01  SMAS    9.9735492+02  ECCS    8.0462747-04  PERS    1.9787564+00
RPS     9.9655242+02  APOS    9.9815740+02  RANS    1.7055191+02  INCS    1.5695368+02  LTS    -1.2155423-01  LNS     8.4143354+01
LTE     6.7155203+00  LNE    -2.6938044+00  THETA  -7.7265234-01  BETA    1.7999999+02  FUEL    9.5800196+02  BARC    7.7270682-01
DELV    1.3811657+02  MASS    6.9728830+04  PLCHNG  1.1807347-05  DRTX   -1.3811427+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      916076.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   20  SEPT. 1969   2 HRS,  29 MINS,  55.599 SECS  G.M.T. ****  90. HRS,   12. MINS,  14.869 SECS  G.E.T.
XL     -1.9282293+02  YL      9.0671246+02  ZL      3.6802740+02  DXL     5.2328315+03  DYL     8.2530487+02  DZL     7.1205439+02
XS      9.9721983+02  YS     -1.7404718+01  ZS      1.4097061+00  DXS    -9.2494251+01  DYS    -5.3473903+03  DZS     3.7391389+02
ALTS    5.8979187+01  LATS    8.0983007-02  LONS   -9.9989551-01  VRS     5.3612451+03  PTR     1.4570804-02  AZR    -8.6000743+01
LIN     1.7598788+02  LAN     1.5478149-01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(b) 76° launch azimuth; first injection opportunity - Continued

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ID      916076.1
CSM PLANE CHANGE BURN INITIATION
   20  SEPT. 1969  23 HRS,  40 MINS,  43.945 SECS  G.M.T. **** 111. HRS,   23. MINS,   3.213 SECS  G.E.T.
XL     -8.9979873+02  YL     -3.6878344+02  ZL     -2.1328733+02  DXL    -2.2755165+03  DYL     4.5142040+03  DZL     1.7463035+03
XS     -2.5070190+01  YS      9.9396866+02  ZS     -6.8454925+01  DXS     5.3623117+03  DYS     1.3138925+02  DZS    -7.8660177+01
ALTS    5.8144994+01  LATS   -3.9385081+00  LONS    9.1444825+01  VRS     5.3644978+03  PTR     1.6581810-02  AZR    -9.0841012+01
LIN     1.7597231+02  LAN    -1.0654330+01  LAP     1.2921205+02  LTS    -1.8000666-01  LNS     6.3929971+01  DEM    -2.5927373+01
THETA   1.7075473-06  BETA    9.0000000+01  MASS    3.6374830+04
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ID      916076.1
CSM PLANE CHANGE BURN TERMINATION
   20  SEPT. 1969  23 HRS,  40 MINS,  43.744 SECS  G.M.T. **** 111. HRS,   23. MINS,   8.013 SECS  G.E.T.
XL     -9.0158980+02  YL     -3.6522824+02  ZL     -2.1687540+02  DXL    -2.2604993+03  DYL     4.4894757+03  DZL     1.8296268+03
XS     -2.0835053+01  YS      9.9406577+02  ZS     -6.8482908+01  DXS     5.3639435+03  DYS     1.1453951+02  DZS     7.9293751+00
ALTS    5.8146216+01  LATS   -3.9401158+00  LONS    9.1200711+01  VRS     5.3651721+03  PTR     1.6702141-02  AZR    -8.9913768+01
LIN     1.7605895+02  LAN     2.4560394+00  LAP     1.0791924+02  SMAS    9.9739106+02  ECCS    8.0803652-04  PERS    1.9788640+00
RPS     9.9658513+02  APOS    9.9819698+02  RANS    1.7187680+02  INCS    1.5608060+02  LTS    -1.8000863-01  LNS     6.3929305+01
LTE     5.7587930+00  LNE    -8.0320412-01  THETA   1.5547218-03  BETA    8.9086860+01  FUEL    3.0505469+02  BARC    2.4278816-01
DELV    8.5242826+01  MASS    3.6069775+04  PLCHNG  9.1310579-01  DRTX    0.0000000     DRTY    8.5242576+01  DRTZ    0.0000000
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ID      916076.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   21  SEPT. 1969   4 HRS,   7 MINS,  46.584 SECS  G.M.T. **** 115. HRS,   50. MINS,   5.853 SECS  G.E.T.
XL     -4.2501590+02  YL      8.3574491+02  ZL      3.4056637+02  DXL     4.8244541+03  DYL     1.9797869+03  DZL     1.1718517+03
XS      9.9739081+02  YS     -1.7407957+01  ZS      1.4167015+00  DXS    -9.0628078+01  DYS    -5.3476276+03  DZS     3.6759717+02
ALTS    5.9050206+01  LATS    8.1370916-02  LONS   -9.9991015-01  VRS     5.3610131+03  PTR     3.4503110-02  AZR    -8.6068268+01
LIN     1.7605559+02  LAN     1.8028206-01
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ID      916076.1
TRANSEARTH INJECTION BURN INITIATION
   21  SEPT. 1969  20 HRS,  39 MINS,   7.744 SECS  G.M.T. **** 132. HRS,   21. MINS,  27.014 SECS  G.E.T.
XL      9.7606923+02  YL     -2.0395444+02  ZL     -2.8959422+01  DXL    -1.0638463+03  DYL    -4.7687467+03  DZL    -2.1657583+03
XS     -7.2698083+02  YS     -6.8099196+02  ZS      5.3815325+01  DXS    -3.6681636+03  DYS     3.9022090+03  DZS    -2.2992059+02
ALTS    5.9077161+01  LATS    3.0924010+00  LONS   -1.3687079+02  VRS     5.3605524+03  PTR    -3.2803674-02  AZR    -9.2460060+01
LIN     1.7604458+02  LAN    -9.2533465+00  LAP     2.6927955+02  LTS    -2.1199405-01  LNS     5.3285009+01  DEM    -2.2560465+01
THETA  -4.2230265+00  BETA   -4.9123529-01  MASS    3.6479776+04
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ID      916076.1
TRANSEARTH INJECTION BURN TERMINATION
   21  SEPT. 1969  20 HRS,  41 MINS,  23.514 SECS  G.M.T. **** 132. HRS,   23. MINS,  42.778 SECS  G.E.T.
XL      9.3751676+02  YL     -3.3417828+02  ZL     -8.8966329+01  DXL    -2.4154638+03  DYL    -6.9803556+03  DZL    -3.2491944+03
XS     -8.2183148+02  YS     -5.6651621+02  ZS      4.6692061+01  DXS    -4.8885886+03  DYS     6.4271155+03  DZS    -4.1370124+02
ALTS    6.0770095+01  LATS    2.6782048+00  LONS   -1.4542019+02  VRS     8.0856206+03  PTR     2.5339599+00  AZR    -9.3057670+01
LIN     1.7593149+02  LAN    -6.5410377+00  LAP    -1.3639425+02  SMAS   -3.5245571+03  ECCS    1.2830196+00  PERS    1.3145423+01
RPS     9.9751882+02  APOS   -8.0466330+03  RANS    1.7188837+02  INCS    1.5586372+02  LTS    -2.1205216-01  LNS     5.3265869+01
LTE     4.8325162+00  LNE     2.9535812-01  THETA   4.3046669+00  BETA   -3.2498221-01  FUEL    8.6312895+03  BARC    8.5279099+00
DELV    2.7327114+03  MASS    2.7848486+04  PLCHNG  1.6578541-01  DRTX    2.7251846+03  DRTY   -2.3363859+01  DRTZ    2.0123362+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(b) 76° launch azimuth; first injection opportunity - Concluded

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ID      916076.1
ENTRY AND TOUCHDOWN
   25  SEPT. 1969  20 HRS,    5 MINS,  40.276 SECS  G.M.T. **** 227. HRS,    47. MINS,   59.544 SECS  G.E.T.
X      -1.0742237+03  Y       2.9531025+03  Z       1.5591106+03  DX     -3.2861611+04  DY     -1.3283975+04  DZ     -6.5224241+03
R       3.5074891+03  DEC     2.6373697+01  RA      1.0998942+02  V       3.6040136+04  PTH    -6.4000211+00  AZ      9.8490884+01
ALT     6.5842801+01  LAT     2.6524259+01  LON     1.6410653+02  VE      3.4672595+04  PTE    -6.6766632+00  AZE     9.8815520+01
SMA     1.0477774+05  ECC     9.6694753-01  INC     2.7613302+01  RAN     1.4137029+00  APF     1.1960257+02  RP      3.4631633+03
INMP    1.8005659+00  RAM     1.8231011+00  DEM     1.9189393+00  RAS    -1.7763406+02  DES    -1.0254611+00  SPSFR   3.4834265+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   1.7441866+01  LONTD   1.9499908+02  AZTD    1.1179450+02
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ID      916076.1
CIRCUMLUNAR PERICYNTHICN
   19  SEPT. 1969   3 HRS,   29 MINS,  49.149 SECS  G.M.T. ****  67. HRS,    12. MINS,    8.418 SECS  G.E.T.
XL     -3.1594612+01  YL     -9.1999777+02  ZL     -3.8799957+02  DXL    -8.4128946+03  DYL     4.4318197+02  DZL    -3.6578462+02
XS     -9.9857242+02  YS      2.3163740+01  ZS     -1.5946026+01  DXS     2.0413903+02  DYS     8.4289039+03  DZS    -5.3948881+02
ALTS    6.0474811+01  LATS   -9.1462240-01  LONS    1.7867115+02  VRS     8.4486177+03  PTR     1.9429920-07  AZR    -9.3661590+01
LIN     1.7621925+02  LAN     1.2651262+01  LAP    -1.2968540+00  LTS    -1.1532385-01  LNS     8.6372507+01  DEM    -2.8655559+01
SMAS   -2.0269998+03  ECCS    1.4928310+00  INCS    1.5699477+02  RANS    1.7111503+02  APFS   -9.6372595+01  RPS     9.9896834+02
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ID      916076.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   21  SEPT. 1969  21 HRS,    8 MINS,  48.185 SECS  G.M.T. **** 132. HRS,    51. MINS,    7.451 SECS  G.E.T.
X       1.2691791+03  Y       3.1652787+03  Z       8.2712290+02  DX     -2.6291713+04  DY     -4.8537837+02  DZ      2.4761786+04
R       3.5091220+03  DEC     1.3633273+01  RA      6.8150736+01  V       3.6119742+04  PTH    -6.5345173+00  AZ      4.2454152+01
ALT     6.5832845+01  LAT     1.3720011+01  LON     1.1038411+02  VE      3.5124329+04  PTE    -6.6547067+00  AZE     4.0616069+01
SMA     1.4707761+05  ECC     9.7645374-01  INC     4.9005888+01  RAN     5.5981894+01  APF     3.1424384+01  RP      3.4631280+03
INMP    3.9721446+01  RAM    -5.0832909+01  DEM    -2.2467307+01  RAS     1.7881208+02  DES     5.1500123-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.6280875+01  LONTD   1.3393708+02  AZTD    5.4369579+01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(c) 80° launch azimuth; first injection opportunity

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ID      916080.1
LAUNCH TIME      16  SEPT. 1969     9 HRS,   16 MINS,  58.567 SECS   G.M.T.
LAUNCH AZIMUTH   80.                          INJECTION OPPORTUNITY    1
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ID      916080.1
EARTH PARKING ORBIT INSERTION
   16  SEPT. 1969   9 HRS,  28 MINS,  16.214 SECS  G.M.T. ****   0. HRS,   11. MINS,  17.648 SECS  G.E.T.
X       3.9169564+02  Y       3.0636227+03  Z       1.7378880+03  DX     -2.5146320+04  DY      4.2486698+03  DZ     -1.8221068+03
ALT     1.0278650+02  LAT     2.9525761+01  LON     3.0548815+02  V       2.5567727+04  PTH    -7.0734184-08  AZ      9.4690495+01
R       3.5439335+03  DEC     2.9365818+01  RA      8.2714047+01  RAS     1.7389097+02  DES     2.6420915+00  RAN    -1.6784345+01
INC     2.9705053+01  MASS    2.8411853+05
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ID      916080.1
3.5 MINS PRIOR TO TLI INITIATION
   16  SEPT. 1969  10 HRS,  53 MINS,  16.589 SECS  G.M.T. ****   1. HRS,   36. MINS,  18.023 SECS  G.E.T.
X       1.1375207+03  Y       2.8627092+03  Z       1.7521584+03  DX     -2.3921397+04  DY      8.9860857+03  DZ      8.5370678+02
ALT     1.0278327+02  LAT     2.9792176+01  LON     2.5979356+02  V       2.5567787+04  PTH     5.8772416-03  AZ      8.7801871+01
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ID      916080.1
TRANSLUNAR INJECTION INITIATION
   16  SEPT. 1969  10 HRS,  56 MINS,  46.589 SECS  G.M.T. ****   1. HRS,   39. MINS,  48.023 SECS  G.E.T.
X       2.8412998+02  Y       3.0815736+03  Z       1.7270244+03  DX     -2.5206384+04  DY      3.6134245+03  DZ     -2.3006023+03
ALT     1.0274822+02  LAT     2.9323779+01  LON     2.8531902+02  V       2.5567780+04  PTH    -3.3197875-05  AZ      9.5914470+01
R       3.5439299+03  DEC     2.9164518+01  RA      8.4732056+01  RAS     1.7394610+02  DES     2.6183696+00  RAN    -1.7269327+01
INC     2.9706453+01  MASS    2.8205664+05
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ID      916080.1
TRANSLUNAR INJECTION TERMINATION
   16  SEPT. 1969  11 HRS,   1 MINS,  55.473 SECS  G.M.T. ****   1. HRS,   44. MINS,  56.906 SECS  G.E.T.
X      -1.2111602+03  Y       3.0581182+03  Z       1.4667884+03  DX     -3.4360592+04  DY     -5.0314762+03  DZ     -8.0485397+03
ALT     1.5944214+02  LAT     2.4170956+01  LON     3.1090234+02  V       3.5647510+04  PTH     6.4508080+00  AZ      1.0741010+02
R       3.6014531+03  DEC     2.4033882+01  RA      1.1160592+02  RAS     1.7394930+02  DES     2.6169899+00  DEM    -2.1895295+01
RAN    -1.5987829+01  INC     2.9370774+01  ECC     9.7576511-01  SMA     1.4670707+05  RP      3.5554300+03  APF     1.1079774+02
INMP    6.9524686+00  C3TLI  -4.6736795-01  DAZTLI-7.1542066-01   MASS    1.3228793+05  FUEL    1.4976870+05
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ID      916080.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   16  SEPT. 1969  13 HRS,   1 MINS,  55.473 SECS  G.M.T. ****   3. HRS,   44. MINS,  56.906 SECS  G.E.T.
X      -1.3506040+04  Y      -1.3536974+04  Z      -9.4224176+03  DX     -3.5898744+03  DY     -1.1829412+04  DZ     -6.9583859+03
ALT     1.7876031+04  LAT    -2.6256124+01  LON     3.4279827+01  V       1.4185955+04  PTH     6.5047489+01  AZ      1.0372267+02
R       2.1317710+04  DEC    -2.6231527+01  RA     -1.3493446+02  RAS     1.7402405+02  DES     2.5848222+00
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ID      916080.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   19  SEPT. 1969   4 HRS,   1 MINS,  44.285 SECS  G.M.T. ****  66. HRS,   44. MINS,  45.718 SECS  G.E.T.
RMP     9.9935072+02  DEMP    5.7970706+00  RAMP   -1.7858725+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(c) 80° launch azimuth; first injection opportunity - Continued

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ID      916080.1
LUNAR ORBIT INSERTION BURN INITIATION
   19  SEPT. 1969    3 HRS,   58 MINS,  23.406 SECS  G.M.T. ****  66. HRS,    41. MINS,  24.840 SECS  G.E.T.
XL      2.4731487+02  YL     -9.1989191+02  ZL     -3.6531112+02  DXL    -8.3134452+03  DYL    -4.3413647+02  DZL    -8.7194022+02
XS     -9.8880994+02  YS     -2.5106645+02  ZS      6.2025563+00  DXS    -7.6446955+02  DYS     8.3238719+03  DZS    -6.8046216+02
ALTS    8.1711324+01  LATS    3.4834425-01  LONS   -1.6575322+02  VRS     8.3865538+03  PTR    -8.9979440+00  AZR    -9.4656800+01
LIN     1.7532096+02  LAN     9.9867331+00  LAP     1.5940604+01  LTS    -1.1599799-01  LNS     8.6130481+01  DEM    -2.8660169+01
THETA   1.3108157+01  BETA    1.7868768+02  MASS    9.4833024+04
*****************************************************************************************************************************

ID      916080.1
LUNAR ORBIT INSERTION BURN TERMINATION
   19  SEPT. 1969    4 HRS,    4 MINS,  44.322 SECS  G.M.T. ****  66. HRS,    47. MINS,  45.753 SECS  G.E.T.
XL     -1.9000446+02  YL     -8.9833935+02  ZL     -3.9042123+02  DXL    -5.3638867+03  DYL     1.1268484+03  DZL     9.8695663+01
XS     -9.7969010+02  YS      1.8715101+02  ZS     -2.6940557+01  DXS     1.0699975+03  DYS     5.3813420+03  DZS    -3.5187421+02
ALTS    5.9275983+01  LATS   -1.5472189+00  LONS    1.6918503+02  VRS     5.4979588+03  PTR    -3.3070556-01  AZR    -9.3679837+01
LIN     1.7599855+02  LAN     1.1898934+01  LAP     1.8502803+02  SMAS    1.0527668+03  ECCS    5.2559619-02  PERS    2.1459324+00
RPS     9.9743383+02  APOS    1.1080998+03  RANS    1.7056067+02  INCS    1.5694525+02  LTS    -1.1614791-01  LNS     8.6076707+01
LTE     6.7482171+00  LNE    -2.8543872+00  THETA  -1.1955555+01  BETA    1.7798518+02  FUEL    2.4216066+04  BARC    2.5072872+01
DELV    2.9844094+03  MASS    7.0616958+04  PLCHNG  6.9373482-01  DRTX   -2.9058852+03  DRTY    6.6567156+01  DRTZ   -6.7683429+02
*****************************************************************************************************************************

ID      916080.1
CIRCULARIZATION BURN INITIATION
   19  SEPT. 1969    8 HRS,   23 MINS,  59.099 SECS  G.M.T. ****  71. HRS,     7. MINS,    .533 SECS  G.E.T.
XL     -2.8995688+02  YL     -8.7248607+02  ZL     -3.8670970+02  DXL    -5.2336246+03  DYL     1.6072629+03  DZL     3.0995440+02
XS     -9.4190250+02  YS      3.2641014+02  ZS     -3.3576200+01  DXS     1.8125458+03  DYS     5.1816262+03  DZS    -3.3520232+02
ALTS    5.8928800+01  LATS   -1.9291108+00  LONS    1.6088657+02  VRS     5.4997212+03  PTR    -4.8582174-02  AZR    -9.3497907+01
LIN     1.7599697+02  LAN     9.6576039+00  LAP     4.5371292+00  LTS    -1.2229094-01  LNS     8.3880839+01  DEM    -2.8667393+01
THETA  -4.2688681-06  BETA   -1.7959999+02  MASS    7.0596957+04
*****************************************************************************************************************************

ID      916080.1
CIRCULARIZATION BURN TERMINATION
   19  SEPT. 1969    8 HRS,   24 MINS,  14.190 SECS  G.M.T. ****  71. HRS,     7. MINS,   15.622 SECS  G.E.T.
XL     -3.0276565+02  YL     -8.6846711+02  ZL     -3.8591526+02  DXL    -5.0802542+03  DYL     1.6288803+03  DZL     3.2973666+02
XS     -9.3737323+02  YS      3.3908863+02  ZS     -3.4395242+01  DXS     1.8344628+03  DYS     5.0272076+03  DZS    -3.2430599+02
ALTS    5.8919485+01  LATS   -1.9762055+00  LONS    1.6011274+02  VRS     5.3612725+03  PTR    -4.0210573-02  AZR    -9.3471429+01
LIN     1.7599698+02  LAN     9.6553572+00  LAP     8.7728640+01  SMAS    9.9747870+02  ECCS    7.0700470-04  PERS    1.9791248+00
RPS     9.9677347+02  APOS    9.9818391+02  RANS    1.7056885+02  INCS    1.5693592+02  LTS    -1.2229691-01  LNS     8.3878700+01
LTE     6.7102335+00  LNE    -2.6714972+00  THETA  -7.7253110-01  BETA   -1.7999300+02  FUEL    9.5940820+02  BARC    7.7254851-01
DELV    1.3849803+02  MASS    6.9637549+04  PLCHNG  1.0921391-05  DRTX   -1.3849606+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      916080.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   20  SEPT. 1969    3 HRS,    1 MINS,  54.603 SECS  G.M.T. ****  89. HRS,    44. MINS,  56.035 SECS  G.E.T.
XL     -1.9765095+02  YL      9.0501823+02  ZL      3.6733676+02  DXL     5.2320493+03  DYL     8.5179441+02  DZL     7.2310788+02
XS      9.9637134+02  YS     -1.7389014+01  ZS      1.3811281+00  DXS    -9.1525382+01  DYS    -5.3522525+03  DZS     3.7427171+02
ALTS    5.8030518+01  LATS    7.9408859-02  LONS   -9.9984407-01  VRS     5.3661031+03  PTR     2.5651205-02  AZR    -8.6000546+01
LIN     1.7598773+02  LAN     1.3234680-01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(c) 80° launch azimuth; first injection opportunity - Continued

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ID      916080.1
CSM PLANE CHANGE BURN INITIATION
   21  SEPT. 1969   0 HRS,  12 MINS,  59.269 SECS  G.M.T. **** 110. HRS,   55. MINS,    .701 SECS  G.E.T.
XL     -8.9776830+02  YL     -3.7315430+02  ZL     -2.2006559+02  DXL    -2.2954156+03  DYL     4.5046713+03  DZL     1.7427824+03
XS     -2.5086867+01  YS      9.9415506+02  ZS     -6.8463568+01  DXS     5.3617603+03  DYS     1.2616325+02  DZS    -7.8455874+01
ALTS    5.8331837+01  LATS   -3.9382666+00  LONS    9.1445515+01  VRS     5.3638182+03  PTR    -3.9783569-02  AZR    -9.0842814+01
LIN     1.7597216+02  LAN    -1.0679503+01  LAP     2.0520059+02  LTS    -1.8081779-01  LNS     6.3657065+01  DEM    -2.5856292+01
THETA  -1.6221698-05  BETA    8.9999991+01  MASS    3.6283549+04
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ID      916080.1
CSM PLANE CHANGE BURN TERMINATION
   21  SEPT. 1969   0 HRS,  13 MINS,   4.068 SECS  G.M.T. **** 110. HRS,   56. MINS,   5.500 SECS  G.E.T.
XL     -8.9957532+02  YL     -3.6960623+02  ZL     -2.1865617+02  DXL    -2.2804612+03  DYL     4.4799258+03  DZL     1.8263409+03
XS     -2.0851362+01  YS      9.9424805+02  ZS     -6.8491306+01  DXS     5.3633977+03  DYS     1.0933293+02  DZS     8.3579912+00
ALTS    5.8328949+01  LATS   -3.9398763+00  LONS    9.1201430+01  VRS     5.3645185+03  PTR    -3.9671114-02  AZR    -8.9913203+01
LIN     1.7605916+02  LAN     2.4672893+00  LAP     1.6590333+02  SMAS    9.9751181+02  ECCS    9.7972752-04  PERS    1.9792234+00
RPS     9.9653453+02  APOS    9.9848908+02  RANS    1.7190665+02  INCS    1.5606326+02  LTS    -1.8081985-01  LNS     6.3656382+01
LTE     5.7384725+00  LNE    -7.7563763-01  THETA   1.5538680-03  BETA    8.9084026+01  FUEL    3.0508984+02  BARC    2.4288888-01
DELV    8.5467636+01  MASS    3.5978459+04  PLCHNG  9.1563447-01  DRTX    0.0000000     DRTY    8.5467497+01  DRTZ    0.0000000
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ID      916080.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   21  SEPT. 1969   4 HRS,  40 MINS,   2.754 SECS  G.M.T. **** 115. HRS,   23. MINS,   4.185 SECS  G.E.T.
XL     -4.2928968+02  YL      8.3296724+02  ZL      3.3948091+02  DXL     4.8172979+03  DYL     2.0043415+03  DZL     1.1821120+03
XS      9.9652735+02  YS     -1.7392039+01  ZS      1.4285721+00  DXS    -9.1094648+01  DYS    -5.3525502+03  DZS     3.6791460+02
ALTS    5.8186617+01  LATS    8.2123824-02  LONS   -9.9986140-01  VRS     5.3659531+03  PTR     3.0415295-02  AZR    -8.6068481+01
LIN     1.7605581+02  LAN     1.9132184-01
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ID      916080.1
TRANSEARTH INJECTION BURN INITIATION
   21  SEPT. 1969  21 HRS,  11 MINS,  42.526 SECS  G.M.T. **** 131. HRS,   54. MINS,  43.958 SECS  G.E.T.
XL      9.7600019+02  YL     -2.0715608+02  ZL     -3.0633361+01  DXL    -1.0773510+03  DYL    -4.7623684+03  DZL    -2.1654470+03
XS     -7.3339852+02  YS     -6.7505309+02  ZS      5.3463256+01  DXS    -3.6350185+03  DYS     3.9287511+03  DZS    -2.3208402+02
ALTS    5.9719080+01  LATS    3.0701730+00  LONS   -1.3737213+02  VRS     5.3574535+03  PTR     1.4931333-02  AZR    -9.2487176+01
LIN     1.7604483+02  LAN    -8.2452806+00  LAP     1.9119166+01  LTS    -2.1283043-01  LNS     5.3009478+01  DEM    -2.2458151+01
THETA  -4.2687751+00  BETA   -4.9967703-01  MASS    3.6388459+04
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ID      916080.1
TRANSEARTH INJECTION BURN TERMINATION
   21  SEPT. 1969  21 HRS,  13 MINS,  58.055 SECS  G.M.T. **** 131. HRS,   56. MINS,  59.488 SECS  G.E.T.
XL      9.3711475+02  YL     -3.3697195+02  ZL     -9.0529197+01  DXL    -2.4384776+03  DYL    -6.9710013+03  DZL    -3.2492362+03
XS     -8.2711596+02  YS     -5.6005909+02  ZS      4.6288732+01  DXS    -4.8346241+03  DYS     6.4661508+03  DZS    -4.1735380+02
ALTS    6.1471303+01  LATS    2.6531904+00  LONS   -1.4589717+02  VRS     8.0844839+03  PTR     2.5384618+00  AZR    -9.3083131+01
LIN     1.7592860+02  LAN    -6.5167829+00  LAP    -1.2818276+01  SMAS   -3.5152233+03  ECCS    1.2839686+00  PERS    1.3093240+01
RPS     9.9821318+02  APOS   -8.0286597+03  RANS    1.7191634+02  INCS    1.5584364+02  LTS    -2.1288842-01  LNS     5.2990384+01
LTE     4.8051828+00  LNE     3.2412498-01  THETA   4.2349819+00  BETA   -3.3035666-01  FUEL    8.6159634+03  BARC    8.5039818+00
DELV    2.7350000+03  MASS    2.7772495+04  PLCHNG  1.6878206-01  DRTX    2.7273016+03  DRTY   -2.3783290+01  DRTZ    2.0357995+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(c) 80° launch azimuth; first injection opportunity - Concluded

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ID      916080.1
ENTRY AND TOUCHDOWN
   25  SEPT. 1969  20 HRS,   6 MINS,  42.618 SECS  G.M.T. **** 226. HRS,   49. MINS,  44.045 SECS  G.E.T.
X      -1.0896832+03  Y       2.9492834+03  Z       1.5546741+03  DX     -3.2792559+04  DY     -1.3433434+04  DZ     -6.5644145+03
R       3.5075196+03  DEC     2.6310810+01  RA      1.1027795+02  V       3.6040264+04  PTH    -6.4000104+00  AZ      9.8569102+01
ALT     6.5863175+01  LAT     2.6461120+01  LON     1.6413459+02  VE      3.4672260+04  PTE    -6.6769135+00  AZE     9.8897098+01
SMA     1.0487573+05  ECC     9.6697813-01  INC     2.7576172+01  RAN     1.5019486+00  APF     1.1978918+02  RP      3.4631941+03
INMP    1.8552754+00  RAM     1.8320052+00  DEM     1.9237918+00  RAS    -1.7763340+02  DES    -1.0257424+00  SPSFR   3.4079003+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   1.7350027+01  LONTD   1.9499929+02  AZTD    1.1181747+02
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ID      916080.1
CIRCUMLUNAR PERICYNTHION
   19  SEPT. 1969   4 HRS,   1 MINS,  34.688 SECS  G.M.T. ****  66. HRS,   44. MINS,  36.118 SECS  G.E.T.
XL     -1.6576082+01  YL     -9.2090251+02  ZL     -3.8763264+02  DXL    -8.4141258+03  DYL     3.7849863+02  DZL    -5.3944648+02
XS     -9.9909434+02  YS      1.3210108+01  ZS     -1.5204799+01  DXS     1.2170979+02  DYS     8.4280251+03  DZS    -6.7639253+02
ALTS    6.0803840+01  LATS   -8.7181704-01  LONS    1.7924247+02  VRS     8.4559995+03  PTR     1.3544795-04  AZR    -9.4588503+01
LIN     1.7532096+02  LAN     9.9574800+00  LAP     1.1675823+01  LTS    -1.1607332-01  LNS     8.6103477+01  DEM    -2.8660640+01
SMAS   -2.0065095+03  ECCS    1.4980277+00  INCS    1.5685025+02  RANS    1.6880924+02  APFS   -9.9356814+01  RPS     9.9929736+02
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ID      916080.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   21  SEPT. 1969  22 HRS,   2 MINS,  50.053 SECS  G.M.T. **** 132. HRS,   45. MINS,  51.485 SECS  G.E.T.
X       1.1742713+03  Y       3.2208434+03  Z       7.4966339+02  DX     -2.4134120+04  DY     -1.9790115+03  DZ      2.6797132+04
R       3.5092364+03  DEC     1.2334917+01  RA      6.9968899+01  V       3.6117288+04  PTH    -6.6262394+00  AZ      3.7815423+01
ALT     6.5832229+01  LAT     1.2413946+01  LON     9.8657509+01  VE      3.5212816+04  PTE    -6.7331728+00  AZE     3.5843218+01
SMA     1.4583535+05  ECC     9.7626130-01  INC     5.3204104+01  RAN     6.0555050+01  APF     2.8886742+01  RP      3.4619433+03
INMP    4.5219363+01  RAM    -5.0276625+01  DEM    -2.2296181+01  RAS     1.7884576+02  DES     5.0040533-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.7106920+01  LONTD   1.1981218+02  AZTD    4.8601560+01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(d) 83° launch azimuth; first injection opportunity

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ID      916083.1
LAUNCH TIME      16  SEPT. 1969   10 HRS,    4 MINS,  49.132 SECS   G.M.T.
LAUNCH AZIMUTH   83.                          INJECTION OPPORTUNITY    1
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ID      916083.1
EARTH PARKING ORBIT INSERTION
   16  SEPT. 1969  10 HRS,  16 MINS,   6.290 SECS  G.M.T. ****   0. HRS,   11. MINS,  17.158 SECS  G.E.T.
X     -2.4740751+02  Y      3.1133445+03  Z      1.6749148+03  DX    -2.5405596+04  DY    -4.9547075+02  DZ    -2.8317644+03
ALT    1.0258841+02  LAT    2.8360051+01  LON    3.0532628+02  V      2.5567727+04  PTH    0.0000000     AZ     9.7219863+01
R      3.5439334+03  DEC    2.8204151+01  RA     9.4543564+01  RAS    1.7392077+02  DES    2.6292707+00  RAN   -1.0461514+01
INC    2.9039910+01  MASS   2.8438825+05
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ID      916083.1
3.5 MINS PRIOR TO TLI INITIATION
   16  SEPT. 1969  11 HRS,  38 MINS,  34.566 SECS  G.M.T. ****   1. HRS,   33. MINS,  45.434 SECS  G.E.T.
X      1.1378100+03  Y      2.8950598+03  Z      1.6977599+03  DX    -2.4099374+04  DY     8.3042677+03  DZ     2.0010889+03
ALT    1.0250543+02  LAT    2.8782848+01  LON    2.5865273+02  V      2.5568438+04  PTH    1.1516107-02  AZ     8.4890895+01
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ID      916083.1
TRANSLUNAR INJECTION INITIATION
   16  SEPT. 1969  11 HRS,  42 MINS,   4.566 SECS  G.M.T. ****   1. HRS,   37. MINS,  15.434 SECS  G.E.T.
X      2.7831871+02  Y      3.0895890+03  Z      1.7135495+03  DX    -2.5379534+04  DY     2.8944549+03  DZ    -1.0920586+03
ALT    1.0268222+02  LAT    2.9073955+01  LON    2.7408358+02  V      2.5567386+04  PTH    4.9197837-03  AZ     9.2799661+01
R      3.5439065+03  DEC    2.8915548+01  RA     8.4952530+01  RAS    1.7397431+02  DES    2.6042275+00  RAN   -1.0922583+01
INC    2.9039109+01  MASS   2.8238025+05
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ID      916083.1
TRANSLUNAR INJECTION TERMINATION
   16  SEPT. 1969  11 HRS,  47 MINS,  13.690 SECS  G.M.T. ****   1. HRS,   42. MINS,  24.558 SECS  G.E.T.
X     -1.2271008+03  Y      3.0228736+03  Z      1.5221366+03  DX    -3.4526288+04  DY    -5.9868930+03  DZ    -6.5929691+03
ALT    1.5819962+02  LAT    2.5153264+01  LON    3.0003364+02  V      3.5656341+04  PTH    6.3665421+00  AZ     1.0491357+02
R      3.6000612+03  DEC    2.5012029+01  RA     1.1209413+02  RAS    1.7397752+02  DES    2.6048461+00  DEM   -2.2033578+01
RAN   -1.0113283+01  INC    2.8872880+01  ECC    9.7596925-01  SMA    1.4794589+05  RP     3.5552499+03  APF    1.0599112+02
INMP   4.0516678+00  C3TLI -4.6345484-01  DAZTLI-4.2562791-01  MASS   1.3249506+05  FUEL   1.4988519+05
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ID      916083.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   16  SEPT. 1969  13 HRS,  47 MINS,  13.690 SECS  G.M.T. ****   3. HRS,   42. MINS,  24.558 SECS  G.E.T.
X     -1.3490985+04  Y     -1.3921271+04  Z     -8.3694186+03  DX    -3.5372780+03  DY    -1.1930818+04  DZ    -6.8217496+03
ALT    1.7876484+04  LAT   -2.4608600+01  LON    2.3756664+01  V      1.4191300+04  PTH    6.5057252+01  AZ     1.0565172+02
R      2.1218420+04  DEC   -2.4585132+01  RA    -1.3410071+02  RAS    1.7405226+02  DES    2.5726765+00
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ID      916083.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   19  SEPT. 1969   4 HRS,  26 MINS,   7.893 SECS  G.M.T. ****  66. HRS,   21. MINS,  18.761 SECS  G.E.T.
RMP    9.9935620+02  DFMP   5.8459757+00  RAMP  -1.7756471+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(d) 83° launch azimuth; first injection opportunity - Continued

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ID      916083.1
LUNAR ORBIT INSERTION BURN INITIATION
   19  SEPT. 1969   4 HRS,  22 MINS,  47.485 SECS  G.M.T. ****  66. HRS,   17. MINS,  58.353 SECS  G.E.T.
XL      2.6826473+02  YL     -9.1793577+02  ZL     -3.5965682+02  DXL    -8.2961231+03  DYL    -5.1569220+02  DZL    -1.0157887+03
XS     -9.8585378+02  YS     -2.6814298+02  ZS      1.0802500+01  DXS    -8.6180038+02  DYS     8.3089884+03  DZS    -7.8332310+02
ALTS    8.3232972+01  LATS    6.0578755-01  LONS   -1.6478417+02  VRS     8.3902074+03  PTR    -9.3101680+00  AZR    -9.5329300+01
LIN     1.7462590+02  LAN     8.7623062+00  LAP     2.0769800+01  LTS    -1.1657423-01  LNS     8.5923792+01  DEM    -2.8663520+01
THETA   1.3754660+01  BETA    1.7736212+02  MASS    9.4833024+04
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ID      916083.1
LUNAR ORBIT INSERTION BURN TERMINATION
   19  SEPT. 1969   4 HRS,  29 MINS,   9.710 SECS  G.M.T. ****  66. HRS,   24. MINS,  20.577 SECS  G.E.T.
XL     -1.7064551+02  YL     -9.0178494+02  ZL     -3.9083477+02  DXL    -5.3831411+03  DYL     1.0366347+03  DZL     6.0075156+01
XS     -9.8232426+02  YS      1.7161906+02  ZS     -2.5955762+01  DXS     9.9257449+02  DYS     5.3965351+03  DZS    -3.5404963+02
ALTS    5.9047332+01  LATS   -1.4909901+00  LONS    1.7009003+02  VRS     5.4984675+03  PTR    -4.1462764-01  AZR    -9.3704025+01
LIN     1.7599744+02  LAN     1.1928189+01  LAP     1.7846213+02  SMAS    1.0524762+03  ECCS    5.2697143-02  PERS    2.1450440+00
RPS     9.9701376+02  APOS    1.1079387+03  RANS    1.7057417+02  INCS    1.5692832+02  LTS    -1.1672475-01  LNS     8.5869832+01
LTE     6.7452161+00  LNE    -2.8374065+00  THETA  -1.1361247+01  BETA    1.7596333+02  FUEL    2.4299263+04  BARC    2.5152890+01
DELV    2.9963415+03  MASS    7.0533760+04  PLCHNG  1.3961065+00  DRTX   -2.9073303+03  DRTY    1.3394614+02  DRTZ   -7.1242470+02
*****************************************************************************************************************

ID      916083.1
CIRCULARIZATION BURN INITIATION
   19  SEPT. 1969   8 HRS,  48 MINS,  55.410 SECS  G.M.T. ****  70. HRS,   44. MINS,   6.277 SECS  G.E.T.
XL     -3.0326110+02  YL     -8.6779311+02  ZL     -3.8596688+02  DXL    -5.2123327+03  DYL     1.6741364+03  DZL     3.4035881+02
XS     -9.3540292+02  YS      3.4324922+02  ZS     -3.4697242+01  DXS     1.9057985+03  DYS     5.1498984+03  DZS    -3.3193772+02
ALTS    5.8503252+01  LATS   -1.9943967+00  LONS    1.5984921+02  VRS     5.5012456+03  PTR    -3.6286811-02  AZR    -9.3462625+01
LIN     1.7599587+02  LAN     9.6823372+00  LAP     3.8472030+00  LTS    -1.2288415-01  LNS     8.3669613+01  DEM    -2.8664757+01
THETA   8.5377364-07  BETA   -1.7999999+02  MASS    7.0513760+04
*****************************************************************************************************************

ID      916083.1
CIRCULARIZATION BURN TERMINATION
   19  SEPT. 1969   8 HRS,  49 MINS,  10.396 SECS  G.M.T. ****  70. HRS,   44. MINS,  21.263 SECS  G.E.T.
XL     -3.1592897+02  YL     -8.6363981+02  ZL     -3.8510414+02  DXL    -5.0594915+03  DYL     1.6936047+03  DZL     3.5920186+02
XS     -9.3067887+02  YS      3.5576170+02  ZS     -3.5502624+01  DXS     1.9247743+03  DYS     4.9960179+03  DZS    -3.2111055+02
ALTS    5.8496940+01  LATS   -2.0407223+00  LONS    1.5908012+02  VRS     5.3635866+03  PTR    -2.7372486-02  AZR    -9.3435434+01
LIN     1.7599589+02  LAN     9.6801291+00  LAP     2.3183612+01  SMAS    9.9749967+02  ECCS    7.0012047-04  PERS    1.9791872+00
RPS     9.9680129+02  APOS    9.9819802+02  RANS    1.7058253+02  INCS    1.5691900+02  LTS    -1.2289006-01  LNS     8.3667505+01
LTE     6.7058751+00  LNE    -2.6536410+00  THETA  -7.6774826-01  BETA    1.7999999+02  FUEL    9.5273828+02  BARC    7.6784798-01
DELV    1.3769206+02  MASS    6.9561022+04  PLCHNG  1.1372999-05  DRTX   -1.3769034+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      916083.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   20  SEPT. 1969   3 HRS,  26 MINS,  33.236 SECS  G.M.T. ****  89. HRS,   21. MINS,  44.101 SECS  G.E.T.
XL     -2.0159749+02  YL      9.0473635+02  ZL      3.6727905+02  DXL     5.2251719+03  DYL     8.7053351+02  DZL     7.3058500+02
XS      9.9688445+02  YS     -1.7397349+01  ZS      1.4153416+00  DXS    -9.1332259+01  DYS    -5.3495736+03  DZS     3.7418158+02
ALTS    5.8543742+01  LATS    8.1334099-02  LONS   -9.9980846-01  VRS     5.3634215+03  PTR     2.7324871-02  AZR    -8.5999522+01
LIN     1.7598664+02  LAN     1.5952014-01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(d) 83° launch azimuth; first injection opportunity - Continued

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ID      916083.1
CSM PLANE CHANGE BURN INITIATION
   21  SEPT. 1969    0 HRS,   37 MINS,   39.594 SECS  G.M.T. **** 110. HRS,    32. MINS,   50.460 SECS  G.E.T.
XL     -8.9594736+02  YL     -3.7637885+02  ZL     -2.2138877+02  DXL    -2.3170716+03  DYL     4.4958463+03  DZL     1.7392927+03
XS     -2.5095573+01  YS      9.9402037+02  ZS     -6.8479104+01  DXS     5.3624733+03  DYS     1.2874193+02  DZS    -7.8493079+01
ALTS    5.8198843+01  LATS   -3.9396881+00  LONS    9.1446213+01  VRS     5.3645927+03  PTR    -1.3149418-02  AZR    -9.0841302+01
LIN     1.7597111+02  LAN    -1.0652848+01  LAP     1.4224613+02  LTS    -1.8143865-01  LNS     6.3448300+01  DEM    -2.5801344+01
THETA  -1.2806605-05  BETA    8.9999994+01  MASS    3.6207022+04
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ID      916083.1
CSM PLANE CHANGE BURN TERMINATION
   21  SEPT. 1969    0 HRS,   37 MINS,   44.378 SECS  G.M.T. **** 110. HRS,    32. MINS,   55.246 SECS  G.E.T.
XL     -8.9776609+02  YL     -3.7284826+02  ZL     -2.1998633+02  DXL    -2.3022015+03  DYL     4.4711571+03  DZL     1.8227898+03
XS     -2.0872387+01  YS      9.9411512+02  ZS     -6.8506820+01  DXS     5.3641062+03  DYS     1.1197165+02  DZS     8.2426806+00
ALTS    5.8197868+01  LATS   -3.9412892+00  LONS    9.1202802+01  VRS     5.3652810+03  PTR    -1.3003841-02  AZR    -8.9912922+01
LIN     1.7605774+02  LAN     2.4768044+00  LAP     1.2655478+02  SMAS    9.9753498+02  ECCS    8.7574266-04  PERS    1.9792923+00
RPS     9.9666139+02  APOS    9.9840854+02  RANS    1.7192645+02  INCS    1.5604908+02  LTS    -1.8144059-01  LNS     6.3447634+01
LTE     5.7228045+00  LNE    -7.5452715-01  THETA   1.5316699-03  BETA    8.9084756+01  FUEL    3.0418164+02  BARC    2.4228393-01
DELV    8.5393505+01  MASS    3.5902840+04  PLCHNG  9.1470411-01  DRTX    0.0000000     DRTY    8.5393491+01  DRTZ    0.0000000
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ID      916083.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   21  SEPT. 1969    5 HRS,    4 MINS,   44.344 SECS  G.M.T. **** 114. HRS,    59. MINS,   55.211 SECS  G.E.T.
XL     -4.3304561+02  YL      8.3178666+02  ZL      3.3903714+02  DXL     4.8055155+03  DYL     2.0216181+03  DZL     1.1890747+03
XS      9.9701498+02  YS     -1.7399630+[illegible]  ZS      1.4408694+00  DXS    -9.0199523+01  DYS    -5.3500164+03  DZS     3.6787134+02
ALTS    5.8674323+01  LATS    9.2790238-02  LONS   -9.9980865-01  VRS     5.3634074+03  PTR     3.9510679-02  AZR    -8.6067102+01
LIN     1.7605439+02  LAN     2.0060806-01
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ID      916083.1
TRANSEARTH INJECTION BURN INITIATION
   21  SEPT. 1969   21 HRS,   36 MINS,   35.210 SECS  G.M.T. **** 131. HRS,    31. MINS,   46.073 SECS  G.E.T.
XL      9.7532674+02  YL     -2.0951754+02  ZL     -3.1893791+01  DXL    -1.0943113+03  DYL    -4.7589211+03  DZL    -2.1663487+03
XS     -7.3783930+02  YS     -6.7003163+02  ZS      5.3176951+01  DXS    -3.6071107+03  DYS     3.9552605+03  DZS    -2.3429064+02
ALTS    5.9593170+01  LATS    3.0541017+00  LONS   -1.3775742+02  VRS     5.3581923+03  PTR    -1.2218936-02  AZR    -9.2509019+01
LIN     1.7604341+02  LAN    -8.2377014+00  LAP     3.2545708+02  LTS    -2.1346931-01  LNS     5.2799094+01  DEM    -2.2379556+01
THETA  -4.1652977+00  BETA   -4.9835364-01  MASS    3.6312840+04
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ID      916083.1
TRANSEARTH INJECTION BURN TERMINATION
   21  SEPT. 1969   21 HRS,   38 MINS,   50.486 SECS  G.M.T. **** 131. HRS,    34. MINS,    1.349 SECS  G.E.T.
XL      9.3612364+02  YL     -3.3899695+02  ZL     -9.1696124+01  DXL    -2.4566723+03  DYL    -6.9660401+03  DZL    -3.2500298+03
XS     -8.3063107+02  YS     -5.5461165+02  ZS      4.5961730+01  DXS    -4.7947308+03  DYS     6.4975454+03  DZS    -4.2003634+02
ALTS    6.1333743+01  LATS    2.6347966+00  LONS   -1.4626899+02  VRS     8.0860354+03  PTR     2.5502630+00  AZR    -9.3101336+01
LIN     1.7592666+02  LAN    -6.5250476+00  LAP    -8.8684986+00  SMAS   -3.5077637+03  ECCS    1.2845288+00  PERS    1.3051585+01
RPS     9.9805990+02  APOS   -8.0135874+03  RANS    1.7193559+02  INCS    1.5583001+02  LTS    -2.1352728-01  LNS     5.2780017+01
LTE     4.7842018+00  LNE     3.4609825-01  THETA   4.3252753+00  BETA   -3.2961545-01  FUEL    8.5999935+03  BARC    8.4908050+00
DELV    2.7356704+03  MASS    2.7712946+04  PLCHNG  1.6838344-01  DRTX    2.7283331+03  DRTY   -2.3731327+01  DRTZ    1.9870248+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(d) 83° launch azimuth; first injection opportunity - Concluded

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ID      916083.1
ENTRY AND TOUCHDOWN
   25  SEPT. 1969  20 HRS,   7 MINS,  30.105 SECS  G.M.T. **** 226. HRS,    2. MINS,  40.970 SECS  G.E.T.
X      -1.1014587+03  Y       2.9463129+03  Z       1.5520166+03  DX     -3.2739479+04  DY     -1.3547318+04  DZ     -6.5964077+03
R       3.5075243+03  DEC     2.6262353+01  RA      1.1049791+02  V       3.6040475+04  PTH    -6.4000379+00  AZ      9.8628624+01
ALT     6.5860096+01  LAT     2.6412470+01  LON     1.6415614+02  VE      3.4672122+04  PTE    -6.6771387+00  AZE     9.8959178+01
SMA     1.0495675+05  ECC     9.6700357-01  INC     2.7547560+01  RAN     1.5687686+00  APF     1.1993206+02  RP      3.4631982+03
INMP    1.8969619+00  RAM     1.8387769+00  DEM     1.9274822+00  RAS    -1.7763291+02  DES    -1.0259565+00  SPSFR   3.3487148+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   1.7279637+01  LONTD   1.9499956+02  AZTD    1.1183464+02
*****************************************************************************************************************************

ID      916083.1
CIRCUMLUNAR PERICYNTHION
   19  SEPT. 1969   4 HRS,  26 MINS,   5.124 SECS  G.M.T. ****  66. HRS,   21. MINS,  15.990 SECS  G.E.T.
XL     -4.1660706+00  YL     -9.2124477+02  ZL     -3.8729143+02  DXL    -8.4150669+03  DYL     3.2201026+02  DZL    -6.7544098+02
XS     -9.9923238+02  YS      4.7120214+00  ZS     -1.4708635+01  DXS     5.1246125+01  DYS     8.4280582+03  DZS    -7.8141925+02
ALTS    6.0858225+01  LATS   -8.4331983-01  LONS    1.7972981+02  VRS     8.4643609+03  PTR     9.0765563-08  AZR    -9.5297597+01
LIN     1.7462590+02  LAN     8.7320975+00  LAP     1.4285420+00  LTS    -1.1665205-01  LNS     8.5895889+01  DEM    -2.8663930+01
SMAS   -1.9862867+03  ECCS    1.5031256+00  INCS    1.5669014+02  RANS    1.6708039+02  APFS   -1.0165661+02  RPS     9.9935174+02
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ID      916083.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   21  SEPT. 1969  22 HRS,  46 MINS,  24.935 SECS  G.M.T. **** 132. HRS,   41. MINS,  35.798 SECS  G.E.T.
X       1.0850986+03  Y       3.2644724+03  Z       6.9358887+02  DX     -2.2140632+04  DY     -3.1672537+03  DZ      2.8356248+04
R       3.5093139+03  DEC     1.1399120+01  RA      7.1613381+01  V       3.6115313+04  PTH    -6.6589247+00  AZ      3.3907797+01
ALT     6.5833513+01  LAT     1.1472491+01  LON     8.9376821+01  VE      3.5293563+04  PTE    -6.7523610+00  AZE     3.1834508+01
SMA     1.4480057+05  ECC     9.7609437-01  INC     5.6848554+01  RAN     6.4045995+01  APF     2.7136253+01  RP      3.4615497+03
INMP    4.9847732+01  RAM    -4.9828855+01  DEM    -2.2156753+01  RAS     1.7887291+02  DES     4.8863201-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.7797826+01  LONTD   1.0837483+02  AZTD    4.3724657+01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(e) 86° launch azimuth; first injection opportunity

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ID      916086.1
LAUNCH TIME      16  SEPT. 1969   10 HRS,   59 MINS,   2.467 SECS   G.M.T.
LAUNCH AZIMUTH   86.                          INJECTION OPPORTUNITY    1
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ID      916086.1
EARTH PARKING ORBIT INSERTION
   16  SEPT. 1969  11 HRS,  10 MINS,  19.296 SECS  G.M.T. ****   0. HRS,   11. MINS,  16.329 SECS  G.E.T.
X      -9.7135121+02  Y      3.0030585+03  Z      1.6117012+03  DX    -2.4581669+04  DY    -5.8860027+03  DZ    -3.8477505+03
ALT     1.0239689+02  LAT    2.7202248+01  LON    3.0511542+02  V      2.5567727+04  PTH   -1.8862449-07  AZ     9.9728391+01
P       3.5439334+03  DEC    2.7050619+01  RA     1.0792401+02  RAS    1.7395453+02  DES    2.6147392+00  RAN   -2.7315581+00
INC     2.8622123+01  MASS   2.8456909+05
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ID      916086.1
3.5 MINS PRIOR TO TLI INITIATION
   16  SEPT. 1969  12 HRS,  29 MINS,  55.096 SECS  G.M.T. ****   1. HRS,   30. MINS,  52.629 SECS  G.E.T.
X       1.1308156+03  Y      2.9346541+03  Z      1.6327597+03  DX    -2.4221226+04  DY     7.4774125+03  DZ     3.3535369+03
ALT     1.0209047+02  LAT    2.7589760+01  LON    2.4616450+02  V      2.5570015+04  PTH    1.8590636-02  AZ     8.1511898+01
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ID      916086.1
TRANSLUNAR INJECTION INITIATION
   16  SEPT. 1969  12 HRS,  33 MINS,  25.096 SECS  G.M.T. ****   1. HRS,   34. MINS,  22.628 SECS  G.E.T.
X       2.6736627+02  Y      3.0996534+03  Z      1.6968109+03  DX    -2.5485443+04  DY     2.0215042+03  DZ     3.3384398+02
ALT     1.0252098+02  LAT    2.8765142+01  LON    2.6143042+02  V      2.5567669+04  PTH    1.1688941-02  AZ     8.9154170+01
R       3.5437978+03  DEC    2.8607802+01  RA     8.5070048+01  RAS    1.7400629+02  DES    2.5924642+00  RAN   -3.1638905+00
INC     2.8619247+01  MASS   2.8262220+05
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ID      916086.1
TRANSLUNAR INJECTION TERMINATION
   16  SEPT. 1969  12 HRS,  38 MINS,  34.462 SECS  G.M.T. ****   1. HRS,   39. MINS,  31.994 SECS  G.E.T.
X      -1.2440278+03  Y      2.9806422+03  Z      1.5871476+03  DX    -3.4606403+04  DY    -7.1278559+03  DZ    -4.8604479+03
ALT     1.5705259+02  LAT    2.6315533+01  LON    2.8772196+02  V      3.5665577+04  PTH    6.3031446+00  AZ     1.0194927+02
R       3.5987319+03  DEC    2.6169598+01  RA     1.1265415+02  RAS    1.7400950+02  DES    2.5910819+00  DEM   -2.2188985+01
RAN    -2.9802161+00  INC    2.8592572+01  ECC    9.7625338-01  SMA    1.4969826+05  RP     3.5548284+03  APE    1.0008721+02
INMP    6.1853736-01  C3TLI -4.5802972-01  DAZTLI-9.1888405-02  MASS   1.3261962+05  FUEL   1.5000258+05
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ID      916086.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   16  SEPT. 1969  14 HRS,  38 MINS,  34.462 SECS  G.M.T. ****   3. HRS,   39. MINS,  31.994 SECS  G.E.T.
X      -1.3440141+04  Y     -1.4372172+04  Z     -8.2112800+03  DX    -3.4728151+03  DY    -1.2048132+04  DZ    -6.6600256+03
ALT     1.7879640+04  LAT    -2.2672663+01  LON    1.1905030+01  V      1.4197671+04  PTH    6.5072678+01  AZ     1.0794770+02
R       2.1321862+04  DEC    -2.2650620+01  RA    -1.3308065+02  RAS    1.7408425+02  DES    2.5589097+00
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ID      916086.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   16  SEPT. 1969   4 HRS,  50 MINS,  17.176 SECS  G.M.T. ****  65. HRS,   51. MINS,  14.706 SECS  G.E.T.
RMP     9.9918036+02  DEMP   5.9020038+00  RAMP  -1.7632653+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(e) 86° launch azimuth; first injection opportunity - Continued

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ID      916086.1
LUNAR ORBIT INSERTION BURN INITIATION
   19  SEPT. 1969   4 HRS,  46 MINS,  55.454 SECS  G.M.T. ****  65. HRS,   47. MINS,  52.983 SECS  G.E.T.
XL      2.9526689+02  YL     -9.1467150+02  ZL     -3.5239243+02  DXL    -8.2726292+03  DYL    -6.2124567+02  DZL    -1.1860423+03
XS     -9.8124207+02  YS     -2.9134320+02  ZS      1.6431477+01  DXS    -9.9186420+02  DYS     8.2888102+03  DZS    -9.0167346+02
ALTS    8.5218771+01  LATS    9.1968690-01  LONS   -1.6346318+02  VRS     8.3964981+03  PTR    -9.7553097+00  AZR    -9.6097256+01
LIN     1.7382196+02  LAN     8.0084302+00  LAP    -1.5703233+02  LTS    -1.1714456-01  LNS     3.5719368+01  DEM    -2.8666300+01
THETA   1.4894772+01  BETA    1.7583746+02  MASS    9.4833024+04
*****************************************************************************************************************

ID      916086.1
LUNAR ORBIT INSERTION BURN TERMINATION
   19  SEPT. 1969   4 HRS,  53 MINS,  19.595 SECS  G.M.T. ****  65. HRS,   54. MINS,  17.127 SECS  G.E.T.
XL     -1.4590737+02  YL     -9.0584529+02  ZL     -3.9109964+02  DXL    -5.4073796+03  DYL     9.1044543+02  DZL     6.0129772+00
XS     -9.8564202+02  YS      1.5069546+02  ZS     -2.4580991+01  DXS     8.7586455+02  DYS     5.4176342+03  DZS    -3.5711353+02
ALTS    5.8904859+01  LATS   -1.4122037+00  LONS    1.7130732+02  VRS     5.4995844+03  PTR    -3.9794929-01  AZR    -9.3734150+01
LIN     1.7599782+02  LAN     1.1938778+01  LAP     1.9862024+00  SMAS    1.0526361+03  ECCS    5.2934678-02  PERS    2.1455327+00
RPS     9.9691518+02  APOS    1.1083571+03  RANS    1.7059009+02  INCS    1.5691332+02  LTS    -1.1729589-01  LNS     8.5665131+01
LTE     6.7421290+00  LNE    -2.8205562+00  THETA  -1.0290178+01  BETA    1.7367247+02  FUEL    2.4421090+04  BARC    2.5276724+01
DELV    3.0138391+03  MASS    7.0411934+04  PLCHNG  2.2031678+00  DRTX   -2.9048881+03  DRTY    2.1141160+02  DRTZ   -7.7469064+02
*****************************************************************************************************************

ID      916086.1
CIRCULARIZATION BURN INITIATION
   19  SEPT. 1969   9 HRS,  13 MINS,  14.053 SECS  G.M.T. ****  70. HRS,   14. MINS,  11.585 SECS  G.E.T.
XL     -2.8391224+02  YL     -8.7359950+02  ZL     -3.8732313+02  DXL    -5.2470013+03  DYL     1.5741111+03  DZL     2.9675256+02
XS     -9.4084774+02  YS      3.2782768+02  ZS     -3.3703750+01  DXS     1.8181214+03  DYS     5.1822542+03  DZS    -3.3513149+02
ALTS    5.8402373+01  LATS   -1.9374648+00  LONS    1.6078968+02  VRS     5.5021484+03  PTR    -4.1142010-03  AZR    -9.3494141+01
LIN     1.7599626+02  LAN     9.6915078+00  LAP     3.4533568+00  LTS    -1.2346283-01  LNS     8.3463711+01  DEM    -2.8661637+01
THETA  -2.5613209-06  BETA   -1.7959999+02  MASS    7.0391934+04
*****************************************************************************************************************

ID      916086.1
CIRCULARIZATION BURN TERMINATION
   19  SEPT. 1969   9 HRS,  13 MINS,  29.053 SECS  G.M.T. ****  70. HRS,   14. MINS,  26.584 SECS  G.E.T.
XL     -2.9667712+02  YL     -8.6968594+02  ZL     -3.8656582+02  DXL    -5.0943339+03  DYL     1.5964189+03  DZL     3.1677426+02
XS     -9.3633289+02  YS      3.4043103+02  ZS     -3.4517688+01  DXS     1.8395821+03  DYS     5.0283404+03  DZS    -3.2427346+02
ALTS    5.8403695+01  LATS   -1.9842701+00  LONS    1.6001979+02  VRS     5.3640864+03  PTR     5.7329927-03  AZR    -9.3467677+01
LIN     1.7599627+02  LAN     9.6892958+00  LAP    -7.2057567+00  SMAS    9.9750011+02  ECCS    6.1266828-04  PERS    1.9791886+00
RPS     9.9688897+02  APOS    9.9811123+02  RANS    1.7059854+02  INCS    1.5690401+02  LTS    -1.2346869-01  LNS     8.3461601+01
LTE     6.7015059+00  LNE    -2.6361850+00  THETA  -7.6860545-01  BETA    1.7999300+02  FUEL    9.5358203+02  BARC    7.6867583-01
DELV    1.3805510+02  MASS    6.9438352+04  PLCHNG  1.1041442-05  DRTX   -1.3805267+02  DRTY    0.0000000     DRTZ    0.0000000
*****************************************************************************************************************

ID      916086.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   20  SEPT. 1969   3 HRS,  51 MINS,  12.544 SECS  G.M.T. ****  88. HRS,   52. MINS,  10.074 SECS  G.E.T.
XL     -2.0551876+02  YL      9.0432318+02  ZL      3.6713960+02  DXL     5.2194123+03  DYL     8.8709090+02  DZL     7.3707768+02
XS      9.9725874+02  YS     -1.7402566+01  ZS      1.4229528+00  DXS    -9.3709787+01  DYS    -5.3475329+03  DZS     3.7399909+02
ALTS    5.8918061+01  LATS    8.1740797-02  LONS   -9.9973296-01  VRS     5.3614144+03  PTR     1.5008580-03  AZR    -8.5999934+01
LIN     1.7598705+02  LAN     1.6551074-01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(e) 86° launch azimuth; first injection opportunity - Continued

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ID      916086.1
CSM PLANE CHANGE BURN INITIATION
   21  SEPT. 1969   1 HRS,   2 MINS,  16.510 SECS  G.M.T. **** 110. HRS,    3. MINS,  14.039 SECS  G.E.T.
XL     -8.9453401+02  YL     -3.7978564+02  ZL     -2.2273530+02  DXL    -2.3376254+03  DYL     4.4847844+03  DZL     1.7348171+03
XS     -2.5124542+01  YS      9.9435329+02  ZS     -6.3496268+01  DXS     5.3606153+03  DYS     1.3137777+02  DZS    -7.8603019+01
ALTS    5.8532786+01  LATS   -3.9393553+00  LONS    9.1447397+01  VRS     5.3628010+03  PTR     1.4326297-02  AZR    -9.0840868+01
LIN     1.7597151+02  LAN    -1.0646611+01  LAP    -1.5554577+02  LTS    -1.3295830-01  LNS     6.3240034+01  DEM    -2.5746036+01
THETA  -9.3915100-06  BETA    9.0000003+01  MASS    3.6084352+04
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ID      916086.1
CSM PLANE CHANGE BURN TERMINATION
   21  SEPT. 1969   1 HRS,   2 MINS,  21.279 SECS  G.M.T. **** 110. HRS,    3. MINS,  18.811 SECS  G.E.T.
XL     -8.9636305+02  YL     -3.7627512+02  ZL     -2.2139089+02  DXL    -2.3228673+03  DYL     4.4601092+03  DZL     1.8183288+03
XS     -2.0916393+01  YS      9.9444988+02  ZS     -6.8523979+01  DXS     5.3622464+03  DYS     1.1469609+02  DZS     8.1404062+00
ALTS    5.8533864+01  LATS   -3.9409471+00  LONS    9.1204932+01  VRS     5.3634790+03  PTR     1.4337811-02  AZR    -8.9911806+01
LIN     1.7605806+02  LAN     2.4910313+00  LAP     7.3024452+01  SMAS    9.9753270+02  ECCS    5.6571677-04  PERS    1.9792855+00
RPS     9.9696838+02  APOS    9.9809700+02  RANS    1.7195033+02  INCS    1.5603568+02  LTS    -1.8206029-01  LNS     6.3239368+01
LTE     5.7070649+00  LNE    -7.3344335-01  THETA   1.5077642-03  BETA    8.9084095+01  FUEL    3.0320117+02  BARC    2.4147496-01
DELV    8.5406627+01  MASS    3.5781150+04  PLCHNG  9.1516072-01  DRTX    0.0000000     DRTY    8.5406451+01  DRTZ    0.0000000
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ID      916086.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   21  SEPT. 1969   5 HRS,  29 MINS,  23.075 SECS  G.M.T. **** 114. HRS,   30. MINS,  20.606 SECS  G.E.T.
XL     -4.3678828+02  YL      8.3058564+02  ZL      3.3859032+02  DXL     4.7948254+03  DYL     2.0365693+03  DZL     1.1949528+03
XS      9.9749423+02  YS     -1.7406800+01  ZS      1.4580515+00  DXS    -9.1943877+01  DYS    -5.3474274+03  DZS     3.6765927+02
ALTS    5.9153639+01  LATS    8.3737247-02  LONS   -9.9974012-01  VRS     5.3608401+03  PTR     2.0399614-02  AZR    -8.6067464+01
LIN     1.7605471+02  LAN     2.1451118-01
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ID      916086.1
TRANSEARTH INJECTION BURN INITIATION
   21  SEPT. 1969  22 HRS,   1 MINS,  20.634 SECS  G.M.T. **** 131. HRS,    2. MINS,  18.167 SECS  G.E.T.
XL      9.7428875+02  YL     -2.1149617+02  ZL     -3.3039550+01  DXL    -1.1086062+03  DYL    -4.7581488+03  DZL    -2.1681645+03
XS     -7.4170297+02  YS     -6.6493920+02  ZS      5.2852162+01  DXS    -3.5829745+03  DYS     3.9810396+03  DZS    -2.3633266+02
ALTS    5.9033823+01  LATS    3.0371343+00  LONS   -1.3812366+02  VRS     5.3611785+03  PTR    -2.2896672-02  AZR    -9.2528872+01
LIN     1.7604376+02  LAN    -8.2248371+00  LAP     2.3944935+02  LTS    -2.1410523-01  LNS     5.2589720+01  DEM    -2.2300927+01
THETA  -4.1211219+00  BETA   -5.0333488-01  MASS    3.6191151+04
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ID      916086.1
TRANSEARTH INJECTION BURN TERMINATION
   21  SEPT. 1969  22 HRS,   3 MINS,  35.459 SECS  G.M.T. **** 131. HRS,    4. MINS,  32.990 SECS  G.E.T.
XL      9.3487193+02  YL     -3.4050040+02  ZL     -9.2680523+01  DXL    -2.4736043+03  DYL    -6.9628911+03  DZL    -3.2516877+03
XS     -8.3350533+02  YS     -5.4927634+02  ZS      4.5607760+01  DXS    -4.7571620+03  DYS     6.5287777+03  DZS    -4.2283715+02
ALTS    6.0764054+01  LATS    2.6159824+00  LONS   -1.4661529+02  VRS     8.0891482+03  PTR     2.5507336+00  AZR    -9.3119235+01
LIN     1.7592507+02  LAN    -6.5065508+00  LAP    -7.7186531+00  SMAS   -3.5000516+03  ECCS    1.2849932+00  PERS    1.3008565+01
RPS     9.9749085+02  APOS   -7.9975939+03  RANS    1.7195832+02  INCS    1.5581518+02  LTS    -2.1416301-01  LNS     5.2570722+01
LTE     4.7632366+00  LNE     3.6796418-01  THETA   4.3498529+00  BETA   -3.3308481-01  FUEL    8.5712256+03  BARC    8.4712064+00
DELV    2.7357255+03  MASS    2.7619925+04  PLCHNG  1.7001890-01  DRTX    2.7285393+03  DRTY   -2.3971853+01  DRTZ    1.9660282+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(e) 86° launch azimuth; first injection opportunity - Concluded

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ID      916086.1
ENTRY AND TOUCHDOWN
   25  SEPT. 1969  20 HRS,   8 MINS,  17.229 SECS  G.M.T. **** 225. HRS,    9. MINS,  14.762 SECS  G.E.T.
X      -1.1131579+03  Y       2.9433411+03  Z       1.5493996+03  DX     -3.2686177+04  DY     -1.3659589+04  DZ     -6.6292630+03
R       3.5075656+03  DEC     2.6214360+01  RA      1.1071638+02  V       3.6040501+04  PTH    -6.4000225+00  AZ      9.8689745+01
ALT     6.5893709+01  LAT     2.6364283+01  LON     1.6417773+02  VE      3.4671798+04  PTE    -6.6773240+00  AZE     9.9022911+01
SMA     1.0503924+05  ECC     9.6702909-01  INC     2.7520039+01  RAN     1.6308237+00  APF     1.2007778+02  RP      3.4632405+03
INMP    1.9361735+00  RAM     1.8455015+00  DEM     1.9311468+00  RAS    -1.7763242+02  DES    -1.0261689+00  SPSFR   3.2562614+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   1.7208810+01  LONTD   1.9499967+02  AZTD    1.1185336+02
*****************************************************************************************************************

ID      916086.1
CIRCUMLUNAR PERICYNTHION
   19  SEPT. 1969   4 HRS,  50 MINS,  22.049 SECS  G.M.T. ****  65. HRS,   51. MINS,  19.581 SECS  G.E.T.
XL      1.0808761+01  YL     -9.2115217+02  ZL     -3.8690515+02  DXL    -8.4165504+03  DYL     2.5166315+02  DZL    -8.3433630+02
XS     -9.9904342+02  YS     -6.3873599+00  ZS     -1.4322693+01  DXS    -4.0970569+01  DYS     8.4293366+03  DZS    -9.0250457+02
ALTS    6.0672978+01  LATS   -8.2134260-01  LONS   -1.7963368+02  VRS     8.4776121+03  PTR     1.1137352-04  AZR    -9.6111771+01
LIN     1.7382195+02  LAN     7.9768558+00  LAP     9.9633504-01  LTS    -1.1722595-01  LNS     8.5690194+01  DEM    -2.8666653+01
SMAS   -1.9571007+03  ECCS    1.5105340+00  INCS    1.5644778+02  RANS    1.6514821+02  APFS   -1.0428620+02  RPS     9.9916652+02
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ID      916086.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   21  SEPT. 1969  23 HRS,  36 MINS,   6.666 SECS  G.M.T. **** 132. HRS,   37. MINS,   4.196 SECS  G.E.T.
X       9.5524781+02  Y       3.3144775+03  Z       6.4609434+02  DX     -1.9349882+04  DY     -4.6496004+03  DZ      3.0134815+04
R       3.5093728+03  DEC     1.0608978+01  RA      7.3922772+01  V       3.6112931+04  PTH    -6.5356427+00  AZ      2.8838265+01
ALT     6.5832384+01  LAT     1.0677509+01  LON     7.9228318+01  VE      3.5405962+04  PTE    -6.6054809+00  AZE     2.6652884+01
SMA     1.4345594+05  ECC     9.7585777-01  INC     6.1699624+01  RAN     6.8134303+01  APF     2.5303199+01  RP      3.4633472+03
INMP    5.5833000+01  RAM    -4.9319264+01  DEM    -2.1996245+01  RAS     1.7890389+02  DES     4.7520625-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.8871980+01  LONTD   9.5311444+01  AZTD    3.7455242+01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity

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ID      916072.2
LAUNCH TIME      16  SEPT. 1969     7 HRS,    23 MINS,  24.138 SECS    G.M.T.
LAUNCH AZIMUTH    72.                                INJECTION OPPORTUNITY     2
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ID      916072.2
EARTH PARKING ORBIT INSERTION
   16  SEPT. 1969    7 HRS,   34 MINS,   43.879 SECS  G.M.T. ****    0. HRS,    11. MINS,   19.741 SECS  G.E.T.
X       1.7388821+03  Y       2.4311163+03  Z       1.9040553+03  DX     -2.1083719+04  DY      1.4440127+04  DZ      8.1745141+02
ALT     1.0334398+02  LAT     3.2667610+01  LON     3.0566189+02  V       2.5567727+04  PTH    -2.0041353-07  AZ      8.7827504+01
R       3.5439334+03  DEC     3.2493104+01  RA      5.4425345+01  RAS     1.7382025+02  DES     2.6725176+00  RAN    -3.1535853+01
INC     3.2562694+01  MASS    2.8296469+05
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ID      916072.2
3.5 MINS PRIOR TO TLI INITIATION
   16  SEPT. 1969  10 HRS,   33 MINS,   47.687 SECS  G.M.T. ****    3. HRS,    10. MINS,   23.549 SECS  G.E.T.
X       1.1124682+03  Y       2.7881394+03  Z       1.8836144+03  DX     -2.3122274+04  DY      1.0693783+04  DZ     -2.1738206+03
ALT     1.0325104+02  LAT     3.2275765+01  LON     2.7459610+02  V       2.5567989+04  PTH    -1.0601125-03  AZ      9.5759973+01
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ID      916072.2
TRANSLUNAR INJECTION INITIATION
   16  SEPT. 1969  10 HRS,   37 MINS,   17.687 SECS  G.M.T. ****    3. HRS,    13. MINS,   53.549 SECS  G.E.T.
X       2.8719141+02  Y       3.0677387+03  Z       1.7508636+03  DX     -2.4387155+04  DY      5.4018295+03  DZ     -5.4684124+03
ALT     1.0276598+02  LAT     2.9768140+01  LON     2.9012246+02  V       2.5569838+04  PTH    -4.3151179-03  AZ      1.0423717+02
R       3.5438712+03  DEC     2.9607387+01  RA      8.4651747+01  RAS     1.7393396+02  DES     2.6235915+00  RAN    -3.2531732+01
INC     3.2570726+01  MASS    2.7982453+05
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ID      916072.2
TRANSLUNAR INJECTION TERMINATION
   16  SEPT. 1969  10 HRS,   42 MINS,   23.801 SECS  G.M.T. ****    3. HRS,    18. MINS,   59.663 SECS  G.E.T.
X      -1.1461902+03  Y       3.1509546+03  Z       1.3032731+03  DX     -3.3231971+04  DY     -2.4138464+03  DZ     -1.2716187+04
ALT     1.5491864+02  LAT     2.1365456+01  LON     3.1418110+02  V       3.5663594+04  PTH     6.2251267+00  AZ      1.1529092+02
R       3.5973306+03  DEC     2.1240835+01  RA      1.0998935+02  RAS     1.7393713+02  DES     2.6222242+00  DEM    -2.1835355+01
RAN    -3.2531736+01  INC     3.2570726+01  ECC     9.7526915-01  SMA     1.4372727+05  RP      3.5544971+03  APF     1.2509424+02
INMP    1.6016307+01  C3TLI  -4.7705688-01  DAZTLI  0.0000000     MASS    1.3139875+05  FUEL    1.4842577+05
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ID      916072.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   16  SEPT. 1969  12 HRS,   42 MINS,   23.801 SECS  G.M.T. ****    5. HRS,    18. MINS,   59.663 SECS  G.E.T.
X      -1.3013140+04  Y      -1.2565432+04  Z      -1.1238962+04  DX     -3.4419202+03  DY     -1.1582773+04  DZ     -7.4197306+03
ALT     1.7855903+04  LAT    -3.1880347+01  LON     3.8106861+01  V       1.4179557+04  PTH     6.5017503+01  AZ      9.7191866+01
R       2.1296623+04  DEC    -3.1852508+01  RA     -1.3600276+02  RAS     1.7401188+02  DES     2.5900574+00
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ID      916072.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   19  SEPT. 1969    4 HRS,   33 MINS,   52.950 SECS  G.M.T. ****   09. HRS,    10. MINS,   28.809 SECS  G.E.T.
RMP     9.9863151+02  DEMP    5.7908731+00  RAMP   -1.7866230+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity - Continued

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ID      916072.2
LUNAR ORBIT INSERTION BURN INITIATION
   19  SEPT. 1969   4 HRS,  30 MINS,  34.234 SECS  G.M.T. ****  69. HRS,    7. MINS,  10.094 SECS  G.E.T.
XL      2.4855780+02  YL     -9.1761176+02  ZL     -3.7557375+02  DXL    -8.3152768+03  DYL    -4.7944950+02  DZL    -5.6089181+02
XS     -9.9181183+02  YS     -2.4726481+02  ZS     -4.1612015+00  DXS    -6.4740841+02  DYS     8.3307047+03  DZS    -3.7507092+02
ALTS    8.3684511+01  LATS   -2.3324698-01  LONS   -1.6600117+02  VRS     8.3642367+03  PTR    -9.5347100+00  AZR    -9.2645390+01
LIN     1.7733907+02  LAN     1.9023986+01  LAP     1.5497727+01  LTS    -1.1675812-01  LNS     8.5857983+01  DEM    -2.8664474+01
THETA   1.4698592+01  BETA   -1.7731577+02  MASS    9.4833024+04
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ID      916072.2
LUNAR ORBIT INSERTION BURN TERMINATION
   19  SEPT. 1969   4 HRS,  36 MINS,  53.391 SECS  G.M.T. ****  69. HRS,   13. MINS,  29.253 SECS  G.E.T.
XL     -1.8693244+02  YL     -9.9810014+02  ZL     -3.9045810+02  DXL    -5.3703651+03  DYL     1.1149175+03  DZL     9.3995764+01
XS     -9.7851539+02  YS      1.8910556+02  ZS     -2.7051171+01  DXS     1.0847555+03  DYS     5.3822817+03  DZS    -3.5181578+02
ALTS    5.8494477+01  LATS   -1.5547912+00  LONS    1.6906200+02  VRS     5.5017656+03  PTR    -3.5633652-01  AZR    -9.3677443+01
LIN     1.7599785+02  LAN     1.1889102+01  LAP     1.8529669+02  SMAS    1.0526547+03  ECCS    5.3247750-02  PERS    2.1455895+00
RPS     9.9660321+02  APOS    1.1087061+03  RANS    1.7057726+02  INCS    1.5692640+02  LTS    -1.1690744-01  LNS     8.5804364+01
LTE     6.7442416+00  LNE    -2.8320227+00  THETA  -1.0174372+01  BETA   -1.7593955+02  FUEL    2.4104226+04  BARC    2.4910462+01
DELV    2.9683916+03  MASS    7.0728797+04  PLCHNG  1.4003035+00  DRTX   -2.3681012+03  DRTY   -1.3446484+02  DRTZ   -7.5318334+02
*****************************************************************************************************************************

ID      916072.2
CIRCULARIZATION BURN INITIATION
   19  SEPT. 1969   8 HRS,  56 MINS,  24.132 SECS  G.M.T. ****  73. HRS,   32. MINS,  59.994 SECS  G.E.T.
XL     -3.0288532+02  YL     -8.6750275+02  ZL     -3.8585091+02  DXL    -5.2156319+03  DYL     1.6724566+03  DZL     3.3957756+02
XS     -9.3469645+02  YS      3.4397691+02  ZS     -3.4696735+01  DXS     1.9102368+03  DYS     5.1509905+03  DZS    -3.3205187+02
ALTS    5.8091369+01  LATS   -1.9951922+00  LONS    1.5979592+02  VRS     5.5038138+03  PTR    -2.2444479-02  AZR    -9.3461718+01
LIN     1.7599627+02  LAN     9.6454539+00  LAP     3.5151251+00  LTS    -1.2306208-01  LNS     8.3606277+01  DEM    -2.8663855+01
THETA  -8.5377364-07  BETA   -1.7999011+02  MASS    7.0708797+04
*****************************************************************************************************************************

ID      916072.2
CIRCULARIZATION BURN TERMINATION
   19  SEPT. 1969   9 HRS,  56 MINS,  39.199 SECS  G.M.T. ****  73. HRS,   33. MINS,  15.059 SECS  G.E.T.
XL     -3.1562906+02  YL     -8.6333083+02  ZL     -3.8498526+02  DXL    -5.0623133+03  DYL     1.6922332+03  DZL     3.5858193+02
XS     -9.2993570+02  YS      3.5655896+02  ZS     -3.5506694+01  DXS     1.9293566+03  DYS     4.9965945+03  DZS    -3.2118832+02
ALTS    5.8088354+01  LATS   -2.0417935+00  LONS    1.5902201+02  VRS     5.3657745+03  PTR    -1.2779772-02  AZR    -9.3434342+01
LIN     1.7599628+02  LAN     9.6432298+00  LAP    -9.1438728+00  SMAS    9.9750096+02  ECCS    9.4813163-04  PERS    1.9791910+00
RPS     9.9655520+02  APOS    9.9844671+02  RANS    1.7058560+02  INCS    1.5691707+02  LTS    -1.2306808-01  LNS     8.3604153+01
LTE     6.7045434+00  LNE    -2.6482750+00  THETA  -7.7250890-01  BETA    1.7999300+02  FUEL    9.5737500+02  BARC    7.7258016-01
DELV    1.3805483+02  MASS    6.9750922+04  PLCHNG  1.1407247-05  DRTX   -1.3805267+02  DRTY    0.0000000     DRTZ    0.0000000
*****************************************************************************************************************************

ID      916072.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   20  SEPT. 1969   3 HRS,  34 MINS,   1.597 SECS  G.M.T. ****  92. HRS,   10. MINS,  37.458 SECS  G.E.T.
XL     -2.0285863+02  YL      9.0496612+02  ZL      3.6733008+02  DXL     5.2213581+03  DYL     8.7588374+02  DZL     7.3252744+02
XS      9.9736739+02  YS     -1.7408160+01  ZS      1.3711113+00  DXS    -9.1307737+01  DYS    -5.3470035+03  DZS     3.7396982+02
ALTS    5.9026723+01  LATS    7.8754210-02  LONS   -9.9994531-01  VRS     5.3608428+03  PTR     2.7074103-02  AZR    -8.5999853+01
LIN     1.7598703+02  LAN     1.2271183-01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity - Concluded

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ID      916072.2
CSM PLANE CHANGE BURN INITIATION
   21  SEPT. 1969   0 HRS,  45 MINS,   7.056 SECS  G.M.T. **** 113. HRS,   21. MINS,  42.917 SECS  G.E.T.
XL     -8.9533783+02  YL     -3.7730136+02  ZL     -2.2173775+02  DXL    -2.3251765+03  DYL     4.4930284+03  DZL     1.7377689+03
XS     -2.5061696+01  YS      9.9390114+02  ZS     -6.3455768+01  DXS     5.3630634+03  DYS     1.3107018+02  DZS    -7.8889760+01
ALTS    5.8077497+01  LATS   -3.9388239+00  LONS    9.1444434+01  VRS     5.3652448+03  PTR     1.3542643-02  AZR    -9.0843538+01
LIN     1.7597146+02  LAN    -1.0689375+01  LAP     9.8832218+01  LTS    -1.8162632-01  LNS     6.3385215+01  DEM    -2.5784644+01
THETA  -1.7929246-05  BETA    8.9999986+01  MASS    3.6396922+04
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ID      916072.2
CSM PLANE CHANGE BURN TERMINATION
   21  SEPT. 1969   0 HRS,  45 MINS,  11.869 SECS  G.M.T. **** 113. HRS,   21. MINS,  47.730 SECS  G.E.T.
XL     -8.9717361+02  YL     -3.7375229+02  ZL     -2.2032826+02  DXL    -2.3101954+03  DYL     4.4683896+03  DZL     1.8213524+03
XS     -2.0813049+01  YS      9.9399824+02  ZS     -6.8483937+01  DXS     5.3647031+03  DYS     1.1416268+02  DZS     7.9076703+00
ALTS    5.8078475+01  LATS   -3.9404435+00  LONS    9.1199525+01  VRS     5.3659234+03  PTR     1.3715885-02  AZR    -8.9914624+01
LIN     1.7605862+02  LAN     2.4481879+00  LAP     9.3506066+01  SMAS    9.9753646+02  ECCS    9.9618635-04  PERS    1.9792967+00
RPS     9.9554274+02  APOS    5.9953016+02  RANS    1.7193213+02  INCS    1.5604734+02  LTS    -1.8162834-01  LNS     6.3384534+01
LTE     5.7180475+00  LNE    -7.4814125-01  THETA   1.4616605-03  BETA    8.9084756+01  FUEL    3.0596484+02  BARC    2.4369315-01
DELV    8.5446294+01  MASS    3.6090957+04  PLCHNG  9.1515693-01  DRTX    0.0000000     DRTY    8.5446163+01  DRTZ    0.0000000
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ID      916072.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   21  SEPT. 1969   5 HRS,  12 MINS,  12.579 SECS  G.M.T. **** 117. HRS,   48. MINS,  48.440 SECS  G.E.T.
XL     -4.3431827+02  YL      8.3170858+02  ZL      3.3897546+02  DXL     4.8002110+03  DYL     2.0265711+03  DZL     1.1908241+03
XS      9.9748220+02  YS     -1.7410249+01  ZS      1.4069317+00  DXS    -8.9487262+01  DYS    -5.3475460+03  DZS     3.6762188+02
ALTS    5.9141605+01  LATS    8.0802366-02  LONS   -9.9995015-01  VRS     5.3609142+03  PTR     4.6680637-02  AZR    -8.6057944+01
LIN     1.7605526+02  LAN     1.7190192-01
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ID      916072.2
TRANSEARTH INJECTION BURN INITIATION
   21  SEPT. 1969  21 HRS,  44 MINS,   6.166 SECS  G.M.T. **** 134. HRS,   20. MINS,  42.025 SECS  G.E.T.
XL      9.7516697+02  YL     -2.0941087+02  ZL     -3.1903514+01  DXL    -1.0965472+03  DYL    -4.7592770+03  DZL    -2.1668019+03
XS     -7.3847229+02  YS     -6.6907205+02  ZS      5.3128085+01  DXS    -3.6014542+03  DYS     3.9616878+03  DZS    -2.3458945+02
ALTS    5.9414966+01  LATS    3.0518379+00  LONS   -1.3782273+02  VRS     5.3591487+03  PTR    -3.7966357-02  AZR    -9.2510395+01
LIN     1.7604429+02  LAN    -8.2667678+00  LAP     2.8213676+02  LTS    -2.1366236-01  LNS     5.2735528+01  DEM    -2.2355728+01
THETA  -4.1676456+00  BETA   -4.8823871-01  MASS    3.6500957+04
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ID      916072.2
TRANSEARTH INJECTION BURN TERMINATION
   21  SEPT. 1969  21 HRS,  46 MINS,  22.141 SECS  G.M.T. **** 134. HRS,   22. MINS,  58.001 SECS  G.E.T.
XL      9.3557380+02  YL     -3.3955761+02  ZL     -9.2017825+01  DXL    -2.4622151+03  DYL    -6.9654111+03  DZL    -3.2497655+03
XS     -8.3155221+02  YS     -5.5287319+02  ZS      4.5871747+01  DXS    -4.7831019+03  DYS     6.5073977+03  DZS    -4.2005423+02
ALTS    6.1132459+01  LATS    2.6301646+00  LONS   -1.4638130+02  VRS     8.0870720+03  PTR     2.5549348+00  AZR    -9.3101098+01
LIN     1.7592984+02  LAN    -6.5899546+00  LAP    -8.3731841+00  SMAS   -3.5054745+03  ECCS    1.2846555+00  PERS    1.3038810+01
RPS     9.9785253+02  APOS   -8.0088015+03  RANS    1.7194234+02  INCS    1.5583171+02  LTS    -2.1372059-01  LNS     5.2716357+01
LTE     4.7778350+00  LNE     3.5274806-01  THETA   4.3698781+00  BETA   -3.2301946-01  FUEL    8.6443110+03  BARC    8.5377256+00
DELV    2.7356214+03  MASS    2.7856646+04  PLCHNG  1.6493452-01  DRTX    2.7282815+03  DRTY   -2.3248544+01  DRTZ    1.9881085+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity - Continued

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ID      916072.2
ENTRY AND TOUCHDOWN
   25  SEPT. 1969  20 HRS,   7 MINS,  43.985 SECS  G.M.T. **** 228. HRS,   44. MINS,  19.845 SECS  G.E.T.
X      -1.1050257+03  Y       2.9453409+03  Z       1.5514383+03  DX     -3.2723262+04  DY     -1.3577155+04  DZ     -6.6144660+03
R       3.5075740+03  DEC     2.6251420+01  RA      1.1056496+02  V       3.6040285+04  PTH    -6.4000034+00  AZ      9.8661710+01
ALT     6.5908079+01  LAT     2.6401491+01  LON     1.6416521+02  VE      3.4671909+04  PTE    -6.6771904+00  AZE     9.8993627+01
SMA     1.0498048+05  ECC     9.6701055-01  INC     2.7546865+01  RAN     1.5605838+00  APF     1.2000029+02  RP      3.4632490+03
INMP    1.8942389+00  RAM     1.8407518+00  DEM     1.9285584+00  RAS    -1.7763277+02  DES    -1.0260189+00  SPSFR   3.4915368+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   1.7253718+01  LONTD   1.9499963+02  AZTD    1.1185371+02
*****************************************************************************************************************************

ID      916072.2
CIRCUMLUNAR PERICYNTHION
   19  SEPT. 1969   4 HRS,  33 MINS,  57.975 SECS  G.M.T. ****  69. HRS,   10. MINS,  33.836 SECS  G.E.T.
XL     -3.2655815+01  YL     -9.1938378+02  ZL     -3.8846230+02  DXL    -8.4152528+03  DYL     3.8410729+02  DZL    -2.0165420+02
XS     -9.9788442+02  YS      3.4449308+01  ZS     -1.6607282+01  DXS     2.9708195+02  DYS     8.4294230+03  DZS    -3.6523850+02
ALTS    6.0123470+01  LATS   -9.5288893-01  LONS    1.7802279+02  VRS     8.4425604+03  PTR    -2.7023111-07  AZR    -9.2479819+01
LIN     1.7733908+02  LAN     1.8992826+01  LAP    -2.2497398+00  LTS    -1.1683832-01  LNS     8.5829133+01  DEM    -2.8664872+01
SMAS   -2.0448031+03  ECCS    1.4883683+00  INCS    1.5706193+02  RANS    1.7414396+02  APFS   -9.3520380+01  RPS     9.9851696+02
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ID      916072.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   21  SEPT. 1969  21 HRS,  43 MINS,  40.409 SECS  G.M.T. **** 134. HRS,   20. MINS,  16.269 SECS  G.E.T.
X       1.3370796+03  Y       3.1085744+03  Z       9.2830239+02  DX     -2.8831010+04  DY     1.2125543+03  DZ      2.1729000+04
R       3.5089545+03  DEC     1.5340358+01  RA      6.6726185+01  V       3.6122663+04  PTH    -6.6183640+00  AZ      4.8717528+01
ALT     6.5832692+01  LAT     1.5436956+01  LON     1.0021809+02  VE      3.5017682+04  PTE    -6.7624090+00  AZE     4.7078750+01
SMA     1.4847288+05  ECC     9.7668405-01  INC     4.3556743+01  RAN     4.9957603+01  APF     3.5972492+01  RP      3.4617865+03
INMP    3.2760687+01  RAM    -5.0473747+01  DEM    -2.2357085+01  RAS     1.7883381+02  DES     5.0558133-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.4858511+01  LONTD   1.2658263+02  AZTD    6.1908352+01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(g) 76° launch azimuth; second injection opportunity

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ID      916076.2
LAUNCH TIME      16  SEPT. 1969     8 HRS,   17 MINS,  40.730 SECS   G.M.T.
LAUNCH AZIMUTH   76.                                  INJECTION OPPORTUNITY    2
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ID      916076.2
EARTH PARKING ORBIT INSERTION
   16  SEPT. 1969   8 HRS,   28 MINS,   59.282 SECS  G.M.T. ****   0. HRS,    11. MINS,  18.551 SECS  G.E.T.
X       1.1394116+03  Y       2.8184941+03  Z       1.8213446+03  DX     -2.3587926+04  DY      9.8527992+03  DZ     -4.9068064+02
ALT     1.0306013+02  LAT     3.1091121+01  LON     3.0562358+02  V       2.5567727+04  PTH     1.6504643-07  AZ      9.1281939+01
R       3.5439334+03  DEC     3.0926166+01  RA      6.7988359+01  RAS     1.7385405+02  DES     2.6579782+00  RAN    -2.4504831+01
INC     3.0950093+01  MASS    2.8362063+05
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ID      916076.2
3.5 MINS PRIOR TO TLI INITIATION
   16  SEPT. 1969  11 HRS,   25 MINS,   16.611 SECS  G.M.T. ****   3. HRS,     7. MINS,  35.881 SECS  G.E.T.
X       1.1123119+03  Y       2.8305127+03  Z       1.8194309+03  DX     -2.3608461+04  DY      9.7840400+03  DZ     -7.8707600+02
ALT     1.0304027+02  LAT     3.1055081+01  LON     2.6198893+02  V       2.5567682+04  PTH     1.1680637-03  AZ      9.2056473+01
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ID      916076.2
TRANSLUNAR INJECTION INITIATION
   16  SEPT. 1969  11 HRS,   28 MINS,   46.611 SECS  G.M.T. ****   3. HRS,    11. MINS,   5.881 SECS  G.E.T.
X       2.7040777+02  Y       3.0776767+03  Z       1.7360969+03  DX     -2.4858120+04  DY      4.4444592+03  DZ     -4.0103085+03
ALT     1.0275007+02  LAT     2.9492708+01  LON     2.7754379+02  V       2.5568768+04  PTH    -3.4803877-03  AZ      1.0036257+02
R       3.5439027+03  DEC     2.9332875+01  RA      8.4978827+01  RAS     1.7396603+02  DES     2.6097923+00  RAN    -2.5490323+01
INC     3.0955309+01  MASS    2.8051039+05
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ID      916076.2
TRANSLUNAR INJECTION TERMINATION
   16  SEPT. 1969  11 HRS,   33 MINS,   53.513 SECS  G.M.T. ****   3. HRS,    16. MINS,  12.783 SECS  G.E.T.
X      -1.1927316+03  Y       3.1041852+03  Z       1.3727701+03  DX     -3.3799082+04  DY     -3.7396844+03  DZ     -1.0749241+04
ALT     1.5540229+02  LAT     2.2561371+01  LON     3.0230115+02  V       3.5663838+04  PTH     6.2410406+00  AZ      1.1191092+02
R       3.5976481+03  DEC     2.2431232+01  RA      1.1101844+02  RAS     1.7396921+02  DES     2.6084210+00  DEM    -2.1992987+01
RAN    -2.5490332+01  INC     3.0955309+01  ECC     9.7546948-01  SMA     1.4490502+05  RP      3.5545969+03  APF     1.1947284+02
INMP    1.1975638+01  C3TLI  -4.7318073-01  DAZTLI  0.0000000     MASS    1.3170259+05  FUEL    1.4880780+05
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ID      916076.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   16  SEPT. 1969  13 HRS,   33 MINS,   53.513 SECS  G.M.T. ****   5. HRS,    16. MINS,  12.783 SECS  G.E.T.
X      -1.3152020+04  Y      -1.3077068+04  Z      -1.0477735+04  DX     -3.4189352+03  DY     -1.1715976+04  DZ     -7.2259832+03
ALT     1.7860695+04  LAT    -2.9490154+01  LON     2.6036848+01  V       1.4183372+04  PTH     6.5028723+01  AZ      9.9960732+01
R       2.1301837+04  DEC    -2.9463565+01  RA     -1.3516372+02  RAS     1.7404395+02  DES     2.5762517+00
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ID      916076.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   19  SEPT. 1969   5 HRS,    1 MINS,   54.384 SECS  G.M.T. ****  68. HRS,    44. MINS,  13.651 SECS  G.E.T.
RMP     9.9915759+02  DEMP    5.8971094+00  RAMP   -1.7644322+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(g) 76° launch azimuth; second injection opportunity - Continued

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ID      916076.2
LUNAR ORBIT INSERTION BURN INITIATION
   19  SEPT. 1969    4 HRS,   58 MINS,   35.616 SECS  G.M.T. ****  68. HRS,    40. MINS,   54.885 SECS  G.E.T.
XL      2.9121123+02  YL     -9.1458491+02  ZL     -3.6660977+02  DXL    -8.2779390+03  DYL    -6.1577337+02  DZL    -7.6924286+02
XS     -9.8699631+02  YS     -2.8548256+02  ZS      3.1973834+00  DXS    -8.1537564+02  DYS     8.2966848+03  DZS    -5.1719401+02
ALTS    8.8965594+01  LATS    1.7830089-01  LONS   -1.6386781+02  VRS     8.3526824+03  PTR    -1.0510097+01  AZR    -9.3577528+01
LIN     1.7641079+02  LAN     1.3288444+01  LAP     1.9446959+02  LTS    -1.1742049-01  LNS     8.5620524+01  DEM    -2.8667454+01
THETA   1.7425899+01  BETA   -1.7918073+02  MASS    9.4833024+04
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ID      916076.2
LUNAR ORBIT INSERTION BURN TERMINATION
   19  SEPT. 1969    5 HRS,    4 MINS,   54.969 SECS  G.M.T. ****  68. HRS,    47. MINS,   14.236 SECS  G.E.T.
XL     -1.4447412+02  YL     -9.0606491+02  ZL     -3.9118218+02  DXL    -5.4085454+03  DYL     9.0237787+02  DZL     2.7394244+00
XS     -9.8560577+02  YS      1.5108765+02  ZS     -2.4569342+01  DXS     8.7716761+02  DYS     5.4172327+03  DZS    -3.5714380+02
ALTS    5.8928093+01  LATS   -1.4115014+00  LONS    1.7128473+02  VRS     5.4993985+03  PTR    -3.8951210-01  AZR    -9.3734375+01
LIN     1.7599785+02  LAN     1.1905651+01  LAP     1.3278800+00  SMAS    1.0526083+03  ECCS    5.2868851-02  PERS    2.1454479+00
RPS     9.9695820+02  APOS    1.1082585+03  RANS    1.7059498+02  INCS    1.5690857+02  LTS    -1.1756998-01  LNS     8.5566968+01
LTE     6.7406074+00  LNE    -2.8124588+00  THETA  -7.4090007+00  BETA   -1.7878635+02  FUEL    2.4115682+04  BARC    2.4838278+01
DELV    2.9701741+03  MASS    7.0716342+04  PLCHNG  4.2210151-01  DRTX   -2.8335683+03  DRTY   -4.0519081+01  DRTZ   -8.8948416+02
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ID      916076.2
CIRCULARIZATION BURN INITIATION
   19  SEPT. 1969    9 HRS,   24 MINS,   44.833 SECS  G.M.T. ****  73. HRS,     7. MINS,    4.103 SECS  G.E.T.
XL     -2.7907935+02  YL     -8.7504696+02  ZL     -3.8767959+02  DXL    -5.2545372+03  DYL     1.5497210+03  DZL     2.8623036+02
XS     -9.4195081+02  YS      3.2480164+02  ZS     -3.3473069+01  DXS     1.8014076+03  DYS     5.1877369+03  DZS    -3.3580690+02
ALTS    5.8445737+01  LATS   -1.9241154+00  LONS    1.6097488+02  VRS     5.5018587+03  PTR    -6.3875489-03  AZR    -9.3501418+01
LIN     1.7599629+02  LAN     9.6590637+00  LAP     5.4904018+00  LTS    -1.2373696-01  LNS     8.3366211+01  DEM    -2.8659972+01
THETA   2.5613209-06  BETA    1.7999999+02  MASS    7.0696342+04
*****************************************************************************************************************

ID      916076.2
CIRCULARIZATION BURN TERMINATION
   19  SEPT. 1969    9 HRS,   24 MINS,   59.892 SECS  G.M.T. ****  73. HRS,     7. MINS,   19.161 SECS  G.E.T.
XL     -2.9191294+02  YL     -8.7117735+02  ZL     -3.8694490+02  DXL    -5.1019908+03  DYL     1.5730004+03  DZL     3.0665169+02
XS     -9.3745863+02  YS      3.3746827+02  ZS     -3.4291857+01  DXS     1.8236449+03  DYS     5.0338548+03  DZS    -3.2494189+02
ALTS    5.8446532+01  LATS   -1.9711982+00  LONS    1.6020203+02  VRS     5.3638570+03  PTR     3.4024952-03  AZR    -9.3475036+01
LIN     1.7599630+02  LAN     9.6568193+00  LAP    -3.9589667+00  SMAS    9.9749997+02  ECCS    5.6445069-04  PERS    1.9791881+00
RPS     9.9693692+02  APOS    9.9806301+02  RANS    1.7060345+02  INCS    1.5689926+02  LTS    -1.2374302-01  LNS     8.3364071+01
LTE     6.6993951+00  LNE    -2.6279005+00  THETA  -7.7154926-01  BETA    1.7999999+02  FUEL    9.5731055+02  BARC    7.7162972-01
DELV    1.3799756+02  MASS    6.9739032+04  PLCHNG  1.1032929-05  DRTX   -1.3799528+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      916076.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   20  SEPT. 1969    4 HRS,    2 MINS,   46.800 SECS  G.M.T. ****  91. HRS,    45. MINS,    6.070 SECS  G.E.T.
XL     -2.0730713+02  YL      9.0392897+02  ZL      3.6694603+02  DXL     5.2176644+03  DYL     8.9614259+02  DZL     7.4075593+02
XS      9.9720026+02  YS     -1.7404280+01  ZS      1.3928248+00  DXS    -9.3647134+01  DYS    -5.3478440+03  DZS     3.7402374+02
ALTS    5.8859570+01  LATS    7.9440325-02  LONS   -9.9988999-01  VRS     5.3617253+03  PTR     2.2247238-03  AZR    -8.5999915+01
LIN     1.7598706+02  LAN     1.3256011-01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(g) 76° launch azimuth; second injection opportunity - Continued

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ID      916076.2
CSM PLANE CHANGE BURN INITIATION
   21  SEPT. 1969    1 HRS,  13 MINS,  50.906 SECS  G.M.T. **** 112. HRS,   55. MINS,  10.173 SECS  G.E.T.
XL     -8.9374908+02  YL     -3.8128524+02  ZL     -2.2338437+02  DXL    -2.3459984+03  DYL     4.4810332+03  DZL     1.7331611+03
XS     -2.5081962+01  YS      9.9435738+02  ZS     -6.8488657+01  DXS     5.3606115+03  DYS     1.3081866+02  DZS    -7.8775559+01
ALTS    5.8535262+01  LATS   -3.9389071+00  LONS    9.1444939+01  VRS     5.3627861+03  PTR     1.0941571-02  AZR    -9.0842901+01
LIN     1.7597151+02  LAN    -1.0679486+01  LAP    -1.6679026+02  LTS    -1.8234976-01  LNS     6.3142122+01  DEM    -2.5719866+01
THETA  -7.6839627-06  BETA    8.9959979+01  MASS    3.6385031+04
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ID      916076.2
CSM PLANE CHANGE BURN TERMINATION
   21  SEPT. 1969    1 HRS,  13 MINS,  55.715 SECS  G.M.T. **** 112. HRS,   56. MINS,  14.983 SECS  G.E.T.
XL     -8.9559988+02  YL     -3.7774851+02  ZL     -2.2197966+02  DXL    -2.3310882+03  DYL     4.4564568+03  DZL     1.8167226+03
XS     -2.0838703+01  YS      9.9445424+02  ZS     -6.8516730+01  DXS     5.3622490+03  DYS     1.1394769+02  DZS     7.9777833+00
ALTS    5.8536083+01  LATS   -3.9405209+00  LONS    9.1200454+01  VRS     5.3634654+03  PTR     1.1001969-02  AZR    -8.9914053+01
LIN     1.7605853+02  LAN     2.4578863+00  LAP     7.2175164+01  SMAS    9.9753204+02  ECCS    5.3923675-04  PERS    1.9792836+00
RPS     9.9699413+02  APOS    9.9806994+02  RANS    1.7195842+02  INCS    1.5603183+02  LTS    -1.8235178-01  LNS     6.3141441+01
LTE     5.6996264+00  LNE    -7.2352242-01  THETA   1.4309246-03  BETA    8.9084445+01  FUEL    3.0571680+02  BARC    2.4349234-01
DELV    8.5404892+01  MASS    3.6079314+04  PLCHNG  9.1513392-01  DRTX    0.0000000     DRTY    8.5404760+01  DRTZ    0.0000000
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ID      916076.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   21  SEPT. 1969    5 HRS,  40 MINS,  57.281 SECS  G.M.T. **** 117. HRS,   23. MINS,  16.548 SECS  G.E.T.
XL     -4.3841624+02  YL      8.2979907+02  ZL      3.3823854+02  DXL     4.7907976+03  DYL     2.0449971+03  DZL     1.1983053+03
XS      9.9743444+02  YS     -1.7408528+01  ZS      1.4182667+00  DXS    -9.1967506+01  DYS    -5.3477468+03  DZS     3.6764205+02
ALTS    5.9093852+01  LATS    8.1457251-02  LONS   -9.9989924-01  VRS     5.3611580+03  PTR     2.0207585-02  AZR    -8.6067869+01
LIN     1.7605518+02  LAN     1.8142607-01
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ID      916076.2
TRANSEARTH INJECTION BURN INITIATION
   21  SEPT. 1969   22 HRS,  12 MINS,  58.154 SECS  G.M.T. **** 133. HRS,   55. MINS,  17.418 SECS  G.E.T.
XL      9.7406692+02  YL     -2.1257465+02  ZL     -3.3598647+01  DXL    -1.1147485+03  DYL    -4.7565160+03  DZL    -2.1681854+03
XS     -7.4378209+02  YS     -6.6266898+02  ZS      5.2737158+01  DXS    -3.5707254+03  DYS     3.9917669+03  DZS    -2.3699268+02
ALTS    5.9065101+01  LATS    3.0304243+00  LONS   -1.3830072+02  VRS     5.3610118+03  PTR    -2.0107291-02  AZR    -9.2536163+01
LIN     1.7604420+02  LAN    -8.2583125+00  LAP     2.3552167+02  LTS    -2.1440399-01  LNS     5.2491406+01  DEM    -2.2263867+01
THETA  -4.0933109+00  BETA   -4.9707592-01  MASS    3.6489315+04
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ID      916076.2
TRANSEARTH INJECTION BURN TERMINATION
   21  SEPT. 1969   22 HRS,  15 MINS,  14.116 SECS  G.M.T. **** 133. HRS,   57. MINS,  33.381 SECS  G.E.T.
XL      9.3410284+02  YL     -3.4260555+02  ZL     -9.3734815+01  DXL    -2.4866505+03  DYL    -6.9588441+03  DZL    -3.2508735+03
XS     -8.3596642+02  YS     -5.4572017+02  ZS      4.5414916+01  DXS    -4.7340068+03  DYS     6.5457705+03  DZS    -4.2365875+02
ALTS    6.0862716+01  LATS    2.6046563+00  LONS   -1.4686343+02  VRS     8.0893397+03  PTR     2.5953950+00  AZR    -9.3126614+01
LIN     1.7592664+02  LAN    -6.5657983+00  LAP    -7.3951437+00  SMAS   -3.4963122+03  ECCS    1.2853084+00  PERS    1.2987724+01
RPS     9.9752711+02  APOS   -7.9901515+03  RANS    1.7196649+02  INCS    1.5581346+02  LTS    -2.1446222-01  LNS     5.2472236+01
LTE     4.7533393+00  LNE     3.7825467-01  THETA   4.4487164+00  BETA   -3.2894693-01  FUEL    8.6435195+03  BARC    8.5422372+00
DELV    2.7363356+03  MASS    2.7845795+04  PLCHNG  1.6793438-01  DRTX    2.7292456+03  DRTY   -2.3679120+01  DRTZ    1.9532184+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(g) 76° launch azimuth; second injection opportunity - Concluded

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ID      916076.2
ENTRY AND TOUCHDOWN
   25  SEPT. 1969  20 HRS,   8 MINS,  39.037 SECS  G.M.T. **** 227. HRS,   50. MINS,  58.305 SECS  G.E.T.
X      -1.1186362+03  Y       2.9418658+03  Z       1.5482625+03  DX     -3.2661171+04  DY     -1.3709933+04  DZ     -6.6490996+03
R       3.5075637+03  DEC     2.6193634+01  RA      1.1081917+02  V       3.6040600+04  PTH    -6.4000157+00  AZ      9.8726285+01
ALT     6.5893555+01  LAT     2.6343474+01  LON     1.6418940+02  VE      3.4671792+04  PTE    -6.6774219+00  AZE     9.9060986+01
SMA     1.0507909+05  ECC     9.6704155-01  INC     2.7511200+01  RAN     1.6449684+00  APF     1.2015943+02  RP      3.4632437+03
INMP    1.9465945+00  RAM     1.8486206+00  DEM     1.9328466+00  RAS    -1.7763220+02  DES    -1.0262675+00  SPSFR   3.4807522+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   1.7173039+01  LONTD   1.9499989+02  AZTD    1.1186929+02
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ID      916076.2
CIRCUMLUNAR PERICYNTHION
   19  SEPT. 1969   5 HRS,   2 MINS,  20.602 SECS  G.M.T. ****  68. HRS,   44. MINS,  39.871 SECS  G.E.T.
XL     -1.8811096+01  YL     -9.2010457+02  ZL     -3.8804309+02  DXL    -8.4164169+03  DYL     3.3201492+02  DZL    -3.7925277+02
XS     -9.9831834+02  YS      2.5132704+01  ZS     -1.5891221+01  DXS     2.2033410+02  DYS     8.4292997+03  DZS    -5.1049849+02
ALTS    6.0267561+01  LATS   -9.1166782-01  LONS    1.7855788+02  VRS     8.4476178+03  PTR    -1.6963446-07  AZR    -9.3464988+01
LIN     1.7641080+02  LAN     1.3254003+01  LAP    -1.5492062+01  LTS    -1.1750913-01  LNS     8.5588758+01  DEM    -2.8667798+01
SMAS   -2.0311472+03  ECCS    1.4917226+00  INCS    1.5697582+02  RANS    1.7165901+02  APFS   -9.6603881+01  RPS     9.9876105+02
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ID      916076.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   21  SEPT. 1969  22 HRS,  32 MINS,  48.680 SECS  G.M.T. **** 134. HRS,   15. MINS,   7.944 SECS  G.E.T.
X       1.2539764+03  Y       3.1650122+03  Z       8.5083067+02  DX     -2.7099480+04  DY     -3.1830020+02  DZ      2.3878612+04
R       3.5090842+03  DEC     1.4032082+01  RA      6.8386550+01  V       3.6120234+04  PTH    -6.6476534+00  AZ      4.4343648+01
ALT     6.5832486+01  LAT     1.4121152+01  LON     8.9560363+01  VE      3.5089807+04  PTE    -6.7781841+00  AZE     4.2562111+01
SMA     1.4727618+05  ECC     9.7649658-01  INC     4.7304381+01  RAN     5.5054932+01  APF     3.2718739+01  RP      3.4614943+03
INMP    3.7974454+01  RAM    -4.9968527+01  DEM    -2.2200406+01  RAS     1.7886443+02  DES     4.9230682-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.5779138+01  LONTD   1.1397334+02  AZTD    5.6604446+01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(h) 80° launch azimuth; second injection opportunity

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ID      916080.2
LAUNCH TIME      16  SEPT. 1969     9 HRS,   16 MINS,  58.567 SECS   G.M.T.
LAUNCH AZIMUTH   80.                          INJECTION OPPORTUNITY    2
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ID      916080.2
EARTH PARKING ORBIT INSERTION
   16  SEPT. 1969    9 HRS,   28 MINS,  16.214 SECS  G.M.T. ****   0. HRS,   11. MINS,  17.648 SECS  G.E.T.
X       3.9169554+02  Y       3.0636227+03  Z       1.7378880+03  DX     -2.5146320+04  DY      4.2486698+03  DZ     -1.8221068+03
ALT     1.0278650+02  LAT     2.9525761+01  LON     3.0548815+02  V       2.5567727+04  PTH    -7.0734184-08  AZ      9.4690495+01
R       3.5439335+03  DEC     2.9365818+01  RA      8.2714047+01  RAS     1.7389097+02  DES     2.6420915+00  RAN    -1.6784345+01
INC     2.9705053+01  MASS    2.8411853+05
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ID      916080.2
3.5 MINS PRIOR TO TLI INITIATION
   16  SEPT. 1969  12 HRS,   21 MINS,  29.259 SECS  G.M.T. ****   3. HRS,    4. MINS,  30.693 SECS  G.E.T.
X       1.1044809+03  Y       2.8745201+03  Z       1.7539494+03  DX     -2.3985703+04  DY      8.8313105+03  DZ      6.3620728+02
ALT     1.0278440+02  LAT     2.9825650+01  LON     2.4833284+02  V       2.5567768+04  PTH     6.2622830-03  AZ      8.8362600+01
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ID      916080.2
TRANSLUNAR INJECTION INITIATION
   16  SEPT. 1969  12 HRS,   24 MINS,  59.259 SECS  G.M.T. ****   3. HRS,    8. MINS,    .693 SECS  G.E.T.
X       2.4991260+02  Y       3.0877252+03  Z       1.7213209+03  DX     -2.5209869+04  DY      3.4423968+03  DZ     -2.5145455+03
ALT     1.0273134+02  LAT     2.9217864+01  LON     2.6384650+02  V       2.5567763+04  PTH     3.6147500-04  AZ      9.6460295+01
R       3.5439312+03  DEC     2.9058964+01  RA      8.5372710+01  RAS     1.7400104+02  DES     2.5947240+00  RAN    -1.7750286+01
INC     2.9707145+01  MASS    2.8104307+05
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ID      916080.2
TRANSLUNAR INJECTION TERMINATION
   16  SEPT. 1969  12 HRS,   30 MINS,   6.787 SECS  G.M.T. ****   3. HRS,   13. MINS,   8.220 SECS  G.E.T.
X      -1.2351360+03  Y       3.0546976+03  Z       1.4450576+03  DX     -3.4198025+04  DY     -5.1211725+03  DZ     -8.7313766+03
ALT     1.5584255+02  LAT     2.3816332+01  LON     2.8920437+02  V       3.5664663+04  PTH     6.2538832+00  AZ      1.0848096+02
R       3.5979063+03  DEC     2.3680647+01  RA      1.1201545+02  RAS     1.7400423+02  DES     2.5933502+00  DEM    -2.2163474+01
RAN    -1.7750289+01  INC     2.9707145+01  ECC     9.7570110-01  SMA     1.4628977+05  RP      3.5546815+03  APF     1.1319470+02
INMP    7.8753032+00  C3TLI  -4.6870206-01  DAZTLI  0.0000000     MASS    1.3193197+05  FUEL    1.4911109+05
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ID      916080.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   16  SEPT. 1969  14 HRS,   30 MINS,   6.787 SECS  G.M.T. ****   5. HRS,   13. MINS,   8.220 SECS  G.E.T.
X      -1.3218690+04  Y      -1.3609284+04  Z      -9.6988359+03  DX     -3.3726501+03  DY     -1.1853639+04  DZ     -7.0292603+03
ALT     1.7866056+04  LAT    -2.7101800+01  LON     1.2940910+01  V       1.4187812+04  PTH     6.5041692+01  AZ      1.0272658+02
R       2.1307600+04  DEC    -2.7076644+01  RA     -1.3416588+02  RAS     1.7407897+02  DES     2.5611784+00
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ID      916080.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   19  SEPT. 1969    5 HRS,   33 MINS,  30.789 SECS  G.M.T. ****  68. HRS,   16. MINS,  32.220 SECS  G.E.T.
RMP     9.9940841+02  DEMP    5.7460129+00  RAMP   -1.7936623+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(h) 80° launch azimuth; second injection opportunity - Continued

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ID      916080.2
LUNAR ORBIT INSERTION BURN INITIATION
   19  SEPT. 1969   5 HRS,  30 MINS,   1.074 SECS  G.M.T. ****  68. HRS,   13. MINS,   2.505 SECS  G.E.T.
XL      2.6144442+02  YL     -9.1642272+02  ZL     -3.6451780+02  DXL    -8.3017525+03  DYL    -5.4539876+02  DZL    -8.9747273+02
XS     -9.8901654+02  YS     -2.5074031+02  ZS      5.7041724+00  DXS    -7.5568206+02  DYS     8.3237074+03  DZS    -6.6255810+02
ALTS    8.1828471+01  LATS    3.2031722-01  LONS   -1.6577383+02  VRS     8.3841601+03  PTR    -9.0356771+00  AZR    -9.4538571+01
LIN     1.7544112+02  LAN     1.0205578+01  LAP     1.5461056+01  LTS    -1.1816386-01  LNS     8.5354344+01  DEM    -2.8669943+01
THETA   1.3719636+01  BETA    1.7891523+02  MASS    9.4833024+04
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ID      916080.2
LUNAR ORBIT INSERTION BURN TERMINATION
   19  SEPT. 1969   5 HRS,  36 MINS,  21.685 SECS  G.M.T. ****  68. HRS,   19. MINS,  23.116 SECS  G.E.T.
XL     -1.7561049+02  YL     -9.0148279+02  ZL     -3.9163952+02  DXL    -5.3790041+03  DYL     1.0298522+03  DZL     5.9082514+01
XS     -9.8038809+02  YS      1.8711179+02  ZS     -2.6834571+01  DXS     1.0437980+03  DYS     5.3815188+03  DZS    -3.5245360+02
ALTS    5.9951130+01  LATS   -1.5400883+00  LONS    1.6919477+02  VRS     5.4931304+03  PTR    -7.2328144-02  AZR    -9.3682055+01
LIN     1.7599923+02  LAN     1.1802201+01  LAP     1.7812102+02  SMAS    1.0522065+03  ECCS   5.1110028-02  PERS    2.1442194+00
RPS     9.9842824+02  APOS    1.1059847+03  RANS    1.7061051+02  INCS    1.5689704+02  LTS    -1.1831391-01  LNS     8.5300620+01
LTE     6.7363431+00  LNE    -2.7904329+00  THETA  -1.1314180+01  BETA    1.7834274+02  FUEL    2.4196715+04  BARC    2.5040034+01
DELV    2.9816360+03  MASS    7.0636309+04  PLCHNG  5.7157116-01  DRTX   -2.8960463+03  DRTY    5.4836775+01  DRTZ   -7.0715832+02
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ID      916080.2
CIRCULARIZATION BURN INITIATION
   19  SEPT. 1969   9 HRS,  53 MINS,  51.938 SECS  G.M.T. ****  72. HRS,   36. MINS,  53.371 SECS  G.E.T.
XL     -1.9532815+02  YL     -8.9745446+02  ZL     -3.9148941+02  DXL    -5.3593441+03  DYL     1.1252821+03  DZL     1.0099798+02
XS     -9.6703717+02  YS      2.4674049+02  ZS     -2.8280239+01  DXS     1.3674581+03  DYS     5.3088388+03  DZS    -3.4932616+02
ALTS    5.9925997+01  LATS   -1.6231204+00  LONS    1.6568632+02  VRS     5.4932449+03  PTR    -2.7144137-02  AZR    -9.3648250+01
LIN     1.7599761+02  LAN     9.5765489+00  LAP     2.5159511+00  LTS    -1.2443085-01  LNS     8.3119587+01  DEM    -2.8655213+01
THETA   8.5377364-07  BETA   -1.7959999+02  MASS    7.0616309+04
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ID      916080.2
CIRCULARIZATION BURN TERMINATION
   19  SEPT. 1969   9 HRS,  54 MINS,   6.903 SECS  G.M.T. ****  72. HRS,   37. MINS,   8.333 SECS  G.E.T.
XL     -2.0834492+02  YL     -8.9463977+02  ZL     -3.9120975+02  DXL    -5.2107512+03  DYL     1.1603424+03  DZL     1.2609935+02
XS     -9.6362684+02  YS      2.5963023+02  ZS     -2.9127330+01  DXS     1.4018534+03  DYS     5.1581690+03  DZS    -3.3854222+02
ALTS    5.9921699+01  LATS   -1.6717593+00  LONS    1.6492085+02  VRS     5.3559790+03  PTR    -1.9138035-02  AZR    -9.3626080+01
LIN     1.7599761+02  LAN     9.5743170+00  LAP     1.7239617+02  SMAS    9.9750033+02  ECCS   9.7647948-04  PERS    1.9791892+00
RPS     9.9652629+02  APOS    9.9847436+02  RANS    1.7061881+02  INCS    1.5688775+02  LTS    -1.2443676-01  LNS     8.3117478+01
LTE     6.6939402+00  LNE    -2.6069079+00  THETA  -7.6442025-01  BETA    1.7999999+02  FUEL    9.5135547+02  BARC    7.6452762-01
DELV    1.3728987+02  MASS    6.9664954+04  PLCHNG  9.1317242-06  DRTX   -1.3728774+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      916080.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   20  SEPT. 1969   4 HRS,  33 MINS,  25.745 SECS  G.M.T. ****  91. HRS,   16. MINS,  27.177 SECS  G.E.T.
XL     -2.1175805+02  YL      9.0163818+02  ZL      3.6591475+02  DXL     5.2204331+03  DYL     9.1984195+02  DZL     7.5077470+02
XS      9.9568212+02  YS     -1.7376938+01  ZS      1.2630183+00  DXS    -9.5339330+01  DYS    -5.3558990+03  DZS     3.7447976+02
ALTS    5.7341040+01  LATS    7.2668335-02  LONS   -9.9984138-01  VRS     5.3698210+03  PTR    -1.4835068-02  AZR    -8.6001050+01
LIN     1.7598836+02  LAN     3.6399750-02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(h) 80° launch azimuth; second injection opportunity - Continued

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ID      916080.2
CSM PLANE CHANGE BURN INITIATION
   21  SEPT. 1969    1 HRS,   44 MINS,   31.138 SECS  G.M.T. **** 112. HRS,   27. MINS,   32.570 SECS  G.E.T.
XL     -8.9219727+02  YL     -3.8562571+02  ZL     -2.2513895+02  DXL    -2.3613016+03  DYL     4.4702963+03  DZL     1.7288771+03
XS     -2.5111400+01  YS      9.9503234+02  ZS     -6.8488647+01  DXS     5.3571574+03  DYS     1.2338933+02  DZS    -7.8808195+01
ALTS    5.9209166+01  LATS   -3.9362418+00  LONS    9.1445654+01  VRS     5.3591576+03  PTR    -6.8065574-02  AZR    -9.0849262+01
LIN     1.7597278+02  LAN    -1.0775536+01  LAP    -4.2916723+01  LTS    -1.8312244-01  LNS     6.2882626+01  DEM    -2.5649981+01
THETA  -7.6839627-06  BETA    8.9999986+01  MASS    3.6310953+04
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ID      916080.2
CSM PLANE CHANGE BURN TERMINATION
   21  SEPT. 1969    1 HRS,   44 MINS,   35.971 SECS  G.M.T. **** 112. HRS,   27. MINS,   37.401 SECS  G.E.T.
XL     -8.9406940+02  YL     -3.8208005+02  ZL     -2.2373045+02  DXL    -2.3463985+03  DYL     4.4455934+03  DZL     1.8130390+03
XS     -2.0849907+01  YS      9.9512375+02  ZS     -6.8516647+01  DXS     5.3588141+03  DYS     1.0647426+02  DZS     8.5494250+00
ALTS    5.9204093+01  LATS   -3.9378735+00  LONS    9.1200289+01  VRS     5.3598785+03  PTR    -6.8159745-02  AZR    -8.9913486+01
LIN     1.7606115+02  LAN     2.4692635+00  LAP    -4.6853099+00  SMAS    9.9752534+02  ECCS    1.2056366-03  PERS    1.9792636+00
RPS     9.9632269+02  APOS    9.9872799+02  RANS    1.7199225+02  INCS    1.5601683+02  LTS    -1.8312442-01  LNS     6.2881944+01
LTE     5.6798007+00  LNE    -6.9721017-01  THETA   1.5436227-03  BETA    8.9077722+01  FUEL    3.0723242+02  BARC    2.4429462-01
DELV    8.6006095+01  MASS    3.6003721+04  PLCHNG  9.2219866-01  DRTX    0.0000000     DRTY    8.6006020+01  DRTZ    0.0000000
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ID      916080.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   21  SEPT. 1969    6 HRS,   11 MINS,   35.801 SECS  G.M.T. **** 116. HRS,   54. MINS,   37.232 SECS  G.E.T.
XL     -4.4218251+02  YL      8.2663844+02  ZL      3.3699515+02  DXL     4.7875373+03  DYL     2.0665944+03  DZL     1.2072900+03
XS      9.9605117+02  YS     -1.7383450+01  ZS      1.4291591+00  DXS    -9.5781521+01  DYS    -5.3550605+03  DZS     3.6789870+02
ALTS    5.7710354+01  LATS    8.2196844-02  LONS   -9.9984547-01  VRS     5.3685377+03  PTR    -1.9155999-02  AZR    -8.6070491+01
LIN     1.7605782+02  LAN     1.9300717-01
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ID      916080.2
TRANSEARTH INJECTION BURN INITIATION
   21  SEPT. 1969   22 HRS,   43 MINS,   41.241 SECS  G.M.T. **** 133. HRS,   26. MINS,   42.672 SECS  G.E.T.
XL      9.7351007+02  YL     -2.1614529+02  ZL     -3.5499518+01  DXL    -1.1276963+03  DYL    -4.7516815+03  DZL    -2.1682388+03
XS     -7.4993063+02  YS     -6.5617721+02  ZS      5.2310208+01  DXS    -3.5397805+03  DYS     4.0170413+03  DZS    -2.3891475+02
ALTS    5.9354590+01  LATS    3.0049951+00  LONS   -1.3881460+02  VRS     5.3594539+03  PTR     6.6438074-02  AZR    -9.2562009+01
LIN     1.7604686+02  LAN    -8.2473727+00  LAP     4.6985793+00  LTS    -2.1519352-01  LNS     5.2231631+01  DEM    -2.2165516+01
THETA  -4.1674031+00  BETA   -5.1803853-01  MASS    3.6413721+04
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ID      916080.2
TRANSEARTH INJECTION BURN TERMINATION
   21  SEPT. 1969   22 HRS,   45 MINS,   57.018 SECS  G.M.T. **** 133. HRS,   28. MINS,   58.449 SECS  G.E.T.
XL      9.3317652+02  YL     -3.4584001+02  ZL     -9.5557431+01  DXL    -2.5122511+03  DYL    -6.9494540+03  DZL    -3.2512651+03
XS     -8.4104514+02  YS     -5.3868267+02  ZS      4.4932958+01  DXS    -4.6797109+03  DYS     6.5844404+03  DZS    -4.2766085+02
ALTS    6.1283926+01  LATS    2.5759096+00  LONS   -1.4736076+02  VRS     8.0893413+03  PTR     2.6200913+00  AZR    -9.3154845+01
LIN     1.7592305+02  LAN    -6.4981277+00  LAP    -7.3526368+00  SMAS   -3.4860697+03  ECCS    1.2862574+00  PERS    1.2930695+01
RPS     9.9791322+02  APOS   -7.9700527+03  RANS    1.7199647+02  INCS    1.5579159+02  LTS    -2.1525170-01  LNS     5.2212492+01
LTE     4.7271395+00  LNE     4.0539918-01  THETA   4.3584914+00  BETA   -3.4264071-01  FUEL    8.6317710+03  BARC    8.5261253+00
DELV    2.7385796+03  MASS    2.7781950+04  PLCHNG  1.7515479-01  DRTX    2.7312189+03  DRTY   -2.4698417+01  DRTZ    1.9901417+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(h) 80° launch azimuth; second injection opportunity - Concluded

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ID      916080.2
ENTRY AND TOUCHDOWN
   25  SEPT. 1969  20 HRS,   9 MINS,  37.404 SECS  G.M.T. **** 226. HRS,   52. MINS,  38.830 SECS  G.E.T.
X      -1.1330817+03  Y       2.9381303+03  Z       1.5448527+03  DX     -3.2594554+04  DY     -1.3850771+04  DZ     -6.6857018+03
R       3.5075708+03  DEC     2.6131561+01  RA      1.1108899+02  V       3.6040913+04  PTH    -6.4000173+00  AZ      9.8794533+01
ALT     6.5885704+01  LAT     2.6281150+01  LON     1.6421536+02  VE      3.4671637+04  PTE    -6.6776557+00  AZE     9.9132191+01
SMA     1.0519069+05  ECC     9.6707650-01  INC     2.7472814+01  RAN     1.7342304+00  APF     1.2032882+02  RP      3.4632462+03
INMP    2.0023249+00  RAM     1.8569438+00  DEM     1.9373823+00  RAS    -1.7763159+02  DES    -1.0265305+00  SPSFR   3.4172969+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   1.7086934+01  LONTD   1.9500045+02  AZTD    1.1188523+02
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ID      916080.2
CIRCUMLUNAR PERICYNTHION
   19  SEPT. 1969   5 HRS,  33 MINS,  13.268 SECS  G.M.T. ****  68. HRS,   16. MINS,  14.700 SECS  G.E.T.
XL     -3.5372722+00  YL     -9.2092925+02  ZL     -3.8773595+02  DXL    -8.4149535+03  DYL     2.6963610+02  DZL    -5.6367985+02
XS     -9.9900523+02  YS      1.4792003+01  ZS     -1.5234221+01  DXS     1.3481210+02  DYS     8.4274880+03  DZS    -6.5823592+02
ALTS    6.0737357+01  LATS   -8.7356225-01  LONS    1.7915169+02  VRS     8.4542297+03  PTR     6.1993670-05  AZR    -9.4466025+01
LIN     1.7544113+02  LAN     1.0176192+01  LAP     1.1327500+00  LTS    -1.1823967-01  LNS     8.5327217+01  DEM    -2.8670146+01
SMAS   -2.0112816+03  ECCS    1.4968130+00  INCS    1.5681243+02  RANS    1.6917238+02  APFS   -9.9767983+01  RPS     9.9923086+02
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ID      916080.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   21  SEPT. 1969  23 HRS,  27 MINS,    .556 SECS  G.M.T. **** 134. HRS,   10. MINS,   1.989 SECS  G.E.T.
X       1.1531180+03  Y       3.2232224+03  Z       7.7180047+02  DX     -2.4925587+04  DY     -1.9011780+03  DZ      2.6068885+04
R       3.5092051+03  DEC     1.2705272+01  RA      7.0315167+01  V       3.6117669+04  PTH    -6.6830378+00  AZ      3.9522698+01
ALT     6.5832589+01  LAT     1.2786517+01  LON     7.7902400+01  VE      3.5178617+04  PTE    -6.7979112+00  AZE     3.7597059+01
SMA     1.4597956+05  ECC     9.7629051-01  INC     5.1625306+01  RAN     6.0030874+01  APF     2.9821706+01  RP      3.4611011+03
INMP    4.3710780+01  RAM    -4.9412517+01  DEM    -2.2025764+01  RAS     1.7889821+02  DFS     4.7766525-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.6727510+01  LONTD   9.9933553+01  AZTD    5.0681273+01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(i) 83° launch azimuth; second injection opportunity

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ID      916083.2
LAUNCH TIME      16  SEPT. 1969    10 HRS,     4 MINS,  49.132 SECS    G.M.T.
LAUNCH AZIMUTH    83.                                INJECTION OPPORTUNITY     2
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ID      916083.2
EARTH PARKING ORBIT INSERTION
   16  SEPT. 1969  10 HRS,   16 MINS,    6.290 SECS  G.M.T. ****    0. HRS,    11. MINS,  17.158 SECS  G.E.T.
X      -2.4740751+02  Y       3.1133445+03  Z       1.6749148+03  DX     -2.5405596+04  DY     -4.9547075+02  DZ     -2.8317644+03
ALT     1.0258841+02  LAT     2.9360051+01  LON     3.0532628+02  V       2.5567727+04  PTH     0.0000000     AZ      9.7219863+01
R       3.5439334+03  DEC     2.8204151+01  RA      9.4543564+01  RAS     1.7392077+02  DES     2.6292707+00  RAN    -1.0461514+01
INC     2.9039910+01  MASS    2.8438825+05
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ID      916083.2
3.5 MINS PRIOR TO TLI INITIATION
   16  SEPT. 1969  13 HRS,    6 MINS,   49.313 SECS  G.M.T. ****    3. HRS,     2. MINS,    .181 SECS  G.E.T.
X       1.0940389+03  Y       2.9087827+03  Z       1.7030615+03  DX     -2.4194436+04  DY      3.0912819+03  DZ      1.7507333+03
ALT     1.0251990+02  LAT     2.8880908+01  LON     2.3737453+02  V       2.5568397+04  PTH     1.1790304-02  AZ      8.5528258+01
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ID      916083.2
TRANSLUNAR INJECTION INITIATION
   16  SEPT. 1969  13 HRS,   10 MINS,   19.313 SECS  G.M.T. ****    3. HRS,     5. MINS,  30.181 SECS  G.E.T.
X       2.3265032+02  Y       3.0952607+03  Z       1.7101241+03  DX     -2.5393701+04  DY      2.6539467+03  DZ     -1.3440987+03
ALT     1.0267355+02  LAT     2.9010469+01  LON     2.5281074+02  V       2.5567363+04  PTH     5.2035765-03  AZ      9.3443925+01
R       3.5439087+03  DEC     2.8852280+01  RA      8.5701535+01  RAS     1.7402928+02  DES     2.5825711+00  RAN    -1.1407244+01
INC     2.9039533+01  MASS    2.8134110+05
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ID      916083.2
TRANSLUNAR INJECTION TERMINATION
   16  SEPT. 1969  13 HRS,   15 MINS,   27.207 SECS  G.M.T. ****    3. HRS,    10. MINS,  38.075 SECS  G.E.T.
X      -1.2635884+03  Y       3.0153210+03  Z       1.5023145+03  DX     -3.4386257+04  DY     -5.2042876+03  DZ     -7.1526176+03
ALT     1.5610951+02  LAT     2.4819244+01  LON     2.7855922+02  V       3.5666060+04  PTH     6.2617181+00  AZ      1.0580997+02
R       3.5980224+03  DEC     2.4679308+01  RA      1.1273642+02  RAS     1.7403247+02  DES     2.5811950+00  DEM    -2.2299732+01
RAN    -1.1407252+01  INC     2.9039533+01  ECC     9.7591754-01  SMA     1.4760499+05  RP      3.5546925+03  APF     1.0798543+02
INMP    4.6946812+00  C3TLI  -4.6452560-01  DAZTLI  0.0000000     MASS    1.3205224+05  FUEL    1.4928887+05
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ID      916083.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   16  SEPT. 1969  15 HRS,   15 MINS,   27.207 SECS  G.M.T. ****    5. HRS,    10. MINS,  38.075 SECS  G.E.T.
X      -1.3223460+04  Y      -1.4025929+04  Z      -9.0911257+03  DX     -3.3251006+03  DY     -1.1960783+04  DZ     -6.8770307+03
ALT     1.7870893+04  LAT    -2.5273292+01  LON     2.4272852+00  V       1.4191905+04  PTH     6.5053791+01  AZ      1.0485694+02
R       2.1312727+04  DEC    -2.5249352+01  RA     -1.3331338+02  RAS     1.7410721+02  DES     2.5490212+00
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ID      916083.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   19  SEPT. 1969   5 HRS,   56 MINS,   29.989 SECS  G.M.T. ****   67. HRS,    51. MINS,  40.857 SECS  G.E.T.
RMP     9.9890754+02  DEMP    5.8189315+00  RAMP   -1.7785425+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(i) 83° launch azimuth; second injection opportunity - Continued

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ID      916083.2
LUNAR ORBIT INSERTION BURN INITIATION
   19  SEPT. 1969    5 HRS,   53 MINS,    4.343 SECS  G.M.T. ****  67. HRS,    48. MINS,   15.210 SECS  G.E.T.
YL      2.8558538+02  YL     -9.1366285+02  ZL     -3.5789970+02  DXL    -8.2805040+03  DYL    -6.3420449+02  DZL    -1.0542280+03
XS     -9.8524869+02  YS     -2.7128752+02  ZS      1.0910673+01  DXS    -8.6670521+02  DYS     8.3066919+03  DZS    -7.7466046+02
ALTS    8.3480532+01  LATS    6.1170574-01  LONS   -1.6460514+02  VRS     8.3876340+03  PTR    -9.4542910+00  AZR    -9.5270430+01
LIN     1.7468383+02  LAN     8.8062762+00  LAP     1.7034905+02  LTS    -1.1870969-01  LNS     8.5159063+01  DEM    -2.8671196+01
THETA   1.4262034+01  BETA    1.7746124+02  MASS    9.4833024+04
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ID      916083.2
LUNAR ORBIT INSERTION BURN TERMINATION
   19  SEPT. 1969    5 HRS,   59 MINS,   26.103 SECS  G.M.T. ****  67. HRS,    54. MINS,   36.971 SECS  G.E.T.
XL     -1.5288569+02  YL     -9.0431985+02  ZL     -3.9149160+02  DXL    -5.4027416+03  DYL     9.4287649+02  DZL     2.1386157+01
XS     -9.8262004+02  YS      1.6804612+02  ZS     -2.5542583+01  DXS     9.6887165+02  DYS     5.4028770+03  DZS    -3.5500038+02
ALTS    5.8719637+01  LATS   -1.4677327+00  LONS    1.7029525+02  VRS     5.5005288+03  PTR    -3.6593551-01  AZR    -9.3711084+01
LIN     1.7599944+02  LAN     1.1786913+01  LAP    -1.7002720+02  SMAS    1.0526273+03  ECCS    5.3030918-02  PERS    2.1455060+00
RPS     9.9680560+02  APOS    1.1084491+03  RANS    1.7062396+02  INCS    1.5688436+02  LTS    -1.1886035-01  LNS     8.5105168+01
LTE     6.7330880+00  LNE    -2.7742187+00  THETA  -1.0829392+01  BETA    1.7613284+02  FUEL    2.4269725+04  BARC    2.5125495+01
DELV    2.9921034+03  MASS    7.0563299+04  PLCHNG  1.3381365+00  DRTX   -2.8970408+03  DRTY    1.2845063+02  DRTZ   -7.3712586+02
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ID      916083.2
CIRCULARIZATION BURN INITIATION
   19  SEPT. 1969   10 HRS,   19 MINS,    8.208 SECS  G.M.T. ****  72. HRS,    14. MINS,   19.072 SECS  G.E.T.
XL     -2.8017773+02  YL     -8.7441715+02  ZL     -3.8791545+02  DXL    -5.2536561+03  DYL     1.5549777+03  DZL     2.9001954+02
XS     -9.3853670+02  YS      3.3403704+02  ZS     -3.3931877+01  DXS     1.8526470+03  DYS     5.1706526+03  DZS    -3.3428496+02
ALTS    5.8292949+01  LATS   -1.9507980+00  LONS    1.6040871+02  VRS     5.5026988+03  PTR    -2.5574034-03  AZR    -9.3484930+01
LIN     1.7599788+02  LAN     9.5414726+00  LAP     2.8242276+00  LTS    -1.2503334-01  LNS     8.2905564+01  DEM    -2.8650452+01
THETA  -5.9764154-06  BETA   -1.7999999+02  MASS    7.0543299+04
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ID      916083.2
CIRCULARIZATION BURN TERMINATION
   19  SEPT. 1969   10 HRS,   19 MINS,   23.236 SECS  G.M.T. ****  72. HRS,    14. MINS,   34.103 SECS  G.E.T.
XL     -2.9298343+02  YL     -8.7054263+02  ZL     -3.8717303+02  DXL    -5.1010872+03  DYL     1.5779751+03  DZL     3.1031571+02
XS     -9.3392888+02  YS      3.4663564+02  ZS     -3.4745273+01  DXS     1.8732357+03  DYS     5.0165784+03  DZS    -3.2342971+02
ALTS    5.8294655+01  LATS   -1.9975768+00  LONS    1.5963716+02  VRS     5.3646693+03  PTR     7.4313558-03  AZR    -9.3458238+01
LIN     1.7599787+02  LAN     9.5392442+00  LAP    -8.2379413+00  SMAS    9.9750014+02  ECCS    7.2547723-04  PERS    1.9791886+00
RPS     9.9677648+02  APOS    9.9822378+02  RANS    1.7063252+02  INCS    1.5687507+02  LTS    -1.2503936-01  LNS     8.2903440+01
LTE     6.6890679+00  LNE    -2.5886337+00  THETA  -7.7022421-01  BETA    1.7999999+02  FUEL    9.5539453+02  BARC    7.7029710-01
DELV    1.3802049+02  MASS    6.9587904+04  PLCHNG  1.1079543-05  DRTX   -1.3801800+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      916083.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   20  SEPT. 1969    4 HRS,   56 MINS,   59.268 SECS  G.M.T. ****  90. HRS,    52. MINS,   10.135 SECS  G.E.T.
XL     -2.1578323+02  YL      9.0242250+02  ZL      3.6622650+02  DXL     5.2069709+03  DYL     9.3801911+02  DZL     7.5745704+02
XS      9.9736958+02  YS     -1.7405564+01  ZS      1.2408102+00  DXS    -9.3463187+01  DYS    -5.3469586+03  DZS     3.7383405+02
ALTS    5.9028704+01  LATS    7.1269797-02  LONS   -9.9979405-01  VRS     5.3608258+03  PTR     3.3573821-03  AZR    -8.6001270+01
LIN     1.7598857+02  LAN     1.6554257-02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(i) 83° launch azimuth; second injection opportunity - Continued

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ID      916083.2
CSM PLANE CHANGE BURN INITIATION
   21  SEPT. 1969    2 HRS,    8 MINS,    3.233 SECS  G.M.T. **** 112. HRS,     3. MINS,  14.101 SECS  G.E.T.
XL     -8.8986870+02  YL     -3.8845742+02  ZL     -2.2622568+02  DXL    -2.3884731+03  DYL     4.4621371+03  DZL     1.7249127+03
XS     -2.5105660+01  YS      9.9429905+02  ZS     -6.8429463+01  DXS     5.3609111+03  DYS     1.3175375+02  DZS    -7.9558662+01
ALTS    5.8473629+01  LATS   -3.9357410+00  LONS    9.1446388+01  VRS     5.3631200+03  PTR     1.9905328-02  AZR    -9.0850586+01
LIN     1.7597298+02  LAN    -1.0795220+01  LAP    -2.0826123+02  LTS    -1.8371563-01  LNS     6.2683490+01  DEM    -2.5595839+01
THETA  -1.6221698-05  BETA    8.9999995+01  MASS    3.6233904+04
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ID      916083.2
CSM PLANE CHANGE BURN TERMINATION
   21  SEPT. 1969    2 HRS,    8 MINS,    8.070 SECS  G.M.T. **** 112. HRS,     3. MINS,  18.935 SECS  G.E.T.
XL     -8.9176390+02  YL     -3.8491555+02  ZL     -2.2481916+02  DXL    -2.3735727+03  DYL     4.4374093+03  DZL     1.8093371+03
XS     -2.0837924+01  YS      9.9439717+02  ZS     -6.8457977+01  DXS     5.3625747+03  DYS     1.1480425+02  DZS     8.0516603+00
ALTS    5.8475117+01  LATS   -3.9373776+00  LONS    9.1200478+01  VRS     5.3638094+03  PTR     1.9981254-02  AZR    -8.9912362+01
LIN     1.7606165+02  LAN     2.4793912+00  LAP    -1.4524894+02  SMAS    9.9753878+02  ECCS    6.7008063-04  PERS    1.9793036+00
RPS     9.9687035+02  APOS    9.9820720+02  RANS    1.7201534+02  INCS    1.5600441+02  LTS    -1.8371772-01  LNS     6.2682808+01
LTE     5.6644732+00  LNE    -6.7699632-01  THETA   1.8074388-03  BETA    8.9075736+01  FUEL    3.0746875+02  BARC    2.4499447-01
DELV    8.6256094+01  MASS    3.5926435+04  PLCHNG  9.2419406-01  DRTX    0.0000000     DRTY    8.6255774+01  DRTZ    0.0000000
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ID      916083.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   21  SEPT. 1969    6 HRS,   35 MINS,    9.997 SECS  G.M.T. **** 116. HRS,    30. MINS,  20.864 SECS  G.E.T.
XL     -4.4623164+02  YL      8.2635932+02  ZL      3.3691783+02  DXL     4.7694083+03  DYL     2.0834362+03  DZL     1.2134991+03
XS      9.9759750+02  YS     -1.7409618+01  ZS      1.4428933+00  DXS    -9.1582385+01  DYS    -5.3469223+03  DZS     3.6729052+02
ALTS    5.9256931+01  LATS    8.2858117-02  LONS   -9.9979842-01  VRS     5.3603047+03  PTR     2.4162944-02  AZR    -8.6071022+01
LIN     1.7605831+02  LAN     2.0280050-01
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ID      916083.2
TRANSEARTH INJECTION BURN INITIATION
   21  SEPT. 1969   23 HRS,    7 MINS,   29.938 SECS  G.M.T. **** 133. HRS,     2. MINS,  40.806 SECS  G.E.T.
XL      9.7253653+02  YL     -2.1874785+02  ZL     -3.6912246+01  DXL    -1.1529667+03  DYL    -4.7472972+03  DZL    -2.1690221+03
XS     -7.5420074+02  YS     -6.5078463+02  ZS      5.1971339+01  DXS    -3.5063343+03  DYS     4.0485157+03  DZS    -2.4139968+02
ALTS    5.9023611+01  LATS    2.9865023+00  LONS   -1.3920975+02  VRS     5.3612623+03  PTR    -2.9758729-02  AZR    -9.2582668+01
LIN     1.7604735+02  LAN    -8.2398690+00  LAP    -3.3549420+00  LTS    -2.1580577-01  LNS     5.2030252+01  DEM    -2.2088850+01
THETA  -3.9008550+00  BETA   -5.2595733-01  MASS    3.6336435+04
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ID      916083.2
TRANSEARTH INJECTION BURN TERMINATION
   21  SEPT. 1969   23 HRS,    9 MINS,   45.439 SECS  G.M.T. **** 133. HRS,     4. MINS,  56.301 SECS  G.E.T.
XL      9.3177887+02  YL     -3.4807584+02  ZL     -9.6868532+01  DXL    -2.5321820+03  DYL    -6.9447279+03  DZL    -3.2524057+03
XS     -8.4430997+02  YS     -5.3283034+02  ZS      4.4549116+01  DXS    -4.6395334+03  DYS     6.6158170+03  DZS    -4.3058526+02
ALTS    6.0882359+01  LATS    2.5549171+00  LONS   -1.4774464+02  VRS     8.0919533+03  PTR     2.6430369+00  AZR    -9.3174709+01
LIN     1.7592078+02  LAN    -6.4768066+00  LAP    -7.9273577+00  SMAS   -3.4778209+03  ECCS    1.2868118+00  PERS    1.2884826+01
RPS     9.9747998+02  APOS   -7.9531217+03  RANS    1.7201761+02  INCS    1.5577673+02  LTS    -2.1586379-01  LNS     5.2011160+01
LTE     4.7067354+00  LNE     4.2644375-01  THETA   4.6141018+00  BETA   -3.4802358-01  FUEL    8.6142012+03  BARC    8.5151917+00
DELV    2.7388527+03  MASS    2.7722234+04  PLCHNG  1.7781550-01  DRTX    2.7323848+03  DRTY   -2.5082506+01  DRTZ    1.8632417+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(i) 83° launch azimuth; second injection opportunity - Concluded

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ID      916083.2
ENTRY AND TOUCHDOWN
   25  SEPT. 1969  20 HRS,  10 MINS,  22.421 SECS  G.M.T. **** 226. HRS,    5. MINS,  33.284 SECS  G.E.T.
X      -1.1442535+03  Y      2.9352102+03  Z      1.5422086+03  DX    -3.2542495+04  DY    -1.3959273+04  DZ    -6.7144664+03
R       3.5075893+03  DEC    2.6083314+01  RA     1.1129768+02  V      3.6041079+04  PTH   -6.4000183+00  AZ     9.8848137+01
ALT     6.5896429+01  LAT    2.6232710+01  LON    1.6423596+02  VE     3.4671438+04  PTE   -6.6778389+00  AZE    9.9188125+01
SMA     1.0528074+05  ECC    9.6710447-01  INC    2.7443324+01  RAN    1.8010782+00  APF    1.2046189+02  RP     3.4632662+03
INMP    2.0445083+00  RAM    1.8633709+00  DEM    1.9409848+00  RAS   -1.7763112+02  DES   -1.0267336+00  SPSFR  3.3579460+03
ENTDT   2.5000000-01  ENTRG  2.0000000+03  LATTD  1.7019712+01  LONTD  1.9500121+02  AZTD   1.1189810+02
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ID      916083.2
CIRCUMLUNAR PERICYNTHION
   19  SEPT. 1969   5 HRS,  56 MINS,  25.110 SECS  G.M.T. ****  67. HRS,   51. MINS,  35.975 SECS  G.E.T.
XL      9.0765877+00  YL    -9.2076333+02  ZL    -3.8717073+02  DXL   -8.4155069+03  DYL    2.1521498+02  DZL   -7.0909017+02
XS     -9.9876795+02  YS     5.8767711+00  ZS    -1.4719415+01  DXS    6.0989878+01  DYS    3.4285843+03  DZS   -7.7276537+02
ALTS    6.0400181+01  LATS  -8.4432498-01  LONS   1.7966287+02  VRS    8.4641550+03  PTR   -4.8930471-05  AZR   -9.5238885+01
LIN     1.7468382+02  LAN    8.7755907+00  LAP    1.0267896+00  LTS   -1.1878891-01  LNS    8.5130727+01  DEM   -2.8671338+01
SMAS   -1.9903836+03  ECCS   1.5018599+00  INCS   1.5663522+02  RANS   1.6729160+02  APFS  -1.0221877+02  RPS    9.9889369+02
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ID      916083.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   22  SEPT. 1969   0 HRS,  10 MINS,   4.395 SECS  G.M.T. **** 134. HRS,    5. MINS,  15.260 SECS  G.E.T.
X       1.0540339+03  Y      3.2691008+03  Z      7.1905547+02  DX    -2.2867646+04  DY    -3.2035252+03  DZ     2.7769563+04
R       3.5092802+03  DEC    1.1823711+01  RA     7.2129473+01  V      3.6115653+04  PTH   -6.6186304+00  AZ     3.5399204+01
ALT     6.5833666+01  LAT    1.1899660+01  LON    6.8921233+01  VE     3.5261917+04  PTE   -6.7161886+00  AZE    3.3363921+01
SMA     1.4490785+05  ECC    9.7610833-01  INC    5.5460147+01  RAN    6.3844781+01  APF    2.7803408+01  RP     3.4620908+03
INMP    4.8617394+01  RAM   -4.8971637+01  DEM   -2.1885639+01  RAS    1.7892505+02  DES    4.6603088-01  ENTDT  2.5000000-01
ENTRG   2.0000000+03  LATTD  3.7612644+01  LONTD  8.8782526+01  AZTD   4.5630918+01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(j) 86° launch azimuth; second injection opportunity

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ID      916086.2
LAUNCH TIME      16  SEPT. 1969   10 HRS,   59 MINS,   2.467 SECS   G.M.T.
LAUNCH AZIMUTH   86.                          INJECTION OPPORTUNITY    2
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ID      916086.2
EARTH PARKING ORBIT INSERTION
   16  SEPT. 1969  11 HRS,  10 MINS,  19.296 SECS  G.M.T. ****   0. HRS,   11. MINS,  16.829 SECS  G.E.T.
X      -9.7135121+02  Y      3.0030585+03  Z      1.6117012+03  DX    -2.4581669+04  DY    -5.8860027+03  DZ    -3.8477505+03
ALT     1.0239699+02  LAT    2.7202248+01  LON    3.0511542+02  V      2.5567727+04  PTH   -1.8862449-07  AZ     9.9728391+01
R       3.5439334+03  DEC    2.7050619+01  RA     1.0792401+02  RAS    1.7395453+02  DES    2.6147392+00  RAN   -2.7315581+00
INC     2.8622123+01  MASS   2.8456909+05
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ID      916086.2
3.5 MINS PRIOR TO TLI INITIATION
   16  SEPT. 1969  13 HRS,  58 MINS,  11.373 SECS  G.M.T. ****   2. HRS,   59. MINS,   8.906 SECS  G.E.T.
X       1.0788769+03  Y      2.9485034+03  Z      1.6429275+03  DX    -2.4341206+04  DY     7.1986008+03  DZ     3.0833746+03
ALT     1.0212342+02  LAT    2.7775826+01  LON    2.2501162+02  V      2.5569931+04  PTH    1.8777615-02  AZ     8.2187819+01
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ID      916086.2
TRANSLUNAR INJECTION INITIATION
   16  SEPT. 1969  14 HRS,   1 MINS,  41.373 SECS  G.M.T. ****   3. HRS,    2. MINS,  38.906 SECS  G.E.T.
X       2.1293108+02  Y      3.1035390+03  Z      1.6974235+03  DX    -2.5509188+04  DY     1.7267175+03  DZ     5.3938071+01
ALT     1.0252817+02  LAT    2.8776418+01  LON    2.4030726+02  V      2.5567619+04  PTH    1.1883151-02  AZ     8.9869150+01
R       3.5438030+03  DEC    2.8619039+01  RA     8.6075136+01  RAS    1.7406127+02  DES    2.5687991+00  RAN   -3.6509261+00
INC     2.8619312+01  MASS   2.8155419+05
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ID      916086.2
TRANSLUNAR INJECTION TERMINATION
   16  SEPT. 1969  14 HRS,   6 MINS,  49.557 SECS  G.M.T. ****   3. HRS,    7. MINS,  47.090 SECS  G.E.T.
X      -1.2899750+03  Y      2.9684600+03  Z      1.5716358+03  DX    -3.4476999+04  DY    -7.4729703+03  DZ    -5.2675714+03
ALT     1.5630904+02  LAT    2.6045067+01  LON    2.6643237+02  V      3.5668698+04  PTH    6.2683666+00  AZ     1.0262063+02
R       3.5980313+03  DEC    2.5900164+01  RA     1.1348785+02  RAS    1.7406446+02  DES    2.5674221+00  DEM   -2.2452767+01
RAN    -3.6516862+00  INC    2.8619312+01  ECC    9.7621187-01  SMA    1.4942808+05  RP     3.5546160+03  APF    1.0153614+02
INMP    9.3696065-01  C3TLI -4.5885810-01  DAZTLI 0.0000000     MASS   1.3212488+05  FUEL   1.4942931+05
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ID      916086.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   16  SEPT. 1969  16 HRS,   6 MINS,  49.557 SECS  G.M.T. ****   5. HRS,    7. MINS,  47.090 SECS  G.E.T.
X      -1.3186225+04  Y     -1.4512645+04  Z     -8.3681806+03  DX    -3.2642865+03  DY    -1.2085145+04  DZ    -6.6977770+03
ALT     1.7877315+04  LAT   -2.3133381+01  LON    3.5060401+02  V      1.4197412+04  PTH    6.5070328+01  AZ     1.0738257+02
R       2.1319471+04  DEC   -2.3110989+01  RA    -1.3225836+02  RAS    1.7413921+02  DES    2.5352458+00
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ID      916086.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   19  SEPT. 1969   6 HRS,  19 MINS,  28.321 SECS  G.M.T. ****  67. HRS,   20. MINS,  25.851 SECS  G.E.T.
RMP     9.9918696+02  DEMP   5.9813338+00  RAMP  -1.7644233+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(j) 86° launch azimuth: second injection opportunity - Continued

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ID      916086.2
LUNAR ORBIT INSERTION BURN INITIATION
   19  SEPT. 1969   6 HRS,  16 MINS,   6.381 SECS  G.M.T. ****  67. HRS,   17. MINS,   3.912 SECS  G.E.T.
XL      3.0836278+02  YL     -9.1086265+02  ZL     -3.5091395+02  DXL    -8.2565490+03  DYL    -7.2468101+02  DZL    -1.2294428+03
XS     -9.8144492+02  YS     -2.9050750+02  ZS      1.6437536+01  DXS    -9.8637075+02  DYS     8.2879798+03  DZS    -9.0324662+02
ALTS    8.5175829+01  LATS    9.2006463-01  LONS   -1.6351125+02  VRS     8.3952003+03  PTR    -9.7440781+00  AZR    -9.6109091+01
LIN     1.7381018+02  LAN     7.9733172+00  LAP    -1.6254797+02  LTS    -1.1925529-01  LNS     8.4963969+01  DEM    -2.8671964+01
THETA   1.4885710+01  BETA    1.7581309+02  MASS    9.4833024+04
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ID      916086.2
LUNAR ORBIT INSERTION BURN TERMINATION
   19  SEPT. 1969   6 HRS,  22 MINS,  30.393 SECS  G.M.T. ****  67. HRS,   23. MINS,  27.925 SECS  G.E.T.
XL     -1.3247844+02  YL     -9.0759177+02  ZL     -3.9189717+02  DXL    -5.4182278+03  DYL     8.4155766+02  DZL    -2.1577327+01
XS     -9.8557155+02  YS      1.5132656+02  ZS     -2.4610753+01  DXS     8.7872502+02  DYS     5.4169153+03  DZS    -3.5703444+02
ALTS    5.8931519+01  LATS   -1.4138761+00  LONS    1.7127086+02  VRS     5.4993275+03  PTR    -3.9209194-01  AZR    -9.3733364+01
LIN     1.7599796+02  LAN     1.1928670+01  LAP    -7.8312056-01  SMAS    1.0525857+03  ECCS    5.2851238-02  PERS    2.1453787+00
RPS     9.9695528+02  APOS    1.1082162+03  RANS    1.7064376+02  INCS    1.5686089+02  LTS    -1.1940700-01  LNS     8.4909749+01
LTE     6.7297275+00  LNE    -2.7579640+00  THETA  -1.0286846+01  BETA    1.7363606+02  FUEL    2.4412867+04  BARC    2.5265358+01
DELV    3.0126572+03  MASS    7.0420156+04  PLCHNG  2.2153433+00  DRTX   -2.9037837+03  DRTY    2.1257301+02  DRTZ   -7.7392710+02
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ID      916086.2
CIRCULARIZATION BURN INITIATION
   19  SEPT. 1969  10 HRS,  42 MINS,  20.639 SECS  G.M.T. ****  71. HRS,   43. MINS,  18.170 SECS  G.E.T.
XL     -2.6819910+02  YL     -8.7787263+02  ZL     -3.8896105+02  DXL    -5.2716982+03  DYL     1.4942131+03  DZL     2.6427215+02
XS     -9.4160791+02  YS      3.2577609+02  ZS     -3.3559740+01  DXS     1.8068392+03  DYS     5.1858260+03  DZS    -3.3552822+02
ALTS    5.8442684+01  LATS   -1.9291053+00  LONS    1.6091547+02  VRS     5.5018213+03  PTR    -6.8492807-03  AZR    -9.3498559+01
LIN     1.7599641+02  LAN     9.6819559+00  LAP     2.0723297+01  LTS    -1.2558716-01  LNS     8.2709004+01  DEM    -2.8645563+01
THETA  -8.5377364-07  BETA    1.7999300+02  MASS    7.0400157+04
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ID      916086.2
CIRCULARIZATION BURN TERMINATION
   19  SEPT. 1969  10 HRS,  42 MINS,  35.628 SECS  G.M.T. ****  71. HRS,   43. MINS,  33.160 SECS  G.E.T.
XL     -2.8101689+02  YL     -8.7415603+02  ZL     -3.8828325+02  DXL    -5.1196367+03  DYL     1.5188261+03  DZL     2.8521573+02
XS     -9.3712357+02  YS      3.3837985+02  ZS     -3.4374118+01  DXS     1.8286246+03  DYS     5.0320834+03  DZS    -3.2467849+02
ALTS    5.8443338+01  LATS   -1.9759349+00  LONS    1.6014618+02  VRS     5.3638742+03  PTR     2.8817353-03  AZR    -9.3472233+01
LIN     1.7599641+02  LAN     9.6797476+00  LAP    -2.6829095+00  SMAS    9.9750004+02  ECCS    5.6680398-04  PERS    1.9791883+00
RPS     9.9693464+02  APOS    9.9806541+02  RANS    1.7065250+02  INCS    1.5685162+02  LTS    -1.2559308-01  LNS     8.2706895+01
LTE     6.6844811+00  LNE    -2.5718096+00  THETA  -7.6809489-01  BETA   -1.7999999+02  FUEL    9.5292773+02  BARC    7.6813465-01
DELV    1.3794364+02  MASS    6.9447229+04  PLCHNG  1.0889537-05  DRTX   -1.3794139+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      916086.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   20  SEPT. 1969   5 HRS,  20 MINS,  21.411 SECS  G.M.T. ****  90. HRS,   21. MINS,  18.942 SECS  G.E.T.
XL     -2.1937909+02  YL      9.0144511+02  ZL      3.6603263+02  DXL     5.2035354+03  DYL     9.5604556+02  DZL     7.6491692+02
XS      9.9719883+02  YS     -1.7401449+01  ZS      1.4103444+00  DXS    -9.3589791+01  DYS    -5.3478544+03  DZS     3.7400831+02
ALTS    5.8858133+01  LATS    8.1021384-02  LONS   -9.9972879-01  VRS     5.3617336+03  PTR     2.7885848-03  AZR    -8.6000080+01
LIN     1.7598720+02  LAN     1.5530374-01
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Continued

(j) 86° launch azimuth; second injection opportunity - Continued

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ID      916086.2
CSM PLANE CHANGE BURN INITIATION
   21  SEPT. 1969   2 HRS,  31 MINS,  25.523 SECS  G.M.T. **** 111. HRS,   32. MINS,  23.052 SECS  G.E.T.
XL     -8.8823695+02  YL     -3.9154647+02  ZL     -2.2754192+02  DXL    -2.4055606+03  DYL     4.4535318+03  DZL     1.7225149+03
XS     -2.5127179+01  YS      9.9434731+02  ZS     -6.8489903+01  DXS     5.3606554+03  DYS     1.3105132+02  DZS    -7.8645168+01
ALTS    5.8526462+01  LATS   -3.9390136+00  LONS    9.1447558+01  VRS     5.3628337+03  PTR     1.0702795-02  AZR    -9.0841535+01
LIN     1.7597170+02  LAN    -1.0657176+01  LAP    -1.9977973+02  LTS    -1.8430504-01  LNS     6.2485751+01  DEM    -2.5541636+01
THETA  -2.5613209-06  BETA    9.0000003+01  MASS    3.6093228+04
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ID      916086.2
CSM PLANE CHANGE BURN TERMINATION
   21  SEPT. 1969   2 HRS,  31 MINS,  30.297 SECS  G.M.T. **** 111. HRS,   32. MINS,  27.828 SECS  G.E.T.
XL     -8.9012147+02  YL     -3.8805652+02  ZL     -2.2615554+02  DXL    -2.3909040+03  DYL     4.4290274+03  DZL     1.8061784+03
XS     -2.0914235+01  YS      9.9444374+02  ZS     -6.8517645+01  DXS     5.3622892+03  DYS     1.1434869+02  DZS     8.1749338+00
ALTS    5.8527257+01  LATS   -3.9406087+00  LONS    9.1204818+01  VRS     5.3635143+03  PTR     1.0765516-02  AZR    -8.9911806+01
LIN     1.7605839+02  LAN     2.4927724+00  LAP    -1.4389697+02  SMAS    9.9753272+02  ECCS    5.4670111-04  PERS    1.9792856+00
RPS     9.9698737+02  APOS    9.9807805+02  RANS    1.7203119+02  INCS    1.5598979+02  LTS    -1.8430701-01  LNS     6.2485084+01
LTE     5.6491577+00  LNE    -6.5690713-01  THETA   1.4932501-03  BETA    8.9083679+01  FUEL    3.0354101+02  BARC    2.4147496-01
DELV    8.5482040+01  MASS    3.5789687+04  PLCHNG  9.1596080-01  DRTX    0.0000000     DRTY    8.5481862+01  DRTZ    0.0000000
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ID      916086.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   21  SEPT. 1969   6 HRS,  58 MINS,  31.935 SECS  G.M.T. **** 115. HRS,   59. MINS,  29.465 SECS  G.E.T.
XL     -4.4948415+02  YL      8.2465883+02  ZL      3.3626702+02  DXL     4.7613806+03  DYL     2.0998688+03  DZL     1.2205388+03
XS      9.9743097+02  YS     -1.7405697+01  ZS      1.4598412+00  DXS    -9.1917315+01  DYS    -5.3477675+03  DZS     3.6765010+02
ALTS    5.9090376+01  LATS    8.3845352-02  LONS   -9.9974013-01  VRS     5.3611783+03  PTR     2.0752861-02  AZR    -8.6067807+01
LIN     1.7605506+02  LAN     2.1618645-01
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ID      916086.2
TRANSEARTH INJECTION BURN INITIATION
   21  SEPT. 1969  23 HRS,  30 MINS,  58.284 SECS  G.M.T. **** 132. HRS,   31. MINS,  55.816 SECS  G.E.T.
XL      9.7197117+02  YL     -2.2122778+02  ZL     -3.8195975+01  DXL    -1.1668521+03  DYL    -4.7433775+03  DZL    -2.1695594+03
XS     -7.5852063+02  YS     -6.4583382+02  ZS      5.1708046+01  DXS    -3.4800284+03  DYS     4.0707023+03  DZS    -2.4343147+02
ALTS    5.9067809+01  LATS    2.9712269+00  LONS   -1.3958764+02  VRS     5.3610142+03  PTR    -2.0476785-02  AZR    -9.2604999+01
LIN     1.7604413+02  LAN    -8.2274240+00  LAP     4.8570126+01  LTS    -2.1640943-01  LNS     5.1831754+01  DEM    -2.2012921+01
THETA  -3.8816417+00  BETA   -5.1439013-01  MASS    3.6199687+04
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ID      916086.2
TRANSEARTH INJECTION BURN TERMINATION
   21  SEPT. 1969  23 HRS,  33 MINS,  13.332 SECS  G.M.T. **** 132. HRS,   34. MINS,  10.859 SECS  G.E.T.
XL      9.3099570+02  YL     -3.5001715+02  ZL     -9.7958037+01  DXL    -2.5504762+03  DYL    -6.9391982+03  DZL    -3.2524988+03
XS     -8.4759739+02  YS     -5.2771219+02  ZS      4.4263381+01  DXS    -4.5996312+03  DYS     6.6447439+03  DZS    -4.3283138+02
ALTS    6.0936691+01  LATS    2.5383811+00  LONS   -1.4809370+02  VRS     8.0929951+03  PTR     2.6429097+00  AZR    -9.3189473+01
LIN     1.7591954+02  LAN    -6.5148610+00  LAP    -9.4439998+00  SMAS   -3.4693883+03  ECCS    1.2875247+00  PERS    1.2837992+01
RPS     9.9753484+02  APOS   -7.9363115+03  RANS    1.7203426+02  INCS    1.5576606+02  LTS    -2.1646731-01  LNS     5.1812724+01
LTE     4.6865427+00  LNE     4.4718807-01  THETA   4.6048187+00  BETA   -3.4020500-01  FUEL    8.5854101+03  BARC    8.4866793+00
DELV    2.7401824+03  MASS    2.7614278+04  PLCHNG  1.7395914-01  DRTX    2.7337786+03  DRTY   -2.4541326+01  DRTZ    1.8549787+02
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TABLE XI.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 16, 1969 - Concluded

(j) 86° launch azimuth; second injection opportunity - Concluded

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ID      916086.2
ENTRY AND TOUCHDOWN
   25  SEPT. 1969  20 HRS,  11 MINS,   6.726 SECS  G.M.T. **** 225. HRS,   12. MINS,   4.253 SECS  G.E.T.
X      -1.1552469+03  Y       2.9323232+03  Z       1.5396140+03  DX     -3.2490761+04  DY     -1.4065406+04  DZ     -6.7435210+03
R       3.5076382+03  DEC     2.6035746+01  RA      1.1150294+02  V       3.6041091+04  PTH    -6.4000376+00  AZ      9.8902261+01
ALT     6.5937741+01  LAT     2.6184948+01  LON     1.6425612+02  VE      3.4671085+04  PTE    -6.6780433+00  AZE     9.9244589+01
SMA     1.0537320+05  ECC     9.6713287-01  INC     2.7414785+01  RAN     1.8636053+00  APF     1.2059577+02  RP      3.4633148+03
INMP    2.0844781+00  RAM     1.8696875+00  DEM     1.9443270+00  RAS    -1.7763066+02  DES    -1.0269332+00  SPSFR   3.2506484+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD   1.6952782+01  LONTD   1.9500159+02  AZTD    1.1191180+02
*****************************************************************************************************************

ID      916086.2
CIRCUMLUNAR PERICYNTHION
   19  SEPT. 1969   6 HRS,  19 MINS,  32.814 SECS  G.M.T. ****  67. HRS,   20. MINS,  30.345 SECS  G.E.T.
XL      2.4465802+01  YL     -9.2090476+02  ZL     -3.8689394+02  DXL    -8.4130766+03  DYL     1.4564984+02  DZL    -8.7870698+02
XS     -9.9905523+02  YS     -5.8190665+00  ZS     -1.4345694+01  DXS    -3.6110231+01  DYS     3.4277302+03  DZS    -9.0406924+02
ALTS    6.0681650+01  LATS   -8.2265451-01  LONS   -1.7966628+02  VRS     8.4761595+03  PTR     2.7694190-05  AZR    -9.6123465+01
LIN     1.7381016+02  LAN     7.9417764+00  LAP     2.0299056+00  LTS    -1.1933677-01  LNS     3.4934828+01  DEM    -2.8672035+01
SMAS   -1.9603429+03  ECCS    1.5096941+00  INCS    1.5636545+02  RANS    1.6520201+02  APFS   -1.0501540+02  RPS     9.9917516+02
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ID      916086.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   22  SEPT. 1969   1 HRS,   0 MINS,  18.474 SECS  G.M.T. **** 134. HRS,    1. MINS,  16.005 SECS  G.E.T.
X       9.2294204+02  Y       3.3208906+03  Z       6.5988690+02  DX     -1.9936422+04  DY     -4.7187489+03  DZ      2.9739327+04
R       3.5093571+03  DEC     1.0838213+01  RA      7.4468321+01  V       3.6113087+04  PTH    -6.5452100+00  AZ      3.0011053+01
ALT     6.5833666+01  LAT     1.0908154+01  LON     5.8667039+01  VE      3.5379051+04  PTE    -6.6197826+00  AZE     2.7850436+01
SMA     1.4350358+05  ECC     9.7586683-01  INC     6.0577545+01  RAN     6.8269652+01  APF     2.5720197+01  RP      3.4631971+03
INMP    5.4958797+01  RAM    -4.8458396+01  DEM    -2.1720691+01  RAS     1.7895636+02  DES     4.5245955-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   3.8689094+01  LONTD   7.5461341+01  AZTD    3.8942096+01
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969

(a) 72° launch azimuth; first injection opportunity

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ID      919072.1
LAUNCH TIME      19  SEPT. 1969    8 HRS,   45 MINS,   9.060 SECS   G.M.T.
LAUNCH AZIMUTH   72.                          INJECTION OPPORTUNITY    1
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ID      919072.1
EARTH PARKING ORBIT INSERTION
   19  SEPT. 1969   8 HRS,  56 MINS,  28.802 SECS  G.M.T. ****   0. HRS,   11. MINS,  19.741 SECS  G.E.T.
X       6.2780689+02  Y       2.9223101+03  Z       1.9040553+03  DX     -2.5088790+04  DY      4.8572677+03  DZ      8.1745141+02
ALT     1.0334398+02  LAT     3.2667610+01  LON     3.0566189+02  V       2.5567727+04  PTH     8.2523217-08  AZ      8.7827516+01
R       3.5439334+03  DEC     3.2498104+01  RA      7.7875298+01  RAS     1.7656169+02  DES     1.4896173+00  RAN    -8.0859023+00
INC     3.2562693+01  MASS    2.8296469+05
*****************************************************************************************************************

ID      919072.1
3.5 MINS PRIOR TO TLI INITIATION
   19  SEPT. 1969  10 HRS,  32 MINS,  52.843 SECS  G.M.T. ****   1. HRS,   47. MINS,  43.783 SECS  G.E.T.
X      -1.4166491+03  Y       2.8059668+03  Z       1.6365420+03  DX     -2.3346969+04  DY     -7.6624646+03  DZ     -7.0789564+03
ALT     1.0235147+02  LAT     2.7656822+01  LON     3.2040828+02  V       2.5571585+04  PTH    -7.0604260-03  AZ      1.0818208+02
*****************************************************************************************************************

ID      919072.1
TRANSLUNAR INJECTION INITIATION
   19  SEPT. 1969  10 HRS,  36 MINS,  22.843 SECS  G.M.T. ****   1. HRS,   51. MINS,  13.783 SECS  G.E.T.
X      -2.1713993+03  Y       2.4570820+03  Z       1.3436413+03  DX     -2.0101778+04  DY     -1.2422498+04  DZ     -9.7826466+03
ALT     1.0140336+02  LAT     2.2413505+01  LON     3.3421107+02  V       2.5575381+04  PTH    -1.1680207-02  AZ      1.1441142+02
R       3.5436702+03  DEC     2.2282066+01  RA      1.3146802+02  RAS     1.7662391+02  DES     1.4627022+00  RAN    -8.6557316+00
INC     3.2583733+01  MASS    2.8075895+05
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ID      919072.1
TRANSLUNAR INJECTION TERMINATION
   19  SEPT. 1969  10 HRS,  41 MINS,  30.610 SECS  G.M.T. ****   1. HRS,   56. MINS,  21.549 SECS  G.E.T.
X      -3.1818843+03  Y       1.5469842+03  Z       6.8109201+02  DX     -2.0026844+04  DY     -2.4405330+04  DZ     -1.6539220+04
ALT     1.5945651+02  LAT     1.0964991+01  LON     3.5552885+02  V       3.5640432+04  PTH     6.5750490+00  AZ      1.1986090+02
R       3.6029757+03  DEC     1.0896530+01  RA      1.5407167+02  RAS     1.7662710+02  DES     1.4613204+00  DEM    -2.8645749+01
RAN    -7.7034993+00  INC     3.1613808+01  ECC     9.7582693-01  SMA     1.4707073+05  RP      3.5551516+03  APF     1.4554775+02
INMP    4.2083455+00  C3TLI  -4.6621295-01  DAZTLI -1.0939552+00  MASS    1.3153183+05  FUEL    1.4922711+05
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ID      919072.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   19  SEPT. 1969  12 HRS,  41 MINS,  30.610 SECS  G.M.T. ****   3. HRS,   56. MINS,  21.549 SECS  G.E.T.
X       9.1512884+02  Y      -1.8218065+04  Z      -1.1032261+04  DX      6.5148607+03  DY     -1.0984577+04  DZ     -6.1581703+03
ALT     1.7876899+04  LAT    -3.1193213+01  LON     8.4250700+01  V       1.4178413+04  PTH     6.5038192+01  AZ      8.4463461+01
R       2.1317742+04  DEC    -3.1165739+01  RA     -8.7124336+01  RAS     1.7670184+02  DES     1.4289865+00
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ID      919072.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   22  SEPT. 1969   2 HRS,  33 MINS,  34.770 SECS  G.M.T. ****  65. HRS,   48. MINS,  25.709 SECS  G.E.T.
RMP     9.9905314+02  DEMP    4.0076835+00  RAMP   -1.7672047+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(a) 72° launch azimuth; first injection opportunity - Continued

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ID      919072.1
LUNAR ORBIT INSERTION BURN INITIATION
   22  SEPT. 1969   2 HRS,  30 MINS,  11.595 SECS  G.M.T. ****  65. HRS,   45. MINS,   2.534 SECS  G.E.T.
XL      8.6940943+02  YL     -5.2005082+02  ZL     -1.7799881+02  DXL    -5.6258111+03  DYL    -5.2073263+03  DZL    -3.2737492+03
XS     -9.7069875+02  YS     -3.3858577+02  ZS      3.3357925+01  DXS    -1.2439967+03  DYS     8.1831899+03  DZS    -1.1142667+03
ALTS    9.0102198+01  LATS    1.8584595+00  LONS   -1.6077091+02  VRS     8.3518688+03  PTR    -1.0736177+01  AZR    -9.7452920+01
LIN     1.7230550+02  LAN     5.3330179+00  LAP     2.3731291+01  LTS    -2.2102415-01  LNS     5.0316191+01  DEM    -2.1421553+01
THETA   1.7430709+01  BETA    1.6978853+02  MASS    9.4833024+04
*****************************************************************************************************************************

ID      919072.1
LUNAR ORBIT INSERTION BURN TERMINATION
   22  SEPT. 1969   2 HRS,  36 MINS,  38.628 SECS  G.M.T. ****  65. HRS,   51. MINS,  29.565 SECS  G.E.T.
XL      5.3611086+02  YL     -7.7466478+02  ZL     -3.2670654+02  DXL    -4.6460445+03  DYL    -2.6259961+03  DZL    -1.2683561+03
XS     -9.9154852+02  YS      1.0474400+02  ZS     -1.0849989+01  DXS     6.2185957+02  DYS     5.4620747+03  DZS    -2.1533821+02
ALTS    5.8631112+01  LATS   -6.2346352-01  LONS    1.7396982+02  VRS     5.5015761+03  PTR    -4.4021715-01  AZR    -9.2248192+01
LIN     1.7766065+02  LAN     9.4183949+00  LAP     6.3611655+00  SMAS    1.0528665+03  ECCS    5.3499277-02  PERS    2.1462372+00
RPS     9.9653894+02  APOS    1.1091941+03  RANS    1.7675477+02  INCS    1.5626638+02  LTS    -2.2119043-01  LNS     5.0261641+01
LTE     4.5259470+00  LNE     6.0940588-01  THETA  -7.3480993+00  BETA    1.6477304+02  FUEL    2.4604890+04  BARC    2.5318725+01
DELV    3.0402955+03  MASS    7.0228133+04  PLCHNG  5.3639419+00  DRTX   -2.8547398+03  DRTY    5.1423822+02  DRTZ   -9.1072755+02
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ID      919072.1
CIRCULARIZATION BURN INITIATION
   22  SEPT. 1969   6 HRS,  56 MINS,  47.178 SECS  G.M.T. ****  70. HRS,   11. MINS,  38.116 SECS  G.E.T.
XL      4.0365350+02  YL     -8.3788331+02  ZL     -3.5785807+02  DXL    -5.0173324+03  DYL    -1.9888565+03  DZL    -9.9771489+02
XS     -9.5265325+02  YS      2.9192474+02  ZS     -1.6693205+01  DXS     1.6166808+03  DYS     5.2579630+03  DZS    -2.0445452+02
ALTS    5.8023886+01  LATS   -9.5983770-01  LONS    1.6296318+02  VRS     5.5046919+03  PTR    -1.8735941-02  AZR    -9.2129173+01
LIN     1.7765896+02  LAN     7.1554594+00  LAP     1.7939751+02  LTS    -2.2790524-01  LNS     4.8061959+01  DEM    -2.0505201+01
THETA   2.5613209-06  BETA   -1.7959999+02  MASS    7.0208133+04
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ID      919072.1
CIRCULARIZATION BURN TERMINATION
   22  SEPT. 1969   6 HRS,  57 MINS,   2.228 SECS  G.M.T. ****  70. HRS,   11. MINS,  53.167 SECS  G.E.T.
XL      3.9134730+02  YL     -8.4267322+02  ZL     -3.6026645+02  DXL    -4.9187427+03  DYL    -1.8785306+03  DZL    -9.4682910+02
XS     -9.4861457+02  YS      3.0475824+02  ZS     -1.7191733+01  DXS     1.6441742+03  DYS     5.1038616+03  DZS    -1.9807050+02
ALTS    5.8021781+01  LATS   -9.8850734-01  LONS    1.6218951+02  VRS     5.3658125+03  PTR    -8.9851058-03  AZR    -9.2115921+01
LIN     1.7765887+02  LAN     7.1531838+00  LAP     1.8841567+02  SMAS    9.9737254+02  ECCS    8.7375410-04  PERS    1.9788089+00
RPS     9.9650108+02  APOS    9.9824397+02  RANS    1.7676518+02  INCS    1.5626236+02  LTS    -2.2791175-01  LNS     4.8059838+01
LTE     4.2898276+00  LNE     8.3966755-01  THETA  -7.7171148-01  BETA   -1.7999999+02  FUEL    9.5681250+02  BARC    7.7188329-01
DELV    1.3889130+02  MASS    6.9251321+04  PLCHNG  4.9363835-06  DRTX   -1.3888901+02  DRTY    0.0000000     DRTZ    0.0000000
*****************************************************************************************************************************

ID      919072.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   23  SEPT. 1969   1 HRS,  48 MINS,  50.433 SECS  G.M.T. ****  89. HRS,    3. MINS,  41.371 SECS  G.E.T.
XL     -1.5533161+02  YL      9.0345822+02  ZL      3.9329644+02  DXL     5.2775218+03  DYL     7.1464612+02  DZL     4.4294262+02
XS      7.3719261+02  YS     -6.7149694+02  ZS      2.6185098+01  DXS    -3.6109624+03  DYS    -3.9578172+03  DZS     1.6831840+02
ALTS    5.9026779+01  LATS    1.5041980+00  LONS   -4.2329884+01  VRS     5.3601956+03  PTR     1.0154480-03  AZR    -8.8199930+01
LIN     1.7765017+02  LAN    -2.5440054+00
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(a) 72° launch azimuth; first injection opportunity - Continued

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ID      919072.1
CSM PLANE CHANGE BURN INITIATION
   23  SEPT. 1969  22 HRS,  59 MINS,  37.430 SECS  G.M.T. **** 110. HRS,   14. MINS,  28.366 SECS  G.E.T.
XL     -9.1691297+02  YL     -3.4936966+02  ZL     -1.7572358+02  DXL    -2.0972253+03  DYL     4.5208855+03  DZL     1.9393665+03
XS      6.3890770+02  YS      7.6427235+02  ZS     -3.6769696+01  DXS     4.1196377+03  DYS    -3.4347648+03  DZS     9.8261067+01
ALTS    5.8335094+01  LATS   -2.1139306+00  LONS    5.0105435+01  VRS     5.3638083+03  PTR     2.9153547-02  AZR    -8.8948517+01
LIN     1.7763772+02  LAN    -1.3372670+01  LAP    -4.5735499+01  LTS    -2.9030178-01  LNS     2.7752268+01  DEM    -1.0700571+01
THETA  -2.3051888-05  BETA    8.9999983+01  MASS    3.5897321+04
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ID      919072.1
CSM PLANE CHANGE BURN TERMINATION
   23  SEPT. 1969  22 HRS,  59 MINS,  39.727 SECS  G.M.T. **** 110. HRS,   14. MINS,  30.667 SECS  G.E.T.
XL     -9.1770420+02  YL     -3.4766274+02  ZL     -1.7498282+02  DXL    -2.0881505+03  DYL     4.5080601+03  DZL     1.9790357+03
XS      6.4046371+02  YS      7.6297239+02  ZS     -3.6724684+01  DXS     4.1120303+03  DYS    -3.4414693+03  DZS     1.3989168+02
ALTS    5.8335134+01  LATS   -2.1113393+00  LONS    4.9988813+01  VRS     5.3639606+03  PTR     2.9175608-02  AZR    -8.8503464+01
LIN     1.7740969+02  LAN    -4.5885853+00  LAP    -4.0492274+01  SMAS    9.9730978+02  ECCS    7.0187473-04  PERS    1.9786221+00
RPS     9.9660978+02  APOS    9.9800977+02  RANS    1.7735460+02  INCS    1.5531616+02  LTS    -2.9030278-01  LNS     2.7751942+01
LTE     1.7599431+00  LNE     2.8873454+00  THETA   2.9455190-04  BETA    8.9557924+01  FUEL    1.4605371+02  BARC    1.1661526-01
DELV    4.1265349+01  MASS    3.5751267+04  PLCHNG  4.4211762-01  DRTX    0.0000000     DRTY    4.1265285+01  DRTZ    0.0000000
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ID      919072.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   24  SEPT. 1969   3 HRS,  26 MINS,  37.611 SECS  G.M.T. **** 114. HRS,   41. MINS,  28.548 SECS  G.E.T.
XL     -3.9014023+02  YL      8.4061916+02  ZL      3.6914615+02  DXL     4.9169078+03  DYL     1.8703208+03  DZL     9.4057678+02
XS      7.3721919+02  YS     -6.7152115+02  ZS      2.6192235+01  DXS    -3.6100508+03  DYS    -3.9572774+03  DZS     1.9690924+02
ALTS    5.9062921+01  LATS    1.5045535+00  LONS   -4.2329885+01  VRS     5.3601570+03  PTR     1.2368453-02  AZR    -8.7894308+01
LIN     1.7740708+02  LAN    -6.8801248+00
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ID      919072.1
TRANSEARTH INJECTION BURN INITIATION
   24  SEPT. 1969  19 HRS,  43 MINS,   8.626 SECS  G.M.T. **** 130. HRS,   57. MINS,  59.562 SECS  G.E.T.
XL      8.6008637+02  YL      4.5393210+02  ZL      2.2119114+02  DXL     2.7023344+03  DYL    -4.2269453+03  DZL    -1.8438905+03
XS     -6.9156910+02  YS     -7.1755397+02  ZS      3.9709717+01  DXS    -3.3608394+03  DYS     3.7178505+03  DZS    -1.1675499+02
ALTS    5.8867191+01  LATS    2.2818232+00  LONS   -1.3394356+02  VRS     5.3611682+03  PTR    -2.5261119-02  AZR    -9.1247877+01
LIN     1.7739761+02  LAN    -1.5187971+01  LAP     9.9956033+01  LTS    -3.2227492-01  LNS     1.7245810+01  DEM    -4.9583707+00
THETA  -4.0725677+00  BETA   -7.2021560+00  MASS    3.6161266+04
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ID      919072.1
TRANSEARTH INJECTION BURN TERMINATION
   24  SEPT. 1969  19 HRS,  45 MINS,  24.035 SECS  G.M.T. **** 131. HRS,    0. MINS,  14.969 SECS  G.E.T.
XL      9.2695621+02  YL      3.3439412+02  ZL      1.6484381+02  DXL     3.3471332+03  DYL    -6.5831268+03  DZL    -3.2655669+03
XS     -7.9189245+02  YS     -6.0935285+02  ZS      3.2463619+01  DXS    -5.2146609+03  DYS     6.1613385+03  DZS    -5.5138504+02
ALTS    6.0626458+01  LATS    1.8619944+00  LONS   -1.4246757+02  VRS     8.0910423+03  PTR     2.5735205+00  AZR    -9.3997542+01
LIN     1.7558343+02  LAN     1.2640306+01  LAP     1.6314983+02  SMAS   -3.4902398+03  ECCS    1.2857461+00  PERS    1.2953903+01
RPS     9.9732222+02  APOS   -7.9778017+03  RANS   -1.7989115+02  INCS    1.5363821+02  LTS    -3.2233238-01  LNS     1.7226737+01
LTE     3.0729397-01  LNE     3.8202613+00  THETA   4.3923785+00  BETA   -4.7586606+00  FUEL    8.6083935+03  BARC    8.5081402+00
DELV    2.7519672+03  MASS    2.7552873+04  PLCHNG  2.4393460+00  DRTX    2.7233522+03  DRTY   -3.4414352+02  DRTZ    1.9544385+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(a) 72° launch azimuth; first injection opportunity - Continued

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ID      919072.1
ENTRY AND TOUCHDOWN
   28  SEPT. 1969  22 HRS,  19 MINS,  39.007 SECS  G.M.T. **** 229. HRS,   34. MINS,  29.941 SECS  G.E.T.
X      -3.0741992+03  Y       1.4192638+03  Z       9.2090654+02  DX     -1.3585818+04  DY     -2.5040502+04  DZ     -2.2066839+04
R       3.5089996+03  DEC     1.5214971+01  RA      1.5521867+02  V       3.6035351+04  PTH    -6.4000164+00  AZ      1.2745107+02
ALT     6.5864971+01  LAT     1.5310855+01  LON     1.7279255+02  VE      3.4863948+04  PTE    -6.6762812+00  AZE     1.2895186+02
SMA     1.0584922+05  ECC     9.6726795-01  INC     3.9999853+01  RAN    -5.8685510+00  APF     1.6892026+02  RP      3.4646623+03
INMP    1.1583772+01  RAM     4.0380915+01  DEM     2.0111681+01  RAS    -1.7484796+02  DES    -2.2297591+00  SPSFR   3.1896191+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD  -5.9030989+00  LONTD   1.9499927+02  AZTD    1.2963689+02
*****************************************************************************************************************************

ID      919072.1
CIRCUMLUNAR PERICYNTHION
   22  SEPT. 1969   2 HRS,  34 MINS,   1.371 SECS  G.M.T. ****  65. HRS,   48. MINS,  52.309 SECS  G.E.T.
XL      6.4110880+02  YL     -7.0552107+02  ZL     -2.9750678+02  DXL    -6.4203739+03  DYL    -4.5598128+03  DZL    -3.0221638+03
XS     -9.9830066+02  YS     -2.4551599+01  ZS     -9.1510381+00  DXS    -1.9559523+02  DYS     8.3731179+03  DZS    -1.1267100+03
ALTS    6.0150927+01  LATS   -5.2503492-01  LONS   -1.7859118+02  VRS     8.4508481+03  PTR    -1.4536236-07  AZR    -9.7662102+01
LIN     1.7230545+02  LAN     5.2979349+00  LAP    -1.0135673+00  LTS    -2.2112285-01  LNS     9.0283814+01  DEM    -2.1408699+01
SMAS   -2.0239676+03  ECCS    1.4934093+00  INCS    1.5222710+02  RANS    1.6860279+02  APFS   -1.4025760+02  RPS     9.9864443+02
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ID      919072.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   24  SEPT. 1969  19 HRS,  38 MINS,  53.766 SECS  G.M.T. **** 130. HRS,   53. MINS,  44.700 SECS  G.E.T.
X      -1.0793999+03  Y       3.1768283+03  Z       1.0267183+03  DX     -3.0201533+04  DY     -1.7738206+04  DZ      8.7973239+03
R       3.5087736+03  DEC     1.7014553+01  RA      1.0876637+02  V       3.6113285+04  PTH    -6.6706755+00  AZ      7.3005533+01
ALT     6.5832949+01  LAT     1.7120484+01  LON     1.7058119+02  VE      3.4704328+04  PTE    -6.9105576+00  AZE     7.2270600+01
SMA     1.4170228+05  ECC     9.7557671-01  INC     2.3868754+01  RAN     6.5012232+01  APF     5.9823689+01  RP      3.4608353+03
INMP    2.8458946+01  RAM    -1.0859515+01  DEM    -4.9783090+00  RAS    -1.7854990+02  DES    -6.2867294-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.3522282+01  LONTD   2.0170531+02  AZTD    8.5427874+01
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(b) 78° launch azimuth; first injection opportunity

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ID      919078.1
LAUNCH TIME      19  SEPT. 1969     9 HRS,   41 MINS,  22.980 SECS   G.M.T.
LAUNCH AZIMUTH   78.                          INJECTION OPPORTUNITY    1
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ID      919078.1
EARTH PARKING ORBIT INSERTION
   19  SEPT. 1969   9 HRS,   52 MINS,  41.044 SECS  G.M.T. ****   0. HRS,   11. MINS,  18.064 SECS  G.E.T.
X      -1.0003443+02  Y      3.0630264+03  Z      1.7796984+03  DX    -2.5541150+04  DY    -1.6368120+02  DZ    -1.1539228+03
ALT     1.0292198+02  LAT    3.0306946+01  LON    3.0556765+02  V      2.5567727+04  PTH    0.0000000     AZ     9.2991643+01
R       3.5439334+03  DEC    3.0144441+01  RA     9.1870540+01  RAS    1.7659669+02  DES    1.4744751+00  RAN   -4.0707597+00
INC     3.0278633+01  MASS   2.8388933+05
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ID      919078.1
3.5 MINS PRIOR TO TLI INITIATION
   19  SEPT. 1969  11 HRS,   26 MINS,  10.792 SECS  G.M.T. ****   1. HRS,   44. MINS,  47.812 SECS  G.E.T.
X      -1.4250051+03  Y      2.8327145+03  Z      1.5823738+03  DX    -2.3387799+04  DY    -8.4195018+03  DZ    -5.9975741+03
ALT     1.0221938+02  LAT    2.6669805+01  LON    3.0696398+02  V      2.5570452+04  PTH   -8.0394691-03  AZ     1.0519254+02
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ID      919078.1
TRANSLUNAR INJECTION INITIATION
   19  SEPT. 1969  11 HRS,   29 MINS,  40.792 SECS  G.M.T. ****   1. HRS,   48. MINS,  17.812 SECS  G.E.T.
X      -2.1808907+03  Y      2.4571032+03  Z      1.3281380+03  DX    -2.0126335+04  DY    -1.3203989+04  DZ    -8.6381822+03
ALT     1.0136416+02  LAT    2.2141619+01  LON    3.2097359+02  V      2.5574066+04  PTH   -1.4492903-02  AZ     1.1135990+02
P       3.5436692+03  DEC    2.2011443+01  RA     1.3159181+02  RAS    1.7665710+02  DES    1.4483416+00  RAN   -4.6271715+00
INC     3.0296451+01  MASS   2.8171647+05
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ID      919078.1
TRANSLUNAR INJECTION TERMINATION
   19  SEPT. 1969  11 HRS,   34 MINS,  49.403 SECS  G.M.T. ****   1. HRS,   53. MINS,  26.423 SECS  G.E.T.
X      -3.1927072+03  Y      1.4988384+03  Z      7.2939113+02  DX    -1.9919552+04  DY    -2.5397807+04  DZ    -1.5130526+04
ALT     1.5819546+02  LAT    1.1757270+01  LON    3.4294434+02  V      3.5647860+04  PTH    6.4819065+00  AZ     1.1736836+02
P       3.6016534+03  DEC    1.1684105+01  RA     1.5485196+02  RAS    1.7666031+02  DES    1.4469557+00  DEM   -2.8632686+01
RAN    -3.7815581+00  INC    2.9579949+01  ECC    9.7591477-01  SMA    1.4760865+05  RP     3.5551894+03  APF    1.4265486+02
INMP    1.3595372+00  C3TLI -4.6451392-01  DAZTLI-8.3153667-01  MASS   1.3208006+05  FUEL   1.4963642+05
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ID      919078.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   19  SEPT. 1969  13 HRS,   34 MINS,  49.403 SECS  G.M.T. ****   3. HRS,   53. MINS,  26.423 SECS  G.E.T.
X       1.0581582+03  Y     -1.8542720+04  Z     -1.0458790+04  DX     6.6121589+03  DY    -1.1022680+04  DZ    -5.9916007+03
ALT     1.7874061+04  LAT   -2.9411317+01  LON    7.1276339+01  V      1.4181657+04  PTH    6.5039826+01  AZ     8.6514436+01
R       2.1315216+04  DEC   -2.9384790+01  RA    -8.6733902+01  RAS    1.7673505+02  DES    1.4146203+00
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ID      919078.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   22  SEPT. 1969   3 HRS,   18 MINS,  26.068 SECS  G.M.T. ****  65. HRS,   37. MINS,   3.087 SECS  G.E.T.
RMP     9.9896263+02  DEMP   3.9450725+00  RAMP  -1.7630152+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(b) 78° launch azimuth; first injection opportunity - Continued

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ID      919078.1
LUNAR ORBIT INSERTION BURN INITIATION
   22  SEPT. 1969    3 HRS,   15 MINS,    1.762 SECS  G.M.T. ****  65. HRS,    33. MINS,   38.779 SECS  G.E.T.
XL      8.7890568+02  YL     -5.0861317+02  ZL     -1.6973165+02  DXL    -5.5382682+03  DYL    -5.2350062+03  DZL    -3.3773410+03
XS     -9.6839327+02  YS     -3.4760895+02  ZS      3.6794557+01  DXS    -1.2909882+03  DYS     8.1638440+03  DZS    -1.1996225+03
ALTS    9.1055569+01  LATS    2.0481023+00  LONS   -1.6025417+02  VRS     8.3518916+03  PTR    -1.0939420+01  AZR    -9.8017448+01
LIN     1.7171101+02  LAN     5.5364741+00  LAP     2.0521072+01  LTS    -2.2218008-01  LNS     4.9937061+01  DEM    -2.1270460+01
THETA   1.7890251+01  BETA    1.6868899+02  MASS    9.4833024+04
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ID      919078.1
LUNAR ORBIT INSERTION BURN TERMINATION
   22  SEPT. 1969    3 HRS,   21 MINS,   30.853 SECS  G.M.T. ****  65. HRS,    40. MINS,    7.870 SECS  G.E.T.
XL      5.4806406+02  YL     -7.6752290+02  ZL     -3.2359332+02  DXL    -4.6029761+03  DYL    -2.6889515+03  DZL    -1.2944469+03
XS     -9.9223469+02  YS      9.7655737+01  ZS     -1.0577375+01  DXS     5.8068299+02  DYS     5.4668730+03  DZS    -2.1582012+02
ALTS    5.8591340+01  LATS   -6.0782219-01  LONS    1.7437905+02  VRS     5.5018606+03  PTR    -4.1798080-01  AZR    -9.2252707+01
LIN     1.7766036+02  LAN     9.4289111+00  LAP    -1.6587324+02  SMAS    1.0528996+03  ECCS    5.3511614-02  PERS    2.1463383+00
RPS     9.9655725+02  APOS    1.1092419+03  RANS    1.7678827+02  INCS    1.5625545+02  LTS    -2.2234730-01  LNS     4.9882219+01
LTE     4.4859295+00  LNE     6.4909542-01  THETA  -6.8886410+00  BETA    1.6316532+02  FUEL    2.4735796+04  BARC    2.5442129+01
DELV    3.0591805+03  MASS    7.0097227+04  PLCHNG  5.9571212+00  DRTX   -2.8547161+03  DRTY    5.7099871+02  DRTZ   -9.3976492+02
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ID      919078.1
CIRCULARIZATION BURN INITIATION
   22  SEPT. 1969    7 HRS,   41 MINS,   31.498 SECS  G.M.T. ****  70. HRS,     0. MINS,    8.514 SECS  G.E.T.
XL      4.2371366+02  YL     -8.2959046+02  ZL     -3.5402302+02  DXL    -4.9669669+03  DYL    -2.0907048+03  DZL    -1.0404709+03
XS     -9.5694444+02  YS      2.7763738+02  ZS     -1.6144959+01  DXS     1.5376722+03  DYS     5.2815356+03  DZS    -2.0581455+02
ALTS    5.8043412+01  LATS   -9.2829326-01  LONS    1.6382102+02  VRS     5.5046720+03  PTR    -1.8719778-02  AZR    -9.2143325+01
LIN     1.7765861+02  LAN     7.1671258+00  LAP     1.6930060+02  LTS    -2.2906182-01  LNS     4.7683685+01  DEM    -2.0347282+01
THETA  -8.5377364-07  BETA   -1.7999999+02  MASS    7.0077227+04
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ID      919078.1
CIRCULARIZATION BURN TERMINATION
   22  SEPT. 1969    7 HRS,   41 MINS,   46.526 SECS  G.M.T. ****  70. HRS,     0. MINS,   23.545 SECS  G.E.T.
XL      4.1154645+02  YL     -8.3462304+02  ZL     -3.5653275+02  DXL    -4.8709897+03  DYL    -1.9784502+03  DZL    -9.8879960+02
XS     -9.5310424+02  YS      2.9051135+02  ZS     -1.6646150+01  DXS     1.5673557+03  DYS     5.1278362+03  DZS    -1.9943463+02
ALTS    5.8041309+01  LATS   -9.5711507-01  LONS    1.6304849+02  VRS     5.3657322+03  PTR    -8.9893170-03  AZR    -9.2130495+01
LIN     1.7765860+02  LAN     7.1648567+00  LAP     1.8930838+02  SMAS    9.9738157+02  ECCS    8.6340275-04  PERS    1.9788357+00
RPS     9.9652042+02  APOS    9.9824269+02  RANS    1.7679875+02  INCS    1.5625146+02  LTS    -2.2906827-01  LNS     4.7681565+01
LTE     4.2483320+00  LNE     8.7919867-01  THETA  -7.7065792-01  BETA    1.7999999+02  FUEL    9.5544336+02  BARC    7.7070983-01
DELV    1.3895163+02  MASS    6.9121783+04  PLCHNG  4.8789447-06  DRTX   -1.3894948+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      919078.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   23  SEPT. 1969    2 HRS,   33 MINS,   52.385 SECS  G.M.T. ****  88. HRS,    52. MINS,   29.403 SECS  G.E.T.
XL     -1.6240990+02  YL      9.0237858+02  ZL      3.9290366+02  DXL     5.2714755+03  DYL     7.4980687+02  DZL     4.5711636+02
XS      7.3718909+02  YS     -6.7149350+02  ZS      2.6192238+01  DXS    -3.6110085+03  DYS    -3.9578344+03  DZS     1.6831335+02
ALTS    5.9022070+01  LATS    1.5046153+00  LONS   -4.2329875+01  VRS     5.3602392+03  PTR     7.7717958-04  AZR    -8.8199984+01
LIN     1.7764996+02  LAN    -2.5352050+00
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(b) 78° launch azimuth; first injection opportunity - Continued

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*****************************************************************************************************************

ID      919078.1
CSM PLANE CHANGE BURN INITIATION
   23  SEPT. 1969  23 HRS,  44 MINS,  40.183 SECS  G.M.T. **** 110. HRS,    3. MINS,  17.201 SECS  G.E.T.
XL     -9.1409872+02  YL     -3.5547828+02  ZL     -1.7819591+02  DXL    -2.1324761+03  DYL     4.5066680+03  DZL     1.9338539+03
XS      6.3891681+02  YS      7.6428287+02  ZS     -3.6770178+01  DXS     4.1185594+03  DYS    -3.4347704+03  DZS     9.8297354+01
ALTS    5.8349027+01  LATS   -2.1139286+00  LONS    5.0105420+01  VRS     5.3637525+03  PTR     2.8571653-02  AZR    -8.8948122+01
LIN     1.7763754+02  LAN    -1.3364443+01  LAP    -4.6173031+01  LTS    -2.9146846-01  LNS     2.7371638+01  DEM    -1.0497404+01
THETA  -1.2806605-05  BETA    9.0000004+01  MASS    3.5767783+04
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ID      919078.1
CSM PLANE CHANGE BURN TERMINATION
   23  SEPT. 1969  23 HRS,  44 MINS,  42.471 SECS  G.M.T. **** 110. HRS,    3. MINS,  19.491 SECS  G.E.T.
XL     -9.1490033+02  YL     -3.5378305+02  ZL     -1.7745996+02  DXL    -2.1234595+03  DYL     4.4938889+03  DZL     1.9735358+03
XS      6.4046705+02  YS      7.6298772+02  ZS     -3.6725322+01  DXS     4.1119780+03  DYS    -3.4414437+03  DZS     1.3992219+02
ALTS    5.8350027+01  LATS   -2.1113466+00  LONS    4.9989232+01  VRS     5.3639049+03  PTR     2.8593576-02  AZR    -8.8503153+01
LIN     1.7740949+02  LAN    -4.5824616+00  LAP    -4.1310887+01  SMAS    9.9731670+02  ECCS    6.8965112-04  PERS    1.9786427+00
RPS     9.9662890+02  APOS    9.9800449+02  RANS    1.7739531+02  INCS    1.5580697+02  LTS    -2.9146944-01  LNS     2.7371313+01
LTE     1.7082424+00  LNE     2.9231595+00  THETA   9.2207553-05  BETA    8.9558002+01  FUEL    1.4551172+02  BARC    1.1598433-01
DELV    4.1261126+01  MASS    3.5622271+04  PLCHNG  4.4207635-01  DRTX    0.0000000     DRTY    4.1261046+01  DRTZ    0.0000000
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ID      919078.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   24  SEPT. 1969   4 HRS,  11 MINS,  40.522 SECS  G.M.T. **** 114. HRS,   30. MINS,  17.540 SECS  G.E.T.
XL     -3.9673033+02  YL      8.3797657+02  ZL      3.6812051+02  DXL     4.9018206+03  DYL     1.9030354+03  DZL     9.5381355+02
XS      7.3721681+02  YS     -6.7151874+02  ZS      2.6197832+01  DXS    -3.6101029+03  DYS    -3.9572782+03  DZS     1.9690844+02
ALTS    5.9059687+01  LATS    1.5043800+00  LONS   -4.2329875+01  VRS     5.3601927+03  PTR     1.1964065-02  AZR    -8.7894331+01
LIN     1.7740688+02  LAN    -6.8740897+00
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ID      919078.1
TRANSEARTH INJECTION BURN INITIATION
   24  SEPT. 1969  20 HRS,  28 MINS,  26.530 SECS  G.M.T. **** 130. HRS,   47. MINS,   3.548 SECS  G.E.T.
XL      8.6286259+02  YL      4.4962570+02  ZL      2.1913289+02  DXL     2.6768648+03  DYL    -4.2397370+03  DZL    -1.8518444+03
XS     -7.0067661+02  YS     -7.0866913+02  ZS      3.9429251+01  DXS    -3.8131356+03  DYS     3.7667678+03  DZS    -1.1948089+02
ALTS    5.8860148+01  LATS    2.2657144+00  LONS   -1.3467507+02  VRS     5.3612329+03  PTR    -2.4946656-02  AZR    -9.1276987+01
LIN     1.7739747+02  LAN    -1.5184302+01  LAP     9.5785940+01  LTS    -3.2342780-01  LNS     1.6863113+01  DEM    -4.7455937+00
THETA  -3.9304776+00  BETA   -7.1767341+00  MASS    3.6032271+04
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ID      919078.1
TRANSEARTH INJECTION BURN TERMINATION
   24  SEPT. 1969  20 HRS,  30 MINS,  41.519 SECS  G.M.T. **** 130. HRS,   49. MINS,  18.536 SECS  G.E.T.
XL      9.2888825+02  YL      3.3016545+02  ZL      1.6278207+02  DXL     3.3151272+03  DYL    -6.5970227+03  DZL    -3.2738000+03
XS     -7.9937238+02  YS     -5.9859093+02  ZS      3.2146509+01  DXS    -5.1432310+03  DYS     6.2232658+03  DZS    -5.5399608+02
ALTS    6.0676429+01  LATS    1.8437076+00  LONS   -1.4317317+02  VRS     8.0925134+03  PTR     2.6110794+00  AZR    -9.4015855+01
LIN     1.7557447+02  LAN     1.2249371+01  LAP     1.7169739+02  SMAS   -3.4789004+03  ECCS    1.2866768+00  PERS    1.2890826+01
RPS     9.9731991+02  APOS   -7.9551207+03  RANS   -1.7988769+02  INCS    1.5362931+02  LTS    -3.2348501-01  LNS     1.6844109+01
LTE     2.5405392-01  LNE     3.8516431+00  THETA   4.5093139+00  BETA   -4.7425323+00  FUEL    8.5816894+03  BARC    8.4825429+00
DELV    2.7534436+03  MASS    2.7450582+04  PLCHNG  2.4320014+00  DRTX    2.7254381+03  DRTY   -3.4317844+02  DRTZ    1.8873695+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(b) 78° launch azimuth; first injection opportunity - Concluded

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ID      919078.1
ENTRY AND TOUCHDOWN
   28  SEPT. 1969  22 HRS,  20 MINS,  58.798 SECS  G.M.T. **** 228. HRS,   39. MINS,  35.807 SECS  G.E.T.
X      -3.0848163+03  Y       1.4016782+03  Z       9.1220863+02  DX     -1.3381281+04  DY     -2.5125066+04  DZ     -2.2096577+04
R       3.5039768+03  DEC     1.5067941+01  RA      1.5556391+02  V       3.6035904+04  PTH    -6.4000004+00  AZ      1.2750275+02
ALT     6.5827046+01  LAT     1.5162988+01  LON     1.7280445+02  VE      3.4864549+04  PTE    -6.6757955+00  AZE     1.2900642+02
SMA     1.0600019+05  ECC     9.6731477-01  INC     3.9999664+01  RAN    -5.7218508+00  APF     1.6916145+02  RP      3.4646412+03
INMP    1.1567503+01  RAM     4.0392818+01  DEM     2.0115937+01  RAS    -1.7484713+02  DES    -2.2301193+00  SPSFR   3.0879529+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD  -6.0576385+00  LUNTD   1.9499971+02  AZTD    1.2961727+02
*****************************************************************************************************************

ID      919078.1
CIRCUMLUNAR PERICYNTHION
   22  SEPT. 1969   3 HRS,  18 MINS,  55.791 SECS  G.M.T. ****  65. HRS,   37. MINS,  32.808 SECS  G.E.T.
XL      6.4929076+02  YL     -6.9857920+02  ZL     -2.9548957+02  DXL    -6.3566070+03  DYL    -4.5855576+03  DZL    -3.1266404+03
XS     -9.9900249+02  YS     -2.8279018+01  ZS     -9.8366772+00  DXS    -2.2501376+02  DYS     8.3639620+03  DZS    -1.2137213+03
ALTS    5.9958006+01  LATS   -5.6448330-01  LONS   -1.7837692+02  VRS     8.4545615+03  PTR    -1.4499145-04  AZR    -9.8254202+01
LIN     1.7171095+02  LAN     5.5007423+00  LAP     2.2902934+01  LTS    -2.2228063-01  LNS     4.9904081+01  DEM    -2.1257258+01
SMAS   -2.0165089+03  ECCS    1.4951387+00  INCS    1.5169251+02  RANS    1.6802155+02  APFS   -1.4138397+02  RPS     9.9845153+02
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ID      919078.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   24  SEPT. 1969  20 HRS,  31 MINS,  19.736 SECS  G.M.T. **** 130. HRS,   49. MINS,  56.754 SECS  G.E.T.
X      -1.1810277+03  Y       3.1512132+03  Z       9.9345767+02  DX     -2.9404862+04  DY     -1.8466467+04  DZ      9.9224032+03
R       3.5038359+03  DEC     1.6447119+01  RA      1.1054525+02  V       3.6112469+04  PTH    -6.1642672+00  AZ      7.1334874+01
ALT     6.5832024+01  LAT     1.6549926+01  LON     1.5921599+02  VE      3.4711600+04  PTE    -6.3798088+00  AZE     7.0531349+01
SMA     1.4139484+05  ECC     9.7547386-01  INC     2.4682079+01  RAN     7.0577125+01  APF     5.5173386+01  RP      3.4678708+03
INMP    3.0876075+01  RAM    -1.0400194+01  DEM    -4.7320259+00  RAS    -1.7851718+02  DES    -6.4285633-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.3969551+01  LONTD   1.9010290+02  AZTD    8.3639480+01
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(c) 84° launch azimuth; first injection opportunity

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ID      919084.1
LAUNCH TIME      19  SEPT. 1969   10 HRS,   37 MINS,  29.283 SECS   G.M.T.
LAUNCH AZIMUTH   84.                                  INJECTION OPPORTUNITY    1
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ID      919084.1
EARTH PARKING ORBIT INSERTION
   19  SEPT. 1969  10 HRS,  48 MINS,  46.313 SECS  G.M.T. ****   0. HRS,   11. MINS,  17.030 SECS  G.E.T.
X      -8.4418386+02  Y      3.0185334+03  Z      1.6538664+03  DX    -2.4830291+04  DY    -5.2074304+03  DZ    -3.1698617+03
ALT     1.0252380+02  LAT    2.7973203+01  LON    3.0526131+02  V      2.5567727+04  PTH    0.0000000     AZ     9.8058250+01
R       3.5439334+03  DEC    2.7318703+01  RA     1.0562455+02  RAS    1.7663162+02  DES    1.4593639+00  RAN   -1.2519466+00
INC     2.8872555+01  MASS   2.8445841+05
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ID      919084.1
3.5 MINS PRIOR TO TLI INITIATION
   19  SEPT. 1969  12 HRS,  19 MINS,  20.794 SECS  G.M.T. ****   1. HRS,   41. MINS,  51.511 SECS  G.E.T.
X      -1.4437803+03  Y      2.8446184+03  Z      1.5436810+03  DX    -2.3346882+04  DY    -8.9579636+03  DZ    -5.3337005+03
ALT     1.0217679+02  LAT    2.5969452+01  LON    2.9384108+02  V      2.5568934+04  PTH   -4.9010656-03  AZ     1.0339715+02
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ID      919084.1
TRANSLUNAR INJECTION INITIATION
   19  SEPT. 1969  12 HRS,  22 MINS,  50.794 SECS  G.M.T. ****   1. HRS,   45. MINS,  21.511 SECS  G.E.T.
X      -2.1976868+03  Y      2.4502226+03  Z      1.3133535+03  DX    -2.0053367+04  DY    -1.3746856+04  DZ    -7.9257037+03
ALT     1.0143020+02  LAT    2.1882135+01  LON    3.0794370+02  V      2.5572062+04  PTH   -1.3332215-02  AZ     1.0948781+02
R       3.5437713+03  DEC    2.1753179+01  RA     1.3188999+02  RAS    1.7669022+02  DES    1.4340158+00  RAN   -1.7871641+00
INC     2.8886188+01  MASS   2.8231864+05
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ID      919084.1
TRANSLUNAR INJECTION TERMINATION
   19  SEPT. 1969  12 HRS,  27 MINS,  59.960 SECS  G.M.T. ****   1. HRS,   50. MINS,  30.677 SECS  G.E.T.
X      -3.2045583+03  Y      1.4589118+03  Z      7.5479035+02  DX    -1.9711364+04  DY    -2.6069214+04  DZ    -1.4243986+04
ALT     1.5759329+02  LAT    1.2174813+01  LON    3.3028404+02  V      3.5651549+04  PTH    6.4322086+00  AZ     1.1580857+02
R       3.6010173+03  DEC    1.2099191+01  RA     1.5552205+02  RAS    1.7669343+02  DES    1.4326269+00  DEM   -2.8617052+01
RAN    -1.0449388+00  INC    2.8326789+01  ECC    9.7596912-01  SMA    1.4794581+05  RP     3.5552680+03  APF    1.4076167+02
INMP    4.6635712-01  C3TLI -4.6345538-01  DA7TLI-6.6272725-01  MASS   1.3241310+05  FUEL   1.4990553+05
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ID      919084.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   19  SEPT. 1969  14 HRS,  27 MINS,  59.960 SECS  G.M.T. ****   3. HRS,   50. MINS,  30.677 SECS  G.E.T.
X       1.2338635+03  Y     -1.8737408+04  Z     -1.0083358+04  DX     6.7191868+03  DY    -1.1024600+04  DZ    -5.8723115+03
ALT     1.7872653+04  LAT   -2.8260661+01  LON    5.9447362+01  V      1.4183558+04  PTH    6.5040872+01  AZ     8.7705849+01
R       2.1314009+04  DEC   -2.8234798+01  RA    -8.6232495+01  RAS    1.7676817+02  DES    1.4002899+00
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ID      919084.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   22  SEPT. 1969   4 HRS,   6 MINS,  17.272 SECS  G.M.T. ****  65. HRS,   28. MINS,  47.988 SECS  G.E.T.
RMP     9.9880880+02  DEMP   3.8858076+00  RAMP  -1.7601075+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(c) 84° launch azimuth; first injection opportunity - Continued

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ID      919084.1
LUNAR ORBIT INSERTION BURN INITIATION
   22  SEPT. 1969    4 HRS,    2 MINS,  52.199 SECS  G.M.T. ****  65. HRS,   25. MINS,  22.915 SECS  G.E.T.
XL      8.8688970+02  YL     -4.9809869+02  ZL     -1.6314507+02  DXL    -5.4607640+03  DYL    -5.2696069+03  DZL    -3.4493200+03
XS     -9.6663091+02  YS     -3.5411117+02  ZS      3.9011293+01  DXS    -1.3237346+03  DYS     3.1506845+03  DZS    -1.2531186+03
ALTS    9.1696719+01  LATS    2.1701982+00  LONS   -1.5988042+02  VRS     8.3520198+03  PTR    -1.1093755+01  AZR    -9.8370528+01
LIN     1.7133824+02  LAN     5.7156248+00  LAP     2.1026921+01  LTS    -2.2341412-01  LNS     4.9532516+01  DEM    -2.1107871+01
THETA   1.8263207+01  BETA    1.6799826+02  MASS    9.4833024+04
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ID      919084.1
LUNAR ORBIT INSERTION BURN TERMINATION
   22  SEPT. 1969    4 HRS,    9 MINS,  22.687 SECS  G.M.T. ****  65. HRS,   31. MINS,  53.403 SECS  G.E.T.
XL      5.5867784+02  YL     -7.6091761+02  ZL     -3.2076802+02  DXL    -4.5632945+03  DYL    -2.7457040+03  DZL    -1.3178977+03
XS     -9.9264742+02  YS      9.2477100+01  ZS     -1.0376976+01  DXS     5.4960866+02  DYS     5.4706148+03  DZS    -2.1619026+02
ALTS    5.8506280+01  LATS   -5.9635683-01  LONS    1.7467757+02  VRS     5.5024026+03  PTR    -3.9080012-01  AZR    -9.2255975+01
LIN     1.7766015+02  LAN     9.4356723+00  LAP    -1.6734362+02  SMAS    1.0529418+03  ECCS    5.3566568-02  PERS    2.1464673+00
RPS     9.9653934+02  APOS    1.1093442+03  RANS    1.7682398+02  INCS    1.5624407+02  LTS    -2.2358197-01  LNS     4.9477489+01
LTE     4.4429309+00  LNE     6.9143090-01  THETA  -6.5178505+00  BETA    1.6217027+02  FUEL    2.4824551+04  BARC    2.5527909+01
DELV    3.0720042+03  MASS    7.0008473+04  PLCHNG  6.3289140+00  DRTX   -2.8534922+03  DRTY    6.0661835+02  DRTZ   -9.6271363+02
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ID      919084.1
CIRCULARIZATION BURN INITIATION
   22  SEPT. 1969    8 HRS,   29 MINS,  14.752 SECS  G.M.T. ****  69. HRS,   51. MINS,  45.468 SECS  G.E.T.
XL      4.4295187+02  YL     -8.2112087+02  ZL     -3.5015181+02  DXL    -4.9158729+03  DYL    -2.1888062+03  DZL    -1.0815761+03
XS     -9.6068259+02  YS      2.6437979+02  ZS     -1.5632777+01  DXS     1.4641907+03  DYS     5.3025272+03  DZS    -2.0704294+02
ALTS    5.8026477+01  LATS   -8.9885695-01  LONS    1.6461310+02  VRS     5.5048630+03  PTR    -1.5716999-02  AZR    -9.2155944+01
LIN     1.7765840+02  LAN     7.1751414+00  LAP    -1.6157295+02  LTS    -2.3029599-01  LNS     4.7280198+01  DEM    -2.0177558+01
THETA   4.2688681-06  BETA   -1.7999999+02  MASS    6.9988473+04
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ID      919084.1
CIRCULARIZATION BURN TERMINATION
   22  SEPT. 1969    8 HRS,   29 MINS,  29.874 SECS  G.M.T. ****  69. HRS,   52. MINS,    .591 SECS  G.E.T.
XL      4.3083360+02  YL     -8.2642566+02  ZL     -3.5277808+02  DXL    -4.9218185+03  DYL    -2.0738820+03  DZL    -1.0287750+03
XS     -9.5699849+02  YS      2.7738541+02  ZS     -1.6140097+01  DXS     1.4961501+03  DYS     5.1481168+03  DZS    -2.0062181+02
ALTS    5.8025066+01  LATS   -9.2803074-01  LONS    1.6383579+02  VRS     5.3648691+03  PTR    -6.0322769-03  AZR    -9.2143463+01
LIN     1.7765842+02  LAN     7.1728513+00  LAP    -1.6473325+02  SMAS    9.9702690+02  ECCS    5.2062424-04  PERS    1.9777803+00
RPS     9.9650783+02  APOS    9.9754597+02  RANS    1.7683455+02  INCS    1.5624012+02  LTS    -2.3030245-01  LNS     4.7278062+01
LTE     4.2037765+00  LNE     9.2135037-01  THETA  -7.7536050-01  BETA    1.7999999+02  FUEL    9.6139649+02  BARC    7.7551918-01
DELV    1.4000193+02  MASS    6.9027077+04  PLCHNG  4.5790949-06  DRTX   -1.3999999+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      919084.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   23  SEPT. 1969    3 HRS,   21 MINS,  14.986 SECS  G.M.T. ****  88. HRS,   43. MINS,  45.702 SECS  G.E.T.
XL     -1.6972955+02  YL      9.0056499+02  ZL      3.9219720+02  DXL     5.2674931+03  DYL     7.8733069+02  DZL     4.7231597+02
XS      7.3667271+02  YS     -6.7102301+02  ZS      2.6181801+01  DXS    -3.6127616+03  DYS    -3.9599959+03  DZS     1.6838722+02
ALTS    5.8323445+01  LATS    1.5050700+00  LONS   -4.2329870+01  VRS     5.3630184+03  PTR     2.5100317-03  AZR    -8.8200188+01
LIN     1.7764983+02  LAN    -2.5236306+00
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(c) 84° launch azimuth; first injection opportunity - Continued

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ID      919084.1
CSM PLANE CHANGE BURN INITIATION
   24  SEPT. 1969   0 HRS,  31 MINS,  22.854 SECS  G.M.T. **** 109. HRS,   53. MINS,  53.568 SECS  G.E.T.
XL     -9.1084687+02  YL     -3.6168247+02  ZL     -1.8069172+02  DXL    -2.1675864+03  DYL     4.4928836+03  DZL     1.9286306+03
XS      6.3872704+02  YS      7.6405665+02  ZS     -3.6754794+01  DXS     4.1178778+03  DYS    -3.4365609+03  DZS     9.8440438+01
ALTS    5.8053381+01  LATS   -2.1136711+00  LONS    5.0105449+01  VRS     5.3643787+03  PTR     9.1593029-03  AZR    -8.8947424+01
LIN     1.7763747+02  LAN    -1.3346630+01  LAP    -2.0004403+01  LTS    -2.9267769-01  LNS     2.6976949+01  DEM    -1.0286234+01
THETA  -3.1589624-05  BETA    8.9959989+01  MASS    3.5673076+04
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ID      919084.1
CSM PLANE CHANGE BURN TERMINATION
   24  SEPT. 1969   0 HRS,  31 MINS,  25.134 SECS  G.M.T. **** 109. HRS,   53. MINS,  55.848 SECS  G.E.T.
XL     -9.1165859+02  YL     -3.5999887+02  ZL     -1.7996056+02  DXL    -2.1586225+03  DYL     4.4801721+03  DZL     1.9682864+03
XS      6.4027113+02  YS      7.6276577+02  ZS     -3.6710063+01  DXS     4.1113178+03  DYS    -3.4432093+03  DZS     1.4001568+02
ALTS    5.8053701+01  LATS   -2.1110968+00  LONS    4.9989656+01  VRS     5.3645343+03  PTR     9.1736888-03  AZR    -8.8503022+01
LIN     1.7740963+02  LAN    -4.5769264+00  LAP    -1.5963200+01  SMAS    9.9696019+02  ECCS    4.4427130-04  PERS    1.9775818+00
RPS     9.9651727+02  APOS    9.9740309+02  RANS    1.7743798+02  INCS    1.5579788+02  LTS    -2.9267871-01  LNS     2.6976622+01
LTF     1.6545330+00  LNE     2.9601514+00  THETA  -8.6231137-05  BETA    8.9558408+01  FUEL    1.4495605+02  BARC    1.1640533-01
DELV    4.1212710+01  MASS    3.5528120+04  PLCHNG  4.4150624-01  DRTX    0.0000000     DRTY    4.1212791+01  DRTZ    0.0000000
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ID      919084.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   24  SEPT. 1969   4 HRS,  58 MINS,  13.997 SECS  G.M.T. **** 114. HRS,   20. MINS,  44.713 SECS  G.E.T.
XL     -4.0323970+02  YL      8.3462084+02  ZL      3.6678439+02  DXL     4.8885826+03  DYL     1.9374984+03  DZL     9.6781495+02
XS      7.3670272+02  YS     -6.7105033+02  ZS      2.6182453+01  DXS    -3.6122092+03  DYS    -3.9590956+03  DZS     1.9697303+02
ALTS    5.8364025+01  LATS    1.5050461+00  LONS   -4.2329870+01  VRS     5.3629555+03  PTR     8.4168643-03  AZR    -8.7894645+01
LIN     1.7740705+02  LAN    -6.8671168+00
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ID      919084.1
TRANSEARTH INJECTION BURN INITIATION
   24  SEPT. 1969  21 HRS,  14 MINS,  43.439 SECS  G.M.T. **** 130. HRS,   37. MINS,  14.152 SECS  G.E.T.
XL      8.6568869+02  YL      4.4435175+02  ZL      2.1662248+02  DXL     2.6491062+03  DYL    -4.2550690+03  DZL    -1.8610107+03
XS     -7.1012332+02  YS     -6.9856093+02  ZS      3.9091437+01  DXS    -3.7628204+03  DYS     3.8190868+03  DZS    -1.2239373+02
ALTS    5.8396971+01  LATS    2.2473369+00  LONS   -1.3547026+02  VRS     5.3627624+03  PTR    -6.2465210-03  AZR    -9.1308517+01
LIN     1.7739767+02  LAN    -1.5174356+01  LAP     5.5642292+01  LTS    -3.2460455-01  LNS     1.6472124+01  DEM    -4.5280616+00
THETA  -3.7454819+00  BETA   -7.1466804+00  MASS    3.5938120+04
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ID      919084.1
TRANSEARTH INJECTION BURN TERMINATION
   24  SEPT. 1969  21 HRS,  16 MINS,  58.154 SECS  G.M.T. **** 130. HRS,   39. MINS,  28.865 SECS  G.E.T.
XL      9.3087519+02  YL      3.2477895+02  ZL      1.6017994+02  DXL     3.2791107+03  DYL    -6.6139829+03  DZL    -3.2833397+03
XS     -8.0722528+02  YS     -5.8740627+02  ZS      3.1761358+01  DXS    -5.0671529+03  DYS     6.2890328+03  DZS    -5.5669426+02
ALTS    6.0339586+01  LATS    1.8222249+00  LONS   -1.4395715+02  VRS     8.0955468+03  PTR     2.6824629+00  AZR    -9.4035028+01
LIN     1.7556587+02  LAN     1.1820926+01  LAP     1.7035974+02  SMAS   -3.4662566+03  ECCS    1.2875961+00  PERS    1.2820613+01
RPS     9.9688183+02  APOS   -7.9293950+03  RANS   -1.7988910+02  INCS    1.5362093+02  LTS    -3.2466168-01  LNS     1.6453144+01
LTF     1.9967084-01  LNE     3.8835034+00  THETA   4.6837671+00  BETA   -4.7241778+00  FUEL    8.5642856+03  BARC    8.4716427+00
DELV    2.7552990+03  MASS    2.7373835+04  PLCHNG  2.4229966+00  DRTX    2.7280460+03  DRTY   -3.4205342+02  DRTZ    1.7998791+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(c) 84° launch azimuth; first injection opportunity - Concluded

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ID      919084.1
ENTRY AND TOUCHDOWN
   28  SEPT. 1969  22 HRS,  22 MINS,  19.953 SECS  G.M.T. **** 227. HRS,   44. MINS,  50.668 SECS  G.E.T.
X      -3.0955210+03  Y      1.3837108+03  Z      9.0334691+02  DX    -1.3172397+04  DY    -2.5209906+04  DZ     -2.2126181+04
R       3.5089801+03  DEC    1.4918132+01  RA     1.5591516+02  V      3.6036360+04  PTH   -6.4000289+00  AZ      1.2755436+02
ALT     6.5815243+01  LAT    1.5012322+01  LON    1.7281658+02  VE     3.4865040+04  PTE   -6.6753468+00  AZE     1.2906092+02
SMA     1.0616613+05  ECC    9.6736582-01  INC    3.9999089+01  RAN   -5.5721222+00  APF    1.6940679+02  RP      3.4646450+03
INMP    1.1551093+01  RAM    4.0404935+01  DEM    2.0120268+01  RAS   -1.7484628+02  DES   -2.2304837+00  SPSFR   3.0116738+03
ENTDT   2.5000000-01  ENTRG  2.0000000+03  LATTD -6.2146736+00  LONTD  1.9500072+02  AZTD   1.2959643+02
*****************************************************************************************************************************

ID      919084.1
CIRCUMLUNAR PERICYNTHION
   22  SEPT. 1969   4 HRS,   6 MINS,  49.445 SECS  G.M.T. ****  65. HRS,   29. MINS,  20.161 SECS  G.E.T.
XL      6.5676338+02  YL    -6.9206082+02  ZL    -2.9348858+02  DXL   -6.2986660+03  DYL   -4.6204491+03  DZL    -3.1997886+03
XS     -9.9768205+02  YS    -3.0733453+01  ZS    -1.0381963+01  DXS   -2.4427971+02  DYS    3.3583419+03  DZS    -1.2682858+03
ALTS    5.9715783+01  LATS  -5.9592052-01  LONS  -1.7823557+02  VRS    8.4575468+03  PTR    4.5866731-07  AZR    -9.8625025+01
LIN     1.7133817+02  LAN    5.6794086+00  LAP    1.4685893+00  LTS   -2.2351611-01  LNS    4.9499087+01  DEM    -2.1094375+01
SMAS   -2.0112611+03  ECCS   1.4963101+00  INCS   1.5133335+02  RANS   1.6773960+02  APFS  -1.4220063+02  RPS     9.9820930+02
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ID      919084.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   24  SEPT. 1969  21 HRS,  23 MINS,  30.498 SECS  G.M.T. **** 130. HRS,   46. MINS,   1.214 SECS  G.E.T.
X      -1.2393212+03  Y      3.1363297+03  Z      9.6941689+02  DX    -2.8915890+04  DY    -1.8895628+04  DZ      1.0530834+04
R       3.5088815+03  DEC    1.6038021+01  RA     1.1156146+02  V      3.6111936+04  PTH   -5.9877290+00  AZ      7.0412736+01
ALT     6.5833154+01  LAT    1.6138550+01  LON    1.4715164+02  VE     3.4715812+04  PTE   -6.1943837+00  AZE     6.9570819+01
SMA     1.4121138+05  ECC    9.7542536-01  INC    2.5114298+01  RAN    7.3735087+01  APF    5.2739336+01  RP      3.4702183+03
INMP    3.2251271+01  RAM   -9.9436414+00  DEM   -4.4867541+00  RAS   -1.7848460+02  DES   -6.5697146-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD  2.4135291+01  LONTD  1.7786893+02  AZTD   8.2587519+01
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(d) 90° launch azimuth; first injection opportunity

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ID      919090.1
LAUNCH TIME      19  SEPT. 1969   11 HRS,   28 MINS,  20.008 SECS   G.M.T.
LAUNCH AZIMUTH   90.                          INJECTION OPPORTUNITY    1
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ID      919090.1
EARTH PARKING ORBIT INSERTION
   19  SEPT. 1969  11 HRS,   39 MINS,  36.649 SECS  G.M.T. ****   0. HRS,   11. MINS,  16.641 SECS  G.E.T.
X      -1.4949595+03  Y       2.8270635+03  Z       1.5271779+03  DX     -2.3181392+04  DY     -9.4453195+03  DZ     -5.2074657+03
ALT     1.0215226+02  LAT     2.5672035+01  LON     3.0476225+02  V       2.5567727+04  PTH    -4.7156124-07  AZ      1.0304435+02
R       3.5439334+03  DEC     2.5526427+01  RA      1.1787002+02  RAS     1.7666329+02  DES     1.4456655+00  RAN    -3.9422321-01
INC     2.8465879+01  MASS    2.8467194+05
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ID      919090.1
3.5 MINS PRIOR TO TLI INITIATION
   19  SEPT. 1969  13 HRS,    7 MINS,  32.420 SECS  G.M.T. ****   1. HRS,   39. MINS,  12.412 SECS  G.E.T.
X      -1.4681805+03  Y       2.8407162+03  Z       1.5278392+03  DX     -2.3269762+04  DY     -9.2305607+03  DZ     -5.1976500+03
ALT     1.0216134+02  LAT     2.5683874+01  LON     2.8218116+02  V       2.5567570+04  PTH     1.0340909-03  AZ      1.0302123+02
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ID      919090.1
TRANSLUNAR INJECTION INITIATION
   19  SEPT. 1969  13 HRS,   11 MINS,   2.420 SECS  G.M.T. ****   1. HRS,   42. MINS,  42.412 SECS  G.E.T.
X      -2.2186960+03  Y       2.4371194+03  Z       1.3026580+03  DX     -1.9935325+04  DY     -1.4003880+04  DZ     -7.7654630+03
ALT     1.0151231+02  LAT     2.1694495+01  LON     2.9628627+02  V       2.5570066+04  PTH    -9.1329739-03  AZ      1.0905599+02
R       3.5438793+03  DEC     2.1566427+01  RA      1.3231399+02  RAS     1.7672024+02  DES     1.4210289+00  RAN    -9.0594485-01
INC     2.8474611+01  MASS    2.8256211+05
*****************************************************************************************************************

ID      919090.1
TRANSLUNAR INJECTION TERMINATION
   19  SEPT. 1969  13 HRS,   16 MINS,  11.826 SECS  G.M.T. ****   1. HRS,   47. MINS,  51.818 SECS  G.E.T.
X      -3.2174721+03  Y       1.4308272+03  Z       7.5337151+02  DX     -1.9471975+04  DY     -2.6364911+04  DZ     -1.4028311+04
ALT     1.5754074+02  LAT     1.2151765+01  LON     3.1870458+02  V       3.5651926+04  PTH     6.4214831+00  AZ      1.1540439+02
R       3.6009667+03  DEC     1.2076275+01  RA      1.5602502+02  RAS     1.7672345+02  DES     1.4196394+00  DEM    -2.8600635+01
RAN    -2.0072435-01  INC     2.7955461+01  ECC     9.7598197-01  SMA     1.4802920+05  RP      3.5553704+03  APF     1.4049247+02
INMP    1.0101481+00  C3TLI  -4.6319432-01  DAZTLI-6.1698809-01  MASS    1.3254038+05  FUEL    1.5002172+05
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ID      919090.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   19  SEPT. 1969  15 HRS,   16 MINS,  11.826 SECS  G.M.T. ****   3. HRS,   47. MINS,  51.818 SECS  G.E.T.
X       1.4089835+03  Y      -1.8787886+04  Z      -9.9651892+03  DX      6.8222536+03  DY     -1.0991129+04  DZ     -5.8170520+03
ALT     1.7872314+04  LAT    -2.7900890+01  LON     4.6886256+01  V       1.4184010+04  PTH     6.5040800+01  AZ      8.7884448+01
R       2.1313725+04  DEC    -2.7875245+01  RA     -8.5711171+01  RAS     1.7679819+02  DES     1.3873010+00
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ID      919090.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   22  SEPT. 1969   4 HRS,   53 MINS,   4.310 SECS  G.M.T. ****  65. HRS,   24. MINS,  44.301 SECS  G.E.T.
RMP     9.9892431+02  DEMP    3.8416298+00  RAMP   -1.7598940+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(d) 90° launch azimuth; first injection opportunity - Continued

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ID      919090.1
LUNAR ORBIT INSERTION BURN INITIATION
   22  SEPT. 1969   4 HRS,  49 MINS,  38.996 SECS  G.M.T. ****  65. HRS,   21. MINS,  18.987 SECS  G.E.T.
XL      8.9160797+02  YL     -4.9117491+02  ZL     -1.5967883+02  DXL    -5.4056311+03  DYL    -5.3048941+03  DZL    -3.4813082+03
XS     -9.6633478+02  YS     -3.5544177+02  ZS      3.9662097+01  DXS    -1.3326182+03  DYS     8.1464569+03  DZS    -1.2693702+03
ALTS    9.1901968+01  LATS    2.2059804+00  LONS   -1.5980523+02  VRS     8.3517621+03  PTR    -1.1109572+01  AZR    -9.8478697+01
LIN     1.7122442+02  LAN     5.7449497+00  LAP     2.2600313+01  LTS    -2.2462138-01  LNS     4.9136957+01  DEM    -2.0947545+01
THETA   1.8258705+01  BETA    1.6779818+02  MASS    9.4833024+04
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ID      919090.1
LUNAR ORBIT INSERTION BURN TERMINATION
   22  SEPT. 1969   4 HRS,  56 MINS,   9.918 SECS  G.M.T. ****  65. HRS,   27. MINS,  49.908 SECS  G.E.T.
XL      5.6567921+02  YL     -7.5657332+02  ZL     -3.1901307+02  DXL    -4.5377304+03  DYL    -2.7801719+03  DZL    -1.3319249+03
XS     -9.9281609+02  YS      9.1513523+01  ZS     -1.0340087+01  DXS     5.4537996+02  DYS     5.4705776+03  DZS    -2.1621834+02
ALTS    5.8584939+01  LATS   -5.9418993-01  LONS    1.7473359+02  VRS     5.5019459+03  PTR    -4.0309307-01  AZR    -9.2256572+01
LIN     1.7766015+02  LAN     9.4366924+00  LAP     1.8110164+02  SMAS    1.0529217+03  ECCS    5.3502471-02  PERS    2.1464060+00
RPS     9.9658782+02  APOS    1.1092556+03  RANS    1.7685889+02  INCS    1.5623331+02  LTS    -2.2478954-01  LNS     4.9081868+01
LTE     4.4005923+00  LNE     7.3280860-01  THETA  -6.5188682+00  BETA    1.6186455+02  FUEL    2.4852123+04  BARC    2.5550371+01
DELV    3.0759916+03  MASS    6.9980901+04  PLCHNG  6.4425609+00  DRTX   -2.8551299+03  DRTY    6.1739574+02  DRTZ   -9.6373316+02
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ID      919090.1
CIRCULARIZATION BURN INITIATION
   22  SEPT. 1969   9 HRS,  16 MINS,   5.472 SECS  G.M.T. ****  69. HRS,   47. MINS,  45.461 SECS  G.E.T.
XL      4.4734679+02  YL     -8.1908867+02  ZL     -3.4946105+02  DXL    -4.9037261+03  DYL    -2.2108836+03  DZL    -1.0902535+03
XS     -9.6004409+02  YS      2.6686379+02  ZS     -1.5730712+01  DXS     1.4780120+03  DYS     5.2983893+03  DZS    -2.0680582+02
ALTS    5.8074793+01  LATS   -9.0444465-01  LONS    1.6446564+02  VRS     5.5045633+03  PTR    -1.8332757-02  AZR    -9.2153626+01
LIN     1.7765839+02  LAN     7.1756126+00  LAP    -1.7500105+02  LTS    -2.3150802-01  LNS     4.6884117+01  DEM    -2.0009683+01
THETA   4.2688681-06  BETA   -1.7959999+02  MASS    6.9960900+04
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ID      919090.1
CIRCULARIZATION BURN TERMINATION
   22  SEPT. 1969   9 HRS,  16 MINS,  20.477 SECS  G.M.T. ****  69. HRS,   48. MINS,    .468 SECS  G.E.T.
XL      4.3535057+02  YL     -8.2440754+02  ZL     -3.5208873+02  DXL    -4.8109723+03  DYL    -2.0964140+03  DZL    -1.0376804+03
XS     -9.5635515+02  YS      2.7975999+02  ZS     -1.6233580+01  DXS     1.5093112+03  DYS     5.1450508+03  DZS    -2.0043149+02
ALTS    5.8072767+01  LATS   -9.3336169-01  LONS    1.6369436+02  VRS     5.3656072+03  PTR    -8.6197332-03  AZR    -9.2141189+01
LIN     1.7765840+02  LAN     7.1733367+00  LAP    -1.6788739+02  SMAS    9.9739768+02  ECCS    8.4710009-04  PERS    1.9788837+00
RPS     9.9655280+02  APOS    9.9824256+02  RANS    1.7686954+02  INCS    1.5622940+02  LTS    -2.3151445-01  LNS     4.6881996+01
LTE     4.1597510+00  LNE     9.6270712-01  THETA  -7.6947971-01  BETA   -1.7999300+02  FUEL    9.5396680+02  BARC    7.6950278-01
DELV    1.3896800+02  MASS    6.9006934+04  PLCHNG  4.7114943-06  DRTX   -1.3896561+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      919090.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   23  SEPT. 1969   4 HRS,   8 MINS,  40.594 SECS  G.M.T. ****  88. HRS,   40. MINS,  20.583 SECS  G.E.T.
XL     -1.7728490+02  YL      8.9996210+02  ZL      3.9200753+02  DXL     5.2578179+03  DYL     8.2369296+02  DZL     4.8691124+02
XS      7.3718694+02  YS     -6.7149142+02  ZS      2.6196767+01  DXS    -3.6110742+03  DYS    -3.9578483+03  DZS     1.6830827+02
ALTS    5.9019184+01  LATS    1.5048799+00  LONS   -4.2329872+01  VRS     5.3602935+03  PTR     3.5998841-04  AZR    -8.8200066+01
LIN     1.7764983+02  LAN    -2.5292812+00
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(d) 90° launch azimuth; first injection opportunity - Continued

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ID      919090.1
CSM PLANE CHANGE BURN INITIATION
   24  SEPT. 1969   1 HRS,  19 MINS,  30.080 SECS  G.M.T. **** 109. HRS,   51. MINS,  10.071 SECS  G.E.T.
XL     -9.0801635+02  YL     -3.6827599+02  ZL     -1.9337494+02  DXL    -2.2063627+03  DYL     4.4759955+03  DZL     1.9218864+03
XS      6.3893353+02  YS      7.6430301+02  ZS     -3.6769857+01  DXS     4.1184307+03  DYS    -3.4347668+03  DZS     9.8315620+01
ALTS    5.8375199+01  LATS   -2.1138547+00  LONS    5.0105423+01  VRS     5.3636517+03  PTR     2.7711109-02  AZR    -8.8948005+01
LIN     1.7763753+02  LAN    -1.3359644+01  LAP    -4.4737353+01  LTS    -2.9392295-01  LNS     2.6570332+01  DEM    -1.0068166+01
THETA  -2.8174530-05  BETA    8.9999994+01  MASS    3.5652933+04
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ID      919090.1
CSM PLANE CHANGE BURN TERMINATION
   24  SEPT. 1969   1 HRS,  19 MINS,  32.361 SECS  G.M.T. **** 109. HRS,   51. MINS,  12.351 SECS  G.E.T.
XL     -9.0884317+02  YL     -3.6659760+02  ZL     -1.8264581+02  DXL    -2.1974234+03  DYL     4.4633263+03  DZL     1.9616139+03
XS      6.4047867+02  YS      7.6301215+02  ZS     -3.6725134+01  DXS     4.1118726+03  DYS    -3.4414122+03  DZS     1.3994143+02
ALTS    5.8376183+01  LATS   -2.1112804+00  LONS    4.9989624+01  VRS     5.3638043+03  PTR     2.7731426-02  AZR    -8.8502940+01
LIN     1.7740943+02  LAN    -4.5775645+00  LAP    -4.0100728+01  SMAS    9.9733134+02  ECCS    6.7076100-04  PERS    1.9736862+00
RPS     9.9666236+02  APOS    9.9800031+02  RANS    1.7748107+02  INCS    1.5578845+02  LTS    -2.9392394-01  LNS     2.6570023+01
LTE     1.5991020+00  LNE     2.9981037+00  THETA  -1.0672170-04  BETA    8.9557506+01  FUEL    1.4505176+02  BARC    1.1598433-01
DELV    4.1263237+01  MASS    3.5507882+04  PLCHNG  4.4210897-01  DRTX    0.0000000     DRTY    4.1263308+01  DRTZ    0.0000000
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ID      919090.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   24  SEPT. 1969   5 HRS,  46 MINS,  30.763 SECS  G.M.T. **** 114. HRS,   18. MINS,  10.754 SECS  G.E.T.
XL     -4.1053913+02  YL      8.3227884+02  ZL      3.6589785+02  DXL     4.8691925+03  DYL     1.9715787+03  DZL     9.8154449+02
XS      7.3721653+02  YS     -6.7151836+02  ZS      2.6201203+01  DXS    -3.6101768+03  DYS    -3.9572667+03  DZS     1.9689977+02
ALTS    5.9059303+01  LATS    1.5050742+00  LONS   -4.2329870+01  VRS     5.3602337+03  PTR     1.1295822-02  AZR    -8.7894411+01
LIN     1.7740685+02  LAN    -6.8694130+00
*****************************************************************************************************************

ID      919090.1
TRANSEARTH INJECTION BURN INITIATION
   24  SEPT. 1969  22 HRS,   3 MINS,  49.234 SECS  G.M.T. **** 130. HRS,   35. MINS,  29.226 SECS  G.E.T.
XL      8.6900108+02  YL      4.3991242+02  ZL      2.1449339+02  DXL     2.6193548+03  DYL    -4.2680921+03  DZL    -1.8691971+03
XS     -7.2001085+02  YS     -6.8903720+02  ZS      3.8797990+01  DXS    -3.7076622+03  DYS     3.8706063+03  DZS    -1.2527155+02
ALTS    5.8849550+01  LATS    2.2294457+00  LONS   -1.3625927+02  VRS     5.3613472+03  PTR    -2.4591784-02  AZR    -9.1338923+01
LIN     1.7739750+02  LAN    -1.5184681+01  LAP     2.6164308+02  LTS    -3.2585181-01  LNS     1.6057340+01  DEM    -4.2971556+00
THETA  -3.6087586+00  BETA   -7.1226830+00  MASS    3.5917882+04
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ID      919090.1
TRANSEARTH INJECTION BURN TERMINATION
   24  SEPT. 1969  22 HRS,   6 MINS,   3.952 SECS  G.M.T. **** 130. HRS,   37. MINS,  43.939 SECS  G.E.T.
XL      9.3343151+02  YL      3.2002854+02  ZL      1.5785985+02  DXL     3.2403310+03  DYL    -6.6291134+03  DZL    -3.2924277+03
XS     -8.1559414+02  YS     -5.7658686+02  ZS      3.1403098+01  DXS    -4.9843996+03  DYS     6.3551436+03  DZS    -5.5967243+02
ALTS    6.0822443+01  LATS    1.8007931+00  LONS   -1.4474148+02  VRS     8.0960064+03  PTR     2.7160660+00  AZR    -9.4056082+01
LIN     1.7555534+02  LAN     1.1400043+01  LAP     1.4284152+02  SMAS   -3.4516117+03  ECCS    1.2989420+00  PERS    1.2739449+01
RPS     9.9731547+02  APOS   -7.9005389+03  RANS   -1.7988492+02  INCS    1.5361051+02  LTS    -3.2590879-01  LNS     1.6038375+01
LTE     1.4198786-01  LNE     3.9170741+00  THETA   4.8164342+00  BETA   -4.7084672+00  FUEL    8.5644424+03  BARC    8.4672704+00
DELV    2.7571421+03  MASS    2.7353439+04  PLCHNG  2.4166976+00  DRTX    2.7304330+03  DRTY   -3.4119120+02  DRTZ    1.7354254+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(d) 90° launch azimuth; first injection opportunity - Concluded

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ID      919090.1
ENTRY AND TOUCHDOWN
   28  SEPT. 1969  22 HRS,  23 MINS,  45.888 SECS  G.M.T. **** 226. HRS,   55. MINS,  25.877 SECS  G.E.T.
X      -3.1067631+03  Y       1.3546419+03  Z       8.9397275+02  DX     -1.2950672+04  DY     -2.5298171+04  DZ     -2.2156630+04
R       3.5090470+03  DEC     1.4759497+01  RA      1.5628657+02  V       3.6036559+04  PTH    -6.4000037+00  AZ      1.2760781+02
ALT     6.5866305+01  LAT     1.4852775+01  LON     1.7282896+02  VE      3.4865244+04  PTE    -6.6748147+00  AZE     1.2911744+02
SMA     1.0635883+05  ECC     9.6742431-01  INC     3.9998028+01  RAN    -5.4132264+00  APF     1.6966589+02  RP      3.4647129+03
INMP    1.1533868+01  RAM     4.0417758+01  DEM     2.0124850+01  RAS    -1.7484538+02  DES    -2.2308706+00  SPSFR   2.9914036+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD  -6.3804708+00  LONTD   1.9500192+02  AZTD    1.2957337+02
*****************************************************************************************************************************

ID      919090.1
CIRCUMLUNAR PERICYNTHION
   22  SEPT. 1969   4 HRS,  53 MINS,  36.601 SECS  G.M.T. ****  65. HRS,   25. MINS,  16.590 SECS  G.E.T.
XL      6.6316135+02  YL     -6.8692980+02  ZL     -2.9152745+02  DXL    -6.2505157+03  DYL    -4.6615701+03  DZL    -3.2344435+03
XS     -9.9776200+02  YS     -3.1710067+01  ZS     -1.0450278+01  DXS    -2.5209364+02  DYS     8.3555992+03  DZS    -1.2848642+03
ALTS    5.9826951+01  LATS   -5.9977509-01  LONS   -1.7817968+02  VRS     8.4575684+03  PTR     1.5320115-07  AZR    -9.8738625+01
LIN     1.7122437+02  LAN     5.7086843+00  LAP     1.0227842+00  LTS    -2.2472357-01  LNS     4.9103482+01  DEM    -2.0933916+01
SMAS   -2.0103001+03  ECCS    1.4966027+00  INCS    1.5120031+02  RANS    1.6772922+02  APFS   -1.4268749+02  RPS     9.9832047+02
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ID      919090.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   24  SEPT. 1969  22 HRS,  11 MINS,  32.611 SECS  G.M.T. **** 130. HRS,   43. MINS,  12.602 SECS  G.E.T.
X      -1.2753797+03  Y       3.1236116+03  Z       9.6373546+02  DX     -2.8750032+04  DY     -1.9159338+04  DZ      1.0507760+04
R       3.5083927+03  DEC     1.5941463+01  RA      1.1221034+02  V       3.6111737+04  PTH    -5.9124331+00  AZ      7.0499448+01
ALT     6.5834077+01  LAT     1.6041451+01  LON     1.3575883+02  VE      3.4713954+04  PTE    -6.1166577+00  AZE     6.9660921+01
SMA     1.4112455+05  ECC     9.7540335-01  INC     2.4989250+01  RAN     7.4413951+01  APF     5.2527496+01  RP      3.4711926+03
INMP    3.2439137+01  RAM    -9.5238375+00  DEM    -4.2609294+00  RAS    -1.7845462+02  DES    -6.6996523-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.4008226+01  LONTD   1.6645850+02  AZTD    8.2602923+01
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(e) 98° launch azimuth; first injection opportunity

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ID      919098.1
LAUNCH TIME      19  SEPT. 1969   12 HRS,   21 MINS,  51.201 SECS   G.M.T.
LAUNCH AZIMUTH   98.                          INJECTION OPPORTUNITY    1
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ID      919098.1
EARTH PARKING ORBIT INSERTION
   19  SEPT. 1969  12 HRS,  33 MINS,   8.326 SECS  G.M.T. ****   0. HRS,   11. MINS,  17.125 SECS  G.E.T.
X      -2.1196933+03  Y      2.4944250+03  Z      1.3580156+03  DX    -2.0482571+04  DY    -1.3093316+04  DZ    -7.9207368+03
ALT     1.0170214+02  LAT    2.2664277+01  LON    3.0383058+02  V      2.5567727+04  PTH   -3.7724900-07  AZ     1.0959661+02
R       3.5439334+03  DEC    2.2531694+01  RA     1.3035697+02  RAS    1.7669663+02  DES    1.4312424+00  RAN   -2.5375022+00
INC     2.9522020+01  MASS   2.8440356+05
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ID      919098.1
3.5 MINS PRIOR TO TLI INITIATION
   19  SEPT. 1969  13 HRS,  58 MINS,  19.656 SECS  G.M.T. ****   1. HRS,   36. MINS,  28.455 SECS  G.E.T.
X      -1.5047093+03  Y      2.8119737+03  Z      1.5452342+03  DX    -2.3139852+04  DY    -9.1558622+03  DZ    -5.8610296+03
ALT     1.0215144+02  LAT    2.5997701+01  LON    2.7026968+02  V      2.5566272+04  PTH    1.0146986-02  AZ     1.0476324+02
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ID      919098.1
TRANSLUNAR INJECTION INITIATION
   19  SEPT. 1969  14 HRS,   1 MINS,  49.656 SECS  G.M.T. ****   1. HRS,   39. MINS,  58.455 SECS  G.E.T.
X      -2.2496518+03  Y      2.4118219+03  Z      1.2968242+03  DX    -1.9744454+04  DY    -1.3880206+04  DZ    -8.4392661+03
ALT     1.0156738+02  LAT    2.1592183+01  LON    2.8424822+02  V      2.5568042+04  PTH   -1.6958948-03  AZ     1.1077247+02
R       3.5439485+03  DEC    2.1464603+01  RA     1.3300751+02  RAS    1.7675187+02  DES    1.4073431+00  RAN   -3.0216934+00
INC     2.9524107+01  MASS   2.8233778+05
*****************************************************************************************************************

ID      919098.1
TRANSLUNAR INJECTION TERMINATION
   19  SEPT. 1969  14 HRS,   6 MINS,  58.890 SECS  G.M.T. ****   1. HRS,   45. MINS,   7.689 SECS  G.E.T.
X      -3.2351600+03  Y      1.4149438+03  Z      7.0989500+02  DX    -1.9159092+04  DY    -2.6152927+04  DZ    -1.4823008+04
ALT     1.5822174+02  LAT    1.1438699+01  LON    3.0632584+02  V      3.5647833+04  PTH    6.4643081+00  AZ     1.1672001+02
R       3.6017048+03  DEC    1.1367409+01  RA     1.5637714+02  RAS    1.7675508+02  DES    1.4059542+00  DEM   -2.8581026+01
RAN    -2.2401110+00  INC    2.8872949+01  ECC    9.7593786-01  SMA    1.4776284+05  RP     3.5554902+03  APF    1.4282045+02
INMP    3.2775509-01  C3TLI -4.6402873-01  DAZTLI-7.5456654-01  MASS   1.3239935+05  FUEL   1.4993843+05
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ID      919098.1
SPACECRAFT SEPARATION            INJECTION + 2HR
   19  SEPT. 1969  16 HRS,   6 MINS,  58.890 SECS  G.M.T. ****   3. HRS,   45. MINS,   7.689 SECS  G.E.T.
X       1.6115046+03  Y     -1.8631285+04  Z     -1.0227109+04  DX     6.9388559+03  DY    -1.0897639+04  DZ    -5.8510805+03
ALT     1.7873401+04  LAT   -2.8699460+01  LON    3.4810038+01  V      1.4182433+04  PTH    6.5039160+01  AZ     8.6525194+01
R       2.1314678+04  DEC   -2.8673339+01  RA    -8.5056528+01  RAS    1.7682982+02  DES    1.3736141+00
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ID      919098.1
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   22  SEPT. 1969   5 HRS,  47 MINS,  49.734 SECS  G.M.T. ****  65. HRS,   25. MINS,  58.531 SECS  G.E.T.
RMP     9.9994995+02  DEMP   3.8045644+00  RAMP  -1.7623373+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(e) 98° launch azimuth; first injection opportunity - Continued

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ID      919098.1
LUNAR ORBIT INSERTION BURN INITIATION
   22  SEPT. 1969   5 HRS,  44 MINS,  25.053 SECS  G.M.T. ****  65. HRS,   22. MINS,  33.849 SECS  G.E.T.
XL      9.9362378+02  YL     -4.8639490+02  ZL     -1.5950993+02  DXL    -5.3686943+03  DYL    -5.3555797+03  DZL    -3.4592627+03
XS     -9.6728406+02  YS     -3.5142700+02  ZS      3.8044979+01  DXS    -1.3147316+03  DYS     3.1547775+03  DZS    -1.2298392+03
ALTS    9.1354449+01  LATS    2.1171211+00  LONS   -1.6003325+02  VRS     8.3511326+03  PTR    -1.0998956+01  AZR    -9.8217969+01
LIN     1.7149939+02  LAN     5.6467116+00  LAP     2.5955558+01  LTS    -2.2603548-01  LNS     4.8673869+01  DEM    -2.0758172+01
THETA   1.8016769+01  BETA    1.6829979+02  MASS    9.4833024+04
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ID      919098.1
LUNAR ORBIT INSERTION BURN TERMINATION
   22  SEPT. 1969   5 HRS,  50 MINS,  54.924 SECS  G.M.T. ****  65. HRS,   29. MINS,   3.620 SECS  G.E.T.
XL      5.7046243+02  YL     -7.5344858+02  ZL     -3.1789783+02  DXL    -4.5202333+03  DYL    -2.8039420+03  DZL    -1.3413702+03
XS     -9.9254771+02  YS      9.4397839+01  ZS     -1.0450121+01  DXS     5.6227196+02  DYS     5.4688212+03  DZS    -2.1603870+02
ALTS    5.8587787+01  LATS   -6.0051149-01  LONS    1.7456713+02  VRS     5.5019001+03  PTR    -4.1337389-01  AZR    -9.2254891+01
LIN     1.7766017+02  LAN     9.4304507+00  LAP     1.8426955+02  SMAS    1.0529085+03  ECCS    5.3511991-02  PERS    2.1463656+00
RPS     9.9656533+02  APOS    1.1092518+03  RANS    1.7689946+02  INCS    1.5622109+02  LTS    -2.2620327-01  LNS     4.8618937+01
LTE     4.3506671+00  LNE     7.8121875-01  THETA  -6.7540726+00  BETA    1.6259409+02  FUEL    2.4779025+04  BARC    2.5480870+01
DELV    3.0654245+03  MASS    7.0053998+04  PLCHNG  6.1680478+00  DRTX   -2.3545495+03  DRTY    5.9115910+02  DRTZ   -9.4812310+02
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ID      919098.1
CIRCULARIZATION BURN INITIATION
   22  SEPT. 1969  10 HRS,  10 MINS,  53.922 SECS  G.M.T. ****  69. HRS,   49. MINS,   2.719 SECS  G.E.T.
XL      4.4943813+02  YL     -8.1799079+02  ZL     -3.4928323+02  DXL    -4.8980240+03  DYL    -2.2218297+03  DZL    -1.0940695+03
XS     -9.5829425+02  YS      2.7298279+02  ZS     -1.5965293+01  DXS     1.5119172+03  DYS     5.2889268+03  DZS    -2.0625695+02
ALTS    5.8051700+01  LATS   -9.1795441-01  LONS    1.6409969+02  VRS     5.5046509+03  PTR    -1.8618543-02  AZR    -9.2147923+01
LIN     1.7765842+02  LAN     7.1688291+00  LAP    -1.7789272+02  LTS    -2.3292661-01  LNS     4.6420730+01  DEM    -1.9811705+01
THETA   2.5613203-06  BETA    1.7999300+02  MASS    7.0033998+04
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ID      919098.1
CIRCULARIZATION BURN TERMINATION
   22  SEPT. 1969  10 HRS,  11 MINS,   8.942 SECS  G.M.T. ****  69. HRS,   49. MINS,  17.739 SECS  G.E.T.
XL      4.3744354+02  YL     -8.2334179+02  ZL     -3.5192286+02  DXL    -4.8056041+03  DYL    -2.1070991+03  DZL    -1.0413861+03
XS     -9.5451831+02  YS      2.8586833+02  ZS     -1.6467310+01  DXS     1.5423083+03  DYS     5.1353741+03  DZS    -1.9987883+02
ALTS    5.8049621+01  LATS   -9.4682339-01  LONS    1.6332760+02  VRS     5.3656998+03  PTR    -8.8941508-03  AZR    -9.2135247+01
LIN     1.7765845+02  LAN     7.1665605+00  LAP    -1.6820472+02  SMAS    9.9738602+02  ECCS    8.5930770-04  PERS    1.9788490+00
RPS     9.9652896+02  APOS    9.8824306+02  RANS    1.7691020+02  INCS    1.5621722+02  LTS    -2.3293311-01  LNS     4.6418609+01
LTE     4.1078810+00  LNE     1.0110673+00  THETA  -7.7030616-01  BETA    1.7999300+02  FUEL    9.5493164+02  BARC    7.7029710-01
DELV    1.3896310+02  MASS    6.9079067+04  PLCHNG  4.7840615-06  DRTX   -1.3896079+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      919098.1
CSM  1ST PASS OVER LUNAR LANDING SITE
   23  SEPT. 1969   5 HRS,   3 MINS,  20.705 SECS  G.M.T. ****  88. HRS,   41. MINS,  29.502 SECS  G.E.T.
XL     -1.8584468+02  YL      8.9848006+02  ZL      3.9144784+02  DXL     5.2493148+03  DYL     8.6623426+02  DZL     5.0407971+02
XS      7.3718853+02  YS     -6.7149309+02  ZS      2.6192687+01  DXS    -3.6110286+03  DYS    -3.9578341+03  DZS     1.6831503+02
ALTS    5.9021416+01  LATS    1.5046421+00  LONS   -4.2329878+01  VRS     5.3602526+03  PTR     6.1983532-04  AZR    -8.8199998+01
LIN     1.7764994+02  LAN    -2.5349759+00
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(e) 98° launch azimuth; first injection opportunity - Continued

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ID      919098.1
CSM PLANE CHANGE BURN INITIATION
   24  SEPT. 1969   2 HRS,  14 MINS,   8.942 SECS  G.M.T. **** 109. HRS,   52. MINS,  17.740 SECS  G.E.T.
XL     -9.0438604+02  YL     -3.7559857+02  ZL     -1.8633798+02  DXL    -2.2488614+03  DYL     4.4579332+03  DZL     1.9147929+03
XS      6.3892152+02  YS      7.6428892+02  ZS     -3.6768729+01  DXS     4.1185244+03  DYS    -3.4347653+03  DZS     9.8287982+01
ALTS    5.8356635+01  LATS   -2.1138293+00  LONS    5.0105435+01  VRS     5.3637222+03  PTR     2.8363445-02  AZR    -8.8948237+01
LIN     1.7763767+02  LAN    -1.3365568+01  LAP    -3.8986649+01  LTS    -2.9533640-01  LNS     2.6108595+01  DEM    -9.8199200+00
THETA -1.9636793-05   BETA    8.9999963+01  MASS    3.5725066+04
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ID      919098.1
CSM PLANE CHANGE BURN TERMINATION
   24  SEPT. 1969   2 HRS,  14 MINS,  11.228 SECS  G.M.T. **** 109. HRS,   52. MINS,  20.026 SECS  G.E.T.
XL     -9.0523075+02  YL     -3.7392313+02  ZL     -1.8560984+02  DXL    -2.2399269+03  DYL     4.4453398+03  DZL     1.9545637+03
XS      6.4047038+02  YS      7.6299490+02  ZS     -3.6723912+01  DXS     4.1119494+03  DYS    -3.4414309+03  DZS     1.3992562+02
ALTS    5.8357622+01  LATS   -2.1112495+00  LONS    4.9989351+01  VRS     5.3638748+03  PTR     2.8385316-02  AZR    -8.8503104+01
LIN     1.7740955+02  LAN    -4.5804205+00  LAP    -3.5480788+01  SMAS    9.9732060+02  ECCS    6.8446676-04  PERS    1.9786543+00
RPS     9.9663797+02  APOS    9.9800321+02  RANS    1.7753037+02  INCS    1.5577826+02  LTS    -2.9533739-01  LNS     2.6108271+01
LTE     1.5360338+00  LNE     3.0410076+00  THETA   2.9028303-05  BETA    8.9557522+01  FUEL    1.4538378+02  BARC    1.1598433-01
DELV    4.1274248+01  MASS    3.5579683+04  PLCHNG  4.4221976-01  DRTX    0.0000000     DRTY    4.1274268+01  DRTZ    0.0000000
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ID      919098.1
CSM  2ND PASS OVER LUNAR LANDING SITE
   24  SEPT. 1969   6 HRS,  41 MINS,   9.374 SECS  G.M.T. **** 114. HRS,   19. MINS,  18.172 SECS  G.E.T.
XL     -4.1845326+02  YL      8.2891086+02  ZL      3.6457723+02  DXL     4.8498022+03  DYL     2.0109043+03  DZL     9.9745980+02
XS      7.3721696+02  YS     -6.7151894+02  ZS      2.6198005+01  DXS    -3.6101244+03  DYS    -3.9572712+03  DZS     1.9689652+02
ALTS    5.9059918+01  LATS    1.5048896+00  LONS   -4.2329878+01  VRS     5.3602016+03  PTR     1.1743706-02  AZR    -8.7894447+01
LIN     1.7740699+02  LAN    -6.8723018+00
*****************************************************************************************************************

ID      919098.1
TRANSEARTH INJECTION BURN INITIATION
   24  SEPT. 1969  22 HRS,  58 MINS,  45.474 SECS  G.M.T. **** 130. HRS,   36. MINS,  54.267 SECS  G.E.T.
XL      8.7270518+02  YL      4.3390623+02  ZL      2.1162730+02  DXL     2.5836932+03  DYL    -4.2852829+03  DZL    -1.8795578+03
XS     -7.3122185+02  YS     -6.7713691+02  ZS      3.8409257+01  DXS    -3.6436345+03  DYS     3.9308719+03  DZS    -1.2863875+02
ALTS    5.8840454+01  LATS    2.2071169+00  LONS   -1.3719924+02  VRS     5.3613780+03  PTR    -2.5440711-02  AZR    -9.1374915+01
LIN     1.7739765+02  LAN    -1.5190259+01  LAP     2.6533729+02  LTS    -3.2724585-01  LNS     1.5593229+01  DEM    -4.0386391+00
THETA -3.4047579+00   BETA   -7.0907453+00  MASS    3.5989682+04
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ID      919098.1
TRANSEARTH INJECTION BURN TERMINATION
   24  SEPT. 1969  23 HRS,   1 MINS,    .571 SECS  G.M.T. **** 130. HRS,   39. MINS,   9.364 SECS  G.E.T.
XL      9.3638626+02  YL      3.1327076+02  ZL      1.5459202+02  DXL     3.1920479+03  DYL    -6.6494998+03  DZL    -3.3040147+03
XS     -8.2528992+02  YS     -5.6284730+02  ZS      3.0918732+01  DXS    -4.8870620+03  DYS     6.4328500+03  DZS    -5.6305323+02
ALTS    6.0934574+01  LATS    1.7728095+00  LONS   -1.4570603+02  VRS     8.0982692+03  PTR     2.7982239+00  AZR    -9.4080423+01
LIN     1.7554422+02  LAN     1.0891234+01  LAP    -2.7304513+01  SMAS   -3.4337433+03  ECCS    1.2904427+00  PERS    1.2640652+01
RPS     9.9730568+02  APOS   -7.8647922+03  RANS   -1.7988673+02  INCS    1.5359966+02  LTS    -3.2730293-01  LNS     1.5574203+01
LTE     7.7453811-02  LNE     3.9543600+00  THETA   5.0455827+00  BETA   -4.6885123+00  FUEL    8.5884999+03  BARC    8.4921583+00
DELV    2.7597041+03  MASS    2.7401183+04  PLCHNG  2.4078616+00  DRTX    2.7337565+03  DRTY   -3.4005886+02  DRTZ    1.6389637+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(e) 98° launch azimuth; first injection opportunity - Concluded

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ID      919098.1
ENTRY AND TOUCHDOWN
   28  SEPT. 1969  22 HRS,  25 MINS,  21.680 SECS  G.M.T. **** 226. HRS,    3. MINS,  30.477 SECS  G.E.T.
X      -3.1192073+03  Y       1.3433328+03  Z       8.8352378+02  DX     -1.2702623+04  DY     -2.5394888+04  DZ     -2.2189194+04
R       3.5092180+03  DEC     1.4582410+01  RA      1.5670016+02  V       3.6036333+04  PTH    -6.4000289+00  AZ      1.2766544+02
ALT     6.6019747+01  LAT     1.4674665+01  LON     1.7284232+02  VE      3.4864973+04  PTE    -6.6742818+00  AZE     1.2917846+02
SMA     1.0659333+05  ECC     9.6749453-01  INC     3.9995731+01  RAN    -5.2355015+00  APE     1.6995428+02  RP      3.4648822+03
INMP    1.1514277+01  RAM     4.0432055+01  DEM     2.0129958+01  RAS    -1.7484438+02  DES    -2.2313020+00  SPSFR   3.0388547+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD  -6.5647092+00  LONTD   1.9500377+02  AZTD    1.2954590+02
*************************************************************************************************************************

ID      919098.1
CIRCUMLUNAR PERICYNTHION
   22  SEPT. 1969   5 HRS,  48 MINS,  20.381 SECS  G.M.T. ****  65. HRS,   26. MINS,  29.179 SECS  G.E.T.
XL      6.6887990+02  YL     -6.8243837+02  ZL     -2.8929800+02  DXL    -6.2099729+03  DYL    -4.7232644+03  DZL    -3.2160238+03
XS     -9.9788767+02  YS     -3.0581985+01  ZS     -1.0033157+01  DXS    -2.4367068+02  DYS     8.3592626+03  DZS    -1.2445666+03
ALTS    5.9913077+01  LATS   -5.7578469-01  LONS   -1.7824462+02  VRS     8.4549151+03  PTR     3.9050467-07  AZR    -9.8465145+01
LIN     1.7149933+02  LAN     5.6107794+00  LAP     8.2281940-01  LTS    -2.2613681-01  LNS     4.8640705+01  DEM    -2.0744540+01
SMAS   -2.0160008+03  ECCS    1.4952412+00  INCS    1.5139681+02  RANS    1.6814999+02  APFS   -1.4275288+02  RPS     9.9840660+02
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ID      919098.1
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   24  SEPT. 1969  23 HRS,   2 MINS,  23.059 SECS  G.M.T. **** 130. HRS,   40. MINS,  36.857 SECS  G.E.T.
X      -1.2617774+03  Y       3.1241736+03  Z       9.7957943+02  DX     -2.9140303+04  DY     -1.9112308+04  DZ      9.4679089+03
R       3.5088629+03  DEC     1.6210847+01  RA      1.1199258+02  V       3.6112032+04  PTH    -6.1919010+00  AZ      7.2170738+01
ALT     6.5833205+01  LAT     1.6312340+01  LON     1.2277519+02  VE      3.4702486+04  PTE    -6.4120862+00  AZE     7.1400389+01
SMA     1.4121068+05  ECC     9.7544429-01  INC     2.3918439+01  RAN     7.1034645+01  APE     5.6057706+01  RP      3.4675287+03
INMP    3.0701559+01  RAM    -9.0792543+00  DEM    -4.0211774+00  RAS    -1.7842284+02  DES    -6.8374115-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.3317678+01  LONTD   1.5365644+02  AZTD    8.4212942+01
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity

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ID      919072.2
LAUNCH TIME      19  SEPT. 1969     8 HRS,   45 MINS,   9.060 SECS   G.M.T.
LAUNCH AZIMUTH   72.                                INJECTION OPPORTUNITY    2
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ID      919072.2
EARTH PARKING ORBIT INSERTION
   19  SEPT. 1969   8 HRS,   56 MINS,  28.802 SECS  G.M.T. ****   0. HRS,   11. MINS,  19.741 SECS  G.E.T.
X       6.2780689+02  Y       2.9223101+03  Z       1.9040553+03  DX     -2.5088790+04  DY      4.8572677+03  DZ      8.1745141+02
ALT     1.0334398+02  LAT     3.2667610+01  LON     3.0566189+02  V       2.5567727+04  PTH     8.2523217-08  AZ      8.7827516+01
R       3.5439334+03  DEC     3.2498104+01  RA      7.7875298+01  RAS     1.7656169+02  DES     1.4896173+00  RAN    -8.0859023+00
INC     3.2562693+01  MASS    2.8296469+05
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ID      919072.2
3.5 MINS PRIOR TO TLI INITIATION
   19  SEPT. 1969  12 HRS,    1 MINS,   3.500 SECS  G.M.T. ****   3. HRS,   15. MINS,  54.439 SECS  G.E.T.
X      -1.4337127+03  Y       2.8043777+03  Z       1.6243817+03  DX     -2.3282652+04  DY     -7.7222811+03  DZ     -7.2241863+03
ALT     1.0232453+02  LAT     2.7434477+01  LON     2.9859366+02  V       2.5571553+04  PTH    -6.5723133-03  AZ      1.0853045+02
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ID      919072.2
TRANSLUNAR INJECTION INITIATION
   19  SEPT. 1969  12 HRS,    4 MINS,  33.500 SECS  G.M.T. ****   3. HRS,   19. MINS,  24.439 SECS  G.E.T.
X      -2.1857350+03  Y       2.4534950+03  Z       1.3268907+03  DX     -2.0009059+04  DY     -1.2477696+04  DZ     -9.9016578+03
ALT     1.0137842+02  LAT     2.2119652+01  LON     3.1233504+02  V       2.5575343+04  PTH    -1.1306119-02  AZ      1.1467378+02
R       3.5436865+03  DEC     2.1989578+01  RA      1.3169675+02  RAS     1.7667883+02  DES     1.4389432+00  RAN    -9.1208432+00
INC     3.2585018+01  MASS    2.7976526+05
*****************************************************************************************************************

ID      919072.2
TRANSLUNAR INJECTION TERMINATION
   19  SEPT. 1969  12 HRS,    9 MINS,  39.644 SECS  G.M.T. ****   3. HRS,   24. MINS,  30.584 SECS  G.E.T.
X      -3.1806075+03  Y       1.5475809+03  Z       6.5439104+02  DX     -1.9704453+04  DY     -2.4202739+04  DZ     -1.7270198+04
ALT     1.5360162+02  LAT     1.0547652+01  LON     3.3341313+02  V       3.5669283+04  PTH     6.2259687+00  AZ      1.2103063+02
R       3.5971514+03  DEC     1.0481568+01  RA      1.5405394+02  RAS     1.7668201+02  DES     1.4375687+00  DEM    -2.8622738+01
RAN    -9.1208426+00  INC     3.2585016+01  ECC     9.7579449-01  SMA     1.4683928+05  RP      3.5543191+03  APF     1.4765044+02
INMP    5.4340768+00  C3TLI  -4.6694756-01  DAZTLI  0.0000000     MASS    1.3132459+05  FUEL    1.4844067+05
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ID      919072.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   19  SEPT. 1969  14 HRS,    9 MINS,  39.644 SECS  G.M.T. ****   5. HRS,   24. MINS,  30.584 SECS  G.E.T.
X       1.2678093+03  Y      -1.8042287+04  Z      -1.1252003+04  DX      6.7199395+03  DY     -1.0860953+04  DZ     -6.1680729+03
ALT     1.7860437+04  LAT    -3.1914091+01  LON     6.3296554+01  V       1.4183194+04  PTH     6.5030071+01  AZ      8.2953098+01
R       2.1301151+04  DEC    -3.1886241+01  RA     -8.5980501+01  RAS     1.7675675+02  DES     1.4052322+00
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ID      919072.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   22  SEPT. 1969   4 HRS,    5 MINS,  30.854 SECS  G.M.T. ****  67. HRS,   20. MINS,  21.793 SECS  G.E.T.
RMP     9.9877977+02  DEMP    3.9382295+00  RAMP   -1.7697190+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity - Continued

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ID      919072.2
LUNAR ORBIT INSERTION BURN INITIATION
   22  SEPT. 1969   4 HRS,   2 MINS,   8.165 SECS  G.M.T. ****  67. HRS,   16. MINS,  59.102 SECS  G.E.T.
XL      8.7502162+02  YL     -5.0990786+02  ZL     -1.7551058+02  DXL    -5.5510872+03  DYL    -5.2912367+03  DZL    -3.2680937+03
XS     -9.7113255+02  YS     -3.3519605+02  ZS      3.1905505+01  DXS    -1.2297120+03  DYS     8.1908257+03  DZS    -1.0773662+03
ALTS    8.9355102+01  LATS    1.7788072+00  LONS   -1.6095737+02  VRS     8.3523969+03  PTR    -1.0643937+01  AZR    -9.7208117+01
LIN     1.7256262+02  LAN     5.2798191+00  LAP     2.1772175+01  LTS    -2.2339517-01  LNS     4.9538724+01  DEM    -2.1110377+01
THETA   1.7440806+01  BETA    1.7325199+02  MASS    9.4833024+04
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ID      919072.2
LUNAR ORBIT INSERTION BURN TERMINATION
   22  SEPT. 1969   4 HRS,   8 MINS,  34.302 SECS  G.M.T. ****  67. HRS,   23. MINS,  25.241 SECS  G.E.T.
XL      5.4628739+02  YL     -7.6858345+02  ZL     -3.2441566+02  DXL    -4.6038249+03  DYL    -2.6862167+03  DZL    -1.2927381+03
XS     -9.9134388+02  YS      1.0730021+02  ZS     -1.0949464+01  DXS     6.2477659+02  DYS     5.4609944+03  DZS    -2.1528773+02
ALTS    5.8700509+01  LATS   -6.2913600-01  LONS    1.7382251+02  VRS     5.5008321+03  PTR    -3.2427464-01  AZR    -9.2246711+01
LIN     1.7766055+02  LAN     9.4146170+00  LAP     4.8364402+00  SMAS    1.0527032+03  ECCS    5.3033946-02  PERS    2.1457379+00
RPS     9.9687424+02  APOS    1.1085322+03  RANS    1.7682230+02  INCS    1.5624509+02  LTS    -2.2356119-01  LNS     4.9484316+01
LTE     4.4436588+00  LNE     6.9071644-01  THETA  -7.3414843+00  BETA    1.6547827+02  FUEL    2.4547994+04  BARC    2.5273062+01
DELV    3.0320983+03  MASS    7.0285030+04  PLCHNG  5.1070810+00  DRTX   -2.8509390+03  DRTY    4.8977891+02  DRTZ   -9.0878144+02
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ID      919072.2
CIRCULARIZATION BURN INITIATION
   22  SEPT. 1969   8 HRS,  28 MINS,    .454 SECS  G.M.T. ****  71. HRS,   42. MINS,  51.391 SECS  G.E.T.
XL      4.4645113+02  YL     -8.1990622+02  ZL     -3.4950962+02  DXL    -4.9041967+03  DYL    -2.2056124+03  DZL    -1.0886884+03
XS     -9.6204638+02  YS      2.6067030+02  ZS     -1.5475441+01  DXS     1.4416984+03  DYS     5.3062851+03  DZS    -2.0729986+02
ALTS    5.8362408+01  LATS   -8.8950975-01  LONS    1.6483949+02  VRS     5.5025566+03  PTR    -6.0768226-03  AZR    -9.2159393+01
LIN     1.7765880+02  LAN     7.1580906+00  LAP    -5.1840051+00  LTS    -2.3026391-01  LNS     4.7290663+01  DEM    -2.0181978+01
THETA   8.5377364-07  BETA    1.7959999+02  MASS    7.0265029+04
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ID      919072.2
CIRCULARIZATION BURN TERMINATION
   22  SEPT. 1969   8 HRS,  28 MINS,  15.445 SECS  G.M.T. ****  71. HRS,   43. MINS,   6.384 SECS  G.E.T.
XL      4.3446497+02  YL     -8.2520746+02  ZL     -3.5213114+02  DXL    -4.8119146+03  DYL    -2.0916296+03  DZL    -1.0363457+03
XS     -9.5844941+02  YS      2.7357426+02  ZS     -1.5979079+01  DXS     1.4740854+03  DYS     5.1539014+03  DZS    -2.0095983+02
ALTS    5.8363281+01  LATS   -9.1845988-01  LONS    1.6406944+02  VRS     5.3643276+03  PTR     3.7462008-03  AZR    -9.2147138+01
LIN     1.7765881+02  LAN     7.1558335+00  LAP    -1.8286626+02  SMAS    9.9749991+02  ECCS    6.4802993-04  PERS    1.9791879+00
RPS     9.9685350+02  APOS    9.9814630+02  RANS    1.7683286+02  INCS    1.5624113+02  LTS    -2.3027035-01  LNS     4.7288558+01
LTE     4.2049391+00  LNE     9.2025379-01  THETA  -7.6823320-01  BETA   -1.7999999+02  FUEL    9.5302735+02  BARC    7.6832570-01
DELV    1.3822515+02  MASS    6.9312003+04  PLCHNG  4.4350541-06  DRTX   -1.3822329+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      919072.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   23  SEPT. 1969   3 HRS,  20 MINS,  54.166 SECS  G.M.T. ****  90. HRS,   35. MINS,  45.105 SECS  G.E.T.
XL     -1.6977014+02  YL      9.0108542+02  ZL      3.9240335+02  DXL     5.2660234+03  DYL     7.8582570+02  DZL     4.7166763+02
XS      7.3708533+02  YS     -6.7139930+02  ZS      2.6179097+01  DXS    -3.6123946+03  DYS    -3.9580064+03  DZS     1.6834159+02
ALTS    5.8881599+01  LATS    1.5040146+00  LONS   -4.2329890+01  VRS     5.3613010+03  PTR    -8.9308184-03  AZR    -8.8199803+01
LIN     1.7765020+02  LAN    -2.5495696+00
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity - Continued

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ID      919072.2
CSM PLANE CHANGE BURN INITIATION
   24  SEPT. 1969   0 HRS,  31 MINS,  55.324 SECS  G.M.T. **** 111. HRS,   46. MINS,  46.262 SECS  G.E.T.
XL     -9.1139881+02  YL     -3.6198654+02  ZL     -1.8084294+02  DXL    -2.1677859+03  DYL     4.4906697+03  DZL     1.9275223+03
XS      6.3913853+02  YS      7.6454893+02  ZS     -3.6784080+01  DXS     4.1166766+03  DYS    -3.4346215+03  DZS     9.8239361+01
ALTS    5.8695645+01  LATS   -2.1139929+00  LONS    5.0105451+01  VRS     5.3622106+03  PTR     1.6896288-02  AZR    -8.8948889+01
LIN     1.7763782+02  LAN    -1.3381374+01  LAP    -5.3787339+01  LTS    -2.9269176-01  LNS     2.6972368+01  DEM    -1.0283781+01
THETA  -1.9636793-05  BETA    8.9999979+01  MASS    3.5958002+04
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ID      919072.2
CSM PLANE CHANGE BURN TERMINATION
   24  SEPT. 1969   0 HRS,  31 MINS,  57.626 SECS  G.M.T. **** 111. HRS,   46. MINS,  48.566 SECS  G.E.T.
XL     -9.1221846+02  YL     -3.6028747+02  ZL     -1.8010509+02  DXL    -2.1587419+03  DYL     4.4779643+03  DZL     1.9672587+03
XS      6.4069707+02  YS      7.6324631+02  ZS     -3.6738977+01  DXS     4.1100602+03  DYS    -3.4413369+03  DZS     1.3988739+02
ALTS    5.8696248+01  LATS   -2.1113984+00  LONS    4.9988662+01  VRS     5.3623654+03  PTR     1.6891976-02  AZR    -8.8503496+01
LIN     1.7740966+02  LAN    -4.5904140+00  LAP    -4.5282582+01  SMAS    9.9743275+02  ECCS    3.8312781-04  PERS    1.9789881+00
RPS     9.9705061+02  APOS    9.9781489+02  RANS    1.7743720+02  INCS    1.5579809+02  LTS    -2.9269268-01  LNS     2.6972044+01
LTE     1.6539090+00  LNE     2.9605801+00  THETA  -2.3649529-04  BETA    8.9557134+01  FUEL    1.4636035+02  BARC    1.1661526-01
DELV    4.1282242+01  MASS    3.5811642+04  PLCHNG  4.4243059-01  DRTX    0.0000000     DRTY    4.1282135+01  DRTZ    0.0000000
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ID      919072.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   24  SEPT. 1969   4 HRS,  58 MINS,  58.518 SECS  G.M.T. **** 116. HRS,   13. MINS,  49.454 SECS  G.E.T.
XL     -4.0359398+02  YL      8.3508995+02  ZL      3.6698156+02  DXL     4.8868671+03  DYL     1.9365399+03  DZL     9.6737065+02
XS      7.3715246+02  YS     -6.7146046+02  ZS      2.6188229+01  DXS    -3.6115405+03  DYS    -3.9570181+03  DZS     1.9691142+02
ALTS    5.8972651+01  LATS    1.5044595+00  LONS   -4.2329890+01  VRS     5.3609692+03  PTR    -1.2639561-03  AZR    -8.7894250+01
LIN     1.7740706+02  LAN    -6.8825983+00
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ID      919072.2
TRANSEARTH INJECTION BURN INITIATION
   24  SEPT. 1969  21 HRS,  16 MINS,   8.246 SECS  G.M.T. **** 132. HRS,   30. MINS,  59.182 SECS  G.E.T.
XL      8.6530662+02  YL      4.4555345+02  ZL      2.1715872+02  DXL     2.6543599+03  DYL    -4.2519039+03  DZL    -1.8594469+03
XS     -7.0957453+02  YS     -6.9957381+02  ZS      3.9137853+01  DXS    -3.7661523+03  DYS     3.8151763+03  DZS    -1.2210068+02
ALTS    5.8718252+01  LATS    2.2492814+00  LONS   -1.3540662+02  VRS     5.3623112+03  PTR    -1.5112450-02  AZR    -9.1305148+01
LIN     1.7739769+02  LAN    -1.5196575+01  LAP     5.2903686+01  LTS    -3.2464050-01  LNS     1.6460184+01  DEM    -4.5214156+00
THETA  -3.8597817+00  BETA   -7.1573266+00  MASS    3.6221641+04
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ID      919072.2
TRANSEARTH INJECTION BURN TERMINATION
   24  SEPT. 1969  21 HRS,  18 MINS,  24.000 SECS  G.M.T. **** 132. HRS,   33. MINS,  14.939 SECS  G.E.T.
XL      9.3105119+02  YL      3.2510231+02  ZL      1.6029818+02  DXL     3.2786214+03  DYL    -6.6130751+03  DZL    -3.2833019+03
XS     -8.0744155+02  YS     -5.8759960+02  ZS      3.1751168+01  DXS    -5.0650319+03  DYS     6.2894883+03  DZS    -5.5700123+02
ALTS    6.0627753+01  LATS    1.8211145+00  LONS   -1.4395548+02  VRS     8.0945946+03  PTR     2.6670805+00  AZR    -9.4037082+01
LIN     1.7556445+02  LAN     1.1846597+01  LAP     1.7055652+02  SMAS   -3.4658385+03  ECCS    1.2877202+00  PERS    1.2818294+01
RPS     9.9719185+02  APOS   -7.9288688+03  RANS   -1.7988253+02  INCS    1.5361935+02  LTS    -3.2469800-01  LNS     1.6441062+01
LTE     1.9799046-01  LNE     3.8844845+00  THETA   4.6309604+00  BETA   -4.7304711+00  FUEL    8.6303013+03  BARC    8.5335027+00
DELV    2.7547304+03  MASS    2.7591340+04  PLCHNG  2.4260624+00  DRTX    2.7270579+03  DRTY   -3.4244432+02  DRTZ    1.8543410+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(f) 72° launch azimuth; second injection opportunity - Concluded

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ID      919072.2
ENTRY AND TOUCHDOWN
   28  SEPT. 1969  22 HRS,   22 MINS,  22.576 SECS  G.M.T. **** 229. HRS,   37. MINS,  13.514 SECS  G.E.T.
X      -3.0958612+03  Y       1.2831523+03  Z       9.0308011+02  DX     -1.3165388+04  DY     -7.5212377+04  DZ     -2.2127170+04
R       3.5088914+03  DEC     1.4913573+01  RA      1.5592612+02  V       3.6036317+04  PTH    -6.4000148+00  AZ      1.2755620+02
ALT     6.5[illegible]6020+01  LAT     1.5007736+01  LON     1.7281658+02  VE      3.4864999+04  PTE    -5.6753171+00  AZE     1.2906297+02
SMA     1.0617177+05  ECC     9.6736745-01  INC     3.9999324+01  RAN    -5.5674545+00  APE     1.6941435+03  RP      3.4646565+03
INMP    1.1550844+01  RAM     4.0405329+01  DEM     2.0120408+01  RAS    -1.7484625+02  DES    -3.2304957+00  SPSFR   3.2273513+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD  -6.2195630+00  LONTD   1.9500029+02  AZTD    1.2959602+02
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ID      919072.2
CIRCUMLUNAR PERICYNTHION
   22  SEPT. 1969   4 HRS,    5 MINS,  55.948 SECS  G.M.T. ****  67. HRS,   20. MINS,  46.886 SECS  G.E.T.
XL      6.5147483+02  YL     -6.9718251+02  ZL     -2.9385699+02  DXL    -6.3480750+03  DYL    -4.6582928+03  DZL    -3.0216435+03
XS     -9.9809623+02  YS     -2.3691150+01  ZS     -8.8323463+00  DXS    -1.8912064+02  DYS     8.3771364+03  DZS    -1.0891408+03
ALTS    5.9922674+01  LATS   -5.0686555-01  LONS   -1.7864083+02  VBS     8.4497578+03  PTR     3.3534331-07  AZR    -9.7406100+01
LIN     1.7256257+02  LAN     5.2450319+00  LAP     3.0323651+00  LTS    -2.2349310-01  LNS     4.9506628+01  DEM    -2.1097418+01
SMAS   -2.0285115+03  ECCS    1.4921915+00  INCS    1.5237576+02  RANS    1.6910774+02  APES   -1.4059727+02  RPS     9.9841620+02
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ID      919072.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   24  SEPT. 1969  21 HRS,    6 MINS,  50.829 SECS  G.M.T. **** 132. HRS,   21. MINS,  41.763 SECS  G.E.T.
X      -1.1506953+03  Y       3.1387285+03  Z       1.0654770+03  DX     -3.0343395+04  DY     -1.8115965+04  DZ      7.4360826+03
R       3.5086975+03  DEC     1.7678006+01  RA      1.1013354+02  V       3.6113781+04  PTH    -6.3534178+00  AZ      7.5348716+01
ALT     6.5833358+01  LAT     1.7787537+01  LON     1.4990042+02  VE      3.4691919+04  PTE    -6.5860895+00  AZE     7.4713573+01
SMA     1.4176435+05  ECC     9.7555667-01  INC     2.2809808+01  RAN     6.0859705+01  APE     6.4431086+01  RP      3.4651927+03
INMP    2.6550549+01  RAM    -1.0089356+01  DEM    -4.5650864+00  RAS    -1.7849500+02  DES    -6.5246451-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.2780714+01  LONTD   1.9126887+02  AZTD    8.7832955+01
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(g) 78° launch azimuth; second injection opportunity

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ID      919078.2
LAUNCH TIME      19  SEPT. 1969     9 HRS,   41 MINS,  22.980 SECS   G.M.T.
LAUNCH AZIMUTH   78.                              INJECTION OPPORTUNITY     2
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ID      919078.2
EARTH PARKING ORBIT INSERTION
   19  SEPT. 1969    9 HRS,  52 MINS,  41.044 SECS  G.M.T. ****   0. HRS,   11. MINS,  18.064 SECS  G.E.T.
X      -1.0003444+02  Y       3.0630265+03  Z       1.7796984+03  DX     -2.5541150+04  DY     -1.6368085+02  DZ     -1.1539234+03
ALT     1.0292198+02  LAT     3.0306944+01  LON     3.0556765+02  V       2.5567727+04  PTH    -1.1789031-08  AZ      9.2991619+01
R       3.5439334+03  DEC     3.0144440+01  RA      9.1870540+01  RAS     1.7659669+02  DES     1.4744751+00  RAN    -4.0707634+00
INC     3.0278630+01  MASS    2.8388933+05
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ID      919078.2
3.5 MINS PRIOR TO TLI INITIATION
   19  SEPT. 1969  12 HRS,  54 MINS,  23.322 SECS  G.M.T. ****   3. HRS,   13. MINS,    .342 SECS  G.E.T.
X      -1.4547300+03  Y       2.8253102+03  Z       1.5685203+03  DX     -2.3287366+04  DY     -8.5610639+03  DZ     -6.1849929+03
ALT     1.0218695+02  LAT     2.6418713+01  LON     2.8539016+02  V       2.5570439+04  PTH    -7.6617192-03  AZ      1.0564487+02
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ID      919078.2
TRANSLUNAR INJECTION INITIATION
   19  SEPT. 1969  12 HRS,  57 MINS,  53.322 SECS  G.M.T. ****   3. HRS,   16. MINS,  30.342 SECS  G.E.T.
X      -2.2062603+03  Y       2.4450848+03  Z       1.3083038+03  DX     -1.9976039+04  DY     -1.3328055+04  DZ     -8.7950517+03
ALT     1.0132885+02  LAT     2.1794423+01  LON     2.9932991+02  V       2.5574052+04  PTH    -1.4213178-02  AZ      1.1171251+02
R       3.5436821+03  DEC     2.1665876+01  RA      1.3206071+02  RAS     1.7671204+02  DES     1.4245731+00  RAN    -5.1040717+00
INC     3.0297595+01  MASS    2.8072077+05
*****************************************************************************************************************

ID      919078.2
TRANSLUNAR INJECTION TERMINATION
   19  SEPT. 1969  13 HRS,   3 MINS,    .533 SECS  G.M.T. ****   3. HRS,   21. MINS,  37.553 SECS  G.E.T.
X      -3.2005300+03  Y       1.4867347+03  Z       6.9887952+02  DX     -1.9565681+04  DY     -2.5322245+04  DZ     -1.5754094+04
ALT     1.5403178+02  LAT     1.1272272+01  LON     3.2106946+02  V       3.5668241+04  PTH     6.2470126+00  AZ      1.1833527+02
R       3.5975276+03  DEC     1.1201884+01  RA      1.5508382+02  RAS     1.7671523+02  DES     1.4231935+00  DEM    -2.8605340+01
RAN    -5.1040705+00  INC     3.0297593+01  ECC     9.7588655-01  SMA     1.4740344+05  RP      3.5544050+03  APF     1.4470263+02
INMP    2.3331463+00  C3TLI  -4.6516053-01  DAZTLI  0.0000000     MASS    1.3176317+05  FUEL    1.4895760+05
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ID      919078.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   19  SEPT. 1969  15 HRS,   3 MINS,    .533 SECS  G.M.T. ****   5. HRS,   21. MINS,  37.553 SECS  G.E.T.
X       1.3990284+03  Y      -1.8406516+04  Z      -1.0635016+04  DX      6.8123178+03  DY     -1.0905761+04  DZ     -5.9884615+03
ALT     1.7862949+04  LAT    -2.9974115+01  LON     5.0250046+01  V       1.4184673+04  PTH     6.5034828+01  AZ      8.5234756+01
R       2.1304006+04  DEC    -2.9947262+01  RA     -8.5653462+01  RAS     1.7678998+02  DES     1.3908554+00
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ID      919078.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   22  SEPT. 1969   4 HRS,  49 MINS,  41.138 SECS  G.M.T. ****  67. HRS,    8. MINS,  18.154 SECS  G.E.T.
RMP     9.9889161+02  DEMP    3.8636031+00  RAMP   -1.7633280+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(g) 78° launch azimuth; second injection opportunity- Continued

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ID      919078.2
LUNAR ORBIT INSERTION BURN INITIATION
   22  SEPT. 1969   4 HRS,  46 MINS,  17.308 SECS  G.M.T. ****  67. HRS,    4. MINS,  54.327 SECS  G.E.T.
XL      8.8682580+02  YL     -4.9600197+02  ZL     -1.6590279+02  DXL    -5.4512633+03  DYL    -5.3215018+03  DZL    -3.3737616+03
XS     -9.6932952+02  YS     -3.4794682+02  ZS      3.5672982+01  DXS    -1.2897456+03  DYS     3.1665434+03  DZS    -1.1682605+03
ALTS    9.1070285+01  LATS    1.9856181+00  LONS   -1.6023527+02  VRS     8.3498926+03  PTR    -1.0959012+01  AZR    -9.7809769+01
LIN     1.7192794+02  LAN     5.6150989+00  LAP     2.0923766+01  LTS    -2.2453456-01  LNS     4.9165382+01  DEM    -2.0959111+01
THETA   1.8009929+01  BETA    1.6906863+02  MASS    9.4833024+04
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ID      919078.2
LUNAR ORBIT INSERTION BURN TERMINATION
   22  SEPT. 1969   4 HRS,  52 MINS,  45.538 SECS  G.M.T. ****  67. HRS,   11. MINS,  22.557 SECS  G.E.T.
XL      5.6112526+02  YL     -7.5934283+02  ZL     -3.2030986+02  DXL    -4.5554569+03  DYL    -2.7563549+03  DZL    -1.3219171+03
XS     -9.9229664+02  YS      9.6426173+01  ZS     -1.0527929+01  DXS     5.7368623+02  DYS     5.4679464+03  DZS    -2.1592277+02
ALTS    5.8532812+01  LATS   -6.0501624-01  LONS    1.7444972+02  VRS     5.5021973+03  PTR    -4.1506643-01  AZR    -9.2253587+01
LIN     1.7766026+02  LAN     9.4276606+00  LAP    -1.4825181+02  SMAS    1.0529131+03  ECCS    5.3571831-02  PERS    2.1463796+00
RPS     9.9650664+02  APOS    1.1093196+03  RANS    1.7685579+02  INCS    1.5623441+02  LTS    -2.2470164-01  LNS     4.9110666+01
LTE     4.4036841+00  LNE     7.2979721-01  THETA  -6.7572264+00  BETA    1.6375997+02  FUEL    2.4681029+04  BARC    2.5334326+01
DELV    3.0512751+03  MASS    7.0151994+04  PLCHNG  5.7398339+00  DRTX   -2.8491225+03  DRTY    5.5027165+02  DRTZ   -9.4339979+02
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ID      919078.2
CIRCULARIZATION BURN INITIATION
   22  SEPT. 1969   9 HRS,  12 MINS,  46.322 SECS  G.M.T. ****  71. HRS,   31. MINS,  23.342 SECS  G.E.T.
XL      4.3800335+02  YL     -8.2317559+02  ZL     -3.5145358+02  DXL    -4.9293947+03  DYL    -2.1640675+03  DZL    -1.0703414+03
XS     -9.5727286+02  YS      2.7632269+02  ZS     -1.6093172+01  DXS     1.5302879+03  DYS     5.2839833+03  DZS    -2.0596242+02
ALTS    5.7992594+01  LATS   -9.2536257-01  LONS    1.6389889+02  VRS     5.5049688+03  PTR    -1.5709423-02  AZR    -9.2144696+01
LIN     1.7765850+02  LAN     7.1658301+00  LAP    -1.7738891+02  LTS    -2.3142213-01  LNS     4.6912185+01  DEM    -2.0021619+01
THETA  -2.5613203-06  BETA    1.7999300+02  MASS    7.0131994+04
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ID      919078.2
CIRCULARIZATION BURN TERMINATION
   22  SEPT. 1969   9 HRS,  13 MINS,   1.476 SECS  G.M.T. ****  71. HRS,   31. MINS,  38.492 SECS  G.E.T.
XL      4.2582732+02  YL     -8.2843002+02  ZL     -3.5405739+02  DXL    -4.8346977+03  DYL    -2.0495024+03  DZL    -1.0176804+03
XS     -9.5341863+02  YS      2.8930811+02  ZS     -1.6599824+01  DXS     1.5604626+03  DYS     5.1291420+03  DZS    -1.9953345+02
ALTS    5.7991195+01  LATS   -9.5444173-01  LONS    1.6311995+02  VRS     5.3649747+03  PTR    -5.9983368-03  AZR    -9.2131826+01
LIN     1.7765850+02  LAN     7.1635383+00  LAP    -1.4349110+02  SMAS    9.9699873+02  ECCS    5.2612628-04  PERS    1.9776965+00
RPS     9.9647419+02  APOS    9.9752326+02  RANS    1.7686643+02  INCS    1.5623049+02  LTS    -2.3142860-01  LNS     4.6910048+01
LTE     4.1628783+00  LNE     9.5977828-01  THETA  -7.7703220-01  BETA    1.7999999+02  FUEL    9.6336719+02  BARC    7.7712619-01
DELV    1.4000215+02  MASS    6.9168627+04  PLCHNG  4.8725208-06  DRTX   -1.3999999+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      919078.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   23  SEPT. 1969   4 HRS,   4 MINS,  29.783 SECS  G.M.T. ****  90. HRS,   23. MINS,   6.801 SECS  G.E.T.
XL     -1.7650293+02  YL      8.9942756+02  ZL      3.9176580+02  DXL     5.2611428+03  DYL     8.2104391+02  DZL     4.8592349+02
XS      7.3665774+02  YS     -6.7100955+02  ZS      2.6176057+01  DXS    -3.6127892+03  DYS    -3.9600209+03  DZS     1.6839598+02
ALTS    5.8303161+01  LATS    1.5047703+00  LONS   -4.2329878+01  VRS     5.3630559+03  PTR     2.4721847-03  AZR    -8.8200107+01
LIN     1.7764995+02  LAN    -2.5305276+00
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(g) 78° launch azimuth; second injection opportunity - Continued

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ID      919078.2
CSM PLANE CHANGE BURN INITIATION
   24  SEPT. 1969   1 HRS,  14 MINS,  34.611 SECS  G.M.T. **** 111. HRS,   33. MINS,  11.629 SECS  G.E.T.
XL     -9.0802032+02  YL     -3.6748701+02  ZL     -1.8303952+02  DXL    -2.2013145+03  DYL     4.4789089+03  DZL     1.9231370+03
XS      6.3870943+02  YS      7.6403567+02  ZS     -3.6753219+01  DXS     4.1179570+03  DYS    -3.4365852+03  DZS     9.8410291+01
ALTS    5.8025951+01  LATS   -2.1136385+00  LONS    5.0105453+01  VRS     5.3644545+03  PTR     9.5110640-03  AZR    -8.8947819+01
LIN     1.7763764+02  LAN    -1.3353333+01  LAP    -1.9772799+01  LTS    -2.9379556-01  LNS     2.6611950+01  DEM    -1.0090511+01
THETA  -2.1344341-05  BETA    8.9999972+01  MASS    3.5814627+04
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ID      919078.2
CSM PLANE CHANGE BURN TERMINATION
   24  SEPT. 1969   1 HRS,  14 MINS,  36.900 SECS  G.M.T. **** 111. HRS,   33. MINS,  13.919 SECS  G.E.T.
XL     -9.0884815+02  YL     -3.6580160+02  ZL     -1.8230734+02  DXL    -2.1923301+03  DYL     4.4662666+03  DZL     1.9628327+03
XS      6.4026000+02  YS      7.6273936+02  ZS     -3.6708310+01  DXS     4.1113679+03  DYS    -3.4432685+03  DZS     1.3999671+02
ALTS    5.8026285+01  LATS   -2.1110540+00  LONS    4.9989171+01  VRS     5.3646102+03  PTR     9.5275909-03  AZR    -8.8503235+01
LIN     1.7740980+02  LAN    -4.5806850+00  LAP    -1.5772697+01  SMAS    9.9693380+02  ECCS    4.4750325-04  PERS    1.9775033+00
RPS     9.9648767+02  APOS    9.9737991+02  RANS    1.7747673+02  INCS    1.5578979+02  LTS    -2.9379655-01  LNS     2.6611626+01
LTE     1.6047783+00  LNE     2.9942275+00  THETA  -2.3051888-05  BETA    8.9557850+01  FUEL    1.4556543+02  BARC    1.1598433-01
DELV    4.1222363+01  MASS    3.5669062+04  PLCHNG  4.4160176-01  DRTX    0.0000000     DRTY    4.1222262+01  DRTZ    0.0000000
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ID      919078.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   24  SEPT. 1969   5 HRS,  41 MINS,  25.130 SECS  G.M.T. **** 116. HRS,    0. MINS,   2.149 SECS  G.E.T.
XL     -4.0950573+02  YL      8.3199435+02  ZL      3.6575267+02  DXL     4.8736113+03  DYL     1.9687169+03  DZL     9.8044766+02
XS      7.3668772+02  YS     -6.7103686+02  ZS      2.6177844+01  DXS    -3.6122305+03  DYS    -3.9591272+03  DZS     1.9697083+02
ALTS    5.8343767+01  LATS    1.5048117+00  LONS   -4.2329878+01  VRS     5.3629931+03  PTR     8.4745663-03  AZR    -8.7894668+01
LIN     1.7740722+02  LAN    -6.8708227+00
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ID      919078.2
TRANSEARTH INJECTION BURN INITIATION
   24  SEPT. 1969  21 HRS,  58 MINS,   5.811 SECS  G.M.T. **** 132. HRS,   16. MINS,  42.825 SECS  G.E.T.
XL      8.6816449+02  YL      4.4037713+02  ZL      2.1470225+02  DXL     2.6255365+03  DYL    -4.2666072+03  DZL    -1.8682034+03
XS     -7.1844345+02  YS     -6.8997911+02  ZS      3.8813224+01  DXS    -3.7167506+03  DYS     3.8639639+03  DZS    -1.2487366+02
ALTS    5.8370889+01  LATS    2.2313929+00  LONS   -1.3615779+02  VRS     5.3628393+03  PTR    -6.7102389-03  AZR    -9.1334989+01
LIN     1.7739786+02  LAN    -1.5179771+01  LAP     2.2192872+02  LTS    -3.2570644-01  LNS     1.6105696+01  DEM    -4.3240817+00
THETA  -3.6467174+00  BETA   -7.1264071+00  MASS    3.6079062+04
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ID      919078.2
TRANSEARTH INJECTION BURN TERMINATION
   24  SEPT. 1969  22 HRS,   0 MINS,  21.134 SECS  G.M.T. **** 132. HRS,   18. MINS,  58.149 SECS  G.E.T.
XL      9.3299453+02  YL      3.1997170+02  ZL      1.5782781+02  DXL     3.2440223+03  DYL    -6.6289741+03  DZL    -3.2921660+03
XS     -8.1466078+02  YS     -5.7715911+02  ZS      3.1391859+01  DXS    -4.9937097+03  DYS     6.3494470+03  DZS    -5.5946191+02
ALTS    6.0391007+01  LATS    1.8009261+00  LONS   -1.4468374+02  VRS     8.0972595+03  PTR     2.7352320+00  AZR    -9.4054647+01
LIN     1.7555660+02  LAN     1.1448659+01  LAP     1.4597879+02  SMAS   -3.4533960+03  ECCS    1.2886598+00  PERS    1.2749329+01
RPS     9.9685644+02  APOS   -7.9036484+03  RANS   -1.7988546+02  INCS    1.5361176+02  LTS    -3.2576377-01  LNS     1.6086638+01
LTE     1.4869928-01  LNE     3.9131798+00  THETA   4.8218864+00  BETA   -4.7112226+00  FUEL    8.6028764+03  BARC    8.5108995+00
DELV    2.7571422+03  MASS    2.7476185+04  PLCHNG  2.4174330+00  DRTX    2.7302953+03  DRTY   -3.4135438+02  DRTZ    1.7536552+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(g) 78° launch azimuth; second injection opportunity - Concluded

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ID      919078.2
ENTRY AND TOUCHDOWN
   28  SEPT. 1969  22 HRS,  23 MINS,  35.910 SECS  G.M.T. **** 228. HRS,   42. MINS,  12.925 SECS  G.E.T.
X      -3.1054591+03  Y      1.3668637+03  Z      8.9506190+02  DX     -1.2976496+04  DY     -2.5287995+04  DZ     -2.2153129+04
R       3.5090352+03  DEC    1.4777941+01  RA     1.5624336+02  V       3.6036555+04  PTH    -6.4000210+00  AZ      1.2760164+02
ALT     6.5856247+01  LAT    1.4871326+01  LON    1.7282744+02  VE      3.4865241+04  PTE    -6.6748925+00  AZE     1.2911090+02
SMA     1.0533533+05  ECC    9.6741724-01  INC    3.9998150+01  RAN    -5.4317547+00  APE     1.6963581+02  RP      3.4647002+03
INMP    1.1535841+01  RAM    4.0416265+01  DEM    2.0124316+01  RAS    -1.7484549+02  DES    -2.2308256+00  SPSFR   3.1133991+03
ENTDT   2.5000000-01  ENTRG  2.0000000+03  LATTD -6.3612098+00  LONTD  1.9500168+02  AZTD   1.2957627+02
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ID      919078.2
CIRCUMLUNAR PERICYNTHION
   22  SEPT. 1969   4 HRS,  50 MINS,  11.872 SECS  G.M.T. ****  67. HRS,    8. MINS,  48.892 SECS  G.E.T.
XL      6.5982483+02  YL    -6.8994300+02  ZL    -2.9206785+02  DXL    -6.2815919+03  DYL    -4.6818224+03  DZL    -3.1313075+03
XS     -9.9791073+02  YS    -2.7769941+01  ZS    -9.8399841+00  DXS    -2.2118577+02  DYS     8.3670490+03  DZS    -1.1817968+03
ALTS    5.9952021+01  LATS  -5.6473302-01  LONS  -1.7840598+02  VRS     8.4529919+03  PTR     3.3227202-07  AZR    -9.8037136+01
LIN     1.7192788+02  LAN    5.5792791+00  LAP    9.3862181-01  LTS    -2.2463550-01  LNS     4.9132327+01  DEM    -2.0945661+01
SMAS   -2.0211805+03  ECCS   1.4939418+00  INCS   1.5179802+02  RANS   1.6850838+02  APES   -1.4175313+02  RPS     9.9834552+02
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ID      919078.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   24  SEPT. 1969  21 HRS,  58 MINS,  47.617 SECS  G.M.T. **** 132. HRS,   17. MINS,  24.635 SECS  G.E.T.
X      -1.1525215+03  Y      3.1605835+03  Z      9.9714191+02  DX     -2.9805743+04  DY     -1.8381442+04  DZ      8.8240386+03
R       3.5083297+03  DEC    1.6509834+01  RA     1.1003462+02  V       3.6112648+04  PTH    -6.7736550+00  AZ      7.3031129+01
ALT     6.5832742+01  LAT    1.6613038+01  LON    1.3677932+02  VE      3.4700044+04  PTE    -7.0194273+00  AZE     7.2295200+01
SMA     1.4148675+05  ECC    9.7554962-01  INC    2.3504438+01  RAN     6.7071174+01  APE     5.9160998+01  RP      3.4594064+03
INMP    2.9080734+01  RAM   -9.6352215+00  DEM   -4.3203086+00  RAS    -1.7846258+02  DES    -6.6651629-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD  2.3093005+01  LONTD  1.6778095+02  AZTD   8.5136139+01
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity

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ID      919084.2
LAUNCH TIME      19  SEPT. 1969   10 HRS,   37 MINS,  29.283 SECS   G.M.T.
LAUNCH AZIMUTH   84.                          INJECTION OPPORTUNITY    2
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ID      919084.2
EARTH PARKING ORBIT INSERTICN
   19  SEPT. 1969  10 HRS,  48 MINS,  46.314 SECS  G.M.T. ****   0. HRS,   11. MINS,  17.030 SECS  G.E.T.
X     -8.4418386+02  Y      3.0185334+03  Z      1.6538664+03  DX    -2.4830291+04  DY    -5.2074304+03  DZ    -3.1698617+03
ALT    1.0252380+02  LAT    2.7973203+01  LON    3.0526131+02  V      2.5567727+04  PTH    0.0000000     AZ     9.8058250+01
R      3.5439334+03  DEC    2.7818703+01  RA     1.0562455+02  RAS    1.7663162+02  DES    1.4593638+00  RAN   -1.2519466+00
INC    2.8872555+01  MASS   2.8445841+05
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ID      919084.2
3.5 MINS PRIOR TO TLI INITIATION
   19  SEPT. 1969  13 HRS,  47 MINS,  33.974 SECS  G.M.T. ****   3. HRS,   10. MINS,   4.691 SECS  G.E.T.
X     -1.4803219+03  Y      2.8334408+03  Z      1.5295851+03  DX    -2.3225548+04  DY    -9.1450856+03  DZ    -5.5417546+03
ALT    1.0214584+02  LAT    2.5715451+01  LON    2.7240047+02  V      2.5568921+04  PTH   -4.6507617-03  AZ     1.0390016+02
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ID      919084.2
TRANSLUNAR INJECTION INITIATION
   19  SEPT. 1969  13 HRS,  51 MINS,   3.974 SECS  G.M.T. ****   3. HRS,   13. MINS,  34.691 SECS  G.E.T.
X     -2.2289471+03  Y      2.4329893+03  Z      1.2925787+03  DX    -1.9870661+04  DY    -1.3908341+04  DZ    -8.1021348+03
ALT    1.0139243+02  LAT    2.1519151+01  LON    2.8643230+02  V      2.5572049+04  PTH   -1.3174883-02  AZ     1.0988834+02
R      3.5437836+03  DEC    2.1391913+01  RA     1.3249389+02  RAS    1.7674517+02  DES    1.4102431+00  RAN   -2.2710443+00
INC    2.8887061+01  MASS   2.8132113+05
*****************************************************************************************************************

ID      919084.2
TRANSLUNAR INJECTION TERMINATION
   19  SEPT. 1969  13 HRS,  56 MINS,  11.852 SECS  G.M.T. ****   3. HRS,   18. MINS,  42.568 SECS  G.E.T.
X     -3.2171489+03  Y      1.4393143+03  Z      7.2315834+02  DX    -1.9336073+04  DY    -2.6065815+04  DZ    -1.4792884+04
ALT    1.5439968+02  LAT    1.1667957+01  LON    3.0854890+02  V      3.5667069+04  PTH    6.2599507+00  AZ     1.1664342+02
R      3.5978647+03  DEC    1.1595239+01  RA     1.5589682+02  RAS    1.7674837+02  DES    1.4088600+00  DEM   -2.8585389+01
RAN   -2.2710449+00  INC    2.8887063+01  ECC    9.7594236-01  SMA    1.4775184+05  RP     3.5545608+03  APF    1.4273849+02
INMP   3.4823435-01  C3TLI -4.6406350-01  DAZTLI 0.0000000     MASS   1.3204039+05  FUEL   1.4928074+05
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ID      919084.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   19  SEPT. 1969  15 HRS,  56 MINS,  11.852 SECS  G.M.T. ****   5. HRS,   18. MINS,  42.568 SECS  G.E.T.
X      1.5689915+03  Y     -1.8623584+04  Z     -1.0229121+04  DX     6.9163916+03  DY    -1.0911140+04  DZ    -5.8602632+03
ALT    1.7864465+04  LAT   -2.8718797+01  LON    3.7385600+01  V      1.4185631+04  PTH    6.5037425+01  AZ     8.6570135+01
R      2.1305739+04  DEC   -2.8692654+01  RA    -8.5184340+01  RAS    1.7682310+02  DES    1.3765203+00
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ID      919084.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   22  SEPT. 1969   5 HRS,  37 MINS,   7.727 SECS  G.M.T. ****  66. HRS,   59. MINS,  38.443 SECS  G.E.T.
RMP    9.9884533+02  DEMP   3.7995914+00  RAMP  -1.7596404+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity - Continued

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ID      919084.2
LUNAR ORBIT INSERTION BURN INITIATION
   22  SEPT. 1969   5 HRS,  33 MINS,  43.088 SECS  G.M.T. ****  66. HRS,   55. MINS,  13.802 SECS  G.E.T.
XL      8.9551943+02  YL     -4.8455740+02  ZL     -1.5873337+02  DXL    -5.3683357+03  DYL    -5.3554648+03  DZL    -3.4549330+03
XS     -9.6638133+02  YS     -3.5581430+02  ZS      3.4035738+01  DXS    -1.3275748+03  DYS     8.1511803+03  DZS    -1.2258577+03
ALTS    5.2014715+01  LATS    2.1180317+00  LONS   -1.5978667+02  VRS     8.3490570+03  PTR    -1.1151808+01  AZR    -9.8190401+01
LIN     1.7152589+02  LAN     5.8405575+00  LAP     3.3207630+01  LTS    -2.2575918-01  LNS     4.8764334+01  DEM    -2.0795306+01
THETA   1.8459910+01  BETA    1.4831842+02  MASS    9.4833024+04
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ID      919084.2
LUNAR ORBIT INSERTION BURN TERMINATION
   22  SEPT. 1969   5 HRS,  40 MINS,  12.739 SECS  G.M.T. ****  67. HRS,    2. MINS,  43.514 SECS  G.E.T.
XL      5.7270559+02  YL     -7.5196886+02  ZL     -3.1712291+02  DXL    -4.5114007+03  DYL    -2.8165493+03  DZL    -1.3468284+03
XS     -9.9288741+02  YS      8.9916037+01  ZS     -1.0275060+01  DXS     5.3669045+02  DYS     5.4719125+03  DZS    -2.1633976+02
ALTS    5.8509924+01  LATS   -5.9049746-01  LONS    1.7482539+02  VRS     5.5024236+03  PTR    -4.0353630-01  AZR    -9.2257635+01
LIN     1.7766006+02  LAN     9.4345581+00  LAP     1.9624445+02  SMAS    1.0529589+03  ECCS    5.3507226-02  PERS    2.1465196+00
RPS     9.9651263+02  APOS    1.1094051+03  RANS    1.7689158+02  INCS    1.5622332+02  LTS    -2.2592693-01  LNS     4.8709416+01
LTE     4.3604571+00  LNE     7.7175751-01  THETA  -6.3039717+00  BETA    1.6268667+02  FUEL    2.4775230+04  BARC    2.5468202+01
DELV    3.0648762+03  MASS    7.0057793+04  PLCHNG  6.1407511+00  DRTX   -2.3449634+03  DRTY    5.8862279+02  DRTZ   -9.7046639+02
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ID      919084.2
CIRCULARIZATION BURN INITIATION
   22  SEPT. 1969  10 HRS,   0 MINS,  10.034 SECS  G.M.T. ****  71. HRS,   22. MINS,  40.749 SECS  G.E.T.
XL      4.5427036+02  YL     -8.1575203+02  ZL     -3.4811661+02  DXL    -4.8846385+03  DYL    -2.2467694+03  DZL    -1.1048994+03
XS     -9.6018280+02  YS      2.6603404+02  ZS     -1.5698674+01  DXS     1.4737005+03  DYS     5.3000847+03  DZS    -2.0690645+02
ALTS    5.7999413+01  LATS   -9.0267068-01  LONS    1.6451098+02  VRS     5.5050432+03  PTR    -1.5726868-02  AZR    -9.2154469+01
LIN     1.7765833+02  LAN     7.1731889+00  LAP    -1.7332558+02  LTS    -2.3264882-01  LNS     4.6511449+01  DEM    -1.9850598+01
THETA  -2.5613203-06  BETA   -1.7999999+02  MASS    7.0037793+04
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ID      919084.2
CIRCULARIZATION BURN TERMINATION
   22  SEPT. 1969  10 HRS,   0 MINS,  25.167 SECS  G.M.T. ****  71. HRS,   22. MINS,  55.883 SECS  G.E.T.
XL      4.4221931+02  YL     -8.2120355+02  ZL     -3.5080224+02  DXL    -4.7322248+03  DYL    -2.1307024+03  DZL    -1.0516285+03
XS     -9.5647273+02  YS      2.7909233+02  ZS     -1.6206006+01  DXS     1.5054349+03  DYS     5.1456030+03  DZS    -2.0048334+02
ALTS    5.7998003+01  LATS   -9.3194606-01  LONS    1.6373310+02  VRS     5.3650496+03  PTR    -6.0036913-03  AZR    -9.2141920+01
LIN     1.7765833+02  LAN     7.1709152+00  LAP    -1.6788378+02  SMAS    9.9704020+02  ECCS    5.6024071-04  PERS    1.9778199+00
RPS     9.9648162+02  APOS    9.9759878+02  RANS    1.7690230+02  INCS    1.5621944+02  LTS    -2.3265535-01  LNS     4.6509328+01
LTE     4.1180664+00  LNE     1.0016021+00  THETA  -7.7598376-01  BETA    1.7999300+02  FUEL    9.6207227+02  BARC    7.7608675-01
DELV    1.4000193+02  MASS    6.9075721+04  PLCHNG  4.7751255-06  DRTX   -1.3999999+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      919084.2
CSM      PASS OVER LUNAR LANDING SITE
   22  SEPT. 1969   4 HRS,  52 MINS,   9.659 SECS  G.M.T. ****  90. HRS,   14. MINS,  40.376 SECS  G.E.T.
XL     -1.8397564+02  YL      8.9820573+02  ZL      3.9131647+02  DXL     5.2535424+03  DYL     8.5805944+02  DZL     5.0084332+02
XS      7.3671164+02  YS     -6.7105855+02  ZS      2.5182013+01  DXS    -3.6126374+03  DYS    -3.9597764+03  DZS     1.6839373+02
ALTS    5.8376149+01  LATS    1.5050024+00  LONS   -4.2329874+01  VRS     5.3627726+03  PTR     1.9111713-03  AZR    -8.8200120+01
LIN     1.7764981+02  LAN    -2.5258542+00
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity - Continued

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ID      919084.2
CSM PLANE CHANGE BURN INITIATION
   24  SEPT. 1969   2 HRS,   2 MINS,  18.960 SECS  G.M.T. **** 111. HRS,   24. MINS,  49.674 SECS  G.E.T.
XL     -9.0491097+02  YL     -3.7390681+02  ZL     -1.8563971+02  DXL    -2.2335221+03  DYL     4.4629750+03  DZL     1.9169111+03
XS      6.3873555+02  YS      7.6406690+02  ZS     -3.6754841+01  DXS     4.1179905+03  DYS    -3.4363721+03  DZS     9.8416717+01
ALTS    5.8066697+01  LATS   -2.1136455+00  LONS    5.0105451+01  VRS     5.3643437+03  PTR     1.1485231-02  AZR    -8.8947634+01
LIN     1.7763757+02  LAN    -1.3349849+01  LAP    -2.0486751+01  LTS    -2.9503043-01  LNS     2.6208574+01  DEM    -9.8737259+00
THETA  -1.1099057-05  BETA    6.9999980+01  MASS    3.5721721+04
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ID      919084.2
CSM PLANE CHANGE BURN TERMINATION
   24  SEPT. 1969   2 HRS,   2 MINS,  21.244 SECS  G.M.T. **** 111. HRS,   24. MINS,  51.961 SECS  G.E.T.
XL     -9.0575065+02  YL     -3.7223176+02  ZL     -1.8491177+02  DXL    -2.2295878+03  DYL     4.4503841+03  DZL     1.9566261+03
XS      6.4028214+02  YS      7.6277403+02  ZS     -3.6710045+01  DXS     4.1114200+03  DYS    -3.4430330+03  DZS     1.4000169+02
ALTS    5.8067109+01  LATS   -2.1110674+00  LONS    4.9989477+01  VRS     5.3644991+03  PTR     1.1501382-02  AZR    -8.8503072+01
LIN     1.7740967+02  LAN    -4.5777026+00  LAP    -1.6597384+01  SMAS    9.9697380+02  ECCS    4.6074357-04  PERS    1.9776223+00
RPS     9.9651445+02  APOS    9.9743313+02  RANS    1.7752007+02  INCS    1.5578055+02  LTS    -2.9503141-01  LNS     2.6208249+01
LTE     1.5496996+00  LNE     3.0317359+00  THETA  -3.6712267-05  BETA    8.9558227+01  FUEL    1.4518652+02  BARC    1.1640533-01
DELV    4.1222062+01  MASS    3.5576534+04  PLCHNG  4.4160724-01  DRTX    0.0000000     DRTY    4.1221914+01  DRTZ    0.0000000
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ID      919084.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   24  SEPT. 1969   6 HRS,  29 MINS,  10.520 SECS  G.M.T. **** 115. HRS,   51. MINS,  41.234 SECS  G.E.T.
XL     -4.1645283+02  YL      8.2912095+02  ZL      3.6463488+02  DXL     4.8564851+03  DYL     2.0029928+03  DZL     9.9431190+02
XS      7.3674275+02  YS     -6.7108691+02  ZS      2.6182453+01  DXS    -3.6120371+03  DYS    -3.9589097+03  DZS     1.9696010+02
ALTS    5.8418243+01  LATS    1.5049643+00  LONS   -4.2329874+01  VRS     5.3627018+03  PTR     8.4359559-03  AZR    -8.7894679+01
LIN     1.7740712+02  LAN    -6.8680944+00
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ID      919084.2
TRANSEARTH INJECTION BURN INITIATION
   24  SEPT. 1969  22 HRS,  46 MINS,  10.875 SECS  G.M.T. **** 132. HRS,    8. MINS,  41.590 SECS  G.E.T.
XL      8.7139949+02  YL      4.3523885+02  ZL      2.1224964+02  DXL     2.5947080+03  DYL    -4.2813766+03  DZL    -1.8771736+03
XS     -7.2823732+02  YS     -6.7971278+02  ZS      3.8480476+01  DXS    -3.6611297+03  DYS     3.9164717+03  DZS    -1.2783130+02
ALTS    5.8411597+01  LATS    2.2121631+00  LONS   -1.3697390+02  VRS     5.3627382+03  PTR    -8.8272342-03  AZR    -9.1366562+01
LIN     1.7739780+02  LAN    -1.5180120+01  LAP     2.3470371+02  LTS    -3.2692681-01  LNS     1.5699486+01  DEM    -4.0978379+00
THETA  -3.4838464+03  BETA   -7.1003699+00  MASS    3.5986534+04
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ID      919084.2
TRANSEARTH INJECTION BURN TERMINATION
   24  SEPT. 1969  22 HRS,  48 MINS,  25.942 SECS  G.M.T. **** 132. HRS,   10. MINS,  56.653 SECS  G.E.T.
XL      9.3532564+02  YL      3.1471463+02  ZL      1.5527661+02  DXL     3.2043521+03  DYL    -6.6457184+03  DZL    -3.3019036+03
XS     -8.2274228+02  YS     -5.6579489+02  ZS      3.1007383+01  DXS    -4.9108399+03  DYS     6.4158539+03  DZS    -5.6244432+02
ALTS    6.0501073+01  LATS    1.7786659+00  LONS   -1.4548393+02  VRS     8.0991583+03  PTR     2.7833764+00  AZR    -9.4075453+01
LIN     1.7554646+02  LAN     1.1018720+01  LAP    -9.3893743+01  SMAS   -3.4379949+03  ECCS    1.2999641+00  PERS    1.2664137+01
RPS     9.9689521+02  APOS   -7.8728851+03  RANS   -1.7988443+02  INCS    1.5360180+02  LTS    -3.2698397-01  LNS     1.5630459+01
LTE     9.2224349-02  LNE     3.9458513+00  THETA   4.9695466+00  BETA   -4.6945719+00  FUEL    8.5866138+03  BARC    8.4953171+00
DELV    2.7592833+03  MASS    2.7399920+04  PLCHNG  2.4103031+00  DRTX    2.7330566+03  DRTY   -3.4043799+02  DRTZ    1.6767342+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity - Continued

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ID      919084.2
LUNAR ORBIT INSERTION BURN INITIATION
   22  SEPT. 1969   5 HRS,  33 MINS,  43.088 SECS  G.M.T. ****  66. HRS,   56. MINS,  13.802 SECS  G.E.T.
XL      8.9551943+02  YL     -4.8455740+02  ZL     -1.5873337+02  DXL    -5.5683857+03  DYL    -5.3554648+03  DZL    -3.4549330+03
XS     -9.6638133+02  YS     -3.5581430+02  ZS      3.4035738+01  DXS    -1.3275748+03  DYS     8.1511803+03  DZS    -1.2258577+03
ALTS    5.2014715+01  LATS    2.1180317+00  LONS   -1.5978667+02  VRS     8.3490570+03  PTR    -1.1151808+01  AZR    -9.8190401+01
LIN     1.7152589+02  LAN     5.8405575+00  LAP     3.3207630+01  LTS    -2.2575918-01  LNS     4.8764334+01  DEM    -2.0795306+01
THETA   1.8459910+01  BETA    1.5831842+02  MASS    9.4833024+04
*****************************************************************************************************************************

ID      919084.2
LUNAR ORBIT INSERTION BURN TERMINATION
   22  SEPT. 1969   5 HRS,  40 MINS,  12.799 SECS  G.M.T. ****  67. HRS,    2. MINS,  43.514 SECS  G.E.T.
XL      5.7270569+02  YL     -7.5196886+02  ZL     -3.1712291+02  DXL    -4.5114007+03  DYL    -2.8165493+03  DZL    -1.3468284+03
XS     -9.9288741+02  YS      8.9916037+01  ZS     -1.0275060+01  DXS     5.3669045+02  DYS     5.4719125+03  DZS    -2.1633976+02
ALTS    5.8509924+01  LATS   -5.9049746-01  LONS    1.7482539+02  VRS     5.5024236+03  PTR    -4.0353630-01  AZR    -9.2257635+01
LIN     1.7766006+02  LAN     9.4345581+00  LAP     1.9624445+02  SMAS    1.0529589+03  ECCS    5.3607226-02  PERS    2.1465196+00
RPS     9.9651263+02  APOS    1.1094051+03  RANS    1.7689158+02  INCS    1.5622332+02  LTS    -2.2592693-01  LNS     4.8709416+01
LTE     4.3604571+00  LNE     7.7175751-01  THETA  -6.3039717+00  BETA    1.5268667+02  FUEL    2.4775230+04  BARC    2.5468202+01
DELV    3.0648762+03  MASS    7.0057793+04  PLCHNG  6.1407511+00  DRTX   -2.8469634+03  DRTY    5.8862279+02  DRTZ   -9.7046639+02
*****************************************************************************************************************************

ID      919084.2
CIRCULARIZATION BURN INITIATION
   22  SEPT. 1969  10 HRS,   0 MINS,  10.034 SECS  G.M.T. ****  71. HRS,   22. MINS,  40.749 SECS  G.E.T.
XL      4.5427036+02  YL     -8.1575208+02  ZL     -3.4811641+02  DXL    -4.3846385+03  DYL    -2.2467694+03  DZL    -1.1048994+03
XS     -9.6018280+02  YS      2.6603404+02  ZS     -1.5699674+01  DXS     1.4737005+03  DYS     5.3000847+03  DZS    -2.0690645+02
ALTS    5.7999419+01  LATS   -9.0267059-01  LONS    1.6451098+02  VRS     5.5050432+03  PTR    -1.5726868-02  AZR    -9.2154469+01
LIN     1.7765833+02  LAN     7.1731889+00  LAP    -1.7332558+02  LTS    -2.3264882-01  LNS     4.6511449+01  DEM    -1.9850598+01
THETA  -2.5613209-06  BETA   -1.7959999+02  MASS    7.0037793+04
*****************************************************************************************************************************

ID      919084.2
CIRCULARIZATION BURN TERMINATION
   22  SEPT. 1969  10 HRS,   0 MINS,  25.167 SECS  G.M.T. ****  71. HRS,   22. MINS,  55.883 SECS  G.E.T.
XL      4.4321931+02  YL     -8.2120355+02  ZL     -3.5080224+02  DXL    -4.7322248+03  DYL    -2.1307024+03  DZL    -1.0516285+03
XS     -9.5647278+02  YS      2.7909233+02  ZS     -1.6206006+01  DXS     1.5054349+03  DYS     5.1456030+03  DZS    -2.0048334+02
ALTS    5.7998008+01  LATS   -9.3194606-01  LONS    1.6373310+02  VRS     5.3650496+03  PTR    -6.0036913-03  AZR    -9.2141920+01
LIN     1.7765833+02  LAN     7.1709152+00  LAP    -1.6788278+02  SMAS    9.9704020+02  ECCS    5.6024071-04  PERS    1.9778199+00
RPS     9.9648162+02  APOS    9.9759878+02  RANS    1.7690230+02  INCS    1.5621944+02  LTS    -2.3265535-01  LNS     4.6509329+01
LTE     4.1180664+00  LNE     1.0016021+00  THETA  -7.7598376-01  BETA    1.7999300+02  FUEL    9.6207227+02  BARC    7.7608675-01
DELV    1.4000193+02  MASS    6.9075721+04  PLCHNG  4.7751255-06  DRTX   -1.3999999+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      919084.2
CSM      PASS OVER LUNAR LANDING SITE
   22  SEPT. 1969   4 HRS,  52 MINS,   9.659 SECS  G.M.T. ****  90. HRS,   14. MINS,  40.376 SECS  G.E.T.
XL     -1.8397564+02  YL      8.3820573+02  ZL      3.9131647+02  DXL     5.2535424+03  DYL     8.5805944+02  DZL     5.0084332+02
XS      7.3671164+02  YS     -6.7105855+02  ZS      2.6182013+01  DXS    -3.6126374+03  DYS    -3.9597764+03  DZS     1.6833373+02
ALTS    5.8376149+01  LATS    1.5050026+00  LONS   -4.3329874+01  VRS     5.3627726+03  PTR     1.9111713-03  AZR    -8.8200120+01
LIN     1.7764981+02  LAN    -2.5258542+00
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity - Continued

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ID      919084.2
CSM PLANE CHANGE BURN INITIATION
   24  SEPT. 1969   2 HRS,   2 MINS,  18.960 SECS  G.M.T. **** 111. HRS,   24. MINS,  49.674 SECS  G.E.T.
XL     -9.0491097+02  YL     -3.7390681+02  ZL     -1.8563971+02  DXL    -2.2335221+03  DYL     4.4629750+03  DZL     1.9169111+03
XS      6.3873556+02  YS      7.6406690+02  ZS     -3.6754841+01  DXS     4.1179905+03  DYS    -3.4353721+03  DZS     9.8416717+01
ALTS    5.8066697+01  LATS   -2.1136455+00  LONS    5.0105451+01  VRS     5.3643437+03  PTR     1.1485231-02  AZR    -8.8947634+01
LIN     1.7763757+02  LAN    -1.3349849+01  LAP    -2.0486751+01  LTS    -2.9503043-01  LNS     2.6208574+01  DEM    -9.8737259+00
THETA  -1.1099057-05  BETA    8.9999980+01  MASS    3.5721721+04
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ID      919084.2
CSM PLANE CHANGE BURN TERMINATION
   24  SEPT. 1969   2 HRS,   2 MINS,  21.244 SECS  G.M.T. **** 111. HRS,   24. MINS,  51.961 SECS  G.E.T.
XL     -9.0575065+02  YL     -3.7223176+02  ZL     -1.8491177+02  DXL    -2.2295878+03  DYL     4.4503841+03  DZL     1.9566261+03
XS      6.4028214+02  YS      7.6277403+02  ZS     -3.6710045+01  DXS     4.1114200+03  DYS    -3.4430330+03  DZS     1.4000169+02
ALTS    5.8067109+01  LATS   -2.1110674+00  LONS    4.9989477+01  VRS     5.3644991+03  PTR     1.1501382-02  AZR    -8.8503072+01
LIN     1.7740967+02  LAN    -4.5777026+00  LAP    -1.6597384+01  SMAS    9.9697380+02  ECCS    4.6074357-04  PERS    1.9776223+00
RPS     9.9651445+02  APOS    9.9743313+02  RANS    1.7752007+02  INCS    1.5578055+02  LTS    -2.9503141-01  LNS     2.6208249+01
LTE     1.5496996+00  LNE     3.0317359+00  THETA  -3.6712267-05  BETA    8.9558227+01  FUEL    1.4518652+02  BARC    1.1640533-01
DELV    4.1222062+01  MASS    3.5576534+04  PLCHNG  4.4160724-01  DRTX    0.0000000     DRTY    4.1221914+01  DRTZ    0.0000000
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ID      919084.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   24  SEPT. 1969   6 HRS,  29 MINS,  10.520 SECS  G.M.T. **** 115. HRS,   51. MINS,  41.234 SECS  G.E.T.
XL     -4.1645283+02  YL      8.2912095+02  ZL      3.6463488+02  DXL     4.8564851+03  DYL     2.0029928+03  DZL     9.9431190+02
XS      7.3674276+02  YS     -6.7108691+02  ZS      2.6182453+01  DXS    -3.6120371+03  DYS    -3.9589097+03  DZS     1.9696010+02
ALTS    5.8418243+01  LATS    1.5049643+00  LONS   -4.2329874+01  VRS     5.3627018+03  PTR     8.4359559-03  AZR    -8.7894679+01
LIN     1.7740712+02  LAN    -6.8680944+00
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ID      919084.2
TRANSEARTH INJECTION BURN INITIATION
   24  SEPT. 1969  22 HRS,  46 MINS,  10.875 SECS  G.M.T. **** 132. HRS,    8. MINS,  41.590 SECS  G.E.T.
XL      8.7139949+02  YL      4.3523885+02  ZL      2.1224964+02  DXL     2.5947080+03  DYL    -4.2813766+03  DZL    -1.8771736+03
XS     -7.2823732+02  YS     -6.7971278+02  ZS      3.8480476+01  DXS    -3.6611297+03  DYS     3.9164717+03  DZS    -1.2783130+02
ALTS    5.8411597+01  LATS    2.2121631+00  LONS   -1.3697390+02  VRS     5.3627382+03  PTR    -8.8272342-03  AZR    -9.1366562+01
LIN     1.7739780+02  LAN    -1.5180120+01  LAP     2.3470371+02  LTS    -3.2692681-01  LNS     1.5699486+01  DEM    -4.0978379+00
THETA  -3.4838464+00  BETA   -7.1003699+00  MASS    3.5986534+04
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ID      919084.2
TRANSEARTH INJECTION BURN TERMINATION
   24  SEPT. 1969  22 HRS,  48 MINS,  25.942 SECS  G.M.T. **** 132. HRS,   10. MINS,  56.653 SECS  G.E.T.
XL      9.3532564+02  YL      3.1471463+02  ZL      1.5527661+02  DXL     3.2043521+03  DYL    -5.6457184+03  DZL    -3.3019036+03
XS     -8.2274228+02  YS     -5.6579489+02  ZS      3.1007383+01  DXS    -4.9108399+03  DYS     6.4158539+03  DZS    -5.6244432+02
ALTS    6.0501073+01  LATS    1.7786659+00  LONS   -1.4548393+02  VRS     8.0991583+03  PTR     2.7833764+00  AZR    -9.4075453+01
LIN     1.7554646+02  LAN     1.1018720+01  LAP    -9.3893743+01  SMAS   -3.4379949+03  ECCS    1.2999641+00  PERS    1.2664137+01
RPS     9.9689521+02  APOS   -7.8728851+03  RANS   -1.7988443+02  INCS    1.5360180+02  LTS    -3.2698397-01  LNS     1.5630459+01
LTE     9.2224349-02  LNE     3.9458513+00  THETA   4.9695466+00  BETA   -4.6945719+00  FUEL    8.5966138+03  BARC    8.4953171+00
DELV    2.7592833+03  MASS    2.7399920+04  PLCHNG  2.4103031+00  DRTX    2.7330566+03  DRTY   -3.4043799+02  DRTZ    1.6767342+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(h) 84° launch azimuth; second injection opportunity - Concluded

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ID      919084.2
ENTRY AND TOUCHDOWN
   28  SEPT. 1969  22 HRS,  24 MINS,  53.868 SECS  G.M.T. **** 227. HRS,   47. MINS,  30.581 SECS  G.E.T.
X      -3.1163875+03  Y       1.3482171+03  Z       8.8531575+02  DX     -1.2759362+04  DY     -2.5372908+04  DZ     -2.2181775+04
R       3.5091890+03  DEC     1.4622892+01  RA      1.5660564+02  V       3.6036327+04  PTH    -6.4000387+00  AZ      1.2765235+02
ALT     6.5994602+01  LAT     1.4715382+01  LON     1.7283893+02  VE      3.4864975+04  PTE    -6.6744215+00  AZE     1.2916461+02
SMA     1.0653804+05  ECC     9.6747778-01  INC     3.9996265+01  RAN    -5.2761672+00  APE     1.6988843+02  RP      3.4648532+03
INMP    1.1518697+01  RAM     4.0428793+01  DEM     2.0128792+01  RAS    -1.7484462+02  DES    -2.2312035+00  SPSER   3.0276003+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD  -6.5226276+00  LONTD   1.9500296+02  AZTD    1.2955225+02
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ID      919084.2
CIRCUMLUNAR PERICYNTHION
   22  SEPT. 1969   5 HRS,  37 MINS,  41.743 SECS  G.M.T. ****  67. HRS,    0. MINS,  12.459 SECS  G.E.T.
XL      6.6736288+02  YL     -6.8323075+02  ZL     -2.9013321+02  DXL    -6.2216157+03  DYL    -4.7147626+03  DZL    -3.2081974+03
XS     -9.9765584+02  YS     -3.0445200+01  ZS     -1.0518942+01  DXS    -2.4206334+02  DYS     8.3607583+03  DZS    -1.2405325+03
ALTS    5.9682182+01  LATS   -6.0380366-01  LONS   -1.7825206+02  VRS     8.4557550+03  PTR     2.0170497-07  AZR    -9.8436711+01
LIN     1.7152583+02  LAN     5.8041209+00  LAP     8.6249511-01  LTS    -2.2586185-01  LNS     4.8730704+01  DEM    -2.0781511+01
SMAS   -2.0158563+03  ECCS    1.4951621+00  INCS    1.5141114+02  RANS    1.6820500+02  APES   -1.4259677+02  RPS     9.9817568+02
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ID      919084.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   24  SEPT. 1969  22 HRS,  50 MINS,  48.745 SECS  G.M.T. **** 132. HRS,   13. MINS,  19.461 SECS  G.E.T.
X      -1.1696576+03  Y       3.1676825+03  Z       9.5401058+02  DX     -2.9421853+04  DY     -1.8620737+04  DZ      9.5757621+03
R       3.5089097+03  DEC     1.5776307+01  RA      1.1026652+02  V       3.6111943+04  PTH    -6.9969073+00  AZ      7.1802688+01
ALT     6.5833461+01  LAT     1.5875368+01  LON     1.2397092+02  VE      3.4704781+04  PTE    -7.2498957+00  AZE     7.1013069+01
SMA     1.4130762+05  ECC     9.7554138-01  INC     2.3907459+01  RAN     7.0673536+01  APE     5.6305376+01  RP      3.4561889+03
INMP    3.0565295+01  RAM    -9.1809565+00  DEM    -4.0760344+00  RAS    -1.7843011+02  DES    -6.8058845-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.3160319+01  LONTD   1.5472336+02  AZTD    8.3627834+01
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(i) 90° launch azimuth; second injection opportunity

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ID      919090.2
LAUNCH TIME      19  SEPT. 1969   11 HRS,   28 MINS,  20.008 SECS   G.M.T.
LAUNCH AZIMUTH   90.                          INJECTION OPPORTUNITY    2
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ID      919090.2
EARTH PARKING ORBIT INSERTION
   19  SEPT. 1969  11 HRS,  39 MINS,  36.649 SECS  G.M.T. ****   0. HRS,   11. MINS,  16.641 SECS  G.E.T.
X     -1.4949595+03  Y      2.8270635+03  Z      1.5271779+03  DX    -2.3181392+04  DY    -9.4453195+03  DZ    -5.2074657+03
ALT    1.0215226+02  LAT    2.5672035+01  LON    3.0476225+02  V      2.5567727+04  PTH   -4.7156124-07  AZ     1.0304435+02
R      3.5439334+03  DEC    2.5526427+01  RA     1.1787002+02  RAS    1.7666329+02  DES    1.4456655+00  RAN   -3.9422321-01
INC    2.8465879+01  MASS   2.8467194+05
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ID      919090.2
3.5 MINS PRIOR TO TLI INITIATION
   19  SEPT. 1969  14 HRS,  35 MINS,  45.197 SECS  G.M.T. ****   3. HRS,    7. MINS,  25.189 SECS  G.E.T.
X     -1.5063608+03  Y      2.8283209+03  Z      1.5136348+03  DX    -2.3141368+04  DY    -9.4291097+03  DZ    -5.4100323+03
ALT    1.0213517+02  LAT    2.5428481+01  LON    2.6077577+02  V      2.5567547+04  PTH    1.1933814-03  AZ     1.0353419+02
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ID      919090.2
TRANSLUNAR INJECTION INITIATION
   19  SEPT. 1969  14 HRS,  39 MINS,  15.197 SECS  G.M.T. ****   3. HRS,   10. MINS,  55.189 SECS  G.E.T.
X     -2.2513027+03  Y      2.4183156+03  Z      1.2816300+03  DX    -1.9742855+04  DY    -1.4174250+04  DZ    -7.9458926+03
ALT    1.0147747+02  LAT    2.1327543+01  LON    2.7481031+02  V      2.5570039+04  PTH   -9.0818307-03  AZ     1.0946605+02
R      3.5438947+03  DEC    2.1201223+01  RA     1.3295164+02  RAS    1.7677518+02  DES    1.3972571+00  RAN   -1.3919801+00
INC    2.8475142+01  MASS   2.8156336+05
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ID      919090.2
TRANSLUNAR INJECTION TERMINATION
   19  SEPT. 1969  14 HRS,  44 MINS,  23.339 SECS  G.M.T. ****   3. HRS,   16. MINS,   3.331 SECS  G.E.T.
X     -3.2310549+03  Y      1.4091707+03  Z      7.2152799+02  DX    -1.9089057+04  DY    -2.6378712+04  DZ    -1.4554952+04
ALT    1.5459905+02  LAT    1.1640631+01  LON    2.9700761+02  V      3.5666163+04  PTH    6.2648568+00  AZ     1.1620111+02
R      3.5980662+03  DEC    1.1568079+01  RA     1.5643638+02  RAS    1.7677838+02  DES    1.3958734+00  DEM   -2.8565064+01
RAN   -1.3919806+00  INC    2.8475139+01  ECC    9.7595286-01  SMA    1.4782181+05  RP     3.5546933+03  APF    1.4244286+02
INMP   2.4648688-01  C3TLI -4.6384291-01  DAZTLI 0.0000000     MASS   1.3215435+05  FUEL   1.4940901+05
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ID      919090.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   19  SEPT. 1969  16 HRS,  44 MINS,  23.339 SECS  G.M.T. ****   5. HRS,   16. MINS,   3.331 SECS  G.E.T.
X      1.7428157+03  Y     -1.8678272+04  Z     -1.0101345+04  DX     7.0182466+03  DY    -1.0877491+04  DZ    -5.8019076+03
ALT    1.7864820+04  LAT   -2.8326969+01  LON    2.5819764+01  V      1.4185828+04  PTH    6.5037634+01  AZ     8.6787522+01
R      2.1306159+04  DEC   -2.8301057+01  RA    -8.4669328+01  RAS    1.7685312+02  DES    1.3635323+00
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ID      919090.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   22  SEPT. 1969   6 HRS,  23 MINS,  56.125 SECS  G.M.T. ****  66. HRS,   55. MINS,  36.115 SECS  G.E.T.
RMP    9.9878737+02  DEMP   3.7563973+00  RAMP  -1.7597168+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(i) 90° launch azimuth; second injection opportunity - Continued

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ID      919090.2
CSM PLANE CHANGE BURN INITIATION
   24  SEPT. 1969   2 HRS,  49 MINS,   8.606 SECS  G.M.T. **** 111. HRS,   20. MINS,  48.596 SECS  G.E.T.
XL     -9.0177572+02  YL     -3.8016847+02  ZL     -1.8817437+02  DXL    -2.2747712+03  DYL     4.4472477+03  DZL     1.9107577+03
XS      6.3873713+02  YS      7.6406873+02  ZS     -3.6754591+01  DXS     4.1179863+03  DYS    -3.4363649+03  DZS     9.8417556+01
ALTS    5.8069097+01  LATS   -2.1136260+00  LONS    5.0105450+01  VRS     5.3643360+03  PTR     1.1515925-02  AZR    -8.8947634+01
LIN     1.7763757+02  LAN    -1.3349386+01  LAP     2.0112886+01  LTS    -2.9624111-01  LNS     2.5812903+01  DEM    -9.6606109+00
THETA  -1.2806605-05  BETA    8.9999988+01  MASS    3.5695371+04
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ID      919090.2
CSM PLANE CHANGE BURN TERMINATION
   24  SEPT. 1969   2 HRS,  49 MINS,  10.888 SECS  G.M.T. **** 111. HRS,   20. MINS,  50.879 SECS  G.E.T.
XL     -9.0262847+02  YL     -3.7850039+02  ZL     -1.8744921+02  DXL    -2.2658671+03  DYL     4.4347132+03  DZL     1.9504993+03
XS      6.4028269+02  YS      7.6277672+02  ZS     -3.6709823+01  DXS     4.1114203+03  DYS    -3.4430204+03  DZS     1.4000597+02
ALTS    5.8069507+01  LATS   -2.1110495+00  LONS    4.9989551+01  VRS     5.3644913+03  PTR     1.1530789-02  AZR    -8.8503005+01
LIN     1.7740966+02  LAN    -4.5765115+00  LAP     1.9048484+00  SMAS    9.9697572+02  ECCS    4.6052844-04  PERS    1.9776281+00
RPS     9.9651659+02  APOS    9.9743485+02  RANS    1.7756265+02  INCS    1.5577175+02  LTS    -2.9624210-01  LNS     2.5812579+01
LTE     1.4955839+00  LNE     3.0683706+00  THETA   6.9155664-05  BETA    8.9558208+01  FUEL    1.4509179+02  BARC    1.1534995-01
DELV    4.1225530+01  MASS    3.5550279+04  PLCHNG  4.4164723-01  DRTX    0.0000000     DRTY    4.1225581+01  DRTZ    0.0000000
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ID      919090.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   24  SEPT. 1969   7 HRS,  16 MINS,    .214 SECS  G.M.T. **** 115. HRS,   47. MINS,  40.205 SECS  G.E.T.
XL     -4.2321208+02  YL      8.2619793+02  ZL      3.6349206+02  DXL     4.8396720+03  DYL     2.0365883+03  DZL     1.0079091+03
XS      7.3674455+02  YS     -6.7108853+02  ZS      2.6183251+01  DXS    -3.6120339+03  DYS    -3.9589019+03  DZS     1.9695710+02
ALTS    5.8420680+01  LATS    1.5050065+00  LONS   -4.2329874+01  VRS     5.3626938+03  PTR     8.4048223-03  AZR    -8.7894692+01
LIN     1.7740712+02  LAN    -6.8669713+00
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ID      919090.2
TRANSEARTH INJECTION BURN INITIATION
   24  SEPT. 1969  23 HRS,  33 MINS,  16.705 SECS  G.M.T. **** 132. HRS,    4. MINS,  56.693 SECS  G.E.T.
XL      8.7458869+02  YL      4.3001797+02  ZL      2.0975565+02  DXL     2.5637092+03  DYL    -4.2961366+03  DZL    -1.8860757+03
XS     -7.3778751+02  YS     -6.6935282+02  ZS      3.8139873+01  DXS    -3.6053719+03  DYS     3.9677911+03  DZS    -1.3073062+02
ALTS    5.8410823+01  LATS    2.1925746+00  LONS   -1.3778432+02  VRS     5.3627571+03  PTR    -9.0006144-03  AZR    -9.1397543+01
LIN     1.7739782+02  LAN    -1.5181509+01  LAP     2.3354655+02  LTS    -3.2812096-01  LNS     1.5301597+01  DEM    -3.8761238+00
THETA  -3.3251520+00  BETA   -7.0693310+00  MASS    3.5960279+04
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ID      919090.2
TRANSEARTH INJECTION BURN TERMINATION
   24  SEPT. 1969  23 HRS,  35 MINS,  31.773 SECS  G.M.T. **** 132. HRS,    7. MINS,  11.763 SECS  G.E.T.
XL      9.3771481+02  YL      3.0913749+02  ZL      1.5257612+02  DXL     3.1630883+03  DYL    -6.6632354+03  DZL    -3.3116766+03
XS     -8.3074930+02  YS     -5.5414213+02  ZS      3.0604224+01  DXS    -4.8269802+03  DYS     6.4816896+03  DZS    -5.6517892+02
ALTS    6.0583324+01  LATS    1.7553878+00  LONS   -1.4629517+02  VRS     8.1013247+03  PTR     2.8393615+00  AZR    -9.4094533+01
LIN     1.7553812+02  LAN     1.0579308+01  LAP    -9.3543682+00  SMAS   -3.4215978+03  ECCS    1.2913531+00  PERS    1.2573645+01
RPS     9.9689311+02  APOS   -7.8400886+03  RANS   -1.7988642+02  INCS    1.5359371+02  LTS    -3.2817797-01  LNS     1.5282585+01
LTE     3.6923503-02  LNE     3.9776307+00  THETA   5.1297085+00  BETA   -4.6746572+00  FUEL    8.5866895+03  BARC    8.4964567+00
DELV    2.7616284+03  MASS    2.7373590+04  PLCHNG  2.4015224+00  DRTX    2.7360140+03  DRTY   -3.3930153+02  DRTZ    1.6018040+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(i) 90° launch azimuth; second injection opportunity - Continued

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ID      919090.2
LUNAR ORBIT INSERTION BURN INITIATION
   22  SEPT. 1969   6 HRS,  20 MINS,  31.252 SECS  G.M.T. ****  66. HRS,   52. MINS,  11.244 SECS  G.E.T.
XL      8.9968807+02  YL     -4.7782395+02  ZL     -1.5530481+02  DXL    -5.3141744+03  DYL    -5.3887597+03  DZL    -3.4879420+03
XS     -9.6601053+02  YS     -3.5664321+02  ZS      3.8770354+01  DXS    -1.3349038+03  DYS     8.1477363+03  DZS    -1.2438048+03
ALTS    9.1979133+01  LATS    2.1561970+00  LONS   -1.5973626+02  VRS     8.3495283+03  PTR    -1.1154803+01  AZR    -9.8309428+01
LIN     1.7140096+02  LAN     5.8465250+00  LAP     1.1338869+01  LTS    -2.2596811-01  LNS     4.8368600+01  DEM    -2.0632356+01
THETA   1.8457292+01  BETA    1.6809312+02  MASS    9.4833024+04
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ID      919090.2
LUNAR ORBIT INSERTION BURN TERMINATION
   22  SEPT. 1969   6 HRS,  27 MINS,   1.384 SECS  G.M.T. ****  66. HRS,   58. MINS,  41.376 SECS  G.E.T.
XL      5.7912584+02  YL     -7.4771830+02  ZL     -3.1542541+02  DXL    -4.4360873+03  DYL    -2.8504219+03  DZL    -1.3606385+03
XS     -9.9289984+02  YS      8.9483050+01  ZS     -1.0258959+01  DXS     5.3320897+02  DYS     5.4723960+03  DZS    -2.1639002+02
ALTS    5.8483187+01  LATS   -5.8958791-01  LONS    1.7485024+02  VRS     5.5025560+03  PTR    -3.9182386-01  AZR    -9.2257950+01
LIN     1.7765997+02  LAN     9.4358025+00  LAP     1.8657636+02  SMAS    1.0529611+03  ECCS    5.3607804-02  PERS    2.1465263+00
RPS     9.9651413+02  APOS    1.1094079+03  RANS    1.7692675+02  INCS    1.5621269+02  LTS    -2.2713608-01  LNS     4.8313623+01
LTE     4.3175171+00  LNE     8.1313910-01  THETA  -6.3074124+00  BETA    1.6234617+02  FUEL    2.4801945+04  BARC    2.5497429+01
DELV    3.0687366+03  MASS    7.0031078+04  PLCHNG  6.2655301+00  DRTX   -2.8482545+03  DRTY    6.0057862+02  DRTZ   -9.7155628+02
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ID      919090.2
CIRCULARIZATION BURN INITIATION
   22  SEPT. 1969  10 HRS,  46 MINS,  54.148 SECS  G.M.T. ****  71. HRS,   18. MINS,  34.137 SECS  G.E.T.
XL      4.6487919+02  YL     -8.1063547+02  ZL     -3.4594554+02  DXL    -4.8543032+03  DYL    -2.3007705+03  DZL    -1.1272215+03
XS     -9.6138389+02  YS      2.6172829+02  ZS     -1.5529899+01  DXS     1.4496183+03  DYS     5.3067030+03  DZS    -2.0730149+02
ALTS    5.8001280+01  LATS   -8.9296376-01  LONS    1.6477080+02  VRS     5.5050399+03  PTR    -1.5730349-02  AZR    -9.2158601+01
LIN     1.7765824+02  LAN     7.1750953+00  LAP    -1.7928614+01  LTS    -2.3385891-01  LNS     4.6116325+01  DEM    -1.9680737+01
THETA   5.9764154-06  BETA    1.7999300+02  MASS    7.0011079+04
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ID      919090.2
CIRCULARIZATION BURN TERMINATION
   22  SEPT. 1969  10 HRS,  47 MINS,   9.276 SECS  G.M.T. ****  71. HRS,   19. MINS,  49.268 SECS  G.E.T.
XL      4.5290636+02  YL     -8.1626808+02  ZL     -3.4868521+02  DXL    -4.7634149+03  DYL    -2.1837076+03  DZL    -1.0735447+03
XS     -9.5773434+02  YS      2.7474860+02  ZS     -1.6038027+01  DXS     1.4926291+03  DYS     5.1523740+03  DZS    -2.0098034+02
ALTS    5.7999868+01  LATS   -9.2218472-01  LONS    1.6399321+02  VRS     5.3650462+03  PTR    -6.0109557-03  AZR    -9.2146180+01
LIN     1.7765824+02  LAN     7.1728052+00  LAP    -1.5761380+02  SMAS    9.9704271+02  ECCS    5.6087882-04  PERS    1.9778274+00
RPS     9.9648349+02  APOS    9.9760191+02  RANS    1.7693756+02  INCS    1.5620885+02  LTS    -2.3336542-01  LNS     4.6114188+01
LTE     4.0735958+00  LNE     1.0428200+00  THETA  -7.7579422-01  BETA    1.7999999+02  FUEL    9.6170703+02  BARC    7.7580304-01
DELV    1.4000203+02  MASS    6.9049371+04  PLCHNG  4.6872580-06  DRTX   -1.3999999+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      919090.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   23  SEPT. 1969   5 HRS,  38 MINS,  59.090 SECS  G.M.T. ****  90. HRS,   10. MINS,  39.082 SECS  G.E.T.
XL     -1.9129330+02  YL      8.9689278+02  ZL      3.9082436+02  DXL     5.2460380+03  DYL     8.9445452+02  DZL     5.1552650+02
XS      7.3671330+02  YS     -6.7106005+02  ZS      2.6183020+01  DXS    -3.6126354+03  DYS    -3.9597686+03  DZS     1.6838404+02
ALTS    5.8378407+01  LATS    1.5050570+00  LONS   -4.2329874+01  VRS     5.3627656+03  PTR     1.8735110-03  AZR    -8.8200120+01
LIN     1.7764973+02  LAN    -2.5249377+00
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(i) 90° launch azimuth; second injection opportunity - Continued

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ID      919090.2
CSM PLANE CHANGE BURN INITIATION
   24  SEPT. 1969    2 HRS,   49 MINS,    8.606 SECS  G.M.T. **** 111. HRS,   20. MINS,  48.596 SECS  G.E.T.
XL     -9.0177572+02  YL     -3.8016847+02  ZL     -1.8817437+02  DXL    -2.2747712+03  DYL     4.4472477+03  DZL     1.9107577+03
XS      6.3873713+02  YS      7.6406873+02  ZS     -3.6754591+01  DXS     4.1179863+03  DYS    -3.4363649+03  DZS     9.8417556+01
ALTS    5.8069097+01  LATS   -2.1136260+00  LONS    5.0105450+01  VRS     5.3643360+03  PTR     1.1515925-02  AZR    -8.8947634+01
LIN     1.7763757+02  LAN    -1.3349386+01  LAP     2.0112886+01  LTS    -2.9624111-01  LNS     2.5812903+01  DEM    -9.6606109+00
THETA  -1.2806605-05  BETA    8.9999988+01  MASS    3.5695371+04
*****************************************************************************************************************

ID      919090.2
CSM PLANE CHANGE BURN TERMINATION
   24  SEPT. 1969    2 HRS,   49 MINS,   10.888 SECS  G.M.T. **** 111. HRS,   20. MINS,  50.879 SECS  G.E.T.
XL     -9.0262847+02  YL     -3.7850039+02  ZL     -1.8744921+02  DXL    -2.2658671+03  DYL     4.4347132+03  DZL     1.9504993+03
XS      6.4028269+02  YS      7.6277672+02  ZS     -3.6709823+01  DXS     4.1114203+03  DYS    -3.4430204+03  DZS     1.4000597+02
ALTS    5.8069507+01  LATS   -2.1110495+00  LONS    4.9989551+01  VRS     5.3644913+03  PTR     1.1530789-02  AZR    -8.8503005+01
LIN     1.7740966+02  LAN    -4.5765115+00  LAP     1.9048484+00  SMAS    9.9697572+02  ECCS    4.6052844-04  PERS    1.9776281+00
RPS     9.9651659+02  APOS    9.9743485+02  RANS    1.7756265+02  INCS    1.5577175+02  LTS    -2.9624210-01  LNS     2.5812579+01
LTE     1.4955839+00  LNE     3.0683706+00  THETA   6.9155664-05  BETA    8.9558208+01  FUEL    1.4509179+02  BARC    1.1534995-01
DELV    4.1225530+01  MASS    3.5550279+04  PLCHNG  4.4164723-01  DRTX    0.0000000     DRTY    4.1225581+01  DRTZ    0.0000000
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ID      919090.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   24  SEPT. 1969    7 HRS,   16 MINS,     .214 SECS  G.M.T. **** 115. HRS,   47. MINS,  40.205 SECS  G.E.T.
XL     -4.2321208+02  YL      8.2619793+02  ZL      3.6349206+02  DXL     4.8396720+03  DYL     2.0365883+03  DZL     1.0079091+03
XS      7.3674455+02  YS     -6.7108853+02  ZS      2.6183251+01  DXS    -3.6120339+03  DYS    -3.9589019+03  DZS     1.9695710+02
ALTS    5.8420680+01  LATS    1.5050065+00  LONS   -4.2329874+01  VRS     5.3626938+03  PTR     8.4048223-03  AZR    -8.7894692+01
LIN     1.7740712+02  LAN    -6.8669713+00
*****************************************************************************************************************

ID      919090.2
TRANSEARTH INJECTION BURN INITIATION
   24  SEPT. 1969   23 HRS,   33 MINS,   16.705 SECS  G.M.T. **** 132. HRS,    4. MINS,  56.693 SECS  G.E.T.
XL      8.7458869+02  YL      4.3001797+02  ZL      2.0975565+02  DXL     2.5637092+03  DYL    -4.2961366+03  DZL    -1.8860757+03
XS     -7.3778751+02  YS     -6.6935282+02  ZS      3.8139873+01  DXS    -3.6053719+03  DYS     3.9677911+03  DZS    -1.3073062+02
ALTS    5.8410823+01  LATS    2.1925746+00  LONS   -1.3778432+02  VRS     5.3627571+03  PTR    -9.0006144-03  AZR    -9.1397543+01
LIN     1.7739782+02  LAN    -1.5181509+01  LAP     2.3354655+02  LTS    -3.2812096-01  LNS     1.5301597+01  DEM    -3.8761238+00
THETA  -3.3251520+00  BETA   -7.0693310+00  MASS    3.5960279+04
*****************************************************************************************************************

ID      919090.2
TRANSEARTH INJECTION BURN TERMINATION
   24  SEPT. 1969   23 HRS,   35 MINS,   31.773 SECS  G.M.T. **** 132. HRS,    7. MINS,  11.763 SECS  G.E.T.
XL      9.3771481+02  YL      3.0913749+02  ZL      1.5257612+02  DXL     3.1630883+03  DYL    -6.6632354+03  DZL    -3.3116766+03
XS     -8.3074930+02  YS     -5.5414213+02  ZS      3.0604224+01  DXS    -4.8269802+03  DYS     6.4816896+03  DZS    -5.6517892+02
ALTS    6.0583324+01  LATS    1.7553878+00  LONS   -1.4629517+02  VRS     8.1013247+03  PTR     2.8393615+00  AZR    -9.4094533+01
LIN     1.7553812+02  LAN     1.0579308+01  LAP    -9.3543682+00  SMAS   -3.4215978+03  ECCS    1.2913531+00  PERS    1.2573645+01
RPS     9.9689311+02  APOS   -7.8400886+03  RANS   -1.7988642+02  INCS    1.5359371+02  LTS    -3.2817797-01  LNS     1.5282585+01
LTE     3.6923503-02  LNE     3.9776307+00  THETA   5.1297085+00  BETA   -4.6746572+00  FUEL    8.5866895+03  BARC    8.4964567+00
DELV    2.7616284+03  MASS    2.7373590+04  PLCHNG  2.4015224+00  DRTX    2.7360140+03  DRTY   -3.3930153+02  DRTZ    1.6018040+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(i) 90° launch azimuth; second injection opportunity - Concluded

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ID      919090.2
ENTRY AND TOUCHDOWN
   28  SEPT. 1969  22 HRS,  26 MINS,  22.769 SECS  G.M.T. **** 226. HRS,   58. MINS,   2.755 SECS  G.E.T.
X      -3.1266744+03  Y       1.3297503+03  Z       8.7697406+02  DX     -1.2547030+04  DY     -2.5452990+04  DZ     -2.2213310+04
R       3.5090471+03  DEC     1.4472660+01  RA      1.5696032+02  V       3.6037672+04  PTH    -6.4000060+00  AZ      1.2770767+02
ALT     6.5837977+01  LAT     1.4554287+01  LON     1.7284726+02  VE      3.4866490+04  PTE    -6.6738738+00  AZE     1.2922283+02
SMA     1.0675188+05  ECC     9.6754423-01  INC     4.0000720+01  RAN    -5.1253828+00  APE     1.7013594+02  RP      3.4647147+03
INMP    1.1509898+01  RAM     4.0441172+01  DEM     2.0133214+01  RAS    -1.7484374+02  DES    -2.2315770+00  SPSFR   3.0114307+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD  -6.6816720+00  LONTD   1.9499940+02  AZTD    1.2953462+02
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ID      919090.2
CIRCUMLUNAR PERICYNTHION
   22  SEPT. 1969   6 HRS,  24 MINS,  29.938 SECS  G.M.T. ****  66. HRS,   56. MINS,   9.929 SECS  G.E.T.
XL      6.7352492+02  YL     -6.7795955+02  ZL     -2.9807967+02  DXL    -5.1733003+03  DYL    -4.7544453+03  DZL    -3.2441294+03
XS     -9.9757742+02  YS     -3.1348025+01  ZS     -1.0554961+01  DXS    -2.4935205+02  DYS     8.3583264+03  DZS    -1.2588322+03
ALTS    5.9632134+01  LATS   -6.0590169-01  LONS   -1.7820012+02  VRS     8.4562670+03  PTR     1.2131340-04  AZR    -9.8561568+01
LIN     1.7140090+02  LAN     5.8100714+00  LAP     9.7074420-01  LTS    -2.2707093-01  LNS     4.8334957+01  DEM    -2.0618444+01
SMAS   -2.0150177+03  ECCS    1.4953434+00  INCS    1.5127140+02  RANS    1.5817602+02  APES   -1.4309693+02  RPS     9.9812566+02
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ID      919090.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   24  SEPT. 1969  23 HRS,  39 MINS,   1.881 SECS  G.M.T. **** 132. HRS,   10. MINS,  41.869 SECS  G.E.T.
X      -1.2561533+03  Y       3.1311217+03  Z       9.6460862+02  DX     -2.9114999+04  DY     -1.9145384+04  DZ      9.4781944+03
R       3.5088903+03  DEC     1.5956302+01  RA      1.1185933+02  V       3.6111841+04  PTH    -6.4483947+00  AZ      7.2119112+01
ALT     6.5833770+01  LAT     1.6056373+01  LON     1.1347650+02  VE      3.4701639+04  PTE    -6.6796245+00  AZE     7.1344933+01
SMA     1.4118261+05  ECC     9.7546386-01  INC     2.3790072+01  RAN     7.1425803+01  APE     5.6019901+01  RP      3.4640773+03
INMP    3.0786633+01  RAM    -9.7603457+00  DEM    -3.8490342+00  RAS    -1.7840001+02  DES    -6.9363230-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.3135928+01  LONTD   1.4429274+02  AZTD    8.4011293+01
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(j) 98° launch azimuth; second injection opportunity

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ID      919098.2
LAUNCH TIME      19  SEPT. 1969   12 HRS,   21 MINS,  51.201 SECS   G.M.T.
LAUNCH AZIMUTH   98.                          INJECTION OPPORTUNITY    2
*****************************************************************************************************************

ID      919098.2
EARTH PARKING ORBIT INSERTION
   19  SEPT. 1969  12 HRS,  33 MINS,   8.326 SECS  G.M.T. ****   0. HRS,   11. MINS,  17.125 SECS  G.E.T.
X      -2.1196938+03  Y      2.4944250+03  Z      1.3580156+03  DX    -2.0482571+04  DY    -1.3093316+04  DZ    -7.9207368+03
ALT     1.0170214+02  LAT    2.2664277+01  LON    3.0383058+02  V      2.5567727+04  PTH   -3.7724900-07  AZ     1.0959661+02
R       3.5439334+03  DEC    2.2531694+01  RA     1.3035697+02  RAS    1.7669663+02  DES    1.4312424+00  RAN   -2.5375022+00
INC     2.9522020+01  MASS   2.8440356+05
*****************************************************************************************************************

ID      919098.2
3.5 MINS PRIOR TO TLI INITIATION
   19  SEPT. 1969  15 HRS,  26 MINS,  30.348 SECS  G.M.T. ****   3. HRS,    4. MINS,  39.147 SECS  G.E.T.
X      -1.5374788+03  Y      2.8022176+03  Z      1.5306807+03  DX    -2.3024262+04  DY    -9.3184911+03  DZ    -6.0565168+03
ALT     1.0213168+02  LAT    2.5735303+01  LON    2.4876523+02  V      2.5566233+04  PTH    1.0296004-02  AZ     1.0523299+02
*****************************************************************************************************************

ID      919098.2
TRANSLUNAR INJECTION INITIATION
   19  SEPT. 1969  15 HRS,  30 MINS,    .348 SECS  G.M.T. ****   3. HRS,    8. MINS,   9.147 SECS  G.E.T.
X      -2.2774531+03  Y      2.3968047+03  Z      1.2760358+03  DX    -1.9574030+04  DY    -1.4020441+04  DZ    -8.6026980+03
ALT     1.0154074+02  LAT    2.1229615+01  LON    2.6267313+02  V      2.5567984+04  PTH   -1.6907007-03  AZ     1.1113959+02
R       3.5439713+03  DEC    2.1103768+01  RA     1.3353734+02  RAS    1.7680679+02  DES    1.3835797+00  RAN   -3.5031001+00
INC     2.9524161+01  MASS   2.8132641+05
*****************************************************************************************************************

ID      919098.2
TRANSLUNAR INJECTION TERMINATION
   19  SEPT. 1969  15 HRS,  35 MINS,   8.219 SECS  G.M.T. ****   3. HRS,   13. MINS,  17.018 SECS  G.E.T.
X      -3.2446873+03  Y      1.3950847+03  Z      6.7858296+02  DX    -1.8791266+04  DY    -2.6106527+04  DZ    -1.5407529+04
ALT     1.5452165+02  LAT    1.0939368+01  LON    2.8452415+02  V      3.5665870+04  PTH    6.2592823+00  AZ     1.1761916+02
R       3.5980427+03  DEC    1.0870965+01  RA     1.5667465+02  RAS    1.7680999+02  DES    1.3821964+00  DEM   -2.8541351+01
RAN    -3.5030969+00  INC    2.9524159+01  ECC    9.7590769-01  SMA    1.4754688+05  RP     3.5547462+03  APF    1.4482438+02
INMP    1.2218730+00  C3TLI -4.6470846-01  DAZTLI 0.0000000     MASS   1.3204865+05  FUEL   1.4927775+05
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ID      919098.2
SPACECRAFT SEPARATION            INJECTION + 2HR
   19  SEPT. 1969  17 HRS,  35 MINS,   8.219 SECS  G.M.T. ****   5. HRS,   13. MINS,  17.018 SECS  G.E.T.
X       1.9481176+03  Y     -1.3499851+04  Z     -1.0385547+04  DX     7.1350317+03  DY    -1.0778735+04  DZ    -5.8416915+03
ALT     1.7863719+04  LAT   -2.9200976+01  LON    1.3778708+01  V      1.4185033+04  PTH    6.5035000+01  AZ     8.5314257+01
R       2.1304911+04  DEC   -2.9174554+01  RA    -8.3988649+01  RAS    1.7688473+02  DES    1.3498538+00
*****************************************************************************************************************

ID      919098.2
TRANSLUNAR MIDCOURSE TARGET PARAMETERS
   22  SEPT. 1969   7 HRS,  18 MINS,  48.194 SECS  G.M.T. ****  66. HRS,   56. MINS,  56.992 SECS  G.E.T.
RMP     9.9891875+02  DEMP   3.7230238+00  RAMP  -1.7629036+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(j) 98° launch azimuth; second injection opportunity - Continued

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ID      919098.2
LUNAR ORBIT INSERTION BURN INITIATION
   22  SEPT. 1969   7 HRS,  15 MINS,  23.971 SECS  G.M.T. ****  66. HRS,   53. MINS,  32.770 SECS  G.E.T.
XL      9.0091007+02  YL    -4.7395536+02  ZL     -1.5567969+02  DXL    -5.2803138+03  DYL    -5.4383785+03  DZL    -3.4617798+03
XS     -9.6731008+02  YS    -3.5135732+02  ZS      3.6986208+01  DXS    -1.3129392+03  DYS     8.1575472+03  DZS    -1.2008687+03
ALTS    9.1316538+01  LATS   2.0582528+00  LONS   -1.6003739+02  VRS     8.3493394+03  PTR    -1.0999932+01  AZR    -9.8026370+01
LIN     1.7169984+02  LAN    5.7011791+00  LAP     1.4224193+01  LTS    -2.2838639-01  LNS     4.7904583+01  DEM    -2.0439643+01
THETA   1.8077167+01  BETA   1.6865178+02  MASS    9.4833024+04
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ID      919098.2
LUNAR ORBIT INSERTION BURN TERMINATION
   22  SEPT. 1969   7 HRS,  21 MINS,  52.916 SECS  G.M.T. ****  67. HRS,    0. MINS,   1.713 SECS  G.E.T.
XL      5.8290665+02  YL    -7.4522074+02  ZL     -3.1461128+02  DXL    -4.4723427+03  DYL    -2.8677899+03  DZL    -1.3673744+03
XS     -9.9259440+02  YS     9.3606203+01  ZS     -1.0418181+01  DXS     5.5798743+02  DYS     5.4694387+03  DZS    -2.1610891+02
ALTS    5.8559293+01  LATS  -5.9869315-01  LONS    1.7461267+02  VRS     5.5020734+03  PTR    -4.1391375-01  AZR    -9.2255519+01
LIN     1.7766000+02  LAN    9.4288728+00  LAP     1.8642230+02  SMAS    1.0529191+03  ECCS    5.3549547-02  PERS    2.1463981+00
RPS     9.9653584+02  APOS   1.1093025+03  RANS    1.7696773+02  INCS    1.5620069+02  LTS    -2.2855396-01  LNS     4.7849761+01
LTE     4.2668156+00  LNE    8.6162256-01  THETA  -6.6824257+00  BETA    1.6313950+02  FUEL    2.4726515+04  BARC    2.5425452+01
DELV    3.0578402+03  MASS   7.0106508+04  PLCHNG  5.9672843+00  DRTX   -2.3500739+03  DRTY    5.7199556+02  DRTZ   -9.4884128+02
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ID      919098.2
CIRCULARIZATION BURN INITIATION
   22  SEPT. 1969  11 HRS,  41 MINS,  53.459 SECS  G.M.T. ****  71. HRS,   20. MINS,   2.258 SECS  G.E.T.
XL      4.6201863+02  YL    -8.1193022+02  ZL     -3.4691643+02  DXL    -4.8624571+03  DYL    -2.2864217+03  DZL    -1.1202335+03
XS     -9.5817898+02  YS     2.7327757+02  ZS     -1.5976477+01  DXS     1.5133720+03  DYS     5.2886983+03  DZS    -2.0625611+02
ALTS    5.8021832+01  LATS  -9.1862502-01  LONS    1.6408157+02  VRS     5.5048312+03  PTR    -1.5702634-02  AZR    -9.2147774+01
LIN     1.7765829+02  LAN    7.1670109+00  LAP    -1.7696249+02  LTS    -2.3528326-01  LNS     4.5651419+01  DEM    -1.9479333+01
THETA  -5.9764154-06  BETA  -1.7999999+02  MASS    7.0086508+04
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ID      919098.2
CIRCULARIZATION BURN TERMINATION
   22  SEPT. 1969  11 HRS,  42 MINS,   8.603 SECS  G.M.T. ****  71. HRS,   20. MINS,  17.398 SECS  G.E.T.
XL      4.5001304+02  YL    -8.1748334+02  ZL     -3.4964175+02  DXL    -4.7711825+03  DYL    -2.1695749+03  DZL    -1.0666393+03
XS     -9.5436895+02  YS     2.8626651+02  ZS     -1.6482542+01  DXS     1.5439924+03  DYS     5.1339685+03  DZS    -1.9982873+02
ALTS    5.8020447+01  LATS  -9.4772705-01  LONS    1.6330318+02  VRS     5.3648370+03  PTR    -6.0161860-03  AZR    -9.2135028+01
LIN     1.7765829+02  LAN    7.1647288+00  LAP    -1.6696145+02  SMAS    9.9700569+02  ECCS    5.0430121-04  PERS    1.9777172+00
RPS     9.9650289+02  APOS   9.9750846+02  RANS    1.7697863+02  INCS    1.5619689+02  LTS    -2.3528983-01  LNS     4.5649282+01
LTE     4.0209188+00  LNE    1.0912831+00  THETA  -7.7655237-01  BETA   -1.7999999+02  FUEL    9.6274414+02  BARC    7.7662240-01
DELV    1.4000230+02  MASS   6.9123764+04  PLCHNG  4.8836113-06  DRTX   -1.3999999+02  DRTY    0.0000000     DRTZ    0.0000000
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ID      919098.2
CSM  1ST PASS OVER LUNAR LANDING SITE
   23  SEPT. 1969   6 HRS,  33 MINS,  41.178 SECS  G.M.T. ****  90. HRS,   11. MINS,  49.974 SECS  G.E.T.
XL     -1.9581109+02  YL     8.9521337+02  ZL      3.9018230+02  DXL     5.2372736+03  DYL     9.3705244+02  DZL     5.3273435+02
XS      7.3664659+02  YS    -6.7099942+02  ZS      2.6176451+01  DXS    -3.6128337+03  DYS    -3.9601126+03  DZS     1.6840508+02
ALTS   -5.8288125+01  LATS   1.5048157+00  LONS   -4.2329879+01  VRS     5.3631538+03  PTR     2.7855593-03  AZR    -8.8200066+01
LIN     1.7764983+02  LAN   -2.5305493+00
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Continued

(j) 98° launch azimuth; second injection opportunity - Continued

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ID      919098.2
CSM PLANE CHANGE BURN INITIATION
   24  SEPT. 1969    3 HRS,   43 MINS,   46.819 SECS  G.M.T. **** 111. HRS,    21. MINS,   55.616 SECS  G.E.T.
XL     -8.9801867+02  YL     -3.8743147+02  ZL     -1.9111298+02  DXL    -2.3166706+03  DYL     4.4288027+03  DZL     1.9035242+03
XS      6.3871393+02  YS      7.6404090+02  ZS     -3.6752485+01  DXS     4.1178647+03  DYS    -3.4366660+03  DZS     9.8405553+01
ALTS    5.8032853+01  LATS   -2.1135817+00  LONS    5.0105444+01  VRS     5.2644352+03  PTR     8.2284170-03  AZR    -8.8947888+01
LIN     1.7763775+02  LAN    -1.3354776+01  LAP    -3.2201175+01  LTS    -2.9765300-01  LNS     2.5351251+01  DEM    -9.4113821+00
THETA  -1.9636793-05  BETA    9.0000008+01  MASS    3.5769764+04
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ID      919098.2
CSM PLANE CHANGE BURN TERMINATION
   24  SEPT. 1969    3 HRS,   43 MINS,   49.107 SECS  G.M.T. **** 111. HRS,    21. MINS,   57.903 SECS  G.E.T.
XL     -8.9888915+02  YL     -3.8576651+02  ZL     -1.9038888+02  DXL    -2.3077722+03  DYL     4.4163451+03  DZL     1.9433068+03
XS      6.4026303+02  YS      7.6274582+02  ZS     -3.6707618+01  DXS     4.1112825+03  DYS    -3.4433407+03  DZS     1.4000339+02
ALTS    5.8033136+01  LATS   -2.1109997+00  LONS    4.9989275+01  VRS     5.3645913+03  PTR     8.2451501-03  AZR    -8.8503218+01
LIN     1.7740931+02  LAN    -4.5793499+00  LAP    -3.5782019+01  SMAS    9.9694044+02  ECCS    4.3941838-04  PERS    1.9775231+00
RPS     9.9650237+02  APOS    9.9737850+02  RANS    1.7761225+02  INCS    1.5576184+02  LTS    -2.9765402-01  LNS     2.5350927+01
LTE     1.4323365+00  LNE     3.1109151+00  THETA   2.1002831-04  BETA    8.9558172+01  FUEL    1.4542480+02  BARC    1.1640533-01
DELV    4.1234127+01  MASS    3.5624339+04  PLCHNG  4.4173016-01  DRTX    0.0000000     DRTY    4.1233971+01  DRTZ    0.0000000
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ID      919098.2
CSM  2ND PASS OVER LUNAR LANDING SITE
   24  SEPT. 1969    8 HRS,   10 MINS,   37.447 SECS  G.M.T. **** 115. HRS,    48. MINS,   46.243 SECS  G.E.T.
XL     -4.3102494+02  YL      8.2265222+02  ZL      3.6209658+02  DXL     4.8200875+03  DYL     2.0757923+03  DZL     1.0237903+03
XS      7.3667604+02  YS     -6.7102625+02  ZS      2.6177458+01  DXS    -3.6123013+03  DYS    -3.9592009+03  DZS     1.9696683+02
ALTS    5.8327974+01  LATS    1.5048134+00  LONS   -4.2329879+01  VRS     5.3630950+03  PTR     8.4462293-03  AZR    -8.7894761+01
LIN     1.7740727+02  LAN    -6.8697286+00
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ID      919098.2
TRANSEARTH INJECTION BURN INITIATION
   25  SEPT. 1969    0 HRS,   28 MINS,    9.764 SECS  G.M.T. **** 132. HRS,     6. MINS,   18.561 SECS  G.E.T.
XL      8.7841134+02  YL      4.2357316+02  ZL      2.0667981+02  DXL     2.5258745+03  DYL    -4.3139904+03  DZL    -1.8967234+03
XS     -7.4896511+02  YS     -6.5678431+02  ZS      3.7721076+01  DXS    -3.5381743+03  DYS     4.0278943+03  DZS    -1.3412817+02
ALTS    5.8370196+01  LATS    2.1685758+00  LONS   -1.3875175+02  VRS     5.3628909+03  PTR    -5.8751979-03  AZR    -9.1433961+01
LIN     1.7739802+02  LAN    -1.5186645+01  LAP     2.1023331+02  LTS    -3.2951095-01  LNS     1.4837937+01  DEM    -3.6176452+00
THETA  -3.1270714+00  BETA   -7.0352705+00  MASS    3.6034339+04
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ID      919098.2
TRANSEARTH INJECTION BURN TERMINATION
   25  SEPT. 1969    0 HRS,   30 MINS,   25.241 SECS  G.M.T. **** 132. HRS,     8. MINS,   34.037 SECS  G.E.T.
XL      9.4072985+02  YL      3.0188823+02  ZL      1.4907462+02  DXL     3.1110471+03  DYL    -6.6850480+03  DZL    -3.3238351+03
XS     -8.4033046+02  YS     -5.3969610+02  ZS      3.0087053+01  DXS    -4.7247873+03  DYS     6.5597247+03  DZS    -5.6857718+02
ALTS    6.0672336+01  LATS    1.7255612+00  LONS   -1.4728969+02  VRS     8.1041274+03  PTR     2.9237238+00  AZR    -9.4118588+01
LIN     1.7552754+02  LAN     1.0057125+01  LAP    -7.2177336+00  SMAS   -3.4010118+03  ECCS    1.2931044+00  PERS    1.2460342+01
RPS     9.9685168+02  APOS   -7.7988753+03  RANS   -1.7989060+02  INCS    1.5358347+02  LTS    -3.2956812-01  LNS     1.4818864+01
LTE    -2.7500903-02  LNE     4.0143862+00  THETA   5.3554753+00  BETA   -4.6529899+00  FUEL    8.6126719+03  BARC    8.5238627+00
DELV    2.7646913+03  MASS    2.7421667+04  PLCHNG  2.3921570+00  DRTX    2.7397829+03  DRTY   -3.3811498+02  DRTZ    1.5081517+02
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TABLE XII.- SUMMARY OF THE PARAMETERS FOR MISSION LAUNCHED SEPTEMBER 19, 1969 - Concluded

(j) 98° launch azimuth; second injection opportunity - Concluded

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ID      919098.2
ENTRY AND TOUCHDOWN
   28  SEPT. 1969  22 HRS,  27 MINS,  58.522 SECS  G.M.T. **** 226. HRS,    6. MINS,   7.314 SECS  G.E.T.
X      -3.1386532+03  Y       1.3083605+03  Z       8.6660902+02  DX     -1.2299699+04  DY     -2.5545034+04  DZ     -2.2246518+04
R       3.5091256+03  DEC     1.4297615+01  RA      1.5737098+02  V       3.5038020+04  PTH    -6.4000373+00  AZ      1.2776665+02
ALT     6.5899405+01  LAT     1.4388227+01  LON     1.7285784+02  VE      3.4866879+04  PTE    -6.6733314+00  AZE     1.2923515+02
SMA     1.0702129+05  ECC     5.6762519-01  INC     4.0001616+01  RAN    -4.9488097+00  APE     1.7042189+02  RP      3.4647945+03
INMP    1.1493911+01  RAM     4.0455455+01  DEM     2.0138312+01  RAS    -1.7484275+02  DES    -2.2320078+00  SPSFR   3.0592144+03
ENTDT   2.5000000-01  ENTRG   2.0000000+03  LATTD  -6.8646842+00  LONTD   1.9499832+02  AZTD    1.2950937+02
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ID      919098.2
CIRCUMLUNAR PERICYNTHION
   22  SEPT. 1969   7 HRS,  19 MINS,  19.431 SECS  G.M.T. ****  66. HRS,   57. MINS,  28.227 SECS  G.E.T.
XL      6.7928116+02  YL     -6.7354105+02  ZL     -2.8571247+02  DXL    -6.1317629+03  DYL    -4.8171074+03  DZL    -3.2223705+03
XS     -9.9784710+02  YS     -3.0224483+01  ZS     -9.9825503+00  DXS    -2.4112491+02  DYS     8.3619397+03  DZS    -1.2150709+03
ALTS    5.9861143+01  LATS   -5.7291017-01  LONS   -1.7826506+02  VRS     8.4531990+03  PTR    -4.3510348-08  AZR    -9.8264791+01
LIN     1.7169978+02  LAN     5.6652119+00  LAP     1.1469257+00  LTS    -2.2848785-01  LNS     4.7871389+01  DEM    -2.0425788+01
SMAS   -2.0205835+03  ECCS    1.4940922+00  INCS    1.5149414+02  RANS    1.6860722+02  APES   -1.4315498+02  RPS     9.9835466+02
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ID      919098.2
CIRCUMLUNAR ENTRY AND TOUCHDOWN
   25  SEPT. 1969   0 HRS,  30 MINS,  12.495 SECS  G.M.T. **** 132. HRS,    8. MINS,  21.292 SECS  G.E.T.
X      -1.2414104+03  Y       3.1308690+03  Z       9.8418021+02  DX     -2.9485557+04  DY     -1.9079577+04  DZ      8.4058824+03
R       3.5088532+03  DEC     1.6289145+01  RA      1.1162866+02  V       3.6112148+04  PTH    -6.7343595+00  AZ      7.3817606+01
ALT     6.5831973+01  LAT     1.6391075+01  LON     1.0041606+02  VE      3.4691776+04  PTE    -6.9818411+00  AZE     7.3113567+01
SMA     1.4125103+05  ECC     5.7550463-01  INC     2.2805156+01  RAN     5.7603316+01  APE     5.9995110+01  RP      3.4599973+03
INMP    2.9003915+01  RAM    -8.3144125+00  DEM    -3.6080109+00  RAS    -1.7336806+02  DES    -7.0747615-01  ENTDT   2.5000000-01
ENTRG   2.0000000+03  LATTD   2.2480102+01  LONTD   1.3140249+02  AZTD    8.5671743+01
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TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH

(A) LAUNCH TIME

LAZ	DAY	MONTH	YEAR	HRS	MINS	SECS
72.	13	SEPT.	1969	3	9	29.338
78.	13	SEPT.	1969	4	9	29.140
84.	13	SEPT.	1969	5	10	7.309
90.	13	SEPT.	1969	6	5	1.196
98.	13	SEPT.	1969	7	0	56.864

(B) EARTH PARKING ORBIT INSERTION

LAZ	** G.M.T. DAY	MONTH	HRS	MINS	SECS **	G.E.T. HRS	MINS	SECS **	MASS	LAT	LON
72.	13	SEPT.	3	20	49.079	0.	11.	19.741	2.82965+05	3.2658+01	3.0566+02
78.	13	SEPT.	4	20	47.204	0.	11.	18.064	2.83889+05	3.0307+01	3.0557+02
84.	13	SEPT.	5	21	24.339	0.	11.	17.030	2.84458+05	2.7973+01	3.0526+02
90.	13	SEPT.	6	16	17.838	0.	11.	16.641	2.84672+05	2.5672+01	3.0476+02
98.	13	SEPT.	7	12	13.989	0.	11.	17.125	2.84404+05	2.2664+01	3.0383+02

(C) 3.5 MINS PRIOR TO TLI INITIATION

LAZ	** DAY	HRS	G.E.T. MINS	SECS **	ALT	LAT	LON	V	RTH	AZ
72.	1	1.	47.	30.884	1.0240+02	2.7928+01	3.1952+02	2.55714+04	-6.8084-03	1.0774+02
78.	1	1.	44.	21.851	1.0231+02	2.7122+01	3.0516+02	2.55701+04	-7.2868-03	1.0433+02
84.	1	1.	41.	9.174	1.0229+02	2.6606+01	2.9089+02	2.55685+04	-3.2831-03	1.0201+02
90.	1	1.	38.	15.123	1.0228+02	2.6504+01	2.7818+02	2.55672+04	3.6375-03	1.0116+02
98.	1	1.	35.	20.819	1.0227+02	2.7089+01	2.6556+02	2.55661+04	1.3610-02	1.0254+02
72.	2	3.	15.	35.829	1.0240+02	2.7832+01	2.9731+02	2.55713+04	-6.2018-03	1.0790+02
78.	2	3.	12.	25.250	1.0231+02	2.7042+01	2.8296+02	2.55700+04	-6.6342-03	1.0449+02
84.	2	3.	9.	11.783	1.0229+02	2.6531+01	2.6872+02	2.55684+04	-2.6143-03	1.0219+02
90.	2	3.	6.	16.695	1.0228+02	2.6436+01	2.5601+02	2.55671+04	4.3281-03	1.0133+02
98.	2	3.	3.	21.177	1.0227+02	2.7021+01	2.4335+02	2.55661+04	1.4322-02	1.0269+02

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Continued

(D) TRANSLUNAR INJECTION INITIATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	** DELTA T FROM EPOI ** HRS	MINS	SECS	MASS	LAT	LON	AZ
72.	1	13	SEPT.	5	0	30.222	1.	51.	.884	1.	39.	41.143	2.80761+05	2.2776+01	3.3340+02	1.1408+02
78.	1	13	SEPT.	5	57	20.991	1.	47.	51.851	1.	36.	33.787	2.81721+05	2.2778+01	3.1930+02	1.1063+02
84.	1	13	SEPT.	5	54	46.483	1.	44.	39.174	1.	33.	22.144	2.82327+05	2.2821+01	3.0518+02	1.0837+02
90.	1	13	SEPT.	7	46	46.319	1.	41.	45.123	1.	30.	28.482	2.82573+05	2.2925+01	2.9253+02	1.0754+02
98.	1	13	SEPT.	8	39	47.683	1.	38.	50.819	1.	27.	33.694	2.82362+05	2.3165+01	2.7986+02	1.0900+02
72.	2	13	SEPT.	6	28	35.147	3.	19.	5.809	3.	7.	46.067	2.79769+05	2.2647+01	3.1117+02	1.1420+02
78.	2	13	SEPT.	7	25	24.391	3.	15.	55.250	3.	4.	37.186	2.80727+05	2.2664+01	2.9707+02	1.1081+02
84.	2	13	SEPT.	8	22	49.031	3.	12.	41.783	3.	1.	24.752	2.81331+05	2.2709+01	2.8299+02	1.0851+02
90.	2	13	SEPT.	9	14	47.331	3.	9.	46.695	2.	58.	30.053	2.81576+05	2.2820+01	2.7033+02	1.0768+02
98.	2	13	SEPT.	10	7	50.126	3.	6.	51.177	2.	55.	34.052	2.81341+05	2.3065+01	2.5763+02	1.0912+02

(E) TRANSLUNAR INJECTION CUTOFF

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	DTBURN(SEC)	MASS	FUEL USED	ENERGY	PLCHNG
72.	1	13	SEPT.	5	5	39.140	1.	56.	9.802	3.0892+02	1.30976+05	1.49785+05	-4.8763-01	-2.0646+00
78.	1	13	SEPT.	5	2	30.804	1.	53.	1.663	3.0981+02	1.31502+05	1.50219+05	-4.8555-01	-1.9566+00
84.	1	13	SEPT.	6	59	56.844	1.	49.	49.535	3.1036+02	1.31842+05	1.50485+05	-4.8410-01	-1.8779+00
90.	1	13	SEPT.	7	51	56.915	1.	46.	55.719	3.1060+02	1.31974+05	1.50599+05	-4.8356-01	-1.8535+00
98.	1	13	SEPT.	8	44	58.106	1.	44.	1.242	3.1042+02	1.31846+05	1.50515+05	-4.8452-01	-1.8976+00
72.	2	13	SEPT.	6	33	42.019	3.	24.	12.682	3.0687+02	1.30975+05	1.48794+05	-4.9022-01	1.4625+00
78.	2	13	SEPT.	7	30	32.121	3.	21.	2.981	3.0773+02	1.31517+05	1.49210+05	-4.8302-01	1.2801+00
84.	2	13	SEPT.	8	27	57.380	3.	17.	50.071	3.0829+02	1.31850+05	1.49480+05	-4.8664-01	1.1724+00
90.	2	13	SEPT.	9	19	56.395	3.	14.	55.199	3.0850+02	1.31992+05	1.49585+05	-4.8611-01	1.1163+00
98.	2	13	SEPT.	10	12	58.407	3.	11.	59.458	3.0828+02	1.31865+05	1.49476+05	-4.8704-01	1.1620+00

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Continued

(E) TRANSLUNAR INJECTION CUTOFF - CONCLUDED

LAZ	OPP	ALT	LAT	LON	V	PTH	AZ	INMP
72.	1	1.6773+02	1.1509+01	3.5493+02	3.55891+04	7.1493+00	1.1878+02	4.2946+01
78.	1	1.6722+02	1.2703+01	3.4158+02	3.55932+04	7.0961+00	1.1595+02	3.9603+01
84.	1	1.6692+02	1.3576+01	3.2793+02	3.55957+04	7.0565+00	1.1405+02	3.7277+01
90.	1	1.6694+02	1.3974+01	3.1546+02	3.55961+04	7.0457+00	1.1340+02	3.6337+01
98.	1	1.6726+02	1.3657+01	3.0253+02	3.55939+04	7.0697+00	1.1472+02	3.7530+01
72.	2	1.6179+02	1.1032+01	3.3232+02	3.56174+04	6.7405+00	1.2226+02	4.6538+01
78.	2	1.6088+02	1.2259+01	3.1901+02	3.56235+04	6.6626+00	1.1915+02	4.2917+01
84.	2	1.6053+02	1.3141+01	3.0542+02	3.56263+04	6.6212+00	1.1708+02	4.0413+01
90.	2	1.6037+02	1.3553+01	2.9295+02	3.56275+04	6.5992+00	1.1636+02	3.9397+01
98.	2	1.6059+02	1.3243+01	2.7997+02	3.56258+04	6.6156+00	1.1775+02	4.0673+01

(F) TRANSLUNAR INJECTION CUTOFF + 2 HOURS

LAZ	OPP	** G.E.T. HRS	MINS	SECS **	ALT	LAT	LON	V	PTH	AZ
72.	1	3.	56.	9.802	1.7883+04	-3.0597+01	8.2022+01	1.41508+04	6.5004+01	8.6247+01
78.	1	3.	53.	1.663	1.7883+04	-2.8663+01	6.8063+01	1.41540+04	6.5007+01	8.8847+01
84.	1	3.	49.	49.535	1.7882+04	-2.7394+01	5.4077+01	1.41562+04	6.5009+01	9.0620+01
90.	1	3.	46.	55.719	1.7883+04	-2.7005+01	4.1455+01	1.41571+04	6.5010+01	9.1321+01
98.	1	3.	44.	1.242	1.7883+04	-2.8010+01	2.8603+01	1.41558+04	6.5009+01	9.0392+01
72.	2	5.	24.	12.682	1.7862+04	-3.3320+01	6.0934+01	1.41553+04	6.4985+01	8.3366+01
78.	2	5.	21.	2.981	1.7861+04	-3.1206+01	4.6838+01	1.41589+04	6.4988+01	8.6248+01
84.	2	5.	17.	50.071	1.7860+04	-2.9822+01	3.2778+01	1.41612+04	6.4990+01	8.8193+01
90.	2	5.	14.	55.198	1.7860+04	-2.9382+01	2.0132+01	1.41623+04	6.4991+01	8.8962+01
98.	2	5.	11.	59.458	1.7860+04	-3.0441+01	7.3160+00	1.41612+04	6.4989+01	8.7948+01

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Continued

(G) MIDCOURSE TARGETING PARAMETERS

LAZ	OPP	DAY	G.M.T. MONTH	HRS	MINS	SECS	G.E.T. HRS	MINS	SECS	RMP	DEMP	RAMP
72.	1	16	SEPT.	3	29	10.842	72.	19.	41.504	9.99201+02	6.30475+00	1.79014+02
78.	1	16	SEPT.	4	8	11.402	71.	58.	42.261	9.99004+02	6.32775+00	1.79535+02
84.	1	16	SEPT.	4	52	12.969	71.	42.	5.661	9.98642+02	6.35341+00	1.79911+02
90.	1	16	SEPT.	5	37	23.376	71.	32.	22.177	9.99059+02	6.37868+00	-1.79693+02
98.	1	16	SEPT.	6	33	56.380	71.	32.	59.513	9.98915+02	6.41513+00	-1.79951+02
72.	2	16	SEPT.	5	11	13.642	74.	1.	44.301	9.99004+02	6.37426+00	1.77704+02
78.	2	16	SEPT.	5	48	43.179	73.	39.	14.037	9.98824+02	6.39714+00	1.78167+02
84.	2	16	SEPT.	6	32	35.941	73.	22.	28.630	9.99161+02	6.42488+00	1.78188+02
90.	2	16	SEPT.	7	17	31.251	73.	12.	30.054	9.99076+02	6.45267+00	1.78303+02
98.	2	16	SEPT.	8	13	56.352	73.	12.	57.399	9.98536+02	6.48737+00	1.78408+02

(H) LUNAR ORBIT INSERTION BURN INITIATION

LAZ	OPP	DAY	G.M.T. MONTH	HRS	MINS	SECS	G.E.T. HRS	MINS	SECS	DELTA T FROM TLI HRS	MINS	SECS	MASS	LOI TARGET PARAMETERS DRTX	DRTY	DRTZ
72.	1	16	SEPT.	3	25	51.475	72.	16.	22.137	70.	20.	12.834	9.48330+04	-2.8570+03	-2.7053+02	-7.9031+02
78.	1	16	SEPT.	4	4	52.790	71.	55.	23.649	70.	2.	21.988	9.48330+04	-2.8453+03	-2.0993+02	-8.0515+02
84.	1	16	SEPT.	4	48	54.809	71.	38.	47.498	69.	48.	57.964	9.48330+04	-2.8377+03	-1.6363+02	-8.1519+02
90.	1	16	SEPT.	5	34	5.314	71.	29.	4.117	69.	42.	8.400	9.48330+04	-2.8330+03	-1.4009+02	-8.2984+02
98.	1	16	SEPT.	6	30	38.180	71.	29.	41.313	69.	45.	40.073	9.48330+04	-2.8367+03	-1.5344+02	-8.2283+02
72.	2	16	SEPT.	5	7	53.649	73.	58.	24.309	70.	34.	11.628	9.48330+04	-2.8829+03	-3.1612+02	-7.3064+02
78.	2	16	SEPT.	5	45	24.322	73.	35.	55.181	70.	14.	52.203	9.48330+04	-2.8744+03	-2.5430+02	-7.2805+02
84.	2	16	SEPT.	6	29	18.150	73.	19.	10.838	70.	1.	20.770	9.48330+04	-2.8784+03	-2.0770+02	-6.9782+02
90.	2	16	SEPT.	7	14	14.302	73.	9.	13.103	69.	54.	17.906	9.48330+04	-2.8779+03	-1.8394+02	-6.9309+02
98.	2	16	SEPT.	8	10	38.815	73.	9.	39.865	69.	57.	40.408	9.48330+04	-2.8715+03	-1.9696+02	-7.2092+02

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Continued

(H) LUNAR ORBIT INSERTION BURN INITIATION - CONCLUDED

LAZ	OPP	ALTS	SELENOGRAPHIC POLAR COORDINATES LATS	LONS	VRS	PTR	AZR
72.	1	8.5888+01	-1.0521+00	-1.7002+02	8.35045+03	-9.8610+00	-8.2974+01
78.	1	8.5911+01	-9.1598-01	-1.6954+02	8.34633+03	-9.9063+00	-8.3585+01
84.	1	8.5755+01	-8.1295-01	-1.6918+02	8.34471+03	-9.9501+00	-8.4052+01
90.	1	8.6875+01	-7.7550-01	-1.6880+02	8.34061+03	-1.0093+01	-8.4290+01
98.	1	8.6418+01	-7.9609-01	-1.6903+02	8.34359+03	-1.0030+01	-8.4155+01
72.	2	8.3330+01	-1.0955+00	-1.7121+02	8.36473+03	-9.3837+00	-8.2514+01
78.	2	8.3026+01	-9.4685-01	-1.7082+02	8.36056+03	-9.3556+00	-8.3135+01
84.	2	8.2381+01	-8.1083-01	-1.7085+02	8.35954+03	-9.1504+00	-8.3601+01
90.	2	8.2085+01	-7.4763-01	-1.7079+02	8.35970+03	-9.1064+00	-8.3839+01
98.	2	8.2359+01	-7.9745-01	-1.7062+02	8.36084+03	-9.2780+00	-8.3711+01

(I) LUNAR ORBIT INSERTION BURN TERMINATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS **	G.E.T. HRS	MINS	SECS **	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	16	SEPT.	3	32	11.534	72.	22.	42.195	3.8006+02	7.06715+04	2.4162+04	2.9766+03	2.8201+00
78.	1	16	SEPT.	4	11	11.516	72.	1.	42.372	3.7872+02	7.07562+04	2.4077+04	2.9645+03	2.1877+00
84.	1	16	SEPT.	4	55	12.711	71.	45.	5.400	3.7790+02	7.08086+04	2.4024+04	2.9570+03	1.7045+00
90.	1	16	SEPT.	5	40	23.036	71.	35.	21.838	3.7772+02	7.08200+04	2.4013+04	2.9553+03	1.4598+00
98.	1	16	SEPT.	6	36	56.155	71.	35.	59.291	3.7798+02	7.08039+04	2.4029+04	2.9576+03	1.5988+00
72.	2	16	SEPT.	5	14	15.263	74.	4.	45.923	3.8161+02	7.05726+04	2.4260+04	2.9908+03	3.2951+00
78.	2	16	SEPT.	5	51	44.317	73.	42.	15.174	3.7999+02	7.06755+04	2.4158+04	2.9760+03	2.6498+00
84.	2	16	SEPT.	6	35	37.379	73.	25.	30.069	3.7923+02	7.07242+04	2.4109+04	2.9690+03	2.1649+00
90.	2	16	SEPT.	7	20	33.188	73.	15.	31.991	3.7889+02	7.07460+04	2.4087+04	2.9659+03	1.9171+00
98.	2	16	SEPT.	8	16	57.832	73.	15.	58.880	3.7901+02	7.07377+04	2.4095+04	2.9671+03	2.0517+00

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Continued

(I) LUNAR ORBIT INSERTION BURN TERMINATION - CONCLUDED

LAZ	OPP	** ALTS	SELENOGRAPHIC POLAR COORDINATES LATS	LONS	VRS	PTR	AZR	** RPS	APOS
72.	1	5.8746+01	1.5476+00	1.6515+02	5.50057+03	-4.6789-01	-8.5965+01	9.9658+02	1.1088+03
78.	1	5.8783+01	1.5082+00	1.6570+02	5.50026+03	-3.8860-01	-8.5950+01	9.9682+02	1.1085+03
84.	1	5.8534+01	1.4798+00	1.6610+02	5.50165+03	-3.4885-01	-8.5940+01	9.9666+02	1.1087+03
90.	1	5.8753+01	1.4504+00	1.6651+02	5.50052+03	-4.2067-01	-8.5930+01	9.9671+02	1.1087+03
98.	1	5.8686+01	1.4684+00	1.6626+02	5.50085+03	-3.9262-01	-8.5936+01	9.9671+02	1.1087+03
72.	2	5.8862+01	1.6423+00	1.6382+02	5.49961+03	-3.5588-01	-8.6002+01	9.9697+02	1.1081+03
78.	2	5.8689+01	1.6088+00	1.6430+02	5.50048+03	-3.5539-01	-8.5989+01	9.9680+02	1.1083+03
84.	2	5.8962+01	1.6098+00	1.6430+02	5.49875+03	-3.8258-01	-8.5989+01	9.9701+02	1.1078+03
90.	2	5.8921+01	1.6055+00	1.6438+02	5.49878+03	-3.5863-01	-8.5987+01	9.9700+02	1.1077+03
98.	2	5.8511+01	1.5943+00	1.6452+02	5.50119+03	-3.1798-01	-8.5983+01	9.9670+02	1.1082+03

(J) CIRCULARIZATION BURN INITIATION

LAZ	OPP	** DAY	G.M.T. MONTH	HRS	MINS	SECS **	G.E.T. HRS	MINS	SECS	** DELTA T FROM LOI ** HRS	MINS	SECS	MASS	** CIRCULARIZATION TARGET PARAMETERS ** DRTX	DRTY	DRTZ
72.	1	16	SEPT.	7	52	33.282	76.	43.	3.943	4.	20.	21.748	7.06515+04	-1.3861+02	0.0000	0.0000
78.	1	16	SEPT.	8	31	2.873	76.	21.	33.733	4.	19.	51.361	7.07362+04	-1.3807+02	0.0000	0.0000
84.	1	16	SEPT.	9	14	40.638	76.	4.	33.326	4.	19.	27.926	7.07886+04	-1.3815+02	0.0000	0.0000
90.	1	16	SEPT.	10	0	34.540	75.	55.	33.341	4.	20.	11.504	7.08000+04	-1.3815+02	0.0000	0.0000
98.	1	16	SEPT.	10	56	55.869	75.	55.	59.005	4.	19.	59.714	7.07839+04	-1.3813+02	0.0000	0.0000
72.	2	16	SEPT.	9	33	49.256	78.	24.	19.918	4.	19.	33.996	7.05526+04	-1.3785+02	0.0000	0.0000
78.	2	16	SEPT.	10	11	22.415	78.	1.	53.272	4.	19.	38.098	7.06555+04	-1.3780+02	0.0000	0.0000
84.	2	16	SEPT.	10	55	13.711	77.	45.	6.400	4.	19.	36.330	7.07042+04	-1.3752+02	0.0000	0.0000
90.	2	16	SEPT.	11	39	53.235	77.	34.	52.037	4.	19.	20.046	7.07260+04	-1.3744+02	0.0000	0.0000
98.	2	16	SEPT.	12	36	21.018	77.	35.	22.068	4.	19.	23.188	7.07177+04	-1.3758+02	0.0000	0.0000

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Continued

(J) CIRCULARIZATION BURN INITIATION - CONCLUDED

			SELENOGRAPHIC POLAR COORDINATES				
LAZ	OPP	ALTS	LATS	LONS	VRS	PTR	AZR
72.	1	5.8057+01	2.2006+00	1.5331+02	5.50408+03	-5.0716-03	-8.6282+01
78.	1	5.8302+01	2.0640+00	1.5538+02	5.50270+03	-3.2717-03	-8.6205+01
84.	1	5.8147+01	1.9532+00	1.5704+02	5.50361+03	-2.4836-02	-8.6148+01
90.	1	5.8194+01	2.0763+00	1.5519+02	5.50336+03	1.5372-02	-8.6212+01
98.	1	5.8197+01	2.0532+00	1.5554+02	5.50332+03	1.3506-02	-8.6200+01
72.	2	5.8454+01	2.1377+00	1.5429+02	5.50167+03	-1.1091-02	-8.6246+01
78.	2	5.8283+01	2.1214+00	1.5454+02	5.50253+03	1.8061-03	-8.6237+01
84.	2	5.8493+01	2.1260+00	1.5449+02	5.50112+03	-2.4912-02	-8.6239+01
90.	2	5.8489+01	2.0720+00	1.5532+02	5.50097+03	-4.8670-02	-8.6209+01
98.	2	5.8183+01	2.0636+00	1.5543+02	5.50284+03	6.2397-03	-8.6205+01

(K) CIRCULARIZATION BURN TERMINATION

		**	G.M.T.				**	G.E.T.		**					
LAZ	OPP	DAY	MONTH	HRS	MINS	SECS	HRS	MINS	SECS	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	16	SEPT.	7	52	48.397	76.	43.	19.056	1.5113+01	6.96906+04	9.6092+02	1.3861+02	1.5967-05
78.	1	16	SEPT.	8	31	17.948	76.	21.	48.805	1.5072+01	6.97778+04	9.5838+02	1.3807+02	1.5294-05
84.	1	16	SEPT.	9	14	55.733	76.	4.	48.422	1.5096+01	6.98289+04	9.5963+02	1.3815+02	1.4385-05
90.	1	16	SEPT.	10	0	49.637	75.	55.	48.441	1.5099+01	6.98402+04	9.5978+02	1.3815+02	1.5312-05
98.	1	16	SEPT.	10	57	10.961	75.	56.	14.097	1.5092+01	6.98245+04	9.5945+02	1.3814+02	1.5287-05
72.	2	16	SEPT.	9	34	4.268	78.	24.	34.928	1.5010+01	6.95982+04	9.5436+02	1.3785+02	1.5407-05
78.	2	16	SEPT.	10	11	37.443	78.	2.	8.300	1.5027+01	6.97001+04	9.5539+02	1.3780+02	1.5665-05
84.	2	16	SEPT.	10	55	28.719	77.	45.	21.410	1.5010+01	6.97501+04	9.5411+02	1.3752+02	1.5623-05
90.	2	16	SEPT.	11	40	8.239	77.	35.	7.040	1.5003+01	6.97721+04	9.5387+02	1.3744+02	1.5226-05
98.	2	16	SEPT.	12	36	36.035	77.	35.	37.085	1.5017+01	6.97630+04	9.5471+02	1.3758+02	1.5196-05

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Continued

(K) CIRCULARIZATION BURN TERMINATION - CONCLUDED

LAZ	OPP	** SELENOGRAPHIC POLAR COORDINATES ALTS	LATS	LONS	VRS	PTR	AZR **
72.	1	5.8058+01	2.2508+00	1.5253+02	5.36546+03	5.0226-03	-8.6312+01
78.	1	5.8303+01	2.1150+00	1.5461+02	5.36461+03	6.7404-03	-8.6234+01
84.	1	5.8144+01	2.0051+00	1.5626+02	5.36547+03	-1.5243-02	-8.6175+01
90.	1	5.8200+01	2.1274+00	1.5441+02	5.36517+03	2.5967-02	-8.6241+01
98.	1	5.8202+01	2.1044+00	1.5475+02	5.36516+03	2.4044-02	-8.6228+01
72.	2	5.8453+01	2.1880+00	1.5352+02	5.36381+03	-1.4497-03	-8.6275+01
78.	2	5.8286+01	2.1719+00	1.5377+02	5.36471+03	1.1915-02	-8.6266+01
84.	2	5.8489+01	2.1764+00	1.5372+02	5.36362+03	-1.5680-02	-8.6268+01
90.	2	5.8480+01	2.1228+00	1.5455+02	5.36357+03	-4.0079-02	-8.6238+01
98.	2	5.8187+01	2.1145+00	1.5466+02	5.36524+03	1.6513-02	-8.6233+01

(L) LUNAR ORBIT PLANE CHANGE BURN INITIATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS **	G.E.T. HRS	MINS	SECS	** DELTA T FROM LOI ** HRS	MINS	SECS	MASS	** LOPC TARGET PARAMETERS DRTX	DRTY	DRTZ **
72.	1	17	SEPT.	23	27	3.470	116.	17.	34.131	43.	54.	51.936	3.63366+04	0.0000	-6.2848+01	0.0000
78.	1	18	SEPT.	0	6	49.748	115.	57.	20.606	43.	55.	38.234	3.64238+04	0.0000	-6.2851+01	0.0000
84.	1	18	SEPT.	0	50	59.121	115.	40.	51.812	43.	55.	46.412	3.64749+04	0.0000	-6.2854+01	0.0000
90.	1	18	SEPT.	1	36	17.772	115.	31.	16.575	43.	55.	54.737	3.64862+04	0.0000	-6.2843+01	0.0000
98.	1	18	SEPT.	2	32	45.738	115.	31.	48.871	43.	55.	49.580	3.64705+04	0.0000	-6.2841+01	0.0000
72.	2	18	SEPT.	1	9	15.383	117.	59.	46.044	43.	55.	.121	3.62442+04	0.0000	-6.2792+01	0.0000
78.	2	18	SEPT.	1	46	53.291	117.	37.	24.150	43.	55.	8.976	3.63461+04	0.0000	-6.2762+01	0.0000
84.	2	18	SEPT.	2	30	43.642	117.	20.	36.333	43.	55.	6.263	3.63961+04	0.0000	-6.2666+01	0.0000
90.	2	18	SEPT.	3	15	31.359	117.	10.	30.162	43.	54.	58.171	3.64181+04	0.0000	-6.2594+01	0.0000
98.	2	18	SEPT.	4	12	8.977	117.	11.	10.025	43.	55.	11.145	3.64090+04	0.0000	-6.2669+01	0.0000

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Continued

(L) LUNAR ORBIT PLANE CHANGE BURN INITIATION - CONCLUDED

LAZ	OPP	SELENOGRAPHIC POLAR COORDINATES ALTS	LATS	LONS	VPS	PTR	AZR
72.	1	5.8050+01	2.6021+00	1.2661+02	5.36522+03	5.7148-03	-8.6572+01
78.	1	5.8302+01	2.6013+00	1.2661+02	5.36432+03	7.9481-03	-8.6572+01
84.	1	5.8107+01	2.6009+00	1.2661+02	5.36535+03	-1.2396-02	-8.6572+01
90.	1	5.8222+01	2.6007+00	1.2661+02	5.36475+03	2.7400-02	-8.6572+01
98.	1	5.8225+01	2.6009+00	1.2661+02	5.36473+03	2.5617-02	-8.6572+01
72.	2	5.8441+01	2.6027+00	1.2661+02	5.36358+03	-1.0079-03	-8.6572+01
78.	2	5.8288+01	2.6028+00	1.2661+02	5.36440+03	1.2882-02	-8.6573+01
84.	2	5.8463+01	2.6039+00	1.2661+02	5.36347+03	-1.5238-02	-8.6573+01
90.	2	5.8418+01	2.6050+00	1.2661+02	5.36360+03	-3.9451-02	-8.6574+01
98.	2	5.8199+01	2.6040+00	1.2661+02	5.36487+03	1.8161-02	-8.6574+01

(M) LUNAR ORBIT PLANE CHANGE BURN TERMINATION

LAZ	OPP	G.M.T. DAY	MONTH	HRS	MINS	SECS	G.E.T. HRS	MINS	SECS	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	17	SEPT.	23	27	7.008	116.	17.	37.668	3.5362+00	3.61116+04	2.2492+02	6.2848+01	6.7314-01
78.	1	18	SEPT.	0	6	53.295	115.	57.	24.152	3.5465+00	3.61984+04	2.2547+02	6.2851+01	6.7329-01
84.	1	18	SEPT.	0	51	2.673	115.	40.	55.362	3.5500+00	3.62491+04	2.2580+02	6.2854+01	6.7320-01
90.	1	18	SEPT.	1	36	21.324	115.	31.	20.128	3.5534+00	3.62604+04	2.2583+02	6.2843+01	6.7316-01
98.	1	18	SEPT.	2	32	49.288	115.	31.	52.424	3.5534+00	3.62447+04	2.2572+02	6.2841+01	6.7313-01
72.	2	18	SEPT.	1	9	18.909	117.	59.	49.570	3.5259+00	3.60201+04	2.2416+02	6.2792+01	6.7277-01
78.	2	18	SEPT.	1	46	56.825	117.	37.	27.683	3.5328+00	3.61214+04	2.2467+02	6.2762+01	6.7232-01
84.	2	18	SEPT.	2	30	47.176	117.	20.	39.865	3.5328+00	3.61715+04	2.2464+02	6.2666+01	6.7142-01
90.	2	18	SEPT.	3	15	34.890	117.	10.	33.691	3.5294+00	3.61936+04	2.2452+02	6.2594+01	6.7063-01
98.	2	18	SEPT.	4	12	12.511	117.	11.	13.561	3.5362+00	3.61842+04	2.2473+02	6.2669+01	6.7127-01

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Continued

(N) TRANSEARTH INJECTION BURN INITIATION

LAZ	OPP	DAY	G.M.T. MONTH	HRS	MINS	SECS	G.E.T. HRS	MINS	SECS	DELTA T FROM LOI HRS	MINS	SECS	MASS	TEI TARGET PARAMETERS DRTX	DRTY	DRTZ
72.	1	18	SEPT.	20	38	33.527	137.	29.	4.183	65.	6.	21.988	3.65216+04	2.7154+03	-2.8275+01	1.7332+02
78.	1	18	SEPT.	21	18	52.232	137.	9.	23.091	65.	7.	40.719	3.66084+04	2.7176+03	-3.3800+01	1.6795+02
84.	1	18	SEPT.	22	3	15.733	136.	53.	8.425	65.	8.	3.028	3.66591+04	2.7214+03	-3.7792+01	1.6038+02
90.	1	18	SEPT.	22	48	52.441	136.	43.	51.239	65.	8.	29.402	3.66704+04	2.7234+03	-4.1815+01	1.5208+02
98.	1	18	SEPT.	23	45	39.985	136.	44.	43.115	65.	8.	43.828	3.66547+04	2.7278+03	-4.7154+01	1.4384+02
72.	2	18	SEPT.	22	21	33.962	139.	12.	4.617	65.	7.	18.698	3.64301+04	2.7207+03	-4.3874+01	1.7981+02
78.	2	18	SEPT.	22	59	26.531	138.	49.	57.386	65.	7.	42.215	3.65314+04	2.7234+03	-4.6444+01	1.6978+02
84.	2	18	SEPT.	23	43	30.763	138.	33.	23.453	65.	7.	53.387	3.65815+04	2.7275+03	-5.0151+01	1.6427+02
90.	2	19	SEPT.	0	28	29.069	138.	23.	27.870	65.	7.	55.880	3.66036+04	2.7320+03	-5.4315+01	1.5748+02
98.	2	19	SEPT.	1	25	34.407	138.	24.	35.457	65.	8.	36.577	3.65942+04	2.7352+03	-5.9499+01	1.4670+02

(N) TRANSEARTH INJECTION BURN INITIATION - CONCLUDED

LAZ	OPP	SELENOGRAPHIC POLAR COORDINATES ALTS	LATS	LONS	VRS	PTR	AZR
72.	1	5.8458+01	-3.2352+00	-1.4238+02	5.36251+03	-3.2805-02	-8.8028+01
78.	1	5.8762+01	-3.2115+00	-1.4305+02	5.36242+03	-2.8613-02	-8.7991+01
84.	1	5.9138+01	-3.1841+00	-1.4383+02	5.36041+03	-3.4921-02	-8.7949+01
90.	1	5.8433+01	-3.1551+00	-1.4463+02	5.36413+03	-3.7036-02	-8.7905+01
98.	1	5.8450+01	-3.1179+00	-1.4563+02	5.36411+03	-3.6113-02	-8.7850+01
72.	2	5.8882+01	-3.1822+00	-1.4389+02	5.36179+03	-1.9070-02	-8.7944+01
78.	2	5.8671+01	-3.1570+00	-1.4458+02	5.36293+03	-3.0526-02	-8.7905+01
84.	2	5.9112+01	-3.1279+00	-1.4538+02	5.36058+03	-1.5253-02	-8.7861+01
90.	2	5.9485+01	-3.0970+00	-1.4620+02	5.35949+03	-1.1580-02	-8.7815+01
98.	2	5.8565+01	-3.0571+00	-1.4723+02	5.36351+03	-3.5884-02	-8.7761+01

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Continued

(O) TRANSEARTH INJECTION BURN TERMINATION
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LAZ	OPP	** DAY	G.M.T. MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS **	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	18	SEPT.	20	40	48.945	137.	31.	19.603	1.3542+02	2.79126+04	8.6090+03	2.7210+03	2.0061-01
78.	1	18	SEPT.	21	21	8.058	137.	11.	38.916	1.3583+02	2.79734+04	8.6349+03	2.7230+03	2.3978-01
84.	1	18	SEPT.	22	5	31.894	136.	55.	24.580	1.3615+02	2.80030+04	8.6561+03	2.7263+03	2.6807-01
90.	1	18	SEPT.	22	51	8.715	136.	46.	7.518	1.3628+02	2.80071+04	8.6633+03	2.7280+03	2.9643-01
98.	1	18	SEPT.	23	47	56.373	136.	46.	59.504	1.3639+02	2.79841+04	8.6706+03	2.7320+03	3.3413-01
72.	2	18	SEPT.	22	23	49.299	139.	14.	19.955	1.3534+02	2.78263+04	8.6038+03	2.7270+03	3.1116-01
78.	2	18	SEPT.	23	1	42.334	138.	52.	13.191	1.3580+02	2.78980+04	8.6334+03	2.7291+03	3.2926-01
84.	2	18	SEPT.	23	45	46.920	138.	35.	39.608	1.3615+02	2.79255+04	8.6560+03	2.7329+03	3.5549-01
90.	2	19	SEPT.	0	30	45.487	138.	25.	44.286	1.3642+02	2.79310+04	8.6726+03	2.7371+03	3.8493-01
98.	2	19	SEPT.	1	27	50.910	138.	26.	51.955	1.3650+02	2.79163+04	8.6779+03	2.7398+03	4.2127-01

(O) TRANSEARTH INJECTION BURN TERMINATION - CONCLUDED
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LAZ	OPP	** ALTS	SELENOGRAPHIC POLAR COORDINATES LATS	LONS	VRS	PTR	AZR **
72.	1	6.0621+01	-2.9244+00	-1.5091+02	8.07503+03	2.7098+00	-8.7770+01
78.	1	6.0811+01	-2.8978+00	-1.5161+02	8.07653+03	2.7648+00	-8.7774+01
84.	1	6.1269+01	-2.8662+00	-1.5240+02	8.07753+03	2.8244+00	-8.7764+01
90.	1	6.0667+01	-2.8327+00	-1.5322+02	8.08251+03	2.8941+00	-8.7752+01
98.	1	6.0785+01	-2.7906+00	-1.5423+02	8.08593+03	2.9611+00	-8.7740+01
72.	2	6.0808+01	-2.8692+00	-1.5241+02	8.08021+03	2.6765+00	-8.7804+01
78.	2	6.0706+01	-2.8387+00	-1.5314+02	8.08302+03	2.7584+00	-8.7786+01
84.	2	6.1253+01	-2.8049+00	-1.5395+02	8.08410+03	2.8182+00	-8.7772+01
90.	2	6.1719+01	-2.7697+00	-1.5479+02	8.08573+03	2.8775+00	-8.7760+01
98.	2	6.0886+01	-2.7244+00	-1.5584+02	8.09308+03	2.9531+00	-8.7748+01

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Continued

(P) ENTRY
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LAZ	OPP	DAY	G.M.T. MONTH	HRS	MINS	SECS	G.E.T. HRS	MINS	SECS	** DELTA T FROM TEI ** HRS	MINS	SECS	FUEL RESERVE
72.	1	22	SEPT. 17	12		22.233	230.	2.	52.890	92.	31.	33.288	3.54715+03
78.	1	22	SEPT. 17	13		24.669	229.	4.	18.426	91.	52.	39.510	3.60763+03
84.	1	22	SEPT. 17	15		21.877	228.	5.	14.566	91.	9.	49.986	3.63700+03
90.	1	22	SEPT. 17	16		58.333	227.	11.	57.133	90.	25.	49.615	3.64104+03
98.	1	22	SEPT. 17	18		57.919	226.	18.	1.055	89.	31.	1.551	3.61822+03
72.	2	22	SEPT. 17	16		2.440	230.	6.	33.098	90.	52.	13.143	3.46137+03
78.	2	22	SEPT. 17	17		22.226	229.	7.	53.085	90.	15.	39.894	3.53265+03
84.	2	22	SEPT. 17	18		55.069	228.	8.	47.756	89.	33.	8.148	3.55996+03
90.	2	22	SEPT. 17	20		29.635	227.	15.	28.434	88.	49.	44.148	3.56544+03
98.	2	22	SEPT. 17	22		29.644	226.	21.	30.694	87.	54.	38.739	3.55084+03

(P) ENTRY - CONCLUDED
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LAZ	OPP	ALT	LAT	LON	V	PTH	AZ	INC	INMP
72.	1	6.5604+01	2.8730+01	1.6153+02	3.60510+04	-6.4000+00	8.7171+01	2.8699+01	1.0221+01
78.	1	6.5921+01	2.8766+01	1.6152+02	3.60498+04	-6.4000+00	8.7144+01	2.8737+01	1.0040+01
84.	1	6.5994+01	2.8816+01	1.6151+02	3.60500+04	-6.4000+00	8.7156+01	2.8785+01	9.8837+00
90.	1	6.5989+01	2.8865+01	1.6150+02	3.60507+04	-6.4000+00	8.7167+01	2.8833+01	9.7212+00
98.	1	6.5921+01	2.8920+01	1.6149+02	3.60519+04	-6.4000+00	8.7169+01	2.8888+01	9.5053+00
72.	2	6.5902+01	2.8813+01	1.6150+02	3.60507+04	-6.4000+00	8.7080+01	2.8790+01	9.7342+00
78.	2	6.5892+01	2.8858+01	1.6149+02	3.60513+04	-6.4000+00	8.7104+01	2.8832+01	9.6145+00
84.	2	6.5866+01	2.8904+01	1.6148+02	3.60522+04	-6.4000+00	8.7116+01	2.8876+01	9.4587+00
90.	2	6.5883+01	2.8945+01	1.6147+02	3.60528+04	-6.4000+00	8.7116+01	2.8917+01	9.2859+00
98.	2	6.5997+01	2.8992+01	1.6146+02	3.60532+04	-6.4000+00	8.7104+01	2.8965+01	9.0540+00

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Continued

(Q) TOUCHDOWN

LAZ	OPP	** G.E.T. HRS	MINS	SECS	** ENTDT HRS	MINS	SECS **	ENTRG	LAT	LON	AZ
72.	1	230.	17.	52.890	0.	15.	.000	2.0000+03	2.5137+01	1.9500+02	1.0446+02
78.	1	229.	19.	18.426	0.	15.	.000	2.0000+03	2.5180+01	1.9500+02	1.0446+02
84.	1	228.	20.	14.566	0.	15.	.000	2.0000+03	2.5213+01	1.9500+02	1.0450+02
90.	1	227.	26.	57.133	0.	15.	.000	2.0000+03	2.5247+01	1.9500+02	1.0454+02
98.	1	226.	33.	1.055	0.	15.	.000	2.0000+03	2.5290+01	1.9500+02	1.0458+02
72.	2	230.	21.	33.098	0.	15.	.000	2.0000+03	2.5252+01	1.9500+02	1.0444+02
78.	2	229.	22.	53.085	0.	15.	.000	2.0000+03	2.5275+01	1.9500+02	1.0449+02
84.	2	228.	23.	47.756	0.	15.	.000	2.0000+03	2.5305+01	1.9500+02	1.0453+02
90.	2	227.	30.	28.434	0.	15.	.000	2.0000+03	2.5338+01	1.9500+02	1.0456+02
98.	2	226.	36.	30.694	0.	15.	.000	2.0000+03	2.5382+01	1.9500+02	1.0458+02

(R) CIRCUMLUNAR PERICYNTHION

LAZ	OPP	** DAY	G.M.T. MONTH	HRS	MINS	SECS	** HRS	G.E.T. MINS	SECS	** DELTA T FROM TLI ** HRS	MINS	SECS
72.	1	16	SEPT.	3	29	22.920	72.	19.	53.582	70.	23.	43.780
78.	1	16	SEPT.	4	8	25.419	71.	58.	56.276	70.	5.	54.615
84.	1	16	SEPT.	4	52	28.430	71.	42.	21.121	69.	52.	31.586
90.	1	16	SEPT.	5	37	42.242	71.	32.	41.046	69.	45.	45.329
98.	1	16	SEPT.	6	34	13.573	71.	33.	16.707	69.	49.	15.466
72.	2	16	SEPT.	5	11	14.198	74.	1.	44.858	70.	37.	32.177
78.	2	16	SEPT.	5	48	44.496	73.	39.	15.355	70.	18.	12.377
84.	2	16	SEPT.	6	32	34.073	73.	22.	26.762	70.	4.	36.694
90.	2	16	SEPT.	7	17	29.278	73.	12.	28.080	69.	57.	32.883
98.	2	16	SEPT.	8	13	57.320	73.	12.	58.368	70.	0.	58.911

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Continued

(R) CIRCUMLUNAR PERICYNTHION - CONCLUDED

LAZ	OPP	** ALTS	LATS	SELENOGRAPHIC POLAR COORDINATES LONS	VRS	PTR	AZR	** LIN
72.	1	6.0623+01	9.8789-01	1.7355+02	8.43431+03	2.4164-07	-8.2965+01	1.7288+02
78.	1	6.0398+01	9.5551-01	1.7392+02	8.43107+03	-3.1581-06	-8.3590+01	1.7351+02
84.	1	6.0012+01	9.2957-01	1.7419+02	8.43028+03	-1.2935-04	-8.4068+01	1.7399+02
90.	1	6.0362+01	9.2130-01	1.7432+02	8.42863+03	-2.1312-07	-8.4311+01	1.7423+02
98.	1	6.0252+01	9.2961-01	1.7421+02	8.43048+03	-1.0501-04	-8.4174+01	1.7409+02
72.	2	6.0511+01	9.7017-01	1.7319+02	8.44057+03	9.5481-05	-8.2496+01	1.7242+02
78.	2	6.0330+01	9.4218-01	1.7359+02	8.43607+03	9.1119-08	-8.3134+01	1.7306+02
84.	2	6.0666+01	9.1056-01	1.7387+02	8.43183+03	8.6674-05	-8.3614+01	1.7354+02
90.	2	6.0580+01	9.0108-01	1.7401+02	8.43132+03	3.9392-05	-8.3859+01	1.7378+02
98.	2	6.0042+01	9.1774-01	1.7389+02	8.43516+03	1.6420-04	-8.3726+01	1.7365+02

(S) CIRCUMLUNAR ENTRY

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	** DELTA T FROM PERICYNTHION** HRS	MINS	SECS
72.	1	18	SEPT.	20	24	45.363	137.	15.	16.019	64.	55.	22.437
78.	1	18	SEPT.	21	17	56.770	137.	8.	27.623	65.	9.	31.351
84.	1	18	SEPT.	22	11	30.513	137.	1.	23.201	65.	19.	2.084
90.	1	18	SEPT.	23	0	23.952	136.	55.	22.753	65.	22.	41.707
98.	1	18	SEPT.	23	50	28.135	136.	49.	31.266	65.	16.	14.563
72.	2	18	SEPT.	21	48	2.067	138.	38.	32.725	64.	36.	47.867
78.	2	18	SEPT.	22	40	53.641	138.	31.	24.499	64.	52.	9.147
84.	2	18	SEPT.	23	35	16.922	138.	25.	9.611	65.	2.	42.852
90.	2	19	SEPT.	0	23	56.314	138.	18.	55.114	65.	6.	27.035
98.	2	19	SEPT.	1	13	23.393	139.	12.	24.942	64.	59.	26.574

TABLE XIII.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 13, 1969 LAUNCH - Concluded

(S) CIRCUMLUNAR ENTRY - CONCLUDED
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LAZ	OPP	ALT	LAT	LON	V	PTH	AZ	INC	INMP
72.	1	6.5833+01	5.9848+00	7.6922+01	3.61403+04	-7.1840+00	5.1331+01	3.9052+01	1.3267+01
78.	1	6.5832+01	5.9350+00	6.5317+01	3.61386+04	-6.7481+00	4.9004+01	4.1343+01	1.6018+01
84.	1	6.5833+01	6.0616+00	5.3359+01	3.61373+04	-6.3819+00	4.7267+01	4.3074+01	1.8100+01
90.	1	6.5833+01	5.2473+00	4.1003+01	3.61366+04	-6.9056+00	4.6321+01	4.3926+01	1.9163+01
98.	1	6.5833+01	6.0409+00	2.9131+01	3.61372+04	-6.6301+00	4.7117+01	4.3220+01	1.8446+01
72.	2	6.5833+01	7.2760+00	5.6467+01	3.61422+04	-7.0618+00	5.3700+01	3.6915+01	1.0834+01
78.	2	6.5833+01	6.7394+00	4.4436+01	3.61402+04	-6.9495+00	5.1265+01	3.9220+01	1.3665+01
84.	2	6.5832+01	6.6683+00	3.2093+01	3.61388+04	-6.7011+00	4.9560+01	4.0887+01	1.5712+01
90.	2	6.5834+01	6.4973+00	2.0471+01	3.61382+04	-6.7531+00	4.8699+01	4.1712+01	1.6759+01
98.	2	6.5833+01	7.0806+00	8.5884+00	3.61389+04	-6.6126+00	4.9418+01	4.1083+01	1.6112+01

(T) CIRCUMLUNAR TOUCHDOWN
****

LAZ	OPP	** G.E.T. HRS	MINS	SECS	** ENTDT HRS	MINS	SECS **	ENTRG	LAT	LON	AZ
72.	1	137.	30.	16.019	0.	15.	.000	2.0000+03	2.5387+01	1.0145+02	5.9210+01
78.	1	137.	23.	27.623	0.	15.	.000	2.0000+03	2.6429+01	8.9080+01	5.6912+01
84.	1	137.	16.	23.201	0.	15.	.000	2.0000+03	2.7333+01	7.6556+01	5.5256+01
90.	1	137.	10.	22.753	0.	15.	.000	2.0000+03	2.7033+01	6.3675+01	5.3902+01
98.	1	137.	4.	31.266	0.	15.	.000	2.0000+03	2.7383+01	5.2270+01	5.5095+01
72.	2	138.	53.	32.725	0.	15.	.000	2.0000+03	2.5378+01	8.1987+01	6.2175+01
78.	2	138.	46.	24.499	0.	15.	.000	2.0000+03	2.6080+01	6.9111+01	5.9541+01
84.	2	138.	40.	9.611	0.	15.	.000	2.0000+03	2.6818+01	5.6209+01	5.7837+01
90.	2	138.	33.	55.114	0.	15.	.000	2.0000+03	2.7066+01	4.4261+01	5.6900+01
98.	2	138.	27.	24.942	0.	15.	.000	2.0000+03	2.7247+01	3.2755+01	5.7913+01

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUNCH

(A) LAUNCH TIME

LAZ	DAY	MONTH	YEAR	HRS	MINS	SECS
72.	14	SEPT.	1969	4	41	51.517
78.	14	SEPT.	1969	5	50	15.070
84.	14	SEPT.	1969	6	58	54.570
90.	14	SEPT.	1969	7	57	11.620
98.	14	SEPT.	1969	8	46	15.321

(B) EARTH PARKING ORBIT INSERTION

LAZ	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS **	MASS	LAT	LON
72.	14	SEPT.	4	53	11.259	0.	11.	19.741	2.82965+05	3.2668+01	3.0566+02
78.	14	SEPT.	6	1	33.134	0.	11.	18.064	2.83889+05	3.0307+01	3.0557+02
84.	14	SEPT.	7	10	11.600	0.	11.	17.030	2.84458+05	2.7973+01	3.0526+02
90.	14	SEPT.	8	8	28.262	0.	11.	16.641	2.84672+05	2.5672+01	3.0476+02
98.	14	SEPT.	8	57	32.446	0.	11.	17.125	2.84404+05	2.2664+01	3.0383+02

(C) 3.5 MINS PRIOR TO TLI INITIATION

LAZ	** G.E.T. DPP	HRS	MINS	SECS **	ALT	LAT	LON	V	PTH	AZ
72.	1	1.	45.	1.516	1.0292+02	3.0577+01	3.0891+02	2.55694+04	-4.1503-03	1.0225+02
78.	1	1.	41.	27.037	1.0276+02	2.9450+01	2.9265+02	2.55683+04	-2.4778-03	9.8051+01
84.	1	1.	37.	50.100	1.0262+02	2.8629+01	2.7662+02	2.55673+04	3.9289-03	9.4999+01
90.	1	1.	34.	46.419	1.0246+02	2.8378+01	2.6321+02	2.55670+04	1.2425-02	9.3840+01
98.	1	1.	32.	14.700	1.0236+02	2.9131+01	2.5218+02	2.55667+04	2.2154-02	9.5857+01
72.	2	3.	13.	6.431	1.0291+02	3.0510+01	2.8672+02	2.55693+04	-3.5172-03	1.0243+02
78.	2	3.	9.	30.362	1.0275+02	2.9405+01	2.7046+02	2.55682+04	-1.8074-03	9.8227+01
84.	2	3.	5.	51.710	1.0261+02	2.8604+01	2.5439+02	2.55673+04	4.6438-03	9.5153+01
90.	2	3.	2.	46.405	1.0246+02	2.8361+01	2.4093+02	2.55670+04	1.3192-02	9.3967+01
98.	2	3.	0.	14.024	1.0236+02	2.9106+01	2.2991+02	2.55668+04	2.2935-02	9.5987+01

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUNCH - Continued

(D) TRANSLUNAR INJECTION INITIATION

LAZ	** OPP	DAY	G.M.T. MONTH	HRS	MINS	SECS	** HRS	G.E.T. MINS	SECS	** DELTA T FROM EPOI ** HRS	MINS	SECS	MASS	LAT	LON	AZ
72.	1	14	SEPT.	6	30	23.034	1.	48.	31.516	1.	37.	11.775	2.80790+05	2.6597+01	3.2366+02	1.0975+02
78.	1	14	SEPT.	7	35	12.107	1.	44.	57.037	1.	33.	38.973	2.81754+05	2.6503+01	3.0760+02	1.0549+02
84.	1	14	SEPT.	8	40	14.670	1.	41.	20.100	1.	30.	3.070	2.82364+05	2.6448+01	2.9165+02	1.0238+02
90.	1	14	SEPT.	9	35	28.040	1.	38.	16.419	1.	26.	59.778	2.82642+05	2.6487+01	2.7827+02	1.0120+02
98.	1	14	SEPT.	10	22	.021	1.	35.	44.700	1.	24.	27.575	2.82428+05	2.6723+01	2.6723+02	1.0334+02
72.	2	14	SEPT.	7	58	27.948	3.	16.	36.431	3.	5.	16.689	2.79795+05	2.6490+01	3.0144+02	1.0990+02
78.	2	14	SEPT.	9	3	15.432	3.	13.	.362	3.	1.	42.298	2.80758+05	2.6418+01	2.8539+02	1.0565+02
84.	2	14	SEPT.	10	8	16.280	3.	9.	21.710	2.	58.	4.679	2.81368+05	2.6386+01	2.6942+02	1.0251+02
90.	2	14	SEPT.	11	3	28.025	3.	6.	16.405	2.	54.	59.764	2.81616+05	2.6440+01	2.5599+02	1.0132+02
98.	2	14	SEPT.	11	49	59.345	3.	3.	44.024	2.	52.	26.899	2.81376+05	2.6668+01	2.4495+02	1.0345+02

(E) TRANSLUNAR INJECTION CUTOFF

LAZ	** OPP	DAY	G.M.T. MONTH	HRS	MINS	SECS	** HRS	G.E.T. MINS	SECS	** DTBURN(SEC)	MASS	FUEL USED	ENERGY	PLCHNG
72.	1	14	SEPT.	6	35	31.604	1.	53.	40.086	3.0857+02	1.31173+05	1.49617+05	-4.8513-01	-1.8249+00
78.	1	14	SEPT.	7	40	21.559	1.	50.	6.489	3.0945+02	1.31710+05	1.50045+05	-4.8233-01	-1.6881+00
84.	1	14	SEPT.	8	45	24.702	1.	46.	30.132	3.1003+02	1.32039+05	1.50326+05	-4.8007-01	-1.6095+00
90.	1	14	SEPT.	9	40	38.385	1.	43.	26.765	3.1035+02	1.32165+05	1.50478+05	-4.7900-01	-1.6067+00
98.	1	14	SEPT.	10	27	10.188	1.	40.	54.867	3.1017+02	1.32037+05	1.50391+05	-4.8059-01	-1.6547+00
72.	2	14	SEPT.	8	3	34.415	3.	21.	42.897	3.0647+02	1.31199+05	1.48597+05	-4.8754-01	1.0421+00
78.	2	14	SEPT.	9	8	22.769	3.	18.	7.699	3.0734+02	1.31740+05	1.49019+05	-4.8452-01	7.7703-01
84.	2	14	SEPT.	10	13	24.169	3.	14.	29.599	3.0789+02	1.32081+05	1.49286+05	-4.8211-01	5.4759-01
90.	2	14	SEPT.	11	8	36.144	3.	11.	24.524	3.0812+02	1.32218+05	1.49398+05	-4.8106-01	4.3014-01
98.	2	14	SEPT.	11	55	7.247	3.	8.	51.926	3.0790+02	1.32084+05	1.49293+05	-4.8266-01	5.5907-01

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUNCH - Continued

(E) TRANSLUNAR INJECTION CUTOFF - CONCLUDED

LAZ	OPP	ALT	LAT	LON	V	PTH	AZ	INMP
72.	1	1.6606+02	1.6571+01	3.4643+02	3.56010+04	6.9897+00	1.1684+02	3.3594+01
78.	1	1.6547+02	1.8023+01	3.3124+02	3.56061+04	6.9246+00	1.1332+02	2.9391+01
84.	1	1.6527+02	1.9141+01	3.1586+02	3.56088+04	6.8906+00	1.1072+02	2.6199+01
90.	1	1.6545+02	1.9622+01	3.0270+02	3.56088+04	6.8956+00	1.0975+02	2.4836+01
98.	1	1.6562+02	1.9020+01	2.9133+02	3.56068+04	6.9205+00	1.1163+02	2.6662+01
72.	2	1.5927+02	1.6177+01	3.2389+02	3.56336+04	6.5277+00	1.1963+02	3.6574+01
78.	2	1.5821+02	1.7678+01	3.0873+02	3.56412+04	6.4381+00	1.1578+02	3.1985+01
84.	2	1.5742+02	1.8846+01	2.9335+02	3.56470+04	6.3725+00	1.1288+02	2.8497+01
90.	2	1.5703+02	1.9361+01	2.8015+02	3.56498+04	6.3441+00	1.1177+02	2.7019+01
98.	2	1.5740+02	1.8740+01	2.6877+02	3.56468+04	6.3765+00	1.1382+02	2.9016+01

(F) TRANSLUNAR INJECTION CUTOFF + 2 HOURS

LAZ	OPP	** G.E.T. HRS	MINS	SECS **	ALT	LAT	LON	V	PTH	AZ
72.	1	3.	53.	40.086	1.7880+04	-3.1116+01	7.1149+01	1.41577+04	6.5010+01	9.2295+01
78.	1	3.	50.	6.489	1.7880+04	-2.8671+01	5.5578+01	1.41619+04	6.5015+01	9.5356+01
84.	1	3.	46.	30.132	1.7881+04	-2.6891+01	4.0022+01	1.41650+04	6.5020+01	9.7618+01
90.	1	3.	43.	26.765	1.7883+04	-2.6247+01	2.6759+01	1.41662+04	6.5024+01	9.8535+01
98.	1	3.	40.	54.866	1.7882+04	-2.7616+01	1.5372+01	1.41641+04	6.5021+01	9.7128+01
72.	2	5.	21.	42.857	1.7857+04	-3.3428+01	4.9839+01	1.41631+04	6.4990+01	8.9915+01
78.	2	5.	18.	7.699	1.7856+04	-3.0720+01	3.4165+01	1.41680+04	6.4996+01	9.3312+01
84.	2	5.	14.	29.599	1.7855+04	-2.8737+01	1.8561+01	1.41718+04	6.5002+01	9.5814+01
90.	2	5.	11.	24.524	1.7855+04	-2.8014+01	5.2894+00	1.41735+04	6.5005+01	9.6820+01
98.	2	5.	8.	51.926	1.7855+04	-2.9496+01	3.5393+02	1.41713+04	6.5001+01	9.5273+01

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUCNC AZIMUTH - SEPTEMBER 14, 1969 LAUNCH - Continued

(G) MIDCOURSE TARGETING PARAMETERS

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS **	G.E.T. HRS	MINS	SECS	RMP	DEMP	RAMP
72.	1	17	SEPT.	3	22	43.500	70.	40.	51.980	9.98519+02	6.28707+00	1.79571+02
78.	1	17	SEPT.	4	5	18.241	70.	15.	3.169	9.98798+02	6.30688+00	1.79668+02
84.	1	17	SEPT.	4	52	7.272	69.	53.	12.699	9.99103+02	6.33126+00	1.79908+02
90.	1	17	SEPT.	5	37	32.722	69.	40.	21.102	9.98806+02	6.36765+00	-1.79219+02
98.	1	17	SEPT.	6	31	58.515	69.	45.	43.193	9.99036+02	6.37009+00	1.79865+02
72.	2	17	SEPT.	5	2	17.846	72.	20.	26.328	9.98942+02	6.30633+00	1.78639+02
78.	2	17	SEPT.	5	42	40.252	71.	52.	25.180	9.98711+02	6.33484+00	1.79146+02
84.	2	17	SEPT.	6	27	56.585	71.	29.	2.013	9.98897+02	6.36806+00	1.79850+02
90.	2	17	SEPT.	7	13	20.998	71.	16.	9.375	9.98623+02	6.38645+00	1.79898+02
98.	2	17	SEPT.	8	7	58.037	71.	21.	42.714	9.98619+02	6.40246+00	1.79648+02

(H) LUNAR ORBIT INSERTION BURN INITIATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS **	G.E.T. HRS	MINS	SECS **	DELTA T FROM TLI ** HRS	MINS	SECS	MASS	** LOI TARGET PARAMETERS ** DRTX	DRTY	DRTZ
72.	1	17	SEPT.	3	19	24.366	70.	37.	32.846	68.	43.	52.760	9.48330+04	-2.8603+03	-2.7363+02	-7.6123+02
78.	1	17	SEPT.	4	1	59.725	70.	11.	44.653	68.	21.	38.165	9.48330+04	-2.8653+03	-1.8747+02	-7.2542+02
84.	1	17	SEPT.	4	48	48.885	69.	49.	54.313	68.	3.	24.184	9.48330+04	-2.8680+03	-1.1644+02	-7.1064+02
90.	1	17	SEPT.	5	34	14.572	69.	37.	2.950	67.	53.	36.186	9.48330+04	-2.8508+03	-8.0845+01	-7.6940+02
98.	1	17	SEPT.	6	28	40.065	69.	42.	24.743	68.	1.	29.878	9.48330+04	-2.8683+03	-1.1237+02	-7.1161+02
72.	2	17	SEPT.	4	58	58.161	72.	17.	6.641	68.	55.	23.745	9.48330+04	-2.8798+03	-3.1842+02	-7.1569+02
78.	2	17	SEPT.	5	39	21.807	71.	49.	6.736	68.	30.	59.038	9.48330+04	-2.8734+03	-2.2628+02	-7.0841+02
84.	2	17	SEPT.	6	24	39.485	71.	25.	44.915	68.	11.	15.316	9.48330+04	-2.8678+03	-1.4998+02	-7.1745+02
90.	2	17	SEPT.	7	10	5.971	71.	12.	54.347	68.	1.	29.824	9.48330+04	-2.8722+03	-1.1397+02	-6.9928+02
98.	2	17	SEPT.	8	4	41.025	71.	18.	25.702	68.	9.	33.778	9.48330+04	-2.8704+03	-1.4720+02	-7.0950+02

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUNCH - Continued

(H) LUNAR ORBIT INSERTION BURN INITIATION - CONCLUDED

LAZ	OPP	ALTS	LATS	LONS	VRS	PTR	AZR
			SELENOGRAPHIC POLAR COORDINATES				
72.	1	8.3830+01	-1.0606+00	-1.6906+02	8.35350+03	-9.5801+00	-8.6096+01
78.	1	8.2877+01	-8.2077-01	-1.6897+02	8.35472+03	-9.3260+00	-8.6960+01
84.	1	8.2737+01	-6.2804-01	-1.6872+02	8.35514+03	-9.2333+00	-8.7673+01
90.	1	8.4314+01	-5.4537-01	-1.6788+02	8.35075+03	-9.6204+00	-8.8034+01
98.	1	8.2665+01	-6.1679-01	-1.6872+02	8.35614+03	-9.2332+00	-8.7714+01
72.	2	8.2699+01	-1.1728+00	-1.6990+02	8.35999+03	-9.2629+00	-8.5643+01
78.	2	8.2131+01	-9.1968-01	-1.6946+02	8.35884+03	-9.1924+00	-8.6569+01
84.	2	8.2793+01	-7.1629-01	-1.6885+02	8.35586+03	-9.2889+00	-8.7336+01
90.	2	8.1698+01	-6.1202-01	-1.6893+02	8.35976+03	-9.1204+00	-8.7696+01
98.	2	8.2068+01	-7.0539-01	-1.6901+02	8.35914+03	-9.1984+00	-8.7363+01

(I) LUNAR ORBIT INSERTION BURN TERMINATION

LAZ	OPP	** DAY	G.M.T. MONTH	HRS	MINS	SECS **	G.E.T. HRS	MINS	SECS **	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	17	SEPT.	3	25	43.976	70.	43.	52.458	3.7961+02	7.07000+04	2.4133+04	2.9725+03	2.8504+00
78.	1	17	SEPT.	4	8	18.139	70.	18.	3.067	3.7841+02	7.07760+04	2.4057+04	2.9616+03	1.9530+00
84.	1	17	SEPT.	4	55	6.793	69.	56.	12.223	3.7791+02	7.08082+04	2.4025+04	2.9570+03	1.2134+00
90.	1	17	SEPT.	5	40	32.136	69.	43.	20.515	3.7757+02	7.08301+04	2.4003+04	2.9539+03	8.4217-01
98.	1	17	SEPT.	6	34	58.016	69.	48.	42.693	3.7795+02	7.08055+04	2.4028+04	2.9574+03	1.1709+00
72.	2	17	SEPT.	5	5	19.085	72.	23.	27.565	3.8092+02	7.06165+04	2.4217+04	2.9845+03	3.3187+00
78.	2	17	SEPT.	5	45	40.925	71.	55.	25.853	3.7912+02	7.07312+04	2.4102+04	2.9680+03	2.3574+00
84.	2	17	SEPT.	6	30	57.716	71.	32.	3.143	3.7823+02	7.07876+04	2.4045+04	2.9600+03	1.5626+00
90.	2	17	SEPT.	7	16	24.023	71.	19.	12.401	3.7805+02	7.07990+04	2.4034+04	2.9583+03	1.1872+00
98.	2	17	SEPT.	8	10	59.306	71.	24.	43.982	3.7828+02	7.07845+04	2.4049+04	2.9604+03	1.5333+00

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUNCH - Continued

(I) LUNAR ORBIT INSERTION BURN TERMINATION - CONCLUDED

LAZ	OPP	** ALTS	SELENOGRAPHIC POLAR COORDINATES LATS	LONS	VRS	PTR	AZR	** RPS	APOS
72.	1	5.8414+01	2.2227-01	1.6600+02	5.50226+03	-3.4397-01	-8.8822+01	9.9655+02	1.1088+03
78.	1	5.8668+01	2.1854-01	1.6614+02	5.50076+03	-3.5650-01	-8.8822+01	9.9678+02	1.1084+03
84.	1	5.8903+01	2.1200-01	1.6643+02	5.49938+03	-3.8382-01	-8.8821+01	9.9695+02	1.1081+03
90.	1	5.8724+01	1.9375-01	1.6731+02	5.50047+03	-3.4185-01	-8.8818+01	9.9686+02	1.1083+03
98.	1	5.8972+01	2.1214-01	1.6642+02	5.49953+03	-3.7075-01	-8.8821+01	9.9695+02	1.1081+03
72.	2	5.8841+01	2.4201-01	1.6507+02	5.49977+03	-3.4267-01	-8.8826+01	9.9698+02	1.1081+03
78.	2	5.8666+01	2.3092-01	1.6560+02	5.50062+03	-3.2570-01	-8.8824+01	9.9684+02	1.1082+03
84.	2	5.8675+01	2.1801-01	1.6627+02	5.50036+03	-3.8959-01	-8.8822+01	9.9671+02	1.1082+03
90.	2	5.8594+01	2.2231-01	1.6618+02	5.50023+03	-3.2455-01	-8.8823+01	9.9676+02	1.1076+03
98.	2	5.8568+01	2.2202-01	1.6609+02	5.50085+03	-3.2952-01	-8.8823+01	9.9673+02	1.1081+03

(J) CIRCULARIZATION BURN INITIATION

LAZ	OPP	** DAY	G.M.T. MONTH	HRS	MINS	SECS	** HRS	G.E.T. MINS	SECS	** DELTA T FROM LOI ** HRS	MINS	SECS	MASS	** CIRCULARIZATION TARGET PARAMETERS ** DRTX	DRTY	DRTZ
72.	1	17	SEPT.	7	45	16.835	75.	3.	25.317	4.	19.	32.859	7.06800+04	-1.3857+02	0.0000	0.0000
78.	1	17	SEPT.	8	27	56.558	74.	37.	41.488	4.	19.	38.421	7.07560+04	-1.3793+02	0.0000	0.0000
84.	1	17	SEPT.	9	14	51.637	74.	15.	57.064	4.	19.	44.841	7.07882+04	-1.3779+02	0.0000	0.0000
90.	1	17	SEPT.	10	0	4.872	74.	2.	53.251	4.	19.	32.736	7.08101+04	-1.3795+02	0.0000	0.0000
98.	1	17	SEPT.	10	54	37.467	74.	8.	22.144	4.	19.	39.451	7.07855+04	-1.3778+02	0.0000	0.0000
72.	2	17	SEPT.	9	24	47.706	76.	42.	56.188	4.	19.	28.623	7.05965+04	-1.3787+02	0.0000	0.0000
78.	2	17	SEPT.	10	5	7.135	76.	14.	52.062	4.	19.	26.209	7.07112+04	-1.3779+02	0.0000	0.0000
84.	2	17	SEPT.	10	50	48.898	75.	51.	54.325	4.	19.	51.182	7.07676+04	-1.3755+02	0.0000	0.0000
90.	2	17	SEPT.	11	35	29.146	75.	38.	17.523	4.	19.	5.122	7.07790+04	-1.3702+02	0.0000	0.0000
98.	2	17	SEPT.	12	30	26.875	75.	44.	11.550	4.	19.	27.569	7.07645+04	-1.3749+02	0.0000	0.0000

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUNCH - Continued

(J) CIRCULARIZATION BURN INITIATION - CONCLUDED

			SELENOGRAPHIC POLAR COORDINATES				
LAZ	OPP	ALTS	LATS	LONS	VRS	PTR	AZR
72.	1	5.8036+01	3.6656-01	1.5664+02	5.50417+03	-5.1435-03	-8.8861+01
78.	1	5.8261+01	3.7029-01	1.5641+02	5.50282+03	-1.0006-03	-8.8863+01
84.	1	5.8431+01	3.7205-01	1.5628+02	5.50177+03	-9.7208-03	-8.8864+01
90.	1	5.8349+01	3.4038-01	1.5787+02	5.50237+03	-1.4698-03	-8.8854+01
98.	1	5.8431+01	3.6675-01	1.5655+02	5.50176+03	-1.0173-02	-8.8862+01
72.	2	5.8462+01	3.8368-01	1.5580+02	5.50168+03	-1.1761-02	-8.8867+01
78.	2	5.8323+01	3.7109-01	1.5643+02	5.50234+03	1.3856-03	-8.8863+01
84.	2	5.8191+01	3.8635-01	1.5570+02	5.50282+03	6.9332-03	-8.8869+01
90.	2	5.8256+01	3.4829-01	1.5773+02	5.50194+03	-3.4574-02	-8.8857+01
98.	2	5.8218+01	3.6661-01	1.5671+02	5.50261+03	7.8651-03	-8.8862+01

(K) CIRCULARIZATION BURN TERMINATION

		**	G.M.T.			**	G.E.T.		**					
LAZ	OPP	DAY	MONTH	HRS	MINS	SECS	HRS	MINS	SECS	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	17	SEPT.	7	45	31.952	75.	3.	40.434	1.5117+01	6.97199+04	9.6105+02	1.3857+02	3.8634-06
78.	1	17	SEPT.	8	28	11.622	74.	37.	56.549	1.5062+01	6.97983+04	9.5767+02	1.3793+02	4.2515-06
84.	1	17	SEPT.	9	15	6.693	74.	16.	12.122	1.5058+01	6.98310+04	9.5716+02	1.3780+02	4.2172-06
90.	1	17	SEPT.	10	0	19.949	74.	3.	8.326	1.5075+01	6.98516+04	9.5853+02	1.3795+02	4.0862-06
98.	1	17	SEPT.	10	54	52.521	74.	8.	37.199	1.5055+01	6.98284+04	9.5705+02	1.3779+02	4.0994-06
72.	2	17	SEPT.	9	25	2.729	76.	43.	11.211	1.5024+01	6.96414+04	9.5506+02	1.3787+02	4.1008-06
78.	2	17	SEPT.	10	5	22.173	76.	15.	7.103	1.5041+01	6.97552+04	9.5606+02	1.3779+02	3.9212-06
84.	2	17	SEPT.	10	51	3.923	75.	52.	9.353	1.5027+01	6.98124+04	9.5524+02	1.3756+02	4.1174-06
90.	2	17	SEPT.	11	35	44.116	75.	38.	32.495	1.4972+01	6.98273+04	9.5170+02	1.3702+02	4.1601-06
98.	2	17	SEPT.	12	30	41.893	75.	44.	26.571	1.5020+01	6.98097+04	9.5477+02	1.3749+02	4.3331-06

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUNCH - Continued

(K) CIRCULARIZATION BURN TERMINATION - CONCLUDED

**		SELENOGRAPHIC POLAR COORDINATES					**
LAZ	OPP	ALTS	LATS	LONS	VRS	PTR	AZR
72.	1	5.8037+01	3.8198-01	1.5586+02	5.36559+03	4.9454-03	-8.8866+01
78.	1	5.8263+01	3.8563-01	1.5564+02	5.36487+03	9.0807-03	-8.8868+01
84.	1	5.8431+01	3.8736-01	1.5551+02	5.36397+03	-9.1985-06	-8.8869+01
90.	1	5.8351+01	3.5585-01	1.5709+02	5.36440+03	8.5371-03	-8.8859+01
98.	1	5.8431+01	3.8208-01	1.5578+02	5.36398+03	-4.7481-04	-8.8867+01
72.	2	5.8461+01	3.9891-01	1.5503+02	5.36381+03	-2.1411-03	-8.8872+01
78.	2	5.8325+01	3.8640-01	1.5566+02	5.36454+03	1.1453-02	-8.8868+01
84.	2	5.8195+01	4.0157-01	1.5493+02	5.36524+03	1.7220-02	-8.8874+01
90.	2	5.8250+01	3.6361-01	1.5696+02	5.36495+03	-2.5474-02	-8.8861+01
98.	2	5.8222+01	3.8190-01	1.5594+02	5.36509+03	1.8144-02	-8.8867+01

(L) LUNAR ORBIT PLANE CHANGE BURN INITIATION

**		G.M.T.					** G.E.T.			** DELTA T FROM LOI **				** LOPC TARGET PARAMETERS **		
LAZ	OPP	DAY	MONTH	HRS	MINS	SECS	HRS	MINS	SECS	HRS	MINS	SECS	MASS	DRTX	DRTY	DRTZ
72.	1	18	SEPT.	23	24	3.570	114.	42.	12.050	43.	58.	19.592	3.63649+04	0.0000	-1.6822+01	0.0000
78.	1	19	SEPT.	0	7	18.480	114.	17.	3.407	43.	59.	.341	3.64443+04	0.0000	-1.6815+01	0.0000
84.	1	19	SEPT.	0	54	11.255	113.	55.	16.683	43.	59.	4.461	3.64770+04	0.0000	-1.6810+01	0.0000
90.	1	19	SEPT.	1	39	54.660	113.	42.	43.038	43.	59.	22.523	3.64976+04	0.0000	-1.6792+01	0.0000
98.	1	19	SEPT.	2	34	2.188	113.	47.	46.865	43.	59.	4.172	3.64744+04	0.0000	-1.6809+01	0.0000
72.	2	19	SEPT.	1	3	58.207	116.	22.	6.688	43.	58.	39.123	3.62874+04	0.0000	-1.6769+01	0.0000
78.	2	19	SEPT.	1	44	29.593	115.	54.	14.521	43.	58.	48.668	3.64012+04	0.0000	-1.6716+01	0.0000
84.	2	19	SEPT.	2	29	57.237	115.	31.	2.667	43.	58.	59.524	3.64584+04	0.0000	-1.6616+01	0.0000
90.	2	19	SEPT.	3	15	16.307	115.	18.	4.687	43.	58.	52.286	3.64733+04	0.0000	-1.6448+01	0.0000
98.	2	19	SEPT.	4	9	54.514	115.	23.	39.190	43.	58.	55.208	3.64557+04	0.0000	-1.6595+01	0.0000

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUNCH - Continued

(L) LUNAR ORBIT PLANE CHANGE BURN INITIATION - CONCLUDED

LAZ	OPP	ALTS	LATS	LONS	VRS	PTR	AZR
		** SELENOGRAPHIC POLAR COORDINATES **					
72.	1	5.8063+01	7.1789-01	1.1666+02	5.36503+03	1.1280-02	-8.9068+01
78.	1	5.8306+01	7.1702-01	1.1666+02	5.36423+03	1.4555-02	-8.9068+01
84.	1	5.8428+01	7.1628-01	1.1666+02	5.36358+03	3.2875-03	-8.9067+01
90.	1	5.8395+01	7.1615-01	1.1666+02	5.36374+03	1.2981-02	-8.9068+01
98.	1	5.8426+01	7.1627-01	1.1666+02	5.36359+03	2.8819-03	-8.9068+01
72.	2	5.8447+01	7.1825-01	1.1666+02	5.36348+03	7.2975-04	-8.9068+01
78.	2	5.8378+01	7.1796-01	1.1666+02	5.36384+03	1.5915-02	-8.9069+01
84.	2	5.8272+01	7.1845-01	1.1666+02	5.36441+03	2.3177-02	-8.9070+01
90.	2	5.8127+01	7.2026-01	1.1666+02	5.36517+03	-1.7859-02	-8.9071+01
98.	2	5.8310+01	7.1869-01	1.1666+02	5.36420+03	2.3956-02	-8.9070+01

(M) LUNAR ORBIT PLANE CHANGE BURN TERMINATION

LAZ	OPP	G.M.T. DAY	MONTH	HRS	MINS	SECS	G.E.T. HRS	MINS	SECS	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	18	SEPT.	23	24	4.520	114.	42.	13.001	9.5100-01	3.63045+04	6.0388+01	1.6822+01	1.8019-01
78.	1	19	SEPT.	0	7	19.432	114.	17.	4.362	9.5444-01	3.63833+04	6.0494+01	1.6815+01	1.8014-01
84.	1	19	SEPT.	0	54	12.207	113.	55.	17.634	9.5100-01	3.64165+04	6.0531+01	1.6810+01	1.8011-01
90.	1	19	SEPT.	1	39	55.611	113.	42.	43.989	9.5100-01	3.64371+04	6.0500+01	1.6792+01	1.7991-01
98.	1	19	SEPT.	2	34	3.140	113.	47.	47.816	9.5100-01	3.64139+04	6.0521+01	1.6809+01	1.8010-01
72.	2	19	SEPT.	1	3	59.152	116.	22.	7.633	9.4414-01	3.62274+04	6.0068+01	1.6769+01	1.7967-01
78.	2	19	SEPT.	1	44	30.538	115.	54.	15.465	9.4414-01	3.63411+04	6.0067+01	1.6716+01	1.7910-01
84.	2	19	SEPT.	2	29	58.178	115.	31.	3.607	9.4070-01	3.63986+04	5.9802+01	1.6616+01	1.7800-01
90.	2	19	SEPT.	3	15	17.239	115.	18.	5.617	9.3040-01	3.64141+04	5.9221+01	1.6448+01	1.7618-01
98.	2	19	SEPT.	4	9	55.453	115.	23.	40.131	9.4070-01	3.63960+04	5.9723+01	1.6595+01	1.7779-01

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUNCH - Continued

(N) TRANSEARTH INJECTION BURN INITIATION

**		G.M.T.					** G.E.T.			** DELTA T FROM LOI **				** TEI TARGET PARAMETERS **		
LAZ	OPP	DAY	MONTH	HRS	MINS	SECS	HRS	MINS	SECS	HRS	MINS	SECS	MASS	DRTX	DRTY	DRTZ
72.	1	19	SEPT.	20	31	16.684	135.	49.	25.162	65.	5.	32.707	3.67145+04	2.7156+03	-4.7865+01	1.8422+02
78.	1	19	SEPT.	21	15	6.894	135.	24.	51.820	65.	6.	48.753	3.67938+04	2.7178+03	-4.9817+01	1.7826+02
84.	1	19	SEPT.	22	2	14.556	135.	3.	19.986	65.	7.	7.766	3.68265+04	2.7210+03	-5.1878+01	1.7176+02
90.	1	19	SEPT.	22	48	13.698	134.	51.	2.075	65.	7.	41.563	3.68471+04	2.7238+03	-5.3797+01	1.6308+02
98.	1	19	SEPT.	23	42	39.685	134.	56.	24.359	65.	7.	41.666	3.68239+04	2.7279+03	-5.5883+01	1.5569+02
72.	2	19	SEPT.	22	12	.660	137.	30.	9.139	65.	6.	41.578	3.66374+04	2.7205+03	-5.3110+01	1.8755+02
78.	2	19	SEPT.	22	52	47.370	137.	2.	32.298	65.	7.	6.448	3.67511+04	2.7232+03	-5.4695+01	1.7667+02
84.	2	19	SEPT.	23	38	31.976	136.	39.	37.400	65.	7.	34.257	3.68086+04	2.7264+03	-5.6531+01	1.6662+02
90.	2	20	SEPT.	0	24	4.548	136.	26.	52.923	65.	7.	40.526	3.68241+04	2.7311+03	-5.8414+01	1.6007+02
98.	2	20	SEPT.	1	19	4.029	136.	32.	48.702	65.	8.	4.724	3.68060+04	2.7341+03	-6.0131+01	1.5163+02

(N) TRANSEARTH INJECTION BURN INITIATION - CONCLUDED

**		SELENOGRAPHIC POLAR COORDINATES					**
LAZ	OPP	ALTS	LATS	LONS	VRS	PTR	AZR
72.	1	5.8473+01	-9.7275-01	-1.4006+02	5.36311+03	-2.5562-02	-8.9658+01
78.	1	5.8577+01	-9.6819-01	-1.4078+02	5.36307+03	-2.3948-02	-8.9647+01
84.	1	5.8700+01	-9.6301-01	-1.4158+02	5.36242+03	-1.2895-02	-8.9634+01
90.	1	5.8549+01	-9.5783-01	-1.4238+02	5.36322+03	-1.8297-02	-8.9621+01
98.	1	5.8700+01	-9.5142-01	-1.4332+02	5.36244+03	-1.2884-02	-8.9605+01
72.	2	5.8735+01	-9.6381-01	-1.4154+02	5.36223+03	-1.0900-02	-8.9633+01
78.	2	5.8516+01	-9.5903-01	-1.4227+02	5.36341+03	-2.0641-02	-8.9621+01
84.	2	5.8437+01	-9.5381-01	-1.4309+02	5.36384+03	-2.9007-02	-8.9607+01
90.	2	5.9139+01	-9.4878-01	-1.4391+02	5.36009+03	-2.0745-02	-8.9591+01
98.	2	5.8391+01	-9.4114-01	-1.4488+02	5.36410+03	-2.6706-02	-8.9577+01

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUNCH - Continued

(D) TRANSEARTH INJECTION BURN TERMINATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS **	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	19	SEPT.	20	33	32.872	135.	51.	41.351	1.3619+02	2.80566+04	8.6579+03	2.7223+03	3.3970-01
78.	1	19	SEPT.	21	17	23.458	135.	27.	8.387	1.3657+02	2.81121+04	8.6818+03	2.7241+03	3.5348-01
84.	1	19	SEPT.	22	4	31.361	135.	5.	36.786	1.3680+02	2.81294+04	8.6971+03	2.7269+03	3.6801-01
90.	1	19	SEPT.	22	50	30.683	134.	53.	19.061	1.3699+02	2.81385+04	8.7086+03	2.7292+03	3.8148-01
98.	1	19	SEPT.	23	44	56.743	134.	58.	41.420	1.3706+02	2.81107+04	8.7132+03	2.7329+03	3.9614-01
72.	2	19	SEPT.	22	14	16.790	137.	32.	25.267	1.3613+02	2.79832+04	8.6542+03	2.7275+03	3.7674-01
78.	2	19	SEPT.	22	55	4.006	137.	4.	48.934	1.3664+02	2.80647+04	8.6864+03	2.7294+03	3.8783-01
84.	2	19	SEPT.	23	40	48.943	136.	41.	54.372	1.3697+02	2.81012+04	8.7074+03	2.7321+03	4.0069-01
90.	2	20	SEPT.	0	26	21.762	136.	29.	10.136	1.3721+02	2.81010+04	8.7231+03	2.7364+03	4.1402-01
98.	2	20	SEPT.	1	21	21.287	136.	35.	5.962	1.3726+02	2.80801+04	8.7259+03	2.7390+03	4.2585-01

(D) TRANSEARTH INJECTION BURN TERMINATION - CONCLUDED

LAZ	OPP	** SELENOGRAPHIC POLAR COORDINATES ALTS	LATS	LONS	VRS	PTR	AZR **
72.	1	6.0371+01	-9.4017-01	-1.4864+02	8.07686+03	2.6621+00	-8.9855+01
78.	1	6.0560+01	-9.3508-01	-1.4938+02	8.07834+03	2.7186+00	-8.9857+01
84.	1	6.0790+01	-9.2925-01	-1.5019+02	8.08001+03	2.7812+00	-8.9860+01
90.	1	6.0734+01	-9.2325-01	-1.5100+02	8.08282+03	2.8489+00	-8.9861+01
98.	1	6.0983+01	-9.1580-01	-1.5195+02	8.08528+03	2.9100+00	-8.9860+01
72.	2	6.0631+01	-9.3083-01	-1.5011+02	8.08112+03	2.6514+00	-8.9868+01
78.	2	6.0536+01	-9.2509-01	-1.5088+02	8.08379+03	2.7416+00	-8.9867+01
84.	2	6.0568+01	-9.1882-01	-1.5172+02	8.08648+03	2.8212+00	-8.9867+01
90.	2	6.1365+01	-9.1270-01	-1.5255+02	8.08666+03	2.8785+00	-8.9865+01
98.	2	6.0713+01	-9.0392-01	-1.5353+02	8.09284+03	2.9464+00	-8.9864+01

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUCNH - Continued

(P) ENTRY
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LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	** DELTA T FROM TEI ** HRS	MINS	SECS	FUEL RESERVE
72.	1	23	SEPT.	18	12	6.239	229.	30.	14.715	93.	38.	33.364	3.69028+03
78.	1	23	SEPT.	18	13	38.539	228.	23.	23.462	92.	56.	15.076	3.74540+03
84.	1	23	SEPT.	18	15	17.846	227.	16.	23.270	92.	10.	46.484	3.76259+03
90.	1	23	SEPT.	18	16	54.163	226.	19.	42.541	91.	26.	23.480	3.77169+03
98.	1	23	SEPT.	18	18	47.650	225.	32.	32.325	90.	33.	50.905	3.74402+03
72.	2	23	SEPT.	18	15	38.566	229.	33.	47.046	92.	1.	21.779	3.61728+03
78.	2	23	SEPT.	18	17	3.989	228.	26.	48.913	91.	21.	59.980	3.69834+03
84.	2	23	SEPT.	18	18	39.413	227.	19.	44.841	90.	37.	50.469	3.73460+03
90.	2	23	SEPT.	18	20	14.214	226.	23.	2.588	89.	53.	52.452	3.73443+03
98.	2	23	SEPT.	18	22	8.901	225.	35.	53.574	89.	0.	47.612	3.71362+03

(P) ENTRY - CONCLUDED
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LAZ	OPP	ALT	LAT	LON	V	PTH	AZ	INC	INMP
72.	1	6.5858+01	2.9611+01	1.6170+02	3.60465+04	-6.4000+00	8.9665+01	2.9451+01	5.1458+00
78.	1	6.5733+01	2.9622+01	1.6171+02	3.60477+04	-6.4000+00	8.9740+01	2.9461+01	5.0317+00
84.	1	6.5882+01	2.9630+01	1.6172+02	3.60474+04	-6.4000+00	8.9818+01	2.9469+01	4.9059+00
90.	1	6.5932+01	2.9637+01	1.6173+02	3.60477+04	-6.4000+00	8.9894+01	2.9475+01	4.7832+00
98.	1	6.5921+01	2.9643+01	1.6175+02	3.60484+04	-6.4000+00	8.9986+01	2.9481+01	4.6374+00
72.	2	6.5832+01	2.9631+01	1.6172+02	3.60478+04	-6.4000+00	8.9830+01	2.9469+01	4.8756+00
78.	2	6.5921+01	2.9637+01	1.6173+02	3.60478+04	-6.4000+00	8.9898+01	2.9475+01	4.7674+00
84.	2	6.5908+01	2.9642+01	1.6175+02	3.60484+04	-6.4000+00	8.9974+01	2.9480+01	4.6445+00
90.	2	6.6031+01	2.9645+01	1.6176+02	3.60484+04	-6.4000+00	9.0046+01	2.9483+01	4.5213+00
98.	2	6.5810+01	2.9645+01	1.6177+02	3.60504+04	-6.4000+00	9.0128+01	2.9483+01	4.3663+00

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUNCH - Continued

(Q) TOUCHDOWN

LAZ	OPP	** G.E.T. HRS	MINS	SECS	** ENTDT HRS	MINS	SECS **	ENTRG	LAT	LON	AZ
72.	1	229.	45.	14.715	0.	15.	.000	2.0000+03	2.4519+01	1.9500+02	1.0696+02
78.	1	228.	38.	23.462	0.	15.	.000	2.0000+03	2.4488+01	1.9500+02	1.0702+02
84.	1	227.	31.	23.270	0.	15.	.000	2.0000+03	2.4454+01	1.9500+02	1.0708+02
90.	1	226.	34.	42.541	0.	15.	.000	2.0000+03	2.4420+01	1.9500+02	1.0715+02
98.	1	225.	47.	32.325	0.	15.	.000	2.0000+03	2.4378+01	1.9500+02	1.0722+02
72.	2	229.	48.	47.046	0.	15.	.000	2.0000+03	2.4448+01	1.9500+02	1.0709+02
78.	2	228.	41.	48.913	0.	15.	.000	2.0000+03	2.4417+01	1.9500+02	1.0715+02
84.	2	227.	34.	44.841	0.	15.	.000	2.0000+03	2.4382+01	1.9500+02	1.0721+02
90.	2	226.	38.	2.588	0.	15.	.000	2.0000+03	2.4346+01	1.9500+02	1.0727+02
98.	2	225.	50.	53.574	0.	15.	.000	2.0000+03	2.4303+01	1.9500+02	1.0733+02

(R) CIRCUMLUNAR PERICYNTHION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	** DELTA T FROM TLI ** HRS	MINS	SECS
72.	1	17	SEPT.	3	22	49.660	70.	40.	58.139	68.	47.	13.054
78.	1	17	SEPT.	4	5	19.599	70.	15.	4.526	68.	24.	58.041
84.	1	17	SEPT.	4	52	6.798	69.	53.	12.225	68.	8.	42.095
90.	1	17	SEPT.	5	37	40.897	69.	40.	29.276	67.	57.	2.512
98.	1	17	SEPT.	6	31	57.918	69.	45.	42.596	68.	4.	47.732
72.	2	17	SEPT.	5	2	16.427	72.	20.	24.907	68.	58.	42.011
78.	2	17	SEPT.	5	42	38.627	71.	52.	23.556	68.	34.	15.858
84.	2	17	SEPT.	6	27	58.518	71.	29.	3.946	68.	14.	34.347
90.	2	17	SEPT.	7	13	21.214	71.	16.	9.592	68.	4.	45.068
98.	2	17	SEPT.	8	7	57.949	71.	21.	42.625	68.	12.	50.701

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUNCH - Continued

(R) CIRCUMLUNAR PERICYNTHION - CONCLUDED

LAZ	OPP	** ALTS	LATS	SELENOGRAPHIC POLAR COORDINATES LONS	VRS	PTR	AZR	** LIN
72.	1	6.0004+01	6.2081-02	1.7489+02	8.43278+03	-4.0489-05	-8.5956+01	1.7595+02
78.	1	6.0303+01	3.0525-02	1.7538+02	8.42990+03	-1.0493-04	-8.6851+01	1.7685+02
84.	1	6.0609+01	1.7187-02	1.7578+02	8.42882+03	-9.7848-05	-8.7590+01	1.7759+02
90.	1	6.0274+01	2.3259-02	1.7597+02	8.43072+03	-6.4534-05	-8.7960+01	1.7796+02
98.	1	6.0543+01	1.7024-02	1.7577+02	8.42981+03	-6.8377-05	-8.7632+01	1.7763+02
72.	2	6.0448+01	3.7177-02	1.7459+02	8.43406+03	1.6837-04	-8.5488+01	1.7548+02
78.	2	6.0216+01	2.6612-02	1.7513+02	8.43186+03	-3.4506-06	-8.6448+01	1.7644+02
84.	2	6.0402+01	2.6583-02	1.7556+02	8.43042+03	-1.4914-04	-8.7241+01	1.7724+02
90.	2	6.0129+01	1.8439-02	1.7576+02	8.43166+03	-3.3658-05	-8.7616+01	1.7761+02
98.	2	6.0126+01	2.2431-02	1.7555+02	8.43226+03	-1.0968-04	-8.7271+01	1.7727+02

(S) CIRCUMLUNAR ENTRY

LAZ	OPP	** DAY	G.M.T. MONTH	HRS	MINS	SECS	** HRS	G.E.T. MINS	SECS	** DELTA T FROM PERICYNTHION** HRS	MINS	SECS
72.	1	19	SEPT.	20	21	38.753	135.	39.	47.233	64.	58.	49.097
78.	1	19	SEPT.	21	22	47.664	135.	32.	32.593	65.	17.	28.068
84.	1	19	SEPT.	22	24	17.852	135.	25.	23.275	65.	32.	11.053
90.	1	19	SEPT.	23	16	1.823	135.	18.	50.198	65.	38.	20.922
98.	1	20	SEPT.	0	0	23.973	135.	14.	8.646	65.	28.	26.053
72.	2	19	SEPT.	21	45	32.494	137.	3.	40.976	64.	43.	16.069
78.	2	19	SEPT.	22	46	9.935	136.	55.	54.861	65.	3.	31.308
84.	2	19	SEPT.	23	47	35.557	136.	48.	40.983	65.	19.	37.041
90.	2	20	SEPT.	0	39	12.131	136.	42.	.511	65.	25.	50.919
98.	2	20	SEPT.	1	23	17.401	136.	37.	2.074	65.	15.	19.453

TABLE XIV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 14, 1969 LAUNCH - Concluded

(S) CIRCUMLUNAR ENTRY - CONCLUDED

LAZ	OPP	ALT	LAT	LON	V	PTH	AZ	INC	INMP
72.	1	6.5833+01	1.0343+01	9.1623+01	3.61342+04	-6.7127+00	4.3806+01	4.2427+01	2.0130+01
78.	1	6.5834+01	9.2622+00	7.7552+01	3.61318+04	-6.8563+00	4.5186+01	4.5551+01	2.4108+01
84.	1	6.5832+01	8.4823+00	6.3423+01	3.61299+04	-6.9305+00	4.2324+01	4.3237+01	2.7492+01
90.	1	6.5833+01	8.5157+00	5.1611+01	3.61292+04	-6.7451+00	4.0986+01	4.9553+01	2.9202+01
98.	1	6.5833+01	9.0818+00	4.0367+01	3.61301+04	-6.7843+00	4.2781+01	4.7871+01	2.7347+01
72.	2	6.5834+01	1.1337+01	7.0701+01	3.61357+04	-6.7726+00	5.1146+01	4.0205+01	1.7537+01
78.	2	6.5832+01	1.0362+01	5.7064+01	3.61331+04	-6.7337+00	4.7487+01	4.3510+01	2.1850+01
84.	2	6.5832+01	9.5796+00	4.3067+01	3.61311+04	-6.7428+00	4.4411+01	4.6356+01	2.5494+01
90.	2	6.5834+01	9.3104+00	3.0976+01	3.61302+04	-6.7603+00	4.3101+01	4.7593+01	2.7133+01
98.	2	6.5833+01	1.0002+01	1.9921+01	3.61313+04	-6.7275+00	4.4914+01	4.5937+01	2.5272+01

(T) CIRCUMLUNAR TOUCHDOWN

LAZ	OPP	G.E.T. HRS	MINS	SECS	ENTDT HRS	MINS	SECS	ENTRG	LAT	LON	AZ
72.	1	135.	54.	47.233	0.	15.	.000	2.0000+03	3.0489+01	1.1637+02	5.8853+01
78.	1	135.	47.	32.593	0.	15.	.000	2.0000+03	3.1110+01	1.0080+02	5.4803+01
84.	1	135.	40.	23.275	0.	15.	.000	2.0000+03	3.1672+01	8.5362+01	5.1434+01
90.	1	135.	33.	50.198	0.	15.	.000	2.0000+03	3.2271+01	7.3012+01	5.0043+01
98.	1	135.	29.	8.646	0.	15.	.000	2.0000+03	3.2012+01	6.2650+01	5.2218+01
72.	2	137.	18.	40.976	0.	15.	.000	2.0000+03	3.0141+01	9.6520+01	6.1934+01
78.	2	137.	10.	54.861	0.	15.	.000	2.0000+03	3.1029+01	8.1436+01	5.7737+01
84.	2	137.	3.	40.983	0.	15.	.000	2.0000+03	3.1738+01	6.6116+01	5.4172+01
90.	2	136.	57.	.511	0.	15.	.000	2.0000+03	3.2077+01	5.3447+01	5.2669+01
98.	2	136.	52.	2.074	0.	15.	.000	2.0000+03	3.1838+01	4.3276+01	5.4914+01

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH

(A) LAUNCH TIME

LAZ	DAY	MONTH	YEAR	HRS	MINS	SECS
72.	16	SEPT.	1969	7	23	24.138
76.	16	SEPT.	1969	8	17	40.730
80.	16	SEPT.	1969	9	16	58.567
83.	16	SEPT.	1969	10	4	49.132
86.	16	SEPT.	1969	10	59	2.467

(B) EARTH PARKING ORBIT INSERTION

LAZ	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS **	MASS	LAT	LON
72.	16	SEPT.	7	34	43.879	0.	11.	19.741	2.82965+05	3.2668+01	3.0566+02
76.	16	SEPT.	8	28	59.281	0.	11.	18.551	2.83621+05	3.1091+01	3.0562+02
80.	16	SEPT.	9	28	16.214	0.	11.	17.648	2.84119+05	2.9526+01	3.0549+02
83.	16	SEPT.	10	16	6.290	0.	11.	17.158	2.84388+05	2.8360+01	3.0533+02
86.	16	SEPT.	11	10	19.296	0.	11.	16.829	2.84569+05	2.7202+01	3.0512+02

(C) 3.5 MINS PRIOR TO TLI INITIATION

LAZ	** OPP	G.E.T. HRS	MINS	SECS **	ALT	LAT	LON	V	PTH	AZ
72.	1	1.	42.	18.984	1.0326+02	3.2304+01	2.9680+02	2.55680+04	-1.6977-03	9.5577+01
76.	1	1.	39.	26.869	1.0305+02	3.1076+01	2.8378+02	2.55677+04	6.3241-04	9.1655+01
80.	1	1.	36.	18.023	1.0278+02	2.9792+01	2.6979+02	2.55678+04	5.8772-03	8.7802+01
83.	1	1.	33.	45.434	1.0251+02	2.8783+01	2.5865+02	2.55684+04	1.1516-02	8.4891+01
86.	1	1.	30.	52.629	1.0209+02	2.7590+01	2.4616+02	2.55700+04	1.8591-02	8.1512+01
72.	2	3.	10.	23.549	1.0325+02	3.2276+01	2.7460+02	2.55680+04	-1.0601-03	9.5760+01
76.	2	3.	7.	35.881	1.0304+02	3.1055+01	2.6199+02	2.55677+04	1.1681-03	9.2056+01
80.	2	3.	4.	30.693	1.0278+02	2.9826+01	2.4833+02	2.55678+04	6.2623-03	8.8363+01
83.	2	3.	2.	.181	1.0252+02	2.8881+01	2.3737+02	2.55684+04	1.1790-02	8.5528+01
86.	2	2.	59.	8.906	1.0212+02	2.7776+01	2.2501+02	2.55699+04	1.8778-02	8.2188+01

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Continued

(D) TRANSLUNAR INJECTION INITIATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	** DELTA T FROM EPOI ** HRS	MINS	SECS	MASS	LAT	LON	AZ
72.	1	16	SEPT.	9	9	13.122	1.	45.	48.984	1.	34.	29.242	2.80820+05	2.9839+01	3.1234+02	1.0408+02
76.	1	16	SEPT.	10	0	37.599	1.	42.	56.869	1.	31.	38.318	2.81508+05	2.9611+01	2.9936+02	9.9990+01
80.	1	16	SEPT.	10	56	46.589	1.	39.	48.023	1.	28.	30.375	2.82057+05	2.9324+01	2.8532+02	9.5914+01
83.	1	16	SEPT.	11	42	4.566	1.	37.	15.434	1.	25.	58.276	2.82380+05	2.9074+01	2.7408+02	9.2800+01
86.	1	16	SEPT.	12	33	25.096	1.	34.	22.628	1.	23.	5.739	2.82622+05	2.8765+01	2.6143+02	8.9154+01
72.	2	16	SEPT.	10	37	17.687	3.	13.	53.549	3.	2.	33.809	2.79825+05	2.9768+01	2.9012+02	1.0424+02
76.	2	16	SEPT.	11	28	46.611	3.	11.	5.881	2.	59.	47.330	2.80510+05	2.9493+01	2.7754+02	1.0036+02
80.	2	16	SEPT.	12	24	59.259	3.	8.	.693	2.	56.	43.045	2.81043+05	2.9218+01	2.6385+02	9.6460+01
83.	2	16	SEPT.	13	10	19.313	3.	5.	30.181	2.	54.	13.023	2.81341+05	2.9010+01	2.5281+02	9.3444+01
86.	2	16	SEPT.	14	1	41.373	3.	2.	38.906	2.	51.	22.077	2.81554+05	2.8776+01	2.4031+02	8.9869+01

(E) TRANSLUNAR INJECTION CUTOFF

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	DTBURN(SEC)	MASS	FUEL USED	ENERGY	PLCHNG
72.	1	16	SEPT.	9	14	21.277	1.	50.	57.139	3.0816+02	1.31405+05	1.49416+05	-4.7535-01	-1.4443+00
76.	1	16	SEPT.	10	5	46.142	1.	48.	5.412	3.0854+02	1.31905+05	1.49603+05	-4.7170-01	-1.0848+00
80.	1	16	SEPT.	11	1	55.473	1.	44.	56.906	3.0888+02	1.32288+05	1.49769+05	-4.6737-01	-7.1542-01
83.	1	16	SEPT.	11	47	13.690	1.	42.	24.558	3.0912+02	1.32495+05	1.49885+05	-4.6345-01	-4.2563-01
86.	1	16	SEPT.	12	38	34.462	1.	39.	31.994	3.0937+02	1.32620+05	1.50003+05	-4.5803-01	-9.1888-02
72.	2	16	SEPT.	10	42	23.801	3.	18.	59.663	3.0611+02	1.31399+05	1.48426+05	-4.7706-01	0.0000
76.	2	16	SEPT.	11	33	53.513	3.	16.	12.783	3.0690+02	1.31703+05	1.48808+05	-4.7318-01	0.0000
80.	2	16	SEPT.	12	30	6.787	3.	13.	9.220	3.0753+02	1.31932+05	1.49111+05	-4.6870-01	0.0000
83.	2	16	SEPT.	13	15	27.207	3.	10.	38.075	3.0789+02	1.32052+05	1.49289+05	-4.6453-01	0.0000
86.	2	16	SEPT.	14	6	49.557	3.	7.	47.090	3.0818+02	1.32125+05	1.49429+05	-4.5886-01	0.0000

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Continued

(F) TRANSLUNAR INJECTION CUTOFF - CONCLUDED

LAZ	OPP	ALT	LAT	LON	V	PTH	AZ	INMP
72.	1	1.6355+02	2.1589+01	3.3665+02	3.56213+04	6.7644+00	1.1383+02	1.4393+01
76.	1	1.6134+02	2.2885+01	3.2436+02	3.56350+04	6.5930+00	1.1064+02	1.0697+01
80.	1	1.5944+02	2.4171+01	3.1090+02	3.56475+04	6.4508+00	1.0741+02	6.9525+00
83.	1	1.5820+02	2.5153+01	3.0003+02	3.56563+04	6.3665+00	1.0491+02	4.0517+00
86.	1	1.5705+02	2.6316+01	2.8772+02	3.56656+04	6.3031+00	1.0195+02	6.1854-01
72.	2	1.5492+02	2.1365+01	3.1418+02	3.56636+04	6.2251+00	1.1529+02	1.6016+01
76.	2	1.5540+02	2.2561+01	3.0230+02	3.56638+04	6.2410+00	1.1191+02	1.1976+01
80.	2	1.5584+02	2.3816+01	2.8920+02	3.56647+04	6.2539+00	1.0848+02	7.8753+00
83.	2	1.5611+02	2.4819+01	2.7856+02	3.56661+04	6.2617+00	1.0581+02	4.6947+00
86.	2	1.5631+02	2.6045+01	2.6643+02	3.56687+04	6.2684+00	1.0262+02	9.3696-01

(F) TRANSLUNAR INJECTION CUTOFF + 2 HOURS

LAZ	OPP	** HRS	G.E.T. MINS	** SECS	ALT	LAT	LON	V	PTH	AZ
72.	1	3.	50.	57.139	1.7882+04	-3.0574+01	5.9413+01	1.41723+04	6.5033+01	9.8706+01
76.	1	3.	48.	5.412	1.7878+04	-2.8413+01	4.7373+01	1.41791+04	6.5039+01	1.0122+02
80.	1	3.	44.	56.906	1.7876+04	-2.6256+01	3.4280+01	1.41860+04	6.5047+01	1.0372+02
83.	1	3.	42.	24.558	1.7876+04	-2.4609+01	2.3757+01	1.41913+04	6.5057+01	1.0565+02
86.	1	3.	39.	31.994	1.7880+04	-2.2673+01	1.1905+01	1.41977+04	6.5073+01	1.0795+02
72.	2	5.	18.	59.663	1.7856+04	-3.1880+01	3.8107+01	1.41796+04	6.5018+01	9.7192+01
76.	2	5.	16.	12.783	1.7861+04	-2.9490+01	2.6037+01	1.41834+04	6.5029+01	9.9961+01
80.	2	5.	13.	8.220	1.7866+04	-2.7102+01	1.2941+01	1.41878+04	6.5042+01	1.0273+02
83.	2	5.	10.	38.075	1.7871+04	-2.5273+01	2.4273+00	1.41919+04	6.5054+01	1.0486+02
86.	2	5.	7.	47.090	1.7877+04	-2.3133+01	3.5060+02	1.41974+04	6.5070+01	1.0738+02

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Continued

(G) MIDCOURSE TARGETING PARAMETERS

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS **	RMP	DEMP	RAMP
72.	1	19	SEPT.	3	0	13.760	67.	36.	49.622	9.98688+02	5.78056+00	-1.79040+02
76.	1	19	SEPT.	3	29	35.222	67.	11.	54.489	9.99080+02	5.87054+00	-1.77260+02
80.	1	19	SEPT.	4	1	44.285	66.	44.	45.718	9.99351+02	5.79707+00	-1.78587+02
83.	1	19	SEPT.	4	26	7.893	66.	21.	18.761	9.99356+02	5.84598+00	-1.77565+02
86.	1	19	SEPT.	4	50	17.176	65.	51.	14.706	9.99180+02	5.90200+00	-1.76327+02
72.	2	19	SEPT.	4	33	52.950	69.	10.	28.809	9.98632+02	5.79087+00	-1.78662+02
76.	2	19	SEPT.	5	1	54.384	68.	44.	13.651	9.99158+02	5.83711+00	-1.76443+02
80.	2	19	SEPT.	5	33	30.789	68.	16.	32.220	9.99408+02	5.74601+00	-1.79366+02
83.	2	19	SEPT.	5	56	29.989	67.	51.	40.857	9.98908+02	5.81893+00	-1.77854+02
86.	2	19	SEPT.	6	19	28.321	67.	20.	25.851	9.99187+02	5.88133+00	-1.76442+02

(H) LUNAR ORBIT INSERTION BURN INITIATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS **	** DELTA T FROM TLI ** HRS	MINS	SECS	MASS	** LOI TARGET PARAMETERS ** DRTX	DRTY	DRTZ
72.	1	19	SEPT.	2	56	53.032	67.	33.	28.891	65.	42.	31.753	9.48330+04	-2.8787+03	-1.0851+02	-7.2157+02
76.	1	19	SEPT.	3	26	11.935	67.	8.	31.204	65.	20.	25.793	9.48330+04	-2.8523+03	-2.1665+01	-8.3308+02
80.	1	19	SEPT.	3	58	23.406	66.	41.	24.840	64.	55.	27.936	9.48330+04	-2.9059+03	6.6567+01	-6.7683+02
83.	1	19	SEPT.	4	22	47.485	66.	17.	58.353	64.	35.	33.796	9.48330+04	-2.9073+03	1.3395+02	-7.1242+02
86.	1	19	SEPT.	4	46	55.454	65.	47.	52.983	64.	8.	20.990	9.48330+04	-2.9049+03	2.1141+02	-7.7469+02
72.	2	19	SEPT.	4	30	34.234	69.	7.	10.094	65.	43.	10.434	9.48330+04	-2.8681+03	-1.3446+02	-7.5318+02
76.	2	19	SEPT.	4	58	35.616	68.	40.	54.885	65.	24.	42.104	9.48330+04	-2.8336+03	-4.0519+01	-8.8948+02
80.	2	19	SEPT.	5	30	1.074	68.	13.	2.505	64.	59.	54.287	9.48330+04	-2.8960+03	5.4837+01	-7.0716+02
83.	2	19	SEPT.	5	53	4.343	67.	48.	15.210	64.	37.	37.138	9.48330+04	-2.8970+03	1.2845+02	-7.3713+02
86.	2	19	SEPT.	6	16	6.381	67.	17.	3.912	64.	9.	16.825	9.48330+04	-2.9038+03	2.1257+02	-7.7393+02

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Continued

(H) LUNAR ORBIT INSERTION BURN INITIATION - CONCLUDED

			SELENOGRAPHIC POLAR COORDINATES				
LAZ	OPP	ALTS	LATS	LONS	VRS	PTR	AZR
72.	1	8.2604+01	-1.8170-01	-1.6625+02	8.36913+03	-9.3034+00	-9.2905+01
76.	1	8.7264+01	1.9618-01	-1.6435+02	8.35991+03	-1.0161+01	-9.3768+01
80.	1	8.1711+01	3.4834-01	-1.6575+02	8.38655+03	-8.9979+00	-9.4657+01
83.	1	8.3233+01	6.0579-01	-1.6478+02	8.39021+03	-9.3102+00	-9.5329+01
86.	1	8.5219+01	9.1969-01	-1.6346+02	8.39650+03	-9.7553+00	-9.6097+01
72.	2	8.3685+01	-2.3325-01	-1.6600+02	8.36424+03	-9.5347+00	-9.2645+01
76.	2	8.8966+01	1.7830-01	-1.6387+02	8.35268+03	-1.0510+01	-9.3578+01
80.	2	8.1828+01	3.2032-01	-1.6577+02	8.38416+03	-9.0357+00	-9.4539+01
83.	2	8.3481+01	6.1171-01	-1.6461+02	8.38763+03	-9.4543+00	-9.5270+01
86.	2	8.5176+01	9.2006-01	-1.6351+02	8.39520+03	-9.7441+00	-9.6109+01

(I) LUNAR ORBIT INSERTION BURN TERMINATION

		** G.M.T.					** G.E.T.			**				
LAZ	OPP	DAY	MONTH	HRS	MINS	SECS	HRS	MINS	SECS	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	19	SEPT.	3	3	12.332	67.	39.	48.194	3.7930+02	7.07197+04	2.4113+04	2.9697+03	1.1301+00
76.	1	19	SEPT.	3	32	31.437	67.	14.	50.706	3.7950+02	7.07068+04	2.4126+04	2.9715+03	2.2566-01
80.	1	19	SEPT.	4	4	44.322	66.	47.	45.753	3.8091+02	7.06170+04	2.4216+04	2.9844+03	6.9373-01
83.	1	19	SEPT.	4	29	9.710	66.	24.	20.577	3.8222+02	7.05338+04	2.4299+04	2.9963+03	1.3961+00
86.	1	19	SEPT.	4	53	19.595	65.	54.	17.127	3.8414+02	7.04119+04	2.4421+04	3.0138+03	2.2032+00
72.	2	19	SEPT.	4	36	53.391	69.	13.	29.253	3.7916+02	7.07288+04	2.4104+04	2.9684+03	1.4003+00
76.	2	19	SEPT.	5	4	54.969	68.	47.	14.236	3.7935+02	7.07163+04	2.4117+04	2.9702+03	4.2210-01
80.	2	19	SEPT.	5	36	21.685	68.	19.	23.116	3.8061+02	7.06363+04	2.4197+04	2.9816+03	5.7157-01
83.	2	19	SEPT.	5	59	26.103	67.	54.	36.971	3.8176+02	7.05633+04	2.4270+04	2.9921+03	1.3381+00
86.	2	19	SEPT.	6	22	30.393	67.	23.	27.925	3.8401+02	7.04202+04	2.4413+04	3.0127+03	2.2153+00

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Continued

(I) LUNAR ORBIT INSERTION BURN TERMINATION - CONCLUDED

LAZ	OPP	** SELENOGRAPHIC POLAR COORDINATES ALTS	LATS	LONS	VRS	PTR	AZR	** PPS	APOS
72.	1	5.8593+01	-1.5747+00	1.6879+02	5.50057+03	-3.4233-01	-9.3668+01	9.9673+02	1.1080+03
76.	1	5.8729+01	-1.4461+00	1.7077+02	5.50023+03	-4.6120-01	-9.3720+01	9.9658+02	1.1085+03
80.	1	5.9276+01	-1.5472+00	1.6919+02	5.49796+03	-3.3071-01	-9.3680+01	9.9743+02	1.1081+03
83.	1	5.9047+01	-1.4910+00	1.7009+02	5.49847+03	-4.1463-01	-9.3704+01	9.9701+02	1.1079+03
86.	1	5.8905+01	-1.4122+00	1.7131+02	5.49958+03	-3.9795-01	-9.3734+01	9.9692+02	1.1084+03
72.	2	5.8494+01	-1.5548+00	1.6906+02	5.50177+03	-3.5634-01	-9.3677+01	9.9660+02	1.1087+03
76.	2	5.8928+01	-1.4115+00	1.7128+02	5.49940+03	-3.8951-01	-9.3734+01	9.9696+02	1.1083+03
80.	2	5.9951+01	-1.5401+00	1.6919+02	5.49313+03	-7.2328-02	-9.3682+01	9.9843+02	1.1060+03
83.	2	5.8720+01	-1.4677+00	1.7030+02	5.50053+03	-3.6594-01	-9.3711+01	9.9681+02	1.1084+03
86.	2	5.8932+01	-1.4139+00	1.7127+02	5.49933+03	-3.9209-01	-9.3733+01	9.9696+02	1.1082+03

(J) CIRCULARIZATION BURN INITIATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	** DELTA T FROM LOI ** HRS	MINS	SECS	MASS	** CIRCULARIZATION TARGET PARAMETERS ** DRTX	DRTY	DRTZ
72.	1	19	SEPT.	7	22	43.909	71.	59.	19.769	4.	19.	31.575	7.06997+04	-1.3739+02	0.0000	0.0000
76.	1	19	SEPT.	7	52	44.338	71.	35.	3.607	4.	20.	12.901	7.06868+04	-1.3811+02	0.0000	0.0000
80.	1	19	SEPT.	8	23	59.099	71.	7.	.533	4.	19.	14.780	7.05970+04	-1.3850+02	0.0000	0.0000
83.	1	19	SEPT.	8	48	55.410	70.	44.	6.277	4.	19.	45.699	7.05138+04	-1.3769+02	0.0000	0.0000
86.	1	19	SEPT.	9	13	14.053	70.	14.	11.585	4.	19.	54.458	7.03919+04	-1.3805+02	0.0000	0.0000
72.	2	19	SEPT.	8	56	24.132	73.	32.	59.994	4.	19.	30.741	7.07088+04	-1.3805+02	0.0000	0.0000
76.	2	19	SEPT.	9	24	44.833	73.	7.	4.103	4.	19.	49.867	7.06963+04	-1.3800+02	0.0000	0.0000
80.	2	19	SEPT.	9	53	51.938	72.	36.	53.371	4.	17.	30.255	7.06163+04	-1.3729+02	0.0000	0.0000
83.	2	19	SEPT.	10	19	8.208	72.	14.	19.072	4.	19.	42.101	7.05433+04	-1.3802+02	0.0000	0.0000
86.	2	19	SEPT.	10	42	20.639	71.	43.	18.170	4.	19.	50.245	7.04002+04	-1.3794+02	0.0000	0.0000

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Continued

(J) CIRCULARIZATION BURN INITIATION - CONCLUDED

			SELENOGRAPHIC POLAR COORDINATES				
LAZ	OPP	ALTS	LATS	LONS	VRS	PTR	AZR
72.	1	5.8216+01	-2.0362+00	1.5915+02	5.50248+03	7.8719-03	-9.3436+01
76.	1	5.8060+01	-2.0351+00	1.5916+02	5.50365+03	-1.1787-02	-9.3438+01
80.	1	5.8929+01	-1.9291+00	1.6089+02	5.49972+03	-4.8582-02	-9.3498+01
83.	1	5.8503+01	-1.9944+00	1.5985+02	5.50125+03	-3.6287-02	-9.3463+01
86.	1	5.8402+01	-1.9375+00	1.6079+02	5.50215+03	-4.1142-03	-9.3494+01
72.	2	5.8091+01	-1.9952+00	1.5980+02	5.50381+03	-2.2444-02	-9.3462+01
76.	2	5.8446+01	-1.9241+00	1.6097+02	5.50186+03	-6.3875-03	-9.3501+01
80.	2	5.9926+01	-1.6231+00	1.6569+02	5.49324+03	-2.7144-02	-9.3648+01
83.	2	5.8293+01	-1.9508+00	1.6041+02	5.50270+03	-2.5574-03	-9.3485+01
86.	2	5.8443+01	-1.9291+00	1.6092+02	5.50182+03	-6.8493-03	-9.3499+01

(K) CIRCULARIZATION BURN TERMINATION

		** G.M.T.				** G.E.T.			**				
LAZ	OPP	DAY	MONTH	HRS	MINS	SECS	HRS	MINS	SECS	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	19	SEPT.	7	22	58.901	71.	59.	34.762	1.4993+01	6.97465+04	9.5316+02	1.3739+02	1.1636-05
76.	1	19	SEPT.	7	52	59.407	71.	35.	18.676	1.5068+01	6.97288+04	9.5800+02	1.3812+02	1.1807-05
80.	1	19	SEPT.	8	24	14.190	71.	7.	15.622	1.5089+01	6.96375+04	9.5941+02	1.3850+02	1.0921-05
83.	1	19	SEPT.	8	49	10.396	70.	44.	21.263	1.4986+01	6.95610+04	9.5274+02	1.3769+02	1.1373-05
86.	1	19	SEPT.	9	13	29.053	70.	14.	26.584	1.5000+01	6.94384+04	9.5358+02	1.3806+02	1.1041-05
72.	2	19	SEPT.	8	56	39.199	73.	33.	15.059	1.5065+01	6.97509+04	9.5787+02	1.3805+02	1.1407-05
76.	2	19	SEPT.	9	24	59.892	73.	7.	19.161	1.5058+01	6.97390+04	9.5731+02	1.3800+02	1.1033-05
80.	2	19	SEPT.	9	54	6.903	72.	37.	8.333	1.4962+01	6.96650+04	9.5136+02	1.3729+02	9.1317-06
83.	2	19	SEPT.	10	19	23.236	72.	14.	34.103	1.5031+01	6.95879+04	9.5539+02	1.3802+02	1.1080-05
86.	2	19	SEPT.	10	42	35.628	71.	43.	33.160	1.4989+01	6.94472+04	9.5293+02	1.3794+02	1.0890-05

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Continued

(K) CIRCULARIZATION BURN TERMINATION - CONCLUDED

LAZ	OPP	** SELENOGRAPHIC POLAR COORDINATES ALTS	LATS	LONS	VRS	PTR	AZR **
72.	1	5.8220+01	-2.0323+00	1.5838+02	5.36507+03	1.8122-02	-9.3409+01
76.	1	5.8060+01	-2.0814+00	1.5838+02	5.36554+03	-1.9284-03	-9.3410+01
80.	1	5.8919+01	-1.9762+00	1.6011+02	5.36127+03	-4.0211-02	-9.3471+01
83.	1	5.8497+01	-2.0407+00	1.5908+02	5.36359+03	-2.7372-02	-9.3435+01
86.	1	5.8404+01	-1.9843+00	1.6002+02	5.36409+03	5.7330-03	-9.3468+01
72.	2	5.8088+01	-2.0418+00	1.5902+02	5.36577+03	-1.2780-02	-9.3434+01
76.	2	5.8447+01	-1.9712+00	1.6020+02	5.36386+03	3.4025-03	-9.3475+01
80.	2	5.9922+01	-1.6718+00	1.6492+02	5.35598+03	-1.9138-02	-9.3626+01
83.	2	5.8295+01	-1.9976+00	1.5964+02	5.36467+03	7.4314-03	-9.3458+01
86.	2	5.8443+01	-1.9759+00	1.6015+02	5.36387+03	2.8817-03	-9.3472+01

(L) LUNAR ORBIT PLANE CHANGE BURN INITIATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS **	G.E.T. HRS	MINS	SECS	** DELTA T FROM LOI ** HRS	MINS	SECS	MASS	** LOPC TARGET PARAMETERS DRTX	DRTY	DRTZ **
72.	1	20	SEPT.	23	11	14.888	111.	47.	50.748	44.	8.	2.554	3.63925+04	0.0000	8.5094+01	0.0000
76.	1	20	SEPT.	23	40	43.945	111.	23.	3.213	44.	8.	12.507	3.63748+04	0.0000	8.5243+01	0.0000
80.	1	21	SEPT.	0	12	59.269	110.	56.	.701	44.	8.	14.948	3.62835+04	0.0000	8.5467+01	0.0000
83.	1	21	SEPT.	0	37	39.594	110.	32.	50.460	44.	8.	29.882	3.62070+04	0.0000	8.5393+01	0.0000
86.	1	21	SEPT.	1	2	16.510	110.	3.	14.039	44.	8.	56.912	3.60844+04	0.0000	8.5406+01	0.0000
72.	2	21	SEPT.	0	45	7.056	113.	21.	42.917	44.	8.	13.664	3.63969+04	0.0000	8.5446+01	0.0000
76.	2	21	SEPT.	1	13	50.906	112.	56.	10.173	44.	8.	55.937	3.63850+04	0.0000	8.5405+01	0.0000
80.	2	21	SEPT.	1	44	31.138	112.	27.	32.570	44.	8.	9.455	3.63110+04	0.0000	8.6006+01	0.0000
83.	2	21	SEPT.	2	8	3.233	112.	3.	14.101	44.	8.	37.130	3.62339+04	0.0000	8.6256+01	0.0000
86.	2	21	SEPT.	2	31	25.523	111.	32.	23.052	44.	8.	55.127	3.60932+04	0.0000	8.5482+01	0.0000

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Continued

(L) LUNAR ORBIT PLANE CHANGE BURN INITIATION - CONCLUDED

LAZ	OPP	** ALTS	SELENOGRAPHIC POLAR COORDINATES LATS	LONS	VRS	PTR	AZR **
72.	1	5.8540+01	-3.9382+00	9.1444+01	5.36278+03	3.0576-02	-9.0840+01
76.	1	5.8145+01	-3.9385+00	9.1445+01	5.36450+03	1.6582-02	-9.0841+01
80.	1	5.8332+01	-3.9383+00	9.1446+01	5.36382+03	-3.9784-02	-9.0843+01
83.	1	5.8199+01	-3.9397+00	9.1446+01	5.36459+03	-1.3149-02	-9.0841+01
86.	1	5.8533+01	-3.9394+00	9.1447+01	5.36280+03	1.4326-02	-9.0841+01
72.	2	5.8077+01	-3.9388+00	9.1444+01	5.36524+03	1.3543-02	-9.0844+01
76.	2	5.8535+01	-3.9389+00	9.1445+01	5.36279+03	1.0942-02	-9.0843+01
80.	2	5.9209+01	-3.9362+00	9.1446+01	5.35916+03	-6.8066-02	-9.0849+01
83.	2	5.8474+01	-3.9357+00	9.1446+01	5.36312+03	1.9905-02	-9.0851+01
86.	2	5.8526+01	-3.9390+00	9.1448+01	5.36283+03	1.0703-02	-9.0842+01

(M) LUNAR ORBIT PLANE CHANGE BURN TERMINATION

LAZ	OPP	** DAY	G.M.T. MONTH	HRS	MINS	SECS **	G.E.T. HRS	MINS	SECS **	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	20	SEPT.	23	11	19.681	111.	47.	55.541	4.7928+00	3.60879+04	3.0467+02	8.5094+01	9.1181-01
76.	1	20	SEPT.	23	40	48.744	111.	23.	8.013	4.7997+00	3.60698+04	3.0505+02	8.5243+01	9.1311-01
80.	1	21	SEPT.	0	13	4.068	110.	56.	5.500	4.7997+00	3.59785+04	3.0509+02	8.5468+01	9.1563-01
83.	1	21	SEPT.	0	37	44.378	110.	32.	55.246	4.7859+00	3.59028+04	3.0418+02	8.5394+01	9.1470-01
86.	1	21	SEPT.	1	2	21.279	110.	3.	18.811	4.7722+00	3.57812+04	3.0320+02	8.5407+01	9.1516-01
72.	2	21	SEPT.	0	45	11.869	113.	21.	47.730	4.8134+00	3.60910+04	3.0596+02	8.5446+01	9.1516-01
76.	2	21	SEPT.	1	13	55.715	112.	56.	14.983	4.8100+00	3.60793+04	3.0572+02	8.5405+01	9.1513-01
80.	2	21	SEPT.	1	44	35.971	112.	27.	37.401	4.8306+00	3.60037+04	3.0723+02	8.6006+01	9.2220-01
83.	2	21	SEPT.	2	8	8.070	112.	3.	18.935	4.8340+00	3.59264+04	3.0747+02	8.6256+01	9.2419-01
86.	2	21	SEPT.	2	31	30.297	111.	32.	27.828	4.7756+00	3.57897+04	3.0354+02	8.5482+01	9.1596-01

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Continued

(N) TRANSEARTH INJECTION BURN INITIATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	** DELTA T FROM LOI ** HRS	MINS	SECS	MASS	** TEI TARGET PARAMETERS ** DRTX	DRTY	DRTZ
72.	1	21	SEPT.	20	9	44.543	132.	44.	22.404	65.	6.	34.210	3.64979+04	2.7230+03	-2.2917+01	2.0519+02
76.	1	21	SEPT.	20	39	7.744	132.	21.	07.014	65.	6.	36.311	3.64798+04	2.7252+03	-2.3364+01	2.0123+02
80.	1	21	SEPT.	21	11	42.526	131.	54.	43.958	65.	6.	53.208	3.63885+04	2.7273+03	-2.3763+01	2.0358+02
83.	1	21	SEPT.	21	36	35.210	131.	31.	46.073	65.	7.	25.496	3.63128+04	2.7283+03	-2.3732+01	1.9870+02
86.	1	21	SEPT.	22	1	20.634	131.	2.	18.167	65.	8.	1.043	3.61912+04	2.7285+03	-2.3972+01	1.9660+02
72.	2	21	SEPT.	21	44	6.166	134.	20.	42.025	65.	7.	12.772	3.65010+04	2.7293+03	-2.3249+01	1.9881+02
76.	2	21	SEPT.	22	12	58.154	133.	55.	17.418	65.	8.	3.186	3.64893+04	2.7292+03	-2.3679+01	1.9532+02
80.	2	21	SEPT.	22	43	41.241	133.	26.	42.672	65.	7.	19.556	3.64137+04	2.7312+03	-2.4698+01	1.9901+02
83.	2	21	SEPT.	23	7	29.938	133.	2.	40.806	65.	8.	3.838	3.63364+04	2.7324+03	-2.5083+01	1.8632+02
86.	2	21	SEPT.	23	30	58.284	132.	31.	55.816	65.	8.	27.891	3.61997+04	2.7338+03	-2.4541+01	1.8550+02

(N) TRANSEARTH INJECTION BURN INITIATION - CONCLUDED

LAZ	OPP	** ALTS	SELENOGRAPHIC POLAR COORDINATES LATS	LONS	VPS	PTR	ATR **
72.	1	5.8382+01	3.1126+00	-1.3640+02	5.36198+03	-3.5808-02	-9.2434+01
76.	1	5.9077+01	3.0924+00	-1.3687+02	5.36055+03	-3.2804-02	-9.2460+01
80.	1	5.9719+01	3.0702+00	-1.3737+02	5.35745+03	1.4931-02	-9.2487+01
83.	1	5.9593+01	3.0541+00	-1.3776+02	5.35819+03	-1.2219-02	-9.2509+01
86.	1	5.9034+01	3.0371+00	-1.3812+02	5.36118+03	-2.2897-02	-9.2529+01
72.	2	5.9415+01	3.0518+00	-1.3782+02	5.35915+03	-3.7966-02	-9.2510+01
76.	2	5.9065+01	3.0304+00	-1.3830+02	5.36101+03	-2.0107-02	-9.2536+01
80.	2	5.9355+01	3.0050+00	-1.3881+02	5.35945+03	6.5438-02	-9.2562+01
83.	2	5.9024+01	2.9865+00	-1.3921+02	5.36126+03	-2.9759-02	-9.2583+01
86.	2	5.9068+01	2.9712+00	-1.3959+02	5.36101+03	-2.0477-02	-9.2605+01

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Continued

(O) TRANSEARTH INJECTION BURN TERMINATION

LAZ	OPP	DAY	G.M.T. MONTH	HRS	MINS	SECS	G.E.T. HRS	MINS	SECS	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	21	SEPT.	20	12	2.300	132.	48.	38.161	1.3576+02	2.78674+04	8.6305+03	2.7309+03	1.6263-01
76.	1	21	SEPT.	20	41	23.514	132.	23.	42.778	1.3576+02	2.78485+04	8.6313+03	2.7327+03	1.6579-01
80.	1	21	SEPT.	21	13	58.055	131.	56.	59.488	1.3553+02	2.77725+04	8.6160+03	2.7350+03	1.6878-01
83.	1	21	SEPT.	21	38	50.486	131.	34.	1.349	1.3528+02	2.77129+04	8.5999+03	2.7357+03	1.6838-01
86.	1	21	SEPT.	22	3	35.459	131.	4.	32.990	1.3482+02	2.76199+04	8.5712+03	2.7357+03	1.7002-01
72.	2	21	SEPT.	21	46	22.141	134.	22.	58.001	1.3598+02	2.78566+04	8.6443+03	2.7356+03	1.6493-01
76.	2	21	SEPT.	22	15	14.116	133.	57.	33.381	1.3596+02	2.78458+04	8.6435+03	2.7363+03	1.6793-01
80.	2	21	SEPT.	22	45	57.018	133.	28.	58.449	1.3578+02	2.77819+04	8.6318+03	2.7386+03	1.7515-01
83.	2	21	SEPT.	23	9	45.439	133.	4.	56.301	1.3550+02	2.77222+04	8.6142+03	2.7389+03	1.7782-01
86.	2	21	SEPT.	23	33	13.332	132.	34.	10.859	1.3504+02	2.76143+04	8.5854+03	2.7402+03	1.7396-01

(O) TRANSEARTH INJECTION BURN TERMINATION - CONCLUDED

LAZ	OPP	ALTS	SELENOGRAPHIC POLAR COORDINATES LATS	LONS	VRS	PTR	AZR
72.	1	6.0527+01	2.7022+00	-1.4496+02	8.08535+03	2.5039+00	-9.3032+01
76.	1	6.0770+01	2.6782+00	-1.4542+02	8.08562+03	2.5340+00	-9.3058+01
80.	1	6.1471+01	2.6532+00	-1.4590+02	8.08448+03	2.5385+00	-9.3083+01
83.	1	6.1334+01	2.6348+00	-1.4627+02	8.08604+03	2.5503+00	-9.3101+01
86.	1	6.0764+01	2.6160+00	-1.4662+02	8.08915+03	2.5507+00	-9.3119+01
72.	2	6.1132+01	2.6302+00	-1.4638+02	8.08707+03	2.5549+00	-9.3101+01
76.	2	6.0863+01	2.6047+00	-1.4686+02	8.08934+03	2.5954+00	-9.3127+01
80.	2	6.1284+01	2.5759+00	-1.4736+02	8.08934+03	2.6201+00	-9.3155+01
83.	2	6.0882+01	2.5549+00	-1.4774+02	8.09195+03	2.6430+00	-9.3175+01
86.	2	6.0937+01	2.5384+00	-1.4809+02	8.09300+03	2.6429+00	-9.3189+01

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Continued

(P) ENTRY
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LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	** DELTA T FROM TEI ** HRS	MINS	SECS	FUEL RESERVE
72.	1	25	SEPT.	20	4	43.763	228.	41.	19.621	95.	52.	41.460	3.50218+03
76.	1	25	SEPT.	20	5	40.276	227.	47.	59.544	95.	24.	16.767	3.48343+03
80.	1	25	SEPT.	20	6	42.618	226.	49.	44.045	94.	52.	44.557	3.40790+03
83.	1	25	SEPT.	20	7	30.105	226.	2.	40.970	94.	28.	39.621	3.34871+03
86.	1	25	SEPT.	20	8	17.229	225.	9.	14.762	94.	4.	41.772	3.25626+03
72.	2	25	SEPT.	20	7	43.985	228.	44.	19.845	94.	21.	21.844	3.49154+03
76.	2	25	SEPT.	20	8	39.037	227.	50.	58.305	93.	53.	24.925	3.48075+03
80.	2	25	SEPT.	20	9	37.404	226.	52.	38.830	93.	23.	40.381	3.41730+03
83.	2	25	SEPT.	20	10	22.421	226.	5.	33.284	93.	0.	35.983	3.35795+03
86.	2	25	SEPT.	20	11	6.726	225.	12.	4.253	92.	37.	53.394	3.25065+03

(P) ENTRY - CONCLUDED
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LAZ	OPP	ALT	LAT	LON	V	PTH	AZ	INC	INMP
72.	1	6.5683+01	2.6581+01	1.6408+02	3.60408+04	-6.4000+00	9.8423+01	2.7648+01	1.7484+00
76.	1	6.5843+01	2.6524+01	1.6411+02	3.60401+04	-6.4000+00	9.8491+01	2.7613+01	1.8006+00
80.	1	6.5863+01	2.6461+01	1.6413+02	3.60403+04	-6.4000+00	9.8569+01	2.7576+01	1.8553+00
83.	1	6.5860+01	2.6412+01	1.6416+02	3.60405+04	-6.4000+00	9.8629+01	2.7548+01	1.8970+00
86.	1	6.5894+01	2.6364+01	1.6418+02	3.60405+04	-6.4000+00	9.8690+01	2.7520+01	1.9362+00
72.	2	6.5908+01	2.6401+01	1.6417+02	3.60403+04	-6.4000+00	9.8662+01	2.7547+01	1.8942+00
76.	2	6.5894+01	2.6343+01	1.6419+02	3.60406+04	-6.4000+00	9.8726+01	2.7511+01	1.9466+00
80.	2	6.5886+01	2.6281+01	1.6422+02	3.60409+04	-6.4000+00	9.8795+01	2.7473+01	2.0023+00
83.	2	6.5896+01	2.6233+01	1.6424+02	3.60411+04	-6.4000+00	9.8848+01	2.7443+01	2.0445+00
86.	2	6.5938+01	2.6185+01	1.6426+02	3.60411+04	-6.4000+00	9.8902+01	2.7415+01	2.0845+00

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Continued

(Q) TOUCHDOWN
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LAZ	OPP	** G.E.T. HRS	MINS	SECS	** ENTDT HRS	MINS	SECS **	ENTRG	LAT	LON	AZ
72.	1	228.	56.	19.621	0.	15.	.000	2.0000+03	1.7523+01	1.9500+02	1.1178+02
76.	1	228.	2.	59.544	0.	15.	.000	2.0000+03	1.7442+01	1.9500+02	1.1179+02
80.	1	227.	4.	44.045	0.	15.	.000	2.0000+03	1.7350+01	1.9500+02	1.1182+02
83.	1	226.	17.	40.970	0.	15.	.000	2.0000+03	1.7280+01	1.9500+02	1.1183+02
86.	1	225.	24.	14.762	0.	15.	.000	2.0000+03	1.7209+01	1.9500+02	1.1185+02
72.	2	229.	59.	19.845	0.	15.	.000	2.0000+03	1.7254+01	1.9500+02	1.1185+02
76.	2	228.	5.	58.305	0.	15.	.000	2.0000+03	1.7173+01	1.9500+02	1.1187+02
80.	2	227.	7.	38.830	0.	15.	.000	2.0000+03	1.7087+01	1.9500+02	1.1189+02
83.	2	226.	20.	33.284	0.	15.	.000	2.0000+03	1.7020+01	1.9500+02	1.1190+02
86.	2	225.	27.	4.253	0.	15.	.000	2.0000+03	1.6953+01	1.9500+02	1.1191+02

(P) CIRCUMLUNAR PERICYNTHION
****

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	** DELTA T FROM TLI ** HRS	MINS	SECS
72.	1	19	SEPT.	3	0	11.633	67.	36.	47.493	65.	45.	50.355
76.	1	19	SEPT.	3	29	49.149	67.	12.	8.418	65.	24.	3.006
80.	1	19	SEPT.	4	1	34.688	66.	44.	36.118	64.	59.	39.215
83.	1	19	SEPT.	4	26	5.124	66.	21.	15.990	64.	38.	51.433
86.	1	19	SEPT.	4	50	22.049	65.	51.	19.581	64.	11.	47.589
72.	2	19	SEPT.	4	33	57.975	69.	10.	33.836	65.	51.	34.176
76.	2	19	SEPT.	5	2	20.602	68.	44.	39.871	65.	28.	27.090
80.	2	19	SEPT.	5	33	13.268	68.	16.	14.700	65.	3.	6.483
83.	2	19	SEPT.	5	56	25.110	67.	51.	35.975	64.	40.	57.903
86.	2	19	SEPT.	6	19	32.814	67.	20.	30.345	64.	12.	43.258

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Continued

(R) CIRCUMLUNAR PERICYNTHION - CONCLUDED

LAZ	OPP	** ALTS	LATS	SELENOGRAPHIC POLAR COORDINATES LONS	VRS	PTR	AZR	** LIN
72.	1	6.0192+01	-9.5597-01	1.7816+02	8.44368+03	7.7631-05	-9.2750+01	1.7708+02
76.	1	6.0475+01	-9.1462-01	1.7867+02	8.44862+03	1.9430-07	-9.3662+01	1.7622+02
80.	1	6.0804+01	-8.7182-01	1.7924+02	8.45600+03	1.3545-04	-9.4589+01	1.7532+02
83.	1	6.0858+01	-8.4332-01	1.7973+02	8.46436+03	9.0766-08	-9.5298+01	1.7463+02
86.	1	6.0673+01	-8.2134-01	-1.7963+02	8.47761+03	1.1137-04	-9.6112+01	1.7382+02
72.	2	6.0123+01	-9.5289-01	1.7802+02	8.44256+03	-2.7023-07	-9.2480+01	1.7734+02
76.	2	6.0268+01	-9.1167-01	1.7856+02	8.44762+03	-1.6963-07	-9.3465+01	1.7641+02
80.	2	6.0737+01	-8.7356-01	1.7915+02	8.45423+03	6.1994-05	-9.4466+01	1.7544+02
83.	2	6.0400+01	-8.4432-01	1.7966+02	8.46415+03	-4.8930-05	-9.5239+01	1.7468+02
86.	2	6.0682+01	-8.2265-01	-1.7967+02	8.47616+03	2.7694-05	-9.6123+01	1.7381+02

(S) CIRCUMLUNAR ENTRY

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	** DELTA T FROM PERICYNTHION** HRS	MINS	SECS
72.	1	21	SEPT.	20	19	22.528	132.	55.	58.390	65.	19.	13.900
76.	1	21	SEPT.	21	8	48.185	132.	51.	7.451	65.	38.	59.037
80.	1	21	SEPT.	22	2	50.053	132.	45.	51.485	66.	1.	15.366
83.	1	21	SEPT.	22	46	24.935	132.	41.	35.798	66.	20.	19.812
86.	1	21	SEPT.	23	36	6.666	132.	37.	4.196	66.	45.	44.618
72.	2	21	SEPT.	21	43	40.409	134.	20.	16.269	65.	9.	42.433
76.	2	21	SEPT.	22	32	48.680	134.	15.	7.944	65.	30.	28.077
80.	2	21	SEPT.	23	27	.556	134.	10.	1.989	65.	53.	47.289
83.	2	22	SEPT.	0	10	4.395	134.	5.	15.260	66.	13.	39.285
86.	2	22	SEPT.	1	0	19.474	134.	1.	16.005	66.	40.	45.660

TABLE XV.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 16, 1969 LAUNCH - Concluded

(S) CIRCUMLUNAR ENTRY - CONCLUDED

LAZ	OPP	ALT	LAT	LON	V	PTH	AZ	INC	INMP
72.	1	6.5833+01	1.4719+01	1.2094+02	3.61220+04	-6.6405+00	4.6551+01	4.5376+01	3.4776+01
76.	1	6.5833+01	1.3720+01	1.1038+02	3.61197+04	-6.5345+00	4.2454+01	4.9006+01	3.9721+01
80.	1	6.5832+01	1.2414+01	9.8658+01	3.61173+04	-6.6262+00	3.7815+01	5.3204+01	4.5219+01
83.	1	6.5834+01	1.1472+01	8.9377+01	3.61153+04	-6.6589+00	3.3908+01	5.6849+01	4.9848+01
86.	1	6.5832+01	1.0678+01	7.9228+01	3.61129+04	-6.5356+00	2.8838+01	6.1700+01	5.5833+01
72.	2	6.5833+01	1.5437+01	1.0022+02	3.61227+04	-6.6184+00	4.8718+01	4.3557+01	3.2761+01
76.	2	6.5832+01	1.4121+01	8.9560+01	3.61202+04	-6.6477+00	4.4344+01	4.7304+01	3.7974+01
80.	2	6.5833+01	1.2787+01	7.7902+01	3.61177+04	-6.6830+00	3.9523+01	5.1625+01	4.3711+01
83.	2	6.5834+01	1.1900+01	6.8921+01	3.61157+04	-6.6186+00	3.5399+01	5.5460+01	4.8617+01
86.	2	6.5834+01	1.0908+01	5.8667+01	3.61131+04	-6.5452+00	3.0011+01	6.0578+01	5.4959+01

(T) CIRCUMLUNAR TOUCHDOWN

LAZ	OPP	** G.E.T. HRS	MINS	SECS	** ENTDT HRS	MINS	SECS **	ENTRG	LAT	LON	AZ
72.	1	133.	10.	58.390	0.	15.	.000	2.0000+03	3.5274+01	1.4635+02	5.9257+01
76.	1	133.	6.	7.451	0.	15.	.000	2.0000+03	3.6281+01	1.3394+02	5.4370+01
80.	1	133.	0.	51.485	0.	15.	.000	2.0000+03	3.7107+01	1.1981+02	4.8602+01
83.	1	132.	56.	35.798	0.	15.	.000	2.0000+03	3.7798+01	1.0837+02	4.3725+01
86.	1	132.	52.	4.196	0.	15.	.000	2.0000+03	3.8872+01	9.5311+01	3.7455+01
72.	2	134.	35.	16.269	0.	15.	.000	2.0000+03	3.4859+01	1.2658+02	6.1908+01
76.	2	134.	30.	7.944	0.	15.	.000	2.0000+03	3.5779+01	1.1397+02	5.6604+01
80.	2	134.	25.	1.989	0.	15.	.000	2.0000+03	3.6728+01	9.9934+01	5.0681+01
83.	2	134.	20.	15.260	0.	15.	.000	2.0000+03	3.7613+01	8.8783+01	4.5631+01
86.	2	134.	16.	16.005	0.	15.	.000	2.0000+03	3.8689+01	7.5461+01	3.8942+01

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH

(A) LAUNCH TIME

LAZ	DAY	MONTH	YEAR	HRS	MINS	SECS
72.	19	SEPT.	1969	8	45	9.060
78.	19	SEPT.	1969	9	41	22.980
84.	19	SEPT.	1969	10	37	29.283
90.	19	SEPT.	1969	11	28	20.008
98.	19	SEPT.	1969	12	21	51.201

(B) EARTH PARKING ORBIT INSERTION

LAZ	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS **	MASS	LAT	LON
72.	19	SEPT.	8	56	28.802	0.	11.	19.741	2.82965+05	3.2668+01	3.0566+02
78.	19	SEPT.	9	52	41.044	0.	11.	18.064	2.83889+05	3.0307+01	3.0557+02
84.	19	SEPT.	10	48	46.313	0.	11.	17.030	2.84458+05	2.7973+01	3.0526+02
90.	19	SEPT.	11	39	36.649	0.	11.	16.641	2.84672+05	2.5672+01	3.0476+02
98.	19	SEPT.	12	33	8.326	0.	11.	17.125	2.84404+05	2.2664+01	3.0383+02

(C) 3.5 MINS PRIOR TO TLI INITIATION

LAZ	** DAY	HRS	G.E.T. MINS	SECS **	ALT	LAT	LON	V	PTH	AZ
72.	1	1.	47.	43.783	1.0235+02	2.7657+01	3.2041+02	2.55716+04	-7.0604-03	1.0818+02
78.	1	1.	44.	47.812	1.0222+02	2.6670+01	3.0696+02	2.55705+04	-8.0395-03	1.0519+02
84.	1	1.	41.	51.511	1.0218+02	2.5969+01	2.9384+02	2.55689+04	-4.9011-03	1.0340+02
90.	1	1.	39.	12.412	1.0216+02	2.5684+01	2.8218+02	2.55676+04	1.0341-03	1.0302+02
98.	1	1.	36.	28.455	1.0215+02	2.5998+01	2.7027+02	2.55663+04	1.0147-02	1.0476+02
72.	2	3.	15.	54.429	1.0232+02	2.7434+01	2.9859+02	2.55716+04	-6.5723-03	1.0853+02
78.	2	3.	13.	.342	1.0219+02	2.6419+01	2.8539+02	2.55704+04	-7.6617-03	1.0564+02
84.	2	3.	10.	4.691	1.0215+02	2.5715+01	2.7240+02	2.55639+04	-4.6508-03	1.0390+02
90.	2	3.	7.	25.189	1.0214+02	2.5428+01	2.6078+02	2.55675+04	1.1934-03	1.0353+02
98.	2	3.	4.	39.147	1.0213+02	2.5735+01	2.4877+02	2.55662+04	1.0296-02	1.0523+02

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Continued

(D) TRANSLUNAR INJECTION INITIATION

LAZ	OPP	G.M.T. DAY	MONTH	HRS	MINS	SECS	G.E.T. HRS	MINS	SECS	DELTA T FROM EPOI HRS	MINS	SECS	MASS	LAT	LON	AZ
72.	1	19	SEPT.	10	36	22.843	1.	51.	13.783	1.	39.	54.041	2.80759+05	2.2414+01	3.3421+02	1.1441+02
78.	1	19	SEPT.	11	29	40.792	1.	48.	17.812	1.	36.	59.748	2.81716+05	2.2142+01	3.2097+02	1.1136+02
84.	1	19	SEPT.	12	22	50.794	1.	45.	21.511	1.	34.	4.480	2.82319+05	2.1882+01	3.0794+02	1.0949+02
90.	1	19	SEPT.	13	11	2.420	1.	42.	42.412	1.	31.	25.771	2.82562+05	2.1694+01	2.9629+02	1.0906+02
98.	1	19	SEPT.	14	1	49.656	1.	39.	58.455	1.	28.	41.330	2.82338+05	2.1592+01	2.9425+02	1.1077+02
72.	2	19	SEPT.	12	4	33.500	3.	19.	24.439	3.	8.	4.698	2.79765+05	2.2120+01	3.1234+02	1.1467+02
78.	2	19	SEPT.	12	57	53.322	3.	16.	30.342	3.	5.	12.278	2.80721+05	2.1794+01	2.9933+02	1.1171+02
84.	2	19	SEPT.	13	51	3.974	3.	13.	34.691	3.	2.	17.661	2.81321+05	2.1519+01	2.8643+02	1.0989+02
90.	2	19	SEPT.	14	39	15.197	3.	10.	55.189	2.	59.	38.548	2.81563+05	2.1328+01	2.7481+02	1.0947+02
98.	2	19	SEPT.	15	30	.348	3.	8.	9.147	2.	56.	52.022	2.81326+05	2.1230+01	2.6267+02	1.1114+02

(E) TRANSLUNAR INJECTION CUTOFF

LAZ	OPP	G.M.T. DAY	MONTH	HRS	MINS	SECS	G.E.T. HRS	MINS	SECS	DTBURN(SEC)	MASS	FUEL USED	ENERGY	PLCHNG
72.	1	19	SEPT.	10	41	30.610	1.	56.	21.549	3.0777+02	1.31532+05	1.49227+05	-4.6621-01	-1.0940+00
78.	1	19	SEPT.	11	34	49.403	1.	53.	26.423	3.0861+02	1.32080+05	1.49636+05	-4.6451-01	-8.3154-01
84.	1	19	SEPT.	12	27	59.960	1.	50.	30.677	3.0917+02	1.32413+05	1.49906+05	-4.6346-01	-6.6273-01
90.	1	19	SEPT.	13	16	11.826	1.	47.	51.818	3.0941+02	1.32540+05	1.50022+05	-4.6319-01	-6.1699-01
98.	1	19	SEPT.	14	6	58.890	1.	45.	7.689	3.0923+02	1.32399+05	1.49938+05	-4.6403-01	-7.5457-01
72.	2	19	SEPT.	12	9	39.644	3.	24.	30.584	3.0614+02	1.31325+05	1.48441+05	-4.6695-01	0.0000
78.	2	19	SEPT.	13	3	.533	3.	21.	37.553	3.0721+02	1.31763+05	1.48958+05	-4.6516-01	0.0000
84.	2	19	SEPT.	13	56	11.852	3.	18.	42.568	3.0788+02	1.32040+05	1.49281+05	-4.6406-01	0.0000
90.	2	19	SEPT.	14	44	23.339	3.	16.	3.331	3.0814+02	1.32154+05	1.49409+05	-4.6384-01	0.0000
98.	2	19	SEPT.	15	35	8.219	3.	13.	17.018	3.0787+02	1.32049+05	1.49278+05	-4.6471-01	0.0000

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Continued

(F) TRANSLUNAR INJECTION CUTOFF - CONCLUDED

LAZ	OPP	ALT	LAT	LON	V	PTH	AZ	INMP
72.	1	1.5946+02	1.0965+01	3.5553+02	3.56404+04	6.5750+00	1.1986+02	4.2083+00
78.	1	1.5820+02	1.1757+01	3.4294+02	3.56479+04	6.4819+00	1.1737+02	1.3595+00
84.	1	1.5759+02	1.2175+01	3.3028+02	3.56515+04	6.4322+00	1.1581+02	4.6636-01
90.	1	1.5754+02	1.2152+01	3.1870+02	3.56519+04	6.4215+00	1.1540+02	1.0101+00
98.	1	1.5822+02	1.1439+01	3.0633+02	3.56478+04	6.4643+00	1.1672+02	3.2776-01
72.	2	1.5360+02	1.0548+01	3.3341+02	3.56693+04	6.2260+00	1.2103+02	5.4341+00
78.	2	1.5403+02	1.1272+01	3.2107+02	3.56682+04	6.2470+00	1.1834+02	2.3331+00
84.	2	1.5440+02	1.1668+01	3.0855+02	3.56671+04	6.2600+00	1.1664+02	3.4823-01
90.	2	1.5460+02	1.1641+01	2.9701+02	3.56662+04	6.2649+00	1.1620+02	2.4649-01
98.	2	1.5452+02	1.0939+01	2.8452+02	3.56659+04	6.2593+00	1.1762+02	1.2219+00

(F) TRANSLUNAR INJECTION CUTOFF + 2 HOURS

LAZ	OPP	** G.E.T. HRS	MINS	SECS **	ALT	LAT	LON	V	PTH	AZ
72.	1	3.	56.	21.549	1.7877+04	-3.1193+01	8.4251+01	1.41784+04	6.5038+01	8.4463+01
78.	1	3.	53.	26.423	1.7874+04	-2.9411+01	7.1276+01	1.41817+04	6.5040+01	8.6514+01
84.	1	3.	50.	30.677	1.7873+04	-2.8261+01	5.8447+01	1.41836+04	6.5041+01	8.7706+01
90.	1	3.	47.	51.818	1.7872+04	-2.7901+01	4.6836+01	1.41840+04	6.5041+01	8.7884+01
98.	1	3.	45.	7.689	1.7873+04	-2.8699+01	3.4810+01	1.41824+04	6.5039+01	8.6525+01
72.	2	5.	24.	30.584	1.7860+04	-3.1914+01	6.3297+01	1.41832+04	6.5030+01	8.2953+01
78.	2	5.	21.	37.553	1.7863+04	-2.9974+01	5.0250+01	1.41847+04	6.5035+01	8.5235+01
84.	2	5.	18.	42.568	1.7864+04	-2.8719+01	3.7386+01	1.41856+04	6.5037+01	8.6570+01
90.	2	5.	16.	3.331	1.7865+04	-2.8327+01	2.5820+01	1.41858+04	6.5038+01	8.6788+01
98.	2	5.	13.	17.018	1.7864+04	-2.9201+01	1.3779+01	1.41850+04	6.5035+01	8.5314+01

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Continued

(G) MIDCOURSE TARGETING PARAMETERS

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS **	RMP	DEMP	RAMP
72.	1	22	SEPT.	2	33	34.770	65.	48.	25.709	9.99053+02	4.00768+00	-1.76720+02
78.	1	22	SEPT.	3	18	26.068	65.	37.	3.087	9.98963+02	3.94507+00	-1.76302+02
84.	1	22	SEPT.	4	6	17.272	65.	28.	47.988	9.98809+02	3.88581+00	-1.76011+02
90.	1	22	SEPT.	4	53	4.310	65.	24.	44.301	9.98924+02	3.84163+00	-1.75989+02
98.	1	22	SEPT.	5	47	49.734	65.	25.	58.531	9.98950+02	3.80456+00	-1.76234+02
72.	2	22	SEPT.	4	5	30.854	67.	20.	21.793	9.98780+02	3.93823+00	-1.76972+02
78.	2	22	SEPT.	4	49	41.138	67.	8.	18.154	9.98892+02	3.86360+00	-1.76333+02
84.	2	22	SEPT.	5	37	7.727	66.	59.	38.443	9.98845+02	3.79959+00	-1.75964+02
90.	2	22	SEPT.	6	23	56.125	66.	55.	36.115	9.98787+02	3.75640+00	-1.75972+02
98.	2	22	SEPT.	7	18	48.194	66.	56.	56.992	9.98919+02	3.72302+00	-1.76290+02

(H) LUNAR ORBIT INSERTION BURN INITIATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS **	** DELTA T FROM TLI ** HRS	MINS	SECS	MASS	** LOI TARGET PARAMETERS ** DRTX	DRTY	DRTZ
72.	1	22	SEPT.	2	30	11.595	65.	45.	2.534	63.	48.	40.987	9.48330+04	-2.8547+03	5.1424+02	-9.1073+02
78.	1	22	SEPT.	3	15	1.762	65.	33.	38.779	63.	40.	12.357	9.48330+04	-2.8547+03	5.7100+02	-9.3976+02
84.	1	22	SEPT.	4	2	52.199	65.	25.	22.915	63.	34.	52.240	9.48330+04	-2.8535+03	6.0662+02	-9.6271+02
90.	1	22	SEPT.	4	49	38.996	65.	21.	18.987	63.	33.	27.171	9.48330+04	-2.8551+03	6.1740+02	-9.6373+02
98.	1	22	SEPT.	5	44	25.053	65.	22.	33.849	63.	37.	26.162	9.48330+04	-2.8545+03	5.9116+02	-9.4812+02
72.	2	22	SEPT.	4	2	8.165	67.	16.	59.102	63.	52.	28.520	9.48330+04	-2.8509+03	4.8978+02	-9.0878+02
78.	2	22	SEPT.	4	46	17.308	67.	4.	54.327	63.	43.	16.777	9.48330+04	-2.8491+03	5.5027+02	-9.4340+02
84.	2	22	SEPT.	5	33	43.088	66.	56.	13.802	63.	37.	31.236	9.48330+04	-2.8470+03	5.8862+02	-9.7047+02
90.	2	22	SEPT.	6	20	31.252	66.	52.	11.244	63.	36.	7.915	9.48330+04	-2.8483+03	6.0058+02	-9.7156+02
98.	2	22	SEPT.	7	15	23.971	66.	53.	32.770	63.	40.	15.753	9.48330+04	-2.8501+03	5.7200+02	-9.4884+02

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Continued

(H) LUNAR ORBIT INSERTION BURN INITIATION - CONCLUDED

LAZ	OPP	ALTS	LATS	LONS	VRS	PTR	AZF
		SELENOGRAPHIC POLAR COORDINATES					
72.	1	9.0102+01	1.8585+00	-1.6077+02	8.35187+03	-1.0736+01	-9.7453+01
78.	1	9.1056+01	2.0481+00	-1.6025+02	8.35189+03	-1.0939+01	-9.8017+01
84.	1	9.1697+01	2.1702+00	-1.5988+02	8.35202+03	-1.1094+01	-9.8371+01
90.	1	9.1902+01	2.2060+00	-1.5981+02	8.35176+03	-1.1110+01	-9.8479+01
98.	1	9.1354+01	2.1171+00	-1.6003+02	8.35113+03	-1.0999+01	-9.8218+01
72.	2	8.9355+01	1.7788+00	-1.6096+02	8.35240+03	-1.0644+01	-9.7208+01
78.	2	9.1070+01	1.9856+00	-1.6024+02	8.34989+03	-1.0959+01	-9.7810+01
84.	2	9.2015+01	2.1180+00	-1.5979+02	8.34907+03	-1.1152+01	-9.8190+01
90.	2	9.1979+01	2.1562+00	-1.5974+02	8.34953+03	-1.1155+01	-9.8309+01
98.	2	9.1317+01	2.0583+00	-1.6004+02	8.34934+03	-1.1000+01	-9.8026+01

(I) LUNAR ORBIT INSERTION BURN TERMINATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS **	G.E.T. HRS	MINS	SECS **	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	22	SEPT.	2	36	38.628	65.	51.	29.565	3.8703+02	7.02281+04	2.4605+04	3.0403+03	5.3639+00
78.	1	22	SEPT.	3	21	30.853	65.	40.	7.870	3.8909+02	7.00972+04	2.4736+04	3.0592+03	5.9571+00
84.	1	22	SEPT.	4	9	22.687	65.	31.	53.403	3.9049+02	7.00085+04	2.4825+04	3.0720+03	6.3289+00
90.	1	22	SEPT.	4	56	9.918	65.	27.	49.908	3.9092+02	6.99809+04	2.4852+04	3.0760+03	6.4426+00
98.	1	22	SEPT.	5	50	54.824	65.	29.	3.620	3.8977+02	7.00540+04	2.4779+04	3.0654+03	6.1680+00
72.	2	22	SEPT.	4	8	34.302	67.	23.	25.241	3.8614+02	7.02850+04	2.4548+04	3.0321+03	5.1071+00
78.	2	22	SEPT.	4	52	45.538	67.	11.	22.557	3.8823+02	7.01520+04	2.4681+04	3.0513+03	5.7398+00
84.	2	22	SEPT.	5	40	12.799	67.	2.	43.514	3.8971+02	7.00578+04	2.4775+04	3.0649+03	6.1408+00
90.	2	22	SEPT.	6	27	1.384	66.	58.	41.376	3.9013+02	7.00311+04	2.4802+04	3.0687+03	6.2655+00
98.	2	22	SEPT.	7	21	52.916	67.	0.	1.713	3.8894+02	7.01065+04	2.4727+04	3.0578+03	5.9673+00

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Continued

(I) LUNAR ORBIT INSERTION BURN TERMINATION - CONCLUDED

LAZ	OPP	** ALTS	SELENOGRAPHIC POLAR COORDINATES LATS	LONS	VRS	PTR	AZR	** RPS	APOS
72.	1	5.8631+01	-6.2346-01	1.7397+02	5.50158+03	-4.4022-01	-9.2248+01	9.9654+02	1.1092+03
78.	1	5.8591+01	-6.0782-01	1.7438+02	5.50186+03	-4.1798-01	-9.2253+01	9.9656+02	1.1092+03
84.	1	5.8506+01	-5.9636-01	1.7468+02	5.50240+03	-3.9080-01	-9.2256+01	9.9654+02	1.1093+03
90.	1	5.8585+01	-5.9419-01	1.7473+02	5.50195+03	-4.0309-01	-9.2257+01	9.9659+02	1.1093+03
98.	1	5.8588+01	-6.0051-01	1.7457+02	5.50190+03	-4.1337-01	-9.2255+01	9.9657+02	1.1093+03
72.	2	5.8701+01	-6.2914-01	1.7382+02	5.50083+03	-3.2427-01	-9.2247+01	9.9687+02	1.1085+03
78.	2	5.8533+01	-6.0502-01	1.7445+02	5.50220+03	-4.1507-01	-9.2254+01	9.9651+02	1.1093+03
84.	2	5.8510+01	-5.9050-01	1.7483+02	5.50242+03	-4.0354-01	-9.2258+01	9.9651+02	1.1094+03
90.	2	5.8483+01	-5.8959-01	1.7485+02	5.50257+03	-3.9183-01	-9.2258+01	9.9651+02	1.1094+03
98.	2	5.8559+01	-5.9869-01	1.7461+02	5.50207+03	-4.1391-01	-9.2256+01	9.9654+02	1.1093+03

(J) CIRCULARIZATION BURN INITIATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS **	G.E.T. HRS	MINS	SECS **	DELTA T FROM LOI ** HRS	MINS	SECS	MASS	** CIRCULARIZATION TARGET PARAMETERS ** DRTX	DRTY	DRTZ
72.	1	22	SEPT.	6	56	47.178	70.	11.	38.116	4.	20.	8.551	7.02081+04	-1.3889+02	0.0000	0.0000
78.	1	22	SEPT.	7	41	31.498	70.	0.	8.514	4.	20.	.644	7.00772+04	-1.3895+02	0.0000	0.0000
84.	1	22	SEPT.	8	29	14.752	69.	51.	45.468	4.	19.	52.065	6.99885+04	-1.4000+02	0.0000	0.0000
90.	1	22	SEPT.	9	16	5.472	69.	47.	45.461	4.	19.	55.553	6.99609+04	-1.3897+02	0.0000	0.0000
98.	1	22	SEPT.	10	10	53.922	69.	49.	2.719	4.	19.	59.099	7.00340+04	-1.3896+02	0.0000	0.0000
72.	2	22	SEPT.	8	28	.454	71.	42.	51.391	4.	19.	26.151	7.02650+04	-1.3822+02	0.0000	0.0000
78.	2	22	SEPT.	9	12	46.322	71.	31.	23.342	4.	20.	.785	7.01320+04	-1.4000+02	0.0000	0.0000
84.	2	22	SEPT.	10	0	10.034	71.	22.	40.749	4.	19.	57.235	7.00378+04	-1.4000+02	0.0000	0.0000
90.	2	22	SEPT.	10	46	54.148	71.	18.	34.137	4.	19.	52.762	7.00111+04	-1.4000+02	0.0000	0.0000
98.	2	22	SEPT.	11	41	53.459	71.	20.	2.258	4.	20.	.545	7.00865+04	-1.4000+02	0.0000	0.0000

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Continued

(J) CIRCULARIZATION BURN INITIATION - CONCLUDED

			SELENOGRAPHIC POLAR COORDINATES				
LAZ	OPP	ALTS	LATS	LONS	VRS	PTR	AZR
72.	1	5.8024+01	-9.5984-01	1.6296+02	5.50469+03	-1.8736-02	-9.2129+01
78.	1	5.8043+01	-9.2829-01	1.6382+02	5.50467+03	-1.8720-02	-9.2143+01
84.	1	5.8026+01	-8.9886-01	1.6461+02	5.50486+03	-1.5717-02	-9.2156+01
90.	1	5.8075+01	-9.0444-01	1.6447+02	5.50456+03	-1.8333-02	-9.2154+01
98.	1	5.8052+01	-9.1795-01	1.6410+02	5.50465+03	-1.8619-02	-9.2148+01
72.	2	5.8362+01	-8.8951-01	1.6484+02	5.50256+03	-6.0768-03	-9.2159+01
78.	2	5.7993+01	-9.2536-01	1.6390+02	5.50497+03	-1.5709-02	-9.2145+01
84.	2	5.7999+01	-9.0267-01	1.6451+02	5.50504+03	-1.5727-02	-9.2154+01
90.	2	5.8001+01	-8.9296-01	1.6477+02	5.50504+03	-1.5730-02	-9.2159+01
98.	2	5.8022+01	-9.1863-01	1.6408+02	5.50483+03	-1.5703-02	-9.2148+01

(K) CIRCULARIZATION BURN TERMINATION

		** G.M.T.					** G.E.T.							
LAZ	OPP	DAY	MONTH	HRS	MINS	SECS	HRS	MINS	SECS	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	22	SEPT.	6	57	2.228	70.	11.	53.167	1.5051+01	6.92513+04	9.5681+02	1.3889+02	4.9364-06
78.	1	22	SEPT.	7	41	46.526	70.	0.	23.545	1.5031+01	6.91218+04	9.5544+02	1.3895+02	4.8789-06
84.	1	22	SEPT.	8	29	29.874	69.	52.	.591	1.5123+01	6.90271+04	9.6140+02	1.4000+02	4.5791-06
90.	1	22	SEPT.	9	16	20.477	69.	48.	.468	1.5007+01	6.90069+04	9.5397+02	1.3897+02	4.7115-06
98.	1	22	SEPT.	10	11	8.942	69.	49.	17.739	1.5020+01	6.90791+04	9.5493+02	1.3896+02	4.7841-06
72.	2	22	SEPT.	8	28	15.445	71.	43.	6.384	1.4993+01	6.93120+04	9.5303+02	1.3823+02	4.4351-06
78.	2	22	SEPT.	9	13	1.476	71.	31.	38.492	1.5151+01	6.91686+04	9.6337+02	1.4000+02	4.8725-06
84.	2	22	SEPT.	10	0	25.167	71.	22.	55.883	1.5134+01	6.90757+04	9.6207+02	1.4000+02	4.7751-06
90.	2	22	SEPT.	10	47	9.276	71.	18.	49.268	1.5130+01	6.90494+04	9.6171+02	1.4000+02	4.6873-06
98.	2	22	SEPT.	11	42	8.603	71.	20.	17.398	1.5141+01	6.91238+04	9.6274+02	1.4000+02	4.8836-06

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Continued

(K) CIRCULARIZATION BURN TERMINATION - CONCLUDED

LAZ	OPP	** ALTS	SELENOGRAPHIC POLAR COORDINATES LATS	LONS	VRS	PTR	AZR **
72.	1	5.8022+01	-9.8851-01	1.6219+02	5.36581+03	-8.9851-03	-9.2116+01
78.	1	5.8041+01	-9.5712-01	1.6305+02	5.36573+03	-8.9893-03	-9.2130+01
84.	1	5.8025+01	-9.2803-01	1.6384+02	5.36487+03	-6.0323-03	-9.2143+01
90.	1	5.8073+01	-9.3336-01	1.6369+02	5.36561+03	-8.6197-03	-9.2141+01
98.	1	5.8050+01	-9.4682-01	1.6333+02	5.36570+03	-8.8942-03	-9.2135+01
72.	2	5.8363+01	-9.1846-01	1.6407+02	5.36433+03	3.7462-03	-9.2147+01
78.	2	5.7991+01	-9.5444-01	1.6312+02	5.36497+03	-5.9983-03	-9.2132+01
84.	2	5.7998+01	-9.3185-01	1.6373+02	5.36505+03	-6.0037-03	-9.2142+01
90.	2	5.8000+01	-9.2218-01	1.6399+02	5.36505+03	-6.0110-03	-9.2146+01
98.	2	5.8020+01	-9.4773-01	1.6330+02	5.36484+03	-6.0162-03	-9.2135+01

(L) LUNAR ORBIT PLANE CHANGE BURN INITIATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS **	G.E.T. HRS	MINS	SECS	** DELTA T FROM LOI ** HRS	MINS	SECS	MASS	** LOPC TARGET PARAMETERS ** DRTX	DRTY	DRTZ
72.	1	23	SEPT.	22	59	37.430	110.	14.	28.366	44.	22.	59.801	3.58973+04	0.0000	4.1265+01	0.0000
78.	1	23	SEPT.	23	44	40.183	110.	3.	17.201	44.	23.	9.331	3.57678+04	0.0000	4.1261+01	0.0000
84.	1	24	SEPT.	0	31	22.854	109.	53.	53.568	44.	22.	.165	3.56731+04	0.0000	4.1213+01	0.0000
90.	1	24	SEPT.	1	19	30.080	109.	51.	10.071	44.	23.	20.163	3.56529+04	0.0000	4.1263+01	0.0000
98.	1	24	SEPT.	2	14	8.942	109.	52.	17.740	44.	23.	14.120	3.57251+04	0.0000	4.1274+01	0.0000
72.	2	24	SEPT.	0	31	55.324	111.	46.	46.262	44.	23.	21.021	3.59580+04	0.0000	4.1282+01	0.0000
78.	2	24	SEPT.	1	14	34.611	111.	33.	11.629	44.	21.	49.072	3.58146+04	0.0000	4.1222+01	0.0000
84.	2	24	SEPT.	2	2	18.960	111.	24.	49.674	44.	22.	6.160	3.57217+04	0.0000	4.1222+01	0.0000
90.	2	24	SEPT.	2	49	8.606	111.	20.	48.596	44.	22.	7.221	3.56954+04	0.0000	4.1226+01	0.0000
98.	2	24	SEPT.	3	43	46.819	111.	21.	55.616	44.	21.	53.903	3.57698+04	0.0000	4.1234+01	0.0000

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Continued

(L) LUNAR ORBIT PLANE CHANGE BURN INITIATION - CONCLUDED

LAZ	OPP	** SELENOGRAPHIC POLAR COORDINATES ** ALTS	LATS	LONS	VRS	PTR	AZR
72.	1	5.8335+01	-2.1139+00	5.0105+01	5.36381+03	2.9154-02	-8.8949+01
78.	1	5.8349+01	-2.1139+00	5.0105+01	5.36375+03	2.8572-02	-8.8948+01
84.	1	5.8053+01	-2.1137+00	5.0105+01	5.36438+03	9.1593-03	-8.8947+01
90.	1	5.8375+01	-2.1139+00	5.0105+01	5.36365+03	2.7711-02	-8.8948+01
98.	1	5.8357+01	-2.1138+00	5.0105+01	5.36372+03	2.8363-02	-8.8948+01
72.	2	5.8696+01	-2.1140+00	5.0105+01	5.36221+03	1.6896-02	-8.8949+01
78.	2	5.8026+01	-2.1136+00	5.0105+01	5.36445+03	9.5111-03	-8.8948+01
84.	2	5.8067+01	-2.1136+00	5.0105+01	5.36434+03	1.1485-02	-8.8948+01
90.	2	5.8069+01	-2.1136+00	5.0105+01	5.36434+03	1.1516-02	-8.8948+01
98.	2	5.8033+01	-2.1136+00	5.0105+01	5.36444+03	8.2284-03	-8.8948+01

(M) LUNAR ORBIT PLANE CHANGE BURN TERMINATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS **	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	23	SEPT.	22	59	39.727	110.	14.	30.667	2.3003+00	3.57513+04	1.4605+02	4.1265+01	4.4212-01
78.	1	23	SEPT.	23	44	42.471	110.	3.	19.491	2.2900+00	3.56223+04	1.4551+02	4.1261+01	4.4208-01
84.	1	24	SEPT.	0	31	25.134	109.	53.	55.848	2.2797+00	3.55281+04	1.4496+02	4.1213+01	4.4151-01
90.	1	24	SEPT.	1	19	32.361	109.	51.	12.351	2.2797+00	3.55079+04	1.4505+02	4.1263+01	4.4211-01
98.	1	24	SEPT.	2	14	11.228	109.	52.	20.026	2.2865+00	3.55797+04	1.4538+02	4.1274+01	4.4222-01
72.	2	24	SEPT.	0	31	57.626	111.	46.	48.566	2.3037+00	3.58116+04	1.4636+02	4.1282+01	4.4243-01
78.	2	24	SEPT.	1	14	36.900	111.	33.	13.919	2.2900+00	3.56691+04	1.4557+02	4.1222+01	4.4160-01
84.	2	24	SEPT.	2	2	21.244	111.	24.	51.961	2.2865+00	3.55765+04	1.4519+02	4.1222+01	4.4161-01
90.	2	24	SEPT.	2	49	10.888	111.	20.	50.879	2.2831+00	3.55503+04	1.4509+02	4.1226+01	4.4165-01
98.	2	24	SEPT.	3	43	49.107	111.	21.	57.903	2.2865+00	3.56243+04	1.4542+02	4.1234+01	4.4173-01

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Continued

(N) TRANSEARTH INJECTION BURN INITIATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	** DELTA T FROM LOI ** HRS	MINS	SECS	MASS	** TEI TARGET PARAMETERS ** DRTX	DRTY	DRTZ
72.	1	24	SEPT.	19	43	8.626	130.	57.	59.562	65.	6.	30.001	3.61613+04	2.7234+03	-3.4414+02	1.9544+02
78.	1	24	SEPT.	20	28	26.530	130.	47.	3.549	65.	6.	55.681	3.60323+04	2.7254+03	-3.4318+02	1.8874+02
84.	1	24	SEPT.	21	14	43.439	130.	37.	14.152	65.	5.	20.753	3.59381+04	2.7290+03	-3.4205+02	1.7999+02
90.	1	24	SEPT.	22	3	49.234	130.	35.	29.226	65.	7.	39.318	3.59179+04	2.7304+03	-3.4119+02	1.7354+02
98.	1	24	SEPT.	22	58	45.474	130.	36.	54.267	65.	7.	50.647	3.59897+04	2.7338+03	-3.4006+02	1.6390+02
72.	2	24	SEPT.	21	16	8.246	132.	30.	59.182	65.	7.	33.941	3.62216+04	2.7271+03	-3.4244+02	1.8543+02
78.	2	24	SEPT.	21	58	5.811	132.	16.	42.825	65.	5.	20.272	3.60791+04	2.7303+03	-3.4135+02	1.7537+02
84.	2	24	SEPT.	22	46	10.875	132.	8.	41.590	65.	5.	58.079	3.59865+04	2.7331+03	-3.4044+02	1.6767+02
90.	2	24	SEPT.	23	33	16.705	132.	4.	56.693	65.	6.	15.320	3.59603+04	2.7360+03	-3.3930+02	1.6018+02
98.	2	25	SEPT.	0	28	9.764	132.	6.	18.561	65.	6.	16.852	3.60343+04	2.7398+03	-3.3811+02	1.5082+02

(N) TRANSEARTH INJECTION BURN INITIATION - CONCLUDED

LAZ	OPP	** ALTS	SELENOGRAPHIC POLAR COORDINATES LATS	LONS	VRS	PTR	AZR **
72.	1	5.8867+01	2.2818+00	-1.3394+02	5.36117+03	-2.5261-02	-9.1248+01
78.	1	5.8860+01	2.2657+00	-1.3468+02	5.36123+03	-2.4947-02	-9.1277+01
84.	1	5.8397+01	2.2473+00	-1.3547+02	5.36276+03	-6.2465-03	-9.1309+01
90.	1	5.8850+01	2.2294+00	-1.3626+02	5.36135+03	-2.4592-02	-9.1339+01
98.	1	5.8840+01	2.2071+00	-1.3720+02	5.36138+03	-2.5441-02	-9.1375+01
72.	2	5.8718+01	2.2493+00	-1.3541+02	5.36231+03	-1.5112-02	-9.1305+01
78.	2	5.8371+01	2.2314+00	-1.3616+02	5.36284+03	-6.7102-03	-9.1335+01
84.	2	5.8412+01	2.2122+00	-1.3697+02	5.36274+03	-8.8272-03	-9.1367+01
90.	2	5.8411+01	2.1926+00	-1.3778+02	5.36276+03	-9.0006-03	-9.1398+01
98.	2	5.8370+01	2.1686+00	-1.3875+02	5.36289+03	-5.8752-03	-9.1434+01

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Continued

(O) TRANSEARTH INJECTION BURN TERMINATION

LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS **	G.E.T. HRS	MINS	SECS **	DTBURN(SEC)	MASS	FUEL USED	DELV	PLCHNG
72.	1	24	SEPT. 19	45	24.035	131.	0.	14.969		1.3541+02	2.75529+04	8.6084+03	2.7520+03	2.4393+00
78.	1	24	SEPT. 20	30	41.519	130.	49.	18.536		1.3499+02	2.74506+04	8.5817+03	2.7534+03	2.4320+00
84.	1	24	SEPT. 21	16	58.154	130.	39.	28.865		1.3471+02	2.73738+04	8.5643+03	2.7553+03	2.4230+00
90.	1	24	SEPT. 22	6	3.952	130.	37.	43.939		1.3471+02	2.73534+04	8.5644+03	2.7571+03	2.4167+00
98.	1	24	SEPT. 23	1	.571	130.	39.	9.364		1.3510+02	2.74012+04	8.5885+03	2.7597+03	2.4079+00
72.	2	24	SEPT. 21	18	24.000	132.	33.	14.939		1.3576+02	2.75913+04	8.6303+03	2.7547+03	2.4261+00
78.	2	24	SEPT. 22	0	21.134	132.	18.	58.149		1.3532+02	2.74762+04	8.6029+03	2.7571+03	2.4174+00
84.	2	24	SEPT. 22	48	25.942	132.	10.	56.653		1.3506+02	2.73999+04	8.5866+03	2.7593+03	2.4103+00
90.	2	24	SEPT. 23	35	31.773	132.	7.	11.763		1.3507+02	2.73736+04	8.5867+03	2.7616+03	2.4015+00
98.	2	25	SEPT. 0	30	25.241	132.	8.	34.037		1.3548+02	2.74217+04	8.6127+03	2.7647+03	2.3922+00

(O) TRANSEARTH INJECTION BURN TERMINATION - CONCLUDED

LAZ	OPP	** ALTS	SELENOGRAPHIC POLAR COORDINATES LATS	LONS	VRS	PTR	AZR **
72.	1	6.0626+01	1.8620+00	-1.4247+02	8.09104+03	2.5735+00	-9.3998+01
78.	1	6.0676+01	1.8437+00	-1.4317+02	8.09251+03	2.6111+00	-9.4016+01
84.	1	6.0340+01	1.8222+00	-1.4396+02	8.09555+03	2.6825+00	-9.4035+01
90.	1	6.0822+01	1.8008+00	-1.4474+02	8.09601+03	2.7161+00	-9.4056+01
98.	1	6.0935+01	1.7728+00	-1.4571+02	8.09827+03	2.7982+00	-9.4080+01
72.	2	6.0628+01	1.8211+00	-1.4396+02	8.09459+03	2.6671+00	-9.4037+01
78.	2	6.0391+01	1.8009+00	-1.4468+02	8.09726+03	2.7352+00	-9.4055+01
84.	2	6.0501+01	1.7787+00	-1.4548+02	8.09916+03	2.7834+00	-9.4075+01
90.	2	6.0583+01	1.7554+00	-1.4630+02	8.10132+03	2.8394+00	-9.4095+01
98.	2	6.0672+01	1.7256+00	-1.4729+02	8.10413+03	2.9237+00	-9.4119+01

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNC AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Continued

(P) ENTRY
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LAZ	OPP	** G.M.T. DAY	MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	** DELTA T FROM TEI ** HRS	MINS	SECS	FUEL RESERVE
72.	1	28	SEPT.	22	19	39.007	229.	34.	29.941	98.	34.	14.972	3.18962+03
78.	1	28	SEPT.	22	20	58.788	228.	39.	35.807	97.	50.	17.271	3.08795+03
84.	1	28	SEPT.	22	22	19.953	227.	44.	50.668	97.	5.	21.803	3.01167+03
90.	1	28	SEPT.	22	23	45.888	226.	55.	25.877	96.	17.	41.938	2.99140+03
98.	1	28	SEPT.	22	25	21.680	226.	3.	30.477	95.	24.	21.113	3.03885+03
72.	2	28	SEPT.	22	22	22.576	229.	37.	13.514	97.	3.	58.575	3.22785+03
78.	2	28	SEPT.	22	23	35.910	228.	42.	12.925	96.	23.	14.776	3.11340+03
84.	2	28	SEPT.	22	24	59.868	227.	47.	30.581	95.	36.	33.929	3.03760+03
90.	2	28	SEPT.	22	26	22.769	226.	58.	2.755	94.	50.	50.993	3.01143+03
98.	2	28	SEPT.	22	27	58.522	226.	6.	7.314	93.	57.	33.278	3.05921+03

(P) ENTRY - CONCLUDED
****

LAZ	OPP	ALT	LAT	LON	V	PTH	AZ	INC	INMP
72.	1	6.5865+01	1.5311+01	1.7279+02	3.60354+04	-6.4000+00	1.2745+02	4.0000+01	1.1584+01
78.	1	6.5827+01	1.5163+01	1.7280+02	3.60359+04	-6.4000+00	1.2750+02	4.0000+01	1.1568+01
84.	1	6.5815+01	1.5012+01	1.7282+02	3.60364+04	-6.4000+00	1.2755+02	3.9999+01	1.1551+01
90.	1	6.5866+01	1.4853+01	1.7283+02	3.60366+04	-6.4000+00	1.2761+02	3.9998+01	1.1534+01
98.	1	6.6020+01	1.4675+01	1.7284+02	3.60363+04	-6.4000+00	1.2767+02	3.9996+01	1.1514+01
72.	2	6.5826+01	1.5008+01	1.7282+02	3.60363+04	-6.4000+00	1.2756+02	3.9999+01	1.1551+01
78.	2	6.5856+01	1.4871+01	1.7283+02	3.60366+04	-6.4000+00	1.2760+02	3.9998+01	1.1536+01
84.	2	6.5995+01	1.4715+01	1.7284+02	3.60363+04	-6.4000+00	1.2765+02	3.9996+01	1.1519+01
90.	2	6.5838+01	1.4564+01	1.7285+02	3.60377+04	-6.4000+00	1.2771+02	4.0001+01	1.1509+01
98.	2	6.5899+01	1.4388+01	1.7286+02	3.60380+04	-6.4000+00	1.2777+02	4.0002+01	1.1494+01

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Continued

(Q) TOUCHDOWN

LAZ	OPP	** G.E.T. HRS	MINS	SECS	** ENTDT HRS	MINS	SECS **	ENTRG	LAT	LON	AZ
72.	1	229.	49.	29.941	0.	15.	.000	2.0000+03	-5.9031+00	1.9500+02	1.2964+02
78.	1	228.	54.	35.807	0.	15.	.000	2.0000+03	-6.0576+00	1.9500+02	1.2962+02
84.	1	227.	59.	50.668	0.	15.	.000	2.0000+03	-6.2147+00	1.9500+02	1.2960+02
90.	1	227.	10.	25.877	0.	15.	.000	2.0000+03	-6.3805+00	1.9500+02	1.2957+02
98.	1	226.	18.	30.477	0.	15.	.000	2.0000+03	-6.5647+00	1.9500+02	1.2955+02
72.	2	229.	52.	13.514	0.	15.	.000	2.0000+03	-6.2196+00	1.9500+02	1.2960+02
78.	2	228.	57.	12.925	0.	15.	.000	2.0000+03	-6.3612+00	1.9500+02	1.2958+02
84.	2	228.	2.	30.581	0.	15.	.000	2.0000+03	-6.5226+00	1.9500+02	1.2955+02
90.	2	227.	13.	2.755	0.	15.	.000	2.0000+03	-6.6817+00	1.9500+02	1.2953+02
98.	2	226.	21.	7.314	0.	15.	.000	2.0000+03	-6.8647+00	1.9500+02	1.2951+02

(R) CIRCUMLUNAR PERICYNTHION

LAZ	OPP	** DAY	G.M.T. MONTH	HRS	MINS	SECS **	HRS	G.E.T. MINS	SECS	** DELTA T FROM TLI ** HRS	MINS	SECS
72.	1	22	SEPT.	2	34	1.371	65.	48.	52.309	63.	52.	30.762
78.	1	22	SEPT.	3	18	55.791	65.	37.	32.808	63.	44.	6.387
84.	1	22	SEPT.	4	6	49.445	65.	29.	20.161	63.	38.	49.486
90.	1	22	SEPT.	4	53	36.601	65.	25.	16.590	63.	37.	24.775
98.	1	22	SEPT.	5	48	20.381	65.	26.	29.179	63.	41.	21.492
72.	2	22	SEPT.	4	5	55.948	67.	20.	46.886	63.	56.	16.305
78.	2	22	SEPT.	4	50	11.872	67.	8.	48.892	63.	47.	11.342
84.	2	22	SEPT.	5	37	41.743	67.	0.	12.459	63.	41.	29.893
90.	2	22	SEPT.	6	24	29.938	66.	56.	9.929	63.	40.	5.600
98.	2	22	SEPT.	7	19	19.431	66.	57.	28.227	63.	44.	11.210

TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Continued

(R) CIRCUMLUNAR PERICYNTHION - CONCLUDED

LAZ	OPP	** ALTS	LATS	SELENOGRAPHIC POLAR COORDINATES LONS	VRS	PTR	AZR	** LIN
72.	1	6.0151+01	-5.2503-01	-1.7859+02	8.45085+03	-1.4536-07	-9.7662+01	1.7231+02
78.	1	5.9958+01	-5.6448-01	-1.7838+02	8.45456+03	-1.4499-04	-9.8254+01	1.7171+02
84.	1	5.9716+01	-5.9592-01	-1.7824+02	8.45755+03	4.5867-07	-9.8625+01	1.7134+02
90.	1	5.9827+01	-5.9978-01	-1.7818+02	8.45757+03	1.5320-07	-9.8739+01	1.7122+02
98.	1	5.9913+01	-5.7578-01	-1.7824+02	8.45492+03	3.9050-07	-9.8465+01	1.7150+02
72.	2	5.9923+01	-5.0687-01	-1.7864+02	8.44976+03	3.3534-07	-9.7406+01	1.7256+02
78.	2	5.9852+01	-5.6473-01	-1.7841+02	8.45299+03	3.3227-07	-9.8037+01	1.7193+02
84.	2	5.9682+01	-6.0380-01	-1.7825+02	8.45575+03	2.0170-07	-9.8437+01	1.7153+02
90.	2	5.9632+01	-6.0590-01	-1.7820+02	8.45627+03	1.2131-04	-9.8562+01	1.7140+02
98.	2	5.9861+01	-5.7291-01	-1.7827+02	8.45320+03	-4.3510-08	-9.8265+01	1.7170+02

(S) CIRCUMLUNAR ENTRY

LAZ	OPP	** DAY	G.M.T. MONTH	HRS	MINS	SECS	** G.E.T. HRS	MINS	SECS	** DELTA T FROM PERICYNTHION** HRS	MINS	SECS
72.	1	24	SEPT.	19	38	53.766	130.	53.	44.700	65.	4.	52.394
78.	1	24	SEPT.	20	31	19.736	130.	49.	56.754	65.	12.	23.946
84.	1	24	SEPT.	21	23	30.498	130.	46.	1.214	65.	16.	41.054
90.	1	24	SEPT.	22	11	32.611	130.	43.	12.602	65.	17.	56.015
98.	1	24	SEPT.	23	2	28.059	130.	40.	36.857	65.	14.	7.678
72.	2	24	SEPT.	21	6	50.829	132.	21.	41.763	65.	0.	54.877
78.	2	24	SEPT.	21	58	47.617	132.	17.	24.635	65.	8.	35.746
84.	2	24	SEPT.	22	50	48.745	132.	13.	19.461	65.	13.	7.006
90.	2	24	SEPT.	23	39	1.881	132.	10.	41.869	65.	14.	31.944
98.	2	25	SEPT.	0	30	12.495	132.	8.	21.292	65.	10.	53.069

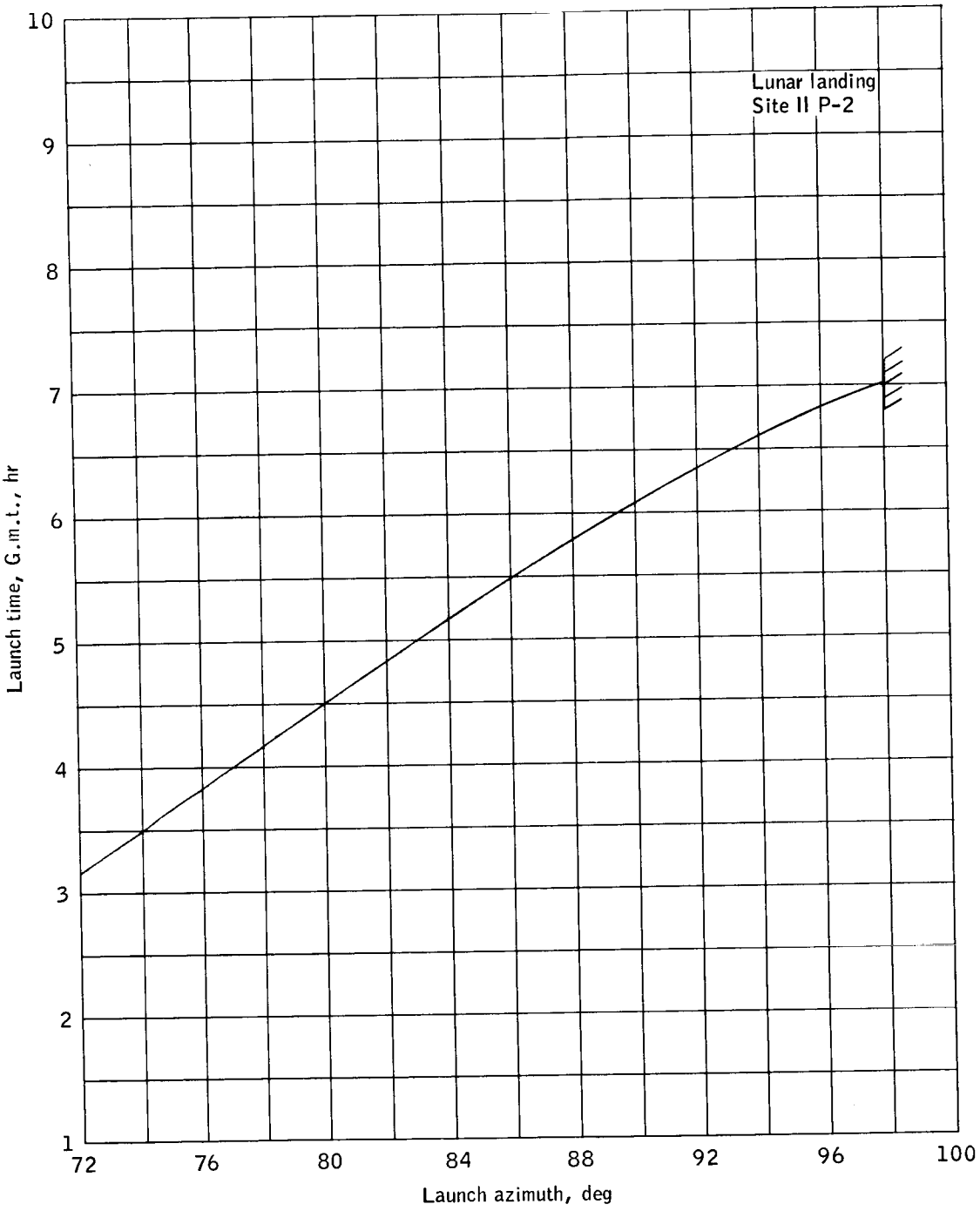
TABLE XVI.- TRAJECTORY PARAMETERS AS A FUNCTION OF LAUNCH AZIMUTH - SEPTEMBER 19, 1969 LAUNCH - Concluded

(S) CIRCUMLUNAR ENTRY - CONCLUDED

LAZ	OPP	ALT	LAT	LON	V	PTH	AZ	INC	INMP
72.	1	6.5833+01	1.7120+01	1.7058+02	3.61133+04	-6.6707+00	7.3006+01	2.3869+01	2.8459+01
78.	1	6.5832+01	1.6550+01	1.5922+02	3.61125+04	-6.1643+00	7.1335+01	2.4682+01	3.0876+01
84.	1	6.5833+01	1.6139+01	1.4715+02	3.61119+04	-5.9877+00	7.0413+01	2.5114+01	3.2251+01
90.	1	6.5834+01	1.6041+01	1.3576+02	3.61117+04	-5.9124+00	7.0499+01	2.4989+01	3.2439+01
98.	1	6.5833+01	1.6312+01	1.2278+02	3.61120+04	-6.1919+00	7.2171+01	2.3918+01	3.0702+01
72.	2	6.5833+01	1.7788+01	1.4990+02	3.61138+04	-6.3534+00	7.5349+01	2.2810+01	2.6551+01
78.	2	6.5833+01	1.6613+01	1.3678+02	3.61126+04	-6.7737+00	7.3031+01	2.3504+01	2.9081+01
84.	2	6.5833+01	1.5875+01	1.2397+02	3.61119+04	-6.9969+00	7.1803+01	2.3907+01	3.0565+01
90.	2	6.5834+01	1.6056+01	1.1348+02	3.61118+04	-6.4484+00	7.2119+01	2.3790+01	3.0787+01
98.	2	6.5832+01	1.6391+01	1.0042+02	3.61121+04	-6.7344+00	7.3818+01	2.2805+01	2.9004+01

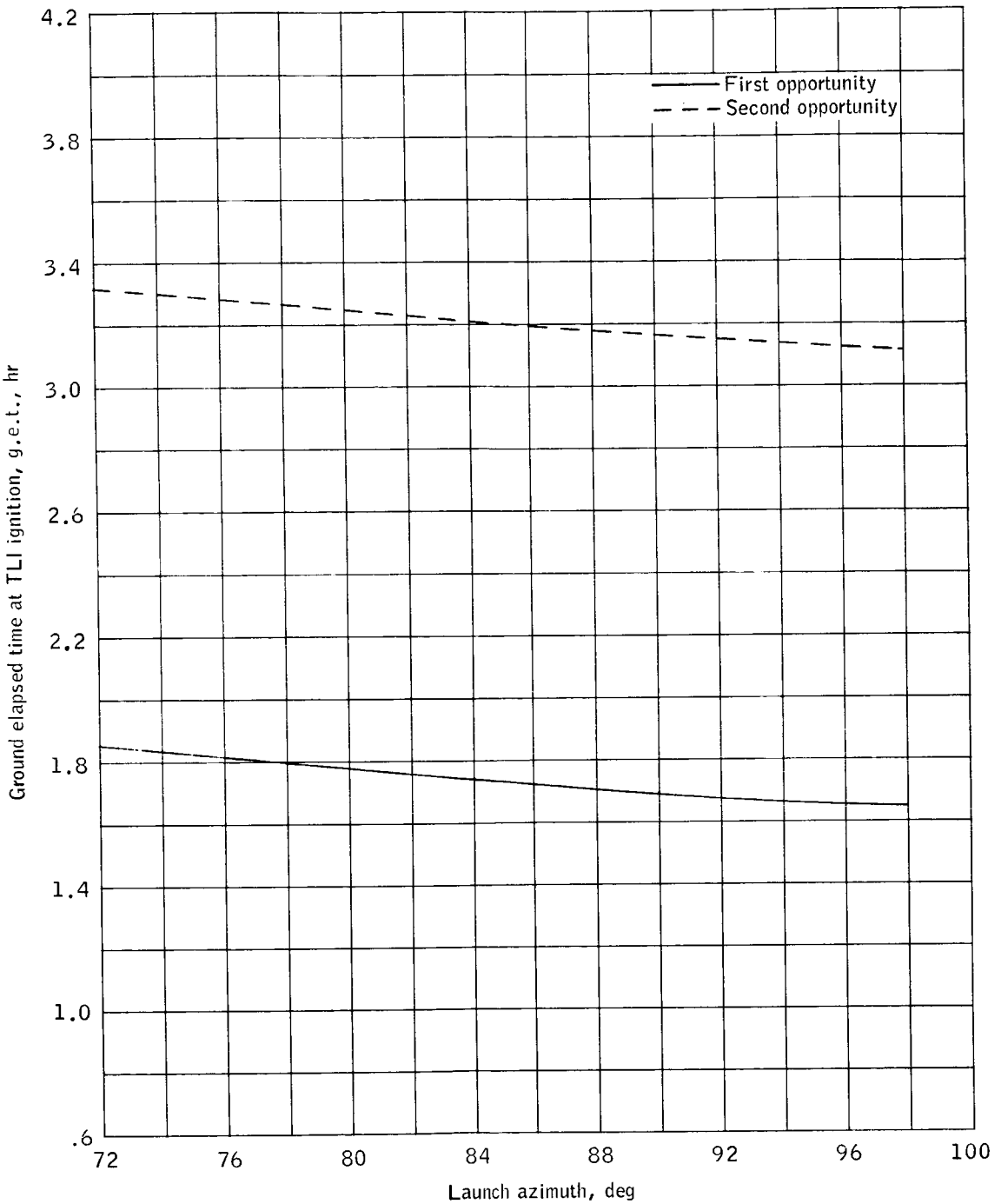
(T) CIRCUMLUNAR TOUCHDOWN

LAZ	OPP	G.E.T. HRS	MINS	SECS	ENTDT HRS	MINS	SECS	ENTRG	LAT	LON	AZ
72.	1	131.	8.	44.700	0.	15.	.000	2.0000+03	2.3522+01	2.0171+02	8.5428+01
78.	1	131.	4.	56.754	0.	15.	.000	2.0000+03	2.3970+01	1.9010+02	8.3639+01
84.	1	131.	1.	1.214	0.	15.	.000	2.0000+03	2.4135+01	1.7787+02	8.2588+01
90.	1	130.	58.	12.602	0.	15.	.000	2.0000+03	2.4008+01	1.6646+02	8.2603+01
98.	1	130.	55.	36.857	0.	15.	.000	2.0000+03	2.3318+01	1.5366+02	8.4213+01
72.	2	132.	36.	41.763	0.	15.	.000	2.0000+03	2.2781+01	1.8127+02	8.7833+01
78.	2	132.	32.	24.635	0.	15.	.000	2.0000+03	2.3093+01	1.6778+02	8.5136+01
84.	2	132.	28.	19.461	0.	15.	.000	2.0000+03	2.3160+01	1.5472+02	8.3628+01
90.	2	132.	25.	41.869	0.	15.	.000	2.0000+03	2.3136+01	1.4429+02	8.4011+01
98.	2	132.	23.	21.292	0.	15.	.000	2.0000+03	2.2480+01	1.3140+02	8.5672+01



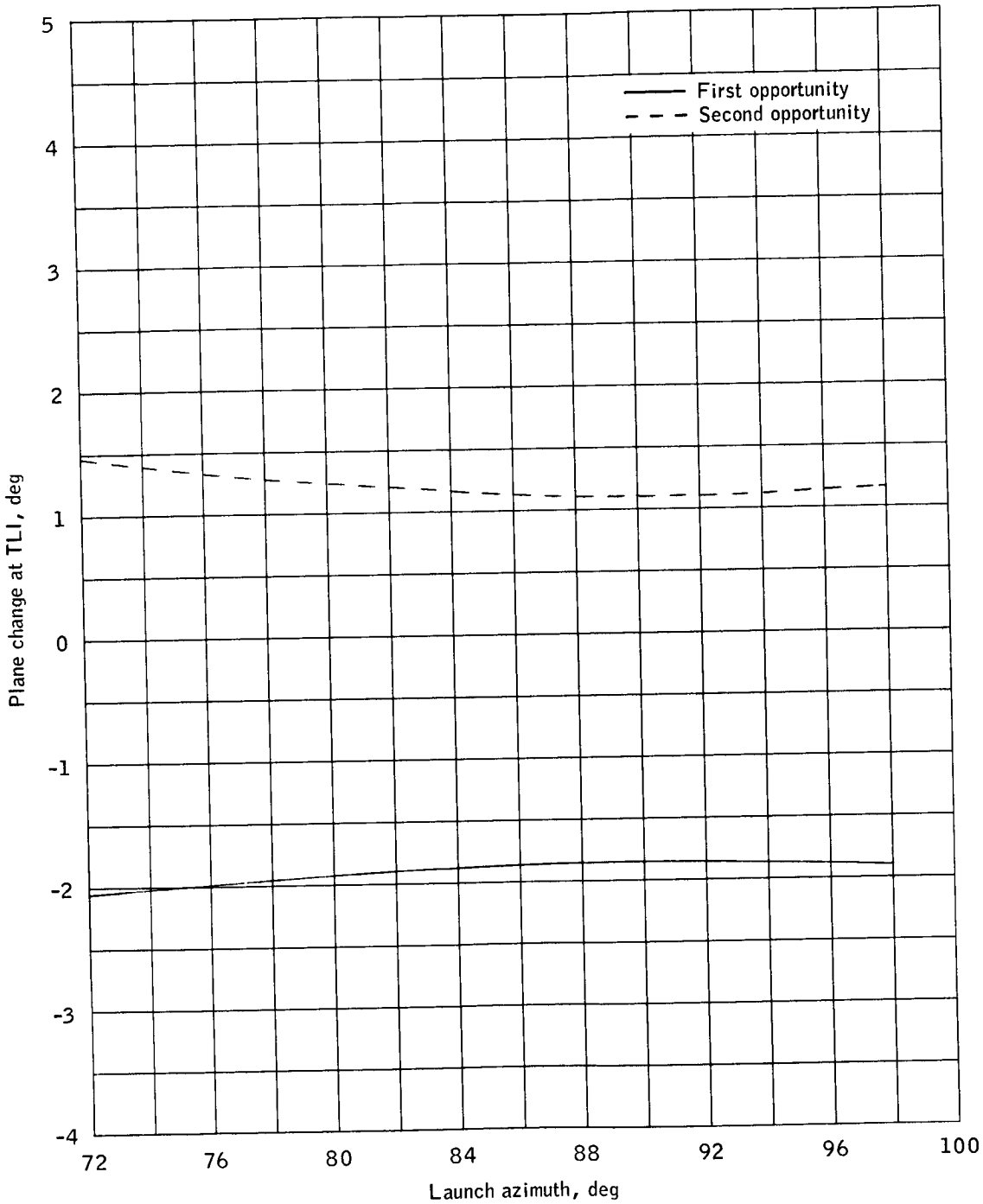
(a) Launch time.

Figure 1 .- Trajectory parameters as a function of launch azimuth for lift-off on September 13, 1969.



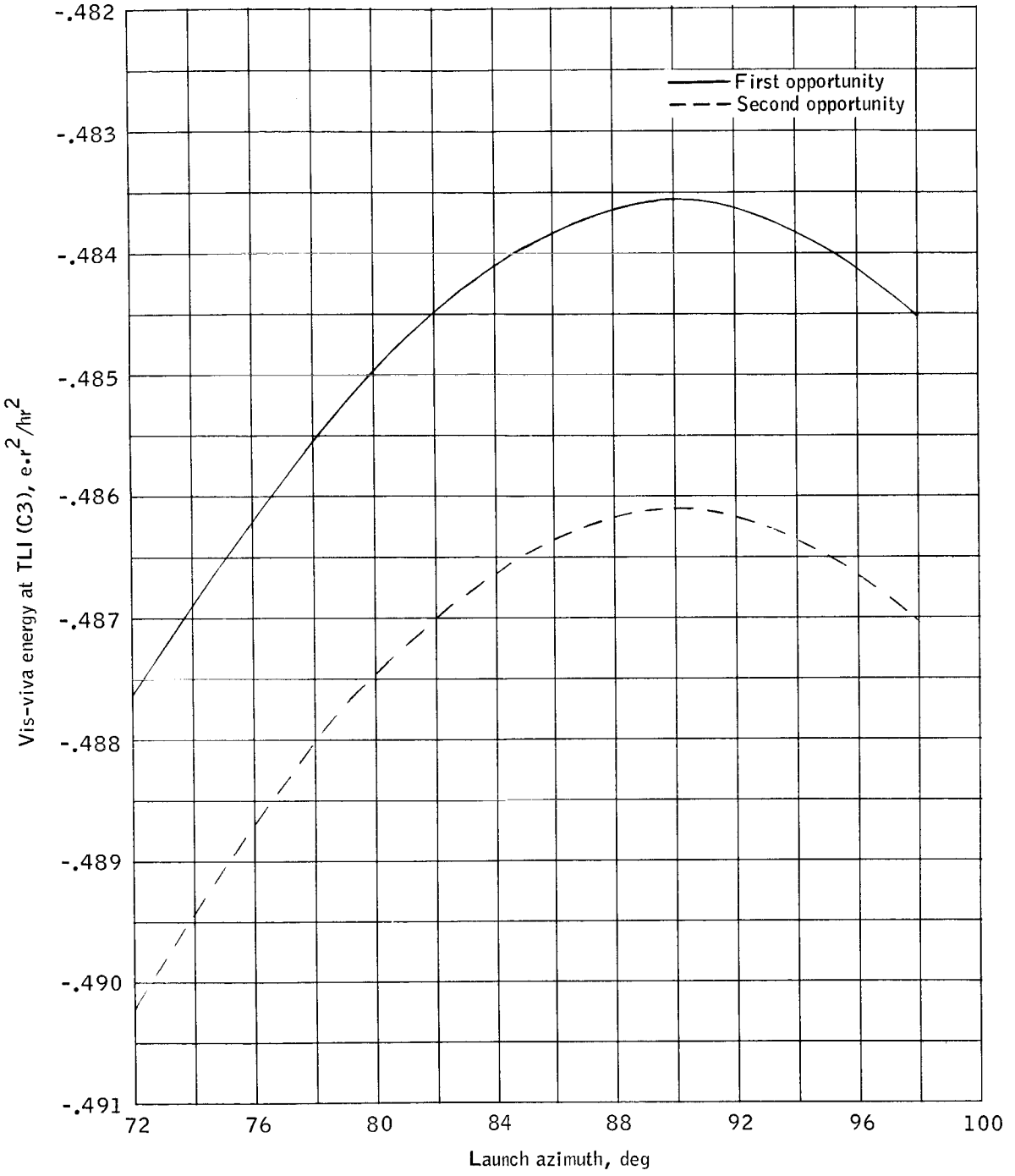
(b) Ground elapsed time at TLI ignition.

Figure 1.- Continued.



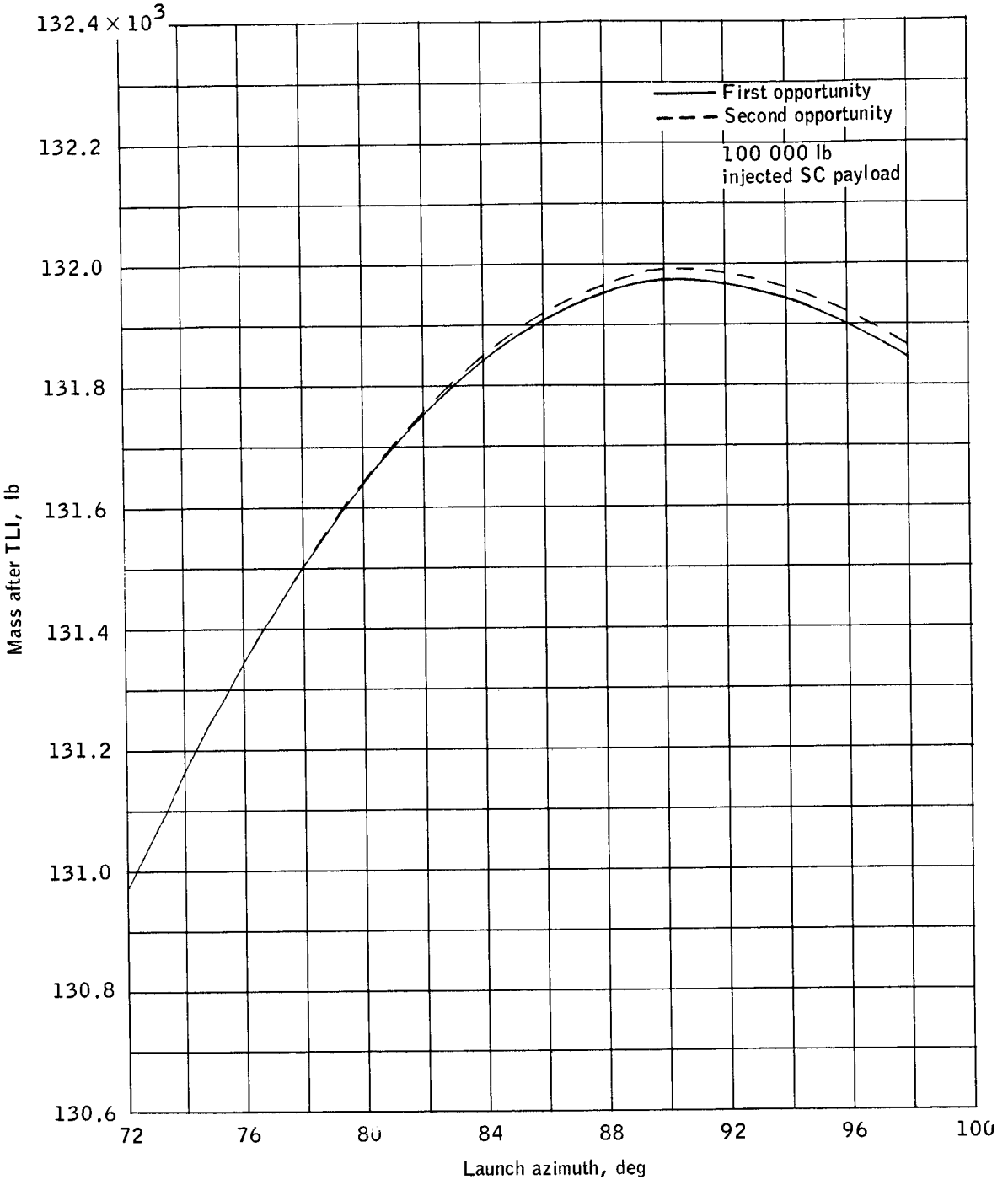
(c) TLI plane change.

Figure 1.- Continued.



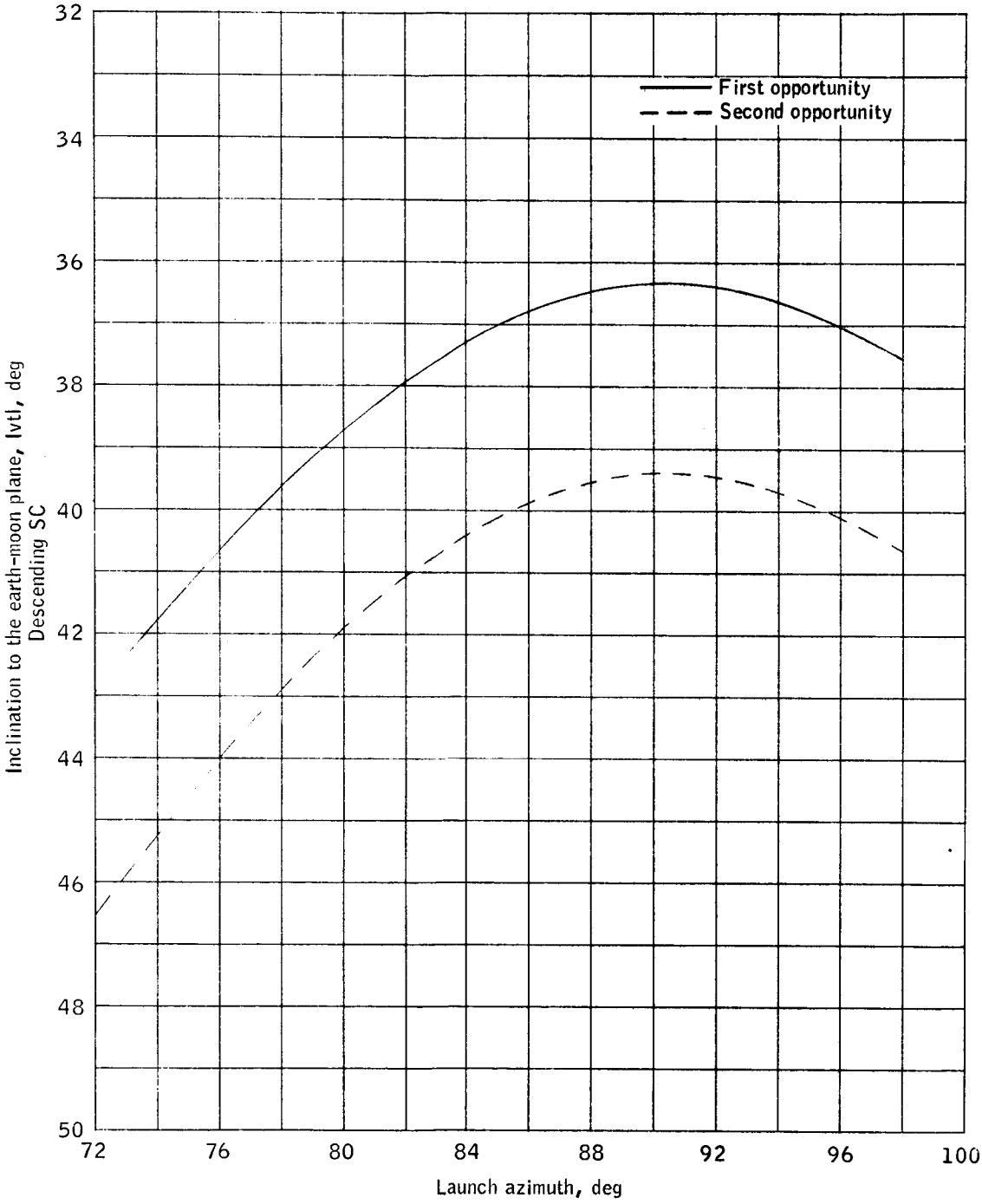
(d) Required energy at TLI termination.

Figure 1.- Continued.



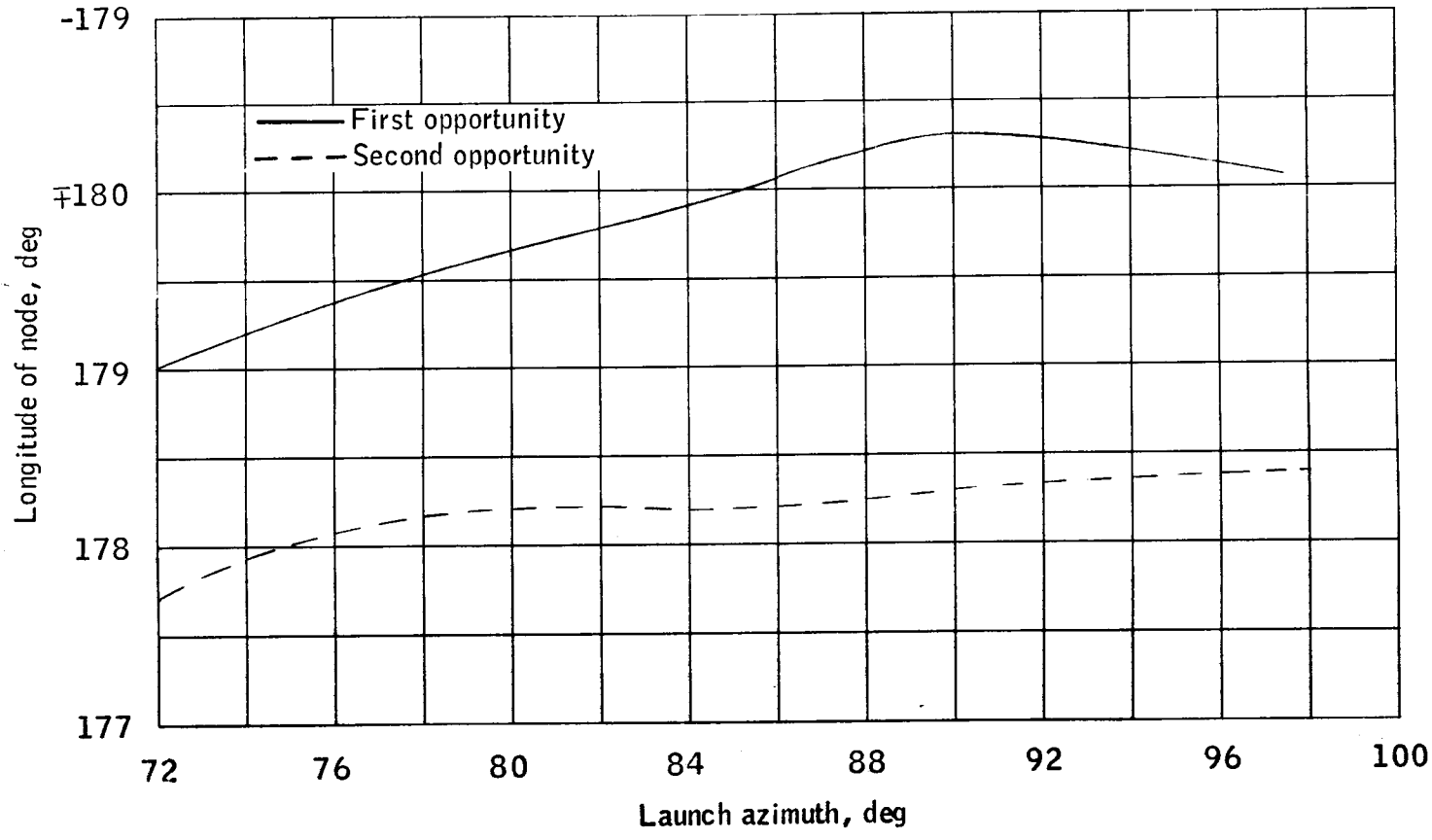
(e) Translunar injected weight.

Figure 1.- Continued.



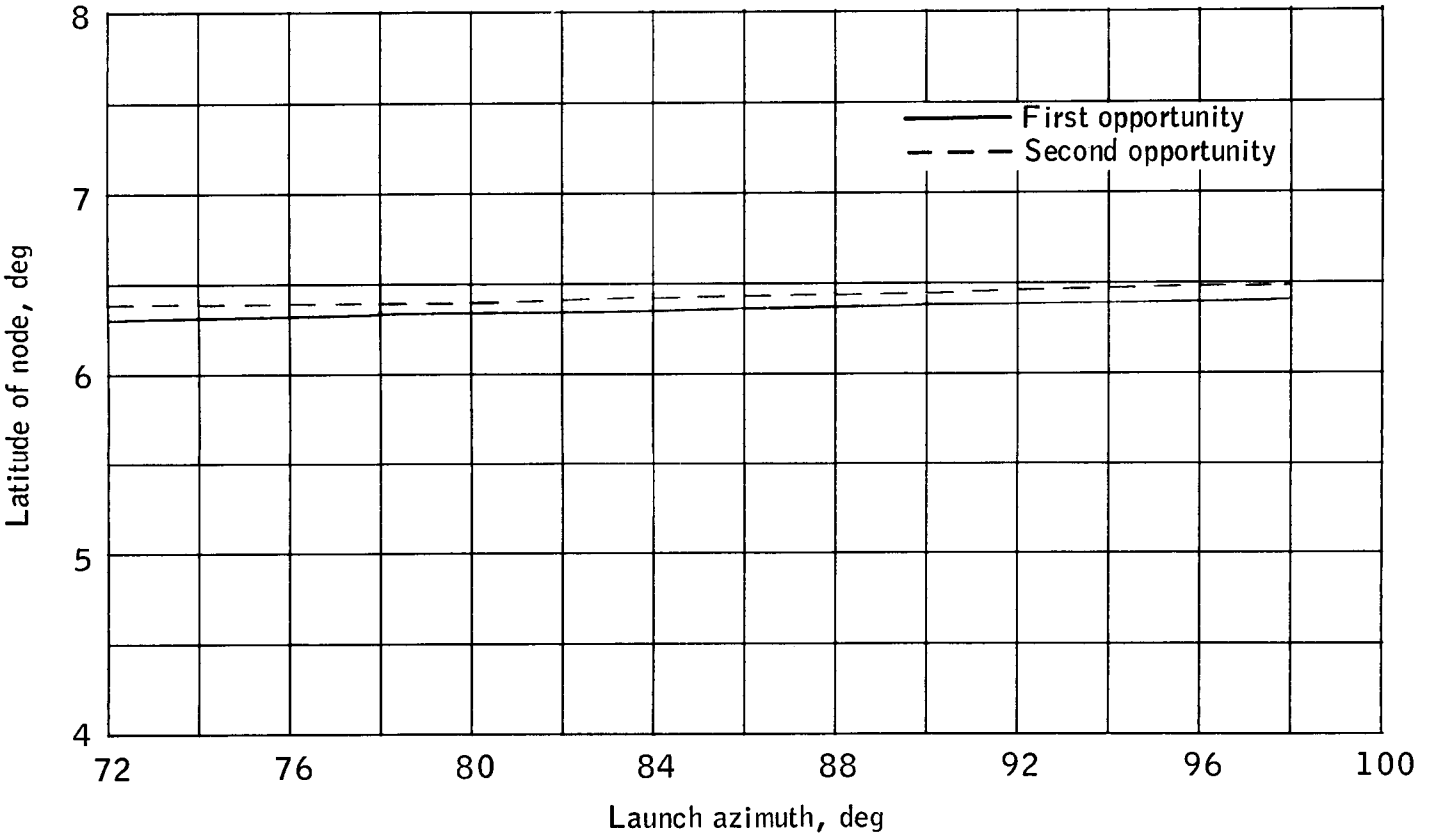
(f) Inclination to the earth-moon plane at TLI termination.

Figure 1.- Continued.



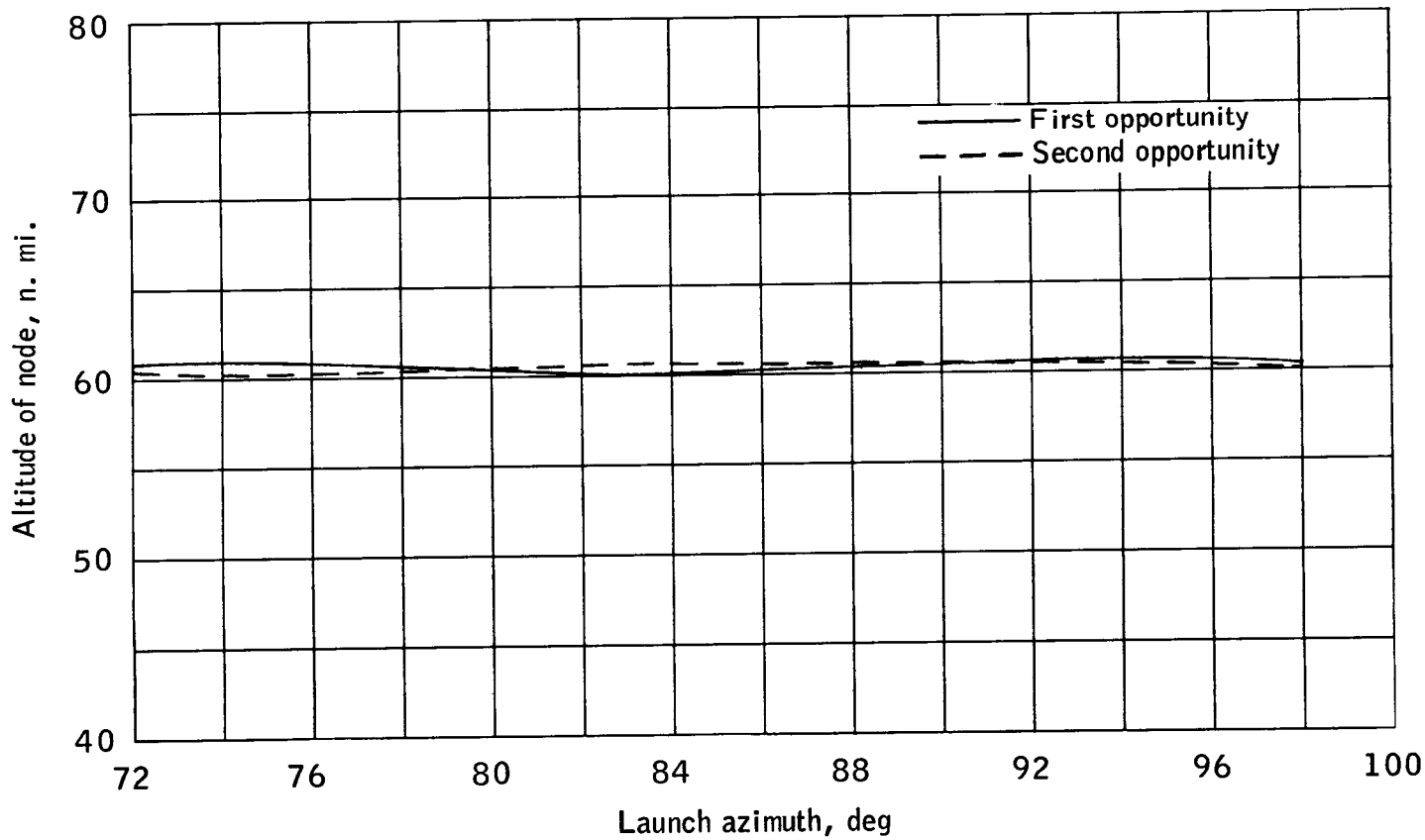
(g) Earth-moon plane longitude of node.

Figure 1.- Continued.



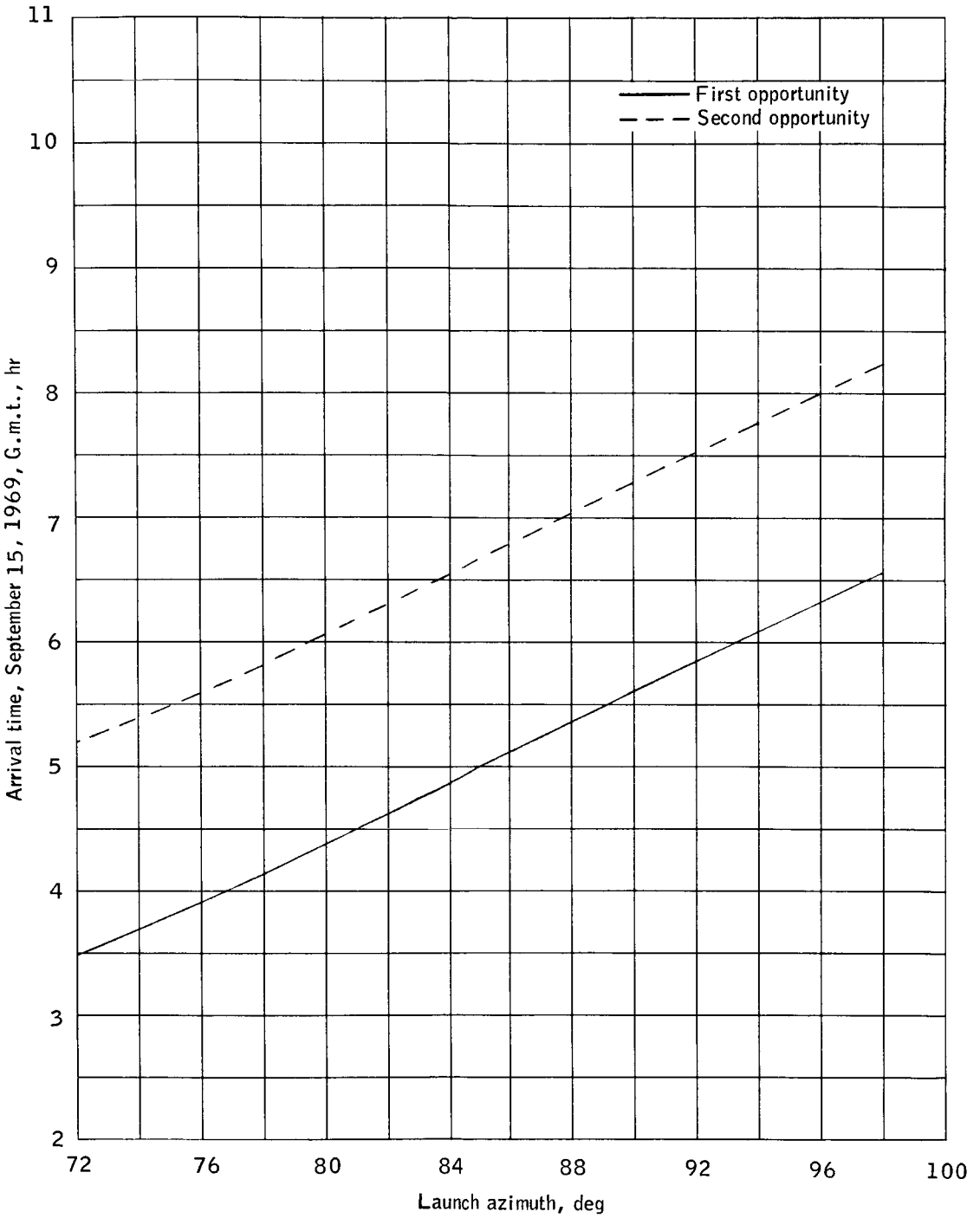
(h) Earth-moon plane latitude of node.

Figure 1.- Continued.



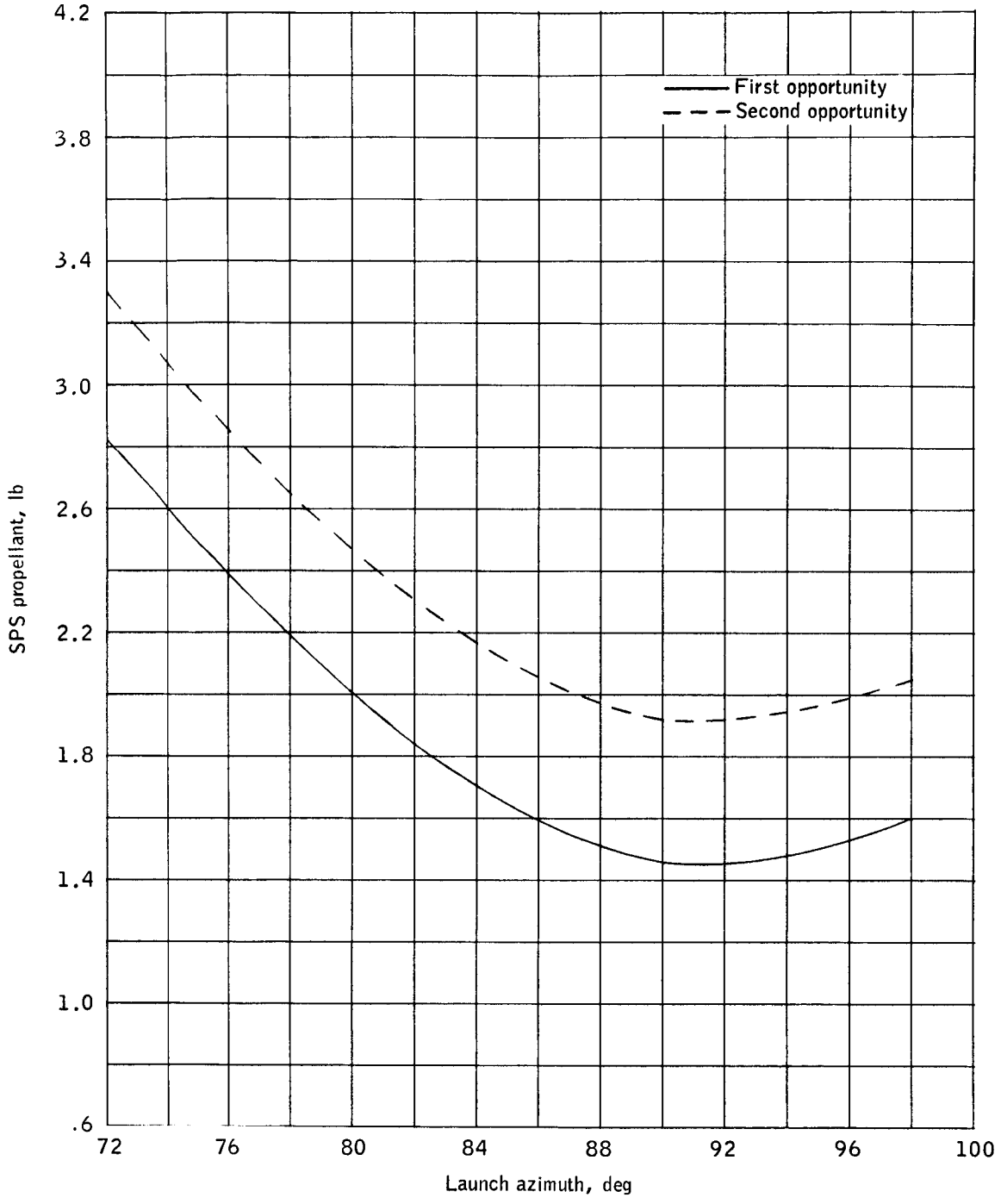
(i) Selenographic altitude of the node.

Figure 1.- Continued.



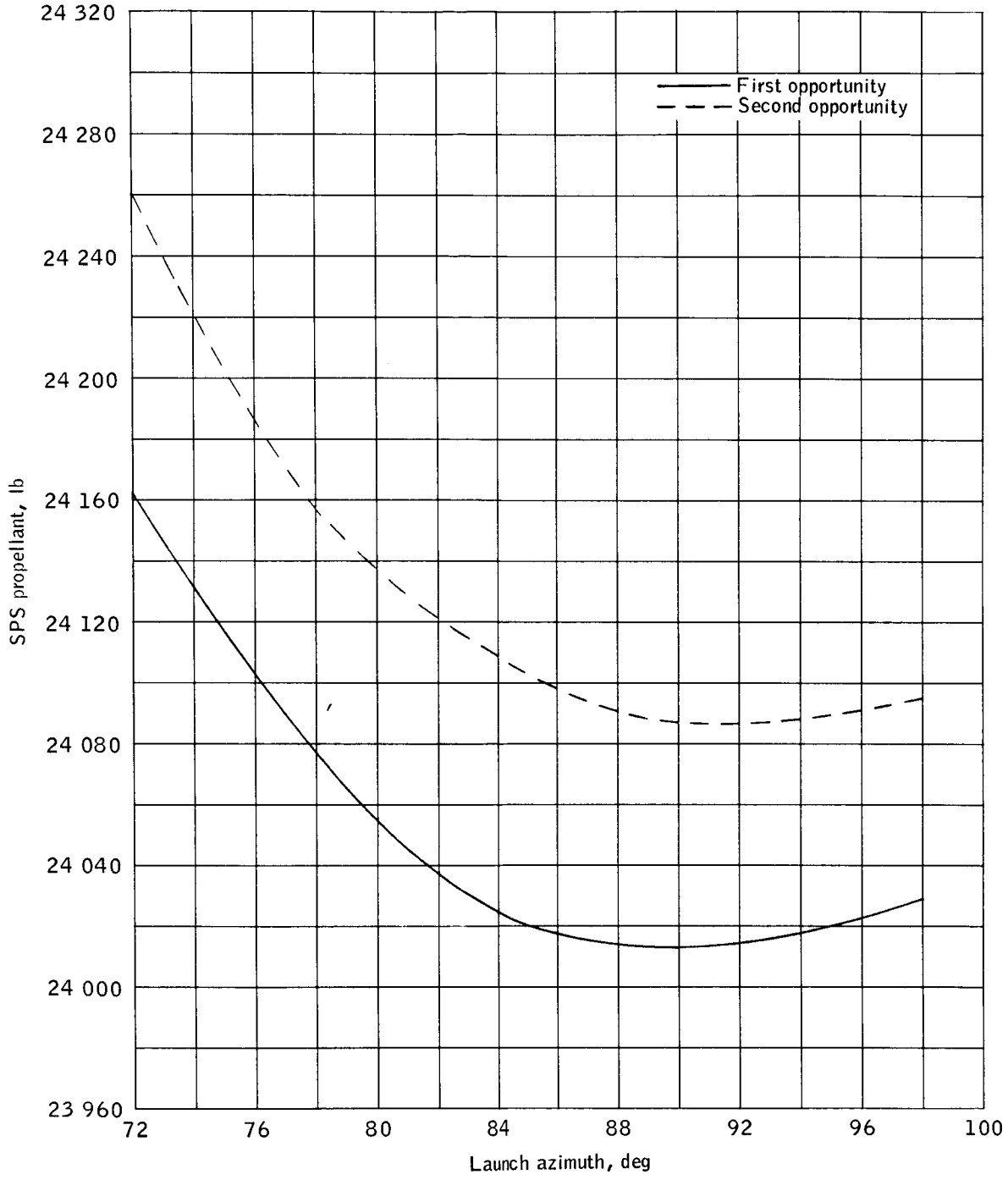
(j) Time of nodal arrival.

Figure 1.- Continued.



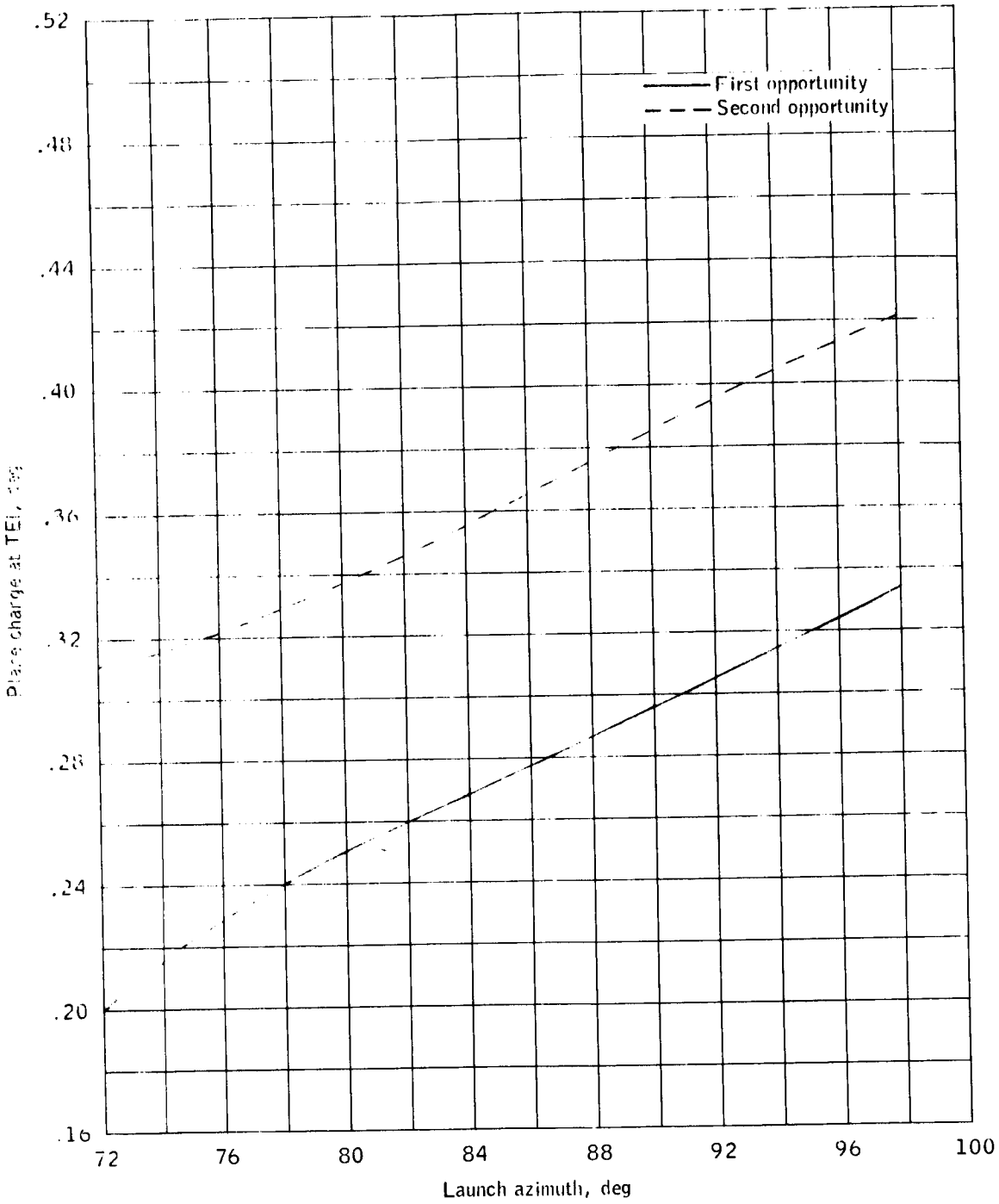
(k) SPS propellant used for LOI.

Figure 1.- Continued.



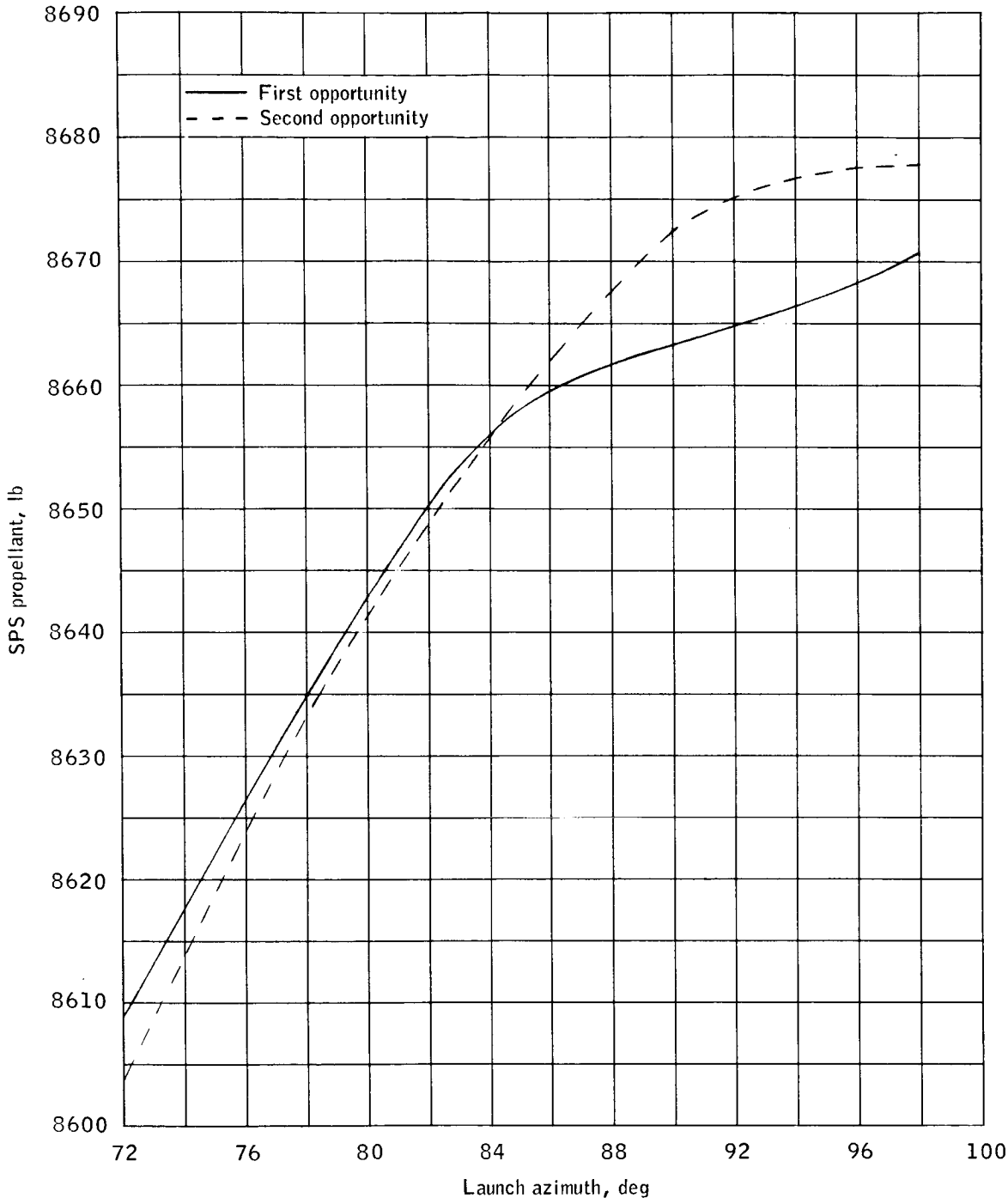
(l) SPS propellant used for LOI.

Figure 1.- Continued.



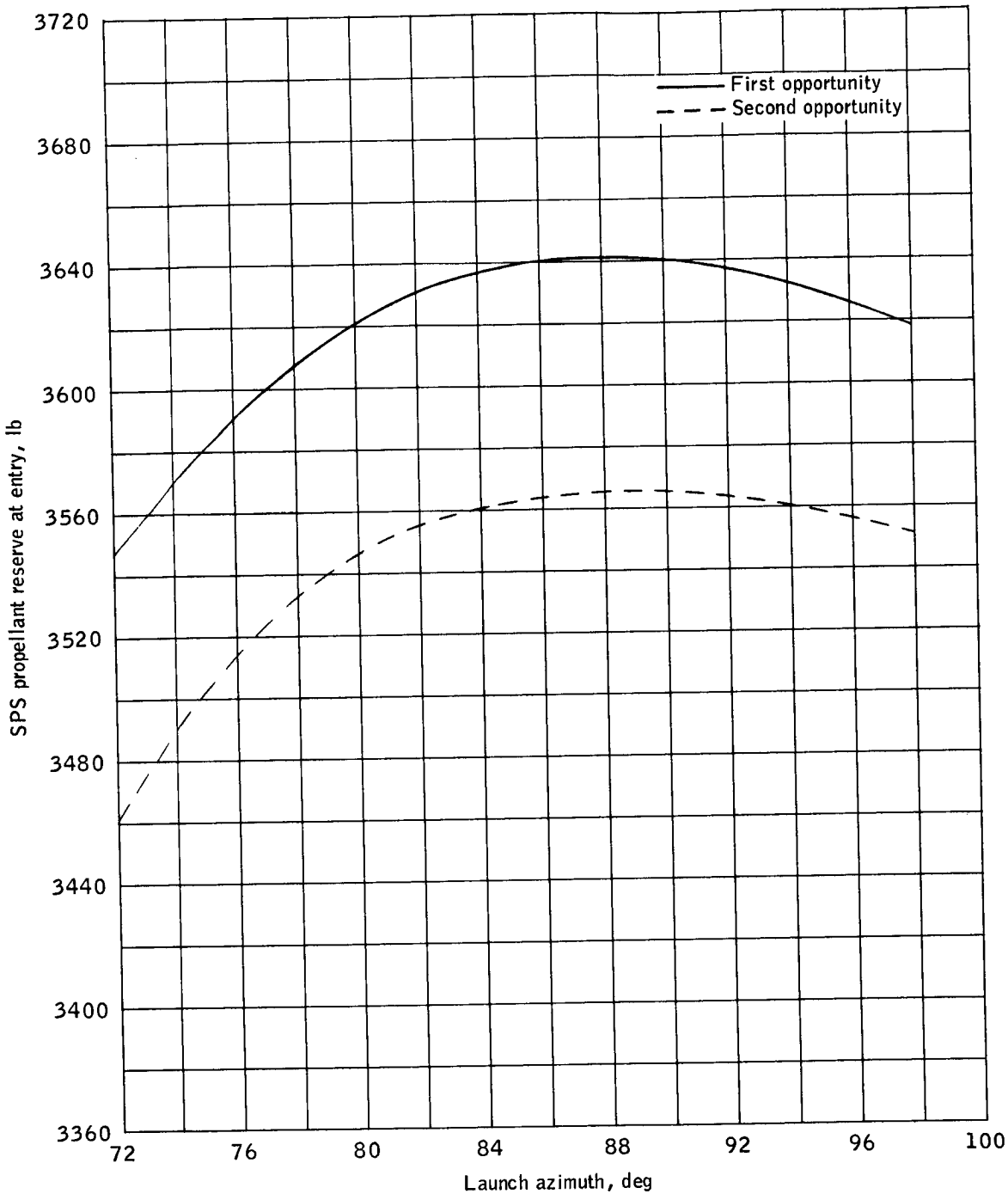
(m) TEI plane change.

Figure 1.- Continued.



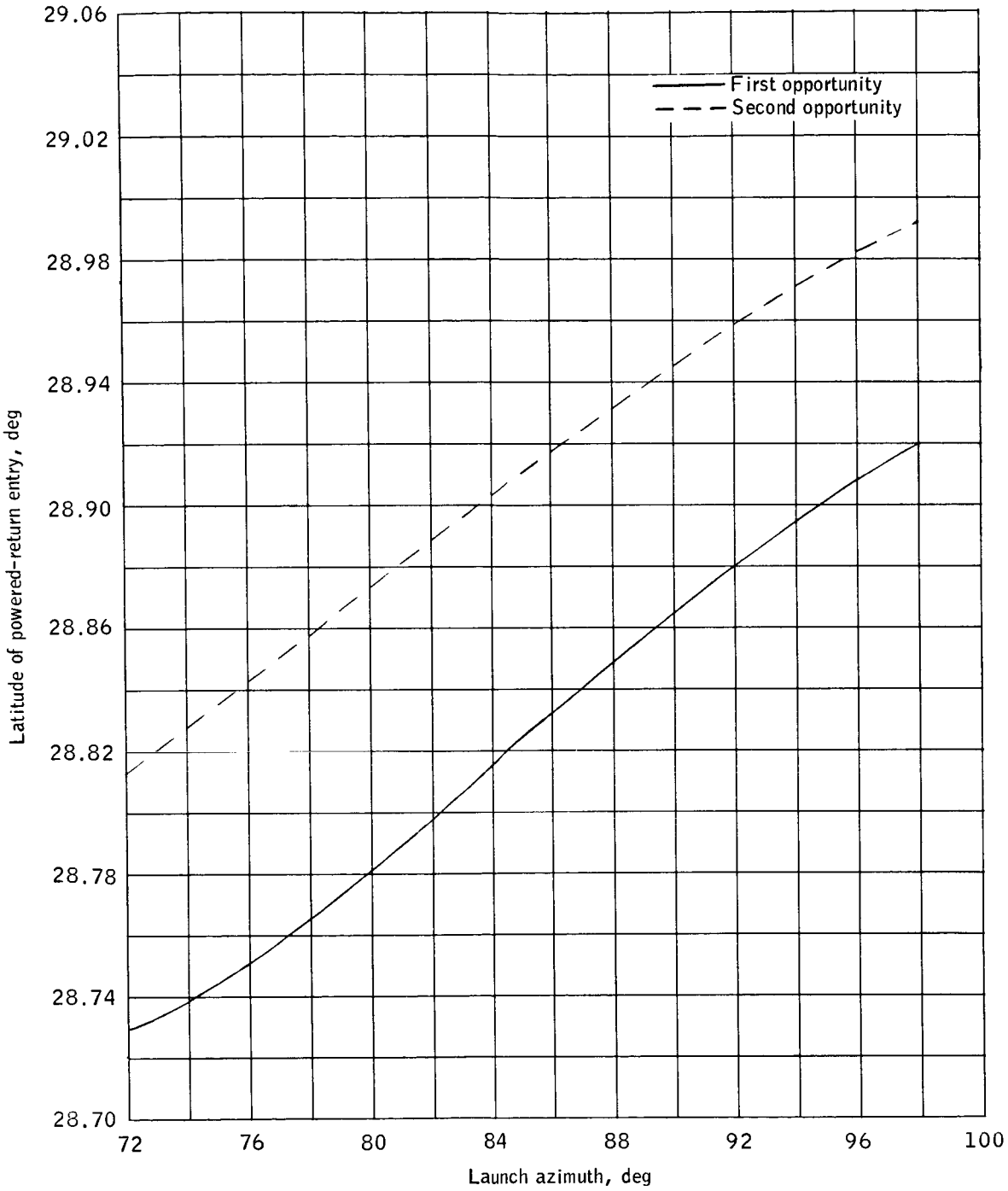
(n) SPS propellant used for TEI.

Figure 1.- Continued.



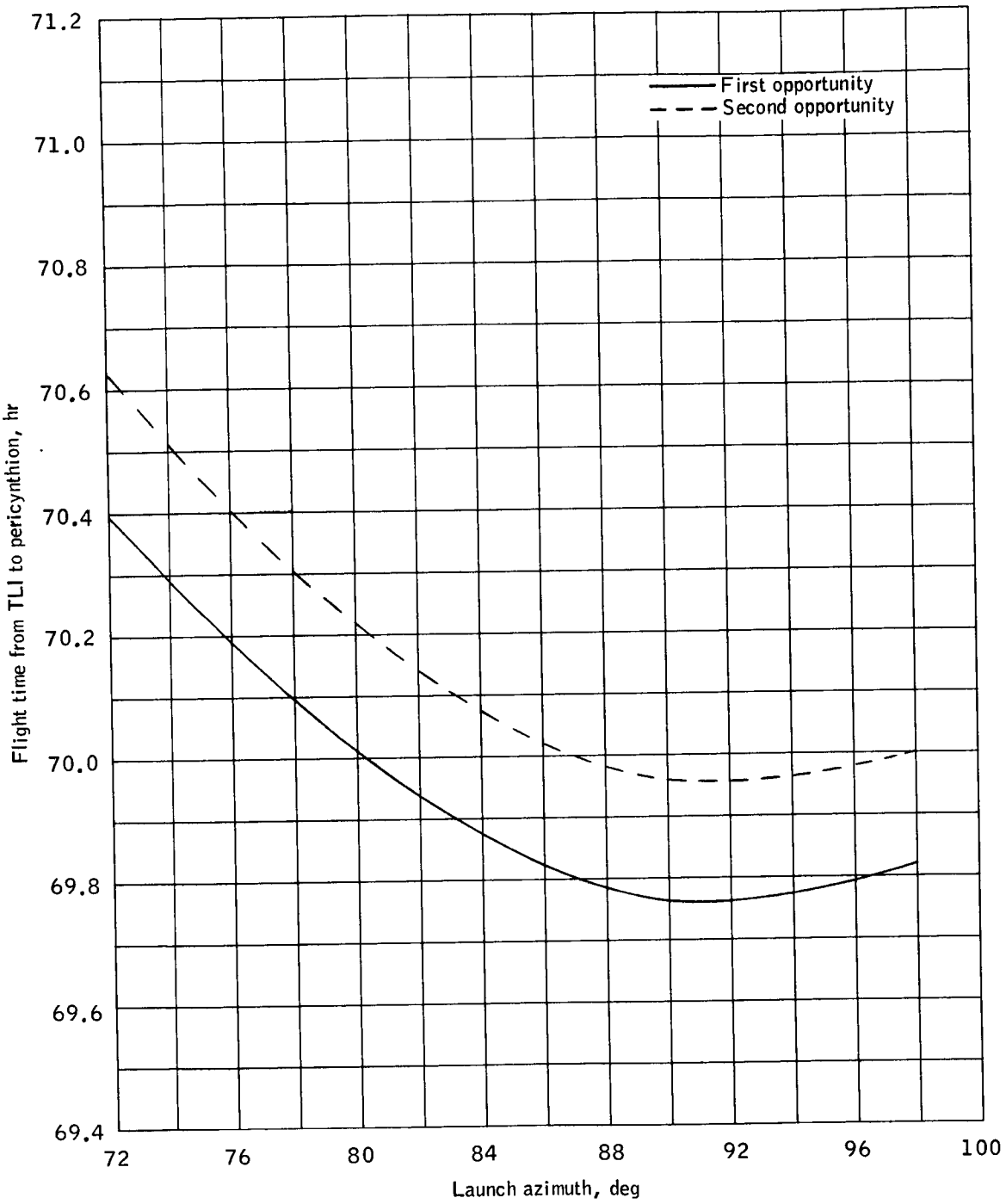
(o) SPS useable propellant reserve at entry.

Figure 1.- Continued.



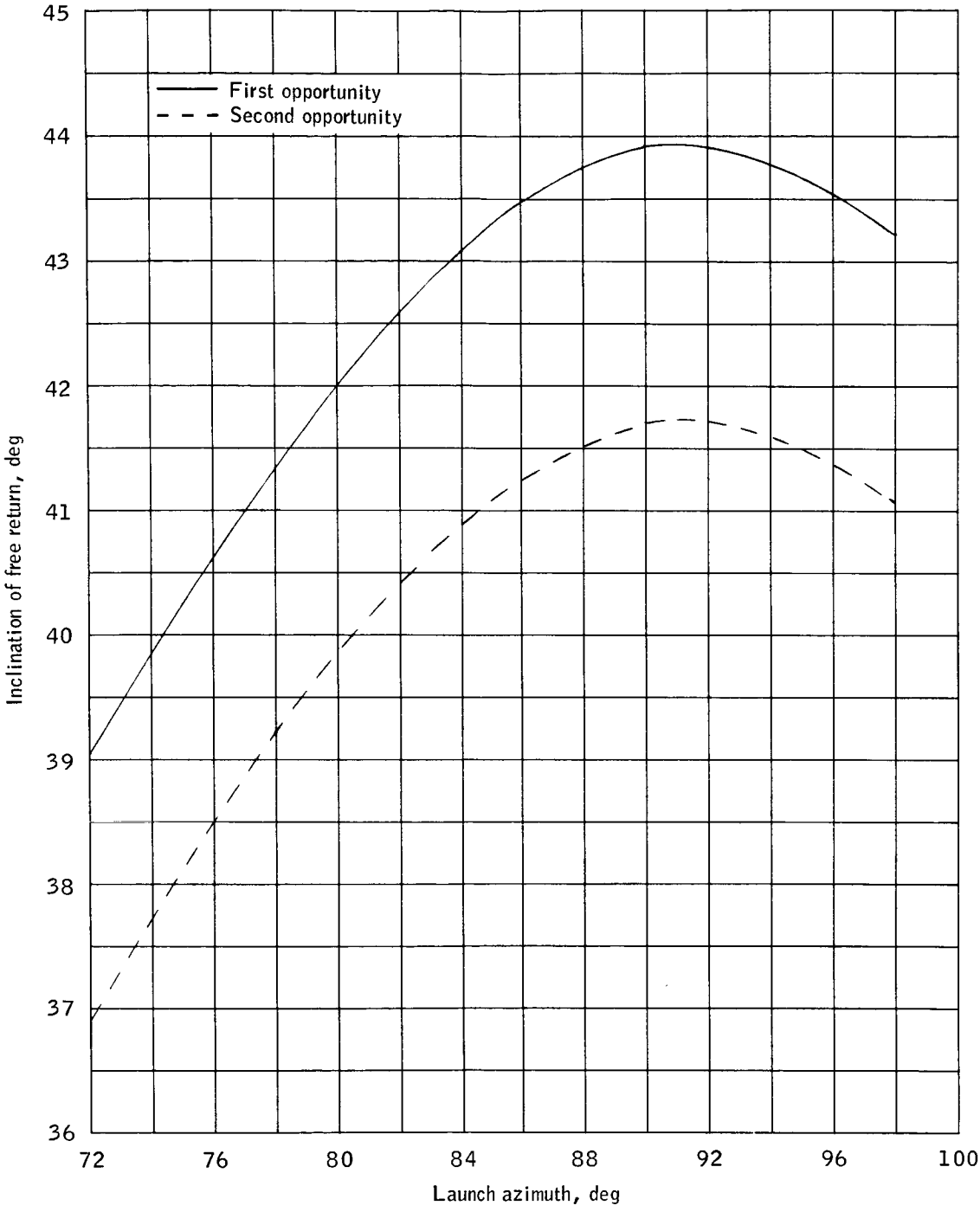
(p) Entry latitude.

Figure 1.- Continued.



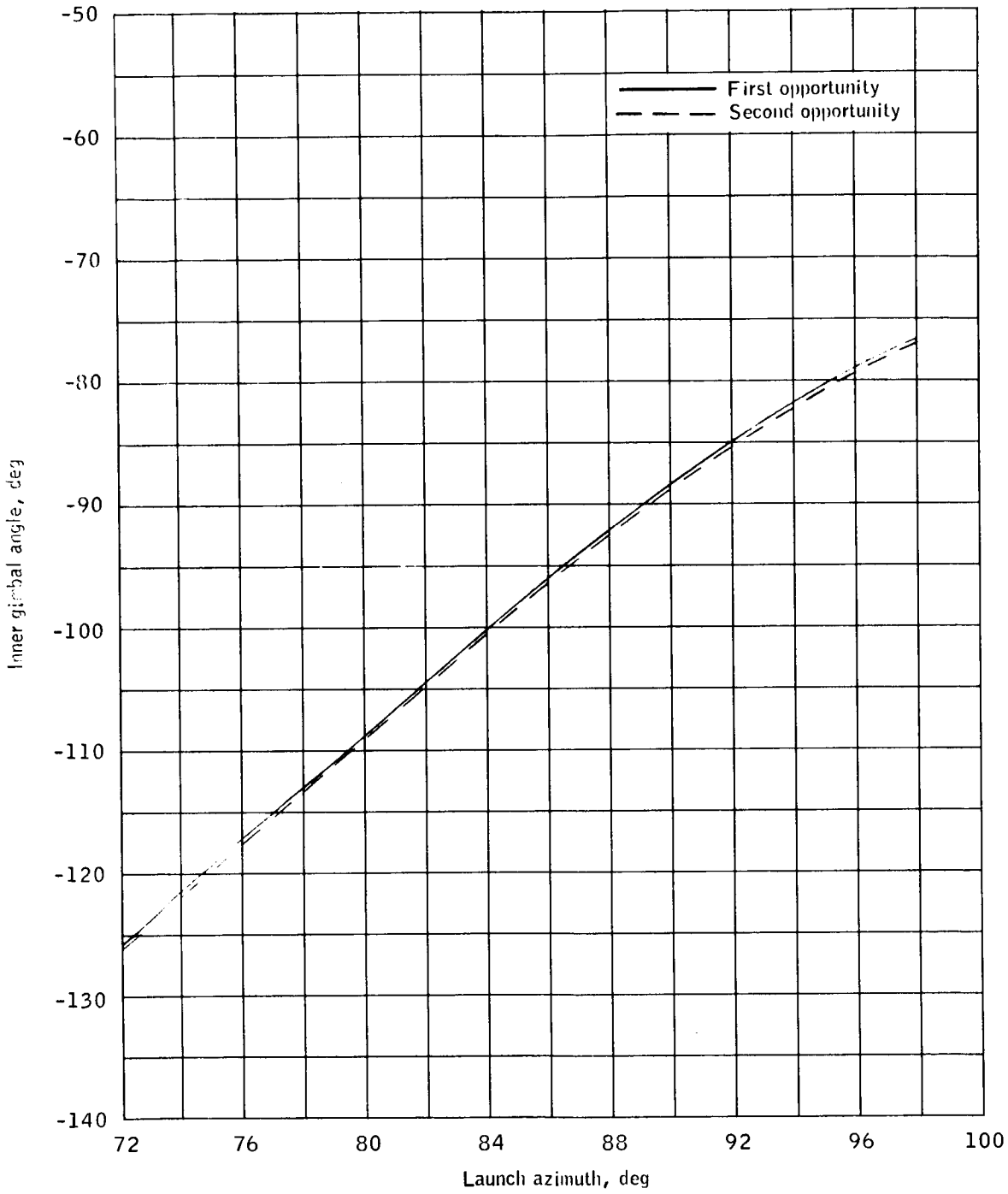
(q) Free return flight time from TLI to pericynthion.

Figure 1.- Continued.



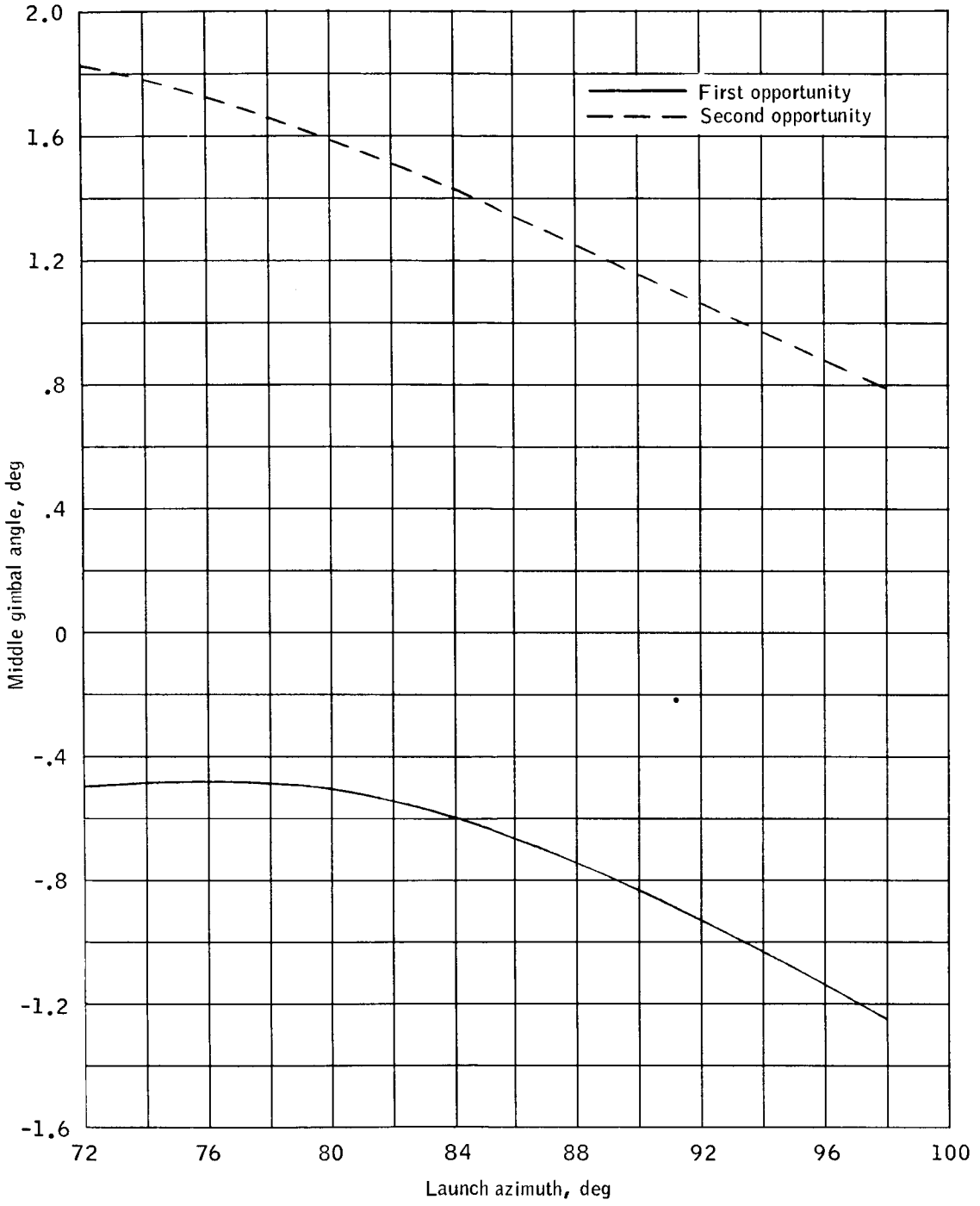
(r) Free return inclination at entry interface.

Figure 1.- Continued.



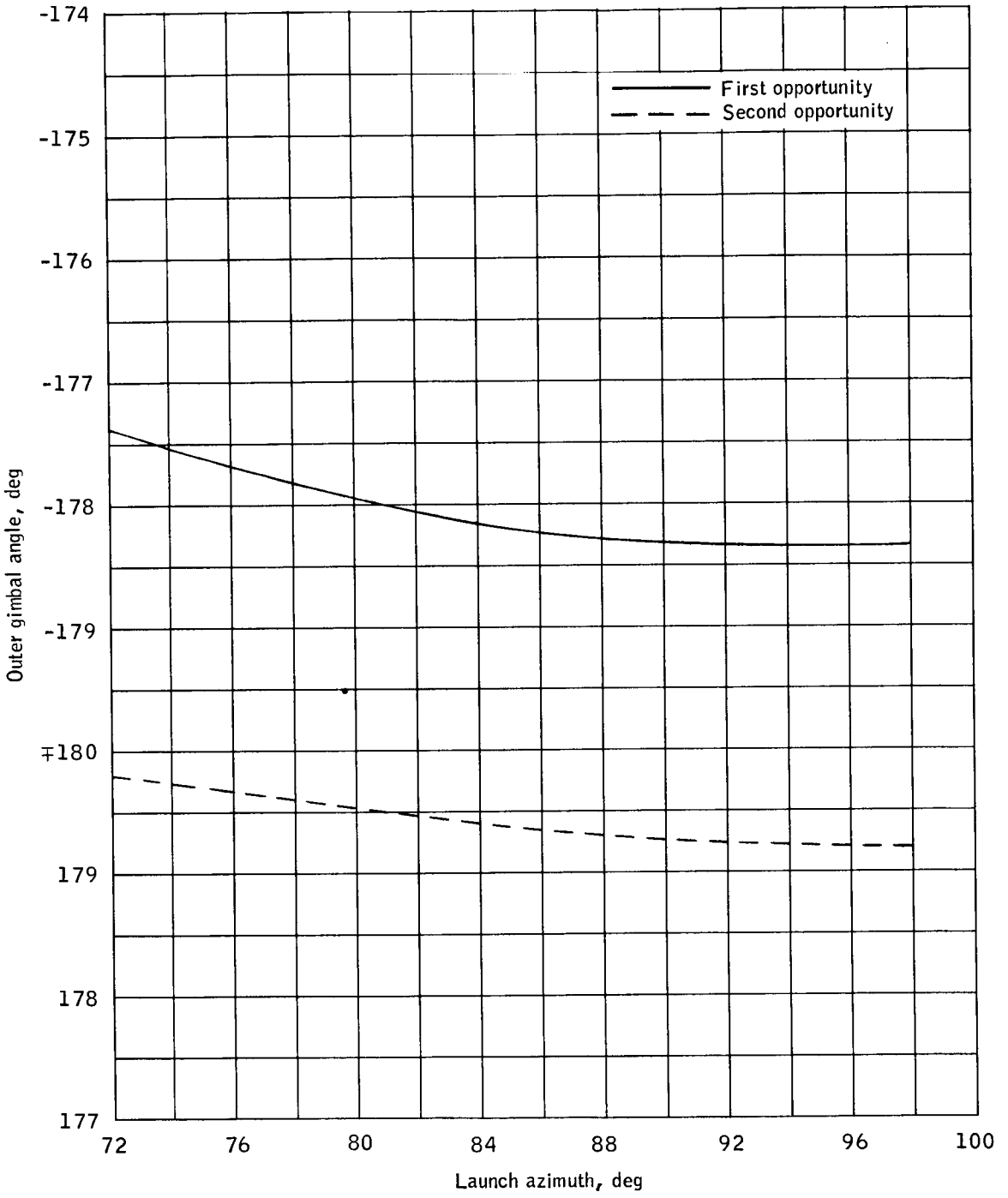
(s) S-IVB IU inner gimbal angle for transposition and docking.

Figure 1.- Continued.



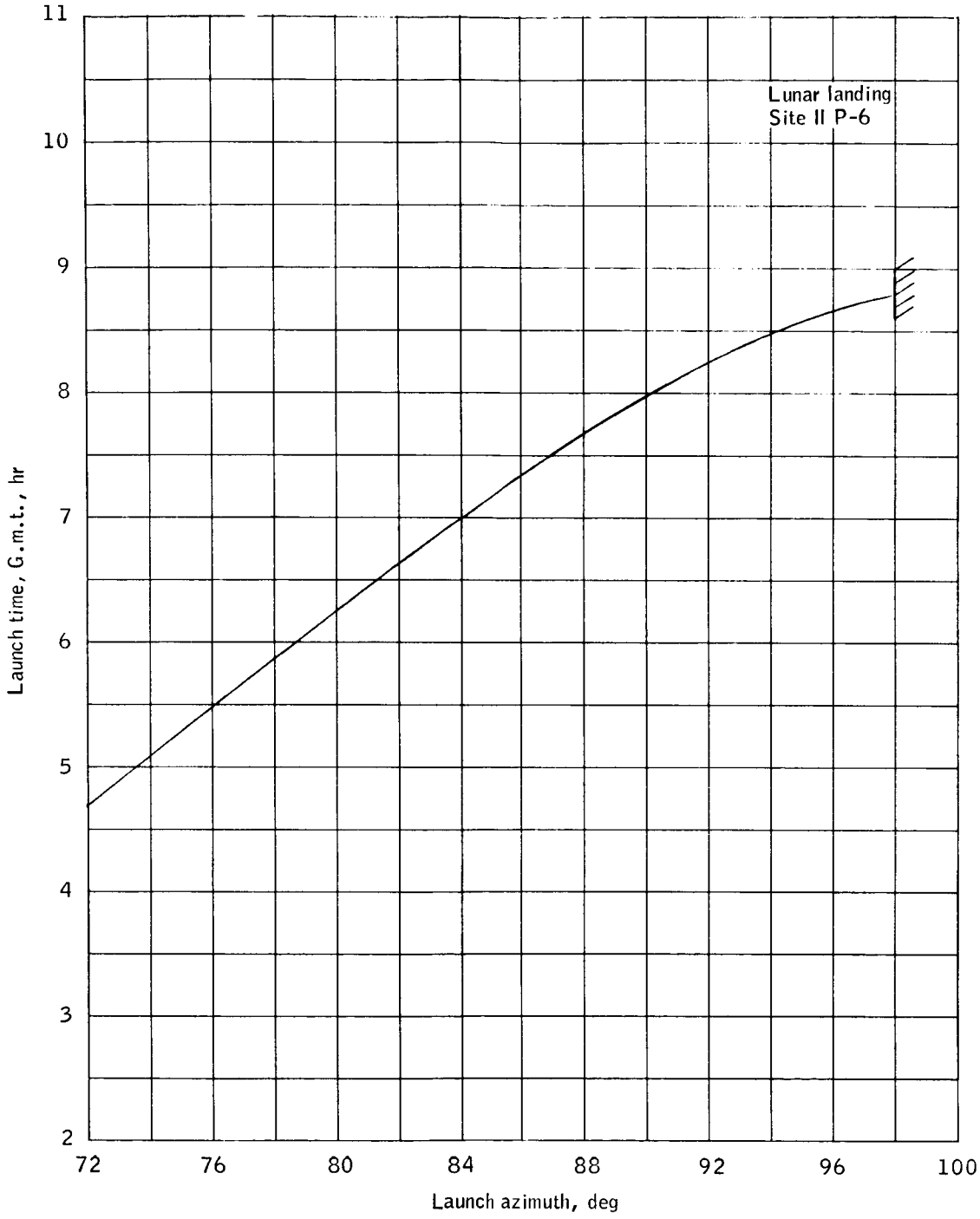
(t) S-IVB IU middle gimbal angle for transposition and docking.

Figure 1.- Continued.



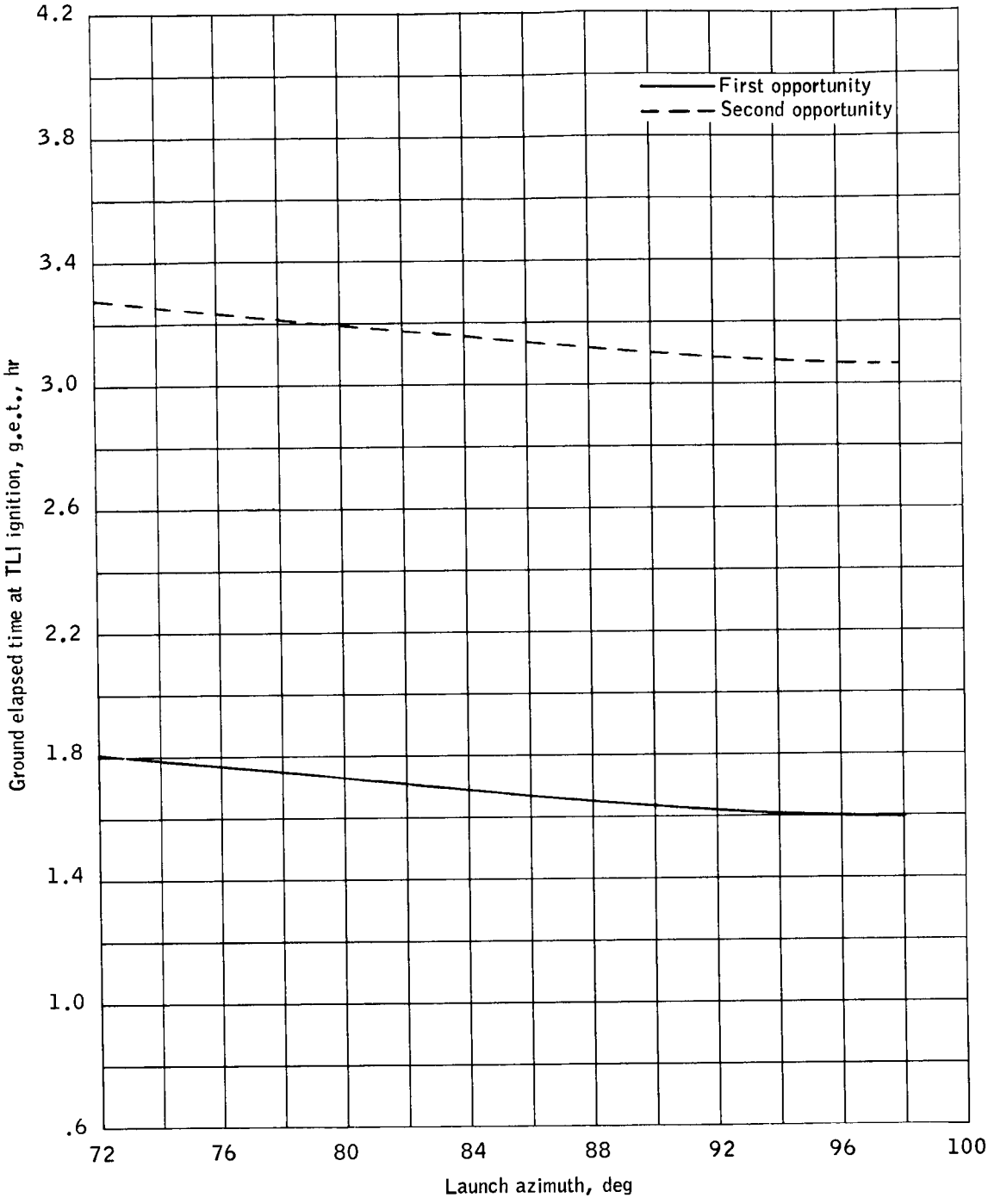
(u) S-IVB IU outer gimbal angle for transposition and docking.

Figure 1.- Concluded.



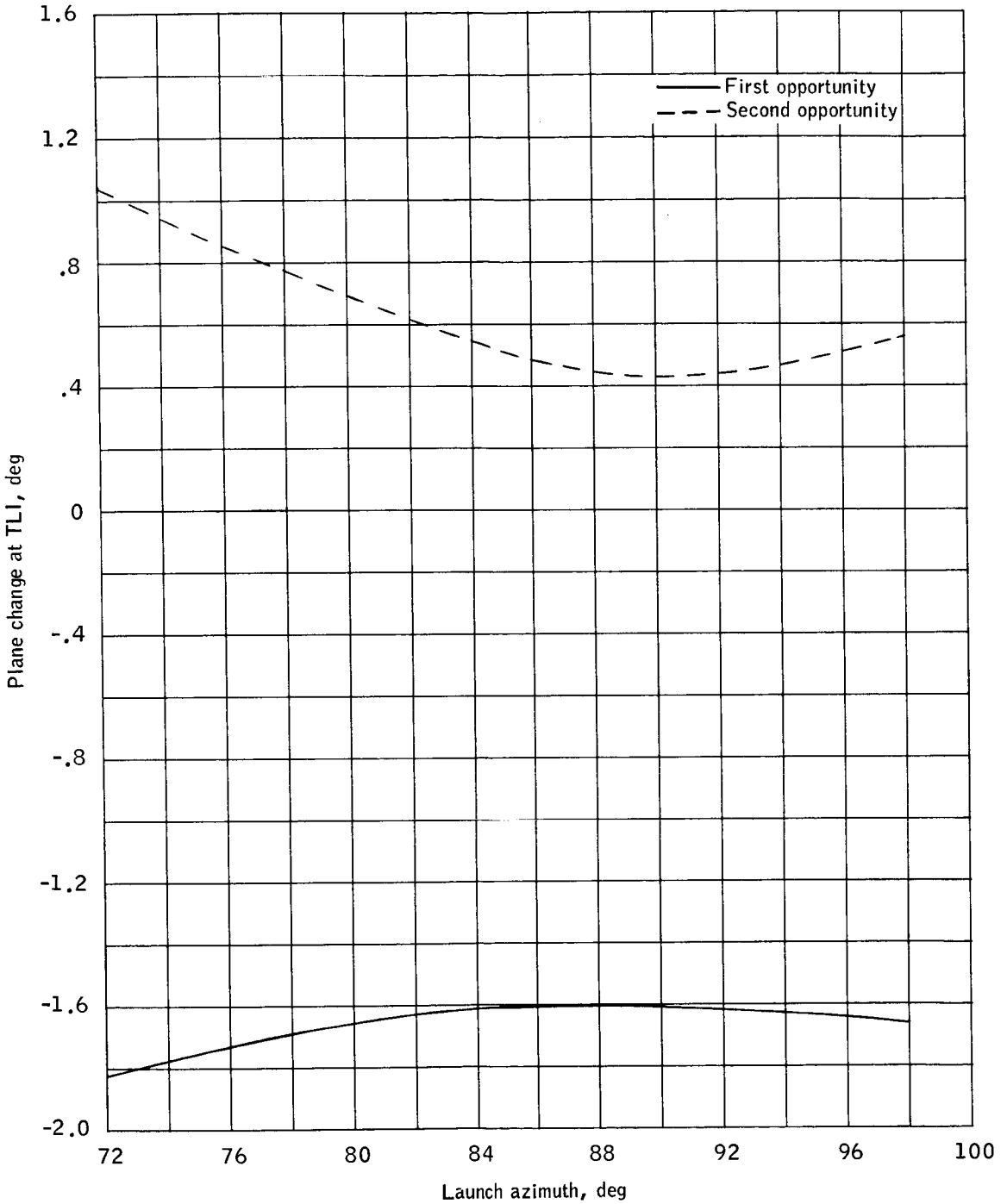
(a) Launch time.

Figure 2.- Trajectory parameters as a function of launch azimuth for lift-off on September 14, 1969.



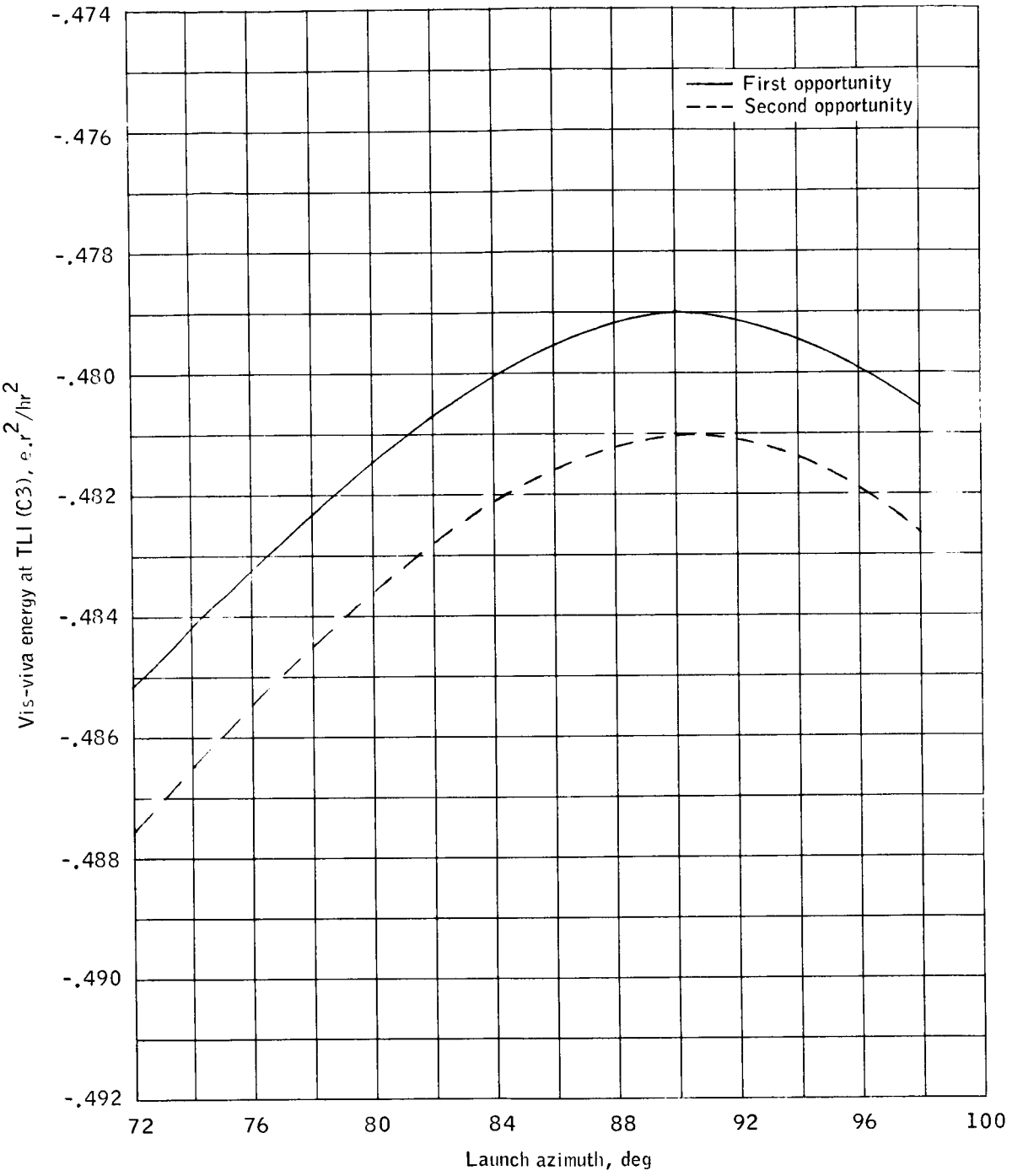
(b) Ground elapsed time at TLI ignition.

Figure 2.- Continued.



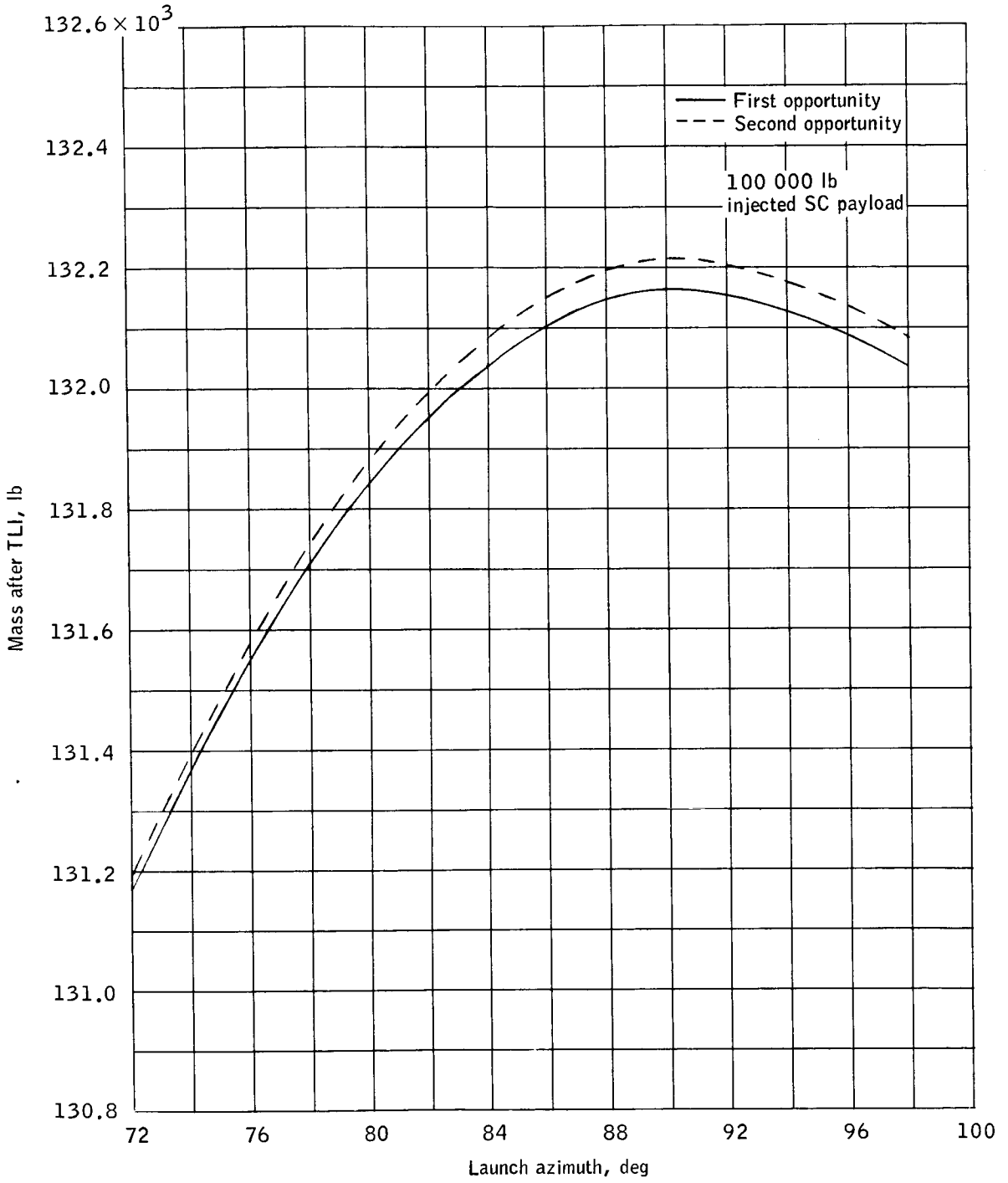
(c) TLI plane change.

Figure 2.- Continued.



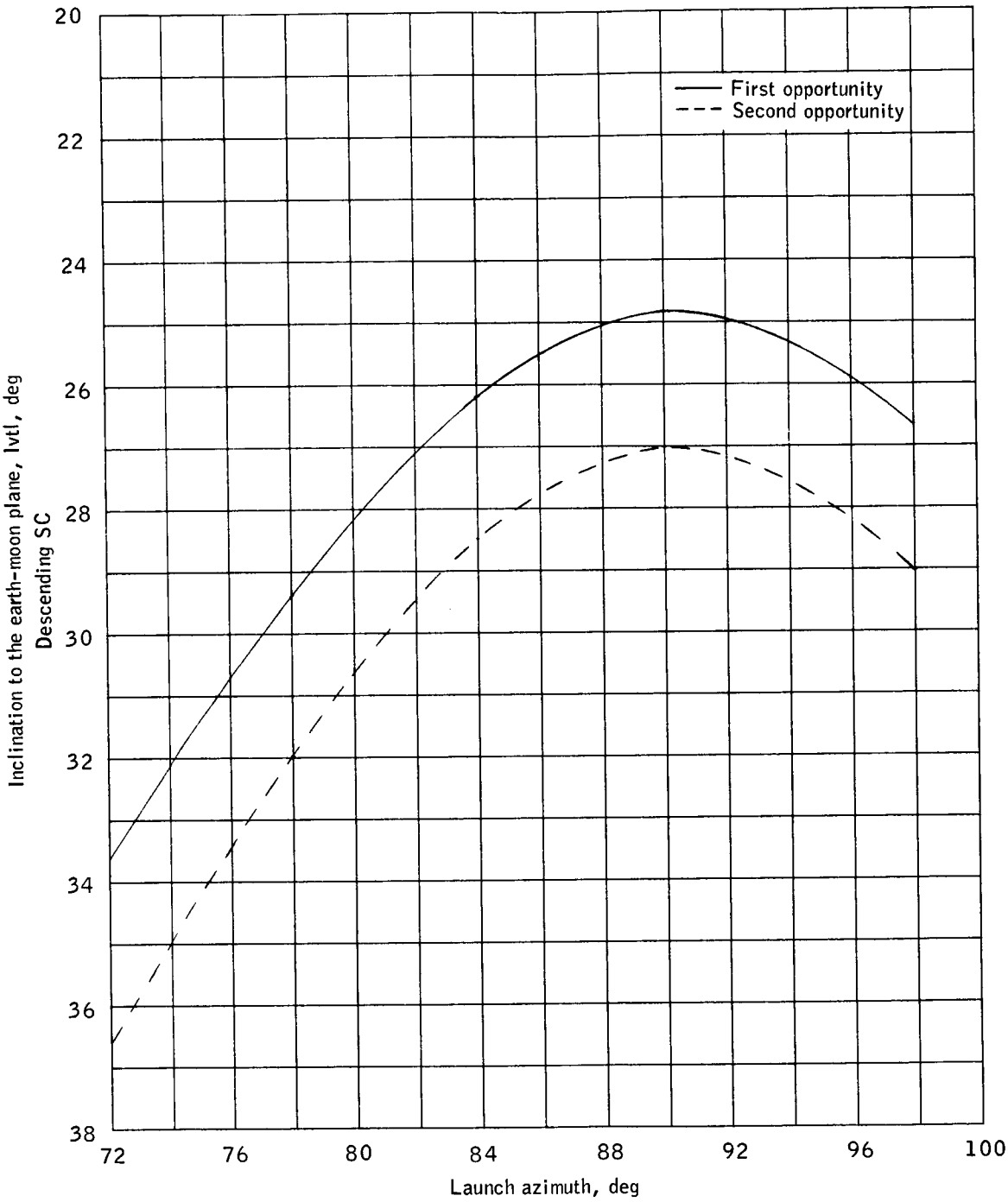
(d) Required energy at TLI termination.

Figure 2.- Continued.



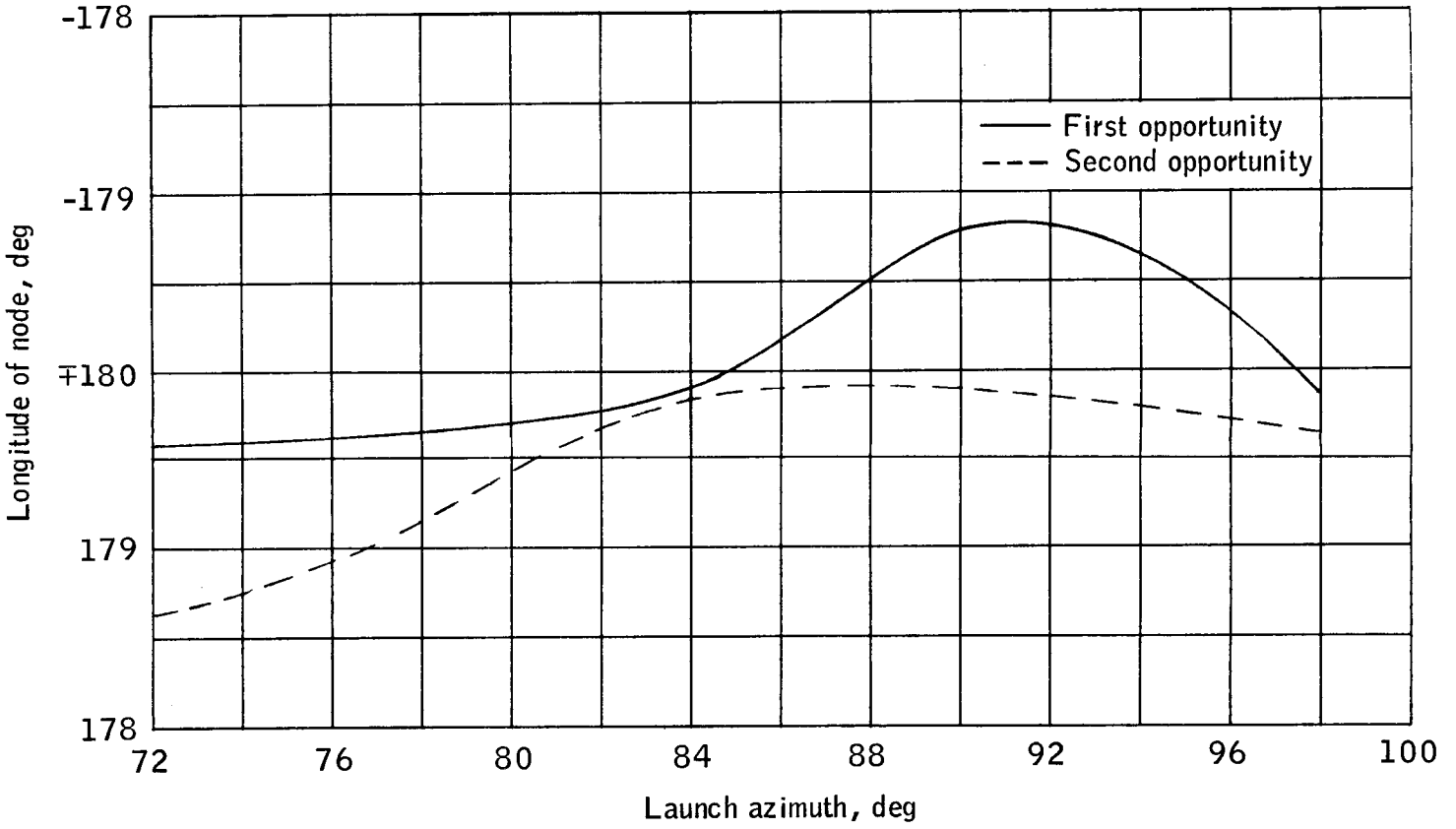
(e) Translunar injected weight.

Figure 2.- Continued.



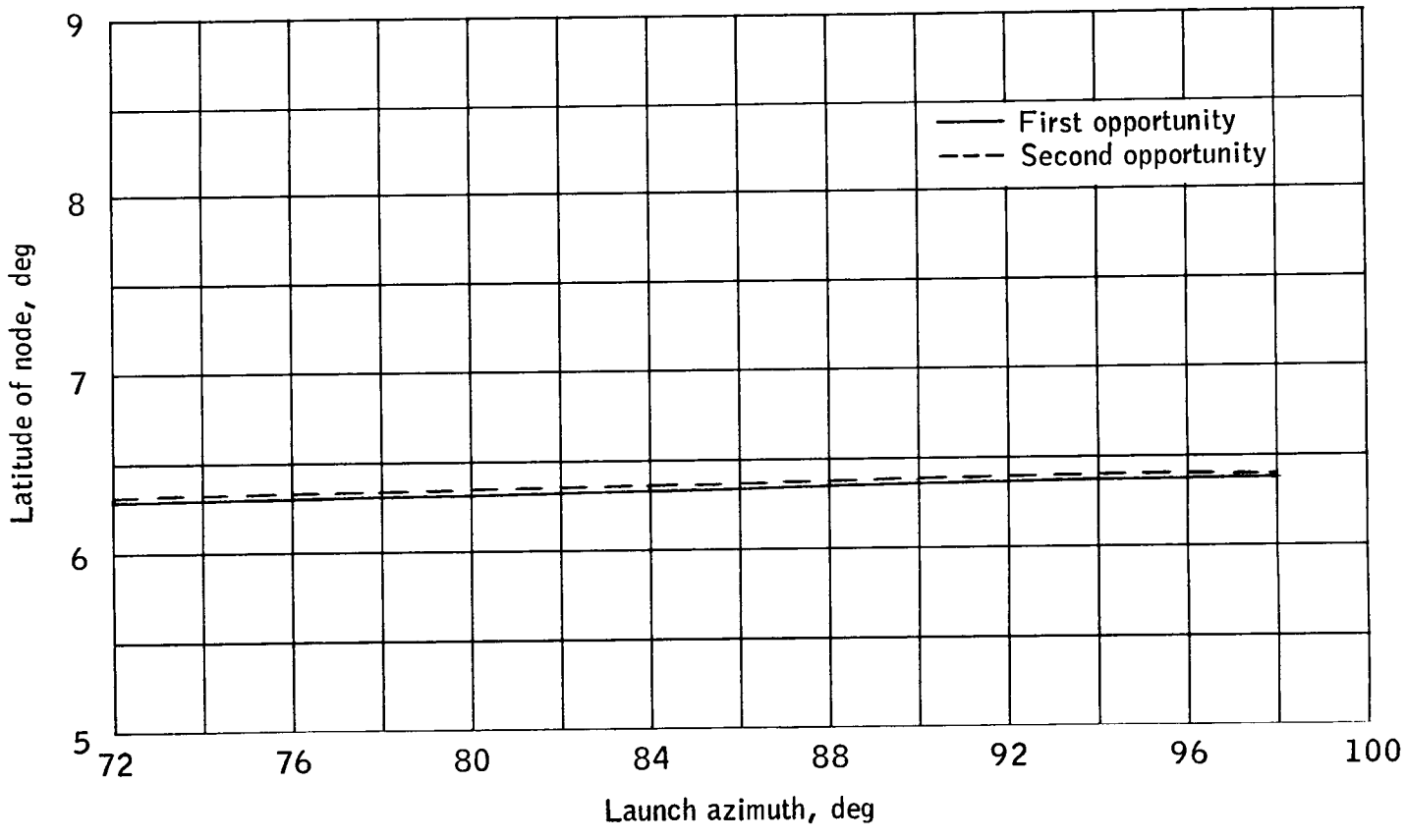
(f) Inclination to the earth-moon plane at TLI termination.

Figure 2.- Continued.



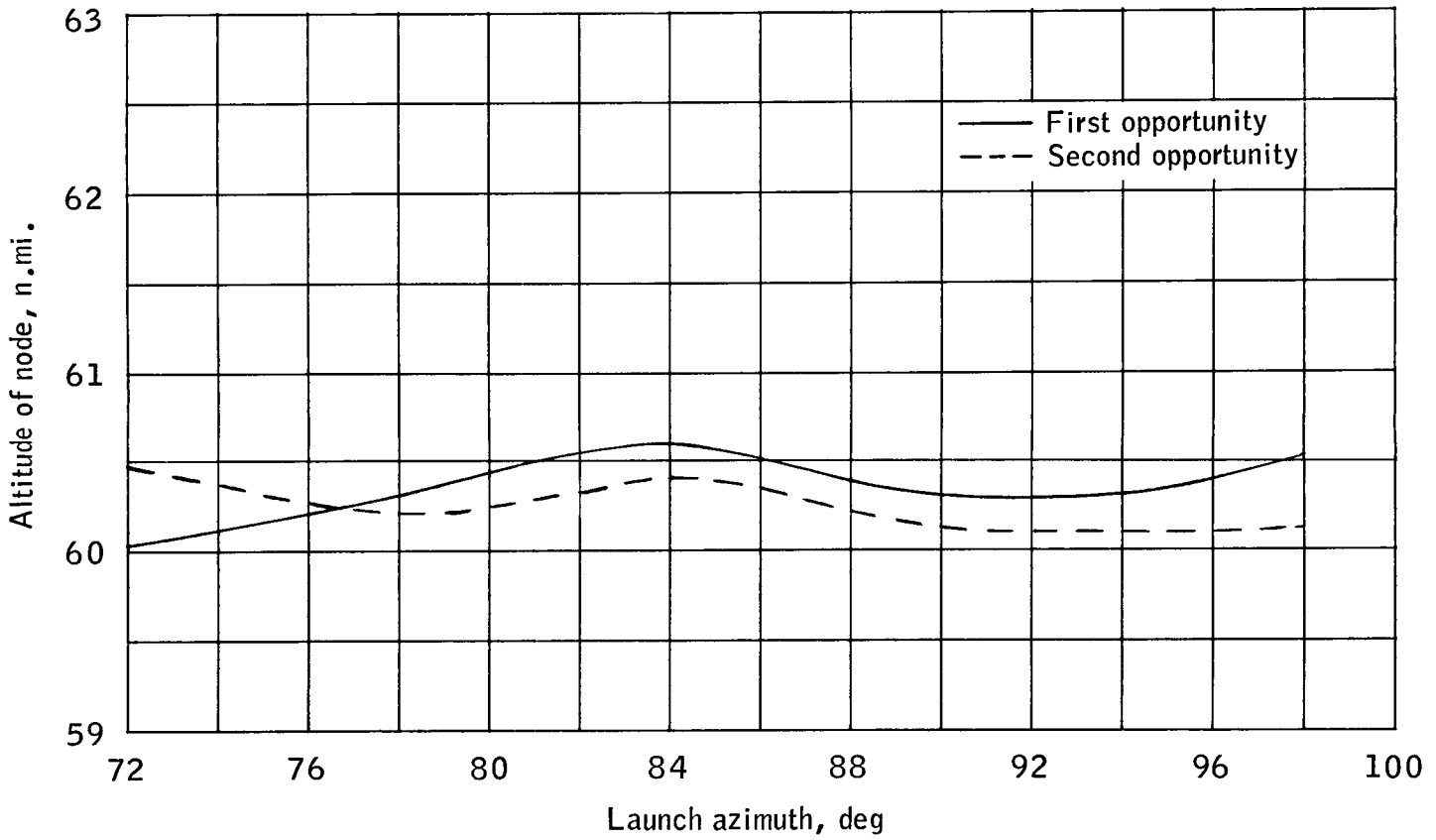
(g) Earth-moon plane longitude of node.

Figure 2.- Continued.



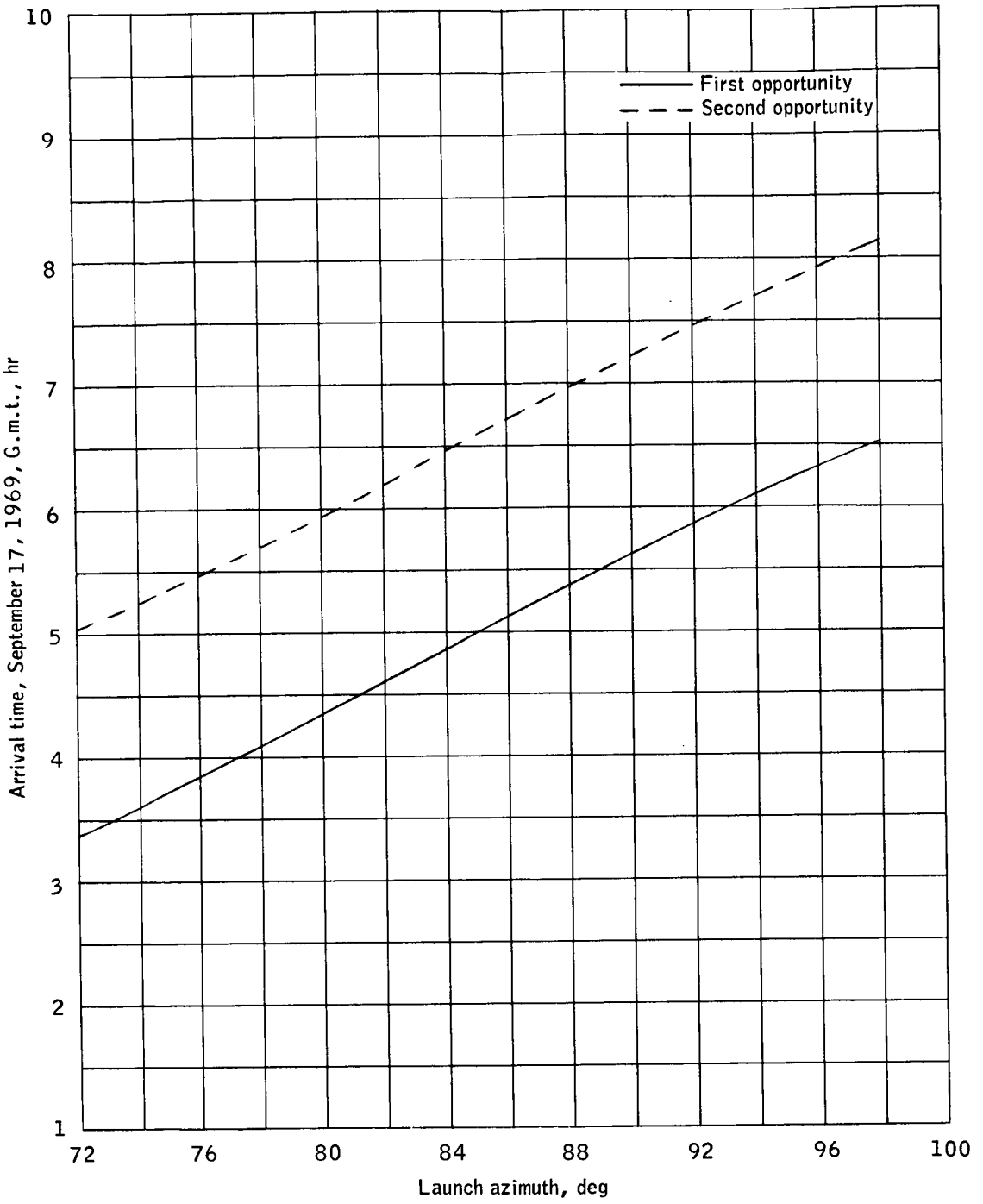
(h) Earth-moon plane latitude of node.

Figure 2.- Continued.



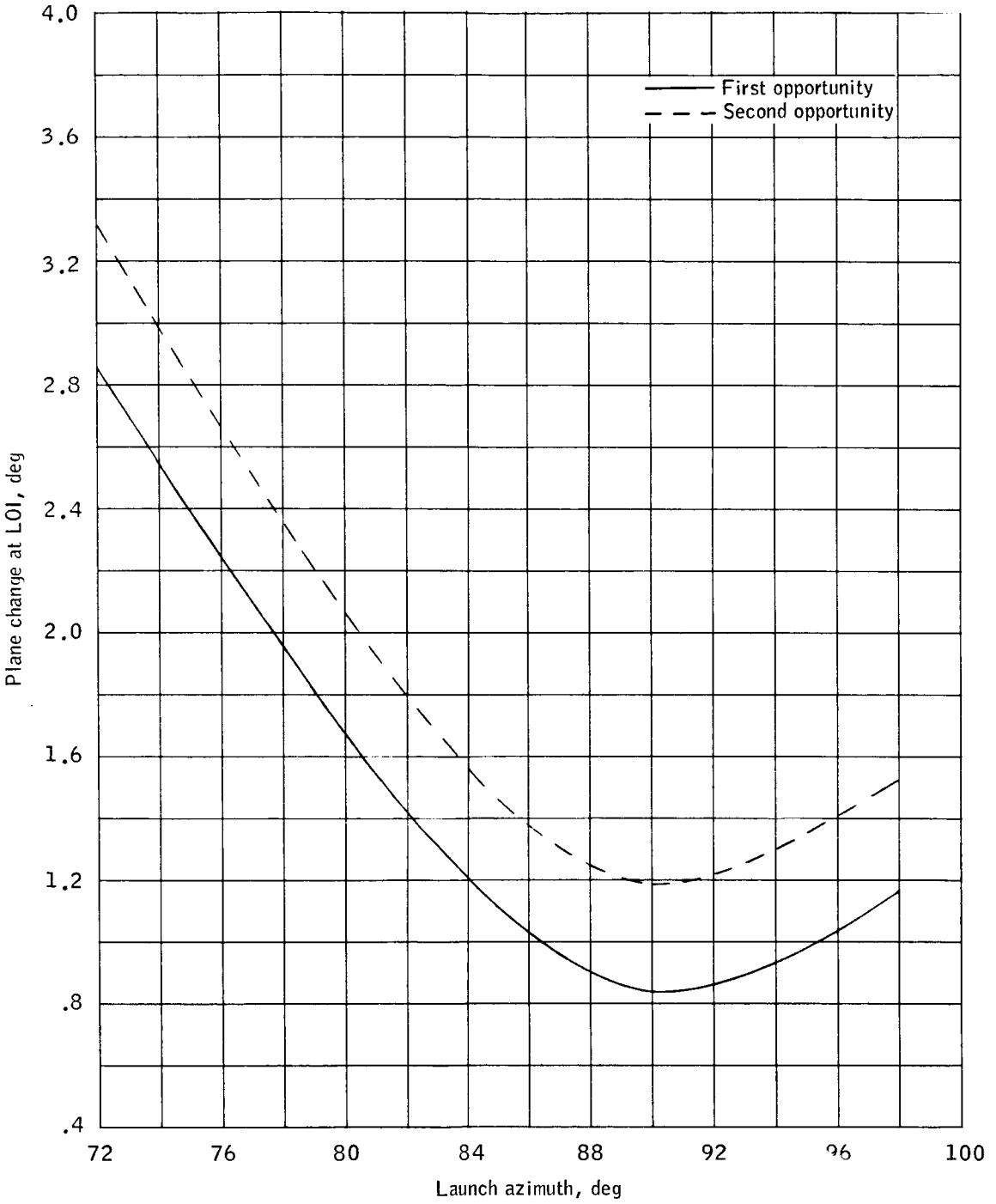
(i) Selenographic altitude of the node.

Figure 2.- Continued.



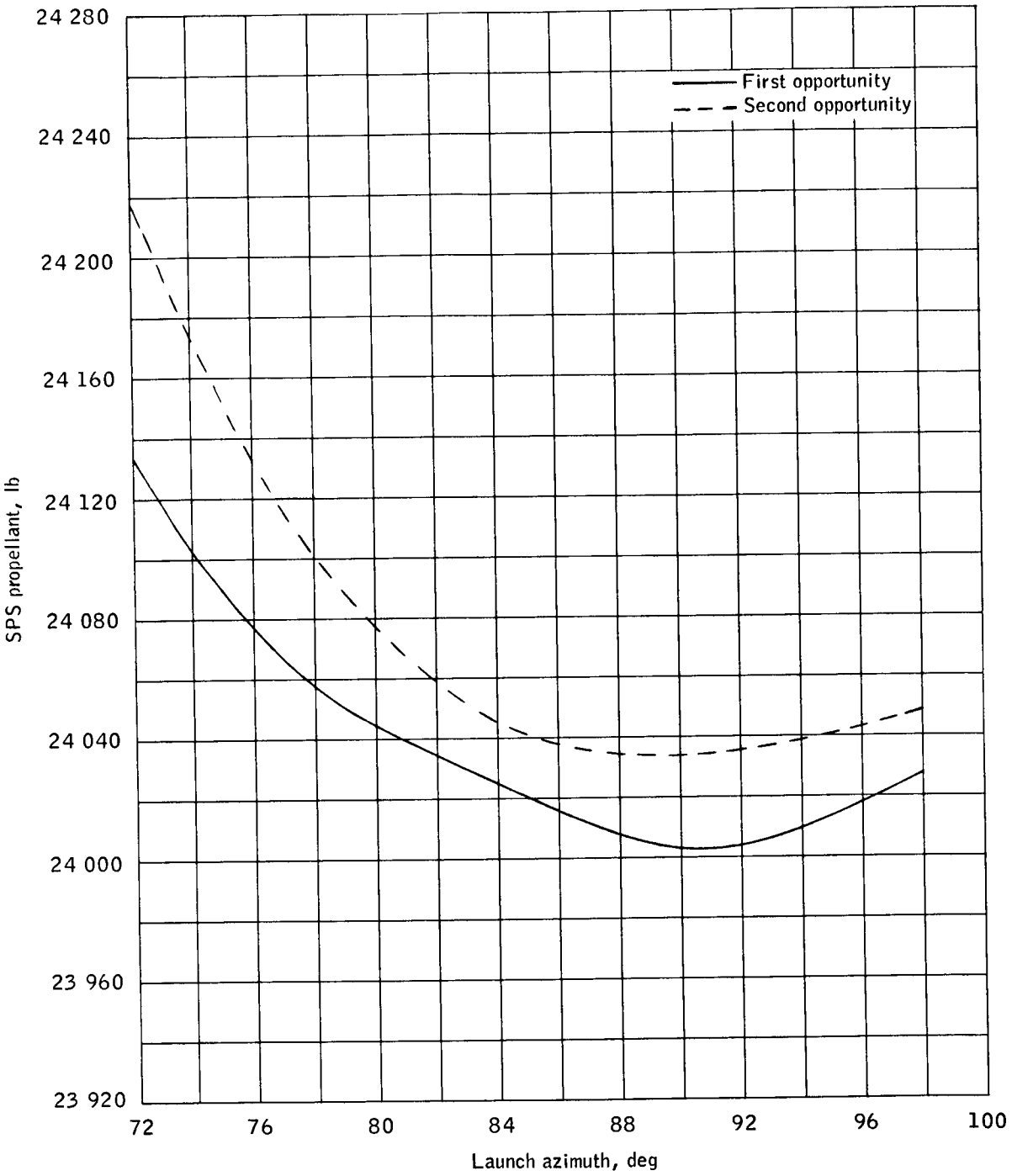
(j) Time of nodal arrival.

Figure 2.- Continued.



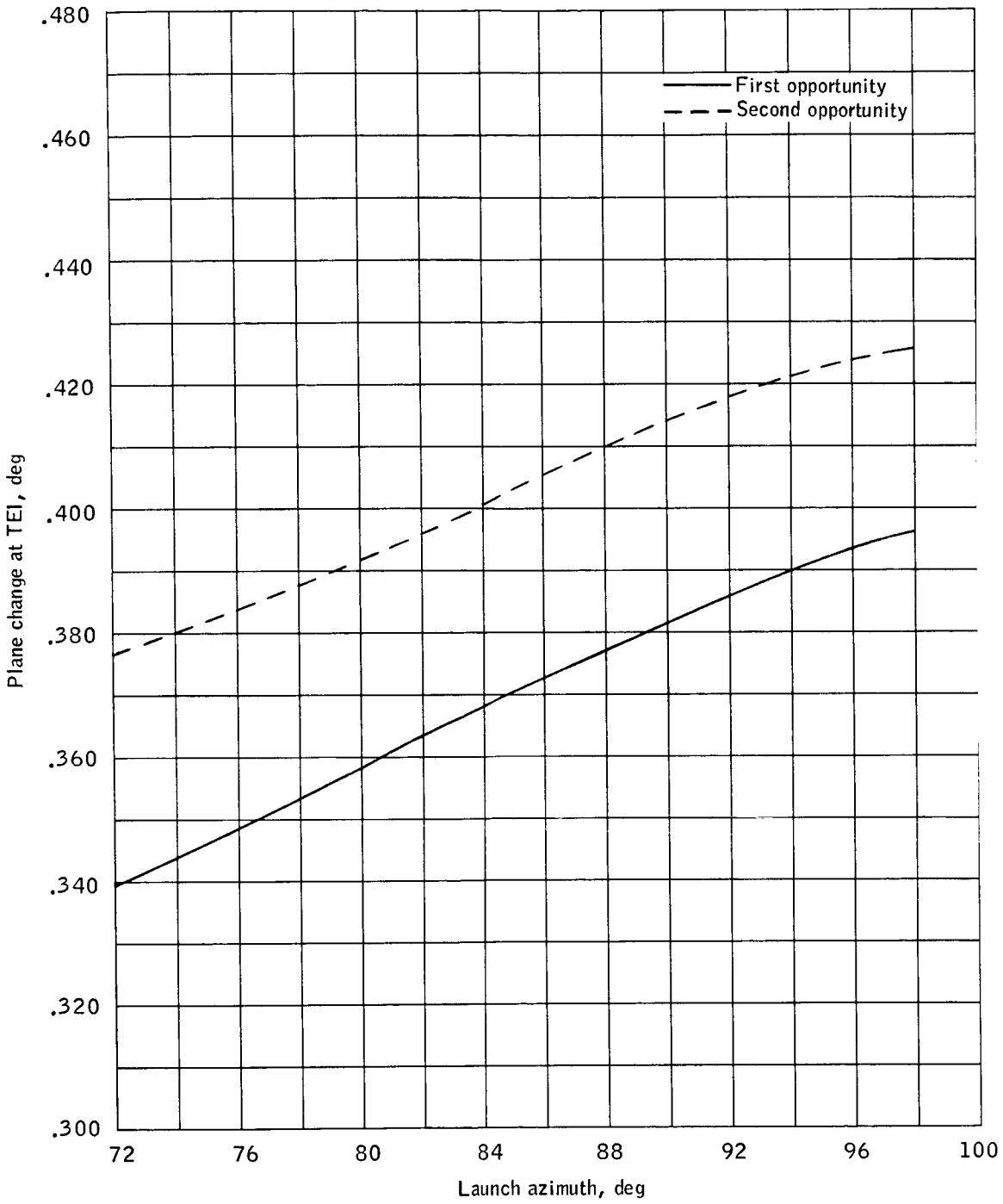
(k) LOI plane change.

Figure 2.- Continued.



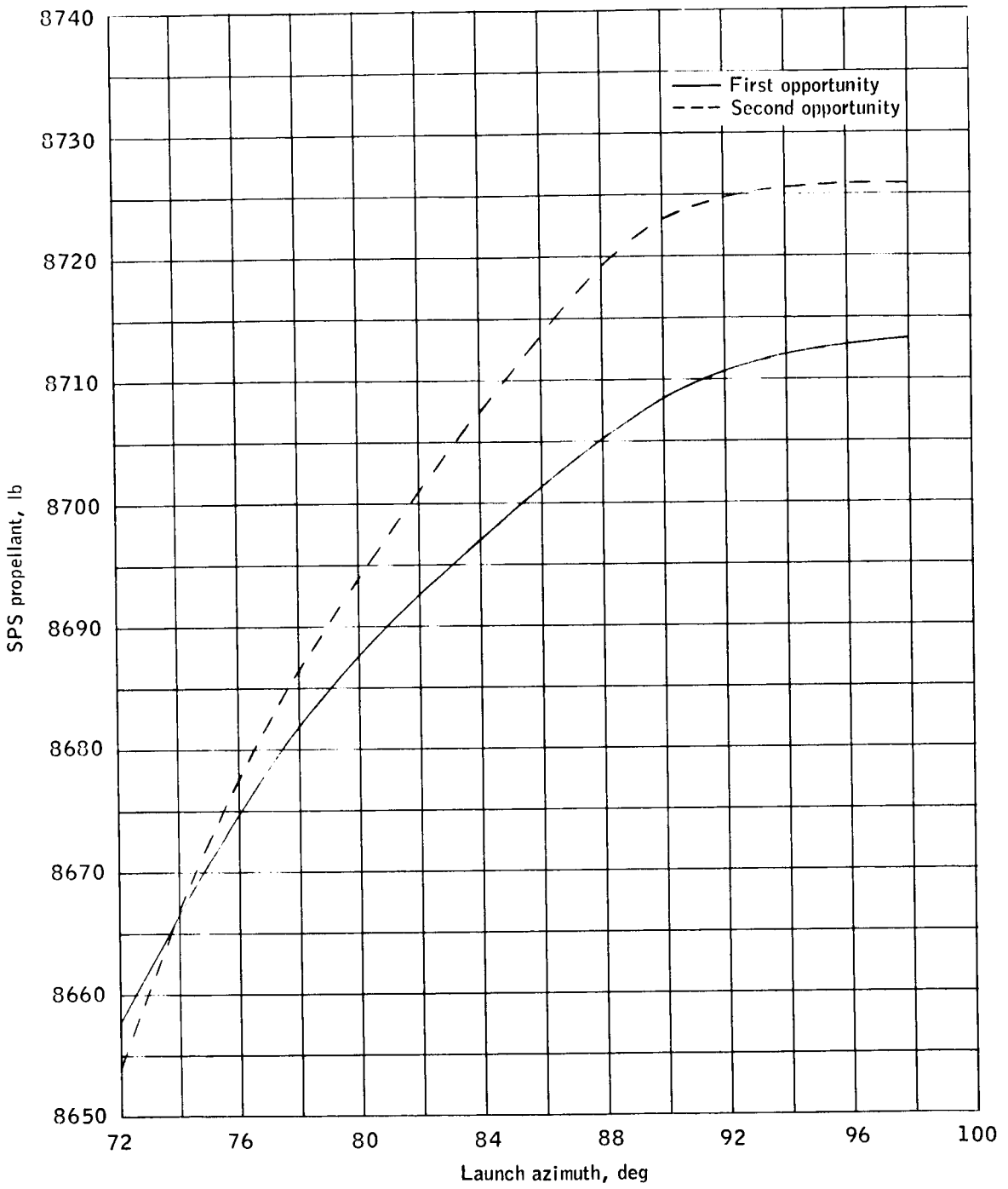
(l) SPS propellant used for LOI.

Figure 2.- Continued.



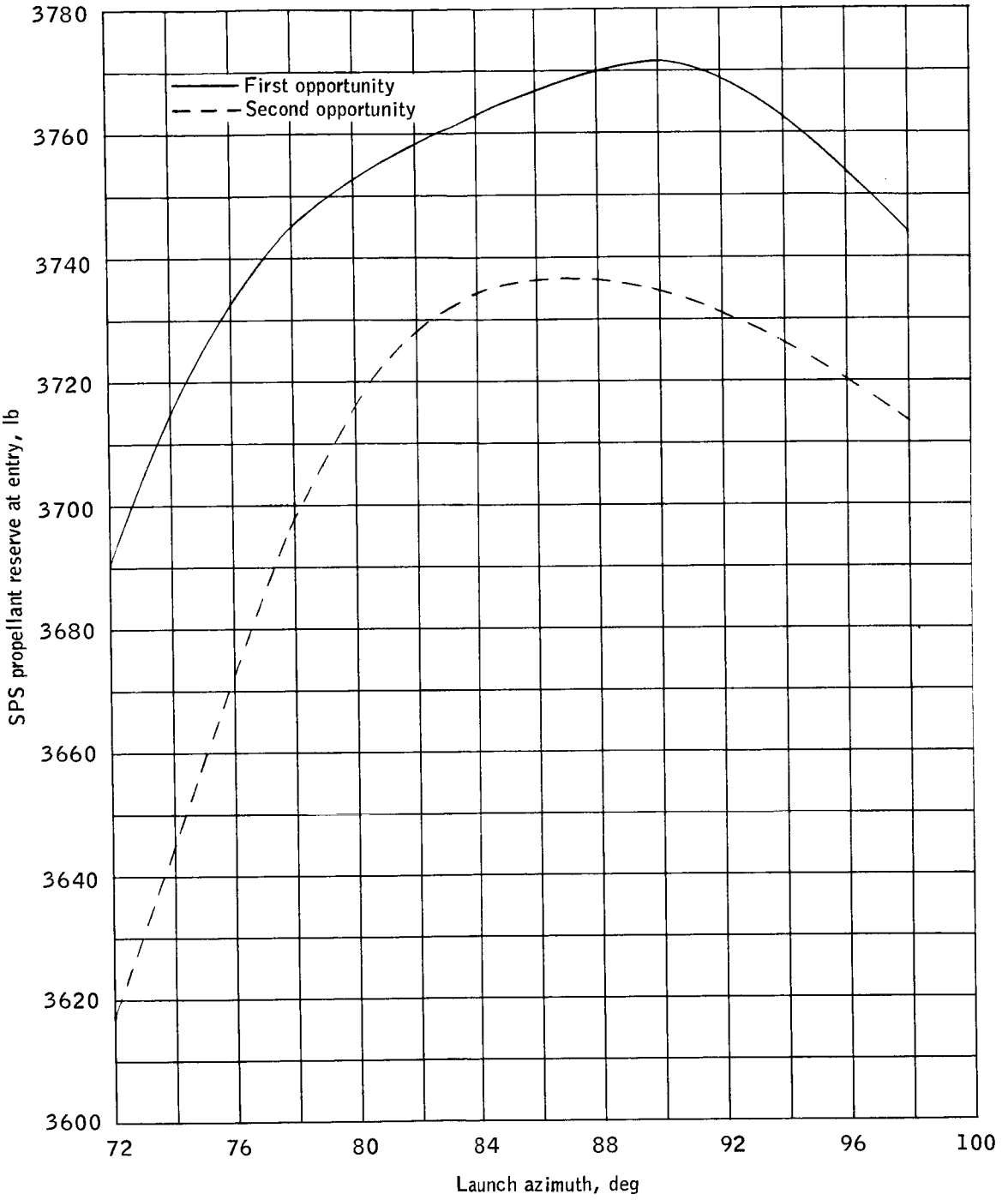
(m) TEI plane change.

Figure 2.- Continued.



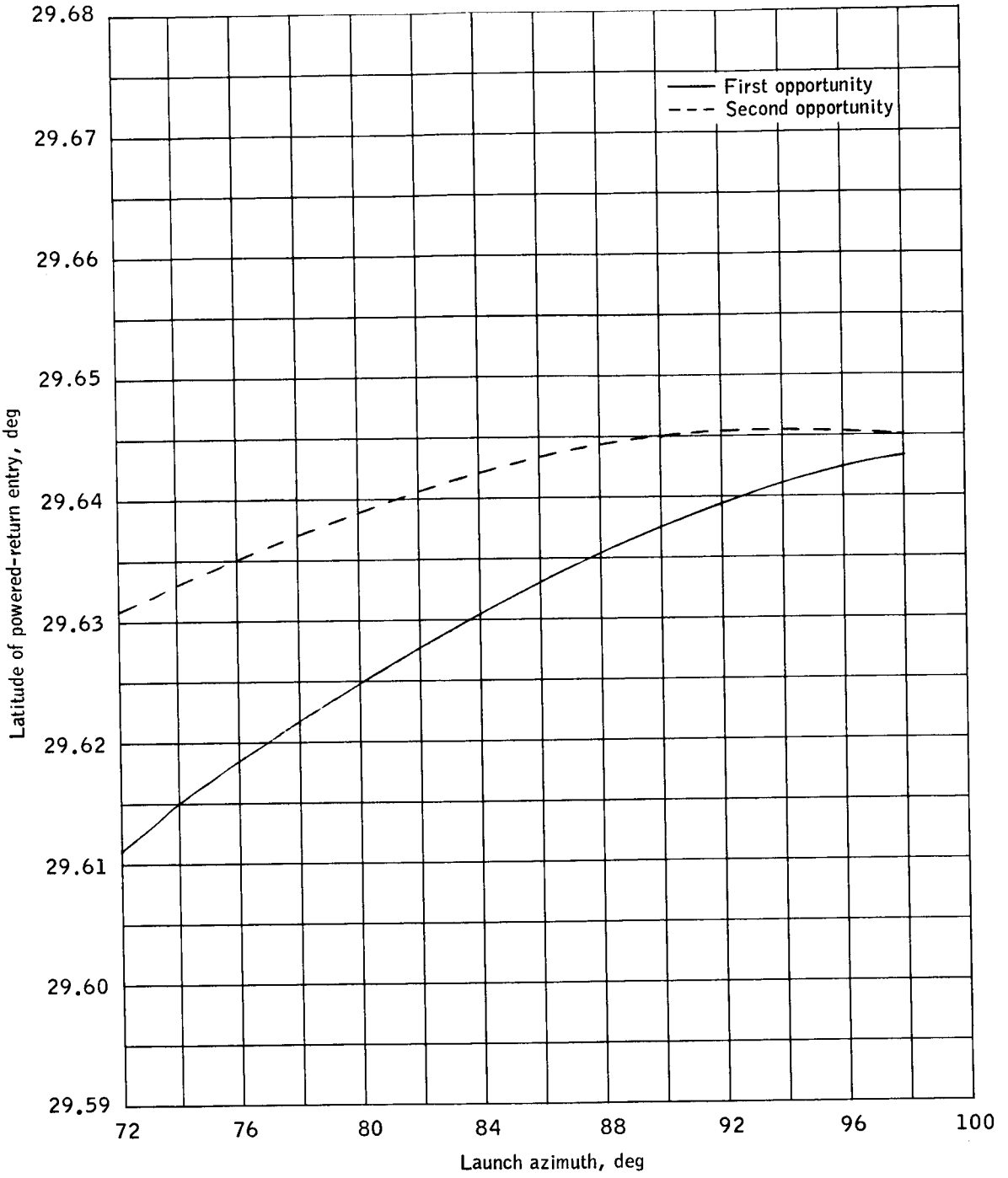
(n) SPS propellant used for TEI.

Figure 2.- Continued.



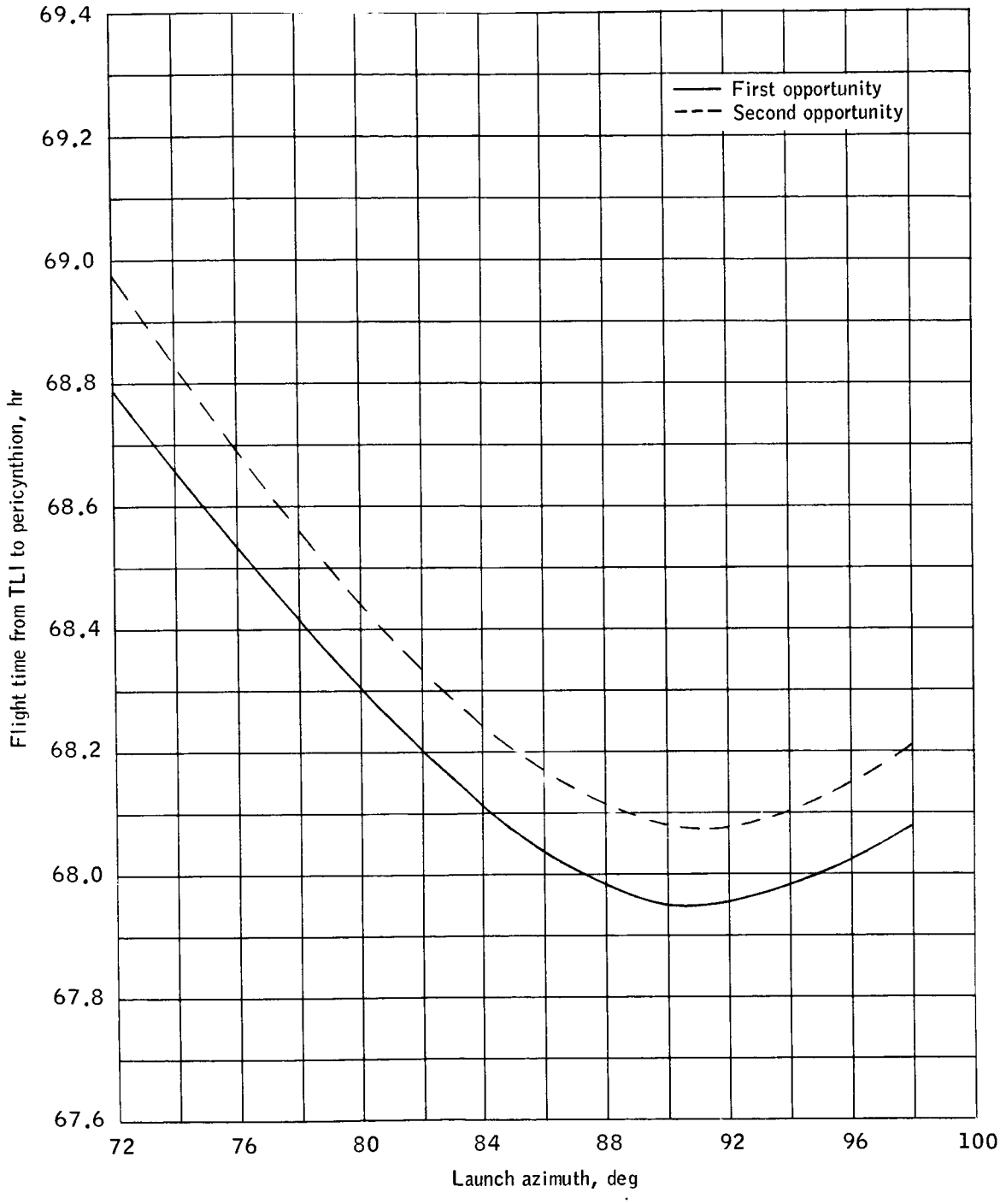
(o) SPS useable propellant reserve at entry.

Figure 2.- Continued.



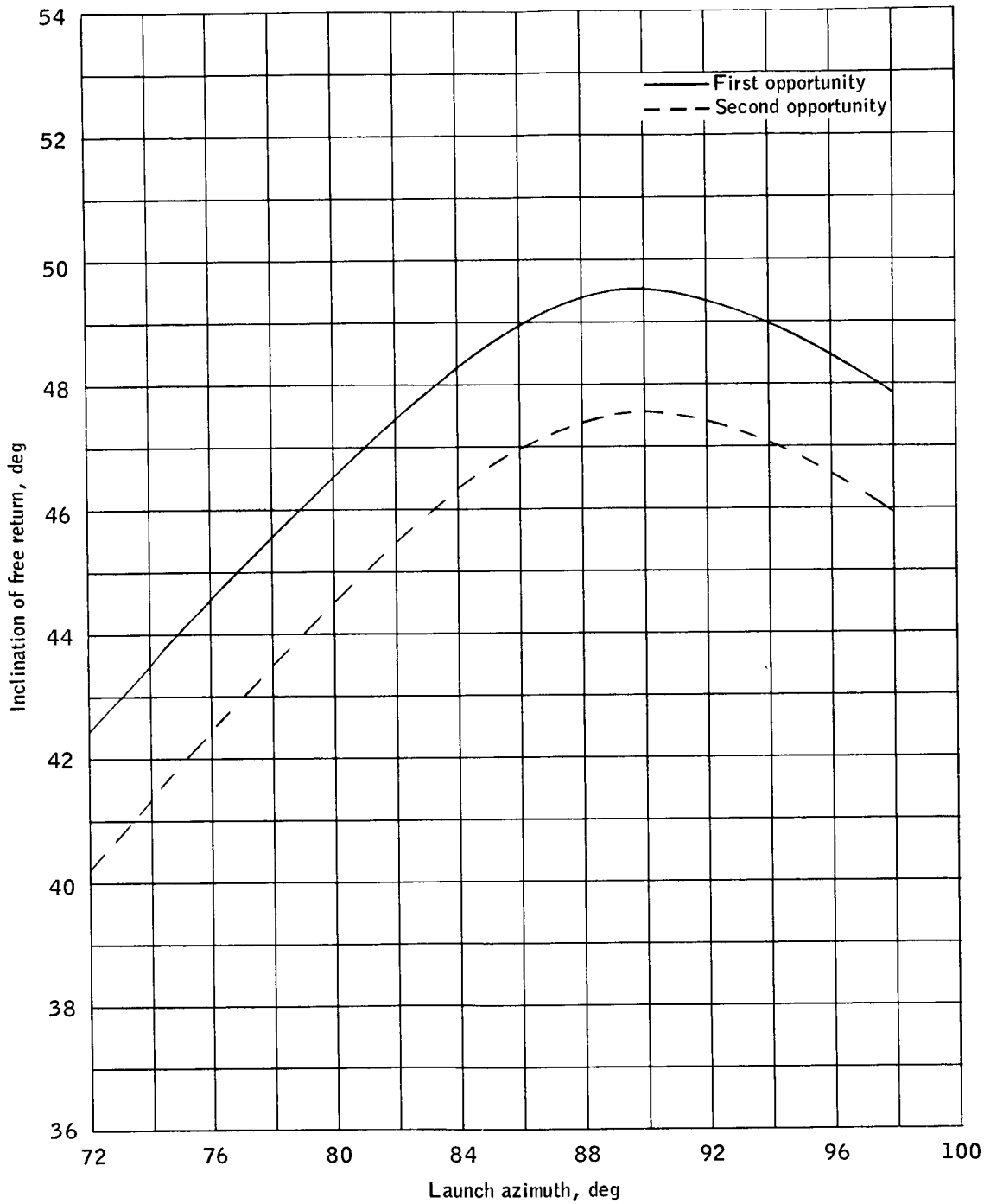
(p) Entry latitude.

Figure 2.- Continued.



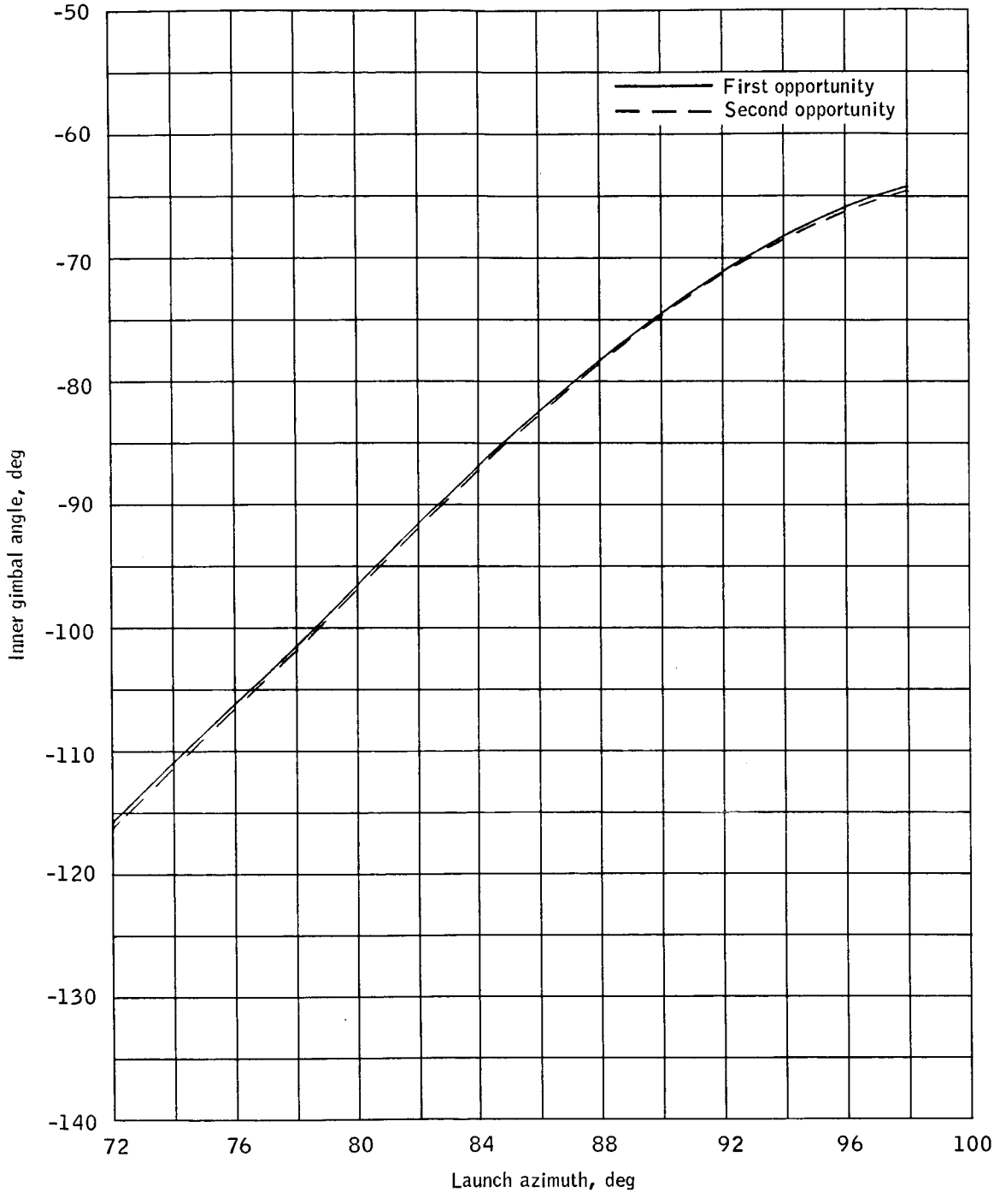
(q) Free return flight time from TLI to pericynthion.

Figure 2.- Continued.



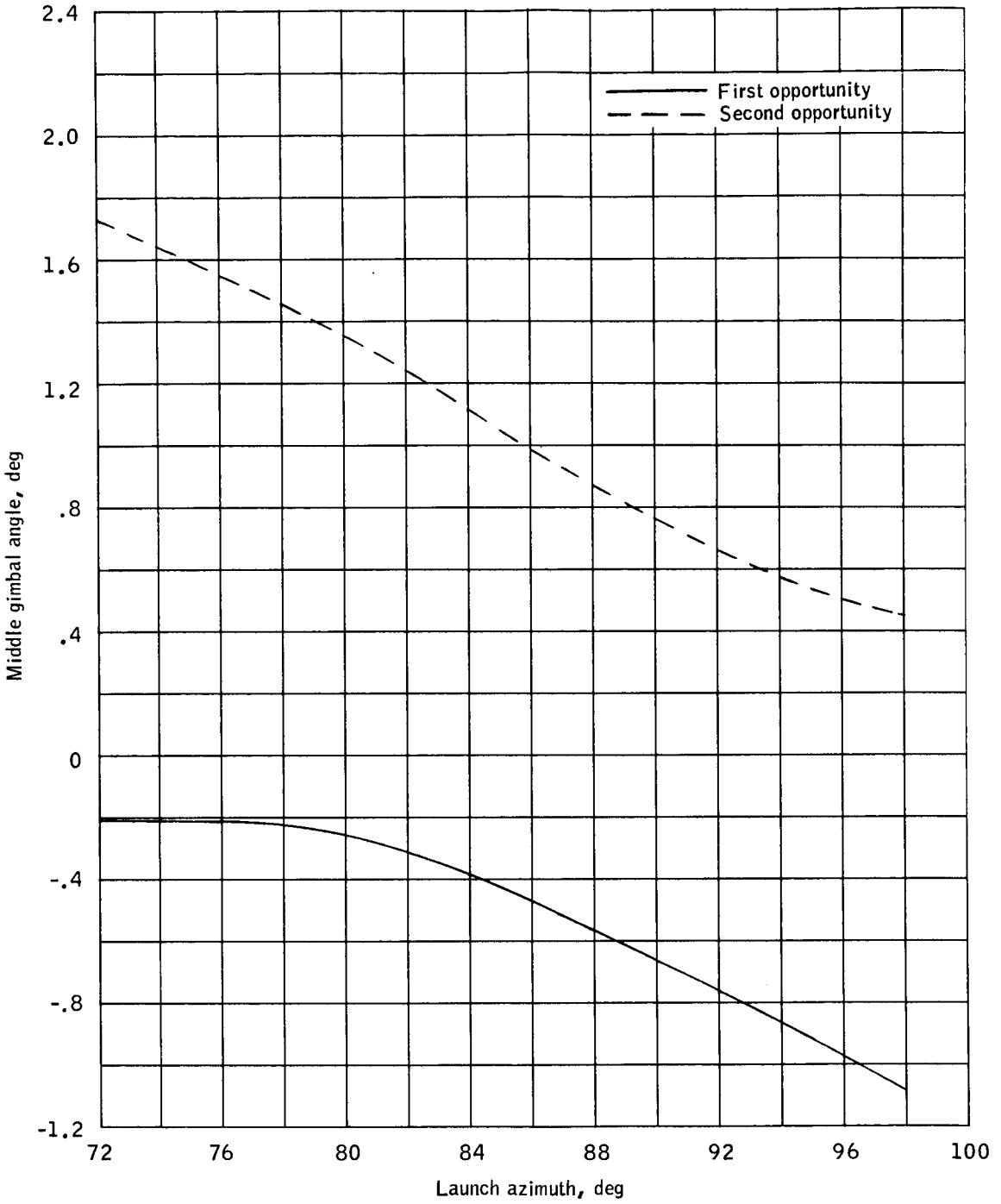
(r) Free return inclination at entry interface.

Figure 2.- Continued.



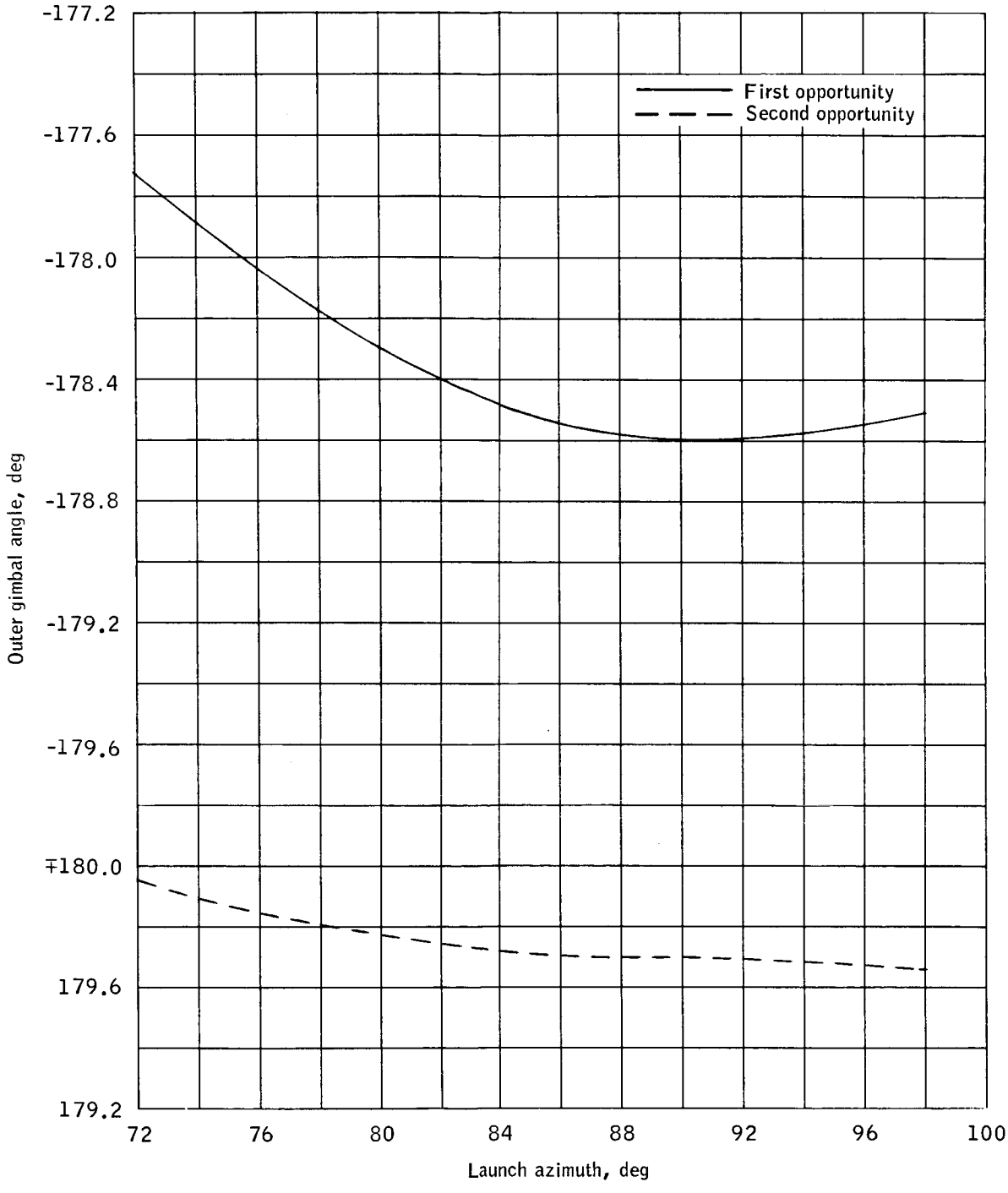
(s) S-IVB IU inner gimbal angle for transposition and docking.

Figure 2.- Continued.



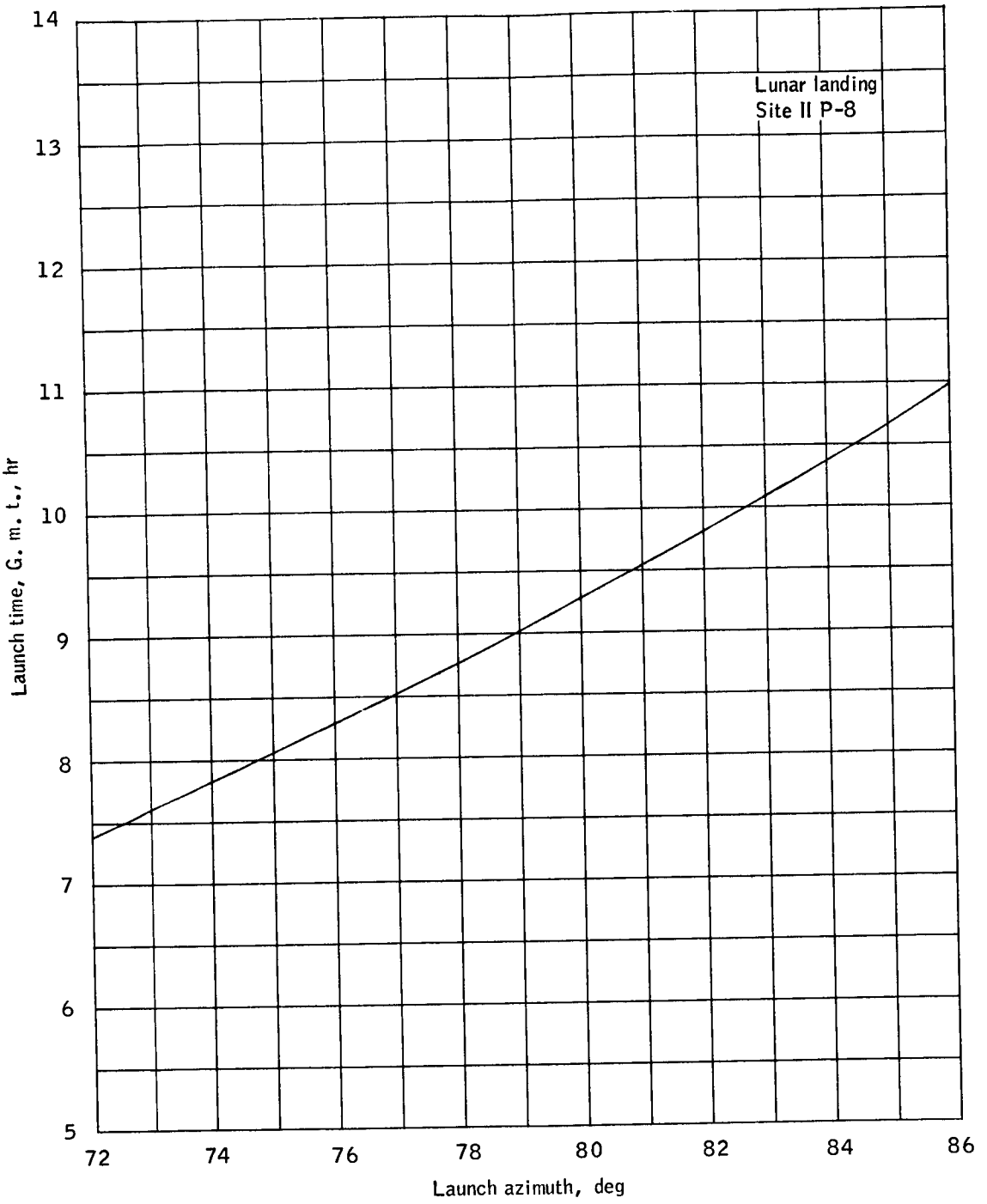
(t) S-IVB IU middle gimbal angle for transposition and docking.

Figure 2.- Continued.



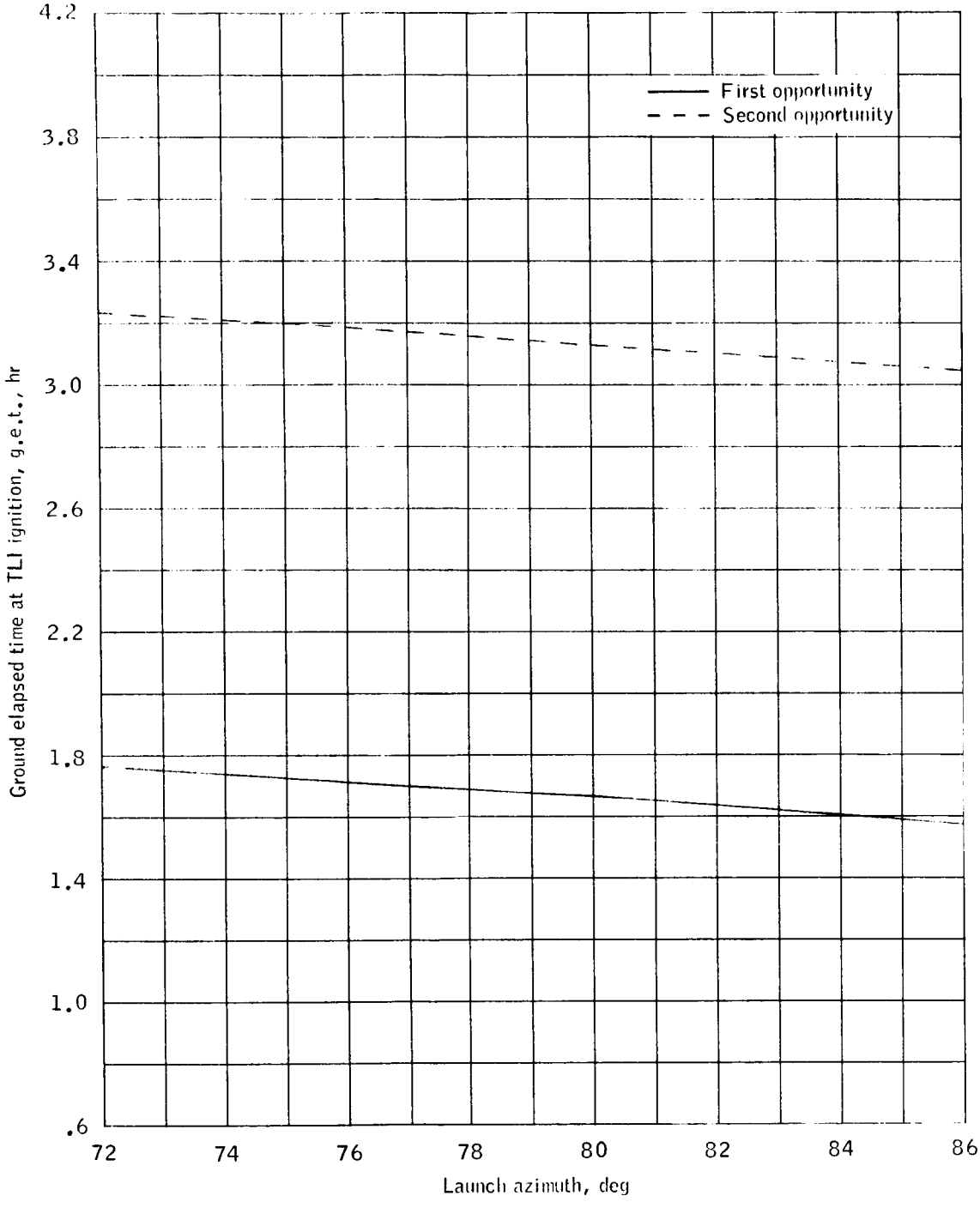
(u) S-IVB IU outer gimbal angle for transposition and docking.

Figure 1.- Concluded.



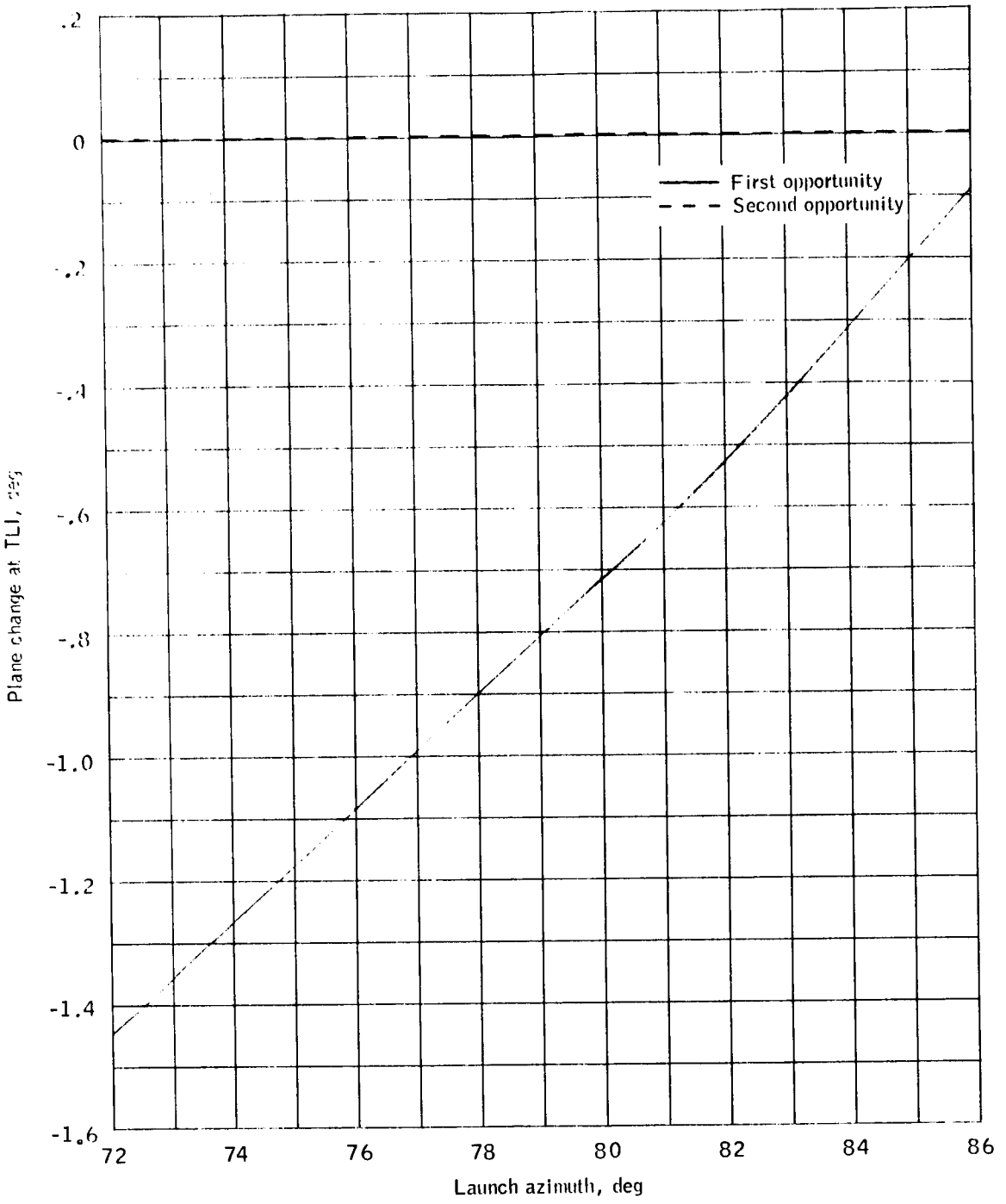
(a) Launch time.

Figure 3.- Trajectory parameters as a function of launch azimuth for lift-off on September 16, 1969.



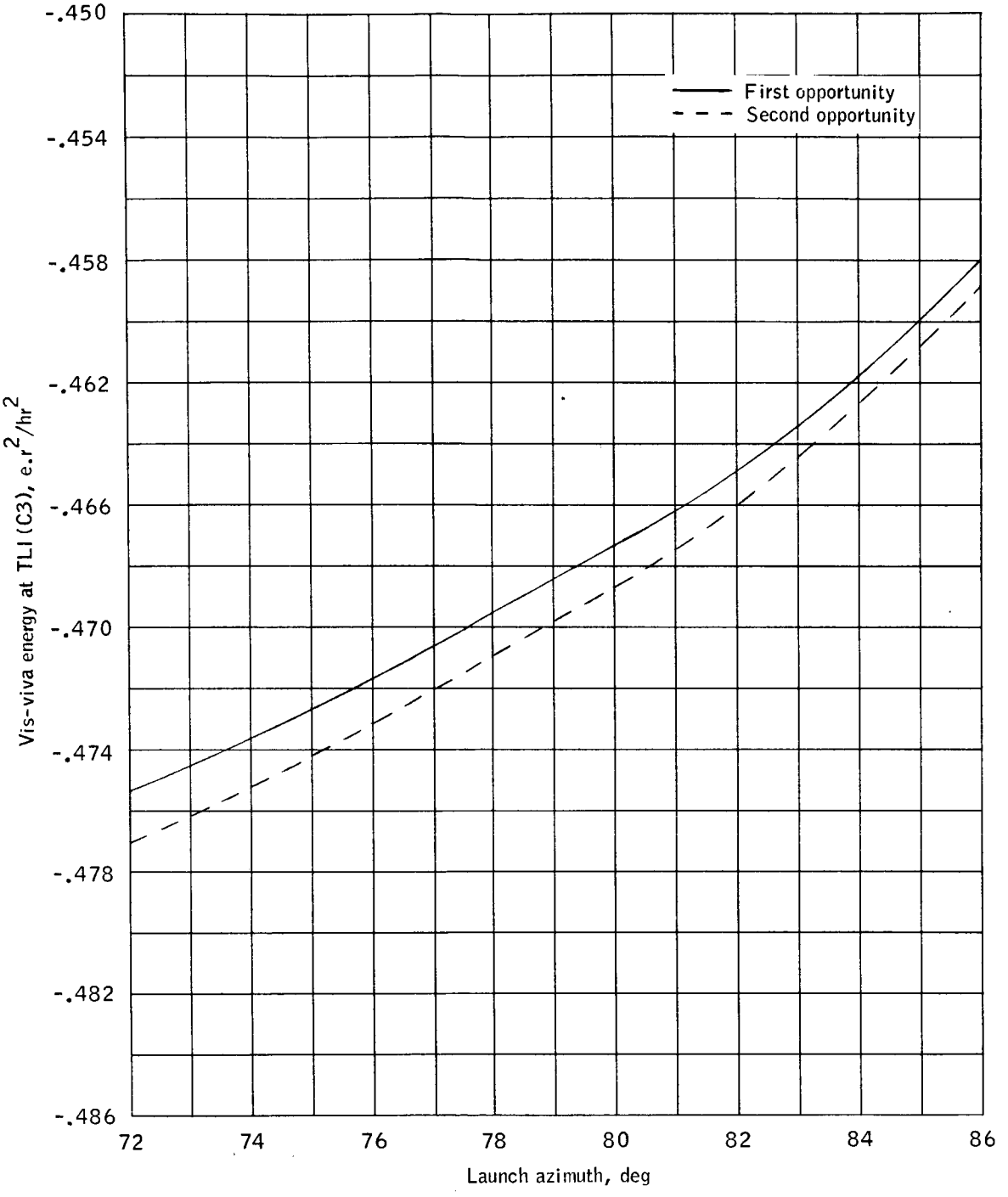
(b) Ground elapsed time at TLI ignition.

Figure 3.- Continued.



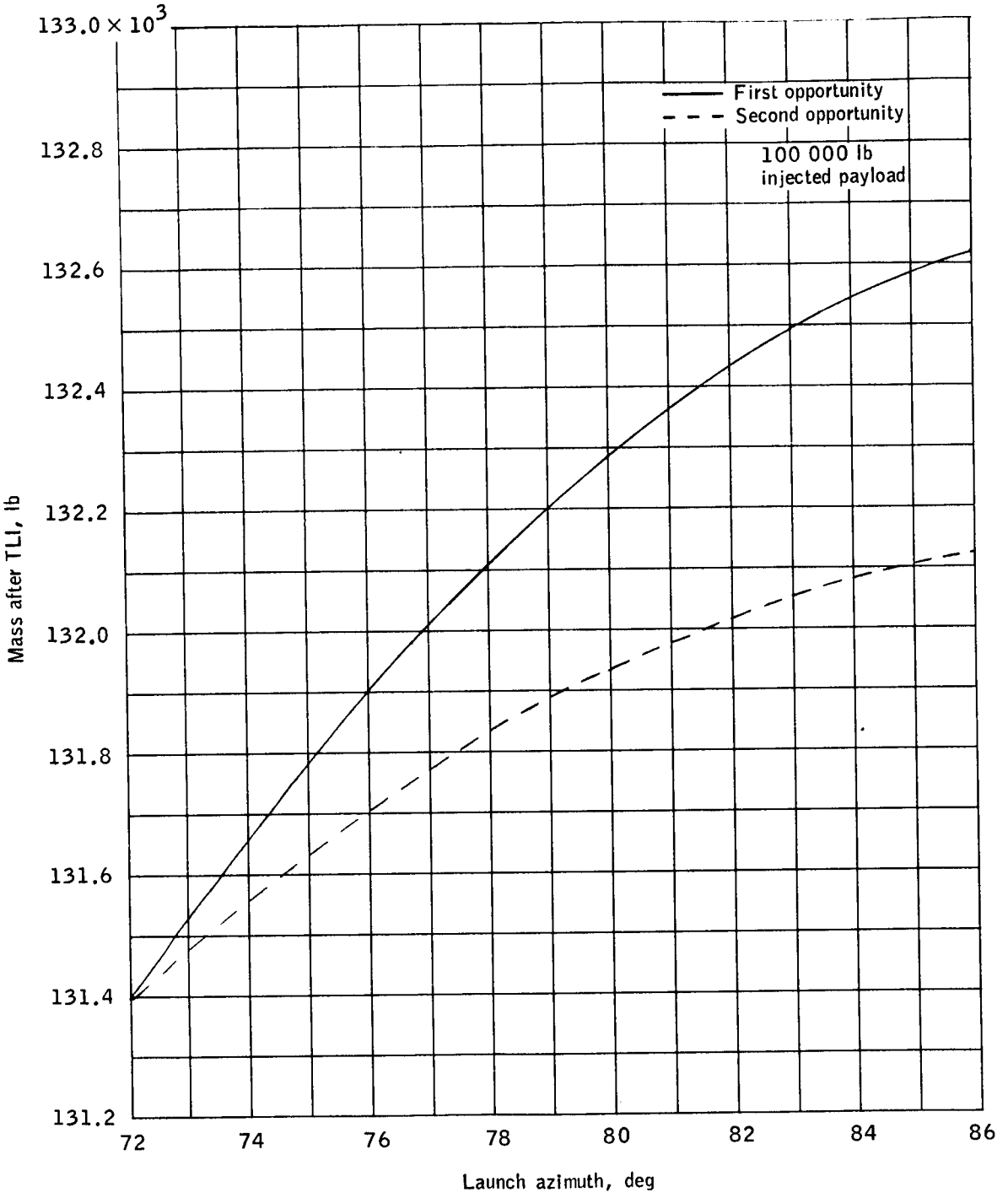
(c) TLI plane change.

Figure 3.- Continued.



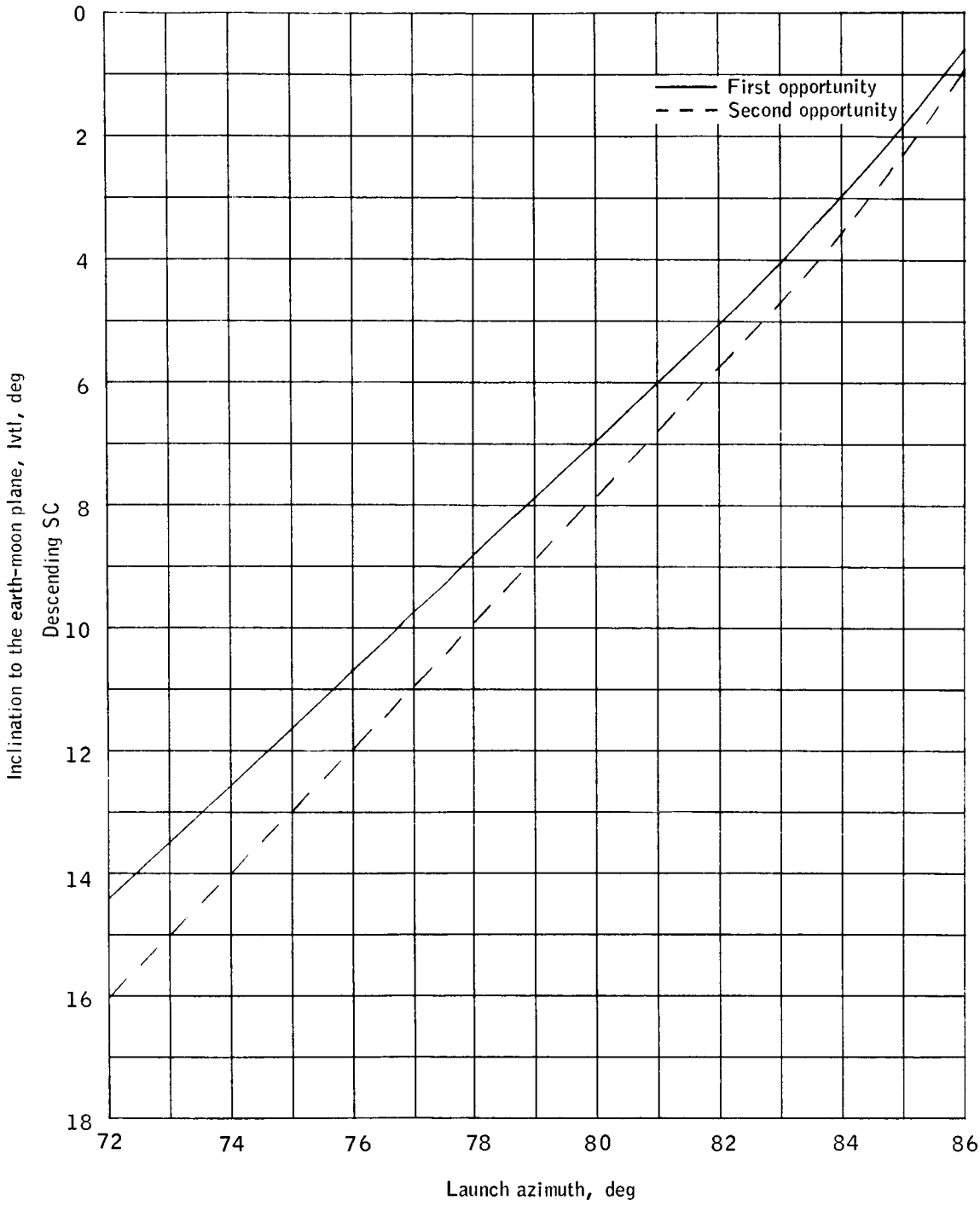
(d) Required energy at TLI termination.

Figure 3.- Continued.



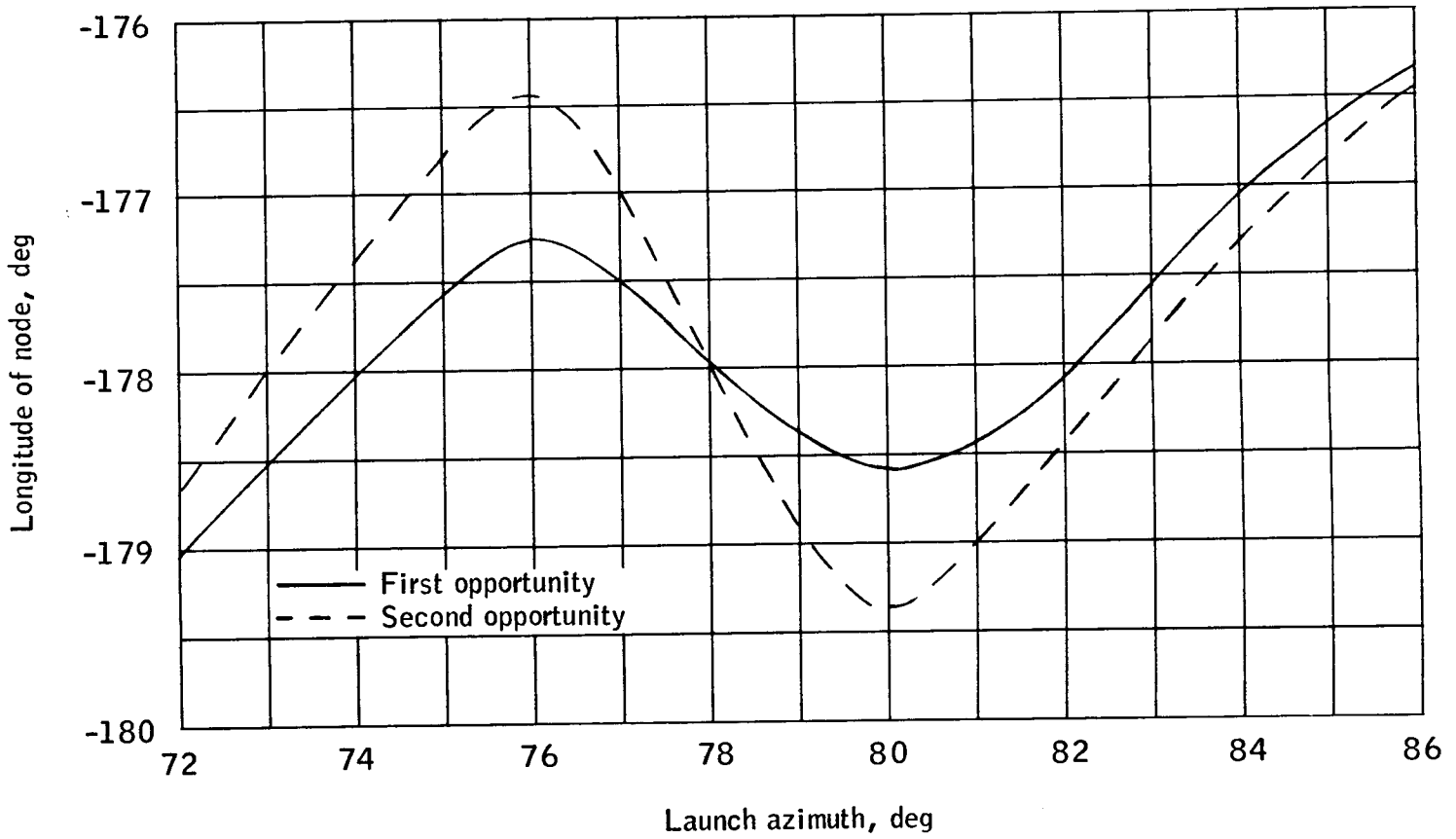
(e) Translunar injected weight.

Figure 3.- Continued.



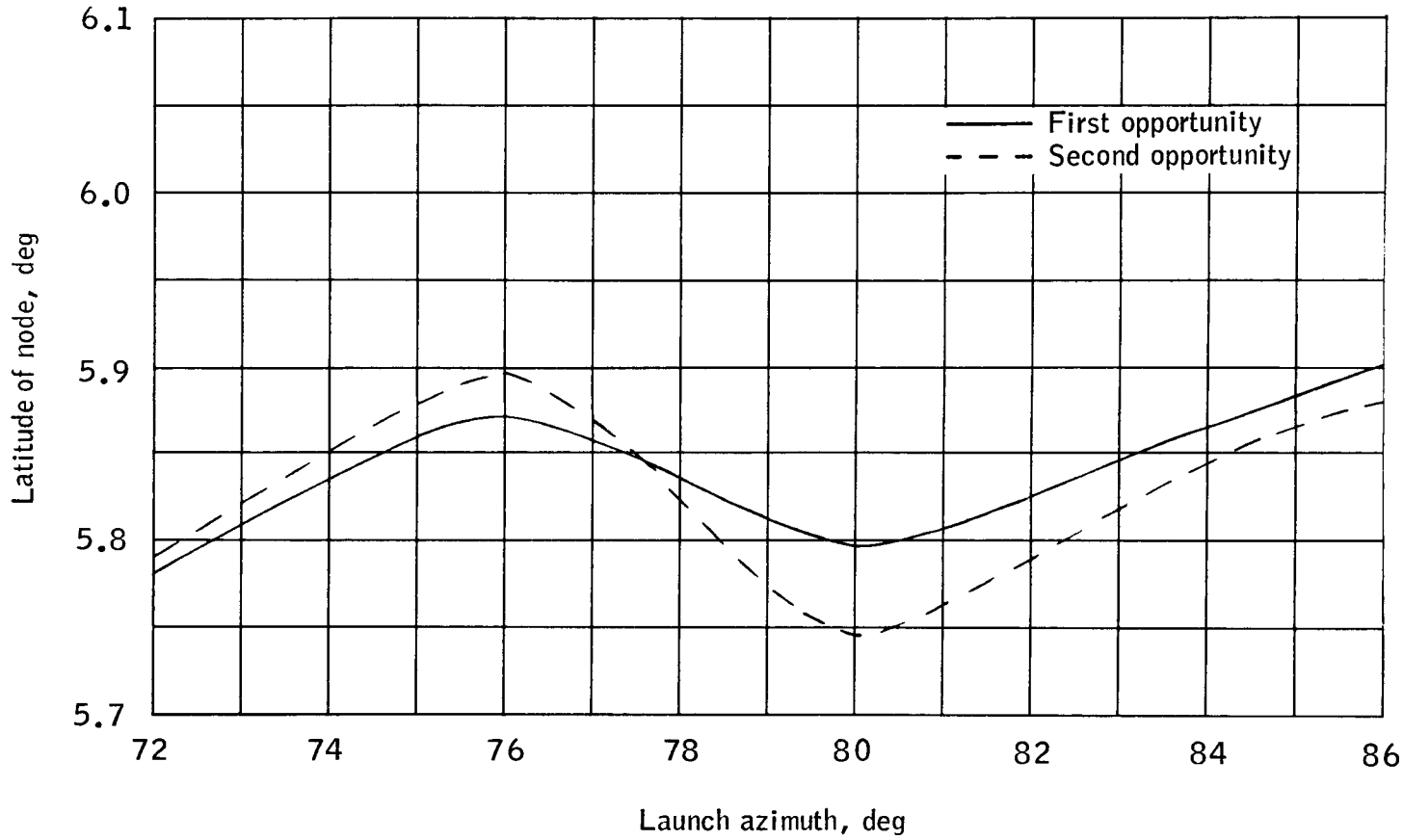
(f) Inclination to the earth-moon plane at TLI termination.

Figure 3.- Continued.



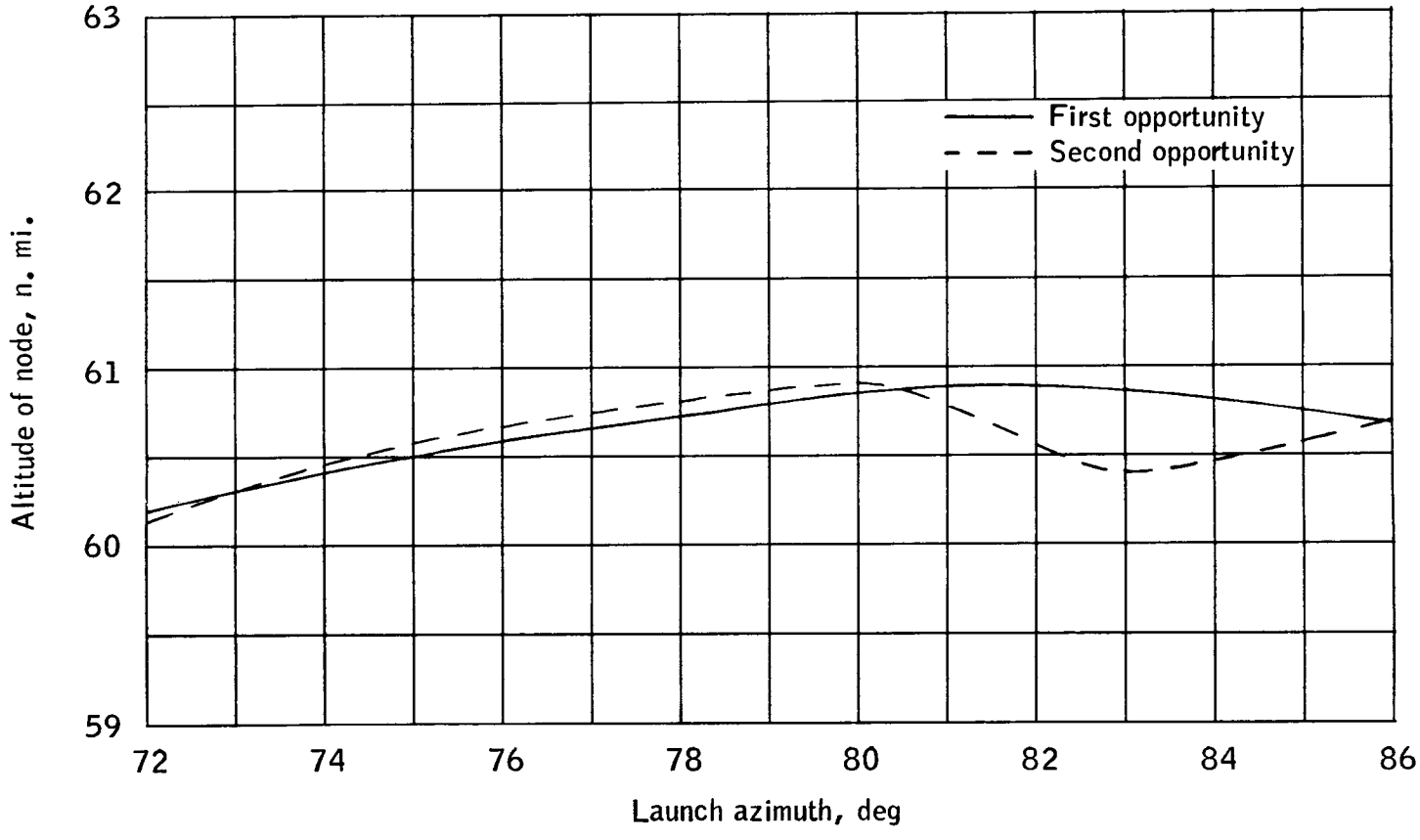
(g) Earth-moon plane longitude of node.

Figure 3.- Continued.



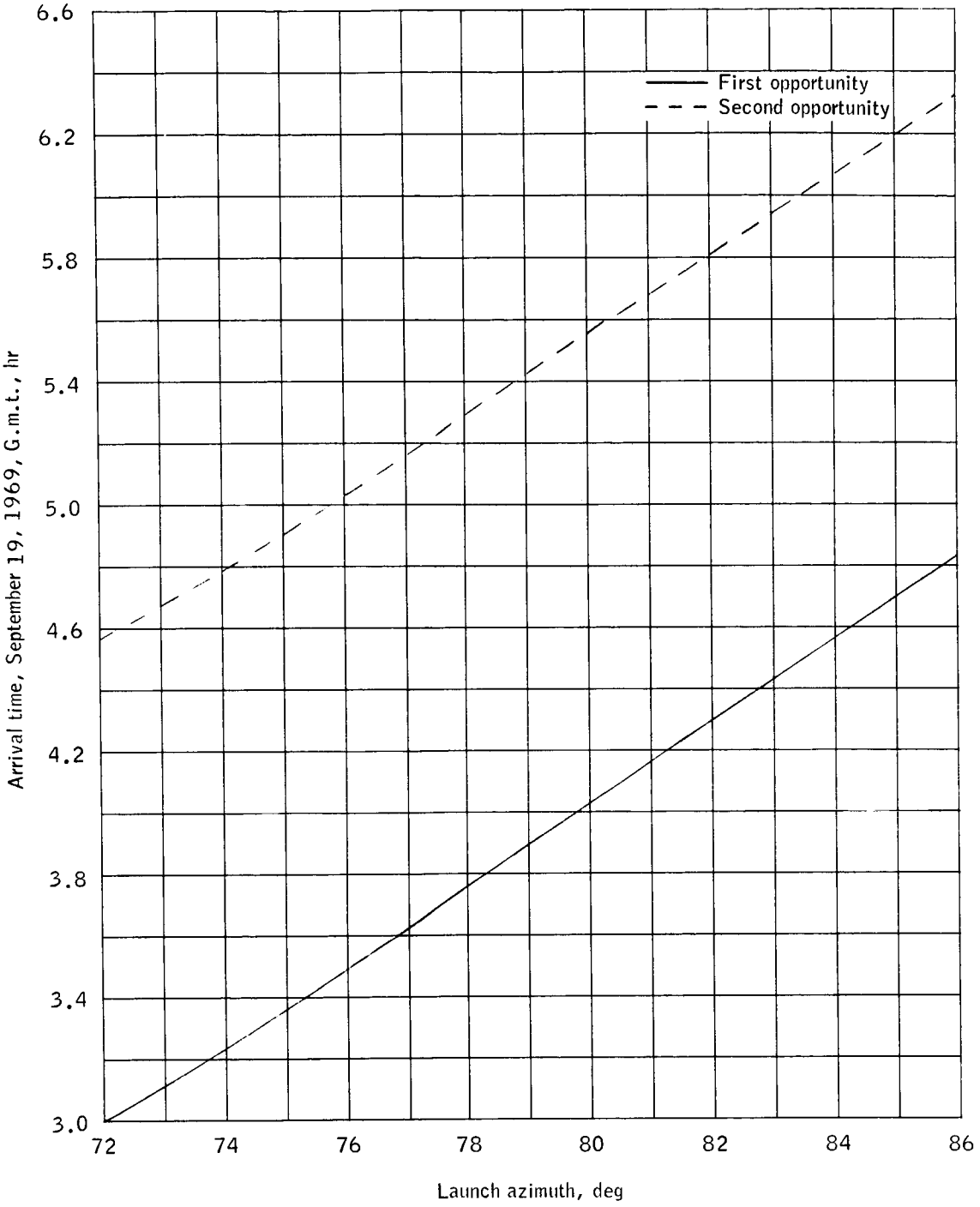
(h) Earth-moon plane latitude of node.

Figure 3.- Continued.



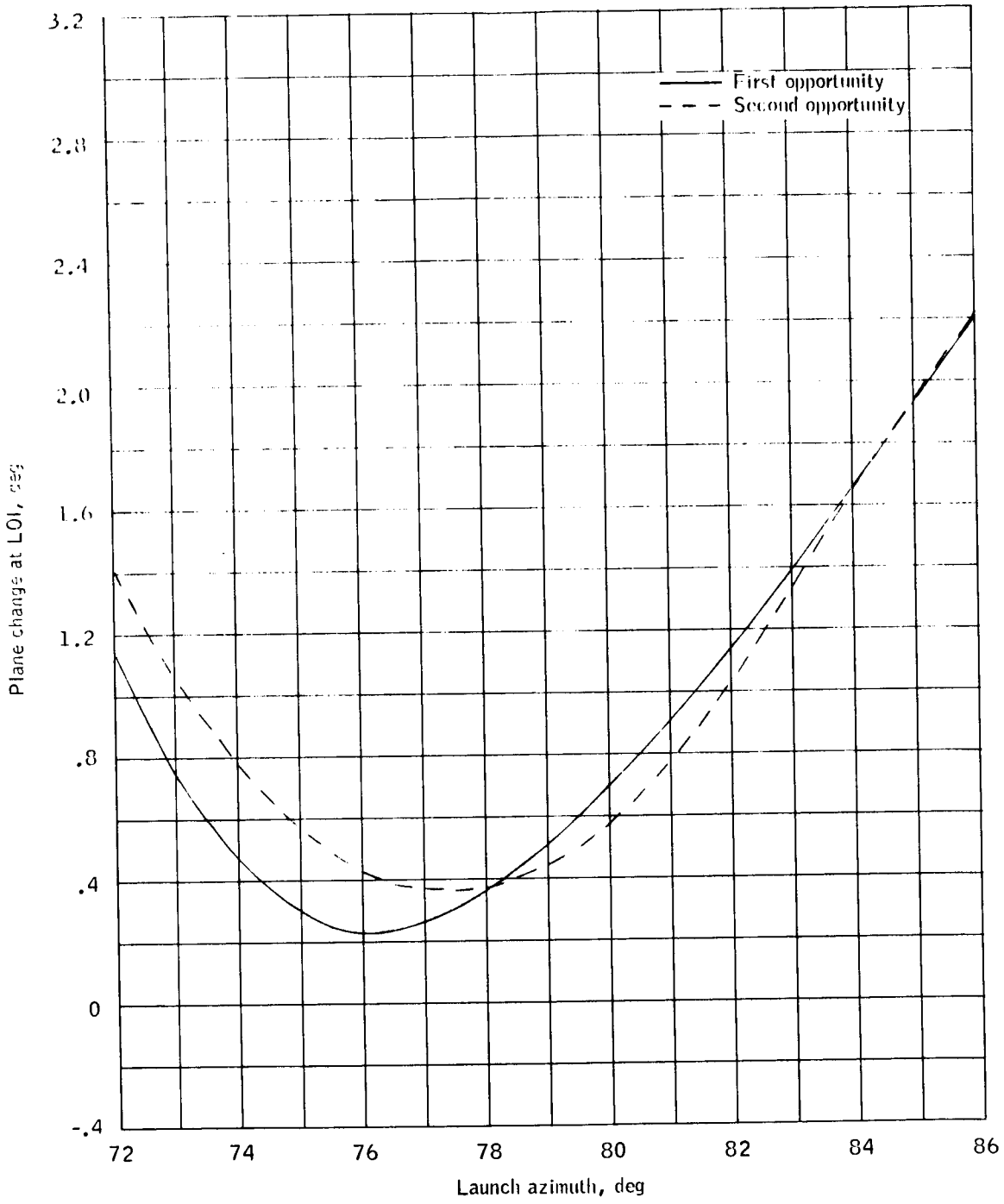
(i) Selenographic altitude of the node.

Figure 3.- Continued.



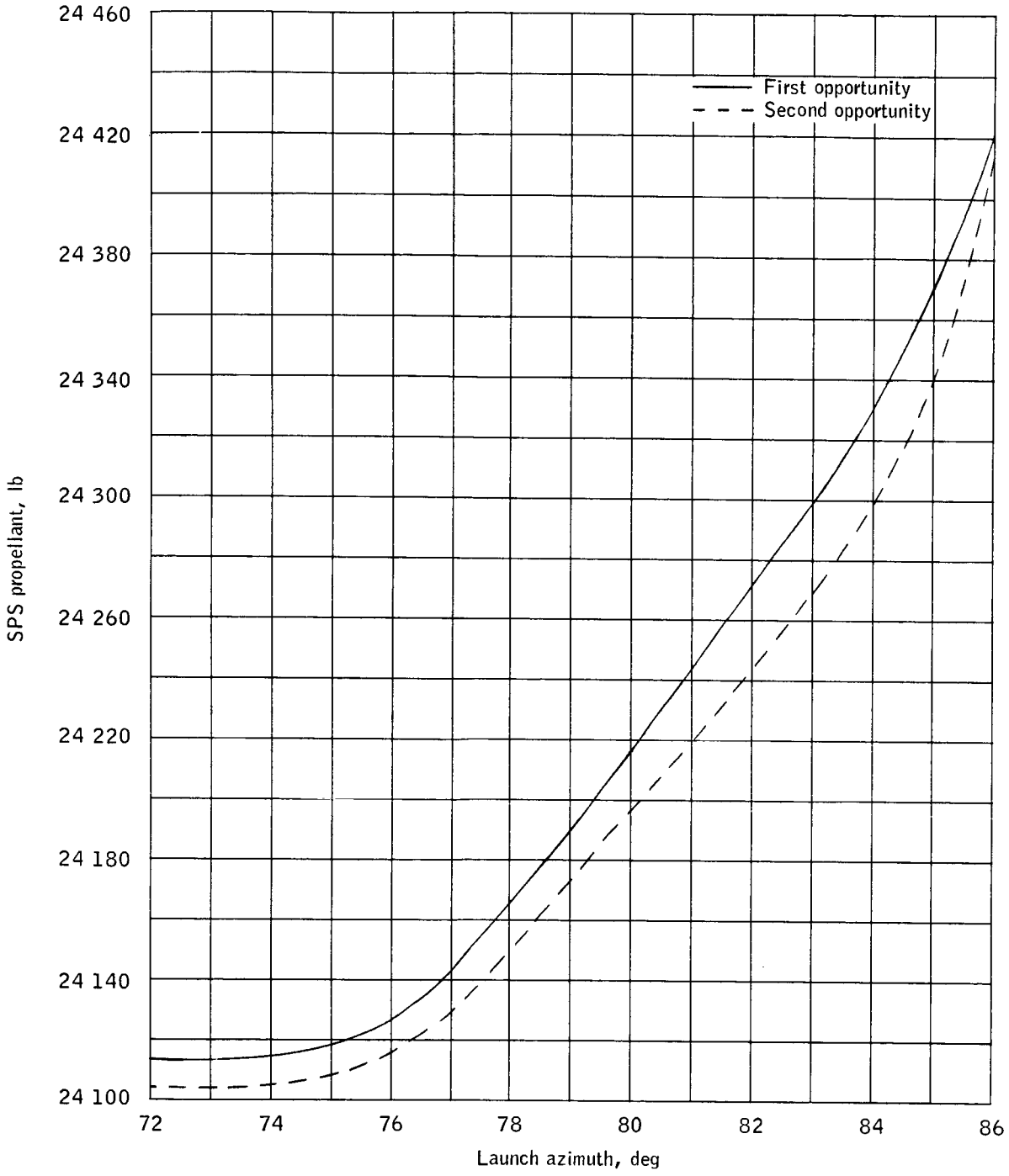
(j) Time of nodal arrival.

Figure 3.- Continued.



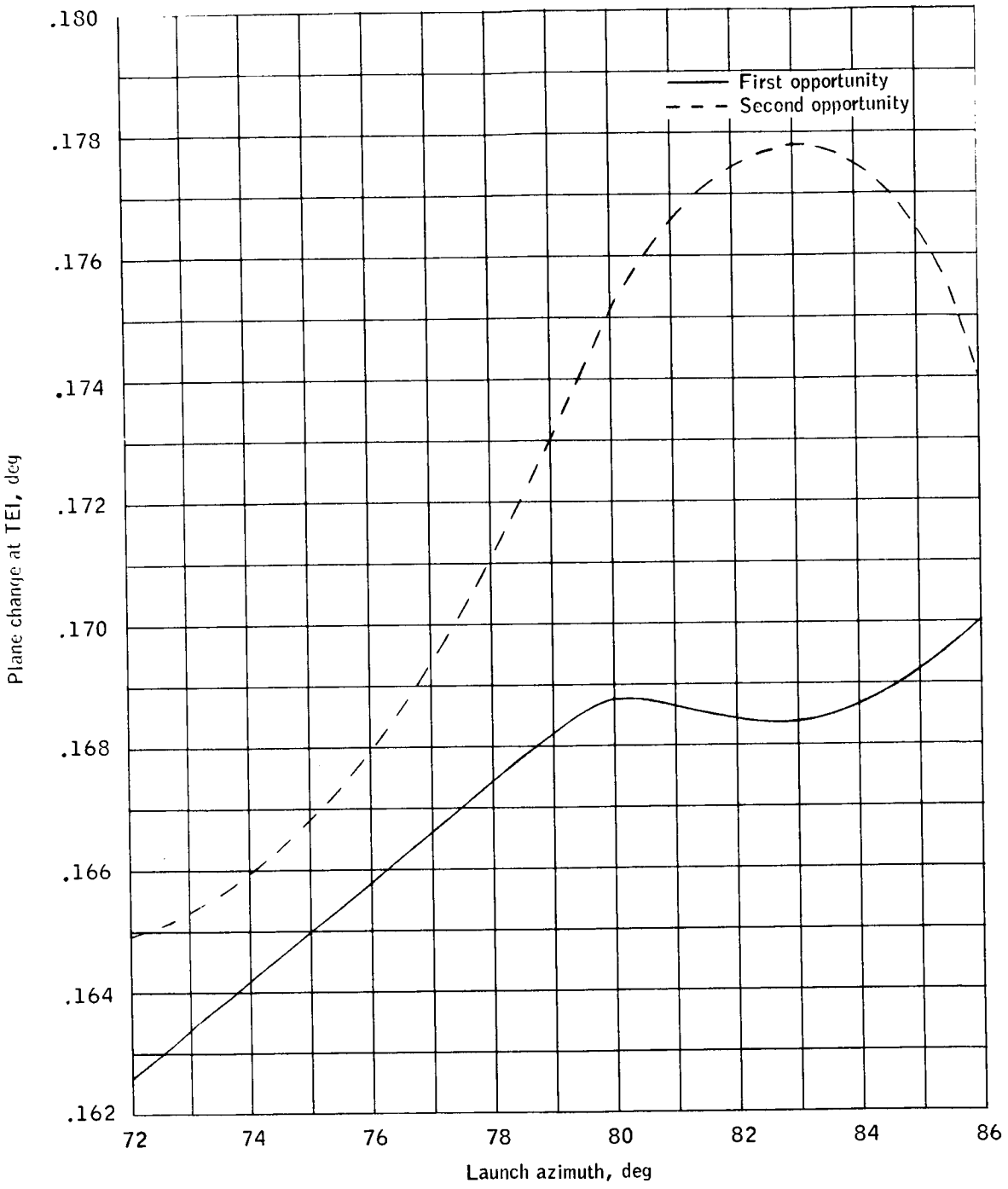
(k) LOI plane change.

Figure 3.- Continued.



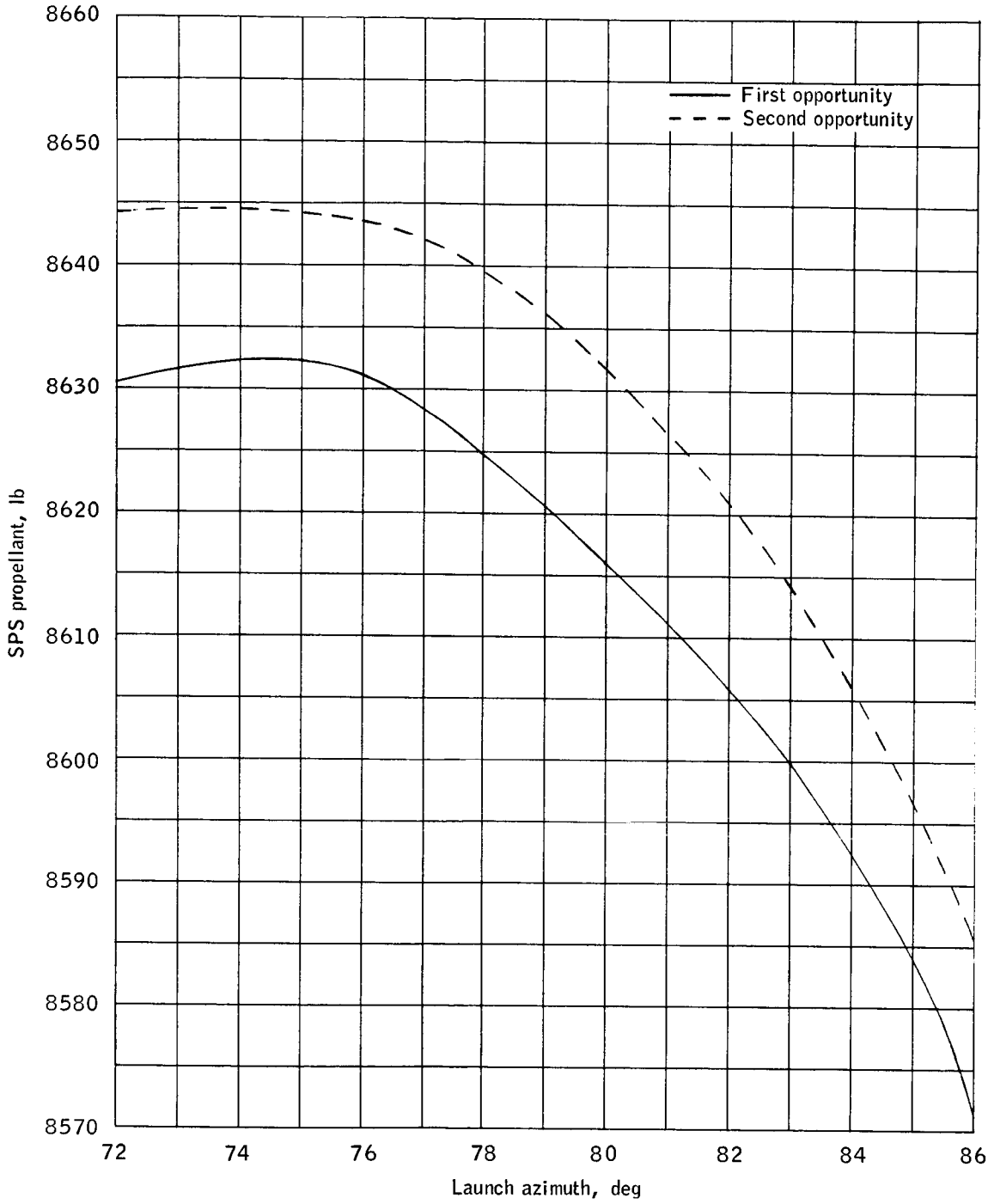
(l) SPS propellant used for LOI.

Figure 3.- Continued.



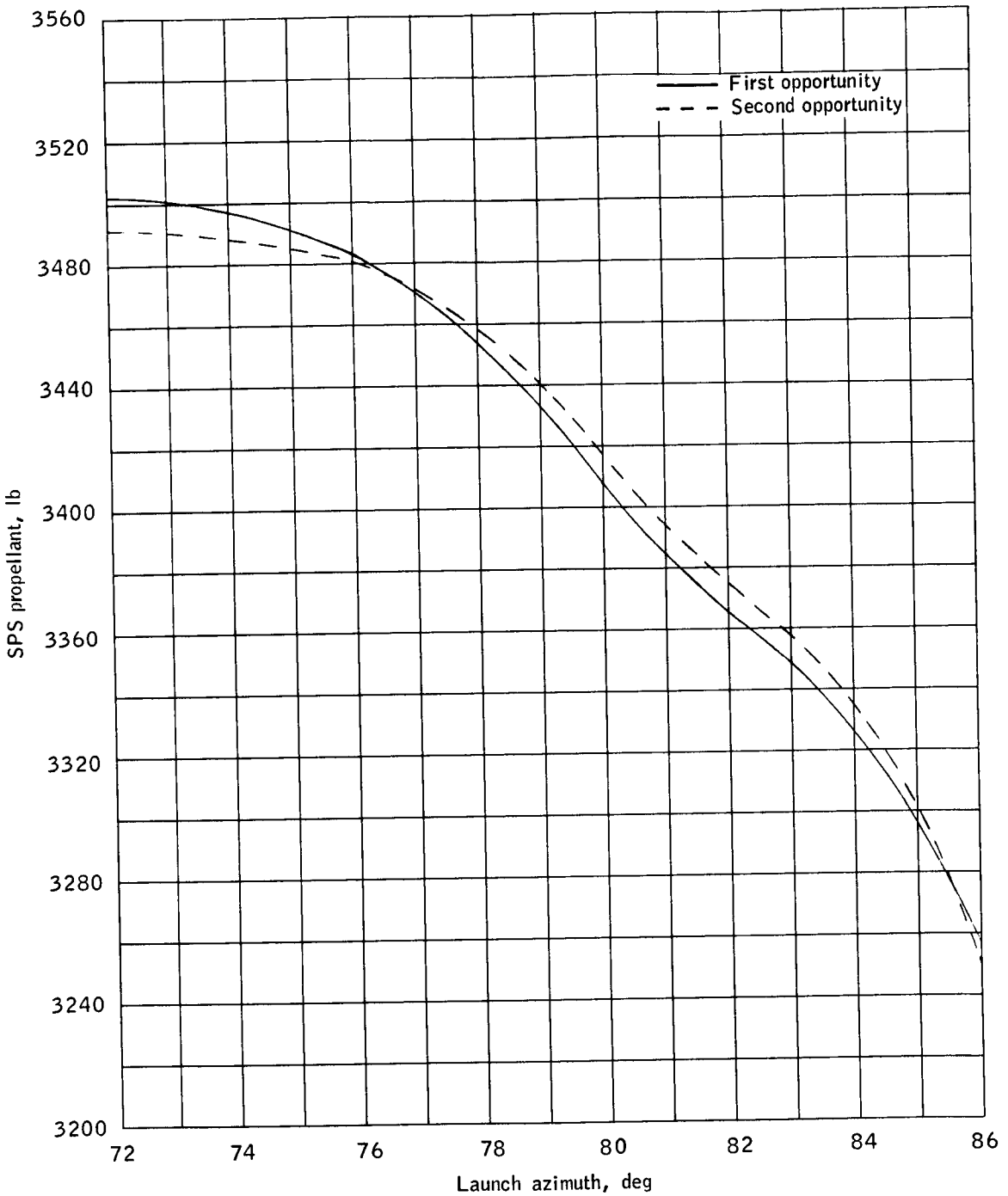
(m) TEI plane change.

Figure 3.- Continued.



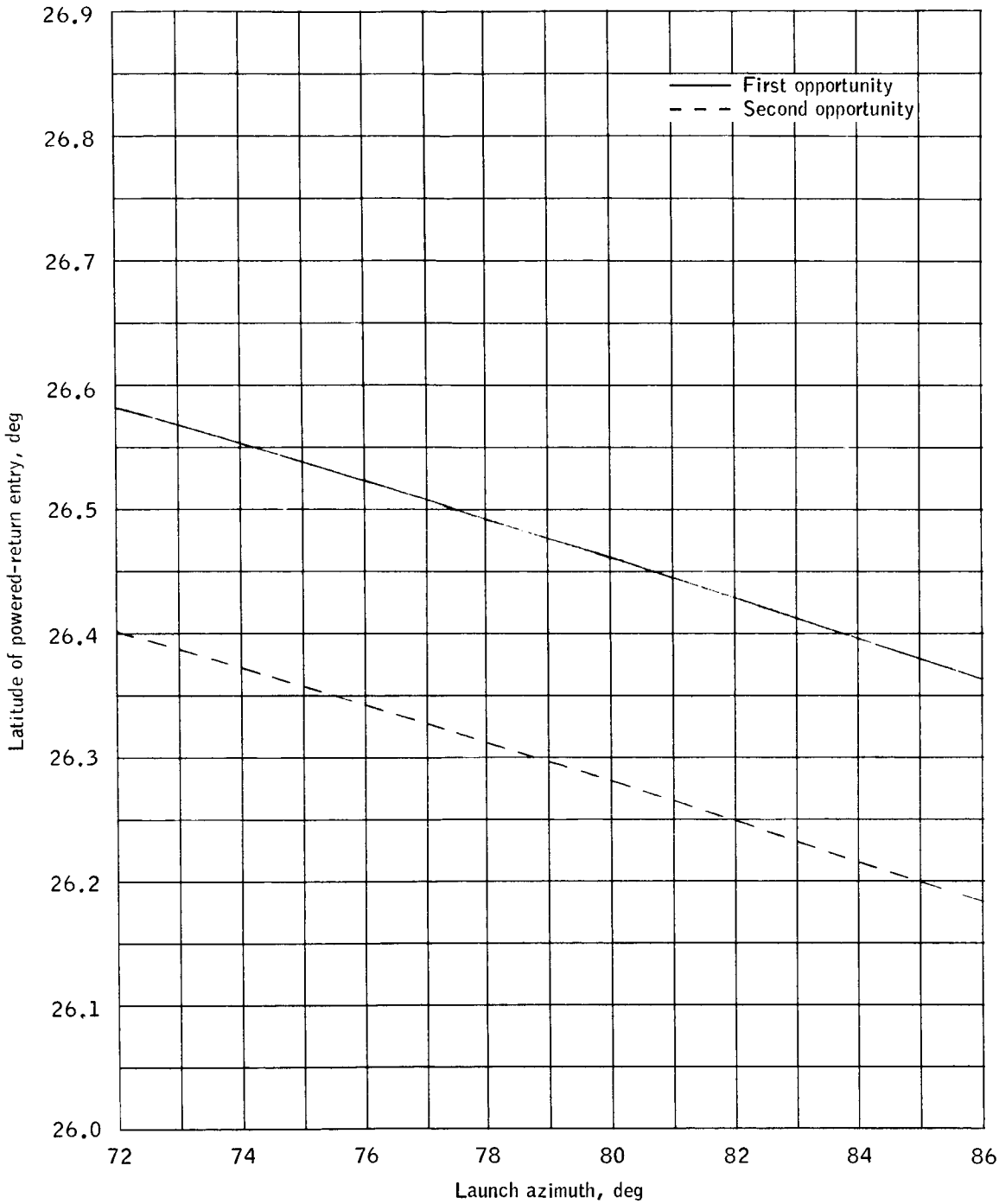
(n) SPS propellant used for TEI.

Figure 3 .- Continued.



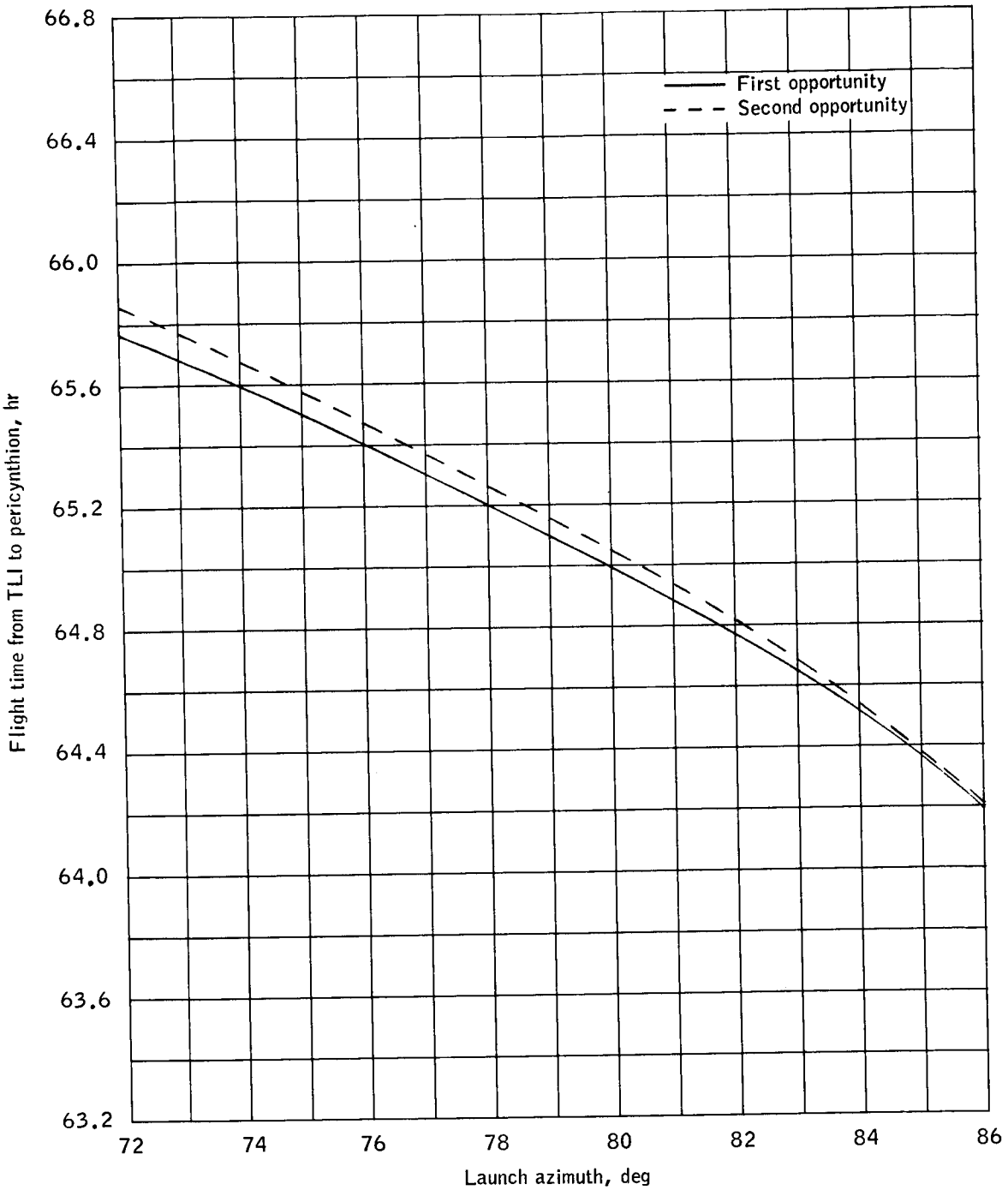
(o) SPS useable propellant reserve at entry.

Figure 3.- Continued.



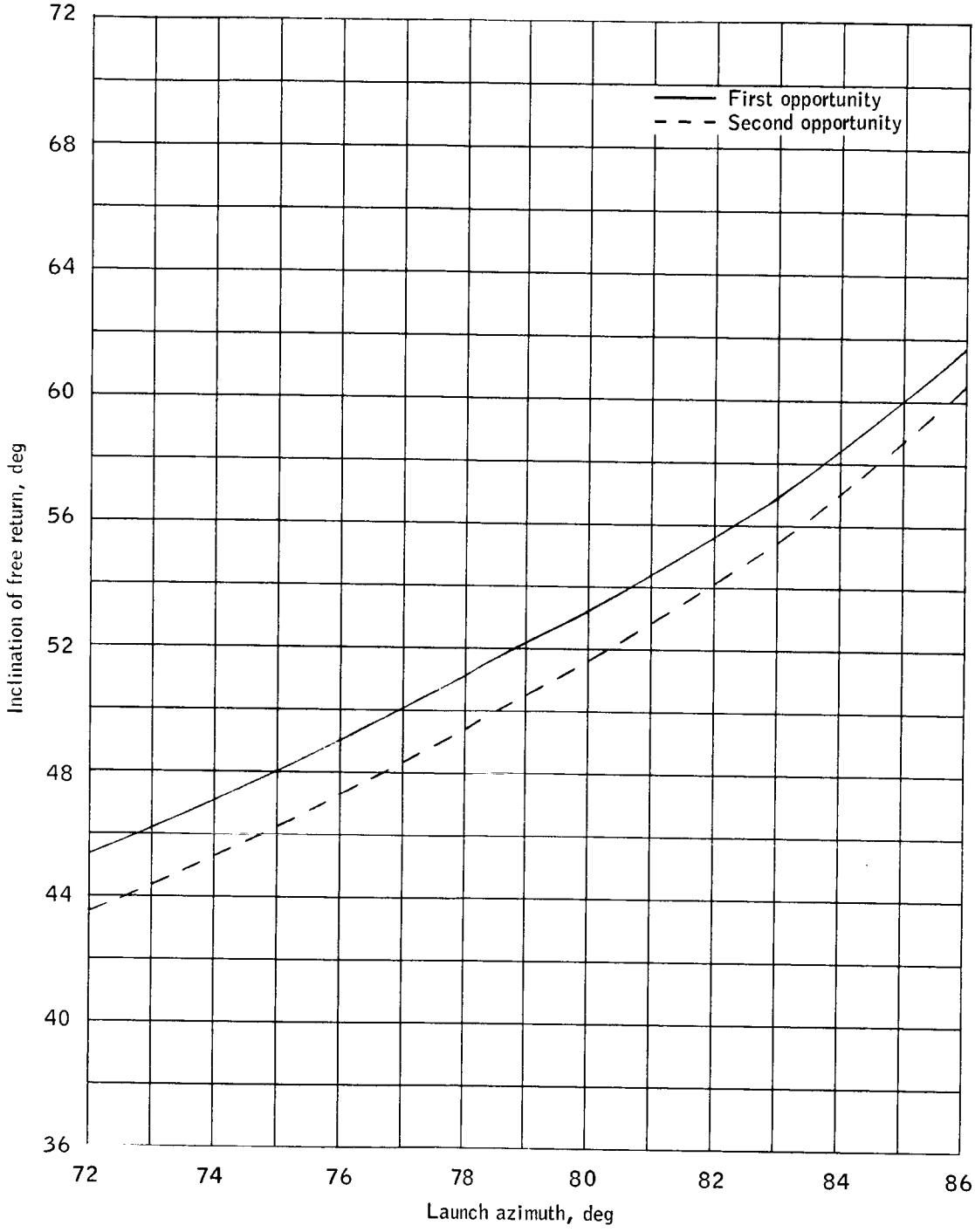
(p) Entry latitude.

Figure 3.- Continued.



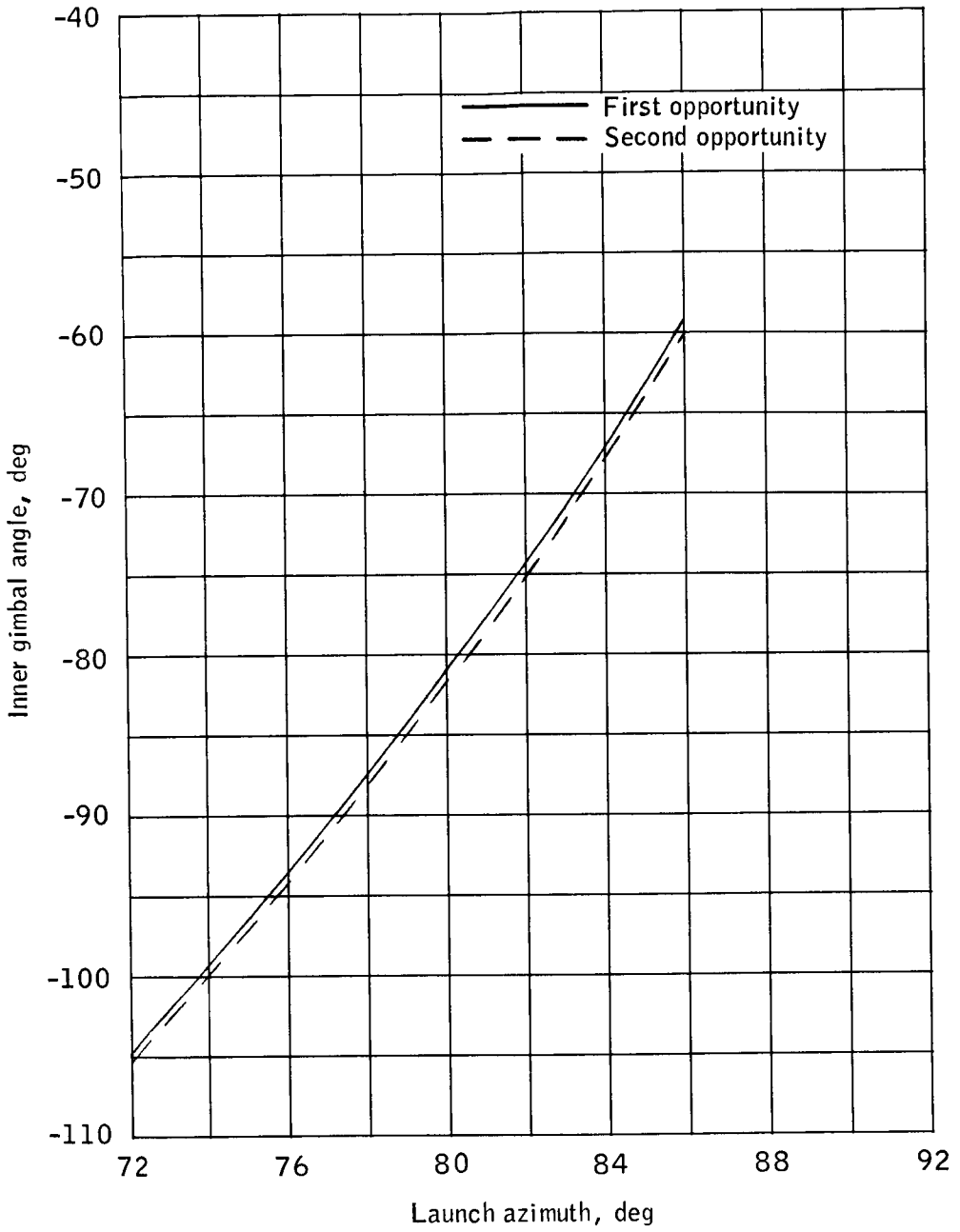
(q) Free return flight time from TLI to pericynthion.

Figure 3.- Continued.



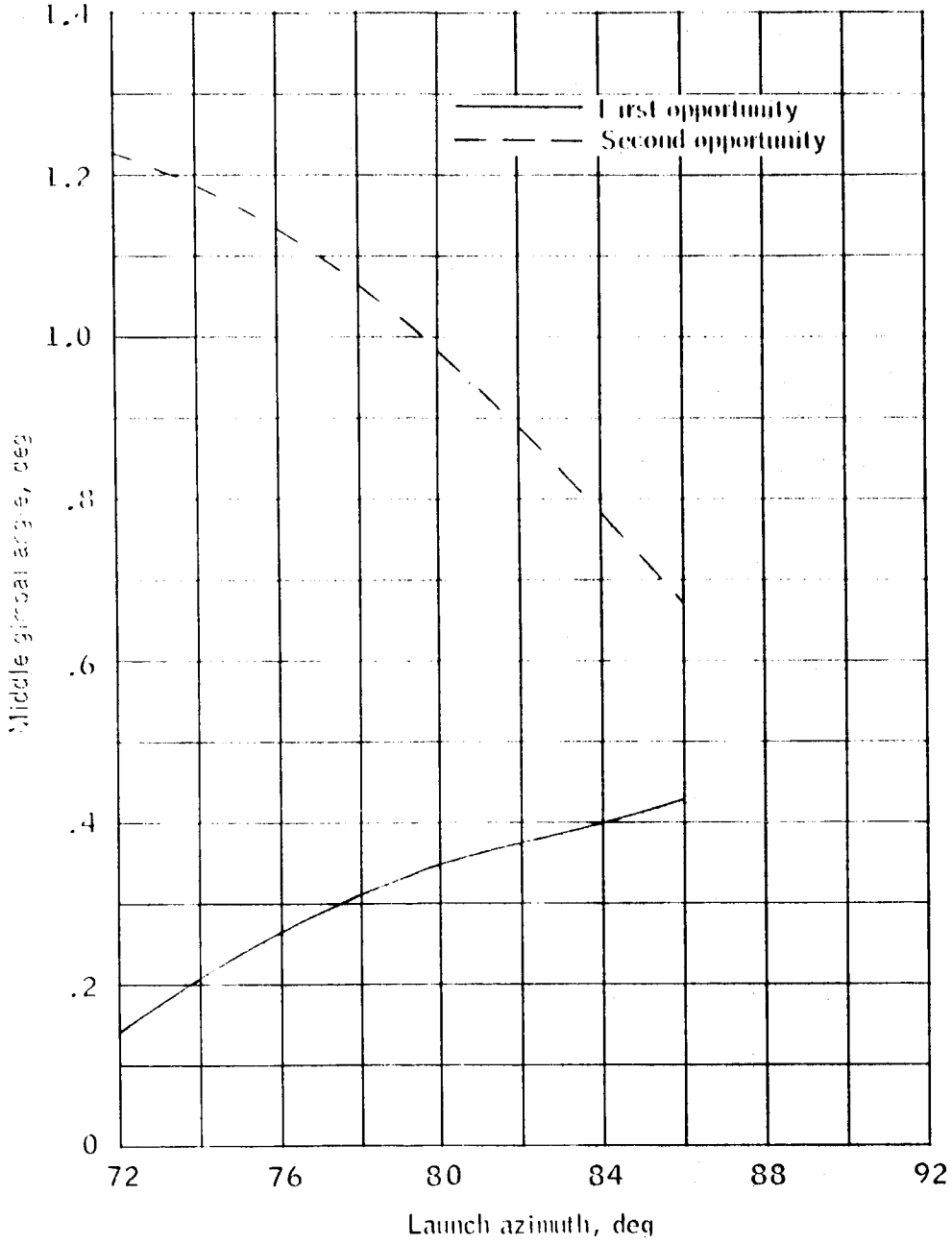
(r) Free return inclination at entry interface.

Figure 3.-Continued..



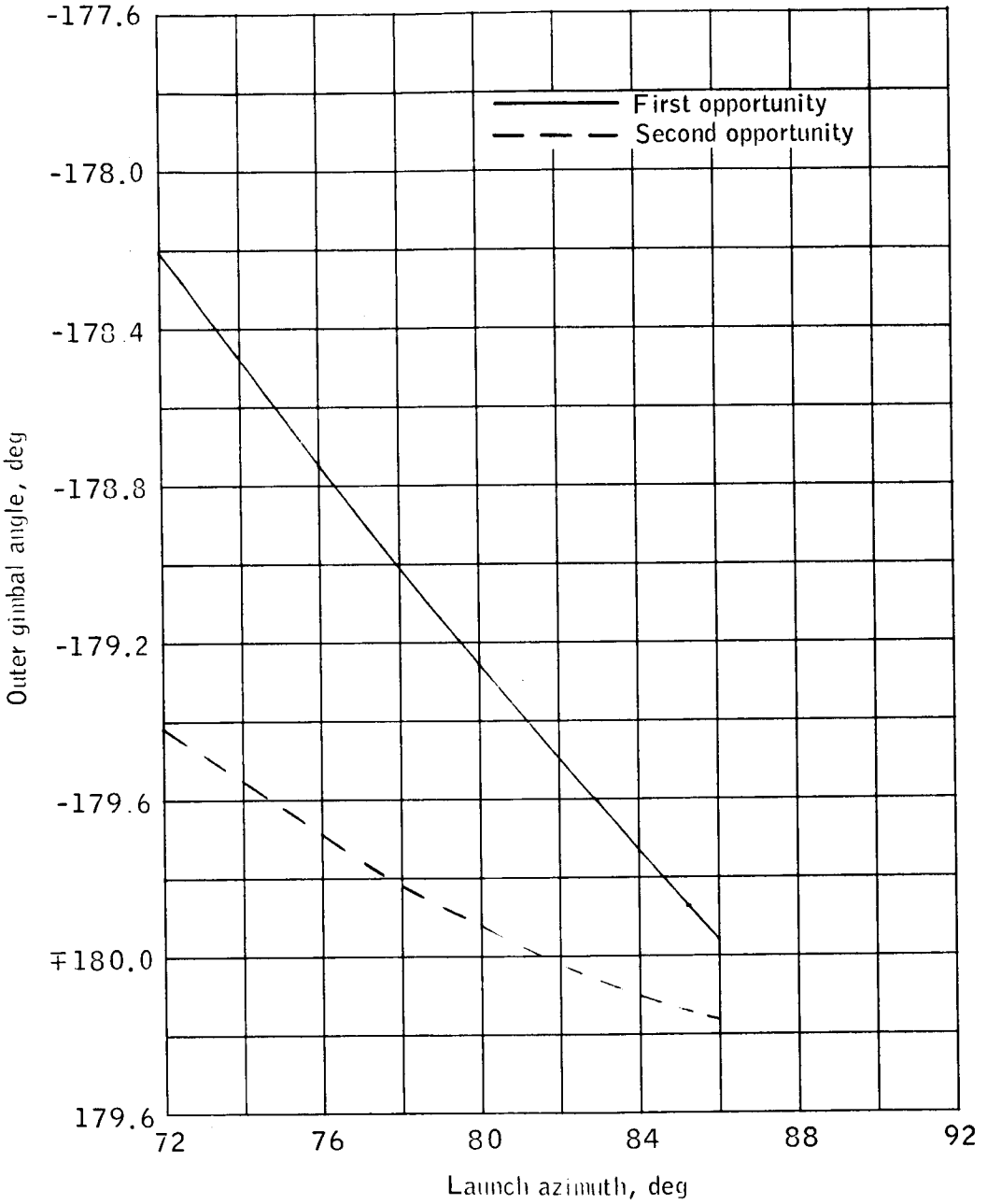
(s) S-IVB IU inner gimbal angle for transposition and docking.

Figure 3.- Continued.



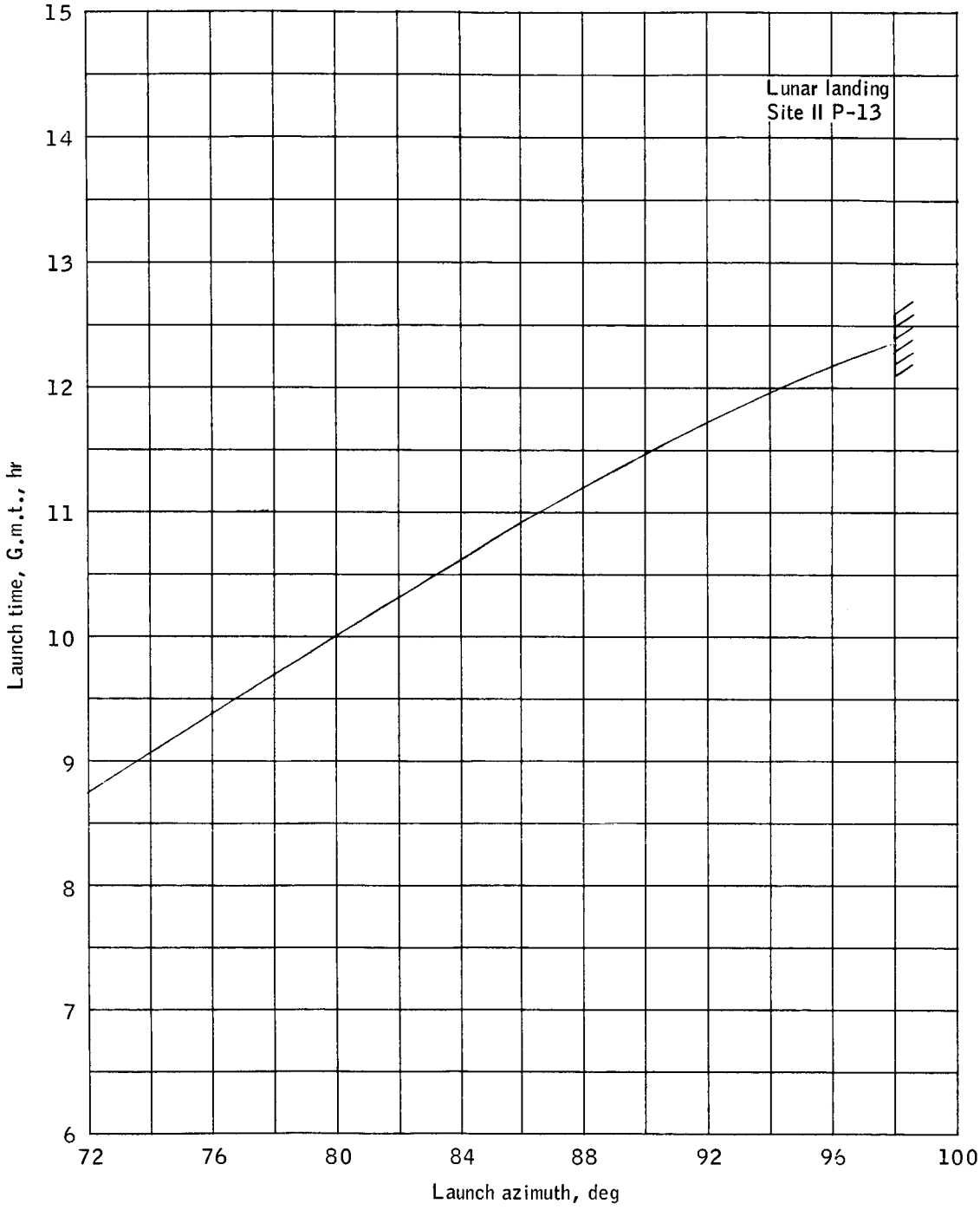
(t) S-IVB IU middle gimbal angle for transposition and docking.

Figure 3.- Continued.



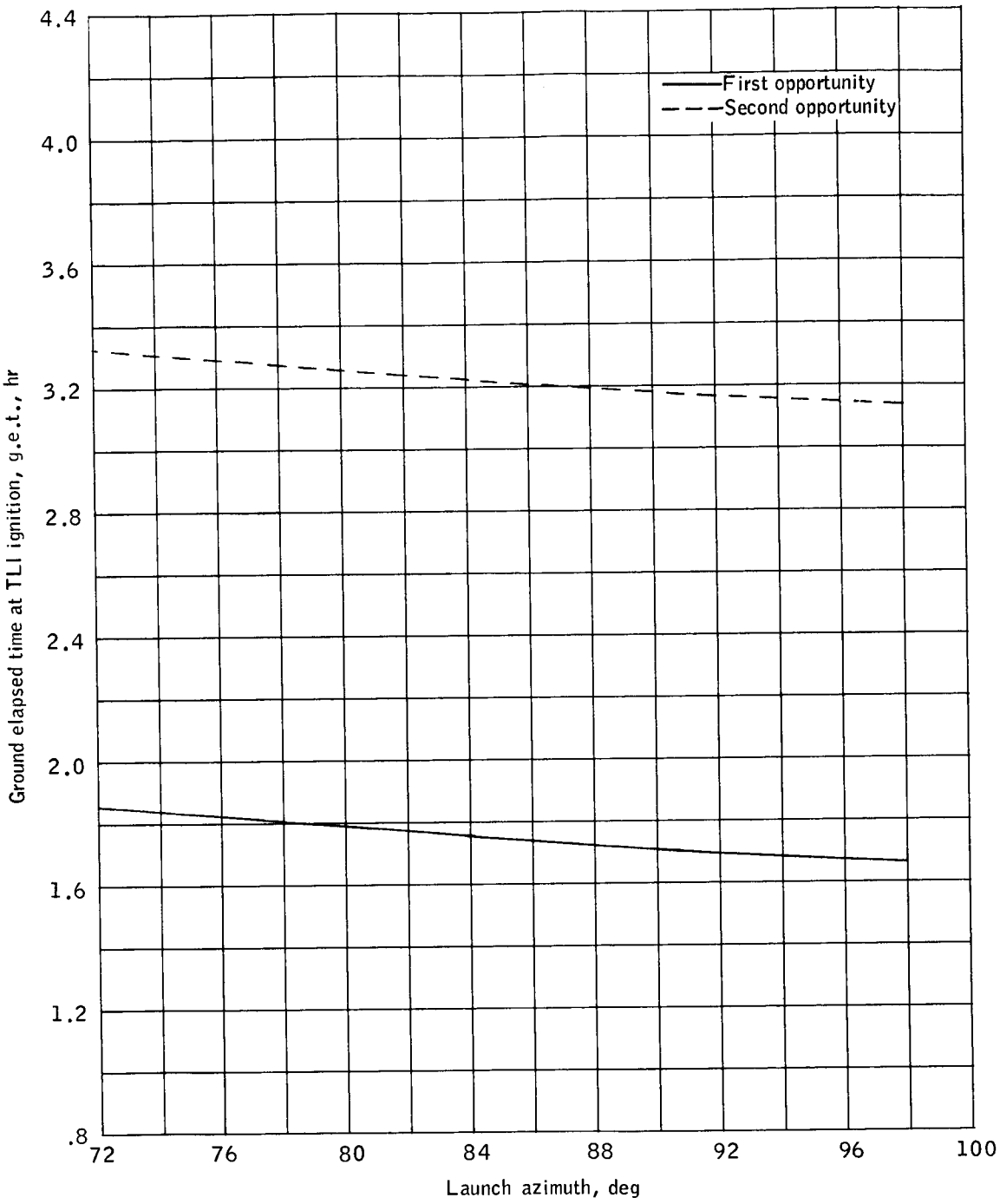
(u) S-IVB IU outer gimbal angle for transposition and docking.

Figure 3.- Concluded.



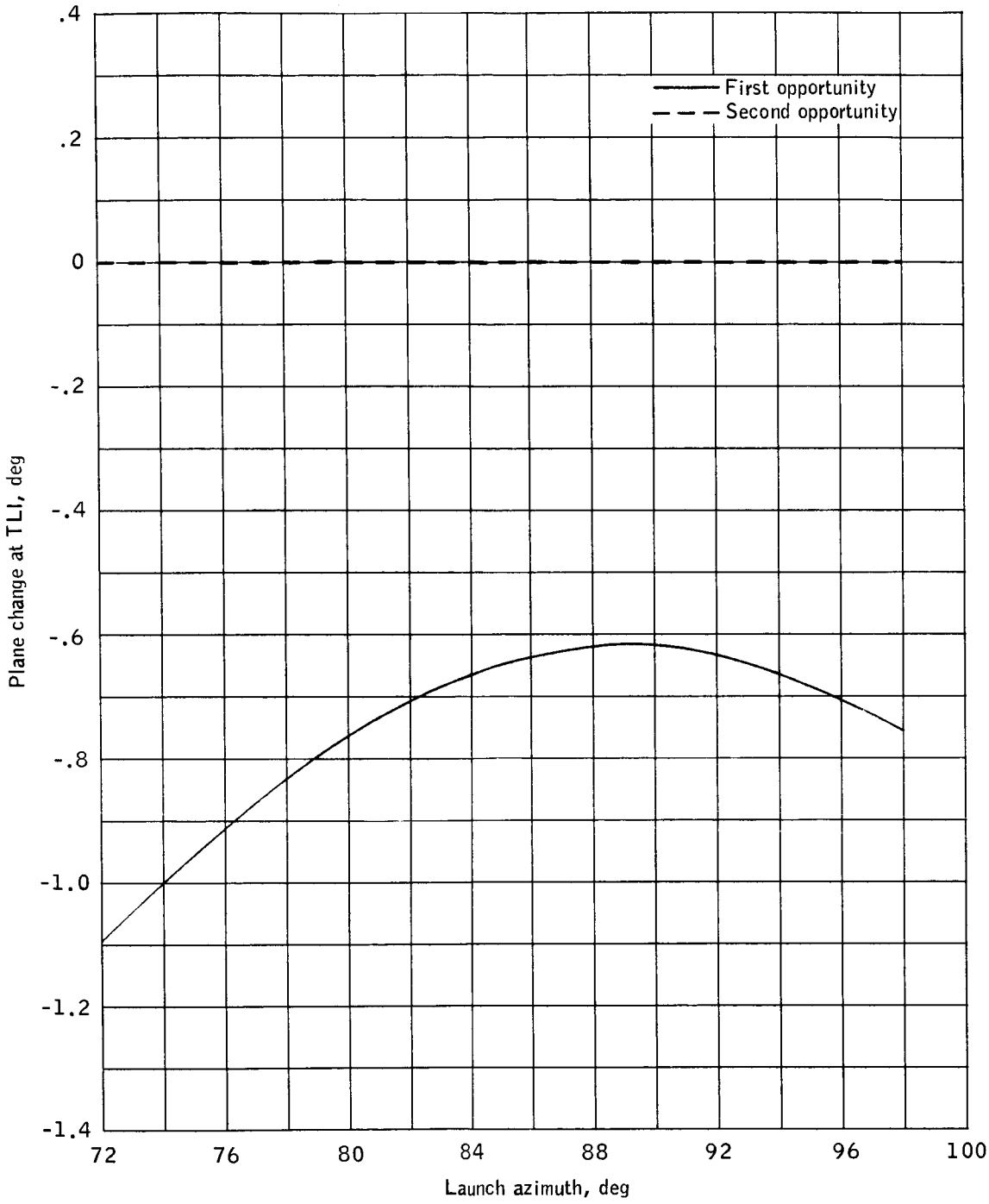
(a) Launch time.

Figure 4.- Trajectory parameters as a function of launch azimuth for lift-off on September 19,1969.



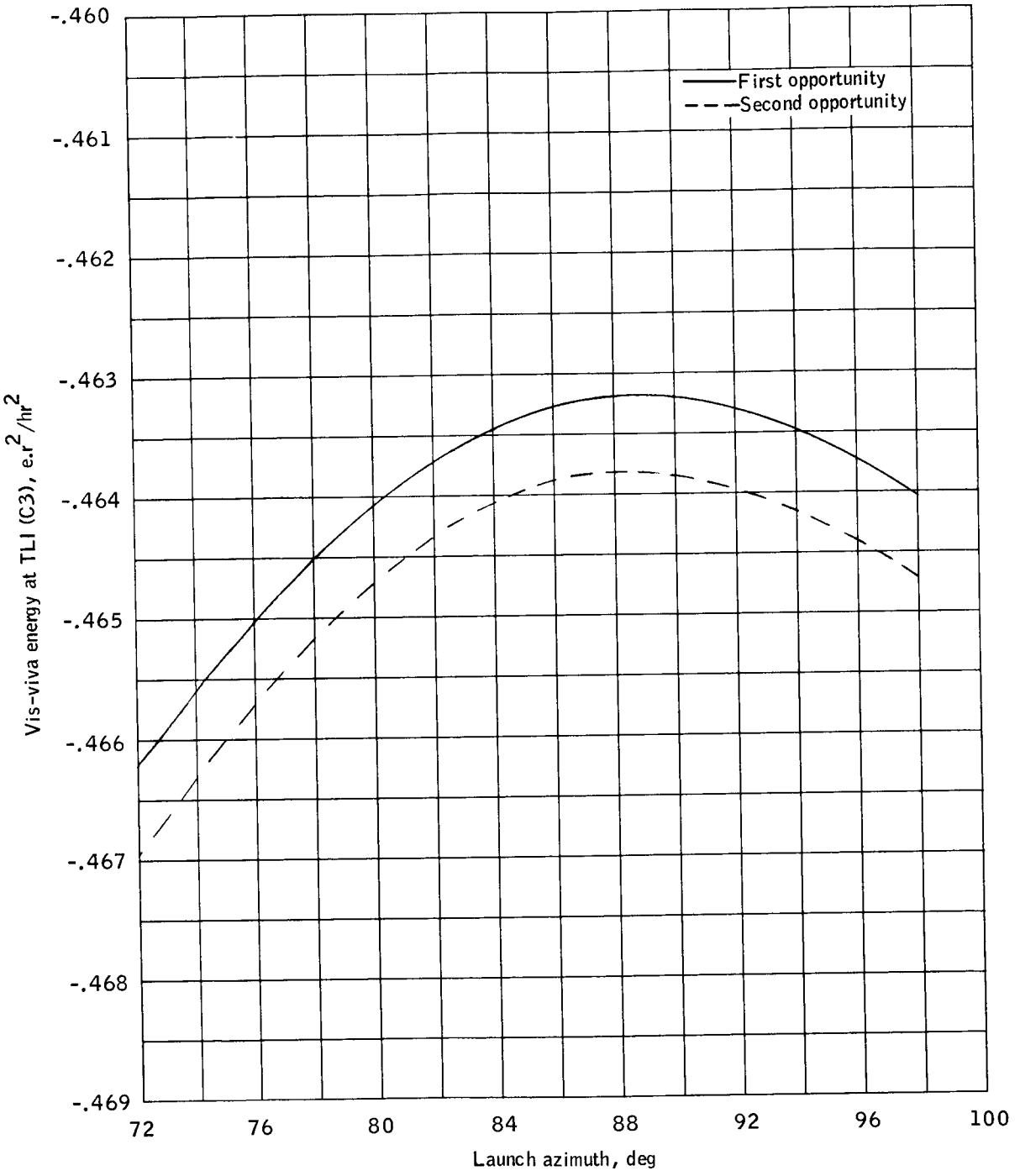
(b) Ground elapsed time at TLI ignition.

Figure 4.- Continued.



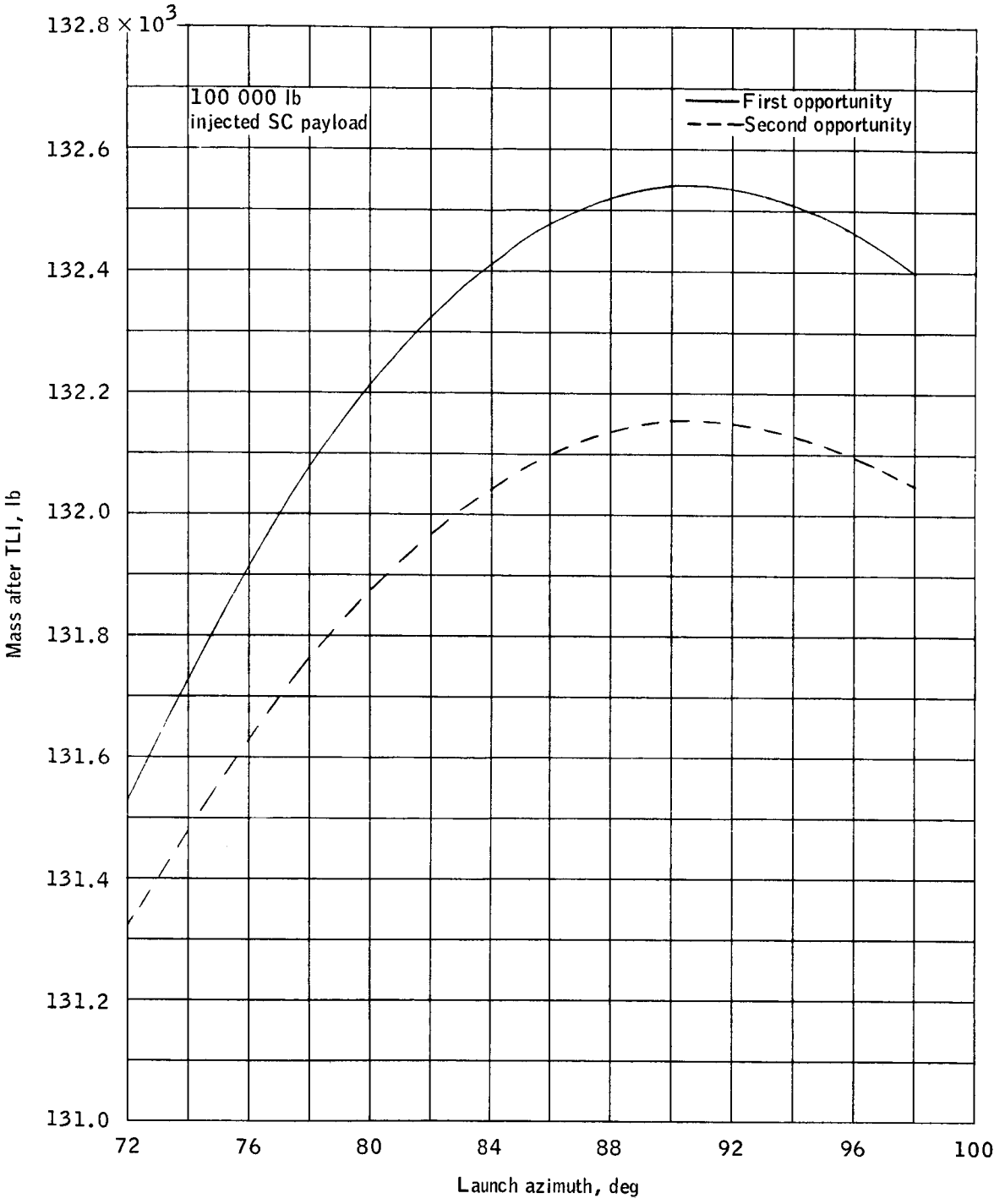
(c) TLI plane change.

Figure 4.- Continued.



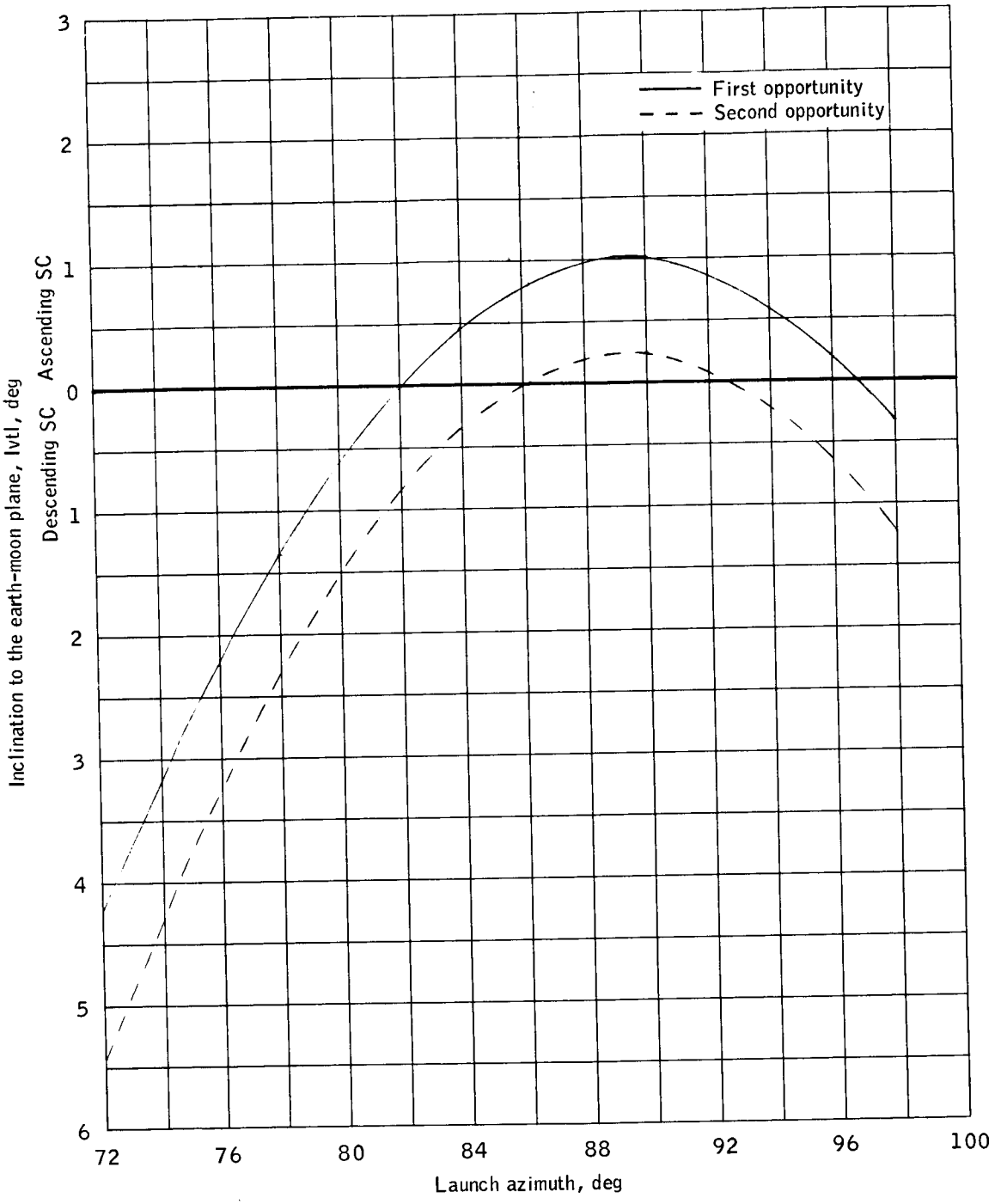
(d) Required energy at TLI termination.

Figure 4.- Continued.



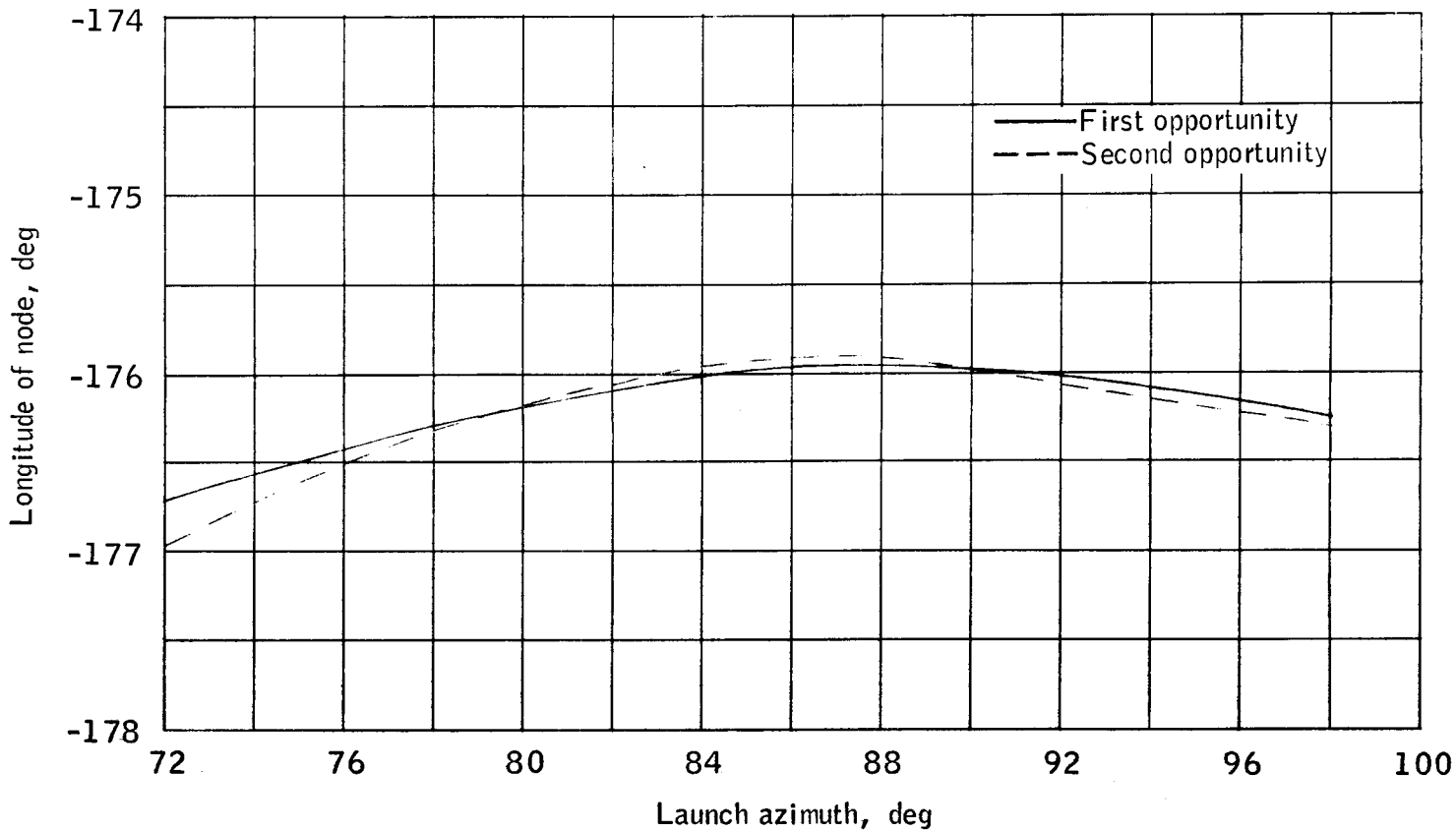
(e) Translunar injected weight.

Figure 4.- Continued.



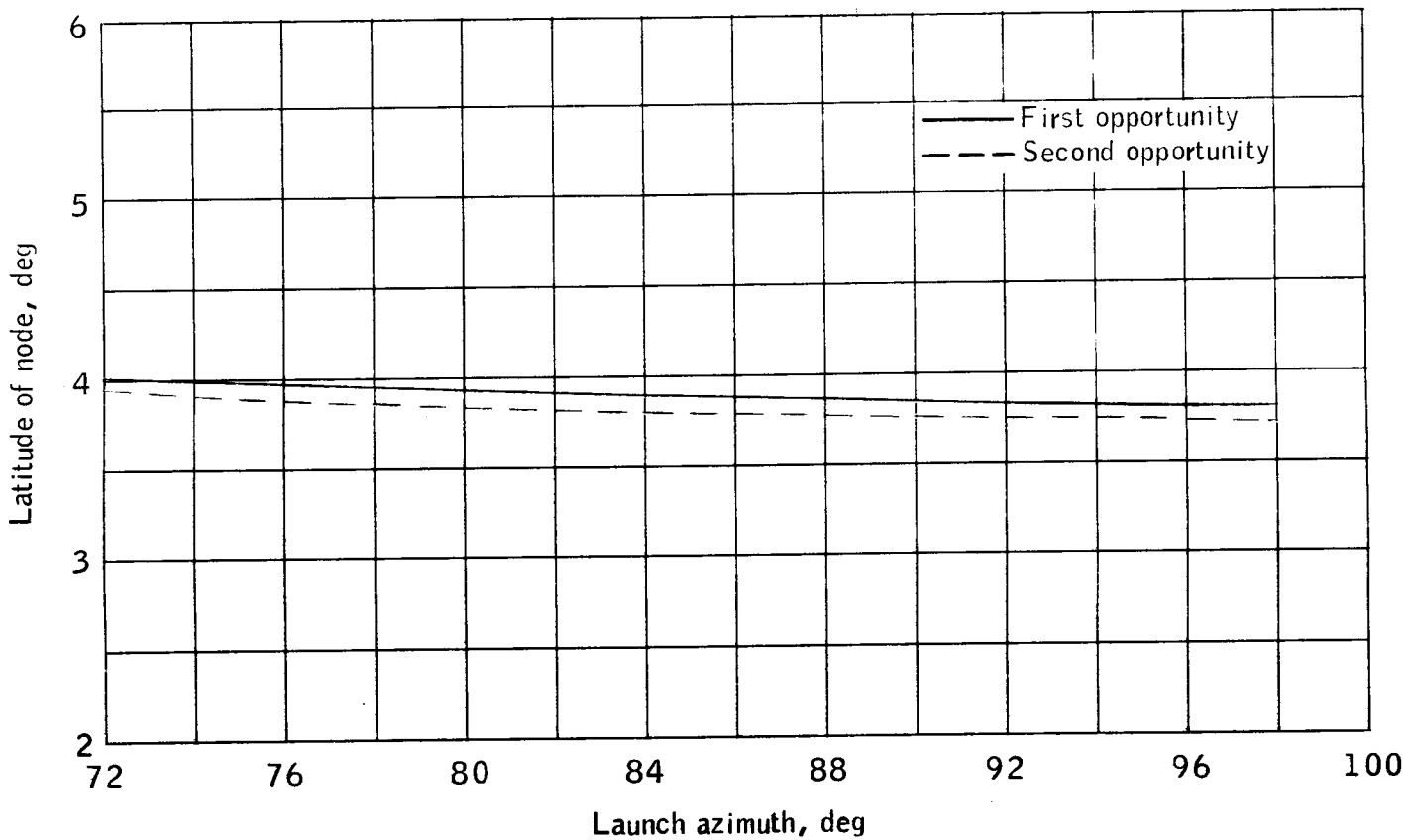
(f) Inclination to the earth-moon plane at TLI termination.

Figure 4.- Continued.



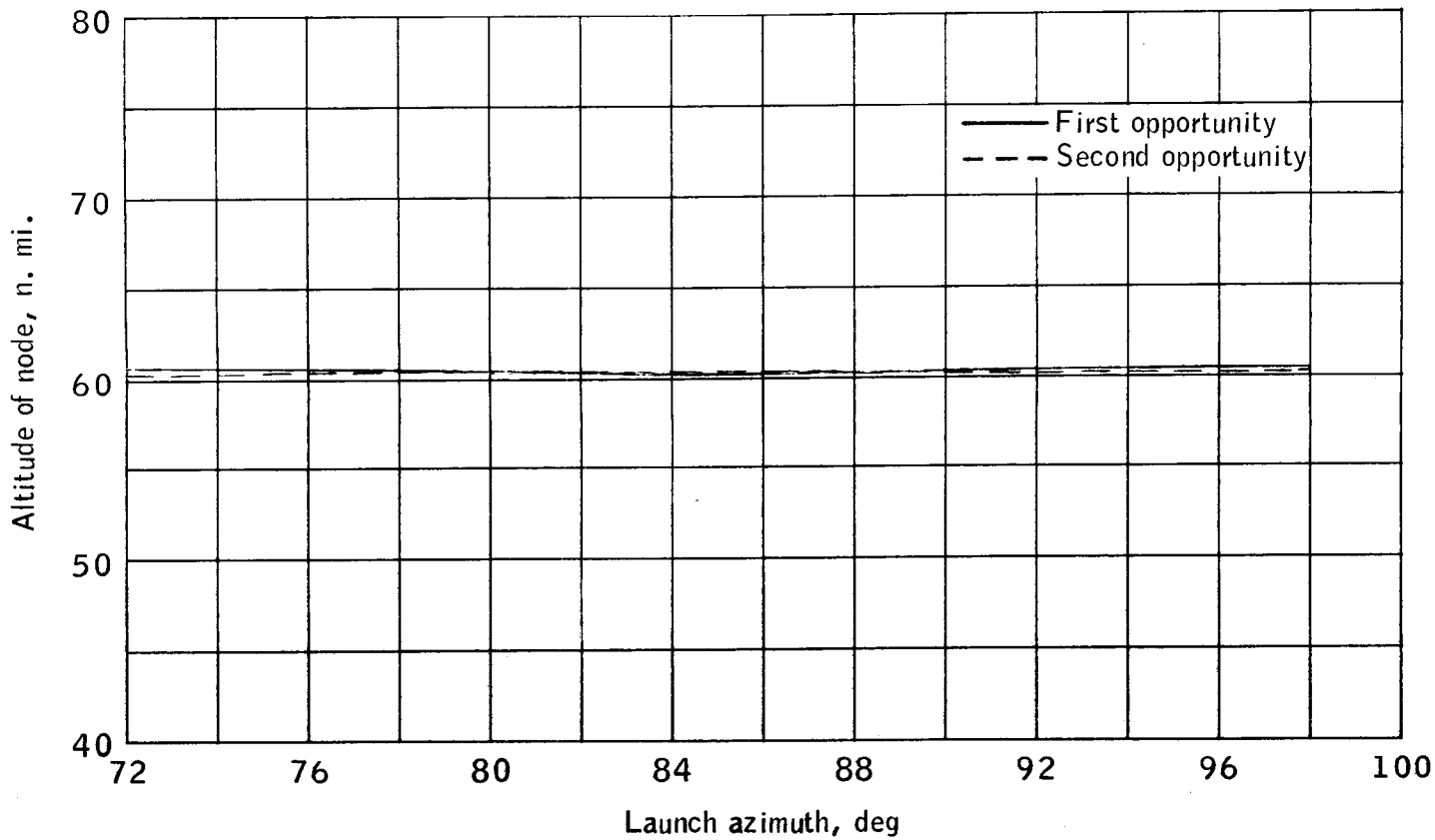
(g) Earth-moon plane longitude of node.

Figure 4.- Continued.



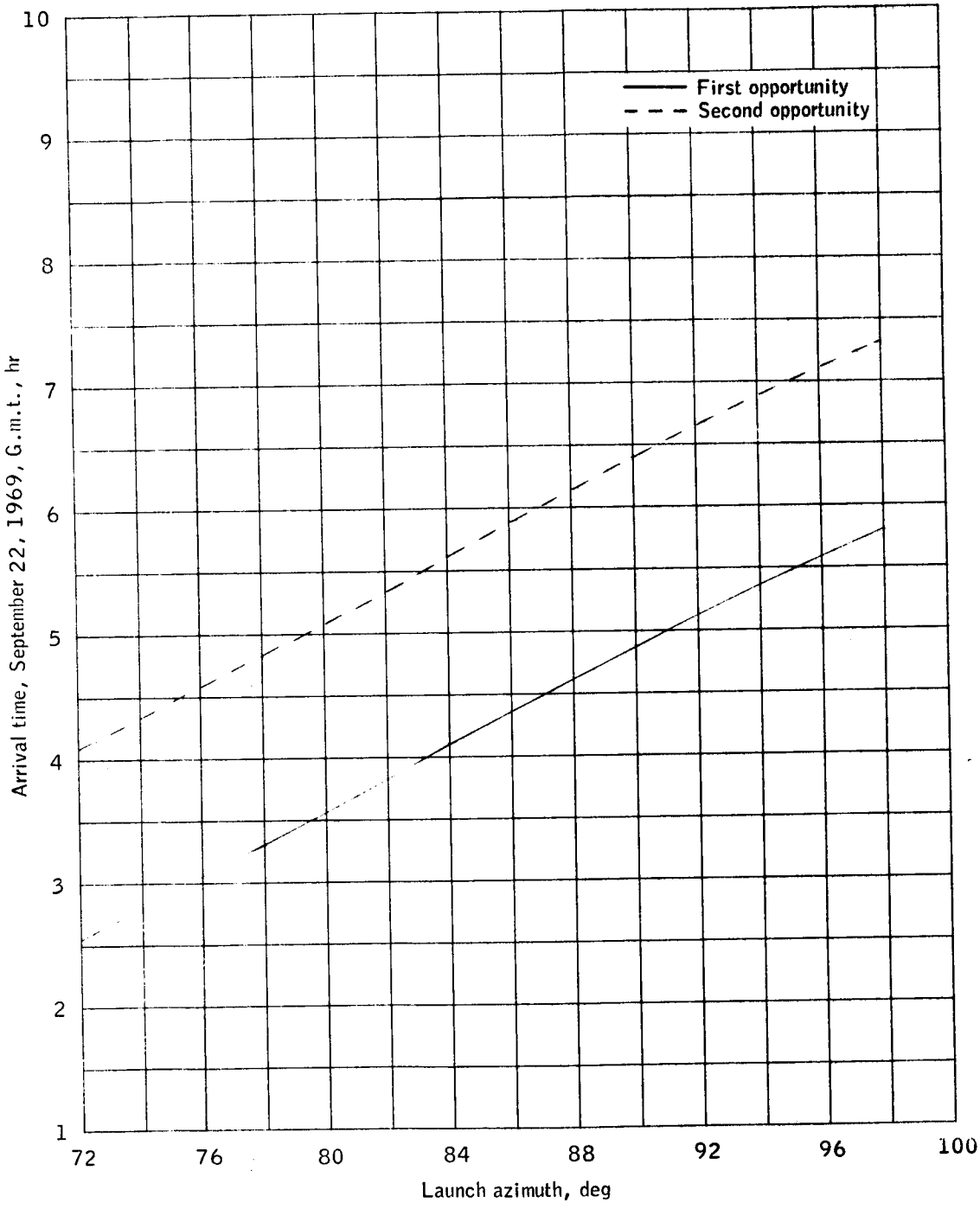
(h) Earth-moon plane latitude of node.

Figure 4.- Continued.



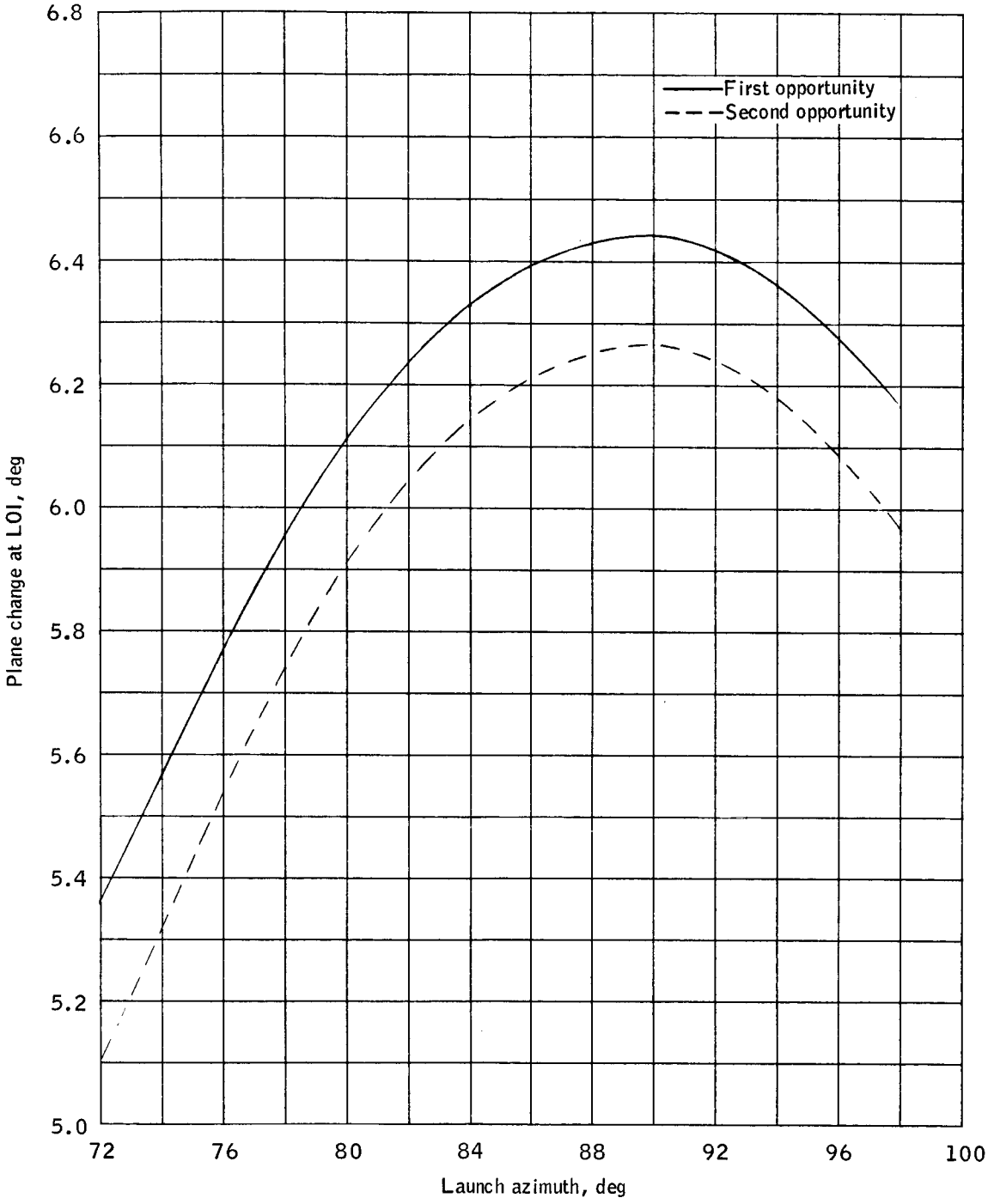
(i) Selenographic altitude of the node.

Figure 4.- Continued.



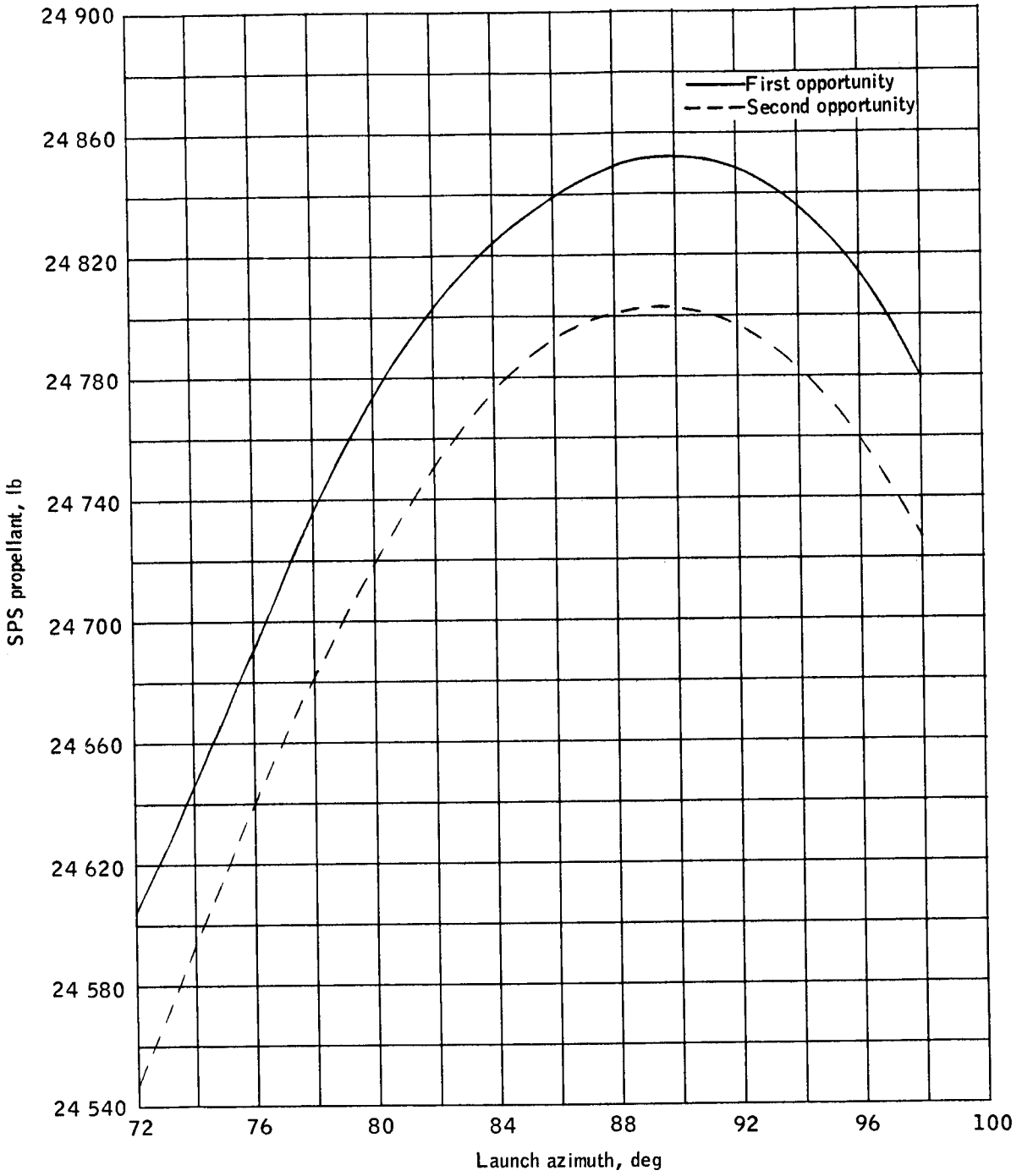
(j) Time of nodal arrival.

Figure 4.- Continued.



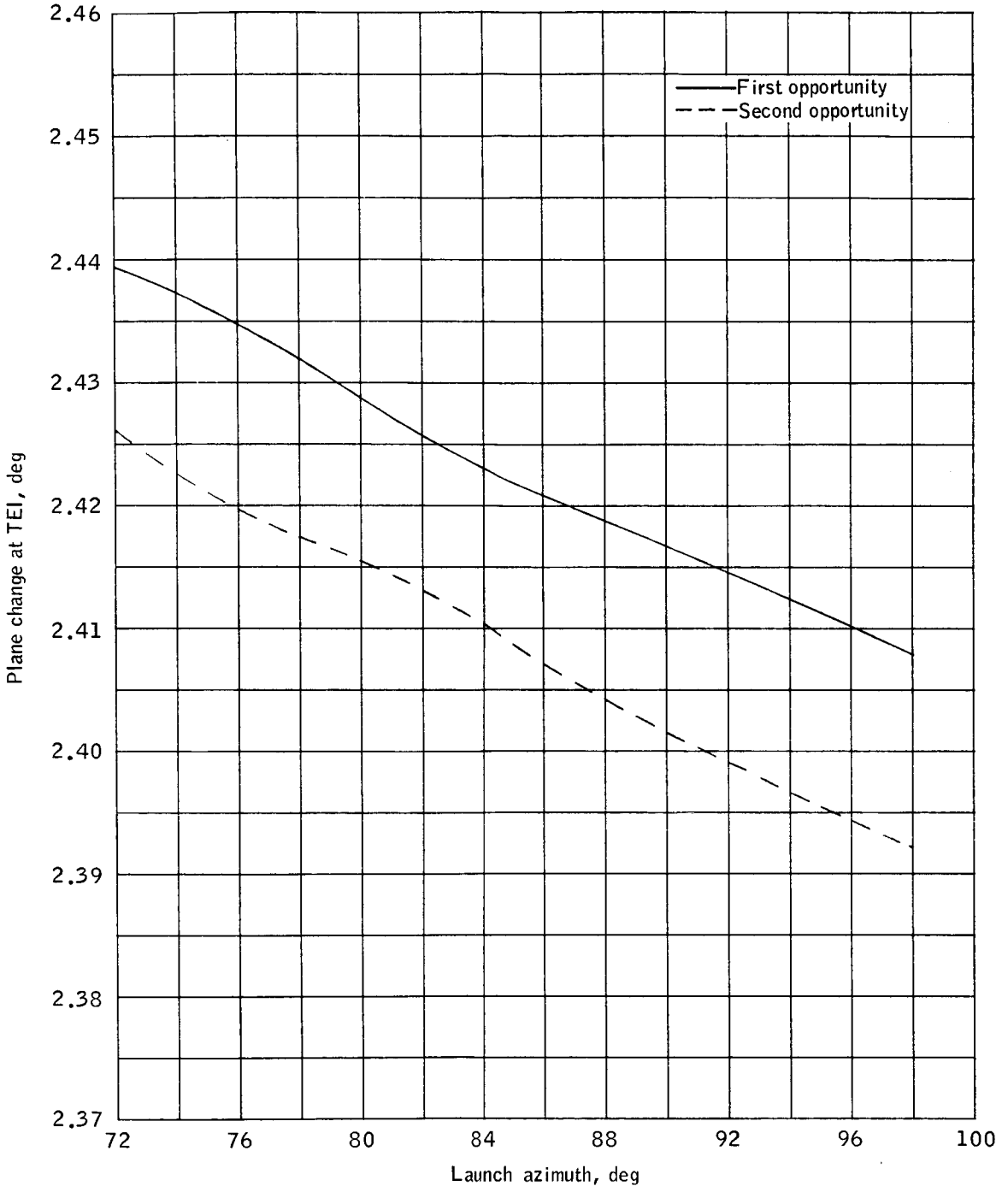
(k) LOI plane change.

Figure 4.- Continued.



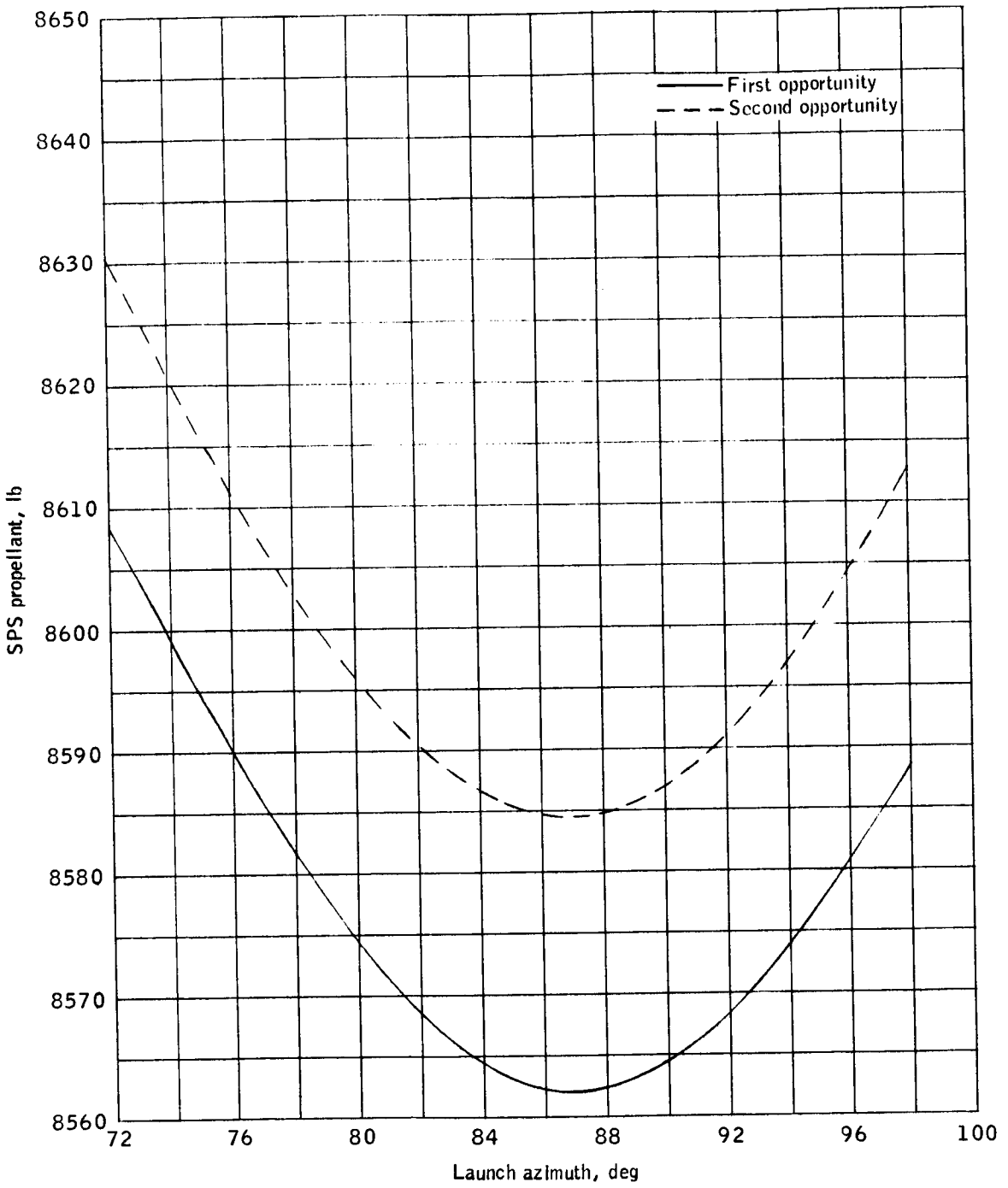
(l) SPS propellant used for LOI.

Figure 4.- Continued.



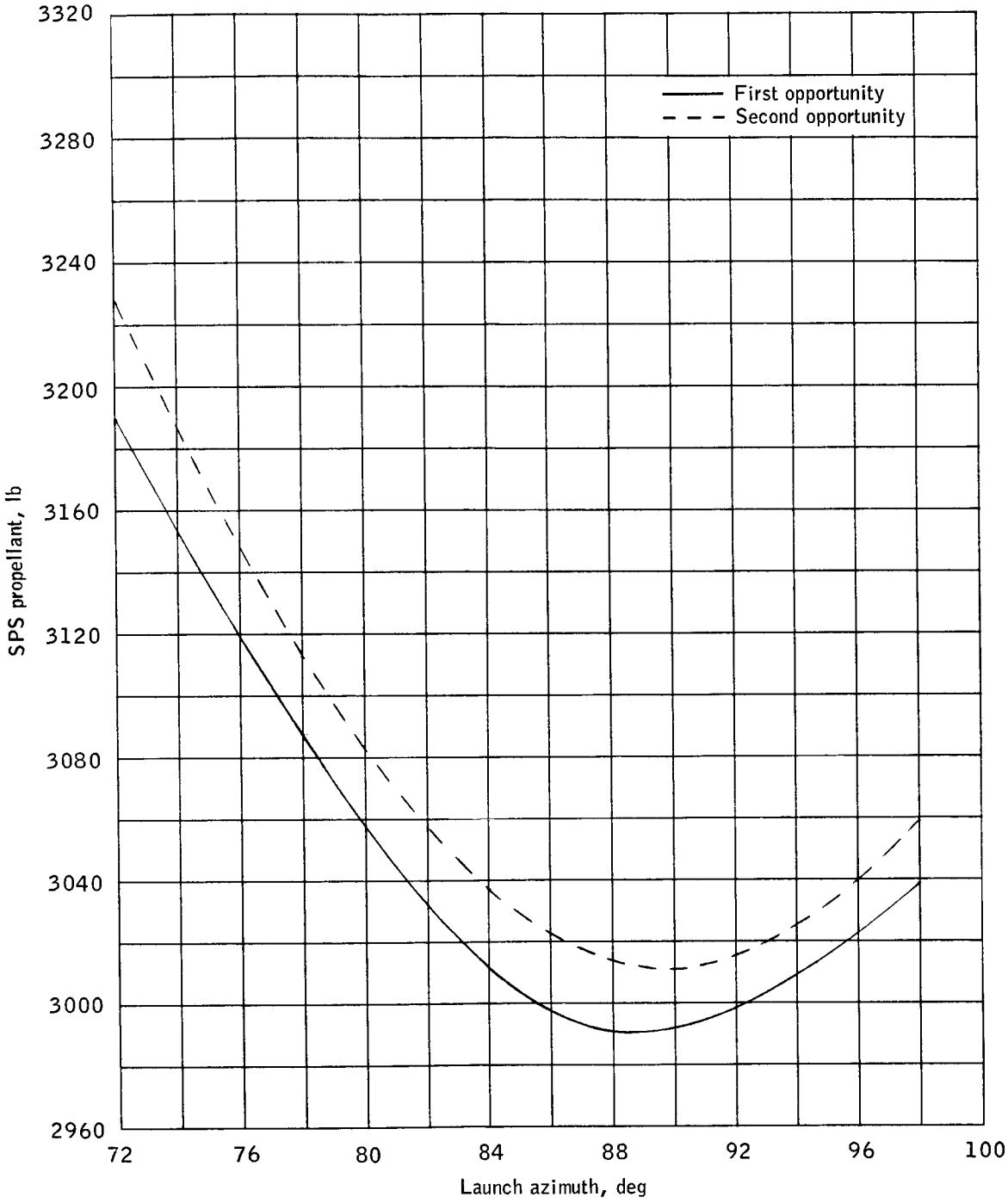
(m) TEI plane change.

Figure 4.- Continued.



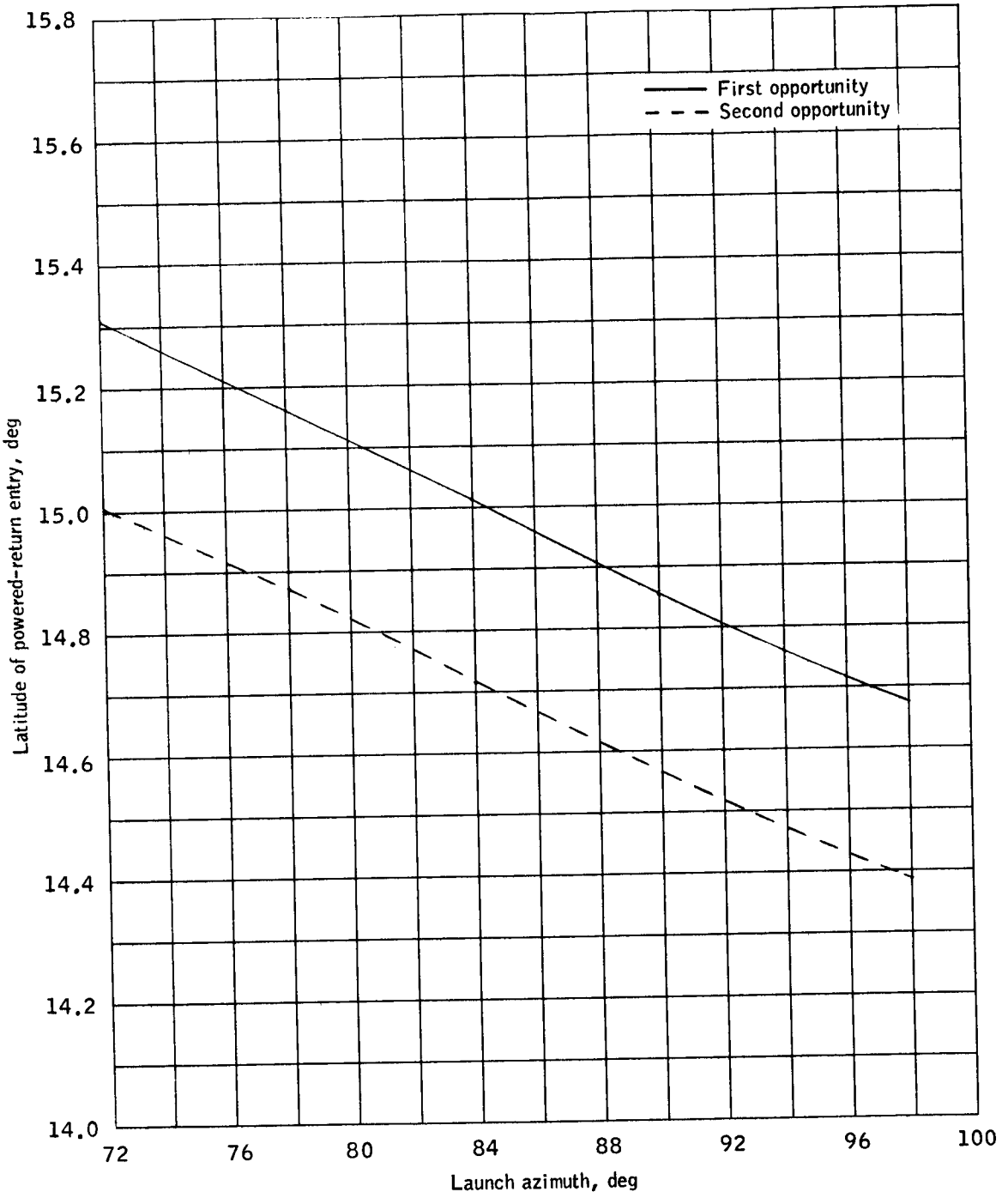
(n) SPS propellant used for TEI.

Figure 4.- Continued.



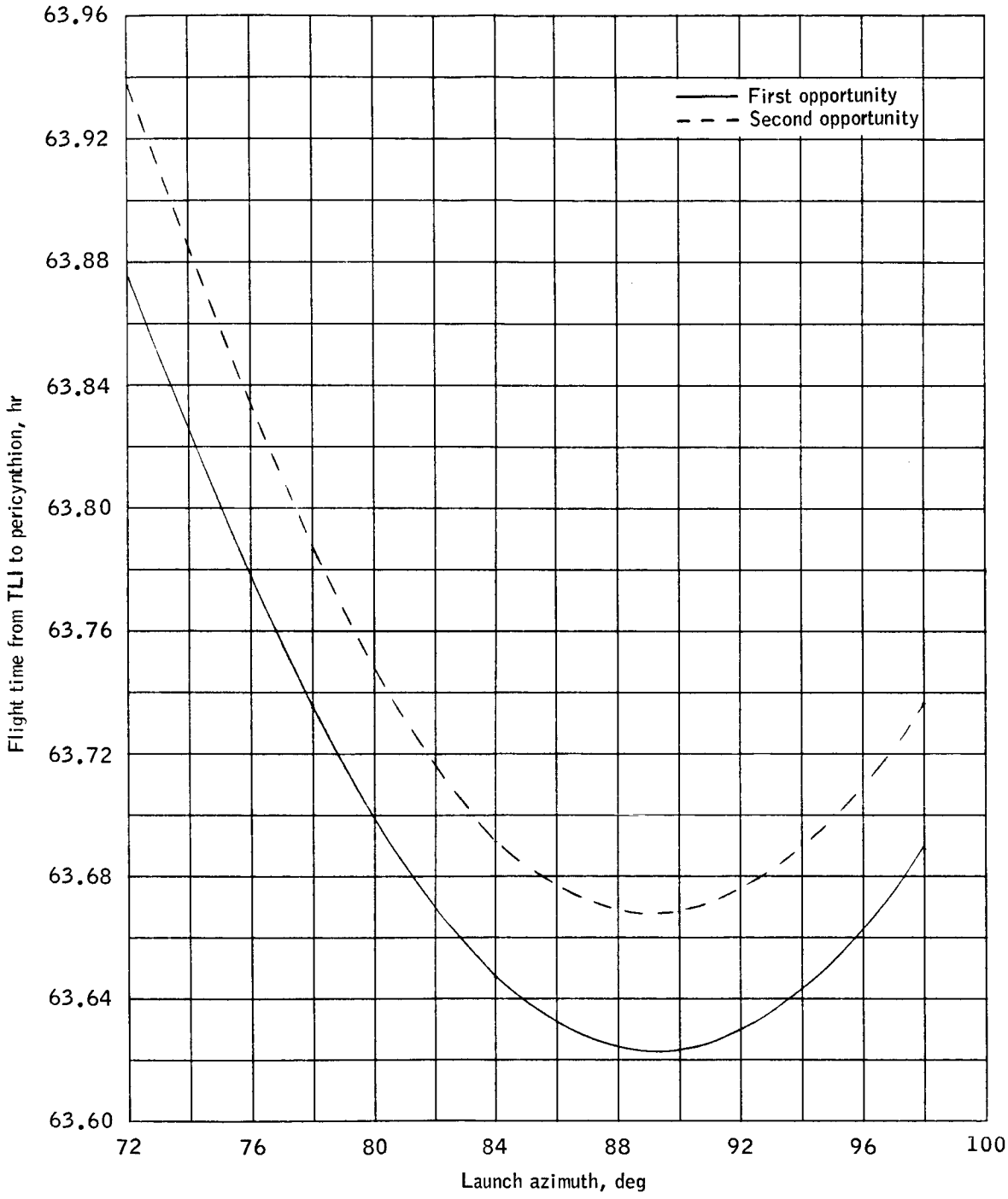
(o) SPS useable propellant reserve at entry.

Figure 4.- Continued.



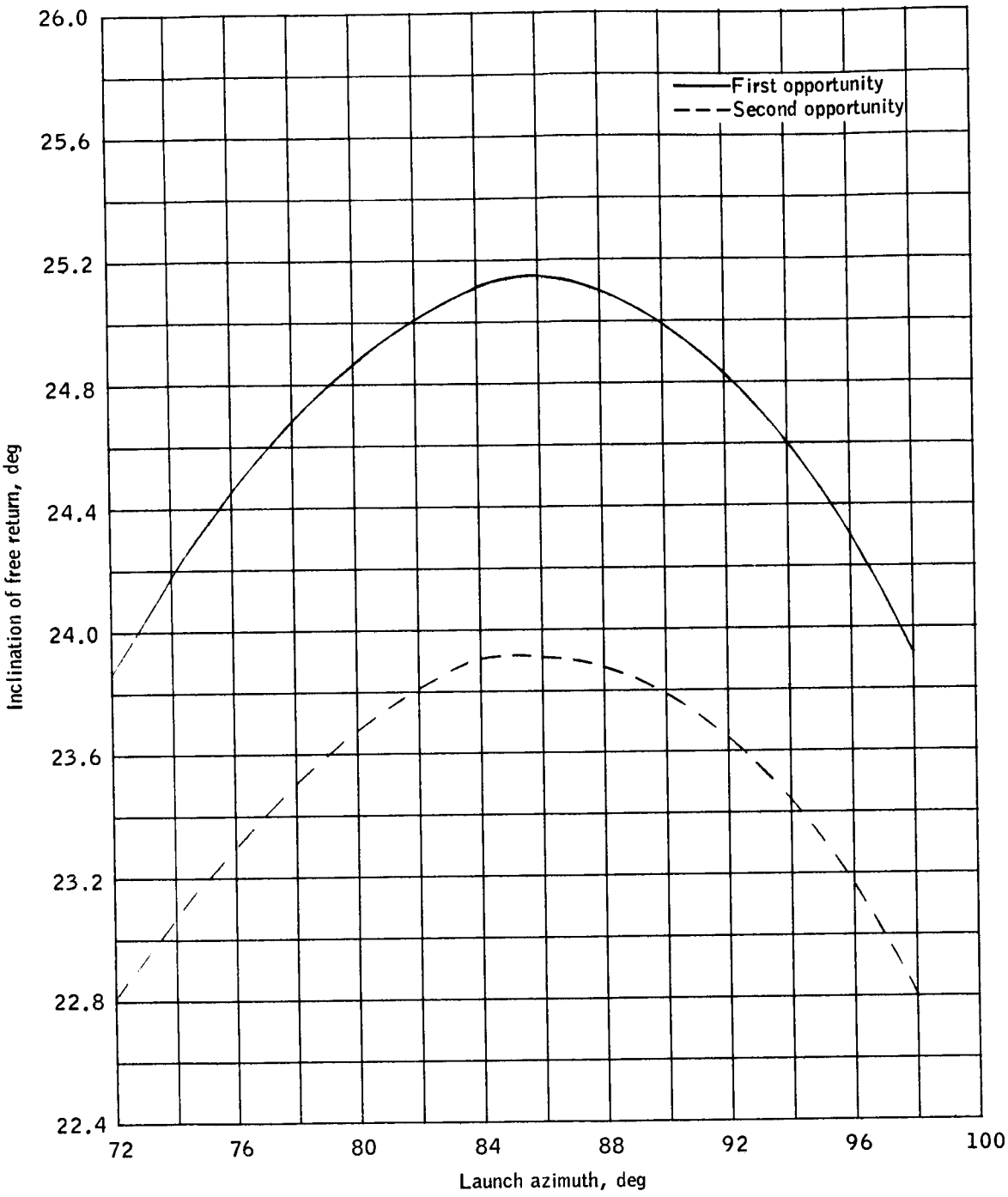
(p) Entry latitude.

Figure 4.- Continued.



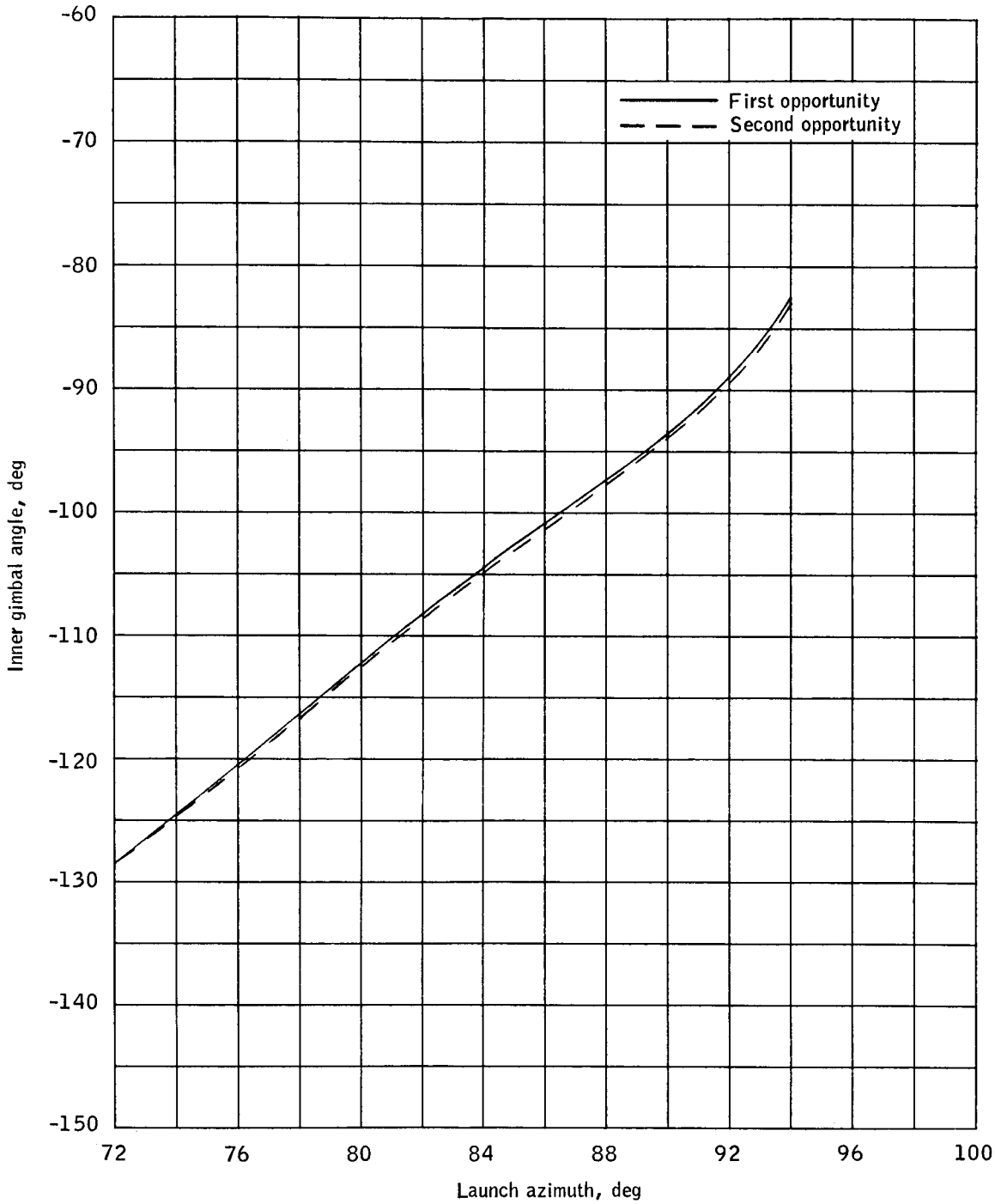
(q) Free return flight time from TLI to pericynthion.

Figure 4.- Continued.



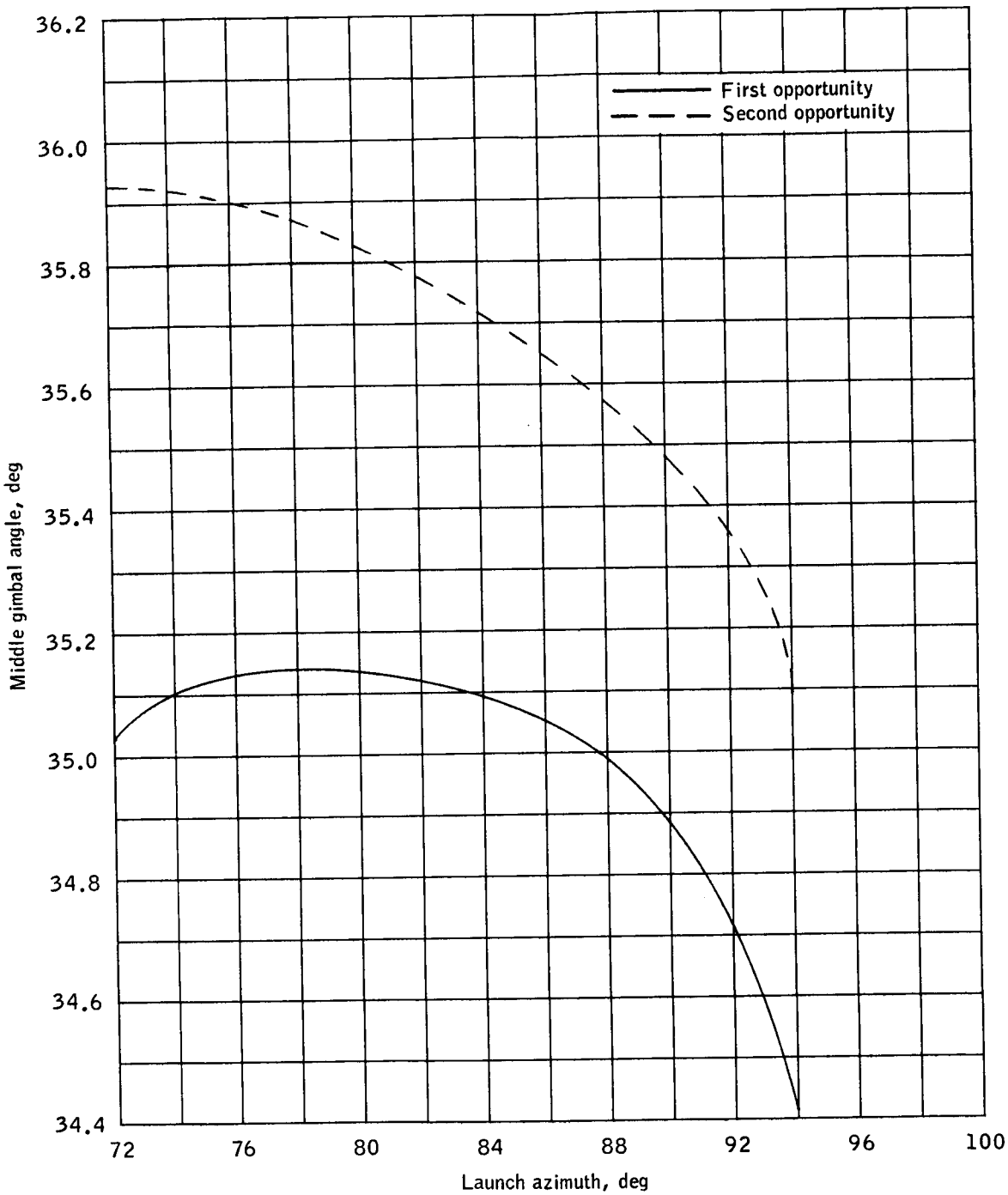
(r) Free return inclination at entry interface.

Figure 4.- Continued.



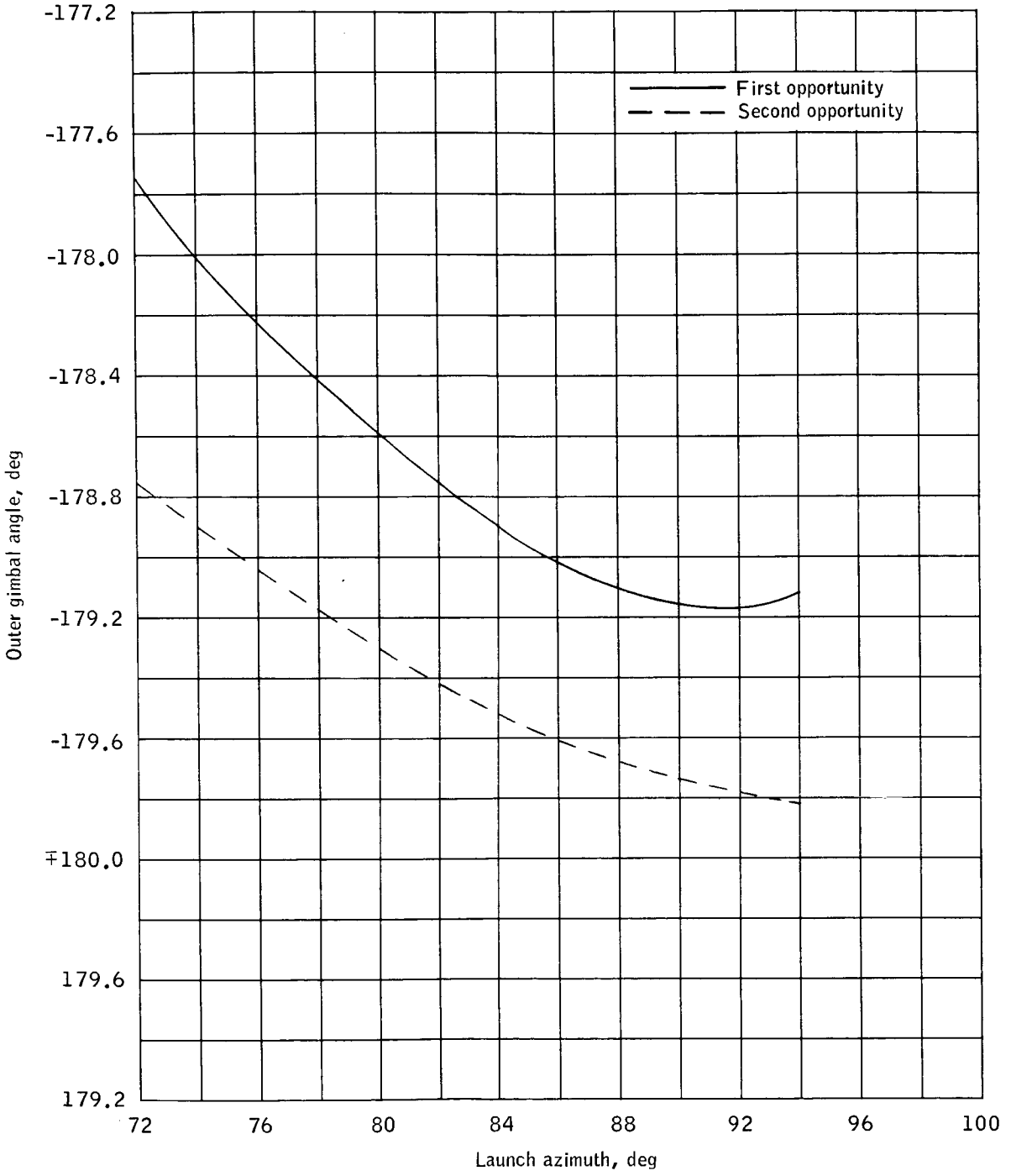
(s) S-IVB IU inner gimbal angle for transposition and docking.

Figure 4.- Continued.



(t) S-IVB IU middle gimbal angle for transposition and docking.

Figure 4.- Continued..



(u) S-IVB IU outer gimbal angle for transposition and docking.

Figure 4.- Concluded. .