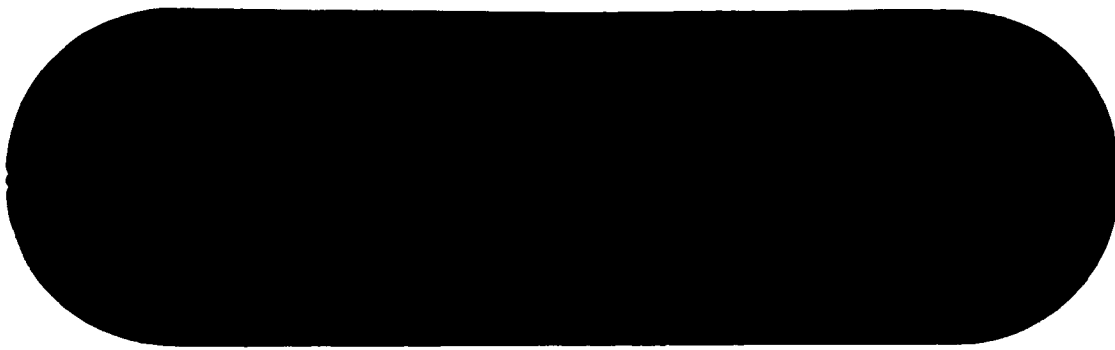


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DOCUMENT NO. D5-15481-1 Volume II of II,
Book 1

TITLE SATURN V AS-504 LAUNCH VEHICLE REFERENCE
TRAJECTORY

MODEL NO. Saturn V CONTRACT NO. NAS8-5608, S/A 131,
Schedule II, Volume I,
Part IIA, Exhibit CC,
Task 8.1.4, DRL 049
Item 15

Prepared by: FLIGHT MECHANICS

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D. B. JACOBS
CHIEF ENGINEER

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SECTION 7

TRAJECTORY DATA FROM LIFTOFF
THROUGH PARKING ORBIT

This section contains the computer-printed listings of the AS-504 trajectory characteristics from liftoff through three revolutions in parking orbit. Trajectory data are presented for launch azimuths of 72, 81, 90, 99, and 108 degrees. Because the insertion boost and parking-orbit coast characteristics associated with each launch azimuth do not change when TLI boost targeting changes, the five-azimuth spectrum of insertion boost and parking-orbit coast phase data is presented only once. Each of the S-IVB-second-burn TLI boost simulations presented in Sections 9 and 10 originates from a preignition (t_{B6}) position in one of these five parking orbits.

The trajectory data are grouped according to launch azimuths as follows:

<u>Launch Azimuth</u>	<u>Tables</u>
72°	7-I through 7-IX
81°	7-X through 7-XVIII
90°	7-XIX through 7-XXVII
99°	7-XXVIII through 7-XXXVI
108°	7-XXXVII through 7-XLV

The tables provide vehicle and trajectory data as functions of flight time. Data are provided at significant event times and at 5-second intervals from liftoff to 660 seconds, at 10-second intervals from 660 seconds to 800 seconds, and at 100-second intervals from 800 seconds to 16,550 seconds (the end of three revolutions in parking orbit). The significant event times are summarized in Tables 1-I, 3-II, and 5-II. The table contents are as follows:

- a. Tables 7-I, 7-X, 7-XIX, 7-XXVIII, and 7-XXXVII contain vehicle weight, total thrust, altitude above the geoid, and the surface range from Cape Kennedy to the geodetic sub-vehicle position. Weight and thrust are given in pounds, altitude is given in meters, and surface range is given in nautical miles.
- b. Tables 7-II, 7-XI, 7-XX, 7-XXIX, and 7-XXXVIII contain inertial velocity, relative velocity, inertial acceleration, and gravitational acceleration. Inertial velocity is velocity measured in an earth-centered coordinate system with space-fixed orientation. Relative velocity is velocity measured in a rotating, earth-fixed coordinate system. The inertial acceleration is the magnitude of the vector sum of the propulsive, aerodynamic, and earth-

b. (Continued)

gravity induced accelerations on the vehicle. Gravitational acceleration is the magnitude of the earth's gravitational acceleration. Velocity data are given in meters/second and acceleration data are given in meters/second².

- c. Tables 7-III, 7-XII, 7-XXI, 7-XXX, and 7-XXXIX contain inertial flight-path angle, inertial heading (azimuth), geodetic latitude, and longitude. The inertial flight-path angle is the angle between the inertial velocity vector and a plane perpendicular to the vehicle radius vector. The inertial path angle is positive when the velocity vector points away from the center of the earth. The inertial heading is the angle between the projection of the inertial velocity vector on a plane perpendicular to the vehicle radius vector and a plane containing the earth spin axis and the vehicle radius vector. Inertial heading is positive when measured east from the local direction of north. Geodetic latitude is positive in the northern hemisphere, and longitude is positive east of the prime meridian. All of these parameters are given in degrees.
- d. Tables 7-IV, 7-XIII, 7-XXII, 7-XXXI, and 7-XL contain the guidance-commanded pitch, yaw, and roll attitude angles and the actual vehicle pitch, yaw, and roll attitude angles. These attitude angles (also called Euler or gimbal angles) are measured from the IU platform inertial axes to the vehicle body axes as shown in Figure 7-1. At Guidance Reference Release (GRR) the platform axes are aligned so that the inertial X axis points up along the launch pad vertical, the inertial Z axis points along the selected flight azimuth, and the inertial Y axis completes the right-handed system. The vehicle body axes are body-fixed; X_B is the vehicle longitudinal axis and is positive through the vehicle nose, Z_B points along Fin I (Position I), and Y_B forms the right-handed system. The commanded vehicle attitude is defined at each flight time by rotating from the inertial axis orientation through the attitude angles in the sequence: pitch (χ_p), yaw (χ_y), roll (χ_r). The commanded and actual vehicle attitude angles are given in degrees.

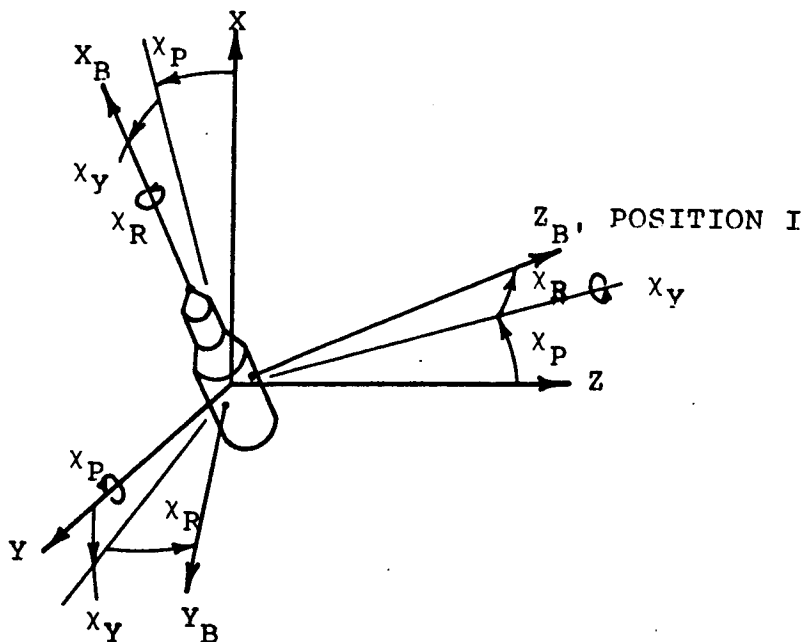


FIGURE 7-1. ATTITUDE-ANGLE ROTATION SEQUENCE FROM THE INERTIAL PLATFORM ORIENTATION TO THE COMMANDED VEHICLE ATTITUDE

- e. Tables 7-V, 7-XIV, 7-XXIII, 7-XXXII, and 7-XLI contain Mach number, relative flight-path angle, angle of attack (α), and normal-force angle. The Mach number is the aerodynamic velocity (or relative velocity for zero wind speed) divided by the local aerodynamic speed of sound. The relative flight-path angle is the angle between the relative velocity vector and a plane perpendicular to the radius vector; the relative flight-path angle is positive when the velocity vector points away from the center of the earth. The angle of attack is the angle between the aerodynamic velocity vector (\bar{V}_{AERO}) and the $+X_B$ or longitudinal body axis (Figure 7-2). The normal force is the aerodynamic force that acts normal to the vehicle longitudinal axis. Its radial direction from the vehicle aerodynamic center is dependent upon the radial orientation of the aerodynamic velocity vector and angle of attack. The normal-force angle is the angle from the $+Y_B$ body axis to the normal-force vector, and is used as a measure of the radial orientation of the angle of attack (Figure 7-2). The Mach number is dimensionless and data for the other parameters are given in degrees.

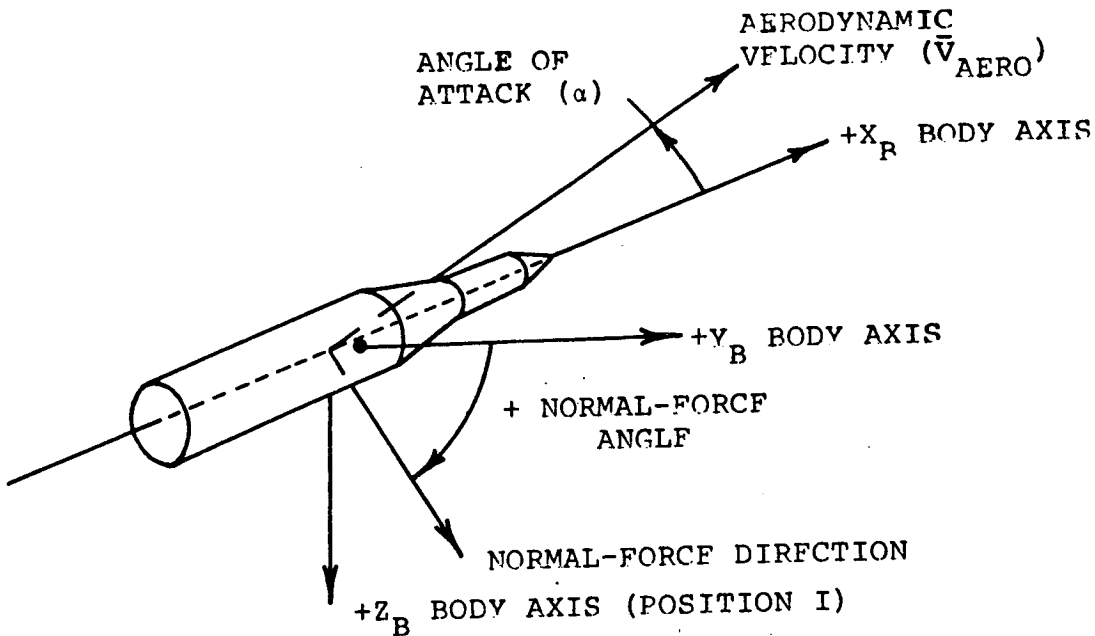


FIGURE 7-2. DEFINITION OF ANGLE OF ATTACK AND NORMAL-FORCE ANGLE

- f. Tables 7-VI, 7-XV, 7-XXIV, 7-XXXIII, and 7-XLII contain aerodynamic dynamic pressure (q), the product of dynamic pressure and angle of attack ($q \times \alpha$), and the aerodynamic heating indicator (AHI). The dynamic pressure and aerodynamic heating indicator are defined as follows:

$$q = \frac{1}{2} \rho_{\infty} V_{AERO}^2$$

$$AHI = \int_{\text{Liftoff}}^{\text{Flight Time}} \frac{q V_{AERO}}{\frac{\pi}{2} - \alpha} dt$$

The term ρ_{∞} is the local atmospheric density. Dynamic pressure is given in pounds per square foot; the product of dynamic pressure and angle of attack is given in pound-degrees per square foot; and the aerodynamic heating indicator is given in foot-pounds per radian-square-foot.

- g. Tables 7-VII, 7-XVI, 7-XXV, 7-XXXIV, and 7-XLIII contain aerodynamic normal force, aerodynamic axial force, geocentric radius, and geocentric latitude. The aerodynamic normal force is the component of the total aerodynamic force that acts normal to the vehicle longitudinal axis. The aerodynamic axial force is the component of the total aerodynamic force that acts parallel to the vehicle longitudinal axis. The axial force is positive when acting in the $-X_B$ direction. The geocentric radius is the magnitude of the vector from the center of the earth to the vehicle position. The geocentric latitude (frequently called declination) is the angle from the geocentric radius vector to the equator. Geocentric latitude is positive in the northern hemisphere. Normal force and axial force are given in pounds, geocentric radius is given in meters, and geocentric latitude is given in degrees.
- h. Tables 7-VIII, 7-XVII, 7-XXVI, 7-XXXV, and 7-XLIV contain the vehicle position coordinates in Project Apollo Standard Coordinate System Number 13. This system is earth-centered and the axis orientations are space-fixed at Guidance Reference Release (GRR). GRR is coincident with liftoff for this trajectory study. At GRR the X axis is aligned parallel with the launch-pad plumbline vertical, the Z axis is aligned parallel with the selected direction of launch (inertial flight azimuth), and the Y axis completes the right-handed system (Figure 7-3). Position coordinates are given in meters.

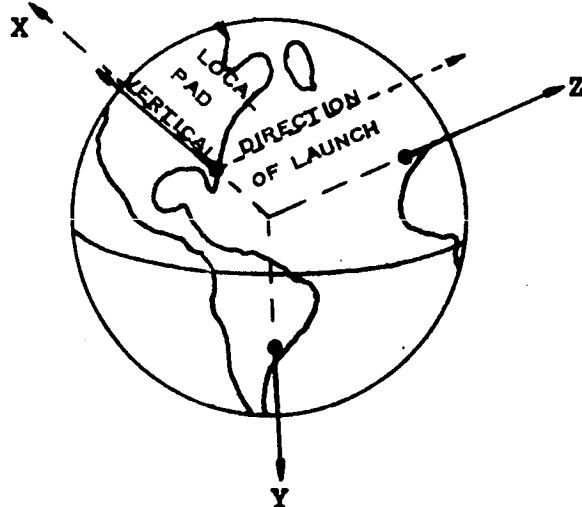


FIGURE 7-3. PROJECT APOLLO STANDARD COORDINATE SYSTEM NO. 13 ORIENTATION AT GUIDANCE REFERENCE RELEASE

- i. Tables 7-IX, 7-XVIII, 7-XXVII, 7-XXXVI and 7-XLV contain the vehicle inertial velocity components in Project Apollo Standard Coordinate System Number 13. Velocity components are given in meters per second.

TABLE 7-1 WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
0.000	6.401386E 06	7.662082E 06	49.3	0.000
5.000	6.257192E 06	7.669934E 06	75.1	0.000
10.000	6.112940E 06	7.684720E 06	156.1	0.000
12.000	6.055222E 06	7.692852E 06	205.8	0.000
15.000	5.968626E 06	7.707578E 06	300.4	0.000
20.000	5.824245E 06	7.739413E 06	515.9	0.000
25.000	5.679789E 06	7.780933E 06	811.8	0.002
30.000	5.535251E 06	7.832039E 06	1197.7	0.010
35.000	5.390626E 06	7.892950E 06	1684.2	0.028
40.000	5.245907E 06	7.963228E 06	2282.1	0.063
45.000	5.101088E 06	8.041952E 06	3002.3	0.122
50.000	4.956165E 06	8.127614E 06	3855.3	0.217
55.000	4.811133E 06	8.218240E 06	4850.4	0.360
60.000	4.665990E 06	8.311216E 06	5995.9	0.565
65.000	4.520741E 06	8.403730E 06	7297.3	0.849
70.000	4.375261E 06	8.493318E 06	8757.4	1.392
75.000	4.229469E 06	8.580827E 06	10376.4	1.829
80.000	4.083509E 06	8.663592E 06	12158.0	2.411
82.250	4.017766E 06	8.697923E 06	13014.1	2.720
85.000	3.937360E 06	8.737229E 06	14107.3	3.140
90.000	3.791011E 06	8.800076E 06	16229.3	4.090
95.000	3.644779E 06	8.851203E 06	18527.9	5.191
100.000	3.498333E 06	8.891824E 06	21005.7	6.542
105.000	3.351668E 06	8.924524E 06	23664.0	8.105
110.000	3.204774E 06	8.951713E 06	26500.7	9.948
115.000	3.057642E 06	8.975301E 06	29516.9	12.075
120.000	2.910258E 06	8.996649E 06	32716.8	14.501
125.000	2.762603E 06	9.016749E 06	36104.6	17.272
130.000	2.614659E 06	9.036320E 06	39685.7	20.391
135.000	2.466401E 06	9.055845E 06	43466.6	23.894
140.000	2.317800E 06	9.075572E 06	47456.3	27.814
145.000	2.168823E 06	9.095534E 06	51666.1	32.185
147.329	2.099288E 06	7.283888E 06	53706.4	34.378
150.000	2.035959E 06	7.238602E 06	56097.4	37.024
155.000	1.917221E 06	7.253477E 06	60692.0	42.289
159.329	1.814177E 06	7.266754E 06	64804.9	47.203
159.329	1.459482E 06	0.000000E-39	64804.9	47.203
159.459	1.459482E 06	2.742796E 05	64930.0	47.354
160.000	1.458931E 06	2.742827E 05	65450.7	47.993
163.759	1.455103E 06	1.024098E 06	69006.1	52.411

TABLE 7-1 WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
165.000	1.452107E 06	1.024102E 06	70157.0	53.874
165.859	1.450031E 06	1.163632E 06	70949.2	54.891
170.000	1.438698E 06	1.163640E 06	74711.0	59.816
175.000	1.425012E 06	1.163645E 06	79136.3	65.844
180.000	1.411327E 06	1.163647E 06	83434.8	71.961
185.000	1.397642E 06	1.163648E 06	87608.8	78.164
189.559	1.375262E 06	1.163648E 06	91308.5	83.898
190.000	1.374056E 06	1.163649E 06	91660.5	84.455
194.559	1.352926E 06	1.163649E 06	95251.1	90.273
195.000	1.351721E 06	1.163649E 06	95592.8	90.839
200.000	1.338035E 06	1.163613E 06	99408.5	97.314
205.000	1.324350E 06	1.163603E 06	103110.6	103.882
210.000	1.310665E 06	1.163649E 06	106713.8	110.542
215.000	1.296979E 06	1.163649E 06	110222.2	117.292
220.000	1.283294E 06	1.163649E 06	113636.2	124.134
225.000	1.269608E 06	1.163649E 06	116956.9	131.071
230.000	1.255923E 06	1.163649E 06	120185.0	138.105
235.000	1.242238E 06	1.163649E 06	123321.5	145.236
240.000	1.228552E 06	1.163649E 06	126367.4	152.467
245.000	1.214867E 06	1.163649E 06	129323.3	159.798
250.000	1.201181E 06	1.163649E 06	132190.4	167.232
255.000	1.187496E 06	1.163649E 06	134969.6	174.771
260.000	1.173811E 06	1.163649E 06	137662.1	182.417
265.000	1.160125E 06	1.163649E 06	140268.7	190.170
270.000	1.146440E 06	1.163649E 06	142790.7	198.033
275.000	1.132754E 06	1.163649E 06	145228.8	206.008
280.000	1.119069E 06	1.163649E 06	147584.4	214.096
285.000	1.105384E 06	1.163649E 06	149858.3	222.301
290.000	1.091698E 06	1.163649E 06	152051.8	230.622
295.000	1.078013E 06	1.163649E 06	154166.0	239.065
300.000	1.064327E 06	1.163649E 06	156202.0	247.628
305.000	1.050642E 06	1.163649E 06	158161.1	256.316
310.000	1.036957E 06	1.163649E 06	160044.2	265.129
315.000	1.023271E 06	1.163649E 06	161852.9	274.070
320.000	1.009586E 06	1.163649E 06	163588.2	283.143
325.000	9.959004E 05	1.163649E 06	165251.4	292.348
330.000	9.822150E 05	1.163649E 06	166844.2	301.689
335.000	9.685296E 05	1.163649E 06	168367.4	311.168
340.000	9.548442E 05	1.163649E 06	169822.7	320.786
345.000	9.411588E 05	1.163649E 06	171211.5	330.548

TABLE 7-1

WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
350.000	9.274734E 05	1.163649E 06	172535.4	340.455
355.000	9.137880E 05	1.163649E 06	173795.6	350.510
360.000	9.001026E 05	1.163649E 06	174993.8	360.716
365.000	8.864172E 05	1.163649E 06	176131.8	371.075
370.000	8.727318E 05	1.163649E 06	177210.9	381.592
375.000	8.590464E 05	1.163649E 06	178233.3	392.267
380.000	8.453610E 05	1.163649E 06	179200.2	403.106
385.000	8.316756E 05	1.163649E 06	180113.9	414.110
390.000	8.179902E 05	1.163649E 06	180976.3	425.283
395.000	8.043048E 05	1.163649E 06	181789.1	436.629
400.000	7.906194E 05	1.163649E 06	182554.5	448.151
405.000	7.769340E 05	1.163649E 06	183274.6	459.851
410.000	7.632486E 05	1.163649E 06	183951.7	471.735
415.000	7.495632E 05	1.163649E 06	184588.2	483.805
420.000	7.358778E 05	1.163649E 06	185186.1	496.066
425.000	7.221924E 05	1.163649E 06	185748.3	508.522
430.000	7.085070E 05	1.163649E 06	186277.2	521.176
435.000	6.948217E 05	1.163649E 06	186775.6	534.033
437.627	6.876303E 05	9.536950E 05	187026.4	540.872
440.000	6.823523E 05	9.536950E 05	187244.6	547.093
445.000	6.712296E 05	9.536950E 05	187673.5	560.331
450.000	6.601069E 05	9.536950E 05	188062.7	573.745
455.000	6.489841E 05	9.536950E 05	188414.0	587.339
460.000	6.378614E 05	9.536950E 05	188730.1	601.117
465.000	6.267387E 05	9.536950E 05	189013.6	615.081
470.000	6.156160E 05	9.536950E 05	189266.8	629.234
475.000	6.044932E 05	9.536950E 05	189492.8	643.583
480.000	5.933705E 05	9.536950E 05	189694.4	658.128
485.000	5.822478E 05	9.536950E 05	189874.5	672.876
490.000	5.711251E 05	9.536950E 05	190036.2	687.830
495.000	5.600024E 05	9.536950E 05	190182.9	702.995
500.000	5.488796E 05	9.536950E 05	190317.7	718.374
505.000	5.377569E 05	9.536950E 05	190444.7	733.973
510.000	5.266342E 05	9.536950E 05	190567.2	749.795
515.000	5.155115E 05	9.536950E 05	190689.4	765.847
520.000	5.043888E 05	9.536950E 05	190815.5	782.133
525.000	4.932661E 05	9.536950E 05	190949.4	798.657
530.000	4.821434E 05	9.536949E 05	191095.9	815.427
535.000	4.710206E 05	9.536950E 05	191259.6	832.448
537.424	4.656272E 05	9.536950E 05	191346.3	840.793

TABLE 7-1 WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
537.424	3.635400E 05	0.000000E-39	191346.3	840.793
537.442	3.635400E 05	2.711470E 04	191347.1	840.853
540.000	3.632896E 05	2.711470E 04	191436.2	849.691
543.142	3.629819E 05	2.069960E 05	191530.4	860.551
545.000	3.620828E 05	2.069960E 05	191579.2	866.977
545.742	3.617234E 05	2.333470E 05	191598.0	869.548
549.542	3.595114E 05	2.333470E 05	191685.2	882.735
550.000	3.592603E 05	2.333470E 05	191694.9	884.325
555.000	3.565169E 05	2.333470E 05	191788.6	901.756
560.000	3.537720E 05	2.333470E 05	191861.8	919.270
565.000	3.510260E 05	2.333470E 05	191915.7	936.867
570.000	3.482801E 05	2.333470E 05	191951.8	954.548
575.000	3.455341E 05	2.333470E 05	191970.8	972.316
580.000	3.427882E 05	2.333470E 05	191974.8	990.169
585.000	3.400422E 05	2.333470E 05	191965.0	1008.109
590.000	3.372962E 05	2.333470E 05	191943.1	1026.136
595.000	3.345522E 05	2.333470E 05	191910.5	1044.252
600.000	3.318087E 05	2.333470E 05	191869.3	1062.458
605.000	3.290653E 05	2.333470E 05	191820.9	1080.753
610.000	3.263218E 05	2.333470E 05	191767.3	1099.140
615.000	3.235783E 05	2.333470E 05	191710.0	1117.618
620.000	3.208349E 05	2.333470E 05	191651.2	1136.188
625.000	3.180914E 05	2.333470E 05	191592.7	1154.852
630.000	3.153480E 05	2.333470E 05	191536.4	1173.610
635.000	3.126045E 05	2.333470E 05	191484.6	1192.463
640.000	3.098610E 05	2.333470E 05	191439.2	1211.412
645.000	3.071176E 05	2.333470E 05	191402.3	1230.457
650.000	3.043741E 05	2.333470E 05	191376.6	1249.599
655.000	3.016306E 05	2.333470E 05	191363.8	1268.840
658.378	2.997771E 05	2.333470E 05	191364.1	1281.895
658.378	2.997771E 05	1.400000E 02	191364.1	1281.895
660.000	2.997744E 05	1.400000E 02	191366.1	1288.174
670.000	2.997575E 05	1.400000E 02	191378.4	1326.888
680.000	2.997406E 05	1.400000E 02	191389.4	1365.601
690.000	2.997237E 05	1.400000E 02	191398.7	1404.315
700.000	2.997068E 05	1.400000E 02	191406.7	1443.028
710.000	2.996899E 05	1.400000E 02	191413.1	1481.742
720.000	2.996730E 05	1.946885E 02	191418.2	1520.455
730.000	2.996500E 05	1.934531E 02	191421.8	1559.168
740.000	2.996271E 05	1.922178E 02	191424.2	1597.881

TABLE 7-1 WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
742.378	2.996217E 05	5.192403E 01	191424.5	1607.088
750.000	2.996173E 05	5.098247E 01	191425.0	1636.595
760.000	2.996117E 05	4.974714E 01	191424.5	1675.308
770.000	2.996061E 05	4.851181E 01	191422.6	1714.020
780.000	2.996008E 05	4.727648E 01	191419.3	1752.733
790.000	2.995955E 05	4.604114E 01	191414.8	1791.445
800.000	2.995904E 05	4.480582E 01	191408.7	1830.157
900.000	2.995501E 05	8.000000E 00	191276.2	2217.263
1000.000	2.995329E 05	5.414024E 01	191020.9	2604.336
1100.000	2.994722E 05	5.468716E 01	190661.2	2991.378
1200.000	2.994118E 05	5.386930E 01	190223.5	3378.388
1300.000	2.993524E 05	5.280449E 01	189740.2	3765.362
1400.000	2.992943E 05	5.140835E 01	189247.1	4152.296
1500.000	2.992380E 05	4.971391E 01	188781.1	4539.185
1600.000	2.991836E 05	4.801946E 01	188378.5	4926.024
1700.000	2.991310E 05	4.632502E 01	188073.4	5312.804
1800.000	2.990804E 05	4.469489E 01	187895.5	5699.518
1900.000	2.990315E 05	4.306989E 01	187867.9	6086.157
2000.000	2.989844E 05	4.144489E 01	188007.0	6472.709
2100.000	2.989391E 05	3.981989E 01	188320.3	6859.161
2200.000	2.988957E 05	3.819489E 01	188806.9	7245.495
2300.000	2.988540E 05	3.656989E 01	189456.8	7631.687
2400.000	2.988142E 05	3.494489E 01	190251.9	8017.702
2500.000	2.987761E 05	3.345102E 01	191166.6	8403.486
2600.000	2.987396E 05	3.200657E 01	192169.4	8788.946
2700.000	2.987047E 05	3.056213E 01	193224.6	9173.906
2800.000	2.986715E 05	2.918079E 01	194293.7	9557.972
2900.000	2.986393E 05	2.823635E 01	195338.1	9940.056
3000.000	2.986077E 05	2.729190E 01	196320.6	10315.642
3100.000	2.985767E 05	2.634746E 01	197207.4	10633.455
3200.000	2.985464E 05	2.540301E 01	197970.2	10455.452
3300.000	2.985167E 05	2.445857E 01	198586.9	10087.722
3400.000	2.984877E 05	2.351413E 01	199043.1	9707.558
3500.000	2.984593E 05	2.256968E 01	199332.9	9324.603
3600.000	2.984316E 05	2.197257E 01	199458.3	8940.626
3700.000	2.984051E 05	2.140312E 01	199428.2	8556.191
3800.000	2.983795E 05	2.083368E 01	199259.3	8171.529
3900.000	2.983551E 05	2.026424E 01	198976.1	7786.751
4000.000	2.983316E 05	1.969479E 01	198607.0	7401.919
4100.000	2.983093E 05	1.912535E 01	198184.6	7017.066

TABLE 7-1 WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
4200.000	2.982879E 05	1.855590E 01	197742.1	6632.215
4300.000	2.982675E 05	1.815793E 01	197312.4	6247.380
4400.000	2.982475E 05	1.782459E 01	196925.6	5862.571
4500.000	2.982278E 05	1.749126E 01	196608.3	5477.798
4600.000	2.982086E 05	1.718247E 01	196380.4	5093.071
4700.000	2.981895E 05	1.704358E 01	196256.1	4708.400
4800.000	2.981706E 05	1.690469E 01	196241.3	4323.800
4900.000	2.981519E 05	1.683420E 01	196334.6	3939.291
5000.000	2.981331E 05	1.697309E 01	196526.8	3554.903
5100.000	2.981142E 05	1.711197E 01	196801.6	3170.681
5200.000	2.980951E 05	1.725086E 01	197137.6	2786.697
5300.000	2.980758E 05	1.738975E 01	197508.2	2403.069
5400.000	2.980563E 05	1.785024E 01	197884.1	2020.006
5500.000	2.980362E 05	1.833636E 01	198235.5	1637.918
5600.000	2.980155E 05	1.882247E 01	198533.1	1257.706
5700.000	2.979944E 05	1.930858E 01	198750.4	881.828
5800.000	2.979726E 05	1.979469E 01	198865.8	519.815
5900.000	2.979504E 05	2.028080E 01	198863.5	244.192
6000.000	2.979276E 05	2.076691E 01	198736.2	382.009
6100.000	2.979043E 05	2.118242E 01	198482.9	727.424
6200.000	2.978805E 05	2.157131E 01	198110.2	1099.683
6300.000	2.978564E 05	2.196020E 01	197632.7	1478.654
6400.000	2.978317E 05	2.231753E 01	197071.8	1860.240
6500.000	2.978069E 05	2.245642E 01	196455.5	2243.104
6600.000	2.977818E 05	2.259531E 01	195815.9	2626.680
6700.000	2.977567E 05	2.253290E 01	195188.5	3010.687
6800.000	2.977317E 05	2.242691E 01	194610.1	3394.967
6900.000	2.977068E 05	2.228802E 01	194116.2	3779.422
7000.000	2.976821E 05	2.214914E 01	193739.8	4163.986
7100.000	2.976576E 05	2.201025E 01	193509.1	4548.612
7200.000	2.976332E 05	2.169126E 01	193446.3	4933.263
7300.000	2.976093E 05	2.135793E 01	193565.5	5317.906
7400.000	2.975857E 05	2.102459E 01	193872.8	5702.515
7500.000	2.975625E 05	2.069126E 01	194365.1	6087.061
7600.000	2.975397E 05	2.035793E 01	195031.1	6471.513
7700.000	2.975172E 05	2.002459E 01	195850.6	6855.838
7800.000	2.974951E 05	1.969126E 01	196796.2	7239.992
7900.000	2.974734E 05	1.932767E 01	197834.8	7623.917
8000.000	2.974521E 05	1.895267E 01	198928.9	8007.527
8100.000	2.974312E 05	1.857767E 01	200038.9	8390.686

TABLE 7-1 WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
8200.000	2.974107E 05	1.820267E 01	201124.8	8773.161
8300.000	2.973907E 05	1.782767E 01	202148.3	9154.506
8400.000	2.973711E 05	1.745267E 01	203074.5	9533.741
8500.000	2.973518E 05	1.707767E 01	203874.2	9908.235
8600.000	2.973330E 05	1.673921E 01	204524.6	10267.986
8700.000	2.973146E 05	1.643366E 01	205010.7	10541.769
8800.000	2.972964E 05	1.612810E 01	205325.6	10417.804
8900.000	2.972787E 05	1.582254E 01	205471.1	10078.117
9000.000	2.972612E 05	1.551699E 01	205457.0	9708.340
9100.000	2.972441E 05	1.521143E 01	205300.5	9331.047
9200.000	2.972274E 05	1.490588E 01	205025.1	8950.848
9300.000	2.972109E 05	1.466375E 01	204659.5	8569.240
9400.000	2.971947E 05	1.455264E 01	204235.0	8186.843
9500.000	2.971786E 05	1.444153E 01	203784.9	7803.963
9600.000	2.971626E 05	1.433042E 01	203341.4	7420.762
9700.000	2.971466E 05	1.438069E 01	202934.9	7037.338
9800.000	2.971306E 05	1.449180E 01	202590.8	6653.748
9900.000	2.971144E 05	1.460291E 01	202330.0	6270.032
10000.000	2.970981E 05	1.473681E 01	202165.7	5886.216
10100.000	2.970816E 05	1.502848E 01	202104.7	5502.317
10200.000	2.970648E 05	1.532015E 01	202145.9	5118.353
10300.000	2.970476E 05	1.561181E 01	202280.4	4734.336
10400.000	2.970301E 05	1.590348E 01	202492.9	4350.281
10500.000	2.970122E 05	1.619515E 01	202762.6	3966.203
10600.000	2.969941E 05	1.648681E 01	203064.1	3582.125
10700.000	2.969756E 05	1.677848E 01	203369.0	3198.076
10800.000	2.969568E 05	1.713447E 01	203648.6	2814.103
10900.000	2.969375E 05	1.749558E 01	203874.8	2430.279
11000.000	2.969179E 05	1.785669E 01	204022.8	2046.736
11100.000	2.968979E 05	1.821780E 01	204071.3	1663.723
11200.000	2.968774E 05	1.857891E 01	204005.8	1281.782
11300.000	2.968566E 05	1.894002E 01	203818.1	902.376
11400.000	2.968354E 05	1.930113E 01	203507.8	531.119
11500.000	2.968138E 05	1.952104E 01	203082.3	215.732
11600.000	2.967920E 05	1.968770E 01	202556.8	328.307
11700.000	2.967700E 05	1.985437E 01	201953.5	682.609
11800.000	2.967478E 05	2.002104E 01	201300.0	1058.852
11900.000	2.967255E 05	2.018770E 01	200629.7	1439.974
12000.000	2.967030E 05	2.035437E 01	199977.8	1822.939
12100.000	2.966803E 05	2.052104E 01	199380.8	2206.803

TABLE 7-1 WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
12200.000	2.966574E 05	2.058538E 01	198874.8	2591.174
12300.000	2.966345E 05	2.055760E 01	198492.4	2975.860
12400.000	2.966117E 05	2.052983E 01	198262.1	3360.752
12500.000	2.965889E 05	2.050205E 01	198205.2	3745.784
12600.000	2.965662E 05	2.021699E 01	198336.1	4130.912
12700.000	2.965439E 05	1.991143E 01	198660.4	4516.104
12800.000	2.965219E 05	1.960588E 01	199174.9	4901.338
12900.000	2.965002E 05	1.930032E 01	199867.7	5286.594
13000.000	2.964789E 05	1.899477E 01	200718.1	5671.859
13100.000	2.964580E 05	1.868921E 01	201698.6	6057.120
13200.000	2.964373E 05	1.838365E 01	202775.5	6442.369
13300.000	2.964171E 05	1.792680E 01	203911.0	6827.596
13400.000	2.963974E 05	1.741291E 01	205064.8	7212.795
13500.000	2.963783E 05	1.689903E 01	206196.2	7597.959
13600.000	2.963598E 05	1.638514E 01	207266.5	7983.081
13700.000	2.963418E 05	1.587125E 01	208239.9	8368.152
13800.000	2.963244E 05	1.535736E 01	209086.5	8753.159
13900.000	2.963076E 05	1.484347E 01	209783.2	9138.079
14000.000	2.962913E 05	1.444652E 01	210313.6	9522.861
14100.000	2.962754E 05	1.415485E 01	210670.2	9907.361
14200.000	2.962598E 05	1.386319E 01	210854.0	10291.002
14300.000	2.962446E 05	1.357152E 01	210873.9	10666.371
14400.000	2.962296E 05	1.327985E 01	210746.5	10529.631
14500.000	2.962150E 05	1.298819E 01	210494.5	10148.247
14600.000	2.962007E 05	1.269652E 01	210145.9	9764.194
14700.000	2.961867E 05	1.249094E 01	209731.9	9379.632
14800.000	2.961728E 05	1.246316E 01	209284.9	8994.880
14900.000	2.961590E 05	1.243538E 01	208837.0	8610.027
15000.000	2.961452E 05	1.240760E 01	208418.5	8225.108
15100.000	2.961313E 05	1.256138E 01	208054.7	7840.134
15200.000	2.961172E 05	1.278360E 01	207766.9	7455.111
15300.000	2.961029E 05	1.300583E 01	207568.9	7070.040
15400.000	2.960883E 05	1.327187E 01	207467.4	6684.920
15500.000	2.960733E 05	1.384132E 01	207462.2	6299.750
15600.000	2.960576E 05	1.441076E 01	207545.5	5914.528
15700.000	2.960413E 05	1.498021E 01	207702.4	5529.254
15800.000	2.960244E 05	1.554965E 01	207913.2	5143.928
15900.000	2.960068E 05	1.611910E 01	208153.1	4758.551
16000.000	2.959886E 05	1.668854E 01	208395.5	4373.128
16100.000	2.959698E 05	1.725798E 01	208612.1	3987.663

TABLE 7-1 WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
16200.000	2.959503E 05	1.773738E 01	208775.8	3602.168
16300.000	2.959304E 05	1.820960E 01	208862.4	3216.657
16400.000	2.959099E 05	1.868102E 01	208851.9	2831.154
16500.000	2.958889E 05	1.908155E 01	208730.0	2445.700
16550.000	2.958783E 05	1.920655E 01	208624.7	2253.011

TABLE 7-II

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(72-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
0.000	408.637	0.00	1.900	9.8181
5.000	408.762	10.40	2.201	9.8181
10.000	409.201	22.27	2.501	9.8178
12.000	409.495	27.45	2.627	9.8177
15.000	410.092	35.70	2.822	9.8174
20.000	412.103	50.82	3.184	9.8167
25.000	415.824	67.85	3.604	9.8158
30.000	421.925	87.01	4.065	9.8146
35.000	431.239	108.48	4.594	9.8131
40.000	444.554	132.52	5.204	9.8113
45.000	462.722	159.42	5.907	9.8090
50.000	486.404	189.51	6.699	9.8064
55.000	516.058	223.08	7.576	9.8034
60.000	551.908	260.41	8.506	9.7998
65.000	593.892	301.64	9.456	9.7958
70.000	641.596	346.72	10.416	9.7914
75.000	695.240	396.41	11.610	9.7864
80.000	755.758	452.20	13.006	9.7809
82.250	785.343	479.50	13.651	9.7783
85.000	823.520	514.78	14.465	9.7749
90.000	898.699	584.57	15.982	9.7685
95.000	981.436	661.87	17.545	9.7614
100.000	1071.888	746.94	19.145	9.7539
105.000	1170.234	839.99	20.843	9.7458
110.000	1276.708	941.30	22.514	9.7371
115.000	1391.356	1051.23	24.206	9.7279
120.000	1514.617	1170.22	26.016	9.7182
125.000	1647.132	1298.84	27.965	9.7080
130.000	1789.653	1437.80	30.072	9.6971
135.000	1943.115	1588.04	32.378	9.6857
140.000	2108.682	1750.68	34.935	9.6737
145.000	2287.795	1927.16	37.804	9.6610
147.329	2376.342	2014.57	31.030	9.6548
150.000	2458.120	2095.01	31.942	9.6477
155.000	2619.917	2254.49	34.275	9.6339
159.329	2769.997	2402.80	36.380	9.6216
159.329	2769.997	2402.80	9.626	9.6216
159.459	2769.561	2402.30	9.025	9.6212
160.000	2768.740	2401.21	9.020	9.6197
163.759	2763.267	2393.89	9.149	9.6090

TABLE 7-II
 INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
 (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
165.000	2767.787	2397.84	9.145	9.6056
165.859	2770.950	2400.61	9.485	9.6033
170.000	2790.464	2418.32	9.515	9.5921
175.000	2814.873	2440.66	9.523	9.5789
180.000	2840.182	2464.02	9.535	9.5662
185.000	2866.374	2488.37	9.547	9.5538
189.559	2891.012	2511.43	9.584	9.5429
190.000	2893.456	2513.73	9.586	9.5418
194.559	2919.139	2537.93	9.623	9.5312
195.000	2921.681	2540.33	9.624	9.5302
200.000	2950.987	2568.13	9.758	9.5190
205.000	2980.887	2596.65	8.967	9.5081
210.000	3010.858	2625.42	9.115	9.4976
215.000	3041.807	2655.22	9.205	9.4873
220.000	3073.579	2685.90	9.294	9.4773
225.000	3106.192	2717.49	9.389	9.4676
230.000	3139.652	2749.98	9.488	9.4582
235.000	3173.961	2783.37	9.587	9.4491
240.000	3209.120	2817.66	9.689	9.4402
245.000	3245.130	2852.85	9.792	9.4317
250.000	3281.997	2888.95	9.899	9.4234
255.000	3319.724	2925.95	10.008	9.4153
260.000	3358.315	2963.87	10.119	9.4075
265.000	3397.778	3002.69	10.234	9.4000
270.000	3438.117	3042.43	10.352	9.3927
275.000	3479.339	3083.09	10.473	9.3857
280.000	3521.453	3124.68	10.597	9.3789
285.000	3564.466	3167.20	10.725	9.3724
290.000	3608.386	3210.67	10.856	9.3661
295.000	3653.224	3255.08	10.990	9.3601
300.000	3698.989	3300.44	11.129	9.3542
305.000	3745.693	3346.78	11.270	9.3486
310.000	3793.347	3394.08	11.416	9.3433
315.000	3841.963	3442.38	11.566	9.3381
320.000	3891.556	3491.67	11.720	9.3331
325.000	3942.139	3541.98	11.878	9.3284
330.000	3993.727	3593.31	12.041	9.3239
335.000	4046.338	3645.69	12.208	9.3195
340.000	4099.987	3699.12	12.381	9.3154
345.000	4154.694	3753.62	12.558	9.3115

TABLE 7-II

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
350.000	4210.478	3809.22	12.740	9.3077
355.000	4267.359	3865.93	12.927	9.3041
360.000	4325.360	3923.77	13.120	9.3007
365.000	4384.503	3982.77	13.319	9.2975
370.000	4444.812	4042.95	13.524	9.2945
375.000	4506.315	4104.33	13.735	9.2916
380.000	4569.038	4166.94	13.953	9.2888
385.000	4633.011	4230.82	14.177	9.2862
390.000	4698.265	4295.98	14.409	9.2838
395.000	4764.831	4362.46	14.649	9.2815
400.000	4832.746	4430.30	14.896	9.2794
405.000	4902.046	4499.53	15.151	9.2773
410.000	4972.770	4570.19	15.416	9.2754
415.000	5044.960	4642.32	15.689	9.2736
420.000	5118.659	4715.97	15.973	9.2720
425.000	5193.915	4791.17	16.266	9.2704
430.000	5270.777	4867.99	16.571	9.2689
435.000	5349.298	4946.47	16.886	9.2675
437.627	5391.244	4988.40	14.602	9.2668
440.000	5422.534	5019.67	14.707	9.2662
445.000	5489.384	5086.48	14.933	9.2650
450.000	5557.495	5154.56	15.165	9.2639
455.000	5626.900	5223.93	15.406	9.2629
460.000	5697.636	5294.64	15.653	9.2620
465.000	5769.740	5366.72	15.909	9.2613
470.000	5843.254	5440.21	16.174	9.2606
475.000	5918.221	5515.16	16.448	9.2599
480.000	5994.685	5591.61	16.731	9.2594
485.000	6072.697	5669.60	17.025	9.2589
490.000	6152.306	5749.20	17.330	9.2584
495.000	6233.569	5830.45	17.646	9.2580
500.000	6316.543	5913.41	17.974	9.2577
505.000	6401.292	5998.15	18.316	9.2573
510.000	6487.881	6084.73	18.672	9.2570
515.000	6576.383	6173.22	19.042	9.2567
520.000	6666.873	6263.70	19.428	9.2563
525.000	6759.433	6356.25	19.832	9.2559
530.000	6854.152	6450.96	20.255	9.2555
535.000	6951.124	6547.92	20.698	9.2551
537.424	6998.988	6595.78	20.921	9.2549

TABLE 7-II

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
537.424	6998.988	6595.78	9.255	9.2549
537.442	6998.987	6595.78	9.182	9.2549
540.000	7000.730	6597.51	9.186	9.2546
543.142	7002.893	6599.66	10.154	9.2543
545.000	7013.130	6609.89	10.123	9.2542
545.742	7017.233	6613.99	10.479	9.2542
549.542	7041.035	6637.78	10.526	9.2539
550.000	7043.912	6640.66	10.527	9.2539
555.000	7075.506	6672.24	10.569	9.2539
560.000	7107.386	6704.11	10.614	9.2536
565.000	7139.554	6736.26	10.662	9.2535
570.000	7172.012	6768.71	10.714	9.2533
575.000	7204.762	6801.45	10.753	9.2532
580.000	7237.800	6834.48	10.797	9.2532
585.000	7271.129	6867.81	10.838	9.2532
590.000	7304.750	6901.42	10.880	9.2532
595.000	7338.665	6935.33	10.922	9.2533
600.000	7372.876	6969.54	10.964	9.2534
605.000	7407.386	7004.05	11.005	9.2535
610.000	7442.195	7038.86	11.047	9.2537
615.000	7477.307	7073.96	11.088	9.2538
620.000	7512.723	7109.38	11.131	9.2540
625.000	7548.446	7145.10	11.172	9.2542
630.000	7584.479	7181.13	11.213	9.2543
635.000	7620.823	7217.48	11.256	9.2545
640.000	7657.482	7254.13	11.295	9.2546
645.000	7694.458	7291.11	11.335	9.2548
650.000	7731.750	7328.40	11.382	9.2549
655.000	7769.375	7366.02	11.378	9.2550
658.378	7794.955	7391.59	11.387	9.2550
658.378	7794.955	7391.59	9.255	9.2550
660.000	7794.961	7391.60	9.255	9.2550
670.000	7795.000	7391.63	9.255	9.2550
680.000	7795.039	7391.66	9.255	9.2550
690.000	7795.079	7391.69	9.255	9.2550
700.000	7795.119	7391.73	9.255	9.2549
710.000	7795.160	7391.77	9.255	9.2549
720.000	7795.202	7391.81	9.255	9.2549
730.000	7795.262	7391.86	9.255	9.2549
740.000	7795.323	7391.93	9.255	9.2549

TABLE 7-II

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
742.378	7795.337	7391.94	9.255	9.2549
750.000	7795.348	7391.95	9.255	9.2549
760.000	7795.363	7391.97	9.255	9.2549
770.000	7795.378	7391.99	9.255	9.2549
780.000	7795.393	7392.01	9.255	9.2549
790.000	7795.408	7392.03	9.255	9.2549
800.000	7795.423	7392.05	9.255	9.2549
900.000	7795.571	7392.35	9.255	9.2551
1000.000	7795.695	7392.74	9.256	9.2555
1100.000	7795.983	7393.40	9.256	9.2561
1200.000	7796.292	7394.16	9.257	9.2568
1300.000	7796.603	7394.98	9.258	9.2576
1400.000	7796.898	7395.81	9.258	9.2584
1500.000	7797.157	7396.61	9.259	9.2591
1600.000	7797.362	7397.31	9.260	9.2597
1700.000	7797.499	7397.88	9.260	9.2600
1800.000	7797.552	7398.29	9.260	9.2601
1900.000	7797.513	7398.49	9.260	9.2599
2000.000	7797.373	7398.46	9.259	9.2594
2100.000	7797.130	7398.21	9.259	9.2585
2200.000	7796.786	7397.72	9.257	9.2573
2300.000	7796.347	7397.01	9.256	9.2557
2400.000	7795.822	7396.11	9.254	9.2539
2500.000	7795.224	7395.04	9.252	9.2518
2600.000	7794.570	7393.86	9.250	9.2496
2700.000	7793.878	7392.60	9.247	9.2472
2800.000	7793.169	7391.32	9.245	9.2448
2900.000	7792.464	7390.06	9.242	9.2424
3000.000	7791.781	7388.89	9.240	9.2402
3100.000	7791.141	7387.84	9.238	9.2381
3200.000	7790.558	7386.95	9.236	9.2363
3300.000	7790.045	7386.24	9.235	9.2347
3400.000	7789.611	7385.75	9.233	9.2335
3500.000	7789.263	7385.47	9.233	9.2326
3600.000	7789.002	7385.41	9.232	9.2320
3700.000	7788.825	7385.54	9.232	9.2317
3800.000	7788.732	7385.85	9.232	9.2317
3900.000	7788.714	7386.31	9.232	9.2319
4000.000	7788.760	7386.88	9.233	9.2324
100.000	7788.857	7387.51	9.233	9.2330

TABLE 7-II

INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
 (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
4200.000	7788.992	7388.17	9.234	9.2336
4300.000	7789.150	7388.80	9.234	9.2343
4400.000	7789.320	7389.37	9.235	9.2349
4500.000	7789.489	7389.85	9.236	9.2354
4600.000	7789.648	7390.20	9.236	9.2359
4700.000	7789.791	7390.41	9.236	9.2361
4800.000	7789.912	7390.47	9.236	9.2362
4900.000	7790.013	7390.39	9.236	9.2362
5000.000	7790.094	7390.17	9.236	9.2360
5100.000	7790.160	7389.85	9.236	9.2357
5200.000	7790.219	7389.44	9.235	9.2352
5300.000	7790.278	7388.98	9.235	9.2348
5400.000	7790.349	7388.52	9.235	9.2343
5500.000	7790.440	7388.09	9.234	9.2339
5600.000	7790.561	7387.73	9.234	9.2337
5700.000	7790.721	7387.48	9.234	9.2335
5800.000	7790.924	7387.37	9.234	9.2336
5900.000	7791.177	7387.42	9.234	9.2338
6000.000	7791.476	7387.63	9.234	9.2343
6100.000	7791.817	7388.02	9.235	9.2350
6200.000	7792.193	7388.57	9.236	9.2358
6300.000	7792.594	7389.26	9.237	9.2369
6400.000	7793.008	7390.06	9.238	9.2380
6500.000	7793.420	7390.94	9.239	9.2392
6600.000	7793.813	7391.86	9.240	9.2405
6700.000	7794.169	7392.76	9.242	9.2416
6800.000	7794.471	7393.60	9.243	9.2426
6900.000	7794.701	7394.34	9.243	9.2435
7000.000	7794.845	7394.92	9.244	9.2440
7100.000	7794.891	7395.31	9.244	9.2443
7200.000	7794.828	7395.48	9.244	9.2442
7300.000	7794.652	7395.41	9.244	9.2437
7400.000	7794.361	7395.10	9.243	9.2429
7500.000	7793.959	7394.55	9.242	9.2416
7600.000	7793.452	7393.76	9.240	9.2401
7700.000	7792.853	7392.78	9.238	9.2382
7800.000	7792.176	7391.63	9.236	9.2360
7900.000	7791.440	7390.36	9.234	9.2337
8000.000	7790.665	7389.01	9.231	9.2312
8100.000	7789.871	7387.64	9.229	9.2287

TABLE 7-II

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
8200.000	7789.082	7386.30	9.226	9.2262
8300.000	7788.317	7385.05	9.224	9.2238
8400.000	7787.596	7383.92	9.222	9.2217
8500.000	7786.937	7382.95	9.220	9.2197
8600.000	7786.353	7382.18	9.218	9.2181
8700.000	7785.855	7381.63	9.217	9.2167
8800.000	7785.450	7381.30	9.216	9.2157
8900.000	7785.141	7381.19	9.215	9.2151
9000.000	7784.927	7381.29	9.215	9.2148
9100.000	7784.802	7381.57	9.215	9.2147
9200.000	7784.759	7382.01	9.215	9.2149
9300.000	7784.787	7382.56	9.215	9.2154
9400.000	7784.875	7383.19	9.216	9.2159
9500.000	7785.010	7383.84	9.217	9.2166
9600.000	7785.178	7384.48	9.217	9.2173
9700.000	7785.366	7385.07	9.218	9.2180
9800.000	7785.563	7385.57	9.219	9.2186
9900.000	7785.759	7385.96	9.219	9.2191
10000.000	7785.948	7386.21	9.220	9.2195
10100.000	7786.124	7386.33	9.220	9.2198
10200.000	7786.287	7386.31	9.220	9.2199
10300.000	7786.437	7386.16	9.220	9.2198
10400.000	7786.579	7385.91	9.220	9.2197
10500.000	7786.717	7385.58	9.219	9.2195
10600.000	7786.859	7385.22	9.219	9.2192
10700.000	7787.014	7384.84	9.219	9.2189
10800.000	7787.189	7384.50	9.219	9.2188
10900.000	7787.394	7384.23	9.219	9.2187
11000.000	7787.634	7384.07	9.219	9.2187
11100.000	7787.913	7384.03	9.219	9.2190
11200.000	7788.235	7384.16	9.219	9.2194
11300.000	7788.598	7384.44	9.220	9.2200
11400.000	7788.999	7384.89	9.221	9.2209
11500.000	7789.429	7385.50	9.222	9.2219
11600.000	7789.879	7386.25	9.223	9.2230
11700.000	7790.335	7387.10	9.224	9.2243
11800.000	7790.782	7388.02	9.226	9.2256
11900.000	7791.203	7388.96	9.227	9.2269
12000.000	7791.581	7389.89	9.228	9.2281
12100.000	7791.898	7390.75	9.229	9.2292

TABLE 7-II

INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
 (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
12200.000	7792.138	7391.49	9.230	9.2301
12300.000	7792.284	7392.07	9.231	9.2307
12400.000	7792.325	7392.46	9.231	9.2309
12500.000	7792.252	7392.62	9.231	9.2308
12600.000	7792.059	7392.54	9.230	9.2303
12700.000	7791.745	7392.20	9.229	9.2294
12800.000	7791.313	7391.61	9.228	9.2281
12900.000	7790.772	7390.80	9.226	9.2264
13000.000	7790.133	7389.77	9.224	9.2245
13100.000	7789.413	7388.57	9.222	9.2222
13200.000	7788.629	7387.25	9.220	9.2198
13300.000	7787.802	7385.85	9.217	9.2172
13400.000	7786.955	7384.42	9.215	9.2146
13500.000	7786.109	7383.02	9.212	9.2120
13600.000	7785.285	7381.71	9.209	9.2095
13700.000	7784.506	7380.51	9.207	9.2072
13800.000	7783.787	7379.48	9.205	9.2051
13900.000	7783.145	7378.65	9.203	9.2033
14000.000	7782.591	7378.04	9.202	9.2019
14100.000	7782.133	7377.65	9.201	9.2008
14200.000	7781.774	7377.49	9.200	9.2000
14300.000	7781.515	7377.54	9.200	9.1996
14400.000	7781.352	7377.78	9.199	9.1995
14500.000	7781.276	7378.19	9.200	9.1996
14600.000	7781.279	7378.71	9.200	9.2000
14700.000	7781.349	7379.32	9.201	9.2006
14800.000	7781.473	7379.96	9.201	9.2012
14900.000	7781.638	7380.60	9.202	9.2019
15000.000	7781.832	7381.20	9.203	9.2027
15100.000	7782.043	7381.72	9.203	9.2033
15200.000	7782.263	7382.13	9.204	9.2039
15300.000	7782.482	7382.42	9.204	9.2044
15400.000	7782.697	7382.59	9.205	9.2047
15500.000	7782.906	7382.62	9.205	9.2049
15600.000	7783.109	7382.53	9.205	9.2050
15700.000	7783.310	7382.35	9.205	9.2051
15800.000	7783.514	7382.09	9.205	9.2050
15900.000	7783.726	7381.79	9.205	9.2049
16000.000	7783.953	7381.50	9.205	9.2048
16100.000	7784.205	7381.23	9.205	9.2048

TABLE 7-II

INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
 (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
16200.000	7784.485	7381.04	9.205	9.2049
16300.000	7784.801	7380.95	9.205	9.2052
16400.000	7785.156	7380.99	9.206	9.2056
16500.000	7785.550	7381.19	9.206	9.2061
16550.000	7785.762	7381.34	9.207	9.2065

TABLE 7-III

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
0.000	0.000	90.000	28.608	-80.604
5.000	1.458	89.996	28.608	-80.604
10.000	3.120	89.991	28.608	-80.604
12.000	3.844	89.989	28.608	-80.604
15.000	4.995	89.986	28.608	-80.604
20.000	7.084	89.957	28.608	-80.604
25.000	9.388	89.886	28.608	-80.604
30.000	11.885	89.753	28.608	-80.604
35.000	14.514	89.534	28.609	-80.604
40.000	17.197	89.211	28.609	-80.603
45.000	19.827	88.764	28.609	-80.602
50.000	22.288	88.185	28.610	-80.600
55.000	24.472	87.480	28.610	-80.598
60.000	26.292	86.667	28.611	-80.594
65.000	27.694	85.776	28.613	-80.589
70.000	28.660	84.847	28.615	-80.582
75.000	29.250	83.912	28.617	-80.573
80.000	29.547	82.986	28.621	-80.562
82.250	29.598	82.579	28.622	-80.556
85.000	29.596	82.091	28.625	-80.548
90.000	29.432	81.240	28.629	-80.532
95.000	29.091	80.445	28.635	-80.511
100.000	28.602	79.712	28.642	-80.487
105.000	27.979	79.045	28.650	-80.458
110.000	27.249	78.444	28.660	-80.425
115.000	26.495	77.908	28.671	-80.387
120.000	25.741	77.434	28.683	-80.343
125.000	24.987	77.013	28.697	-80.293
130.000	24.244	76.641	28.713	-80.236
135.000	23.523	76.312	28.731	-80.173
140.000	22.831	76.022	28.751	-80.102
145.000	22.175	75.767	28.773	-80.023
147.329	21.883	75.659	28.784	-79.983
150.000	21.519	75.572	28.797	-79.935
155.000	20.868	75.423	28.823	-79.840
159.329	20.364	75.308	28.848	-79.751
159.329	20.364	75.308	28.848	-79.751
159.459	20.343	75.309	28.849	-79.748
160.000	20.256	75.315	28.852	-79.736
163.759	19.651	75.356	28.874	-79.656

TABLE 7-III

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
165.000	19.464	75.363	28.881	-79.630
165.859	19.335	75.368	28.886	-79.611
170.000	18.729	75.390	28.911	-79.522
175.000	18.012	75.418	28.940	-79.412
180.000	17.314	75.448	28.970	-79.301
185.000	16.635	75.478	29.001	-79.188
189.559	16.033	75.508	29.029	-79.084
190.000	15.975	75.510	29.032	-79.074
194.559	15.391	75.541	29.060	-78.968
195.000	15.336	75.544	29.063	-78.957
200.000	14.716	75.578	29.094	-78.839
205.000	14.135	75.614	29.125	-78.720
210.000	13.623	75.652	29.157	-78.598
215.000	13.114	75.691	29.190	-78.475
220.000	12.617	75.731	29.222	-78.350
225.000	12.131	75.773	29.255	-78.223
230.000	11.656	75.816	29.288	-78.094
235.000	11.192	75.860	29.322	-77.963
240.000	10.739	75.906	29.355	-77.831
245.000	10.298	75.953	29.389	-77.696
250.000	9.867	76.001	29.424	-77.560
255.000	9.448	76.050	29.458	-77.421
260.000	9.039	76.102	29.493	-77.281
265.000	8.642	76.154	29.529	-77.138
270.000	8.256	76.208	29.564	-76.993
275.000	7.880	76.263	29.600	-76.846
280.000	7.515	76.320	29.636	-76.697
285.000	7.161	76.379	29.673	-76.546
290.000	6.818	76.439	29.709	-76.392
295.000	6.485	76.500	29.747	-76.236
300.000	6.162	76.564	29.784	-76.078
305.000	5.850	76.628	29.822	-75.917
310.000	5.547	76.695	29.860	-75.753
315.000	5.255	76.763	29.898	-75.588
320.000	4.973	76.832	29.937	-75.419
325.000	4.700	76.904	29.976	-75.248
330.000	4.438	76.977	30.015	-75.074
335.000	4.185	77.052	30.054	-74.898
340.000	3.941	77.129	30.094	-74.719
345.000	3.707	77.207	30.134	-74.537

TABLE 7-III

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
350.000	3.482	77.287	30.175	-74.352
355.000	3.267	77.370	30.216	-74.164
360.000	3.060	77.454	30.257	-73.973
365.000	2.863	77.540	30.298	-73.779
370.000	2.674	77.628	30.339	-73.582
375.000	2.495	77.718	30.381	-73.382
380.000	2.324	77.810	30.423	-73.179
385.000	2.162	77.904	30.466	-72.972
390.000	2.008	78.000	30.509	-72.762
395.000	1.864	78.099	30.551	-72.549
400.000	1.727	78.199	30.595	-72.332
405.000	1.599	78.302	30.638	-72.111
410.000	1.480	78.407	30.682	-71.887
415.000	1.368	78.515	30.726	-71.659
420.000	1.265	78.624	30.770	-71.427
425.000	1.171	78.736	30.814	-71.192
430.000	1.084	78.851	30.859	-70.952
435.000	1.006	78.968	30.903	-70.708
437.627	0.968	79.031	30.927	-70.578
440.000	0.919	79.089	30.948	-70.460
445.000	0.822	79.214	30.993	-70.209
450.000	0.732	79.342	31.038	-69.953
455.000	0.649	79.471	31.083	-69.695
460.000	0.572	79.603	31.128	-69.432
465.000	0.503	79.737	31.173	-69.166
470.000	0.440	79.874	31.218	-68.895
475.000	0.384	80.013	31.263	-68.621
480.000	0.335	80.154	31.308	-68.343
485.000	0.294	80.298	31.353	-68.060
490.000	0.259	80.444	31.398	-67.774
495.000	0.231	80.593	31.442	-67.483
500.000	0.210	80.745	31.487	-67.187
505.000	0.196	80.900	31.531	-66.887
510.000	0.189	81.057	31.575	-66.583
515.000	0.190	81.217	31.620	-66.274
520.000	0.197	81.379	31.663	-65.959
525.000	0.212	81.545	31.707	-65.640
530.000	0.234	81.714	31.750	-65.316
535.000	0.263	81.886	31.793	-64.987
537.424	0.280	81.970	31.814	-64.826

TABLE 7-III

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
537.424	0.280	81.970	31.814	-64.826
537.442	0.279	81.971	31.814	-64.824
540.000	0.244	82.066	31.836	-64.653
543.142	0.201	82.184	31.863	-64.443
545.000	0.185	82.252	31.878	-64.318
545.742	0.179	82.280	31.884	-64.268
549.542	0.151	82.420	31.915	-64.013
550.000	0.148	82.437	31.919	-63.982
555.000	0.113	82.623	31.959	-63.643
560.000	0.081	82.810	31.998	-63.303
565.000	0.051	82.998	32.037	-62.961
570.000	0.024	83.188	32.075	-62.616
575.000	-0.001	83.379	32.111	-62.270
580.000	-0.024	83.571	32.147	-61.922
585.000	-0.044	83.765	32.182	-61.572
590.000	-0.061	83.960	32.217	-61.220
595.000	-0.075	84.156	32.250	-60.865
600.000	-0.087	84.353	32.282	-60.509
605.000	-0.095	84.552	32.313	-60.151
610.000	-0.101	84.752	32.343	-59.791
615.000	-0.104	84.953	32.373	-59.429
620.000	-0.104	85.155	32.401	-59.064
625.000	-0.101	85.359	32.428	-58.698
630.000	-0.095	85.564	32.455	-58.329
635.000	-0.086	85.771	32.480	-57.959
640.000	-0.074	85.979	32.504	-57.586
645.000	-0.058	86.188	32.527	-57.211
650.000	-0.040	86.399	32.548	-56.835
655.000	-0.018	86.612	32.569	-56.456
658.378	0.000	86.756	32.582	-56.198
658.378	0.000	86.756	32.582	-56.198
660.000	0.000	86.826	32.589	-56.075
670.000	0.000	87.259	32.624	-55.311
680.000	0.001	87.692	32.654	-54.547
690.000	0.001	88.126	32.679	-53.783
700.000	0.001	88.561	32.699	-53.018
710.000	0.001	88.996	32.713	-52.253
720.000	0.002	89.431	32.722	-51.487
730.000	0.002	89.866	32.727	-50.722
740.000	0.002	90.302	32.726	-49.956

TABLE 7-III INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
742.378	0.002	90.405	32.725	-49.774
750.000	0.002	90.737	32.719	-49.190
760.000	0.003	91.172	32.708	-48.425
770.000	0.003	91.607	32.692	-47.660
780.000	0.003	92.042	32.670	-46.895
790.000	0.003	92.476	32.643	-46.131
800.000	0.004	92.909	32.611	-45.367
900.000	0.007	97.183	32.010	-37.777
1000.000	0.009	101.281	30.912	-30.333
1100.000	0.012	105.116	29.351	-23.101
1200.000	0.014	108.621	27.366	-16.129
1300.000	0.017	111.754	25.005	-9.437
1400.000	0.019	114.489	22.317	-3.029
1500.000	0.020	116.817	19.353	3.111
1600.000	0.022	118.741	16.161	9.011
1700.000	0.022	120.266	12.787	14.707
1800.000	0.023	121.402	9.275	20.240
1900.000	0.023	122.159	5.666	25.655
2000.000	0.024	122.543	1.998	30.997
2100.000	0.024	122.559	-1.690	36.313
2200.000	0.023	122.205	-5.360	41.650
2300.000	0.023	121.480	-8.975	47.055
2400.000	0.023	120.377	-12.495	52.573
2500.000	0.024	118.886	-15.880	58.250
2600.000	0.024	116.999	-19.087	64.126
2700.000	0.024	114.707	-22.070	70.238
2800.000	0.025	112.011	-24.781	76.615
2900.000	0.026	108.917	-27.170	83.273
3000.000	0.027	105.448	-29.188	90.211
3100.000	0.028	101.647	-30.788	97.409
3200.000	0.029	97.576	-31.927	104.823
3300.000	0.030	93.321	-32.576	112.389
3400.000	0.030	88.984	-32.713	120.023
3500.000	0.031	84.672	-32.335	127.635
3600.000	0.031	80.493	-31.454	135.136
3700.000	0.030	76.542	-30.096	142.452
3800.000	0.029	72.892	-28.297	149.526
3900.000	0.027	69.597	-26.103	156.328
4000.000	0.024	66.689	-23.561	162.845
4100.000	0.021	64.183	-20.722	-190.913

TABLE 7-III

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
4200.000	0.018	62.082	-17.635	-184.924
4300.000	0.014	60.381	-14.347	-179.155
4400.000	0.009	59.071	-10.901	-173.568
4500.000	0.005	58.143	-7.340	-168.118
4600.000	-0.000	57.589	-3.703	-162.762
4700.000	-0.005	57.403	-0.028	-157.453
4800.000	-0.010	57.583	3.647	-152.143
4900.000	-0.014	58.132	7.285	-146.788
5000.000	-0.018	59.055	10.849	-141.339
5100.000	-0.021	60.359	14.297	-135.753
5200.000	-0.024	62.055	17.589	-129.986
5300.000	-0.026	64.151	20.680	-123.999
5400.000	-0.027	66.652	23.523	-117.758
5500.000	-0.027	69.555	26.070	-111.243
5600.000	-0.027	72.846	28.270	-104.443
5700.000	-0.025	76.492	30.075	-97.369
5800.000	-0.023	80.442	31.440	-90.053
5900.000	-0.020	84.620	32.327	-82.551
6000.000	-0.017	88.931	32.711	-74.938
6100.000	-0.014	93.271	32.580	-67.302
6200.000	-0.010	97.528	31.938	-59.733
6300.000	-0.006	101.602	30.803	-52.315
6400.000	-0.001	105.407	29.208	-45.113
6500.000	0.002	108.879	27.195	-38.172
6600.000	0.006	111.977	24.810	-31.512
6700.000	0.009	114.678	22.103	-25.134
6800.000	0.012	116.974	19.124	-19.020
6900.000	0.015	118.865	15.921	-13.144
7000.000	0.017	120.360	12.540	-7.469
7100.000	0.019	121.468	9.024	-1.953
7200.000	0.021	122.198	5.413	3.448
7300.000	0.022	122.556	1.747	8.780
7400.000	0.023	122.546	-1.936	14.089
7500.000	0.024	122.169	-5.599	19.422
7600.000	0.024	121.421	-9.205	24.826
7700.000	0.025	120.294	-12.714	30.346
7800.000	0.026	118.781	-16.085	36.026
7900.000	0.026	116.871	-19.275	41.908
8000.000	0.027	114.558	-22.239	48.028
8100.000	0.028	111.841	-24.929	54.412

TABLE 7-III

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
8200.000	0.029	108.729	-27.295	61.076
8300.000	0.030	105.245	-29.288	68.020
8400.000	0.031	101.432	-30.862	75.222
8500.000	0.032	97.355	-31.974	82.636
8600.000	0.033	93.099	-32.595	90.196
8700.000	0.033	88.766	-32.706	97.820
8800.000	0.033	84.464	-32.304	105.417
8900.000	0.033	80.300	-31.400	112.900
9000.000	0.031	76.367	-30.022	120.195
9100.000	0.030	72.737	-28.207	127.247
9200.000	0.027	69.463	-26.000	134.026
9300.000	0.025	66.577	-23.448	140.521
9400.000	0.021	64.091	-20.602	-213.257
9500.000	0.017	62.009	-17.511	-207.287
9600.000	0.012	60.325	-14.220	-201.535
9700.000	0.007	59.031	-10.775	-195.962
9800.000	0.002	58.118	-7.215	-190.525
9900.000	-0.003	57.577	-3.581	-185.179
10000.000	-0.009	57.403	0.089	-179.878
10100.000	-0.014	57.595	3.758	-174.576
10200.000	-0.018	58.154	7.390	-169.226
10300.000	-0.023	59.086	10.946	-163.782
10400.000	-0.026	60.399	14.386	-158.200
10500.000	-0.029	62.102	17.669	-152.436
10600.000	-0.031	64.205	20.750	-146.451
10700.000	-0.032	66.712	23.584	-140.213
10800.000	-0.032	69.621	26.120	-133.700
10900.000	-0.032	72.915	28.310	-126.903
11000.000	-0.030	76.564	30.105	-119.833
11100.000	-0.028	80.514	31.460	-112.523
11200.000	-0.025	84.689	32.338	-105.028
11300.000	-0.021	88.998	32.713	-97.422
11400.000	-0.017	93.332	32.574	-89.795
11500.000	-0.013	97.582	31.926	-82.237
11600.000	-0.009	101.648	30.787	-74.830
11700.000	-0.004	105.446	29.189	-67.640
11800.000	-0.000	108.911	27.173	-60.709
11900.000	0.004	112.002	24.788	-54.059
12000.000	0.008	114.697	22.081	-47.690
12100.000	0.011	116.987	19.104	-41.586

TABLE 7-III INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
12200.000	0.014	118.874	15.903	-35.718
12300.000	0.017	120.366	12.525	-30.050
12400.000	0.019	121.471	9.012	-24.541
12500.000	0.021	122.199	5.405	-19.146
12600.000	0.023	122.556	1.743	-13.820
12700.000	0.024	122.546	-1.937	-8.517
12800.000	0.025	122.170	-5.596	-3.190
12900.000	0.026	121.423	-9.198	2.208
13000.000	0.027	120.298	-12.703	7.721
13100.000	0.028	118.788	-16.071	13.394
13200.000	0.029	116.882	-19.259	19.268
13300.000	0.031	114.574	-22.221	25.378
13400.000	0.032	111.863	-24.910	31.753
13500.000	0.033	108.757	-27.276	38.407
13600.000	0.034	105.281	-29.271	45.340
13700.000	0.035	101.475	-30.847	52.530
13800.000	0.036	97.406	-31.963	59.932
13900.000	0.036	93.157	-32.590	67.482
14000.000	0.036	88.829	-32.708	75.096
14100.000	0.036	84.532	-32.314	82.684
14200.000	0.035	80.370	-31.420	90.160
14300.000	0.034	76.436	-30.052	97.448
14400.000	0.032	72.805	-28.247	104.496
14500.000	0.029	69.528	-26.050	111.271
14600.000	0.025	66.636	-23.508	117.764
14700.000	0.021	64.145	-20.672	-236.017
14800.000	0.017	62.056	-17.590	-230.049
14900.000	0.012	60.364	-14.308	-224.300
15000.000	0.006	59.062	-10.871	-218.730
15100.000	0.001	58.139	-7.318	-213.297
15200.000	-0.005	57.588	-3.691	-207.957
15300.000	-0.011	57.403	-0.026	-202.663
15400.000	-0.016	57.583	3.640	-197.369
15500.000	-0.022	58.129	7.269	-192.028
15600.000	-0.026	59.047	10.823	-186.596
15700.000	-0.030	60.345	14.264	-181.026
15800.000	-0.033	62.032	17.549	-175.277
15900.000	-0.035	64.117	20.636	-169.309
16000.000	-0.037	66.605	23.477	-163.089
16100.000	-0.037	69.494	26.023	-156.595

TABLE 7-III INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
16200.000	-0.036	72.770	28.226	-149.818
16300.000	-0.035	76.400	30.036	-142.768
16400.000	-0.033	80.334	31.410	-135.475
16500.000	-0.029	84.497	32.308	-127.995
16550.000	-0.028	86.636	32.571	-124.207

TABLE 7-IV

COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (72-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
0.000	-0.00	0.00	0.00	-0.00	-18.00	-18.00
5.000	-0.00	-0.00	0.00	0.00	-18.00	-18.00
10.000	-0.00	0.00	0.00	-0.00	-18.00	-18.00
12.000	-0.03	0.00	0.00	-0.00	-17.00	-18.00
15.000	-0.45	-0.12	0.00	0.00	-14.00	-14.31
20.000	-1.09	-0.86	0.00	-0.00	-9.00	-9.58
25.000	-2.18	-1.79	0.00	-0.01	-4.00	-4.61
30.000	-3.68	-3.20	0.00	-0.02	0.00	0.39
35.000	-5.61	-5.04	0.00	-0.01	0.00	-0.01
40.000	-8.01	-7.34	0.00	-0.00	0.00	-0.02
45.000	-10.81	-10.10	0.00	0.00	0.00	-0.01
50.000	-13.95	-13.22	0.00	0.00	0.00	-0.00
55.000	-17.35	-16.61	0.00	0.00	0.00	-0.00
60.000	-20.92	-20.20	0.00	0.00	0.00	-0.00
65.000	-24.53	-23.88	0.00	-0.00	0.00	-0.00
70.000	-28.15	-27.53	0.00	-0.00	0.00	0.00
75.000	-31.71	-31.12	0.00	0.01	0.00	-0.00
80.000	-35.16	-34.60	0.00	0.02	0.00	-0.00
82.250	-36.67	-36.12	0.00	0.02	0.00	-0.00
85.000	-38.45	-37.93	0.00	0.02	0.00	-0.00
90.000	-41.57	-41.10	0.00	0.01	0.00	-0.00
95.000	-44.53	-44.13	0.00	0.00	0.00	-0.00
100.000	-47.32	-46.99	0.00	-0.00	0.00	-0.00
105.000	-49.94	-50.02	0.00	-0.00	0.00	-0.00
110.000	-52.41	-52.51	0.00	-0.01	0.00	-0.00
115.000	-54.66	-54.54	0.00	-0.00	0.00	-0.00
120.000	-56.71	-56.49	0.00	-0.00	0.00	-0.00
125.000	-58.58	-58.37	0.00	-0.00	0.00	0.00
130.000	-60.31	-60.10	0.00	-0.00	0.00	0.00
135.000	-61.89	-61.70	0.00	-0.00	0.00	0.00
140.000	-63.34	-63.16	0.00	-0.00	0.00	0.00
145.000	-64.67	-64.51	0.00	-0.00	0.00	0.00
147.329	-65.26	-65.10	0.00	-0.00	0.00	0.00
150.000	-65.90	-65.75	0.00	-0.00	0.00	0.00
155.000	-66.59	-66.84	0.00	-0.00	0.00	-0.00
159.329	-66.59	-66.90	0.00	-0.00	0.00	-0.00
159.329	-66.59	-66.90	0.00	-0.00	0.00	-0.00
159.459	-66.59	-66.90	0.00	-0.00	0.00	-0.00
160.000	-66.59	-66.87	0.00	-0.00	0.00	-0.00
163.759	-66.59	-66.55	0.00	-0.00	0.00	0.00

TABLE 7-IV
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
165.000	-66.59	-66.48	0.00	-0.00	0.00	0.00
165.859	-66.59	-66.47	0.00	-0.00	0.00	0.00
170.000	-66.59	-66.57	0.00	-0.00	0.00	0.00
175.000	-66.59	-66.57	0.00	-0.00	0.00	-0.00
180.000	-66.59	-66.58	0.00	-0.00	0.00	0.00
185.000	-66.59	-66.59	0.00	-0.00	0.00	0.00
189.559	-66.59	-66.59	0.00	-0.00	0.00	-0.00
190.000	-66.59	-66.59	0.00	-0.00	0.00	0.00
194.559	-66.59	-66.59	0.00	-0.00	0.00	0.00
195.000	-66.59	-66.59	0.00	-0.00	0.00	-0.00
200.000	-65.59	-66.59	0.00	-0.00	0.00	-0.00
205.000	-62.11	-62.50	-0.03	-0.00	0.00	0.00
210.000	-62.64	-62.37	-0.03	-0.03	0.00	-0.00
215.000	-63.16	-63.00	-0.03	-0.03	0.00	0.00
220.000	-63.68	-63.50	-0.03	-0.03	0.00	0.00
225.000	-64.22	-64.03	-0.03	-0.03	0.00	0.00
230.000	-64.76	-64.59	-0.03	-0.03	0.00	0.00
235.000	-65.30	-65.12	-0.03	-0.03	0.00	0.00
240.000	-65.83	-65.65	-0.03	-0.03	0.00	0.00
245.000	-66.36	-66.18	-0.03	-0.03	0.00	0.00
250.000	-66.89	-66.71	-0.03	-0.03	0.00	0.00
255.000	-67.42	-67.24	-0.03	-0.03	0.00	0.00
260.000	-67.95	-67.77	-0.03	-0.03	0.00	0.00
265.000	-68.49	-68.30	-0.03	-0.03	0.00	0.00
270.000	-69.02	-68.84	-0.03	-0.03	0.00	0.00
275.000	-69.56	-69.37	-0.03	-0.03	0.00	0.00
280.000	-70.09	-69.91	-0.03	-0.03	0.00	0.00
285.000	-70.63	-70.45	-0.03	-0.03	0.00	0.00
290.000	-71.17	-70.99	-0.03	-0.03	0.00	0.00
295.000	-71.71	-71.53	-0.03	-0.03	0.00	0.00
300.000	-72.26	-72.07	-0.03	-0.03	0.00	0.00
305.000	-72.80	-72.62	-0.03	-0.03	0.00	0.00
310.000	-73.35	-73.16	-0.03	-0.03	0.00	0.00
315.000	-73.89	-73.71	-0.03	-0.03	0.00	0.00
320.000	-74.44	-74.26	-0.02	-0.02	0.00	0.00
325.000	-74.99	-74.81	-0.02	-0.02	0.00	0.00
330.000	-75.54	-75.36	-0.02	-0.02	0.00	0.00
335.000	-76.09	-75.91	-0.02	-0.02	0.00	0.00
340.000	-76.65	-76.46	-0.02	-0.02	0.00	0.00
345.000	-77.20	-77.01	-0.02	-0.02	0.00	0.00

TABLE 7-IV
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
350.000	-77.75	-77.56	-0.02	-0.02	0.00	0.00
355.000	-78.31	-78.12	-0.02	-0.02	0.00	0.00
360.000	-78.86	-78.67	-0.02	-0.02	0.00	0.00
365.000	-79.42	-79.23	-0.02	-0.02	0.00	0.00
370.000	-79.97	-79.78	-0.02	-0.02	0.00	0.00
375.000	-80.53	-80.34	-0.02	-0.02	0.00	0.00
380.000	-81.08	-80.90	-0.02	-0.02	0.00	0.00
385.000	-81.64	-81.45	-0.02	-0.02	0.00	0.00
390.000	-82.20	-82.01	-0.02	-0.02	0.00	0.00
395.000	-82.75	-82.57	-0.01	-0.02	0.00	0.00
400.000	-83.31	-83.12	-0.01	-0.01	0.00	0.00
405.000	-83.87	-83.68	-0.01	-0.01	0.00	0.00
410.000	-84.42	-84.24	-0.01	-0.01	0.00	0.00
415.000	-84.98	-84.79	-0.01	-0.01	0.00	0.00
420.000	-85.53	-85.35	-0.01	-0.01	0.00	0.00
425.000	-86.09	-85.90	-0.01	-0.01	0.00	0.00
430.000	-86.64	-86.45	-0.01	-0.01	0.00	0.00
435.000	-87.19	-87.01	-0.01	-0.01	0.00	0.00
437.627	-87.48	-87.30	-0.01	-0.01	0.00	0.00
440.000	-87.75	-87.56	-0.01	-0.01	0.00	0.00
445.000	-88.30	-88.11	-0.01	-0.01	0.00	0.00
450.000	-88.85	-88.66	-0.00	-0.01	0.00	0.00
455.000	-89.39	-89.21	-0.00	-0.00	0.00	0.00
460.000	-89.94	-89.75	-0.00	-0.00	0.00	0.00
465.000	-90.48	-90.30	-0.00	-0.00	0.00	0.00
470.000	-91.02	-90.84	-0.00	-0.00	0.00	0.00
475.000	-91.55	-91.37	0.00	0.00	0.00	0.00
480.000	-92.09	-91.91	0.00	0.00	0.00	-0.00
485.000	-92.62	-92.44	0.00	0.00	0.00	-0.00
490.000	-93.15	-92.97	0.00	0.00	0.00	-0.00
495.000	-93.68	-93.50	0.01	0.01	0.00	-0.00
500.000	-94.20	-94.03	0.01	0.01	0.00	-0.00
505.000	-94.72	-94.55	0.01	0.01	0.00	-0.00
510.000	-95.24	-95.07	0.01	0.01	0.00	-0.00
515.000	-95.76	-95.59	0.01	0.01	0.00	-0.00
520.000	-96.28	-96.10	0.01	0.01	0.00	-0.00
525.000	-96.79	-96.62	0.01	0.01	0.00	-0.00
530.000	-97.31	-97.14	0.01	0.01	0.00	-0.00
535.000	-97.83	-97.65	0.01	0.01	0.00	-0.00
537.424	-98.09	-97.91	0.01	0.01	0.00	-0.00

TABLE 7-IV
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
537.424	-98.09	-97.91	0.01	0.01	0.00	-0.00
537.442	-98.09	-97.91	0.01	0.01	0.00	-0.00
540.000	-97.97	-98.16	0.01	0.01	0.00	-0.00
543.142	-97.97	-98.28	0.01	0.01	0.00	-0.00
545.000	-98.76	-98.32	0.00	0.01	0.00	-0.00
545.742	-98.81	-98.53	-0.00	0.00	0.00	-0.00
549.542	-99.18	-99.11	-0.00	-0.00	0.00	-0.00
550.000	-99.22	-99.14	-0.00	-0.00	0.00	-0.00
555.000	-99.74	-99.61	-0.00	-0.00	0.00	-0.00
560.000	-100.27	-100.14	-0.00	-0.00	0.00	-0.00
565.000	-100.81	-100.68	0.00	0.00	0.00	-0.00
570.000	-101.36	-101.24	0.01	0.01	0.00	-0.00
575.000	-101.82	-101.70	0.01	0.01	0.00	-0.00
580.000	-102.28	-102.17	0.01	0.01	0.00	-0.00
585.000	-102.73	-102.62	0.01	0.01	0.00	-0.00
590.000	-103.17	-103.06	0.01	0.01	0.00	-0.00
595.000	-103.60	-103.50	0.01	0.01	0.00	-0.00
600.000	-104.03	-103.93	0.01	0.01	0.00	-0.00
605.000	-104.45	-104.35	0.01	0.01	0.00	-0.00
610.000	-104.87	-104.77	0.01	0.01	0.00	-0.00
615.000	-105.28	-105.18	0.02	0.02	0.00	-0.00
620.000	-105.68	-105.58	0.03	0.02	0.00	-0.00
625.000	-106.07	-105.97	0.04	0.03	0.00	-0.00
630.000	-106.45	-106.36	0.05	0.04	0.00	-0.00
635.000	-106.83	-106.74	0.06	0.06	0.00	-0.00
640.000	-107.18	-107.09	0.08	0.08	0.00	-0.00
645.000	-107.52	-107.45	0.12	0.11	0.00	-0.00
650.000	-108.01	-107.83	0.32	0.19	0.00	-0.00
655.000	-107.85	-107.87	0.20	0.23	0.00	-0.00
658.378	-107.85	-107.84	0.20	0.19	0.00	-0.00
658.378	-107.83	-107.83	0.68	0.68	-0.00	-0.00
660.000	-109.51	-109.51	0.66	0.66	-0.00	-0.00
670.000	-114.42	-114.42	0.59	0.59	-0.00	-0.00
680.000	-115.11	-115.11	0.59	0.59	-0.00	-0.00
690.000	-115.79	-115.79	0.58	0.58	-0.00	-0.00
700.000	-116.47	-116.47	0.57	0.57	-0.00	-0.00
710.000	-117.15	-117.15	0.56	0.56	-0.00	-0.00
720.000	-117.83	-117.83	0.55	0.55	-0.00	-0.00
730.000	-118.51	-118.51	0.54	0.54	-0.00	-0.00
740.000	-119.19	-119.19	0.53	0.53	-0.00	-0.00

TABLE 7-IV

COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
742.378	-119.35	-119.35	0.53	0.53	-0.00	-0.00
750.000	-119.87	-119.87	0.52	0.52	-0.00	-0.00
760.000	-120.55	-120.55	0.52	0.52	-0.00	-0.00
770.000	-121.23	-121.23	0.51	0.51	-0.00	-0.00
780.000	-121.91	-121.91	0.50	0.50	-0.00	-0.00
790.000	-122.59	-122.59	0.49	0.49	-0.00	-0.00
800.000	-123.27	-123.27	0.48	0.48	-0.00	-0.00
900.000	-130.07	-130.07	0.38	0.38	-0.00	-0.00
1000.000	-136.87	-136.87	0.28	0.28	-0.00	-0.00
1100.000	-143.67	-143.67	0.17	0.17	-0.00	-0.00
1200.000	-150.47	-150.47	0.06	0.06	-0.00	-0.00
1300.000	-157.28	-157.28	-0.05	-0.05	-0.00	-0.00
1400.000	-164.08	-164.08	-0.16	-0.16	-0.00	-0.00
1500.000	-170.88	-170.88	-0.27	-0.27	-0.00	-0.00
1600.000	-177.69	-177.69	-0.38	-0.38	-0.00	-0.00
1700.000	175.51	175.51	-0.48	-0.48	-0.00	-0.00
1800.000	168.71	168.71	-0.58	-0.58	-0.00	-0.00
1900.000	161.90	161.90	-0.67	-0.67	-0.00	-0.00
2000.000	155.10	155.10	-0.75	-0.75	-0.00	-0.00
2100.000	148.29	148.29	-0.82	-0.82	-0.00	-0.00
2200.000	141.49	141.49	-0.88	-0.88	-0.00	-0.00
2300.000	134.69	134.69	-0.93	-0.93	-0.00	-0.00
2400.000	127.89	127.89	-0.97	-0.97	-0.00	-0.00
2500.000	121.08	121.08	-1.00	-1.00	-0.00	-0.00
2600.000	114.28	114.28	-1.01	-1.01	-0.00	-0.00
2700.000	107.48	107.48	-1.01	-1.01	-0.00	-0.00
2800.000	100.69	100.69	-0.99	-0.99	-0.00	-0.00
2900.000	93.89	93.89	-0.97	-0.97	-0.00	-0.00
3000.000	87.09	87.09	-0.93	-0.93	-0.00	-0.00
3100.000	80.30	80.30	-0.87	-0.87	-0.00	-0.00
3200.000	73.50	73.50	-0.81	-0.81	-0.00	-0.00
3300.000	66.71	66.71	-0.73	-0.73	-0.00	-0.00
3400.000	59.92	59.92	-0.65	-0.65	41.62	41.62
3500.000	53.13	53.13	-0.55	-0.55	141.62	141.62
3600.000	26.34	26.34	-0.09	-0.09	180.00	180.00
3700.000	19.55	19.55	0.03	0.03	180.00	180.00
3800.000	12.76	12.76	0.15	0.15	180.00	180.00
3900.000	5.97	5.97	0.27	0.27	180.00	180.00
4000.000	-0.82	-0.82	0.38	0.38	180.00	180.00
4100.000	-7.61	-7.61	0.49	0.49	180.00	180.00

TABLE 7-IV
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
4200.000	-14.40	-14.40	0.60	0.60	180.00	180.00
4300.000	-21.20	-21.20	0.70	0.70	180.00	180.00
4400.000	-27.99	-27.99	0.79	0.79	180.00	180.00
4500.000	-34.78	-34.78	0.86	0.86	180.00	180.00
4600.000	-41.58	-41.58	0.93	0.93	180.00	180.00
4700.000	-48.37	-48.37	0.99	0.99	180.00	180.00
4800.000	-55.17	-55.17	1.03	1.03	180.00	180.00
4900.000	-61.96	-61.96	1.06	1.06	180.00	180.00
5000.000	-68.75	-68.75	1.08	1.08	180.00	180.00
5100.000	-75.55	-75.55	1.08	1.08	180.00	180.00
5200.000	-82.34	-82.34	1.06	1.06	180.00	180.00
5300.000	-89.14	-89.14	1.04	1.04	180.00	180.00
5400.000	-95.93	-95.93	1.00	1.00	180.00	180.00
5500.000	-102.72	-102.72	0.94	0.94	180.00	180.00
5600.000	-109.51	-109.51	0.87	0.87	180.00	180.00
5700.000	-116.30	-116.30	0.79	0.79	180.00	180.00
5800.000	-123.09	-123.09	0.70	0.70	180.00	180.00
5900.000	-109.89	-109.89	0.90	0.90	158.38	158.38
6000.000	-116.68	-116.68	0.82	0.82	58.38	58.38
6100.000	-123.47	-123.47	0.72	0.72	-0.00	-0.00
6200.000	-130.26	-130.26	0.62	0.62	-0.00	-0.00
6300.000	-137.05	-137.05	0.51	0.51	-0.00	-0.00
6400.000	-143.84	-143.84	0.40	0.40	-0.00	-0.00
6500.000	-150.63	-150.63	0.27	0.27	-0.00	-0.00
6600.000	-157.42	-157.42	0.14	0.14	-0.00	-0.00
6700.000	-164.21	-164.21	0.01	0.01	-0.00	-0.00
6800.000	-171.01	-171.01	-0.12	-0.12	-0.00	-0.00
6900.000	-177.80	-177.80	-0.25	-0.25	-0.00	-0.00
7000.000	175.41	175.41	-0.38	-0.38	-0.00	-0.00
7100.000	168.61	168.61	-0.50	-0.50	-0.00	-0.00
7200.000	161.82	161.82	-0.62	-0.62	-0.00	-0.00
7300.000	155.02	155.02	-0.73	-0.73	-0.00	-0.00
7400.000	148.23	148.23	-0.83	-0.83	-0.00	-0.00
7500.000	141.44	141.44	-0.93	-0.93	-0.00	-0.00
7600.000	134.64	134.64	-1.00	-1.00	-0.00	-0.00
7700.000	127.85	127.85	-1.07	-1.07	-0.00	-0.00
7800.000	121.06	121.06	-1.12	-1.12	-0.00	-0.00
7900.000	114.26	114.26	-1.16	-1.16	-0.00	-0.00
8000.000	107.47	107.47	-1.18	-1.18	-0.00	-0.00
8100.000	100.68	100.68	-1.19	-1.19	-0.00	-0.00

TABLE 7-IV

COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
8200.000	93.89	93.89	-1.18	-1.18	-0.00	-0.00
8300.000	87.11	87.11	-1.15	-1.15	-0.00	-0.00
8400.000	80.32	80.32	-1.11	-1.11	-0.00	-0.00
8500.000	73.53	73.53	-1.05	-1.05	-0.00	-0.00
8600.000	66.75	66.75	-0.98	-0.98	-0.00	-0.00
8700.000	59.97	59.97	-0.90	-0.90	-0.00	-0.00
8800.000	53.19	53.19	-0.80	-0.80	-0.00	-0.00
8900.000	46.40	46.40	-0.69	-0.69	-0.00	-0.00
9000.000	39.62	39.62	-0.57	-0.57	-0.00	-0.00
9100.000	32.84	32.84	-0.44	-0.44	-0.00	-0.00
9200.000	26.06	26.06	-0.31	-0.31	-0.00	-0.00
9300.000	19.28	19.28	-0.17	-0.17	-0.00	-0.00
9400.000	12.50	12.50	-0.03	-0.03	-0.00	-0.00
9500.000	5.72	5.72	0.11	0.11	-0.00	-0.00
9600.000	-1.07	-1.07	0.26	0.26	-0.00	-0.00
9700.000	-7.85	-7.85	0.40	0.40	-0.00	-0.00
9800.000	-14.63	-14.63	0.53	0.53	-0.00	-0.00
9900.000	-21.41	-21.41	0.66	0.66	-0.00	-0.00
10000.000	-28.20	-28.20	0.78	0.78	-0.00	-0.00
10100.000	-34.98	-34.98	0.89	0.89	-0.00	-0.00
10200.000	-41.77	-41.77	0.99	0.99	-0.00	-0.00
10300.000	-48.55	-48.55	1.08	1.08	-0.00	-0.00
10400.000	-55.34	-55.34	1.15	1.15	-0.00	-0.00
10500.000	-62.12	-62.12	1.21	1.21	-0.00	-0.00
10600.000	-68.91	-68.91	1.25	1.25	-0.00	-0.00
10700.000	-75.69	-75.69	1.28	1.28	-0.00	-0.00
10800.000	-82.48	-82.48	1.29	1.29	-0.00	-0.00
10900.000	-89.26	-89.26	1.28	1.28	-0.00	-0.00
11000.000	-96.05	-96.05	1.25	1.25	-0.00	-0.00
11100.000	-102.83	-102.83	1.21	1.21	-0.00	-0.00
11200.000	-109.61	-109.61	1.15	1.15	-0.00	-0.00
11300.000	-116.40	-116.40	1.07	1.07	-0.00	-0.00
11400.000	-123.18	-123.18	0.98	0.98	-0.00	-0.00
11500.000	-129.96	-129.96	0.87	0.87	-0.00	-0.00
11600.000	-136.75	-136.75	0.75	0.75	-0.00	-0.00
11700.000	-143.53	-143.53	0.63	0.63	-0.00	-0.00
11800.000	-150.31	-150.31	0.49	0.49	-0.00	-0.00
11900.000	-157.10	-157.10	0.34	0.34	-0.00	-0.00
12000.000	-163.88	-163.88	0.19	0.19	-0.00	-0.00
12100.000	-170.66	-170.66	0.04	0.04	-0.00	-0.00

TABLE 7-IV

COMMANDED AND ACTUAL VEHICLE ATTITUDE ANGLES - LIFTOFF THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
12200.000	-177.45	-177.45	-0.12	-0.12	-0.00	-0.00
12300.000	175.76	175.76	-0.27	-0.27	-0.00	-0.00
12400.000	168.98	168.98	-0.42	-0.42	-0.00	-0.00
12500.000	162.19	162.19	-0.57	-0.57	-0.00	-0.00
12600.000	155.41	155.41	-0.71	-0.71	-0.00	-0.00
12700.000	148.62	148.62	-0.84	-0.84	-0.00	-0.00
12800.000	141.83	141.83	-0.96	-0.96	-0.00	-0.00
12900.000	135.05	135.05	-1.07	-1.07	-0.00	-0.00
13000.000	128.26	128.26	-1.17	-1.17	-0.00	-0.00
13100.000	121.48	121.48	-1.25	-1.25	-0.00	-0.00
13200.000	114.69	114.69	-1.31	-1.31	-0.00	-0.00
13300.000	107.91	107.91	-1.35	-1.35	-0.00	-0.00
13400.000	101.13	101.13	-1.38	-1.38	-0.00	-0.00
13500.000	94.35	94.35	-1.39	-1.39	-0.00	-0.00
13600.000	87.57	87.57	-1.38	-1.38	-0.00	-0.00
13700.000	80.79	80.79	-1.35	-1.35	-0.00	-0.00
13800.000	74.01	74.01	-1.30	-1.30	-0.00	-0.00
13900.000	67.23	67.23	-1.24	-1.24	-0.00	-0.00
14000.000	60.46	60.46	-1.15	-1.15	-0.00	-0.00
14100.000	53.68	53.68	-1.05	-1.05	-0.00	-0.00
14200.000	46.91	46.91	-0.94	-0.94	-0.00	-0.00
14300.000	40.13	40.13	-0.81	-0.81	-0.00	-0.00
14400.000	33.36	33.36	-0.67	-0.67	-0.00	-0.00
14500.000	26.59	26.59	-0.52	-0.52	-0.00	-0.00
14600.000	19.82	19.82	-0.37	-0.37	-0.00	-0.00
14700.000	13.04	13.04	-0.20	-0.20	-0.00	-0.00
14800.000	6.27	6.27	-0.04	-0.04	-0.00	-0.00
14900.000	-0.50	-0.50	0.13	0.13	-0.00	-0.00
15000.000	-7.28	-7.28	0.30	0.30	-0.00	-0.00
15100.000	-14.05	-14.05	0.46	0.46	-0.00	-0.00
15200.000	-20.82	-20.82	0.62	0.62	-0.00	-0.00
15300.000	-27.60	-27.60	0.77	0.77	-0.00	-0.00
15400.000	-34.37	-34.37	0.91	0.91	-0.00	-0.00
15500.000	-41.15	-41.15	1.04	1.04	-0.00	-0.00
15600.000	-47.93	-47.93	1.16	1.16	-0.00	-0.00
15700.000	-54.70	-54.70	1.26	1.26	-0.00	-0.00
15800.000	-61.48	-61.48	1.35	1.35	-0.00	-0.00
15900.000	-68.26	-68.26	1.41	1.41	-0.00	-0.00
16000.000	-75.04	-75.04	1.46	1.46	-0.00	-0.00
16100.000	-81.81	-81.81	1.49	1.49	-0.00	-0.00

TABLE 7-IV

COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
16200.000	-88.59	-88.59	1.50	1.50	-0.00	-0.00
16300.000	-95.37	-95.37	1.48	1.48	-0.00	-0.00
16400.000	-102.15	-102.15	1.45	1.45	-0.00	-0.00
16500.000	-108.92	-108.92	1.40	1.40	-0.00	-0.00
16550.000	-112.31	-112.31	1.37	1.37	-0.00	-0.00

TABLE 7-V MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
0.000	0.00	0.000	0.00	0.
5.000	0.03	89.830	0.03	89.
10.000	0.06	89.794	0.09	90.
12.000	0.08	89.777	0.11	90.
15.000	0.10	89.751	0.25	95.
20.000	0.15	89.522	0.43	93.
25.000	0.20	88.506	0.29	83.
30.000	0.25	87.016	0.19	69.
35.000	0.32	85.051	0.09	19.
40.000	0.39	82.671	0.12	-36.
45.000	0.47	79.889	0.15	-50.
50.000	0.57	76.770	0.17	-56.
55.000	0.68	73.396	0.16	-58.
60.000	0.80	69.850	0.14	-55.
65.000	0.94	66.210	0.12	-55.
70.000	1.11	62.563	0.14	-59.
75.000	1.30	58.977	0.16	-62.
80.000	1.53	55.505	0.18	-65.
82.250	1.64	53.993	0.18	-66.
85.000	1.78	52.193	0.19	-68.
90.000	2.05	49.065	0.17	-73.
95.000	2.30	46.133	0.11	-73.
100.000	2.55	43.391	0.04	-44.
105.000	2.83	40.814	0.39	86.
110.000	3.14	38.389	0.40	87.
115.000	3.46	36.190	0.18	82.
120.000	3.79	34.202	0.09	75.
125.000	4.14	32.391	0.09	76.
130.000	4.50	30.738	0.10	79.
135.000	4.88	29.232	0.11	82.
140.000	5.31	27.863	0.12	84.
145.000	5.87	26.620	0.13	86.
147.329	6.19	26.081	0.14	87.
150.000	6.51	25.492	0.15	87.
155.000	7.18	24.454	0.09	88.
159.329	7.86	23.651	0.74	-90.
159.329	7.86	23.651	0.74	-90.
159.459	7.86	23.627	0.77	-90.
160.000	7.89	23.528	0.91	-90.
163.759	8.05	22.841	2.01	-90.

TABLE 7-V

MACH NUMBER, RELATIVE FLIGHT-PATH
 ANGLE, ANGLE OF ATTACK, AND NORMAL
 FORCE ANGLE - LIFTOFF THROUGH
 PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
165.000	8.13	22.621	2.33	-90.
165.859	8.18	22.469	2.50	-90.
170.000	8.46	21.746	3.23	-90.
175.000	8.80	20.893	4.19	-90.
180.000	9.14	20.063	5.14	-90.
185.000	9.24	19.255	6.06	-90.
189.559	9.22	18.538	6.88	-90.
190.000	9.20	18.470	6.96	-90.
194.559	9.03	17.775	7.77	-90.
195.000	9.02	17.709	7.85	-90.
200.000	8.86	16.972	8.71	-90.
205.000	8.61	16.281	13.62	-90.
210.000	8.38	15.671	14.49	-90.
215.000	8.17	15.066	14.60	-90.
220.000	7.77	14.475	14.82	-90.
225.000	7.46	13.899	14.99	-90.
230.000	7.19	13.336	15.14	-90.
235.000	6.72	12.788	15.29	-90.
240.000	6.36	12.253	15.43	-90.
245.000	6.08	11.732	15.56	-90.
250.000	5.86	11.226	15.68	-90.
255.000	5.68	10.733	15.78	-90.
260.000	5.53	10.255	15.87	-90.
265.000	5.41	9.790	15.95	-90.
270.000	5.31	9.339	16.02	-90.
275.000	5.23	8.901	16.07	-90.
280.000	5.16	8.476	16.11	-90.
285.000	5.10	8.065	16.14	-90.
290.000	5.09	7.667	16.15	-90.
295.000	5.08	7.282	16.16	-90.
300.000	5.07	6.910	16.15	-90.
305.000	5.07	6.550	16.12	-90.
310.000	5.08	6.202	16.09	-90.
315.000	5.11	5.867	16.05	-90.
320.000	5.14	5.544	15.99	-91.
325.000	5.18	5.233	15.92	-91.
330.000	5.22	4.933	15.85	-91.
335.000	5.26	4.645	15.76	-91.
340.000	5.31	4.369	15.66	-91.
345.000	5.36	4.104	15.56	-91.

TABLE 7-V

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
350.000	5.42	3.849	15.44	-91.
355.000	5.48	3.606	15.31	-91.
360.000	5.55	3.374	15.18	-91.
365.000	5.61	3.152	15.04	-91.
370.000	5.68	2.940	14.88	-91.
375.000	5.75	2.739	14.72	-91.
380.000	5.82	2.548	14.56	-91.
385.000	5.90	2.367	14.38	-91.
390.000	5.97	2.197	14.20	-91.
395.000	6.05	2.036	14.01	-91.
400.000	6.13	1.884	13.82	-91.
405.000	6.22	1.742	13.61	-91.
410.000	6.30	1.610	13.41	-91.
415.000	6.39	1.487	13.19	-91.
420.000	6.48	1.374	12.97	-91.
425.000	6.58	1.269	12.75	-91.
430.000	6.67	1.174	12.52	-91.
435.000	6.77	1.088	12.29	-91.
437.627	6.82	1.046	12.16	-91.
440.000	6.86	0.993	12.06	-91.
445.000	6.95	0.887	11.85	-91.
450.000	7.03	0.789	11.64	-91.
455.000	7.12	0.699	11.43	-91.
460.000	7.21	0.616	11.22	-91.
465.000	7.30	0.540	11.00	-91.
470.000	7.40	0.473	10.78	-91.
475.000	7.50	0.412	10.56	-91.
480.000	7.60	0.360	10.34	-91.
485.000	7.70	0.314	10.11	-91.
490.000	7.80	0.277	9.89	-91.
495.000	7.91	0.247	9.66	-91.
500.000	8.02	0.224	9.43	-91.
505.000	8.13	0.209	9.20	-91.
510.000	8.25	0.202	8.97	-92.
515.000	8.37	0.202	8.74	-92.
520.000	8.49	0.210	8.50	-92.
525.000	8.61	0.225	8.27	-92.
530.000	8.74	0.248	8.02	-92.
535.000	8.87	0.279	7.77	-92.
537.424	8.93	0.297	7.65	-92.

TABLE 7-V

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
537.424	8.93	0.297	7.65	-92.
537.442	8.93	0.297	7.65	-92.
540.000	8.93	0.259	7.60	-92.
543.142	8.93	0.213	7.71	-92.
545.000	8.95	0.197	7.81	-92.
545.742	8.95	0.190	7.64	-92.
549.542	8.98	0.160	7.33	-92.
550.000	8.99	0.157	7.33	-92.
555.000	9.03	0.120	7.20	-92.
560.000	9.07	0.086	7.02	-92.
565.000	9.11	0.054	6.82	-93.
570.000	9.15	0.025	6.60	-93.
575.000	9.20	-0.001	6.48	-93.
580.000	9.24	-0.025	6.36	-93.
585.000	9.29	-0.046	6.25	-93.
590.000	9.33	-0.064	6.14	-93.
595.000	9.38	-0.080	6.03	-93.
600.000	9.43	-0.092	5.94	-93.
605.000	9.47	-0.101	5.85	-93.
610.000	9.52	-0.107	5.76	-94.
615.000	9.57	-0.110	5.68	-94.
620.000	9.62	-0.110	5.61	-94.
625.000	9.67	-0.107	5.54	-94.
630.000	9.72	-0.101	5.48	-94.
635.000	9.77	-0.091	5.42	-94.
640.000	9.82	-0.078	5.39	-93.
645.000	9.87	-0.062	5.35	-93.
650.000	9.92	-0.042	5.29	-92.
655.000	9.97	-0.019	5.55	-92.
658.378	10.01	0.000	5.80	-92.
658.378	10.01	0.000	5.80	-88.
660.000	10.01	0.000	4.24	-87.
670.000	10.01	0.000	0.15	1.
680.000	10.01	0.001	0.13	1.
690.000	10.01	0.001	0.10	1.
700.000	10.01	0.001	0.08	1.
710.000	10.01	0.001	0.06	1.
720.000	10.01	0.002	0.03	1.
730.000	10.01	0.002	0.01	2.
740.000	10.01	0.002	0.02	-180.

TABLE 7-V

MACH NUMBER, RELATIVE FLIGHT
ANGLE, ANGLE OF ATTACK, AND
NORMAL FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES L4 AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
742.378	10.01	0.002	03	-179.
750.000	10.01	0.002	04	-179.
760.000	10.01	0.003	07	-179.
770.000	10.01	0.003	09	-179.
780.000	10.01	0.003	11	-179.
790.000	10.01	0.004	14	-179.
800.000	10.01	0.004	16	-179.
900.000	10.01	0.007	39	-179.
1000.000	10.02	0.010	52	-179.
1100.000	10.02	0.013	64	-179.
1200.000	10.03	0.015	75	-179.
1300.000	10.04	0.018	85	-179.
1400.000	10.06	0.020	92	-179.
1500.000	10.07	0.021	98	-179.
1600.000	10.08	0.023	101	-179.
1700.000	10.09	0.024	102	-179.
1800.000	10.10	0.024	101	-179.
1900.000	10.10	0.025	106	-179.
2000.000	10.09	0.025	109	-179.
2100.000	10.09	0.025	110	-179.
2200.000	10.07	0.025	107	-180.
2300.000	10.05	0.025	101	-180.
2400.000	10.03	0.025	93	-180.
2500.000	10.02	0.025	83	-180.
2600.000	10.00	0.025	70	180.
2700.000	9.97	0.026	54	180.
2800.000	9.95	0.026	47	180.
2900.000	9.93	0.027	47	180.
3000.000	9.91	0.028	47	179.
3100.000	9.90	0.029	55	179.
3200.000	9.88	0.030	62	179.
3300.000	9.87	0.031	68	179.
3400.000	9.86	0.032	65	1.
3500.000	9.86	0.033	59	-1.
3600.000	9.85	0.032	51	87.
3700.000	9.85	0.032	42	87.
3800.000	9.86	0.030	32	86.
3900.000	9.86	0.028	23	86.
4000.000	9.87	0.026	14	85.
4100.000	9.88	0.023	5	85.

TABLE 7-V

MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
4200.000	9.89	0.019	20.07	84.
4300.000	9.90	0.015	20.08	84.
4400.000	9.90	0.010	20.08	84.
4500.000	9.91	0.005	20.09	84.
4600.000	9.91	-0.000	20.09	84.
4700.000	9.92	-0.005	20.10	84.
4800.000	9.92	-0.010	20.09	84.
4900.000	9.92	-0.015	20.09	84.
5000.000	9.91	-0.019	20.08	84.
5100.000	9.91	-0.022	20.07	85.
5200.000	9.90	-0.025	20.06	85.
5300.000	9.89	-0.027	20.05	86.
5400.000	9.89	-0.028	20.04	87.
5500.000	9.88	-0.029	20.03	87.
5600.000	9.87	-0.028	20.02	88.
5700.000	9.87	-0.027	20.01	89.
5800.000	9.87	-0.025	20.01	89.
5900.000	9.87	-0.022	0.30	0.
6000.000	9.87	-0.018	0.06	-0.
6100.000	9.87	-0.014	0.18	-179.
6200.000	9.88	-0.010	0.41	-179.
6300.000	9.89	-0.006	0.64	-179.
6400.000	9.90	-0.002	0.86	-179.
6500.000	9.91	0.003	1.07	-179.
6600.000	9.93	0.006	1.26	-179.
6700.000	9.94	0.010	1.44	-179.
6800.000	9.95	0.013	1.59	-179.
6900.000	9.96	0.016	1.72	-179.
7000.000	9.97	0.018	1.83	-179.
7100.000	9.97	0.020	1.91	-179.
7200.000	9.97	0.022	1.97	-179.
7300.000	9.97	0.023	2.00	-179.
7400.000	9.97	0.024	2.00	-179.
7500.000	9.96	0.025	1.97	-179.
7600.000	9.94	0.026	1.91	-179.
7700.000	9.93	0.026	1.83	-180.
7800.000	9.91	0.027	1.72	-180.
7900.000	9.89	0.028	1.59	-180.
8000.000	9.87	0.029	1.43	-180.
8100.000	9.85	0.030	1.26	180.

TABLE 7-V

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
8200.000	9.83	0.031	1.06	180.
8300.000	9.81	0.032	0.85	180.
8400.000	9.79	0.033	0.63	179.
8500.000	9.77	0.034	0.40	179.
8600.000	9.76	0.035	0.17	179.
8700.000	9.75	0.035	0.07	1.
8800.000	9.75	0.035	0.30	-1.
8900.000	9.74	0.034	0.54	-1.
9000.000	9.74	0.033	0.76	-1.
9100.000	9.75	0.031	0.98	-1.
9200.000	9.75	0.029	1.18	-1.
9300.000	9.76	0.026	1.36	-1.
9400.000	9.77	0.022	1.52	-1.
9500.000	9.78	0.018	1.67	-1.
9600.000	9.78	0.013	1.79	-1.
9700.000	9.79	0.008	1.88	-1.
9800.000	9.80	0.002	1.95	-1.
9900.000	9.80	-0.004	1.99	-1.
10000.000	9.81	-0.009	2.01	-1.
10100.000	9.81	-0.014	1.99	-1.
10200.000	9.81	-0.019	1.95	-1.
10300.000	9.81	-0.024	1.88	-1.
10400.000	9.80	-0.028	1.78	-1.
10500.000	9.80	-0.031	1.66	-0.
10600.000	9.79	-0.033	1.52	-0.
10700.000	9.78	-0.034	1.35	-0.
10800.000	9.78	-0.034	1.17	-0.
10900.000	9.77	-0.033	0.96	0.
11000.000	9.77	-0.032	0.75	0.
11100.000	9.77	-0.029	0.52	0.
11200.000	9.77	-0.026	0.29	0.
11300.000	9.78	-0.022	0.06	-0.
11400.000	9.78	-0.018	0.18	-179.
11500.000	9.79	-0.014	0.42	-179.
11600.000	9.80	-0.009	0.65	-179.
11700.000	9.81	-0.005	0.87	-179.
11800.000	9.82	-0.000	1.07	-179.
11900.000	9.84	0.004	1.27	-179.
12000.000	9.85	0.008	1.44	-179.
12100.000	9.86	0.012	1.60	-179.

TABLE 7-V

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
12200.000	9.87	0.015	1.73	-179.
12300.000	9.88	0.018	1.84	-179.
12400.000	9.88	0.020	1.92	-179.
12500.000	9.89	0.022	1.97	-179.
12600.000	9.88	0.024	2.00	-179.
12700.000	9.88	0.025	2.00	-179.
12800.000	9.87	0.027	1.97	-179.
12900.000	9.85	0.028	1.91	-179.
13000.000	9.84	0.029	1.83	-179.
13100.000	9.82	0.030	1.72	-179.
13200.000	9.80	0.031	1.59	-180.
13300.000	9.78	0.032	1.43	-180.
13400.000	9.75	0.033	1.26	-180.
13500.000	9.73	0.035	1.07	180.
13600.000	9.71	0.036	0.86	180.
13700.000	9.70	0.037	0.64	179.
13800.000	9.68	0.037	0.41	179.
13900.000	9.67	0.038	0.17	179.
14000.000	9.66	0.038	0.06	1.
14100.000	9.65	0.038	0.30	-1.
14200.000	9.65	0.037	0.53	-1.
14300.000	9.65	0.035	0.76	-1.
14400.000	9.65	0.033	0.97	-1.
14500.000	9.66	0.030	1.17	-1.
14600.000	9.66	0.027	1.36	-1.
14700.000	9.67	0.023	1.52	-1.
14800.000	9.68	0.018	1.67	-1.
14900.000	9.69	0.012	1.79	-1.
15000.000	9.69	0.007	1.88	-1.
15100.000	9.70	0.001	1.95	-1.
15200.000	9.71	-0.006	1.99	-1.
15300.000	9.71	-0.012	2.01	-1.
15400.000	9.71	-0.017	1.99	-1.
15500.000	9.71	-0.023	1.95	-1.
15600.000	9.71	-0.028	1.88	-1.
15700.000	9.71	-0.032	1.79	-1.
15800.000	9.70	-0.035	1.67	-1.
15900.000	9.70	-0.037	1.52	-1.
16000.000	9.69	-0.039	1.36	-0.
16100.000	9.69	-0.039	1.17	-0.

TABLE 7-V MACH NUMBER, RELATIVE FLIGHT-PATH
 ANGLE, ANGLE OF ATTACK, AND NORMAL
 FORCE ANGLE - LIFTOFF THROUGH
 PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
16200.000	9.69	-0.038	0.97	-0.
16300.000	9.69	-0.037	0.76	0.
16400.000	9.69	-0.034	0.53	0.
16500.000	9.69	-0.031	0.30	0.
16550.000	9.69	-0.029	0.18	0.

TABLE 7-VI

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (72-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
0.000	0.0	0.	0.
5.000	1.3	0.	0.
10.000	6.0	1.	610.
12.000	9.1	1.	1398.
15.000	15.3	4.	3815.
20.000	30.5	13.	14127.
25.000	52.8	15.	39879.
30.000	83.7	16.	95013.
35.000	124.1	11.	200956.
40.000	174.6	21.	388741.
45.000	234.9	35.	700942.
50.000	304.2	51.	1192697.
55.000	380.4	62.	1931617.
60.000	460.3	65.	2995585.
65.000	539.0	67.	4466308.
70.000	609.1	85.	6416808.
75.000	664.0	109.	8896312.
80.000	696.7	125.	11925517.
82.250	700.4	129.	13459086.
85.000	693.1	128.	15455193.
90.000	643.5	109.	19314262.
95.000	552.2	63.	23219220.
100.000	456.6	19.	26919745.
105.000	369.2	143.	30330352.
110.000	293.7	118.	33409752.
115.000	228.2	41.	36119675.
120.000	172.5	15.	38428205.
125.000	127.8	11.	40347854.
130.000	93.1	9.	41910712.
135.000	67.0	7.	43162296.
140.000	48.1	6.	44154876.
145.000	34.9	5.	44942205.
147.329	30.0	4.	45252995.
150.000	24.4	4.	45563597.
155.000	16.1	2.	46017358.
159.329	10.8	8.	46298392.
159.329	10.8	8.	46298392.
159.459	10.7	8.	46305432.
160.000	9.9	9.	46333624.
163.759	6.1	12.	46484319.

TABLE 7-VI

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
165.000	5.2	12.	46520325.
165.859	4.7	12.	46542237.
170.000	2.7	9.	46620345.
175.000	1.4	6.	46673309.
180.000	0.7	4.	46700800.
185.000	0.3	2.	46714430.
189.559	0.2	1.	46720653.
190.000	0.2	1.	46721062.
194.559	0.1	1.	46724071.
195.000	0.1	1.	46724274.
200.000	0.0	0.	46725917.
205.000	0.0	0.	46726818.
210.000	0.0	0.	46727346.
215.000	0.0	0.	46727658.
220.000	0.0	0.	46727848.
225.000	0.0	0.	46727969.
230.000	0.0	0.	46728050.
235.000	0.0	0.	46728105.
240.000	0.0	0.	46728144.
245.000	0.0	0.	46728172.
250.000	0.0	0.	46728194.
255.000	0.0	0.	46728212.
260.000	0.0	0.	46728227.
265.000	0.0	0.	46728239.
270.000	0.0	0.	46728249.
275.000	0.0	0.	46728259.
280.000	0.0	0.	46728267.
285.000	0.0	0.	46728274.
290.000	0.0	0.	46728282.
295.000	0.0	0.	46728288.
300.000	0.0	0.	46728293.
305.000	0.0	0.	46728298.
310.000	0.0	0.	46728303.
315.000	0.0	0.	46728308.
320.000	0.0	0.	46728313.
325.000	0.0	0.	46728318.
330.000	0.0	0.	46728323.
335.000	0.0	0.	46728328.
340.000	0.0	0.	46728333.
345.000	0.0	0.	46728338.

TABLE 7-VI

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
350.000	0.0	0.	46728343.
355.000	0.0	0.	46728348.
360.000	0.0	0.	46728353.
365.000	0.0	0.	46728358.
370.000	0.0	0.	46728363.
375.000	0.0	0.	46728368.
380.000	0.0	0.	46728373.
385.000	0.0	0.	46728378.
390.000	0.0	0.	46728383.
395.000	0.0	0.	46728388.
400.000	0.0	0.	46728393.
405.000	0.0	0.	46728398.
410.000	0.0	0.	46728403.
415.000	0.0	0.	46728408.
420.000	0.0	0.	46728413.
425.000	0.0	0.	46728418.
430.000	0.0	0.	46728423.
435.000	0.0	0.	46728431.
437.627	0.0	0.	46728434.
440.000	0.0	0.	46728438.
445.000	0.0	0.	46728445.
450.000	0.0	0.	46728453.
455.000	0.0	0.	46728460.
460.000	0.0	0.	46728468.
465.000	0.0	0.	46728475.
470.000	0.0	0.	46728483.
475.000	0.0	0.	46728490.
480.000	0.0	0.	46728498.
485.000	0.0	0.	46728508.
490.000	0.0	0.	46728518.
495.000	0.0	0.	46728528.
500.000	0.0	0.	46728538.
505.000	0.0	0.	46728548.
510.000	0.0	0.	46728558.
515.000	0.0	0.	46728570.
520.000	0.0	0.	46728582.
525.000	0.0	0.	46728595.
530.000	0.0	0.	46728607.
535.000	0.0	0.	46728620.
537.424	0.0	0.	46728626.

TABLE 7-VI

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
537.424	0.0	0.	46728626.
537.442	0.0	0.	46728626.
540.000	0.0	0.	46728634.
543.142	0.0	0.	46728643.
545.000	0.0	0.	46728648.
545.742	0.0	0.	46728650.
549.542	0.0	0.	46728661.
550.000	0.0	0.	46728662.
555.000	0.0	0.	46728677.
560.000	0.0	0.	46728692.
565.000	0.0	0.	46728707.
570.000	0.0	0.	46728722.
575.000	0.0	0.	46728737.
580.000	0.0	0.	46728752.
585.000	0.0	0.	46728767.
590.000	0.0	0.	46728782.
595.000	0.0	0.	46728797.
600.000	0.0	0.	46728812.
605.000	0.0	0.	46728828.
610.000	0.0	0.	46728845.
615.000	0.0	0.	46728863.
620.000	0.0	0.	46728880.
625.000	0.0	0.	46728898.
630.000	0.0	0.	46728915.
635.000	0.0	0.	46728933.
640.000	0.0	0.	46728950.
645.000	0.0	0.	46728968.
650.000	0.0	0.	46728987.
655.000	0.0	0.	46729007.
658.378	0.0	0.	46729021.
658.378	0.0	0.	46729021.
660.000	0.0	0.	46729021.
670.000	0.0	0.	46729021.
680.000	0.0	0.	46729021.
690.000	0.0	0.	46729021.
700.000	0.0	0.	46729021.
710.000	0.0	0.	46729021.
720.000	0.0	0.	46729021.
730.000	0.0	0.	46729021.
740.000	0.0	0.	46729021.

TABLE 7-VI

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
742.378	0.0	0.	46729021.
750.000	0.0	0.	46729021.
760.000	0.0	0.	46729021.
770.000	0.0	0.	46729021.
780.000	0.0	0.	46729021.
790.000	0.0	0.	46729021.
800.000	0.0	0.	46729021.
900.000	0.0	0.	46729021.
1000.000	0.0	0.	46729021.
1100.000	0.0	0.	46729021.
1200.000	0.0	0.	46729021.
1300.000	0.0	0.	46729021.
1400.000	0.0	0.	46729021.
1500.000	0.0	0.	46729021.
1600.000	0.0	0.	46729021.
1700.000	0.0	0.	46729021.
1800.000	0.0	0.	46729021.
1900.000	0.0	0.	46729021.
2000.000	0.0	0.	46729021.
2100.000	0.0	0.	46729021.
2200.000	0.0	0.	46729021.
2300.000	0.0	0.	46729021.
2400.000	0.0	0.	46729021.
2500.000	0.0	0.	46729021.
2600.000	0.0	0.	46729021.
2700.000	0.0	0.	46729021.
2800.000	0.0	0.	46729021.
2900.000	0.0	0.	46729021.
3000.000	0.0	0.	46729021.
3100.000	0.0	0.	46729021.
3200.000	0.0	0.	46729021.
3300.000	0.0	0.	46729021.
3400.000	0.0	0.	46729021.
3500.000	0.0	0.	46729021.
3600.000	0.0	0.	46729021.
3700.000	0.0	0.	46729021.
3800.000	0.0	0.	46729021.
3900.000	0.0	0.	46729021.
4000.000	0.0	0.	46729021.
4100.000	0.0	0.	46729021.
4200.000	0.0	0.	46729021.

TABLE 7-VI

DYNAMIC PRESSURE, DYNAMIC PRESSURE
 TIMES ALPHA, AND AERODYNAMIC HEATING
 INDICATOR - LIFTOFF THROUGH PARKING
 ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
4200.000	0.0	0.	46729021.
4300.000	0.0	0.	46729021.
4400.000	0.0	0.	46729021.
4500.000	0.0	0.	46729021.
4600.000	0.0	0.	46729021.
4700.000	0.0	0.	46729021.
4800.000	0.0	0.	46729021.
4900.000	0.0	0.	46729021.
5000.000	0.0	0.	46729021.
5100.000	0.0	0.	46729021.
5200.000	0.0	0.	46729021.
5300.000	0.0	0.	46729021.
5400.000	0.0	0.	46729021.
5500.000	0.0	0.	46729021.
5600.000	0.0	0.	46729021.
5700.000	0.0	0.	46729021.
5800.000	0.0	0.	46729021.
5900.000	0.0	0.	46729021.
6000.000	0.0	0.	46729021.
6100.000	0.0	0.	46729021.
6200.000	0.0	0.	46729021.
6300.000	0.0	0.	46729021.
6400.000	0.0	0.	46729021.
6500.000	0.0	0.	46729021.
6600.000	0.0	0.	46729021.
6700.000	0.0	0.	46729021.
6800.000	0.0	0.	46729021.
6900.000	0.0	0.	46729021.
7000.000	0.0	0.	46729021.
7100.000	0.0	0.	46729021.
7200.000	0.0	0.	46729021.
7300.000	0.0	0.	46729021.
7400.000	0.0	0.	46729021.
7500.000	0.0	0.	46729021.
7600.000	0.0	0.	46729021.
7700.000	0.0	0.	46729021.
7800.000	0.0	0.	46729021.
7900.000	0.0	0.	46729021.
8000.000	0.0	0.	46729021.
8100.000	0.0	0.	46729021.

TABLE 7-VI

DYNAMIC PRESSURE, DYNAMIC PRESSURE
 TIMES ALPHA, AND AERODYNAMIC HEATING
 INDICATOR - LIFTOFF THROUGH PARKING
 ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
8200.000	0.0	0.	46729021.
8300.000	0.0	0.	46729021.
8400.000	0.0	0.	46729021.
8500.000	0.0	0.	46729021.
8600.000	0.0	0.	46729021.
8700.000	0.0	0.	46729021.
8800.000	0.0	0.	46729021.
8900.000	0.0	0.	46729021.
9000.000	0.0	0.	46729021.
9100.000	0.0	0.	46729021.
9200.000	0.0	0.	46729021.
9300.000	0.0	0.	46729021.
9400.000	0.0	0.	46729021.
9500.000	0.0	0.	46729021.
9600.000	0.0	0.	46729021.
9700.000	0.0	0.	46729021.
9800.000	0.0	0.	46729021.
9900.000	0.0	0.	46729021.
10000.000	0.0	0.	46729021.
10100.000	0.0	0.	46729021.
10200.000	0.0	0.	46729021.
10300.000	0.0	0.	46729021.
10400.000	0.0	0.	46729021.
10500.000	0.0	0.	46729021.
10600.000	0.0	0.	46729021.
10700.000	0.0	0.	46729021.
10800.000	0.0	0.	46729021.
10900.000	0.0	0.	46729021.
11000.000	0.0	0.	46729021.
11100.000	0.0	0.	46729021.
11200.000	0.0	0.	46729021.
11300.000	0.0	0.	46729021.
11400.000	0.0	0.	46729021.
11500.000	0.0	0.	46729021.
11600.000	0.0	0.	46729021.
11700.000	0.0	0.	46729021.
11800.000	0.0	0.	46729021.
11900.000	0.0	0.	46729021.
12000.000	0.0	0.	46729021.
12100.000	0.0	0.	46729021.

TABLE 7-VI

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
12200.000	0.0	0.	46729021.
12300.000	0.0	0.	46729021.
12400.000	0.0	0.	46729021.
12500.000	0.0	0.	46729021.
12600.000	0.0	0.	46729021.
12700.000	0.0	0.	46729021.
12800.000	0.0	0.	46729021.
12900.000	0.0	0.	46729021.
13000.000	0.0	0.	46729021.
13100.000	0.0	0.	46729021.
13200.000	0.0	0.	46729021.
13300.000	0.0	0.	46729021.
13400.000	0.0	0.	46729021.
13500.000	0.0	0.	46729021.
13600.000	0.0	0.	46729021.
13700.000	0.0	0.	46729021.
13800.000	0.0	0.	46729021.
13900.000	0.0	0.	46729021.
14000.000	0.0	0.	46729021.
14100.000	0.0	0.	46729021.
14200.000	0.0	0.	46729021.
14300.000	0.0	0.	46729021.
14400.000	0.0	0.	46729021.
14500.000	0.0	0.	46729021.
14600.000	0.0	0.	46729021.
14700.000	0.0	0.	46729021.
14800.000	0.0	0.	46729021.
14900.000	0.0	0.	46729021.
15000.000	0.0	0.	46729021.
15100.000	0.0	0.	46729021.
15200.000	0.0	0.	46729021.
15300.000	0.0	0.	46729021.
15400.000	0.0	0.	46729021.
15500.000	0.0	0.	46729021.
15600.000	0.0	0.	46729021.
15700.000	0.0	0.	46729021.
15800.000	0.0	0.	46729021.
15900.000	0.0	0.	46729021.
16000.000	0.0	0.	46729021.
16100.000	0.0	0.	46729021.

TABLE 7-VI

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
16200.000	0.0	0.	46729021.
16300.000	0.0	0.	46729021.
16400.000	0.0	0.	46729021.
16500.000	0.0	0.	46729021.
16550.000	0.0	0.	46729021.

TABLE 7-VII

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE THROUGH
PARKING ORBIT (72-DEG AZIMUTH)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
0.000	0.	12697.	344.	28.447
5.000	3.	1305.	370.	28.447
10.000	37.	5946.	451.	28.447
12.000	68.	8992.	501.	28.447
15.000	263.	14743.	595.	28.447
20.000	896.	20438.	711.	28.447
25.000	1049.	18025.	806.	28.447
30.000	1089.	25727.	922.	28.447
35.000	744.	36357.	1079.	28.447
40.000	1426.	51451.	1277.	28.447
45.000	2490.	72575.	1497.	28.448
50.000	3712.	103326.	1750.	28.448
55.000	4683.	144692.	1945.	28.449
60.000	5095.	208406.	2090.	28.450
65.000	5513.	301317.	2191.	28.452
70.000	6807.	415140.	2250.	28.454
75.000	8024.	438590.	2268.	28.456
80.000	8758.	389715.	2249.	28.459
82.250	8909.	366465.	2204.	28.461
85.000	8718.	332538.	2197.	28.463
90.000	7189.	269977.	2117.	28.468
95.000	4185.	208597.	2014.	28.474
100.000	1223.	153990.	1990.	28.481
105.000	9381.	112073.	1946.	28.489
110.000	7756.	79313.	1979.	28.499
115.000	2690.	54529.	1992.	28.510
120.000	1008.	36165.	1988.	28.522
125.000	745.	23363.	1972.	28.536
130.000	609.	14903.	1948.	28.552
135.000	491.	9244.	1923.	28.570
140.000	393.	5504.	1906.	28.590
145.000	316.	2862.	1809.	28.612
147.329	284.	1806.	1746.	28.623
150.000	240.	881.	1633.	28.636
155.000	103.	-531.	1519.	28.663
159.329	544.	-1274.	1424.	28.687
159.459	275.	2063.	1424.	28.687
160.000	282.	2028.	1449.	28.688
163.759	308.	1889.	1369.	28.691
	420.	1145.	1318.	28.713

TABLE 7-VII

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
165.000	445.	972.	6443366.	28.720
165.859	441.	866.	6444157.	28.725
170.000	360.	494.	6447911.	28.750
175.000	256.	245.	6452327.	28.780
180.000	165.	119.	6456616.	28.810
185.000	95.	56.	6460780.	28.840
189.559	55.	28.	6464471.	28.868
190.000	52.	26.	6464822.	28.871
194.559	30.	14.	6468404.	28.899
195.000	29.	13.	6468745.	28.902
200.000	17.	7.	6472550.	28.933
205.000	16.	4.	6476242.	28.965
210.000	10.	2.	6479836.	28.997
215.000	6.	1.	6483334.	29.029
220.000	4.	1.	6486738.	29.061
225.000	2.	1.	6490048.	29.094
230.000	2.	0.	6493265.	29.127
235.000	1.	0.	6496391.	29.161
240.000	1.	0.	6499426.	29.194
245.000	1.	0.	6502371.	29.228
250.000	1.	0.	6505228.	29.263
255.000	0.	0.	6507996.	29.297
260.000	0.	0.	6510677.	29.332
265.000	0.	0.	6513273.	29.367
270.000	0.	0.	6515783.	29.403
275.000	0.	0.	6518210.	29.439
280.000	0.	0.	6520554.	29.475
285.000	0.	0.	6522816.	29.511
290.000	0.	0.	6524998.	29.548
295.000	0.	0.	6527100.	29.585
300.000	0.	0.	6529124.	29.622
305.000	0.	0.	6531071.	29.660
310.000	0.	0.	6532942.	29.698
315.000	0.	0.	6534738.	29.736
320.000	0.	0.	6536461.	29.775
325.000	0.	0.	6538112.	29.814
330.000	0.	0.	6539692.	29.853
335.000	0.	0.	6541203.	29.892
340.000	0.	0.	6542645.	29.932
345.000	0.	0.	6544021.	29.972

TABLE 7-VII

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
350.000	0.	0.	6545332.	30.012
355.000	0.	0.	6546579.	30.053
360.000	0.	0.	6547764.	30.094
365.000	0.	0.	6548888.	30.135
370.000	0.	0.	6549954.	30.177
375.000	0.	0.	6550963.	30.218
380.000	0.	0.	6551916.	30.260
385.000	0.	0.	6552816.	30.303
390.000	0.	0.	6553665.	30.345
395.000	0.	0.	6554463.	30.388
400.000	0.	0.	6555215.	30.431
405.000	0.	0.	6555921.	30.474
410.000	0.	0.	6556584.	30.518
415.000	0.	0.	6557206.	30.562
420.000	0.	0.	6557789.	30.606
425.000	0.	0.	6558337.	30.650
430.000	0.	0.	6558851.	30.694
435.000	0.	0.	6559335.	30.739
437.627	0.	0.	6559578.	30.762
440.000	0.	0.	6559789.	30.784
445.000	0.	0.	6560203.	30.828
450.000	0.	0.	6560578.	30.873
455.000	0.	0.	6560914.	30.918
460.000	0.	0.	6561216.	30.963
465.000	0.	0.	6561484.	31.008
470.000	0.	0.	6561723.	31.053
475.000	0.	0.	6561934.	31.098
480.000	0.	0.	6562121.	31.142
485.000	0.	0.	6562286.	31.187
490.000	0.	0.	6562433.	31.232
495.000	0.	0.	6562565.	31.276
500.000	0.	0.	6562685.	31.321
505.000	0.	0.	6562797.	31.365
510.000	0.	0.	6562905.	31.409
515.000	0.	0.	6563013.	31.453
520.000	0.	0.	6563124.	31.497
525.000	0.	0.	6563243.	31.540
530.000	0.	0.	6563376.	31.583
535.000	0.	0.	6563525.	31.626
537.424	0.	0.	6563605.	31.647

TABLE 7-VII

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
537.424	0.	0.	6563605.	31.647
537.442	0.	0.	6563605.	31.647
540.000	0.	0.	6563687.	31.669
543.142	0.	0.	6563773.	31.695
545.000	0.	0.	6563816.	31.711
545.742	0.	0.	6563833.	31.717
549.542	0.	0.	6563910.	31.748
550.000	0.	0.	6563918.	31.752
555.000	0.	0.	6563999.	31.792
560.000	0.	0.	6564059.	31.831
565.000	0.	0.	6564100.	31.869
570.000	0.	0.	6564100.	31.907
575.000	0.	0.	6564123.	31.907
580.000	0.	0.	6564130.	31.944
585.000	0.	0.	6564122.	31.979
590.000	0.	0.	6564100.	32.014
595.000	0.	0.	6564067.	32.048
600.000	0.	0.	6564023.	32.081
605.000	0.	0.	6563971.	32.113
610.000	0.	0.	6563912.	32.145
615.000	0.	0.	6563848.	32.175
620.000	0.	0.	6563781.	32.204
625.000	0.	0.	6563713.	32.232
630.000	0.	0.	6563645.	32.259
635.000	0.	0.	6563580.	32.286
640.000	0.	0.	6563520.	32.311
645.000	0.	0.	6563467.	32.335
650.000	0.	0.	6563422.	32.358
655.000	0.	0.	6563389.	32.379
658.378	0.	0.	6563369.	32.400
658.378	0.	0.	6563365.	32.413
660.000	0.	0.	6563365.	32.413
670.000	0.	0.	6563365.	32.419
680.000	0.	0.	6563365.	32.454
690.000	0.	0.	6563366.	32.484
700.000	0.	0.	6563367.	32.509
710.000	0.	0.	6563368.	32.529
720.000	0.	0.	6563370.	32.543
730.000	0.	0.	6563372.	32.553
740.000	0.	0.	6563374.	32.557
			6563377.	32.556

TABLE 7-VII

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
742.378	0.	0.	6563377.	32.555
750.000	0.	0.	6563380.	32.550
760.000	0.	0.	6563383.	32.538
770.000	0.	0.	6563386.	32.522
780.000	0.	0.	6563391.	32.500
790.000	0.	0.	6563395.	32.473
800.000	0.	0.	6563400.	32.442
900.000	0.	0.	6563469.	31.842
1000.000	0.	0.	6563577.	30.748
1100.000	0.	0.	6563721.	29.192
1200.000	0.	0.	6563900.	27.214
1300.000	0.	0.	6564111.	24.862
1400.000	0.	0.	6564351.	22.186
1500.000	0.	0.	6564615.	19.237
1600.000	0.	0.	6564900.	16.062
1700.000	0.	0.	6565199.	12.707
1800.000	0.	0.	6565510.	9.216
1900.000	0.	0.	6565826.	5.629
2000.000	0.	0.	6566146.	1.985
2100.000	0.	0.	6566467.	-1.679
2200.000	0.	0.	6566787.	-5.325
2300.000	0.	0.	6567106.	-8.917
2400.000	0.	0.	6567424.	-12.416
2500.000	0.	0.	6567743.	-15.782
2600.000	0.	0.	6568065.	-18.972
2700.000	0.	0.	6568392.	-21.940
2800.000	0.	0.	6568728.	-24.639
2900.000	0.	0.	6569074.	-27.019
3000.000	0.	0.	6569432.	-29.029
3100.000	0.	0.	6569805.	-30.624
3200.000	0.	0.	6570191.	-31.760
3300.000	0.	0.	6570590.	-32.406
3400.000	0.	0.	6571000.	-32.543
3500.000	0.	0.	6571417.	-32.167
3600.000	0.	0.	6571836.	-31.288
3700.000	0.	0.	6572250.	-29.934
3800.000	0.	0.	6572650.	-28.142
3900.000	0.	0.	6573029.	-25.956
4000.000	0.	0.	6573379.	-23.425
4100.000	0.	0.	6573692.	-20.599

TABLE 7-VII

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
4200.000	0.	0.	6573959.	-17.528
4300.000	0.	0.	6574175.	-14.257
4400.000	0.	0.	6574332.	-10.832
4500.000	0.	0.	6574427.	-7.293
4600.000	0.	0.	6574457.	-3.679
4700.000	0.	0.	6574421.	-0.028
4800.000	0.	0.	6574320.	3.624
4900.000	0.	0.	6574158.	7.239
5000.000	0.	0.	6573940.	10.780
5100.000	0.	0.	6573673.	14.208
5200.000	0.	0.	6573365.	17.482
5300.000	0.	0.	6573026.	20.557
5400.000	0.	0.	6572667.	23.387
5500.000	0.	0.	6572298.	25.923
5600.000	0.	0.	6571932.	28.115
5700.000	0.	0.	6571579.	29.914
5800.000	0.	0.	6571248.	31.274
5900.000	0.	0.	6570950.	32.159
6000.000	0.	0.	6570694.	32.542
6100.000	0.	0.	6570484.	32.411
6200.000	0.	0.	6570327.	31.770
6300.000	0.	0.	6570225.	30.639
6400.000	0.	0.	6570177.	29.050
6500.000	0.	0.	6570184.	27.043
6600.000	0.	0.	6570242.	24.668
6700.000	0.	0.	6570348.	21.973
6800.000	0.	0.	6570497.	19.009
6900.000	0.	0.	6570685.	15.823
7000.000	0.	0.	6570905.	12.461
7100.000	0.	0.	6571152.	8.966
7200.000	0.	0.	6571422.	5.378
7300.000	0.	0.	6571711.	1.736
7400.000	0.	0.	6572014.	-1.924
7500.000	0.	0.	6572328.	-5.563
7600.000	0.	0.	6572653.	-9.146
7700.000	0.	0.	6572988.	-12.634
7800.000	0.	0.	6573332.	-15.986
7900.000	0.	0.	6573687.	-19.159
8000.000	0.	0.	6574053.	-22.109
8100.000	0.	0.	6574431.	-24.787

TABLE 7-VII

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
8200.000	0.	0.	6574823.	-27.144
8300.000	0.	0.	6575228.	-29.129
8400.000	0.	0.	6575647.	-30.698
8500.000	0.	0.	6576079.	-31.807
8600.000	0.	0.	6576521.	-32.426
8700.000	0.	0.	6576970.	-32.537
8800.000	0.	0.	6577420.	-32.135
8900.000	0.	0.	6577867.	-31.235
9000.000	0.	0.	6578302.	-29.861
9100.000	0.	0.	6578719.	-28.052
9200.000	0.	0.	6579109.	-25.853
9300.000	0.	0.	6579462.	-23.312
9400.000	0.	0.	6579772.	-20.480
9500.000	0.	0.	6580029.	-17.404
9600.000	0.	0.	6580226.	-14.132
9700.000	0.	0.	6580358.	-10.706
9800.000	0.	0.	6580421.	-7.169
9900.000	0.	0.	6580412.	-3.558
10000.000	0.	0.	6580331.	0.088
10100.000	0.	0.	6580179.	3.734
10200.000	0.	0.	6579960.	7.343
10300.000	0.	0.	6579681.	10.876
10400.000	0.	0.	6579348.	14.296
10500.000	0.	0.	6578973.	17.561
10600.000	0.	0.	6578564.	20.627
10700.000	0.	0.	6578135.	23.447
10800.000	0.	0.	6577697.	25.973
10900.000	0.	0.	6577262.	28.155
11000.000	0.	0.	6576842.	29.943
11100.000	0.	0.	6576447.	31.294
11200.000	0.	0.	6576089.	32.169
11300.000	0.	0.	6575775.	32.544
11400.000	0.	0.	6575511.	32.405
11500.000	0.	0.	6575303.	31.759
11600.000	0.	0.	6575154.	30.623
11700.000	0.	0.	6575065.	29.030
11800.000	0.	0.	6575035.	27.022
11900.000	0.	0.	6575062.	24.646
12000.000	0.	0.	6575143.	21.952
12100.000	0.	0.	6575272.	18.989

TABLE 7-VII

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
12200.000	0.	0.	6575447.	15.805
12300.000	0.	0.	6575660.	12.446
12400.000	0.	0.	6575907.	8.954
12500.000	0.	0.	6576182.	5.370
12600.000	0.	0.	6576481.	1.731
12700.000	0.	0.	6576801.	-1.924
12800.000	0.	0.	6577138.	-5.560
12900.000	0.	0.	6577491.	-9.139
13000.000	0.	0.	6577857.	-12.623
13100.000	0.	0.	6578238.	-15.972
13200.000	0.	0.	6578632.	-19.143
13300.000	0.	0.	6579040.	-22.091
13400.000	0.	0.	6579462.	-24.768
13500.000	0.	0.	6579900.	-27.125
13600.000	0.	0.	6580352.	-29.112
13700.000	0.	0.	6580818.	-30.683
13800.000	0.	0.	6581295.	-31.796
13900.000	0.	0.	6581781.	-32.421
14000.000	0.	0.	6582272.	-32.539
14100.000	0.	0.	6582761.	-32.146
14200.000	0.	0.	6583243.	-31.254
14300.000	0.	0.	6583710.	-29.891
14400.000	0.	0.	6584153.	-28.092
14500.000	0.	0.	6584563.	-25.903
14600.000	0.	0.	6584933.	-23.372
14700.000	0.	0.	6585251.	-20.549
14800.000	0.	0.	6585512.	-17.483
14900.000	0.	0.	6585706.	-14.219
15000.000	0.	0.	6585829.	-10.802
15100.000	0.	0.	6585876.	-7.271
15200.000	0.	0.	6585844.	-3.667
15300.000	0.	0.	6585734.	-0.026
15400.000	0.	0.	6585547.	3.616
15500.000	0.	0.	6585288.	7.222
15600.000	0.	0.	6584963.	10.754
15700.000	0.	0.	6584579.	14.175
15800.000	0.	0.	6584149.	17.442
15900.000	0.	0.	6583682.	20.513
16000.000	0.	0.	6583191.	23.341
16100.000	0.	0.	6582689.	25.877

TABLE 7-VII

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
16200.000	0.	0.	6582189.	28.071
16300.000	0.	0.	6581703.	29.875
16400.000	0.	0.	6581244.	31.244
16500.000	0.	0.	6580823.	32.140
16550.000	0.	0.	6580629.	32.402

TABLE 7-VIII

VEHICLE POSITION COORDINATES THROUGH
PARKING ORBIT (72-DEGREES LA

POSITION COOR
APOLLO STANDARD COORDIN. 13.

TIME FROM LIFTOFF (SEC)	X (METERS)	Y (METERS)	Z (METERS)
0.000	6373319.	1700	-5550.
5.000	6373344.	1770	-3607.
10.000	6373424.	1830	-1663.
12.000	6373473.	1850	-886.
15.000	6373567.	1890	280.
20.000	6373780.	1960	2224.
25.000	6374073.	2020	4173.
30.000	6374455.	2080	6132.
35.000	6374938.	2140	8111.
40.000	6375530.	2210	10120.
45.000	6376245.	2270	12177.
50.000	6377091.	2330	14300.
55.000	6378078.	2400	16514.
60.000	6379214.	2460	18844.
65.000	6380505.	2520	21321.
70.000	6381953.	2580	23974.
75.000	6383557.	2650	26835.
80.000	6385321.	2710	29939.
82.250	6386168.	2740	31425.
85.000	6387250.	2770	33324.
90.000	6389347.	2830	37028.
95.000	6391616.	2890	41093.
100.000	6394059.	2960	45561.
105.000	6396675.	3020	50476.
110.000	6399461.	3080	55882.
115.000	6402416.	3140	61826.
120.000	6405543.	3210	68350.
125.000	6408843.	3270	75501.
130.000	6412320.	3330	83329.
135.000	6415975.	3390	91880.
140.000	6419815.	3450	101235.
145.000	6423846.	3510	111435.
147.329	6425792.	3540	116498.
150.000	6428066.	3580	122531.
155.000	6432412.	3640	134438.
159.329	6436276.	3690	145431.
159.329	6436276.	3690	145431.
159.459	6436393.	3690	145769.
160.000	6436880.	3700	147184.
163.759	6440194.	3740	157030.

TABLE 7-VIII

 VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
165.000	6441262.	37635.	160287.
165.859	6441996.	37739.	162549.
170.000	6445462.	38244.	173516.
175.000	6449502.	38852.	186920.
180.000	6453381.	39459.	200501.
185.000	6457102.	40065.	214260.
189.559	6460358.	40617.	226963.
190.000	6460666.	40670.	228198.
194.559	6463779.	41220.	241066.
195.000	6464073.	41274.	242317.
200.000	6467326.	41876.	256621.
205.000	6470426.	42477.	271110.
210.000	6473387.	43077.	285781.
215.000	6476213.	43675.	300634.
220.000	6478901.	44272.	315672.
225.000	6481452.	44868.	330898.
230.000	6483864.	45462.	346313.
235.000	6486139.	46054.	361921.
240.000	6488273.	46645.	377723.
245.000	6490269.	47235.	393724.
250.000	6492123.	47823.	409925.
255.000	6493836.	48410.	426329.
260.000	6495408.	48995.	442939.
265.000	6496837.	49578.	459759.
270.000	6498122.	50160.	476790.
275.000	6499263.	50740.	494035.
280.000	6500258.	51318.	511499.
285.000	6501108.	51895.	529184.
290.000	6501810.	52470.	547092.
295.000	6502364.	53044.	565228.
300.000	6502769.	53615.	583595.
305.000	6503023.	54185.	602196.
310.000	6503126.	54754.	621034.
315.000	6503076.	55320.	640113.
320.000	6502872.	55885.	659437.
325.000	6502513.	56447.	679010.
330.000	6501996.	57008.	698834.
335.000	6501321.	57567.	718915.
340.000	6500487.	58125.	739256.
345.000	6499491.	58680.	759860.

TABLE 7-VIII

 VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

 POSITION COORDINATES IN
 APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	X (METERS)	Y (METERS)	Z (METERS)
350.000	6498332.	59233.	780733.
355.000	6497008.	59785.	801879.
360.000	6495517.	60335.	823301.
365.000	6493858.	60882.	845005.
370.000	6492029.	61428.	866995.
375.000	6490028.	61972.	889276.
380.000	6487852.	62513.	911853.
385.000	6485499.	63053.	934730.
390.000	6482968.	63591.	957914.
395.000	6480256.	64126.	981409.
400.000	6477360.	64660.	1005221.
405.000	6474278.	65191.	1029356.
410.000	6471007.	65721.	1053819.
415.000	6467545.	66248.	1078616.
420.000	6463889.	66773.	1103755.
425.000	6460036.	67296.	1129241.
430.000	6455983.	67817.	1155081.
435.000	6451727.	68336.	1181282.
437.627	6449408.	68607.	1195197.
440.000	6447264.	68852.	1207842.
445.000	6442588.	69366.	1234713.
450.000	6437697.	69879.	1261888.
455.000	6432586.	70389.	1289373.
460.000	6427253.	70896.	1317172.
465.000	6421695.	71402.	1345291.
470.000	6415909.	71905.	1373736.
475.000	6409890.	72407.	1402512.
480.000	6403637.	72905.	1431626.
485.000	6397144.	73402.	1461082.
490.000	6390408.	73897.	1490888.
495.000	6383426.	74389.	1521051.
500.000	6376193.	74878.	1551576.
505.000	6368705.	75366.	1582472.
510.000	6360959.	75851.	1613745.
515.000	6352948.	76334.	1645404.
520.000	6344670.	76815.	1677456.
525.000	6336119.	77293.	1709910.
530.000	6327289.	77770.	1742774.
535.000	6318176.	78243.	1776058.
537.424	6313654.	78472.	1792351.

TABLE 7-VIII

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

POSITION COORDINATES IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	X (METERS)	Y (METERS)	Z (METERS)
742.378	5720723.	95620.	3215915.
750.000	5691370.	96167.	3267570.
760.000	5652151.	96874.	3334936.
770.000	5612136.	97568.	3401831.
780.000	5571329.	98250.	3468247.
790.000	5529736.	98920.	3534174.
800.000	5487364.	99577.	3599603.
900.000	5022115.	105429.	4224498.
1000.000	4486117.	109923.	4789908.
1100.000	3886905.	112991.	5287877.
1200.000	3232904.	114583.	5711391.
1300.000	2533316.	114671.	6054479.
1400.000	1797988.	113245.	6312299.
1500.000	1037276.	110312.	6481208.
1600.000	261894.	105905.	6558819.
1700.000	-517229.	100071.	6544028.
1800.000	-1289112.	92880.	6437040.
1900.000	-2042871.	84419.	6239361.
2000.000	-2767882.	74791.	5953781.
2100.000	-3453923.	64119.	5584334.
2200.000	-4091331.	52537.	5136238.
2300.000	-4671130.	40193.	4615821.
2400.000	-5185163.	27246.	4030434.
2500.000	-5626209.	13866.	3388336.
2600.000	-5988080.	225.	2698586.
2700.000	-6265711.	-13495.	1970905.
2800.000	-6455224.	-27114.	1215539.
2900.000	-6553987.	-40450.	443117.
3000.000	-6560643.	-53326.	-335504.
3100.000	-6475129.	-65568.	-1109386.
3200.000	-6298673.	-77010.	-1867670.
3300.000	-6033776.	-87496.	-2599719.
3400.000	-5684174.	-96881.	-3295272.
3500.000	-5254786.	-105034.	-3944580.
3600.000	-4751644.	-111841.	-4538547.
3700.000	-4181808.	-117201.	-5068848.
3800.000	-3553272.	-121037.	-5528050.
3900.000	-2874850.	-123286.	-5909717.
4000.000	-2156055.	-123910.	-6208493.
100.000	-1406968.	-122890.	-6420184.

TABLE 7-VIII

 VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
4200.000	-638097.	-120229.	-6541813.
4300.000	139769.	-115953.	-6571666.
4400.000	915713.	-110108.	-6509315.
4500.000	1678842.	-102762.	-6355629.
4600.000	2418436.	-94004.	-6112758.
4700.000	3124110.	-83942.	-5784108.
4800.000	3785949.	-72702.	-5374290.
4900.000	4394656.	-60426.	-4889060.
5000.000	4941684.	-47273.	-4335230.
5100.000	5419349.	-33412.	-3720580.
5200.000	5820946.	-19024.	-3053743.
5300.000	6140841.	-4298.	-2344081.
5400.000	6374547.	10572.	-1601558.
5500.000	6518786.	25386.	-836596.
5600.000	6571538.	39948.	-59928.
5700.000	6532063.	54060.	717551.
5800.000	6400915.	67532.	1484934.
5900.000	6179931.	80179.	2231459.
6000.000	5872206.	91827.	2946656.
6100.000	5482048.	102314.	3620491.
6200.000	5014920.	111492.	4243507.
6300.000	4477364.	119230.	4806958.
6400.000	3876912.	125416.	5302928.
6500.000	3221981.	129955.	5724444.
6600.000	2521756.	132778.	6065575.
6700.000	1786061.	133835.	6321514.
6800.000	1025228.	133101.	6488653.
6900.000	249943.	130574.	6564631.
7000.000	-528896.	126278.	6548367.
7100.000	-1300342.	120258.	6440085.
7200.000	-2053545.	112586.	6241304.
7300.000	-2777915.	103354.	5954821.
7400.000	-3463268.	92677.	5584671.
7500.000	-4099972.	80691.	5136070.
7600.000	-4679088.	67549.	4615339.
7700.000	-5192489.	53421.	4029811.
7800.000	-5632982.	38491.	3387732.
7900.000	-5994406.	22957.	2698135.
8000.000	-6271715.	7023.	1970714.
8100.000	-6461050.	-9098.	1215687.

TABLE 7-VIII

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
8200.000	-6559789.	-25190.	443650.
8300.000	-6566582.	-41037.	-334574.
8400.000	-6481366.	-56423.	-1108082.
8500.000	-6305364.	-71141.	-1866048.
8600.000	-6041066.	-84986.	-2597871.
8700.000	-5692190.	-97769.	-3293318.
8800.000	-5263634.	-109311.	-3942673.
8900.000	-4761402.	-119450.	-4536862.
9000.000	-4192526.	-128040.	-5067583.
9100.000	-3564963.	-134958.	-5527420.
9200.000	-2887491.	-140098.	-5909944.
9300.000	-2169583.	-143382.	-6209805.
9400.000	-1421280.	-144754.	-6422804.
9500.000	-653049.	-144184.	-6545954.
9600.000	124361.	-141667.	-6577526.
9700.000	900068.	-137226.	-6517067.
9800.000	1663212.	-130907.	-6365417.
9900.000	2403105.	-122787.	-6124690.
10000.000	3109384.	-112962.	-5798252.
10100.000	3772152.	-101556.	-5390669.
10200.000	4382124.	-88713.	-4907646.
10300.000	4930755.	-74598.	-4355948.
10400.000	5410360.	-59395.	-3743301.
10500.000	5814222.	-43302.	-3078284.
10600.000	6136686.	-26532.	-2370210.
10700.000	6373238.	-9308.	-1628993.
10800.000	6520567.	8140.	-865009.
10900.000	6576610.	25577.	-88951.
11000.000	6540583.	42767.	688321.
11100.000	6412986.	59476.	1455931.
11200.000	6195598.	75475.	2203138.
11300.000	5891453.	90543.	2919486.
11400.000	5504797.	104471.	3594948.
11500.000	5041029.	117062.	4220064.
11600.000	4506628.	128138.	4786078.
11700.000	3909063.	137541.	5285054.
11800.000	3256690.	145131.	5709991.
11900.000	2558637.	150796.	6054922.
12000.000	1824678.	154446.	6314998.
12100.000	1065094.	156020.	6486559.

TABLE 7-VIII VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
12200.000	290532.	155484.	6567185.
12300.000	-488146.	152833.	6555735.
12400.000	-1260016.	148090.	6452362.
12500.000	-2014248.	141308.	6258515.
12600.000	-2740261.	132567.	5976914.
12700.000	-3427868.	121974.	5611520.
12800.000	-4067429.	109665.	5167469.
12900.000	-4649984.	95795.	4651006.
13000.000	-5167376.	80547.	4069391.
13100.000	-5612374.	64119.	3430795.
13200.000	-5978768.	46729.	2744184.
13300.000	-6261455.	28607.	2019191.
13400.000	-6456511.	9998.	1265976.
13500.000	-6561242.	-8850.	495088.
13600.000	-6574219.	-27682.	-282692.
13700.000	-6495294.	-46240.	-1056491.
13800.000	-6325603.	-64273.	-1815505.
13900.000	-6067542.	-81532.	-2549142.
14000.000	-5724738.	-97780.	-3247171.
14100.000	-5301991.	-112789.	-3899862.
14200.000	-4805213.	-126349.	-4498117.
14300.000	-4241342.	-138269.	-5033600.
14400.000	-3618250.	-148377.	-5498847.
14500.000	-2944629.	-156525.	-5887371.
14600.000	-2229876.	-162593.	-6193751.
14700.000	-1483964.	-166486.	-6413710.
14800.000	-717299.	-168138.	-6544171.
14900.000	59417.	-167515.	-6583307.
15000.000	835341.	-164611.	-6530563.
15100.000	1599636.	-159454.	-6386666.
15200.000	2341625.	-152100.	-6153617.
15300.000	3050940.	-142638.	-5834664.
15400.000	3717668.	-131185.	-5434259.
15500.000	4332489.	-117885.	-4957989.
15600.000	4886810.	-102910.	-4412508.
15700.000	5372884.	-86454.	-3805434.
15800.000	5783918.	-68733.	-3145247.
15900.000	6114168.	-49983.	-2441170.
16000.000	6359020.	-30452.	-1703036.
16100.000	6515053.	-10403.	-941154.

TABLE 7-VIII

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

POSITION COORDINATES IN
 APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	X (METERS)	Y (METERS)	Z (METERS)
16200.000	6580084.	9893.	-166162.
16300.000	6553201.	30161.	611120.
16400.000	6434774.	50125.	1379839.
16500.000	6226447.	69511.	2129262.
16550.000	6089429.	78903.	2493453.

TABLE 7-IX

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
0.000	0.00	126.28	388.64
5.000	10.27	126.21	388.65
10.000	22.01	126.13	388.65
12.000	27.14	126.10	388.65
15.000	35.31	126.05	388.64
20.000	50.30	125.97	389.14
25.000	67.17	125.87	390.58
30.000	86.11	125.77	393.43
35.000	107.15	125.65	398.37
40.000	130.36	125.54	406.05
45.000	155.70	125.45	417.29
50.000	183.05	125.36	432.86
55.000	212.13	125.27	453.46
60.000	242.57	125.18	479.68
65.000	273.81	125.09	511.95
70.000	305.15	124.98	550.37
75.000	336.69	124.90	595.31
80.000	369.13	124.85	647.55
82.250	384.04	124.83	673.57
85.000	402.50	124.81	707.53
90.000	436.58	124.74	775.56
95.000	471.14	124.63	851.89
100.000	505.90	124.49	936.76
105.000	540.32	124.33	1030.55
110.000	574.08	124.16	1133.58
115.000	608.11	123.98	1245.27
120.000	642.64	123.80	1365.92
125.000	677.58	123.62	1496.21
130.000	713.04	123.43	1636.82
135.000	749.35	123.23	1788.57
140.000	786.85	123.03	1952.50
145.000	826.02	122.83	2129.93
147.329	844.97	122.73	2217.65
150.000	857.31	122.62	2300.51
155.000	881.28	122.41	2464.21
159.329	904.38	122.23	2615.35
159.329	904.38	122.23	2615.35
159.459	903.13	122.22	2615.32
160.000	898.32	122.20	2616.11
163.759	864.92	122.03	2621.58

TABLE 7-IX

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

VELOCITY COMPONENTS IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
165.000	856.45	121.98	2629.12
165.859	850.58	121.94	2634.35
170.000	823.90	121.76	2663.28
175.000	791.85	121.53	2698.46
180.000	760.02	121.30	2733.91
185.000	728.40	121.07	2769.63
189.559	699.75	120.86	2802.44
190.000	697.01	120.83	2805.65
194.559	668.67	120.61	2838.96
195.000	665.95	120.59	2842.21
200.000	635.22	120.35	2879.29
205.000	605.63	120.08	2916.24
210.000	578.75	119.81	2952.28
215.000	551.36	119.53	2989.03
220.000	523.92	119.25	3026.25
225.000	496.38	118.96	3063.97
230.000	468.71	118.67	3102.20
235.000	440.93	118.37	3140.96
240.000	413.02	118.08	3180.24
245.000	384.99	117.77	3220.06
250.000	356.81	117.46	3260.43
255.000	328.50	117.15	3301.35
260.000	300.04	116.84	3342.84
265.000	271.42	116.52	3384.91
270.000	242.64	116.19	3427.58
275.000	213.68	115.86	3470.84
280.000	184.54	115.53	3514.72
285.000	155.21	115.20	3559.22
290.000	125.67	114.86	3604.37
295.000	95.93	114.51	3650.17
300.000	65.96	114.17	3696.64
305.000	35.76	113.81	3743.79
310.000	5.32	113.46	3791.65
315.000	-25.37	113.10	3840.21
320.000	-56.32	112.74	3889.51
325.000	-87.55	112.38	3939.56
330.000	-119.07	112.01	3990.38
335.000	-150.88	111.63	4041.98
340.000	-183.01	111.26	4094.39
345.000	-215.45	110.88	4147.62

TABLE 7-IX

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
 PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
350.000	-248.24	110.50	4201.70
355.000	-281.37	110.11	4256.65
360.000	-314.87	109.72	4312.49
365.000	-348.74	109.33	4369.24
370.000	-383.00	108.94	4426.94
375.000	-417.67	108.54	4485.60
380.000	-452.77	108.14	4545.26
385.000	-488.30	107.73	4605.95
390.000	-524.29	107.32	4667.69
395.000	-560.75	106.91	4730.51
400.000	-597.70	106.50	4794.46
405.000	-635.16	106.08	4859.56
410.000	-673.15	105.66	4925.86
415.000	-711.69	105.24	4993.40
420.000	-750.81	104.82	5062.21
425.000	-790.51	104.39	5132.34
430.000	-830.83	103.96	5203.85
435.000	-871.79	103.53	5276.77
437.627	-893.57	103.30	5315.67
440.000	-913.73	103.09	5344.00
445.000	-956.64	102.66	5404.41
450.000	-1000.13	102.22	5465.81
455.000	-1044.23	101.78	5528.22
460.000	-1088.96	101.34	5591.69
465.000	-1134.33	100.90	5656.24
470.000	-1180.37	100.45	5721.91
475.000	-1227.10	100.00	5788.74
480.000	-1274.54	99.55	5856.78
485.000	-1322.72	99.10	5926.06
490.000	-1371.65	98.65	5996.64
495.000	-1421.37	98.20	6068.56
500.000	-1471.91	97.74	6141.88
505.000	-1523.29	97.29	6216.65
510.000	-1575.54	96.83	6292.92
515.000	-1628.70	96.37	6370.78
520.000	-1682.82	95.91	6450.28
525.000	-1737.91	95.45	6531.50
530.000	-1794.04	94.99	6614.51
535.000	-1851.25	94.52	6699.41
537.424	-1879.39	94.29	6741.28

TABLE 7-IX

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

VELOCITY COMPONENTS IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
537.424	-1879.39	94.29	6741.28
537.442	-1879.55	94.29	6741.23
540.000	-1902.58	94.04	6736.58
543.142	-1930.85	93.73	6730.79
545.000	-1948.81	93.54	6736.27
545.742	-1956.01	93.47	6738.46
549.542	-1993.49	93.09	6752.30
550.000	-1998.01	93.05	6753.96
555.000	-2047.49	92.54	6772.15
560.000	-2097.24	92.04	6790.29
565.000	-2147.26	91.53	6808.39
570.000	-2197.55	91.03	6826.44
575.000	-2248.11	90.52	6844.44
580.000	-2298.90	90.01	6862.41
585.000	-2349.92	89.49	6880.35
590.000	-2401.18	88.97	6898.24
595.000	-2452.67	88.45	6916.11
600.000	-2504.40	87.92	6933.94
605.000	-2556.35	87.40	6951.75
610.000	-2608.53	86.87	6969.52
615.000	-2660.95	86.34	6987.28
620.000	-2713.59	85.82	7005.00
625.000	-2766.45	85.29	7022.71
630.000	-2819.54	84.77	7040.40
635.000	-2872.86	84.25	7058.08
640.000	-2926.39	83.74	7075.75
645.000	-2980.13	83.25	7093.42
650.000	-3034.06	82.76	7111.09
655.000	-3088.29	82.42	7128.74
658.378	-3124.80	82.11	7140.74
658.378	-3124.80	82.11	7140.74
660.000	-3138.55	81.93	7134.72
670.000	-3223.05	80.79	7097.00
680.000	-3307.11	79.64	7058.28
690.000	-3390.69	78.48	7018.57
700.000	-3473.80	77.32	6977.86
710.000	-3556.42	76.14	6936.18
720.000	-3638.54	74.94	6893.52
730.000	-3720.16	73.74	6849.90
740.000	-3801.25	72.53	6805.31

TABLE 7-IX

 VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
 PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
742.378	-3820.46	72.24	6794.57
750.000	-3881.79	71.31	6759.74
760.000	-3961.78	70.08	6713.20
770.000	-4041.21	68.84	6665.72
780.000	-4120.07	67.58	6617.30
790.000	-4198.35	66.32	6567.94
800.000	-4276.04	65.05	6517.66
900.000	-5018.02	51.86	5965.55
1000.000	-5689.37	37.90	5329.39
1100.000	-6280.80	23.37	4618.27
1200.000	-6783.86	8.44	3842.05
1300.000	-7191.46	-6.69	3011.63
1400.000	-7497.81	-21.83	2138.69
1500.000	-7698.56	-36.76	1235.52
1600.000	-7790.83	-51.30	314.85
1700.000	-7773.30	-65.25	-610.32
1800.000	-7646.19	-78.42	-1526.93
1900.000	-7411.27	-90.63	-2421.99
2000.000	-7071.88	-101.71	-3282.87
2100.000	-6632.83	-111.51	-4097.37
2200.000	-6100.35	-119.89	-4854.00
2300.000	-5482.01	-126.73	-5542.07
2400.000	-4786.60	-131.92	-6151.90
2500.000	-4023.99	-135.40	-6674.93
2600.000	-3204.98	-137.10	-7103.85
2700.000	-2341.16	-137.00	-7432.68
2800.000	-1444.71	-135.08	-7656.90
2900.000	-528.28	-131.36	-7773.43
3000.000	395.26	-125.87	-7780.73
3100.000	1312.97	-118.69	-7678.80
3200.000	2211.98	-109.89	-7469.13
3300.000	3079.73	-99.59	-7154.73
3400.000	3904.10	-87.90	-6740.05
3500.000	4673.59	-74.98	-6230.93
3600.000	5377.47	-60.98	-5634.51
3700.000	6005.91	-46.10	-4959.11
3800.000	6550.11	-30.51	-4214.20
3900.000	7002.46	-14.41	-3410.20
4000.000	7356.61	1.97	-2558.33
4100.000	7607.58	18.43	-1670.52

TABLE 7-IX

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
 PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

VELOCITY COMPONENTS IN
 APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
4200.000	7751.83	34.75	-759.20
4300.000	7787.28	50.70	162.86
4400.000	7713.42	66.08	1082.71
4500.000	7531.25	80.68	1987.43
4600.000	7243.31	94.30	2864.31
4700.000	6853.61	106.74	3701.00
4800.000	6367.65	117.83	4485.75
4900.000	5792.24	127.42	5207.50
5000.000	5135.48	135.37	5856.11
5100.000	4406.63	141.56	6422.48
5200.000	3615.92	145.89	6898.65
5300.000	2774.49	148.30	7277.96
5400.000	1894.15	148.75	7555.10
5500.000	987.26	147.21	7726.23
5600.000	66.54	143.69	7788.95
5700.000	-855.11	138.24	7742.42
5800.000	-1764.78	130.89	7587.29
5900.000	-2649.73	121.76	7325.74
6000.000	-3497.58	110.93	6961.44
6100.000	-4296.46	98.56	6499.47
6200.000	-5035.18	84.78	5946.26
6300.000	-5703.36	69.79	5309.55
6400.000	-6291.62	53.76	4598.21
6500.000	-6791.67	36.91	3822.20
6600.000	-7196.44	19.46	2992.38
6700.000	-7500.20	1.64	2120.39
6800.000	-7698.63	-16.32	1218.46
6900.000	-7788.88	-34.17	299.28
7000.000	-7769.64	-51.68	-624.18
7100.000	-7641.16	-68.60	-1538.93
7200.000	-7405.23	-84.69	-2432.03
7300.000	-7065.17	-99.75	-3290.89
7400.000	-6625.81	-113.56	-4103.39
7500.000	-6093.36	-125.91	-4858.07
7600.000	-5475.38	-136.65	-5544.31
7700.000	-4780.63	-145.61	-6152.47
7800.000	-4018.95	-152.66	-6674.04
7900.000	-3201.10	-157.69	-7101.73
8000.000	-2338.64	-160.63	-7429.63
8100.000	-1443.69	-161.43	-7653.22

TABLE 7-IX

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
8200.000	-528.84	-160.05	-7769.46
8300.000	393.08	-156.52	-7776.82
8400.000	1309.19	-150.86	-7675.28
8500.000	2206.69	-143.14	-7466.35
8600.000	3073.07	-133.45	-7153.02
8700.000	3896.27	-121.91	-6739.71
8800.000	4664.83	-108.66	-6232.24
8900.000	5368.07	-93.87	-5637.68
9000.000	5996.18	-77.73	-4964.36
9100.000	6540.42	-60.44	-4221.65
9200.000	6993.21	-42.24	-3419.90
9300.000	7348.19	-23.35	-2570.30
9400.000	7600.40	-4.04	-1684.69
9500.000	7746.28	15.45	-775.43
9600.000	7783.75	34.85	144.76
9700.000	7712.26	53.90	1063.01
9800.000	7532.78	72.34	1966.46
9900.000	7247.79	89.91	2842.45
10000.000	6861.26	106.38	3678.69
10100.000	6378.60	121.50	4463.45
10200.000	5806.58	135.08	5185.71
10300.000	5153.22	146.91	5835.36
10400.000	4427.67	156.83	6403.28
10500.000	3640.12	164.68	6881.52
10600.000	2801.62	170.35	7263.41
10700.000	1923.89	173.75	7543.61
10800.000	1019.24	174.82	7718.22
10900.000	100.32	173.53	7784.81
11000.000	-820.03	169.88	7742.48
11100.000	-1728.95	163.92	7591.80
11200.000	-2613.75	155.69	7334.89
11300.000	-3462.07	145.32	6975.33
11400.000	-4262.05	132.91	6518.11
11500.000	-5002.50	118.62	5969.60
11600.000	-5673.05	102.64	5337.43
11700.000	-6264.30	85.17	4630.40
11800.000	-6767.92	66.44	3858.38
11900.000	-7176.82	46.70	3032.15
12000.000	-7485.21	26.20	2163.27
12100.000	-7688.70	5.22	1263.91

TABLE 7-IX

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

VELOCITY COMPONENTS IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
12200.000	-7784.40	-15.95	346.71
12300.000	-7770.92	-37.03	-575.45
12400.000	-7648.41	-57.74	-1489.59
12500.000	-7418.58	-77.77	-2382.82
12600.000	-7084.67	-96.87	-3242.58
12700.000	-6651.39	-114.75	-4056.74
12800.000	-6124.88	-131.18	-4813.85
12900.000	-5512.59	-145.91	-5503.29
13000.000	-4823.19	-158.73	-6115.38
13100.000	-4066.41	-169.47	-6641.58
13200.000	-3252.94	-177.95	-7074.56
13300.000	-2394.24	-184.07	-7408.35
13400.000	-1502.38	-187.71	-7638.34
13500.000	-589.86	-188.82	-7761.44
13600.000	330.56	-187.38	-7776.01
13700.000	1246.03	-183.38	-7681.95
13800.000	2143.79	-176.87	-7480.66
13900.000	3011.37	-167.92	-7175.01
14000.000	3836.71	-156.65	-6769.33
14100.000	4608.36	-143.18	-6269.30
14200.000	5315.62	-127.70	-5681.90
14300.000	5948.65	-110.40	-5015.31
14400.000	6498.68	-91.51	-4278.80
14500.000	6958.05	-71.26	-3482.62
14600.000	7320.36	-49.94	-2637.84
14700.000	7580.53	-27.81	-1756.20
14800.000	7734.91	-5.18	-849.98
14900.000	7781.32	17.65	68.19
15000.000	7719.07	40.37	985.49
15100.000	7549.01	62.67	1889.12
15200.000	7273.47	84.25	2766.44
15300.000	6896.28	104.80	3605.18
15400.000	6422.71	124.03	4393.60
15500.000	5859.37	141.68	5120.68
15600.000	5214.13	157.50	5776.23
15700.000	4496.02	171.26	6351.10
15800.000	3715.08	182.76	6837.24
15900.000	2882.23	191.83	7227.89
16000.000	2009.10	198.34	7517.59
16100.000	1107.90	202.18	7702.31

TABLE 7-IX

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
 PARKING ORBIT (72-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
16200.000	191.19	203.28	7779.48
16300.000	-728.23	201.62	7748.04
16400.000	-1637.57	197.20	7608.43
16500.000	-2524.13	190.07	7362.57
16550.000	-2954.99	185.51	7200.81

TABLE 7-X

WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
0.000	6.401386E 06	7.662082E 06	49.3	0.000
5.000	6.257192E 06	7.669934E 06	75.1	0.000
10.000	6.112940E 06	7.684710E 06	156.1	0.000
12.000	6.055222E 06	7.692852E 06	205.8	0.000
15.000	5.968626E 06	7.707588E 06	300.5	0.000
20.000	5.824245E 06	7.739413E 06	515.9	0.000
25.000	5.679789E 06	7.780933E 06	811.8	0.002
30.000	5.535251E 06	7.832039E 06	1197.7	0.010
35.000	5.390626E 06	7.892950E 06	1684.2	0.028
40.000	5.245907E 06	7.963235E 06	2282.2	0.062
45.000	5.101088E 06	8.041959E 06	3002.3	0.122
50.000	4.956165E 06	8.127614E 06	3855.3	0.216
55.000	4.811133E 06	8.218259E 06	4850.6	0.359
60.000	4.665990E 06	8.311228E 06	5996.1	0.564
65.000	4.520741E 06	8.403751E 06	7297.6	0.848
70.000	4.375261E 06	8.493332E 06	8757.6	1.392
75.000	4.229469E 06	8.580856E 06	10377.0	1.877
80.000	4.083508E 06	8.663619E 06	12158.7	2.411
82.000	4.025072E 06	8.694228E 06	12918.1	2.752
85.000	3.937360E 06	8.737262E 06	14108.4	3.140
90.000	3.791011E 06	8.800106E 06	16230.7	4.069
95.000	3.644778E 06	8.851230E 06	18529.7	5.208
100.000	3.498333E 06	8.891846E 06	21008.0	6.528
105.000	3.351667E 06	8.924543E 06	23667.0	8.105
110.000	3.204774E 06	8.951728E 06	26504.7	9.948
115.000	3.057641E 06	8.975313E 06	29522.0	12.061
120.000	2.910257E 06	8.996659E 06	32723.1	14.495
125.000	2.762603E 06	9.016757E 06	36112.8	17.262
130.000	2.614658E 06	9.036326E 06	39695.9	20.378
135.000	2.466400E 06	9.055849E 06	43479.0	23.883
140.000	2.317799E 06	9.075575E 06	47471.3	27.805
145.000	2.168822E 06	9.095536E 06	51684.4	32.171
147.329	2.099290E 06	7.283889E 06	53726.3	34.370
150.000	2.035959E 06	7.238603E 06	56119.3	37.010
155.000	1.917221E 06	7.253477E 06	60718.1	42.272
159.329	1.814177E 06	7.266754E 06	64835.0	47.184
159.329	1.459482E 06	0.000000E-39	64835.0	47.184
159.459	1.459482E 06	2.742798E 05	64960.2	47.337
160.000	1.458931E 06	2.742828E 05	65481.5	47.972
163.759	1.455103E 06	1.024098E 06	69040.7	52.393

TABLE 7-X WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
165.000	1.452107E 06	1.024102E 06	70192.6	53.853
165.859	1.450031E 06	1.163632E 06	70985.8	54.868
170.000	1.438698E 06	1.163640E 06	74752.1	59.796
175.000	1.425012E 06	1.163645E 06	79183.0	65.819
180.000	1.411327E 06	1.163647E 06	83487.5	71.932
185.000	1.397642E 06	1.163648E 06	87667.8	78.136
189.559	1.375262E 06	1.163648E 06	91373.5	83.867
190.000	1.374056E 06	1.163649E 06	91726.2	84.425
194.559	1.352926E 06	1.163649E 06	95322.9	90.241
195.000	1.351721E 06	1.163649E 06	95665.3	90.806
200.000	1.338035E 06	1.163613E 06	99488.2	97.278
205.000	1.324350E 06	1.163606E 06	103197.9	103.844
210.000	1.310665E 06	1.163649E 06	106808.7	110.500
215.000	1.296979E 06	1.163649E 06	110324.3	117.247
220.000	1.283294E 06	1.163649E 06	113744.7	124.089
225.000	1.269608E 06	1.163649E 06	117071.4	131.023
230.000	1.255923E 06	1.163649E 06	120304.8	138.055
235.000	1.242238E 06	1.163649E 06	123446.2	145.184
240.000	1.228552E 06	1.163649E 06	126496.3	152.414
245.000	1.214867E 06	1.163649E 06	129455.9	159.744
250.000	1.201181E 06	1.163649E 06	132326.3	167.177
255.000	1.187496E 06	1.163649E 06	135108.1	174.715
260.000	1.173811E 06	1.163649E 06	137802.6	182.360
265.000	1.160125E 06	1.163649E 06	140410.8	190.113
270.000	1.146440E 06	1.163649E 06	142933.4	197.975
275.000	1.132754E 06	1.163649E 06	145371.8	205.950
280.000	1.119069E 06	1.163649E 06	147727.1	214.038
285.000	1.105384E 06	1.163649E 06	150000.1	222.243
290.000	1.091698E 06	1.163649E 06	152192.1	230.565
295.000	1.078013E 06	1.163649E 06	154304.3	239.008
300.000	1.064327E 06	1.163649E 06	156337.4	247.572
305.000	1.050642E 06	1.163649E 06	158293.2	256.261
310.000	1.036957E 06	1.163649E 06	160172.5	265.076
315.000	1.023271E 06	1.163649E 06	161976.7	274.018
320.000	1.009586E 06	1.163649E 06	163707.0	283.093
325.000	9.959004E 05	1.163649E 06	165364.5	292.300
330.000	9.822150E 05	1.163649E 06	166950.9	301.642
335.000	9.685296E 05	1.163649E 06	168467.2	311.123
340.000	9.548442E 05	1.163649E 06	169914.9	320.744
345.000	9.411588E 05	1.163649E 06	171295.5	330.508

TABLE 7-X

WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
350.000	9.274734E 05	1.163649E 06	172610.4	340.418
355.000	9.137880E 05	1.163649E 06	173861.3	350.476
360.000	9.001026E 05	1.163649E 06	175049.5	360.685
365.000	8.864172E 05	1.163649E 06	176176.7	371.048
370.000	8.727318E 05	1.163649E 06	177244.6	381.568
375.000	8.590464E 05	1.163649E 06	178254.9	392.247
380.000	8.453610E 05	1.163649E 06	179209.5	403.090
385.000	8.316756E 05	1.163649E 06	180109.9	414.098
390.000	8.179902E 05	1.163649E 06	180958.3	425.276
395.000	8.043048E 05	1.163649E 06	181756.7	436.626
400.000	7.906194E 05	1.163649E 06	182507.0	448.152
405.000	7.769340E 05	1.163649E 06	183211.3	459.858
410.000	7.632486E 05	1.163649E 06	183872.1	471.747
415.000	7.495632E 05	1.163649E 06	184491.4	483.823
420.000	7.358778E 05	1.163649E 06	185071.9	496.089
425.000	7.221924E 05	1.163649E 06	185615.7	508.551
430.000	7.085070E 05	1.163649E 06	186125.8	521.211
435.000	6.948217E 05	1.163649E 06	186604.8	534.074
437.627	6.876303E 05	9.536950E 05	186844.9	540.916
440.000	6.823523E 05	9.536950E 05	187053.4	547.140
445.000	6.712296E 05	9.536950E 05	187461.9	560.385
450.000	6.601069E 05	9.536950E 05	187829.9	573.806
455.000	6.489841E 05	9.536950E 05	188160.1	587.407
460.000	6.378614E 05	9.536950E 05	188454.4	601.191
465.000	6.267387E 05	9.536950E 05	188715.6	615.162
470.000	6.156160E 05	9.536950E 05	188946.4	629.324
475.000	6.044932E 05	9.536950E 05	189149.5	643.680
480.000	5.933705E 05	9.536950E 05	189328.0	658.234
485.000	5.822478E 05	9.536950E 05	189484.4	672.990
490.000	5.711251E 05	9.536950E 05	189622.2	687.952
495.000	5.600024E 05	9.536950E 05	189744.5	703.125
500.000	5.488796E 05	9.536950E 05	189855.0	718.513
505.000	5.377569E 05	9.536950E 05	189957.1	734.120
510.000	5.266342E 05	9.536950E 05	190054.5	749.952
515.000	5.155115E 05	9.536950E 05	190151.4	766.012
520.000	5.043888E 05	9.536950E 05	190251.6	782.307
525.000	4.932661E 05	9.536950E 05	190359.6	798.842
530.000	4.821434E 05	9.536950E 05	190479.8	815.622
535.000	4.710206E 05	9.536950E 05	190617.0	832.652
537.424	4.656272E 05	9.536950E 05	190691.0	841.002

TABLE 7-X WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
537.424	3.635400E 05	0.000000E-39	190691.0	841.002
537.442	3.635400E 05	2.711470E 04	190691.6	841.062
540.000	3.632896E 05	2.711470E 04	190767.2	849.905
543.142	3.629819E 05	2.069960E 05	190845.1	860.772
545.000	3.620828E 05	2.069960E 05	190884.6	867.201
545.742	3.617234E 05	2.333470E 05	190899.4	869.774
549.542	3.595114E 05	2.333470E 05	190967.8	882.969
550.000	3.592603E 05	2.333470E 05	190975.2	884.560
555.000	3.565169E 05	2.333470E 05	191044.4	902.001
560.000	3.537720E 05	2.333470E 05	191093.7	919.525
565.000	3.510260E 05	2.333470E 05	191124.5	937.133
570.000	3.482801E 05	2.333470E 05	191137.9	954.826
575.000	3.455341E 05	2.333470E 05	191135.2	972.604
580.000	3.427882E 05	2.333470E 05	191117.9	990.468
585.000	3.400422E 05	2.333470E 05	191087.6	1008.419
590.000	3.372962E 05	2.333470E 05	191046.0	1026.458
595.000	3.345522E 05	2.333470E 05	190994.5	1044.586
600.000	3.318087E 05	2.333470E 05	190934.9	1062.802
605.000	3.290653E 05	2.333470E 05	190869.3	1081.109
610.000	3.263218E 05	2.333470E 05	190798.9	1099.507
615.000	3.235783E 05	2.333470E 05	190726.0	1117.997
620.000	3.208349E 05	2.333470E 05	190652.3	1136.579
625.000	3.180914E 05	2.333470E 05	190579.8	1155.255
630.000	3.153480E 05	2.333470E 05	190510.4	1174.025
635.000	3.126045E 05	2.333470E 05	190446.7	1192.889
640.000	3.098610E 05	2.333470E 05	190390.0	1211.850
645.000	3.071176E 05	2.333470E 05	190343.3	1230.907
650.000	3.043741E 05	2.333470E 05	190308.2	1250.061
655.000	3.016306E 05	2.333470E 05	190287.3	1269.314
656.031	3.010649E 05	2.333470E 05	190285.2	1273.296
656.031	3.010649E 05	1.400000E 02	190285.2	1273.296
660.000	3.010582E 05	1.400000E 02	190278.3	1288.634
670.000	3.010413E 05	1.400000E 02	190259.8	1327.278
680.000	3.010244E 05	1.400000E 02	190240.0	1365.923
690.000	3.010075E 05	1.400000E 02	190219.1	1404.568
700.000	3.009906E 05	1.400000E 02	190196.8	1443.213
710.000	3.009737E 05	1.400000E 02	190173.2	1481.858
720.000	3.009568E 05	1.943985E 02	190148.4	1520.503
730.000	3.009339E 05	1.931632E 02	190122.4	1559.149
740.000	3.009110E 05	1.919279E 02	190095.2	1597.795

TABLE 7-X WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
740.031	3.009110E 05	5.192403E 01	190095.0	1597.915
750.000	3.009052E 05	5.069253E 01	190066.7	1636.441
760.000	3.008996E 05	4.945720E 01	190037.2	1675.087
770.000	3.008941E 05	4.822187E 01	190006.5	1713.733
780.000	3.008887E 05	4.698654E 01	189974.8	1752.379
790.000	3.008835E 05	4.575121E 01	189941.9	1791.025
800.000	3.008784E 05	4.451588E 01	189908.0	1829.671
900.000	3.008404E 05	8.000000E 00	189515.1	2216.132
1000.000	3.008218E 05	5.416632E 01	189040.9	2602.591
1100.000	3.007611E 05	5.468064E 01	188512.1	2989.052
1200.000	3.007007E 05	5.384431E 01	187960.7	3375.516
1300.000	3.006413E 05	5.277950E 01	187420.3	3761.984
1400.000	3.005833E 05	5.136858E 01	186924.3	4148.452
1500.000	3.005270E 05	4.967414E 01	186504.4	4534.920
1600.000	3.004726E 05	4.797969E 01	186188.4	4921.383
1700.000	3.004201E 05	4.628525E 01	185999.2	5307.839
1800.000	3.003695E 05	4.465675E 01	185953.6	5694.282
1900.000	3.003207E 05	4.303175E 01	186061.2	6080.708
2000.000	3.002736E 05	4.140675E 01	186324.4	6467.112
2100.000	3.002284E 05	3.978175E 01	186737.5	6853.487
2200.000	3.001850E 05	3.815675E 01	187288.3	7239.828
2300.000	3.001434E 05	3.653175E 01	187957.9	7626.127
2400.000	3.001036E 05	3.490675E 01	188721.5	8012.376
2500.000	3.000655E 05	3.341711E 01	189551.4	8398.562
2600.000	3.000291E 05	3.197267E 01	190416.6	8784.670
2700.000	2.999943E 05	3.052823E 01	191285.7	9170.672
2800.000	2.999610E 05	2.915863E 01	192128.0	9556.508
2900.000	2.999288E 05	2.821418E 01	192915.4	9942.022
3000.000	2.998973E 05	2.726974E 01	193623.9	10326.554
3100.000	2.998663E 05	2.632529E 01	194234.3	10698.892
3200.000	2.998360E 05	2.538085E 01	194733.7	10493.065
3300.000	2.998064E 05	2.443640E 01	195115.9	10110.089
3400.000	2.997773E 05	2.349196E 01	195380.8	9725.108
3500.000	2.997489E 05	2.254752E 01	195535.2	9339.752
3600.000	2.997213E 05	2.195920E 01	195592.1	8954.290
3700.000	2.996948E 05	2.138976E 01	195567.2	8568.804
3800.000	2.996693E 05	2.082032E 01	195481.6	8183.326
3900.000	2.996448E 05	2.025087E 01	195359.4	7797.870
4000.000	2.996214E 05	1.968143E 01	195225.6	7412.440
4100.000	2.995991E 05	1.911198E 01	195104.7	7027.039

TABLE 7-X WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
4200.000	2.995778E 05	1.854254E 01	195019.0	6641.666
4300.000	2.995574E 05	1.815010E 01	194987.2	6256.318
4400.000	2.995373E 05	1.781677E 01	195024.0	5870.992
4500.000	2.995177E 05	1.748344E 01	195137.4	5485.684
4600.000	2.994984E 05	1.717921E 01	195329.9	5100.390
4700.000	2.994794E 05	1.704032E 01	195597.8	4715.105
4800.000	2.994605E 05	1.690143E 01	195930.9	4329.826
4900.000	2.994418E 05	1.683746E 01	196313.5	3944.547
5000.000	2.994230E 05	1.697635E 01	196725.6	3559.266
5100.000	2.994040E 05	1.711523E 01	197143.6	3173.978
5200.000	2.993849E 05	1.725412E 01	197541.5	2788.681
5300.000	2.993657E 05	1.739301E 01	197893.5	2403.377
5400.000	2.993461E 05	1.786165E 01	198174.5	2018.069
5500.000	2.993260E 05	1.834777E 01	198362.3	1632.770
5600.000	2.993054E 05	1.883388E 01	198438.2	1247.516
5700.000	2.992842E 05	1.931999E 01	198389.8	862.412
5800.000	2.992624E 05	1.980610E 01	198210.0	477.915
5900.000	2.992402E 05	2.029221E 01	197899.2	101.666
6000.000	2.992174E 05	2.077832E 01	197466.3	299.430
6100.000	2.991940E 05	2.119155E 01	196925.2	682.991
6200.000	2.991703E 05	2.158043E 01	196296.4	1068.128
6300.000	2.991461E 05	2.196932E 01	195604.9	1453.624
6400.000	2.991215E 05	2.232079E 01	194881.0	1839.281
6500.000	2.990966E 05	2.245968E 01	194157.1	2225.034
6600.000	2.990716E 05	2.259857E 01	193466.7	2610.857
6700.000	2.990465E 05	2.253127E 01	192842.8	2996.733
6800.000	2.990214E 05	2.242365E 01	192316.4	3382.652
6900.000	2.989966E 05	2.228476E 01	191914.3	3768.605
7000.000	2.989719E 05	2.214588E 01	191658.1	4154.585
7100.000	2.989473E 05	2.200699E 01	191562.9	4540.583
7200.000	2.989230E 05	2.168344E 01	191637.1	4926.593
7300.000	2.988991E 05	2.135010E 01	191881.0	5312.608
7400.000	2.988755E 05	2.101677E 01	192287.6	5698.621
7500.000	2.988523E 05	2.068344E 01	192842.4	6084.625
7600.000	2.988295E 05	2.035010E 01	193524.8	6470.615
7700.000	2.988070E 05	2.001677E 01	194309.0	6856.583
7800.000	2.987849E 05	1.968344E 01	195165.0	7242.525
7900.000	2.987632E 05	1.931887E 01	196060.6	7628.435
8000.000	2.987419E 05	1.894387E 01	196963.1	8014.307
8100.000	2.987210E 05	1.856887E 01	197840.7	8400.137

TABLE 7-X

WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
8200.000	2.987006E 05	1.819387E 01	198664.5	8785.917
8300.000	2.986805E 05	1.781887E 01	199409.0	9171.642
8400.000	2.986609E 05	1.744387E 01	200054.7	9557.297
8500.000	2.986417E 05	1.706887E 01	200587.5	9942.851
8600.000	2.986229E 05	1.673204E 01	201000.7	10328.167
8700.000	2.986045E 05	1.642648E 01	201293.7	10710.771
8800.000	2.985863E 05	1.612093E 01	201472.6	10499.000
8900.000	2.985686E 05	1.581537E 01	201549.6	10114.116
9000.000	2.985511E 05	1.550982E 01	201541.9	9728.848
9100.000	2.985341E 05	1.520426E 01	201470.3	9343.533
9200.000	2.985173E 05	1.489871E 01	201358.5	8958.224
9300.000	2.985009E 05	1.466115E 01	201230.6	8572.934
9400.000	2.984846E 05	1.455003E 01	201110.9	8187.667
9500.000	2.984685E 05	1.443892E 01	201020.8	7802.422
9600.000	2.984525E 05	1.432781E 01	200978.9	7417.198
9700.000	2.984366E 05	1.438330E 01	200998.7	7031.990
9800.000	2.984205E 05	1.449441E 01	201088.3	6646.797
9900.000	2.984044E 05	1.460552E 01	201250.2	6261.614
10000.000	2.983881E 05	1.474366E 01	201480.4	5876.439
10100.000	2.983715E 05	1.503533E 01	201769.1	5491.270
10200.000	2.983547E 05	1.532699E 01	202100.8	5106.104
10300.000	2.983375E 05	1.561866E 01	202456.1	4720.944
10400.000	2.983200E 05	1.591033E 01	202812.1	4335.791
10500.000	2.983021E 05	1.620199E 01	203144.0	3950.651
10600.000	2.982840E 05	1.649366E 01	203426.6	3565.535
10700.000	2.982655E 05	1.678533E 01	203636.1	3180.461
10800.000	2.982466E 05	1.714294E 01	203751.6	2795.460
10900.000	2.982274E 05	1.750405E 01	203755.8	2410.588
11000.000	2.982078E 05	1.786516E 01	203637.1	2025.941
11100.000	2.981877E 05	1.822628E 01	203390.2	1641.712
11200.000	2.981673E 05	1.858739E 01	203015.7	1258.328
11300.000	2.981464E 05	1.894850E 01	202522.3	876.968
11400.000	2.981252E 05	1.930961E 01	201924.4	502.373
11500.000	2.981036E 05	1.952495E 01	201243.3	182.808
11600.000	2.980818E 05	1.969161E 01	200505.0	335.102
11700.000	2.980598E 05	1.985828E 01	199739.8	699.350
11800.000	2.980376E 05	2.002495E 01	198980.5	1078.834
11900.000	2.980153E 05	2.019161E 01	198261.2	1461.753
12000.000	2.979928E 05	2.035828E 01	197614.8	1845.978
12100.000	2.979700E 05	2.052495E 01	197072.4	2230.833

TABLE 7-X WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
12200.000	2.979472E 05	2.058473E 01	196660.5	2616.034
12300.000	2.979243E 05	2.055695E 01	196400.7	3001.435
12400.000	2.979015E 05	2.052917E 01	196308.1	3386.950
12500.000	2.978786E 05	2.050140E 01	196390.2	3772.523
12600.000	2.978560E 05	2.020982E 01	196647.4	4158.109
12700.000	2.978337E 05	1.990426E 01	197072.2	4543.675
12800.000	2.978117E 05	1.959871E 01	197649.8	4929.186
12900.000	2.977901E 05	1.929315E 01	198359.2	5314.611
13000.000	2.977688E 05	1.898759E 01	199173.8	5699.915
13100.000	2.977478E 05	1.868204E 01	200063.4	6085.061
13200.000	2.977272E 05	1.837648E 01	200995.5	6470.000
13300.000	2.977069E 05	1.791474E 01	201936.7	6854.673
13400.000	2.976873E 05	1.740085E 01	202854.7	7238.999
13500.000	2.976682E 05	1.688696E 01	203719.9	7622.865
13600.000	2.976497E 05	1.637308E 01	204507.0	8006.099
13700.000	2.976317E 05	1.585919E 01	205195.1	8388.424
13800.000	2.976143E 05	1.534530E 01	205770.3	8769.363
13900.000	2.975975E 05	1.483141E 01	206224.4	9148.005
14000.000	2.975813E 05	1.443967E 01	206556.5	9522.375
14100.000	2.975654E 05	1.414801E 01	206772.4	9887.306
14200.000	2.975498E 05	1.385634E 01	206883.2	10224.721
14300.000	2.975345E 05	1.356467E 01	206905.4	10445.137
14400.000	2.975196E 05	1.327301E 01	206859.5	10333.373
14500.000	2.975050E 05	1.298134E 01	206768.4	10021.433
14600.000	2.974907E 05	1.268967E 01	206656.0	9663.787
14700.000	2.974767E 05	1.249029E 01	206545.6	9292.703
14800.000	2.974628E 05	1.246251E 01	206458.7	8916.169
14900.000	2.974490E 05	1.243473E 01	206413.3	8536.962
15000.000	2.974352E 05	1.240695E 01	206423.1	8156.285
15100.000	2.974213E 05	1.256660E 01	206496.1	7774.743
15200.000	2.974072E 05	1.278882E 01	206634.9	7392.678
15300.000	2.973929E 05	1.301104E 01	206835.5	7010.301
15400.000	2.973783E 05	1.328524E 01	207088.5	6627.756
15500.000	2.973633E 05	1.385468E 01	207379.3	6245.148
15600.000	2.973476E 05	1.442413E 01	207688.7	5862.566
15700.000	2.973312E 05	1.499357E 01	207994.3	5480.091
15800.000	2.973143E 05	1.556302E 01	208272.4	5097.807
15900.000	2.972967E 05	1.613246E 01	208498.4	4715.810
16000.000	2.972785E 05	1.670191E 01	208649.2	4334.217
16100.000	2.972596E 05	1.727135E 01	208704.7	3953.181

TABLE 7-XI
 INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
 (81-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
0.000	408.637	0.00	1.900	9.8181
5.000	408.762	10.40	2.201	9.8181
10.000	409.201	22.27	2.501	9.8178
12.000	409.495	27.45	2.627	9.8177
15.000	410.092	35.70	2.822	9.8174
20.000	412.123	50.82	3.184	9.8167
25.000	415.897	67.85	3.604	9.8158
30.000	422.104	87.01	4.065	9.8146
35.000	431.595	108.48	4.593	9.8131
40.000	445.162	132.52	5.203	9.8113
45.000	463.668	159.42	5.906	9.8090
50.000	487.780	189.50	6.697	9.8064
55.000	517.943	223.07	7.574	9.8034
60.000	554.371	260.39	8.504	9.7998
65.000	596.981	301.62	9.453	9.7958
70.000	645.336	346.70	10.413	9.7913
75.000	699.637	396.38	11.607	9.7864
80.000	760.811	452.17	13.004	9.7809
82.000	787.296	476.36	13.576	9.7786
85.000	829.217	514.74	14.463	9.7749
90.000	905.022	584.52	15.980	9.7684
95.000	988.360	661.81	17.541	9.7614
100.000	1079.382	746.87	19.141	9.7539
105.000	1178.264	839.91	20.839	9.7457
110.000	1285.241	941.21	22.510	9.7371
115.000	1400.349	1051.13	24.202	9.7279
120.000	1524.031	1170.11	26.012	9.7182
125.000	1656.930	1298.71	27.960	9.7079
130.000	1799.802	1437.66	30.067	9.6971
135.000	1953.584	1587.88	32.373	9.6856
140.000	2119.442	1750.50	34.930	9.6736
145.000	2298.820	1926.96	37.799	9.6609
147.329	2387.478	2014.36	31.025	9.6548
150.000	2469.367	2094.80	31.936	9.6476
155.000	2631.353	2254.25	34.270	9.6338
159.329	2781.583	2402.54	36.375	9.6215
159.329	2781.583	2402.54	9.626	9.6215
159.459	2781.149	2402.04	9.024	9.6211
160.000	2780.334	2400.95	9.019	9.6195
163.759	2774.896	2393.61	9.145	9.6089

TABLE 7-XI

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
165.000	2779.432	2397.56	9.141	9.6055
165.859	2782.606	2400.33	9.481	9.6031
170.000	2802.170	2418.02	9.510	9.5919
175.000	2826.636	2440.34	9.519	9.5787
180.000	2851.997	2463.67	9.530	9.5659
185.000	2878.237	2488.00	9.542	9.5536
189.559	2902.916	2511.04	9.579	9.5426
190.000	2905.363	2513.33	9.581	9.5416
194.559	2931.083	2537.51	9.617	9.5310
195.000	2933.628	2539.91	9.619	9.5300
200.000	2962.971	2567.68	9.753	9.5187
205.000	2992.894	2596.16	8.975	9.5078
210.000	3022.959	2624.97	9.150	9.4972
215.000	3053.994	2654.79	9.236	9.4869
220.000	3085.852	2685.51	9.326	9.4769
225.000	3118.552	2717.12	9.421	9.4672
230.000	3152.100	2749.65	9.520	9.4578
235.000	3186.497	2783.08	9.619	9.4486
240.000	3221.743	2817.41	9.721	9.4398
245.000	3257.843	2852.65	9.824	9.4312
250.000	3294.798	2888.79	9.930	9.4228
255.000	3332.614	2925.85	10.039	9.4148
260.000	3371.296	2963.81	10.151	9.4070
265.000	3410.848	3002.69	10.266	9.3995
270.000	3451.277	3042.48	10.384	9.3922
275.000	3492.591	3083.20	10.505	9.3852
280.000	3534.795	3124.85	10.629	9.3784
285.000	3577.898	3167.44	10.756	9.3719
290.000	3621.910	3210.96	10.887	9.3656
295.000	3666.839	3255.44	11.022	9.3595
300.000	3712.695	3300.87	11.160	9.3537
305.000	3759.490	3347.27	11.302	9.3481
310.000	3807.235	3394.65	11.447	9.3427
315.000	3855.943	3443.02	11.597	9.3375
320.000	3905.627	3492.38	11.751	9.3326
325.000	3956.301	3542.76	11.909	9.3279
330.000	4007.981	3594.17	12.072	9.3234
335.000	4060.682	3646.62	12.239	9.3190
340.000	4114.422	3700.12	12.411	9.3149
345.000	4169.220	3754.70	12.588	9.3110

TABLE 7-XI

INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
 (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
350.000	4225.094	3810.38	12.770	9.3072
355.000	4282.065	3867.17	12.957	9.3037
360.000	4340.156	3925.09	13.150	9.3003
365.000	4399.388	3984.17	13.348	9.2971
370.000	4459.788	4044.42	13.553	9.2941
375.000	4521.379	4105.88	13.764	9.2912
380.000	4584.191	4168.58	13.981	9.2885
385.000	4648.252	4232.53	14.206	9.2860
390.000	4713.593	4297.77	14.437	9.2836
395.000	4780.247	4364.33	14.677	9.2813
400.000	4848.249	4432.25	14.924	9.2792
405.000	4917.635	4501.56	15.179	9.2772
410.000	4988.445	4572.30	15.443	9.2753
415.000	5060.720	4644.52	15.716	9.2736
420.000	5134.504	4718.24	15.999	9.2719
425.000	5209.844	4793.53	16.293	9.2704
430.000	5286.789	4870.43	16.597	9.2690
435.000	5365.394	4948.99	16.913	9.2676
437.627	5407.382	4990.96	14.627	9.2669
440.000	5438.706	5022.26	14.732	9.2664
445.000	5505.628	5089.15	14.957	9.2652
450.000	5573.810	5157.29	15.190	9.2642
455.000	5643.285	5226.74	15.429	9.2632
460.000	5714.089	5297.52	15.677	9.2624
465.000	5786.262	5369.67	15.933	9.2617
470.000	5859.843	5443.23	16.197	9.2610
475.000	5934.876	5518.25	16.471	9.2604
480.000	6011.406	5594.76	16.754	9.2599
485.000	6089.481	5672.82	17.047	9.2595
490.000	6169.154	5752.49	17.352	9.2591
495.000	6250.480	5833.80	17.667	9.2588
500.000	6333.516	5916.83	17.996	9.2585
505.000	6418.325	6001.63	18.337	9.2582
510.000	6504.974	6088.28	18.692	9.2579
515.000	6593.534	6176.83	19.062	9.2576
520.000	6684.081	6267.37	19.448	9.2573
525.000	6776.698	6359.98	19.851	9.2570
530.000	6871.472	6454.75	20.273	9.2567
535.000	6968.498	6551.77	20.716	9.2563
537.424	7016.388	6599.65	20.939	9.2561

TABLE 7-XI

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
537.424	7016.388	6599.65	9.256	9.2561
537.442	7016.387	6599.65	9.184	9.2561
540.000	7018.143	6601.40	9.189	9.2559
543.142	7020.322	6603.57	10.165	9.2557
545.000	7030.571	6613.82	10.134	9.2556
545.742	7034.678	6617.93	10.490	9.2555
549.542	7058.503	6641.75	10.538	9.2553
550.000	7061.383	6644.63	10.538	9.2553
555.000	7093.007	6676.25	10.580	9.2551
560.000	7124.916	6708.15	10.624	9.2550
565.000	7157.111	6740.35	10.672	9.2549
570.000	7189.595	6772.83	10.724	9.2548
575.000	7222.369	6805.61	10.763	9.2548
580.000	7255.429	6838.67	10.806	9.2549
585.000	7288.780	6872.03	10.847	9.2550
590.000	7322.421	6905.67	10.888	9.2551
595.000	7356.355	6939.61	10.929	9.2552
600.000	7390.584	6973.85	10.970	9.2554
605.000	7425.109	7008.38	11.012	9.2556
610.000	7459.933	7043.21	11.053	9.2558
615.000	7495.058	7078.34	11.093	9.2560
620.000	7530.486	7113.78	11.135	9.2562
625.000	7566.219	7149.52	11.176	9.2564
630.000	7602.260	7185.57	11.217	9.2566
635.000	7638.611	7221.93	11.258	9.2567
640.000	7675.276	7258.60	11.296	9.2569
645.000	7712.255	7295.59	11.337	9.2570
650.000	7749.554	7332.89	11.408	9.2571
655.000	7787.164	7370.51	11.362	9.2572
656.031	7794.955	7378.30	11.368	9.2572
656.031	7794.955	7378.30	9.257	9.2572
660.000	7794.977	7378.33	9.257	9.2572
670.000	7795.033	7378.40	9.257	9.2572
680.000	7795.089	7378.47	9.257	9.2572
690.000	7795.146	7378.54	9.257	9.2573
700.000	7795.204	7378.62	9.257	9.2573
710.000	7795.262	7378.69	9.257	9.2573
720.000	7795.321	7378.77	9.257	9.2574
730.000	7795.398	7378.87	9.257	9.2574
740.000	7795.476	7378.97	9.258	9.2575

TABLE 7-XI

INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
 (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
740.031	7795.476	7378.97	9.258	9.2575
750.000	7795.508	7379.02	9.258	9.2576
760.000	7795.540	7379.08	9.258	9.2577
770.000	7795.573	7379.13	9.258	9.2577
780.000	7795.605	7379.19	9.258	9.2578
790.000	7795.638	7379.25	9.258	9.2578
800.000	7795.671	7379.31	9.258	9.2579
900.000	7795.985	7379.94	9.259	9.2587
1000.000	7796.279	7380.62	9.260	9.2596
1100.000	7796.720	7381.49	9.261	9.2606
1200.000	7797.167	7382.40	9.262	9.2616
1300.000	7797.597	7383.28	9.263	9.2627
1400.000	7797.994	7384.11	9.264	9.2636
1500.000	7798.338	7384.83	9.264	9.2643
1600.000	7798.614	7385.41	9.265	9.2649
1700.000	7798.809	7385.82	9.265	9.2652
1800.000	7798.915	7386.03	9.265	9.2652
1900.000	7798.924	7386.04	9.265	9.2649
2000.000	7798.836	7385.85	9.264	9.2643
2100.000	7798.650	7385.45	9.263	9.2633
2200.000	7798.373	7384.86	9.262	9.2621
2300.000	7798.013	7384.12	9.261	9.2607
2400.000	7797.580	7383.24	9.259	9.2590
2500.000	7797.089	7382.28	9.257	9.2571
2600.000	7796.555	7381.27	9.255	9.2552
2700.000	7795.993	7380.24	9.253	9.2532
2800.000	7795.420	7379.26	9.251	9.2513
2900.000	7794.851	7378.34	9.249	9.2494
3000.000	7794.300	7377.52	9.248	9.2477
3100.000	7793.778	7376.83	9.246	9.2461
3200.000	7793.296	7376.29	9.245	9.2448
3300.000	7792.858	7375.90	9.244	9.2436
3400.000	7792.468	7375.66	9.243	9.2427
3500.000	7792.127	7375.57	9.242	9.2419
3600.000	7791.833	7375.60	9.242	9.2414
3700.000	7791.580	7375.73	9.241	9.2410
3800.000	7791.367	7375.94	9.241	9.2407
3900.000	7791.188	7376.20	9.241	9.2405
4000.000	7791.033	7376.46	9.241	9.2404
4100.000	7790.894	7376.71	9.241	9.2403

TABLE 7-XI

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
4200.000	7790.765	7376.90	9.240	9.2402
4300.000	7790.640	7377.01	9.240	9.2400
4400.000	7790.513	7377.04	9.240	9.2397
4500.000	7790.384	7376.95	9.239	9.2393
4600.000	7790.251	7376.76	9.239	9.2388
4700.000	7790.118	7376.46	9.238	9.2382
4800.000	7789.989	7376.07	9.238	9.2376
4900.000	7789.870	7375.62	9.237	9.2368
5000.000	7789.770	7375.12	9.236	9.2361
5100.000	7789.699	7374.61	9.236	9.2354
5200.000	7789.666	7374.12	9.235	9.2348
5300.000	7789.679	7373.70	9.235	9.2343
5400.000	7789.748	7373.36	9.234	9.2340
5500.000	7789.881	7373.15	9.234	9.2339
5600.000	7790.082	7373.09	9.234	9.2340
5700.000	7790.354	7373.19	9.235	9.2343
5800.000	7790.695	7373.47	9.235	9.2349
5900.000	7791.104	7373.92	9.236	9.2358
6000.000	7791.571	7374.54	9.237	9.2368
6100.000	7792.084	7375.31	9.238	9.2381
6200.000	7792.630	7376.19	9.240	9.2395
6300.000	7793.193	7377.16	9.241	9.2410
6400.000	7793.757	7378.17	9.243	9.2426
6500.000	7794.303	7379.19	9.244	9.2441
6600.000	7794.813	7380.16	9.246	9.2455
6700.000	7795.268	7381.05	9.247	9.2468
6800.000	7795.652	7381.81	9.248	9.2479
6900.000	7795.951	7382.41	9.249	9.2487
7000.000	7796.153	7382.82	9.249	9.2492
7100.000	7796.249	7383.02	9.249	9.2494
7200.000	7796.236	7383.00	9.249	9.2492
7300.000	7796.111	7382.76	9.249	9.2486
7400.000	7795.878	7382.31	9.248	9.2477
7500.000	7795.544	7381.66	9.246	9.2465
7600.000	7795.118	7380.84	9.245	9.2450
7700.000	7794.614	7379.89	9.243	9.2433
7800.000	7794.048	7378.85	9.241	9.2414
7900.000	7793.434	7377.76	9.239	9.2393
8000.000	7792.792	7376.65	9.237	9.2373
8100.000	7792.138	7375.59	9.235	9.2353

TABLE 7-XI

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
8200.000	7791.487	7374.59	9.233	9.2333
8300.000	7790.857	7373.70	9.231	9.2315
8400.000	7790.258	7372.94	9.230	9.2298
8500.000	7789.701	7372.33	9.228	9.2283
8600.000	7789.195	7371.87	9.227	9.2271
8700.000	7788.742	7371.58	9.226	9.2260
8800.000	7788.346	7371.43	9.225	9.2252
8900.000	7788.004	7371.42	9.225	9.2246
9000.000	7787.714	7371.52	9.224	9.2241
9100.000	7787.470	7371.70	9.224	9.2238
9200.000	7787.265	7371.93	9.224	9.2236
9300.000	7787.092	7372.17	9.224	9.2235
9400.000	7786.944	7372.40	9.223	9.2234
9500.000	7786.814	7372.59	9.223	9.2233
9600.000	7786.696	7372.71	9.223	9.2231
9700.000	7786.587	7372.75	9.223	9.2229
9800.000	7786.485	7372.68	9.223	9.2225
9900.000	7786.388	7372.52	9.222	9.2222
10000.000	7786.300	7372.27	9.222	9.2217
10100.000	7786.224	7371.93	9.221	9.2212
10200.000	7786.167	7371.53	9.221	9.2206
10300.000	7786.136	7371.11	9.220	9.2201
10400.000	7786.139	7370.67	9.220	9.2195
10500.000	7786.183	7370.27	9.219	9.2191
10600.000	7786.278	7369.93	9.219	9.2188
10700.000	7786.431	7369.68	9.219	9.2187
10800.000	7786.646	7369.56	9.219	9.2188
10900.000	7786.929	7369.59	9.219	9.2191
11000.000	7787.279	7369.78	9.220	9.2196
11100.000	7787.695	7370.14	9.220	9.2204
11200.000	7788.172	7370.67	9.221	9.2214
11300.000	7788.701	7371.36	9.223	9.2226
11400.000	7789.272	7372.19	9.224	9.2240
11500.000	7789.871	7373.13	9.226	9.2256
11600.000	7790.481	7374.15	9.227	9.2272
11700.000	7791.085	7375.21	9.229	9.2289
11800.000	7791.664	7376.26	9.231	9.2305
11900.000	7792.201	7377.26	9.232	9.2320
12000.000	7792.676	7378.17	9.233	9.2334
12100.000	7793.074	7378.95	9.235	9.2345

TABLE 7-XI

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
12200.000	7793.381	7379.56	9.235	9.2353
12300.000	7793.584	7379.97	9.236	9.2358
12400.000	7793.675	7380.16	9.236	9.2360
12500.000	7793.651	7380.12	9.236	9.2358
12600.000	7793.509	7379.86	9.235	9.2352
12700.000	7793.253	7379.38	9.234	9.2342
12800.000	7792.891	7378.70	9.233	9.2330
12900.000	7792.432	7377.85	9.231	9.2314
13000.000	7791.890	7376.85	9.230	9.2296
13100.000	7791.281	7375.77	9.228	9.2276
13200.000	7790.622	7374.63	9.225	9.2255
13300.000	7789.931	7373.47	9.223	9.2233
13400.000	7789.225	7372.35	9.221	9.2212
13500.000	7788.522	7371.30	9.219	9.2191
13600.000	7787.836	7370.35	9.217	9.2171
13700.000	7787.182	7369.54	9.215	9.2154
13800.000	7786.570	7368.87	9.214	9.2138
13900.000	7786.009	7368.36	9.212	9.2124
14000.000	7785.504	7368.01	9.211	9.2113
14100.000	7785.058	7367.81	9.210	9.2103
14200.000	7784.671	7367.75	9.210	9.2096
14300.000	7784.339	7367.81	9.209	9.2091
14400.000	7784.059	7367.95	9.209	9.2087
14500.000	7783.824	7368.15	9.208	9.2085
14600.000	7783.627	7368.37	9.208	9.2083
14700.000	7783.462	7368.58	9.208	9.2082
14800.000	7783.322	7368.76	9.208	9.2080
14900.000	7783.203	7368.88	9.208	9.2079
15000.000	7783.099	7368.92	9.208	9.2077
15100.000	7783.010	7368.87	9.207	9.2074
15200.000	7782.934	7368.73	9.207	9.2071
15300.000	7782.875	7368.51	9.207	9.2067
15400.000	7782.835	7368.21	9.206	9.2062
15500.000	7782.821	7367.86	9.206	9.2058
15600.000	7782.839	7367.49	9.205	9.2054
15700.000	7782.897	7367.11	9.205	9.2050
15800.000	7783.003	7366.77	9.205	9.2047
15900.000	7783.164	7366.50	9.205	9.2046
16000.000	7783.386	7366.33	9.205	9.2046
16100.000	7783.673	7366.28	9.205	9.2049

TABLE 7-XI

INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
 (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
16200.000	7784.028	7366.38	9.205	9.2053
16300.000	7784.452	7366.65	9.206	9.2061
16400.000	7784.940	7367.08	9.207	9.2070
16500.000	7785.486	7367.68	9.208	9.2082
16550.000	7785.779	7368.04	9.209	9.2088

TABLE 7-XII INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING, GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT-PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
0.000	0.000	90.000	28.608	-80.604
5.000	1.458	89.996	28.608	-80.604
10.000	3.120	89.991	28.608	-80.604
12.000	3.844	89.989	28.608	-80.604
15.000	4.995	89.986	28.608	-80.604
20.000	7.083	89.968	28.608	-80.604
25.000	9.387	89.929	28.608	-80.604
30.000	11.880	89.859	28.608	-80.604
35.000	14.503	89.746	28.609	-80.604
40.000	17.174	89.581	28.609	-80.603
45.000	19.787	89.353	28.609	-80.602
50.000	22.225	89.060	28.609	-80.600
55.000	24.381	88.705	28.609	-80.597
60.000	26.173	88.298	28.610	-80.594
65.000	27.546	87.856	28.611	-80.588
70.000	28.489	87.397	28.612	-80.581
75.000	29.060	86.936	28.613	-80.572
80.000	29.345	86.483	28.615	-80.561
82.000	29.389	86.306	28.615	-80.555
85.000	29.388	86.046	28.617	-80.546
90.000	29.224	85.634	28.619	-80.529
95.000	28.887	85.250	28.622	-80.508
100.000	28.407	84.900	28.625	-80.482
105.000	27.796	84.583	28.629	-80.453
110.000	27.079	84.301	28.634	-80.418
115.000	26.340	84.052	28.639	-80.378
120.000	25.600	83.835	28.646	-80.333
125.000	24.861	83.647	28.652	-80.281
130.000	24.133	83.483	28.660	-80.222
135.000	23.425	83.344	28.669	-80.157
140.000	22.745	83.225	28.679	-80.083
145.000	22.101	83.125	28.690	-80.001
147.329	21.815	83.085	28.695	-79.960
150.000	21.456	83.057	28.701	-79.910
155.000	20.814	83.014	28.714	-79.812
159.329	20.318	82.985	28.726	-79.719
159.329	20.318	82.985	28.726	-79.719
159.459	20.297	82.987	28.726	-79.716
160.000	20.210	82.993	28.728	-79.705
163.759	19.609	83.038	28.738	-79.622

TABLE 7-XII

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
165.000	19.423	83.050		
165.859	19.295	83.059	28.742	-79.594
170.000	18.692	83.097	28.744	-79.575
175.000	17.980	83.145	28.756	-79.482
180.000	17.287	83.194	28.770	-79.369
185.000	16.613	83.244	28.784	-79.254
189.559	16.014	83.290	28.799	-79.138
190.000	15.957	83.294	28.812	-79.030
194.559	15.377	83.342	28.813	-79.019
195.000	15.322	83.346	28.826	-78.910
200.000	14.707	83.399	28.827	-78.899
205.000	14.130	83.453	28.842	-78.777
210.000	13.618	83.509	28.857	-78.654
215.000	13.109	83.565	28.871	-78.528
220.000	12.611	83.623	28.886	-78.401
225.000	12.125	83.682	28.901	-78.272
230.000	11.650	83.741	28.915	-78.141
235.000	11.186	83.802	28.930	-78.009
240.000	10.733	83.864	28.945	-77.874
245.000	10.291	83.927	28.960	-77.738
250.000	9.861	83.991	28.975	-77.599
255.000	9.441	84.056	28.990	-77.459
260.000	9.033	84.123	29.005	-77.317
265.000	8.635	84.191	29.020	-77.172
270.000	8.248	84.259	29.035	-77.026
275.000	7.873	84.330	29.050	-76.877
280.000	7.507	84.401	29.065	-76.726
285.000	7.153	84.474	29.080	-76.573
290.000	6.809	84.548	29.095	-76.418
295.000	6.476	84.623	29.110	-76.260
300.000	6.153	84.699	29.125	-76.100
305.000	5.840	84.777	29.140	-75.938
310.000	5.537	84.857	29.155	-75.773
315.000	5.244	84.937	29.170	-75.606
320.000	4.962	85.019	29.184	-75.437
325.000	4.689	85.103	29.199	-75.265
330.000	4.426	85.188	29.214	-75.090
335.000	4.172	85.274	29.229	-74.912
340.000	3.928	85.362	29.243	-74.732
345.000	3.694	85.452	29.258	-74.550
			29.273	-74.364

TABLE 7-XII

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
350.000	3.468	85.543	29.287	
355.000	3.252	85.636	29.301	-74.176
360.000	3.046	85.730	29.315	-73.985
365.000	2.848	85.826	29.330	-73.791
370.000	2.659	85.923	29.343	-73.593
375.000	2.479	86.022	29.357	-73.393
380.000	2.308	86.123	29.371	-73.190
385.000	2.145	86.226	29.384	-72.984
390.000	1.991	86.330	29.398	-72.774
395.000	1.846	86.437	29.411	-72.561
400.000	1.709	86.545	29.424	-72.345
405.000	1.581	86.655	29.436	-72.125
410.000	1.460	86.767	29.449	-71.902
415.000	1.349	86.881	29.461	-71.675
420.000	1.245	86.996	29.473	-71.445
425.000	1.150	87.114	29.485	-71.211
430.000	1.063	87.234	29.496	-70.973
435.000	0.984	87.356	29.507	-70.731
437.627	0.946	87.421	29.512	-70.486
440.000	0.898	87.481	29.518	-70.355
445.000	0.801	87.608	29.528	-70.236
450.000	0.710	87.738	29.538	-69.983
455.000	0.627	87.869	29.547	-69.727
460.000	0.551	88.002	29.556	-69.467
465.000	0.481	88.137	29.564	-69.203
470.000	0.419	88.274	29.572	-68.936
475.000	0.363	88.412	29.580	-68.665
480.000	0.314	88.553	29.587	-68.391
485.000	0.272	88.696	29.593	-68.112
490.000	0.237	88.841	29.599	-67.830
495.000	0.210	88.988	29.604	-67.544
500.000	0.189	89.137	29.609	-67.253
505.000	0.175	89.288	29.612	-66.959
510.000	0.168	89.442	29.616	-66.660
515.000	0.169	89.597	29.618	-66.357
520.000	0.177	89.755	29.620	-66.050
525.000	0.191	89.916	29.620	-65.738
530.000	0.214	90.079	29.620	-65.422
535.000	0.243	90.244	29.620	-65.100
537.424	0.260	90.325	29.619	-64.774
				-64.615

TABLE 7-XII

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
537.424	0.260	90.325	29.619	-64.615
537.442	0.260	90.325	29.619	-64.613
540.000	0.225	90.414	29.618	-64.444
543.142	0.182	90.523	29.616	-64.236
545.000	0.168	90.587	29.615	-64.113
545.742	0.162	90.612	29.615	-64.064
549.542	0.134	90.743	29.612	-63.811
550.000	0.131	90.759	29.612	-63.781
555.000	0.098	90.932	29.607	-63.447
560.000	0.067	91.106	29.601	-63.112
565.000	0.039	91.280	29.595	-62.775
570.000	0.012	91.456	29.587	-62.436
575.000	-0.012	91.632	29.579	-62.096
580.000	-0.033	91.808	29.569	-61.755
585.000	-0.051	91.986	29.559	-61.411
590.000	-0.067	92.164	29.547	-61.067
595.000	-0.080	92.343	29.535	-60.720
600.000	-0.091	92.523	29.521	-60.372
605.000	-0.098	92.703	29.506	-60.023
610.000	-0.102	92.884	29.490	-59.671
615.000	-0.104	93.066	29.473	-59.318
620.000	-0.103	93.249	29.455	-58.964
625.000	-0.098	93.432	29.436	-58.608
630.000	-0.091	93.616	29.415	-58.250
635.000	-0.080	93.801	29.394	-57.890
640.000	-0.067	93.987	29.371	-57.529
645.000	-0.050	94.173	29.347	-57.166
650.000	-0.030	94.361	29.322	-56.802
655.000	-0.006	94.549	29.296	-56.436
656.031	0.000	94.588	29.290	-56.360
660.000	0.000	94.588	29.290	-56.068
670.000	0.000	94.739	29.268	-55.334
680.000	0.000	95.117	29.209	-54.601
690.000	0.000	95.493	29.146	-53.869
700.000	0.000	95.869	29.079	-53.138
710.000	0.000	96.243	28.930	-52.408
720.000	0.000	96.616	28.849	-51.679
730.000	0.001	96.987	28.764	-50.952
740.000	0.001	97.357	28.674	-50.225

TABLE 7-XII

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
740.031	0.001	97.726	28.674	-50.223
750.000	0.001	98.091	28.580	-49.500
760.000	0.001	98.456	28.482	-48.777
770.000	0.001	98.819	28.379	-48.055
780.000	0.001	99.180	28.273	-47.334
790.000	0.001	99.538	28.162	-46.615
800.000	0.001	99.895	28.046	-45.897
900.000	0.002	103.335	26.669	-38.819
1000.000	0.003	106.503	24.907	-31.941
1100.000	0.004	109.359	22.799	-25.286
1200.000	0.005	111.874	20.388	-18.859
1300.000	0.006	114.033	17.717	-12.650
1400.000	0.006	115.830	14.829	-6.642
1500.000	0.007	117.266	11.765	-0.805
1600.000	0.007	118.343	8.567	4.893
1700.000	0.008	119.066	5.274	10.488
1800.000	0.008	119.439	1.923	16.020
1900.000	0.009	119.463	-1.449	21.529
2000.000	0.010	119.140	-4.805	27.056
2100.000	0.011	118.466	-8.109	32.639
2200.000	0.012	117.439	-11.322	38.320
2300.000	0.014	116.055	-14.406	44.134
2400.000	0.015	114.309	-17.321	50.115
2500.000	0.017	112.201	-20.025	56.292
2600.000	0.020	109.737	-22.475	62.686
2700.000	0.022	106.929	-24.628	69.306
2800.000	0.025	103.804	-26.440	76.150
2900.000	0.027	100.402	-27.874	83.197
3000.000	0.030	96.778	-28.895	90.413
3100.000	0.033	93.004	-29.478	97.745
3200.000	0.035	89.163	-29.607	105.131
3300.000	0.037	85.340	-29.280	112.500
3400.000	0.038	81.624	-28.504	119.785
3500.000	0.039	78.091	-27.301	126.928
3600.000	0.039	74.806	-25.700	133.884
3700.000	0.038	71.818	-23.737	140.624
3800.000	0.037	69.160	-21.455	147.136
3900.000	0.035	66.851	-18.895	153.424
4000.000	0.032	64.902	-16.100	159.502
4100.000	0.029	63.313	-13.114	-194.604

TABLE 7-XII

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
4200.000	0.025	62.083	-9.977	-188.865
4300.000	0.021	61.208	-6.728	-183.243
4400.000	0.016	60.682	-3.406	-177.703
4500.000	0.011	60.505	-0.047	-172.203
4600.000	0.007	60.673	3.312	-166.704
4700.000	0.002	61.188	6.635	-161.166
4800.000	-0.003	62.053	9.886	-155.549
4900.000	-0.007	63.273	13.026	-149.814
5000.000	-0.011	64.850	16.016	-143.928
5100.000	-0.014	66.789	18.815	-137.858
5200.000	-0.017	69.085	21.382	-131.580
5300.000	-0.019	71.732	23.672	-125.078
5400.000	-0.021	74.708	25.644	-118.350
5500.000	-0.022	77.982	27.256	-111.406
5600.000	-0.022	81.505	28.471	-104.274
5700.000	-0.022	85.214	29.261	-96.999
5800.000	-0.021	89.031	29.603	-89.638
5900.000	-0.019	92.870	29.490	-82.259
6000.000	-0.018	96.644	28.924	-74.931
6100.000	-0.016	100.271	27.919	-67.717
6200.000	-0.014	103.680	26.502	-60.669
6300.000	-0.012	106.813	24.705	-53.825
6400.000	-0.009	109.631	22.567	-47.203
6500.000	-0.007	112.107	20.131	-40.807
6600.000	-0.005	114.227	17.440	-34.628
6700.000	-0.003	115.987	14.536	-28.646
6800.000	-0.001	117.386	11.462	-22.832
6900.000	0.001	118.427	8.257	-17.154
7000.000	0.003	119.116	4.960	-11.573
7100.000	0.004	119.456	1.610	-6.052
7200.000	0.006	119.448	-1.758	-0.550
7300.000	0.008	119.093	-5.107	4.973
7400.000	0.010	118.389	-8.400	10.557
7500.000	0.012	117.332	-11.600	16.240
7600.000	0.014	115.917	-14.667	22.060
7700.000	0.017	114.142	-17.562	28.049
7800.000	0.019	112.007	-20.243	34.236
7900.000	0.022	109.516	-22.666	40.640
8000.000	0.025	106.684	-24.790	47.270
8100.000	0.028	103.539	-26.571	54.122

TABLE 7-XII

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
8200.000	0.031	100.121	-27.971	61.175
8300.000	0.034	96.488	-28.957	68.393
8400.000	0.036	92.710	-29.504	75.721
8500.000	0.038	88.872	-29.598	83.097
8600.000	0.040	85.060	-29.237	90.452
8700.000	0.041	81.360	-28.430	97.718
8800.000	0.041	77.847	-27.199	104.838
8900.000	0.041	74.587	-25.574	111.769
9000.000	0.040	71.625	-23.590	118.484
9100.000	0.038	68.993	-21.291	124.971
9200.000	0.036	66.712	-18.717	131.234
9300.000	0.032	64.788	-15.913	137.291
9400.000	0.029	63.225	-12.921	-216.835
9500.000	0.024	62.019	-9.780	-211.113
9600.000	0.019	61.166	-6.530	-205.506
9700.000	0.014	60.662	-3.210	-199.977
9800.000	0.009	60.505	0.146	-194.487
9900.000	0.003	60.692	3.499	-188.995
10000.000	-0.002	61.226	6.815	-183.462
10100.000	-0.007	62.109	10.056	-177.848
10200.000	-0.011	63.346	13.185	-172.115
10300.000	-0.016	64.940	16.162	-166.228
10400.000	-0.019	66.893	18.947	-160.157
10500.000	-0.022	69.204	21.498	-153.877
10600.000	-0.024	71.863	23.771	-147.374
10700.000	-0.026	74.850	25.725	-140.644
10800.000	-0.027	78.132	27.318	-133.700
10900.000	-0.027	81.661	28.514	-126.570
11000.000	-0.026	85.371	29.284	-119.299
11100.000	-0.025	89.186	29.608	-111.945
11200.000	-0.024	93.020	29.476	-104.576
11300.000	-0.022	96.786	28.893	-97.260
11400.000	-0.020	100.401	27.874	-90.060
11500.000	-0.017	103.797	26.444	-83.028
11600.000	-0.015	106.916	24.636	-76.199
11700.000	-0.012	109.720	22.490	-69.592
11800.000	-0.010	112.181	20.047	-63.212
11900.000	-0.007	114.288	17.351	-57.047
12000.000	-0.005	116.034	14.445	-51.077
12100.000	-0.002	117.421	11.369	-45.274

TABLE 7-XII

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
12200.000	0.000	118.452	8.165	-39.605
12300.000	0.002	119.130	4.870	-34.033
12400.000	0.004	119.460	1.522	-28.519
12500.000	0.007	119.444	-1.843	-23.024
12600.000	0.009	119.080	-5.187	-17.506
12700.000	0.011	118.369	-8.475	-11.927
12800.000	0.014	117.305	-11.669	-6.247
12900.000	0.016	115.884	-14.729	-0.431
13000.000	0.019	114.103	-17.617	5.556
13100.000	0.022	111.963	-20.290	11.739
13200.000	0.025	109.469	-22.706	18.140
13300.000	0.028	106.635	-24.822	24.766
13400.000	0.031	103.489	-26.595	31.613
13500.000	0.034	100.071	-27.988	38.660
13600.000	0.037	96.439	-28.967	45.871
13700.000	0.039	92.665	-29.508	53.191
13800.000	0.041	88.831	-29.597	60.558
13900.000	0.043	85.024	-29.232	67.903
14000.000	0.044	81.330	-28.422	75.159
14100.000	0.044	77.824	-27.189	82.269
14200.000	0.043	74.569	-25.563	89.189
14300.000	0.042	71.612	-23.580	95.894
14400.000	0.040	68.985	-21.283	102.371
14500.000	0.037	66.707	-18.712	108.626
14600.000	0.033	64.787	-15.911	114.674
14700.000	0.029	63.226	-12.922	-239.460
14800.000	0.024	62.021	-9.785	-233.745
14900.000	0.019	61.168	-6.540	-228.146
15000.000	0.013	60.664	-3.224	-222.625
15100.000	0.007	60.505	0.127	-217.142
15200.000	0.002	60.690	3.476	-211.658
15300.000	-0.004	61.220	6.788	-206.132
15400.000	-0.010	62.099	10.026	-200.527
15500.000	-0.015	63.331	13.152	-194.803
15600.000	-0.019	64.919	16.128	-188.925
15700.000	-0.023	66.865	18.912	-182.865
15800.000	-0.026	69.169	21.463	-176.596
15900.000	-0.029	71.820	23.738	-170.104
16000.000	-0.030	74.798	25.695	-163.386
16100.000	-0.031	78.072	27.293	-156.454

TABLE 7-XII

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
16200.000	-0.031	81.592	28.495	-149.336
16300.000	-0.031	85.296	29.273	-142.075
16400.000	-0.030	89.105	29.605	-134.731
16500.000	-0.028	92.936	29.484	-127.370
16550.000	-0.027	94.831	29.254	-123.704

TABLE 7-XIII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (81-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
0.000	-0.00	0.00	0.00	-0.00	-9.00	-9.00
5.000	-0.00	-0.00	0.00	0.00	-9.00	-9.00
10.000	-0.00	0.00	0.00	-0.00	-9.00	-9.00
12.000	-0.03	0.00	0.00	-0.00	-8.00	-9.00
15.000	-0.45	-0.12	0.00	-0.00	-5.00	-5.31
20.000	-1.09	-0.86	0.00	-0.00	0.00	-0.58
25.000	-2.18	-1.79	0.00	-0.01	0.00	-0.31
30.000	-3.68	-3.21	0.00	-0.00	0.00	-0.07
35.000	-5.61	-5.04	0.00	0.00	0.00	-0.01
40.000	-8.01	-7.35	0.00	0.00	0.00	-0.00
45.000	-10.81	-10.10	0.00	0.00	0.00	-0.00
50.000	-13.95	-13.22	0.00	0.00	0.00	-0.00
55.000	-17.35	-16.61	0.00	0.00	0.00	-0.00
60.000	-20.92	-20.20	0.00	0.00	0.00	-0.00
65.000	-24.53	-23.88	0.00	-0.00	0.00	0.00
70.000	-28.15	-27.53	0.00	-0.00	0.00	0.00
75.000	-31.71	-31.12	0.00	0.01	0.00	-0.00
80.000	-35.16	-34.60	0.00	0.01	0.00	-0.00
82.000	-36.50	-35.96	0.00	0.01	0.00	-0.00
85.000	-38.45	-37.94	0.00	0.01	0.00	-0.00
90.000	-41.57	-41.11	0.00	0.00	0.00	-0.00
95.000	-44.53	-44.13	0.00	-0.00	0.00	-0.00
100.000	-47.32	-46.99	0.00	-0.00	0.00	0.00
105.000	-49.94	-50.02	0.00	-0.00	0.00	-0.00
110.000	-52.41	-52.51	0.00	-0.00	0.00	-0.00
115.000	-54.66	-54.54	0.00	-0.00	0.00	-0.00
120.000	-56.71	-56.49	0.00	-0.00	0.00	0.00
125.000	-58.58	-58.37	0.00	-0.00	0.00	0.00
130.000	-60.31	-60.10	0.00	-0.00	0.00	0.00
135.000	-61.89	-61.70	0.00	-0.00	0.00	0.00
140.000	-63.34	-63.16	0.00	-0.00	0.00	0.00
145.000	-64.67	-64.51	0.00	-0.00	0.00	0.00
147.329	-65.26	-65.10	0.00	-0.00	0.00	-0.00
150.000	-65.90	-65.75	0.00	-0.00	0.00	-0.00
155.000	-66.59	-66.84	0.00	-0.00	0.00	0.00
159.329	-66.59	-66.90	0.00	0.00	0.00	0.00
159.329	-66.59	-66.90	0.00	0.00	0.00	0.00
159.459	-66.59	-66.90	0.00	0.00	0.00	0.00
160.000	-66.59	-66.87	0.00	-0.00	0.00	0.00
163.759	-66.59	-66.55	0.00	-0.00	0.00	0.00

TABLE 7-XIII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
165.000	-66.59	-66.48	0.00	-0.00	0.00	0.00
165.859	-66.59	-66.47	0.00	-0.00	0.00	0.00
170.000	-66.59	-66.57	0.00	-0.00	0.00	0.00
175.000	-66.59	-66.57	0.00	-0.00	0.00	0.00
180.000	-66.59	-66.58	0.00	-0.00	0.00	0.00
185.000	-66.59	-66.59	0.00	-0.00	0.00	0.00
189.559	-66.59	-66.59	0.00	-0.00	0.00	0.00
190.000	-66.59	-66.59	0.00	-0.00	0.00	0.00
194.559	-66.59	-66.59	0.00	-0.00	0.00	0.00
195.000	-66.59	-66.59	0.00	-0.00	0.00	-0.00
200.000	-65.59	-66.59	0.00	-0.00	0.00	-0.00
205.000	-62.38	-62.57	0.00	0.00	0.00	0.00
210.000	-62.91	-62.66	0.00	0.00	0.00	0.00
215.000	-63.43	-63.27	0.00	0.00	0.00	-0.00
220.000	-63.95	-63.77	0.00	0.00	0.00	-0.00
225.000	-64.50	-64.31	-0.00	-0.00	0.00	-0.00
230.000	-65.04	-64.86	-0.00	-0.00	0.00	-0.00
235.000	-65.57	-65.39	-0.00	-0.00	0.00	0.00
240.000	-66.10	-65.92	-0.00	-0.00	0.00	0.00
245.000	-66.63	-66.45	-0.00	-0.00	0.00	0.00
250.000	-67.16	-66.98	-0.00	-0.00	0.00	0.00
255.000	-67.69	-67.51	-0.00	-0.00	0.00	0.00
260.000	-68.22	-68.04	-0.00	-0.00	0.00	0.00
265.000	-68.76	-68.58	-0.01	-0.00	0.00	0.00
270.000	-69.29	-69.11	-0.01	-0.01	0.00	0.00
275.000	-69.83	-69.65	-0.01	-0.01	0.00	0.00
280.000	-70.36	-70.18	-0.01	-0.01	0.00	0.00
285.000	-70.90	-70.72	-0.01	-0.01	0.00	0.00
290.000	-71.44	-71.26	-0.01	-0.01	0.00	0.00
295.000	-71.98	-71.80	-0.01	-0.01	0.00	0.00
300.000	-72.53	-72.34	-0.01	-0.01	0.00	0.00
305.000	-73.07	-72.89	-0.01	-0.01	0.00	0.00
310.000	-73.61	-73.43	-0.01	-0.01	0.00	0.00
315.000	-74.16	-73.98	-0.01	-0.01	0.00	0.00
320.000	-74.71	-74.52	-0.01	-0.01	0.00	0.00
325.000	-75.26	-75.07	-0.01	-0.01	0.00	0.00
330.000	-75.81	-75.62	-0.01	-0.01	0.00	0.00
335.000	-76.36	-76.17	-0.01	-0.01	0.00	0.00
340.000	-76.91	-76.72	-0.01	-0.01	0.00	0.00
345.000	-77.46	-77.27	-0.01	-0.01	0.00	0.00

TABLE 7-XIII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
350.000	-78.01	-77.82	-0.01	-0.01	0.00	0.00
355.000	-78.57	-78.38	-0.01	-0.01	0.00	0.00
360.000	-79.12	-78.93	-0.01	-0.01	0.00	0.00
365.000	-79.67	-79.49	-0.01	-0.01	0.00	0.00
370.000	-80.23	-80.04	-0.01	-0.01	0.00	0.00
375.000	-80.78	-80.60	-0.01	-0.01	0.00	0.00
380.000	-81.34	-81.15	-0.01	-0.01	0.00	0.00
385.000	-81.89	-81.71	-0.01	-0.01	0.00	0.00
390.000	-82.45	-82.26	-0.01	-0.01	0.00	0.00
395.000	-83.00	-82.82	-0.01	-0.01	0.00	0.00
400.000	-83.56	-83.37	-0.01	-0.01	0.00	0.00
405.000	-84.11	-83.93	-0.01	-0.01	0.00	0.00
410.000	-84.67	-84.48	-0.01	-0.01	0.00	0.00
415.000	-85.22	-85.04	-0.01	-0.01	0.00	0.00
420.000	-85.78	-85.59	-0.01	-0.01	0.00	0.00
425.000	-86.33	-86.14	-0.01	-0.01	0.00	0.00
430.000	-86.88	-86.69	-0.01	-0.01	0.00	0.00
435.000	-87.43	-87.25	-0.01	-0.01	0.00	0.00
437.627	-87.72	-87.54	-0.01	-0.01	0.00	0.00
440.000	-87.98	-87.80	-0.01	-0.01	0.00	0.00
445.000	-88.53	-88.35	-0.01	-0.01	0.00	0.00
450.000	-89.08	-88.90	-0.01	-0.01	0.00	0.00
455.000	-89.62	-89.44	-0.01	-0.01	0.00	0.00
460.000	-90.17	-89.98	-0.01	-0.01	0.00	0.00
465.000	-90.71	-90.53	-0.01	-0.01	0.00	0.00
470.000	-91.24	-91.06	-0.00	-0.01	0.00	0.00
475.000	-91.78	-91.60	-0.00	-0.00	0.00	0.00
480.000	-92.31	-92.13	-0.00	-0.00	0.00	0.00
485.000	-92.84	-92.67	-0.00	-0.00	0.00	0.00
490.000	-93.37	-93.19	-0.00	-0.00	0.00	0.00
495.000	-93.90	-93.72	-0.00	-0.00	0.00	0.00
500.000	-94.42	-94.24	-0.00	-0.00	0.00	0.00
505.000	-94.94	-94.76	0.00	0.00	0.00	-0.00
510.000	-95.45	-95.28	0.00	0.00	0.00	-0.00
515.000	-95.97	-95.80	0.00	0.00	0.00	-0.00
520.000	-96.48	-96.31	0.00	0.00	0.00	-0.00
525.000	-97.00	-96.82	0.00	0.00	0.00	-0.00
530.000	-97.51	-97.34	0.00	0.00	0.00	-0.00
535.000	-98.03	-97.85	-0.00	0.00	0.00	-0.00
537.424	-98.29	-98.11	-0.00	-0.00	0.00	0.00

TABLE 7-XIII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
537.424	-98.29	-98.11	-0.00	-0.00	0.00	0.00
537.442	-98.29	-98.11	-0.00	-0.00	0.00	0.00
540.000	-98.17	-98.35	-0.00	-0.00	0.00	-0.00
543.142	-98.17	-98.48	-0.00	-0.00	0.00	0.00
545.000	-98.95	-98.51	-0.01	-0.00	0.00	0.00
545.742	-99.01	-98.73	-0.01	-0.01	0.00	-0.00
549.542	-99.37	-99.30	-0.01	-0.01	0.00	-0.00
550.000	-99.41	-99.33	-0.01	-0.01	0.00	-0.00
555.000	-99.93	-99.80	-0.01	-0.01	0.00	-0.00
560.000	-100.45	-100.32	-0.01	-0.01	0.00	-0.00
565.000	-100.99	-100.86	-0.01	-0.01	0.00	-0.00
570.000	-101.53	-101.42	-0.01	-0.01	0.00	-0.00
575.000	-101.99	-101.87	-0.01	-0.01	0.00	-0.00
580.000	-102.44	-102.34	-0.01	-0.01	0.00	-0.00
585.000	-102.89	-102.78	-0.01	-0.01	0.00	-0.00
590.000	-103.32	-103.22	-0.01	-0.01	0.00	-0.00
595.000	-103.76	-103.65	-0.01	-0.01	0.00	-0.00
600.000	-104.18	-104.08	-0.01	-0.01	0.00	-0.00
605.000	-104.60	-104.50	-0.00	-0.01	0.00	-0.00
610.000	-105.01	-104.91	-0.00	-0.00	0.00	-0.00
615.000	-105.41	-105.31	0.01	0.00	0.00	-0.00
620.000	-105.80	-105.71	0.01	0.01	0.00	-0.00
625.000	-106.19	-106.10	0.02	0.02	0.00	-0.00
630.000	-106.56	-106.48	0.04	0.03	0.00	-0.00
635.000	-106.93	-106.85	0.05	0.05	0.00	-0.00
640.000	-107.28	-107.20	0.08	0.07	0.00	0.00
645.000	-107.59	-107.54	0.11	0.10	0.00	0.00
650.000	-107.94	-108.04	0.26	0.32	0.00	0.00
655.000	-107.81	-107.75	0.17	0.14	0.00	0.00
656.031	-107.81	-107.77	0.17	0.15	0.00	0.00
656.031	-107.78	-107.78	0.32	0.32	-0.00	-0.00
660.000	-111.89	-111.89	0.29	0.29	-0.00	-0.00
670.000	-114.53	-114.53	0.27	0.27	-0.00	-0.00
680.000	-115.21	-115.21	0.26	0.26	-0.00	-0.00
690.000	-115.89	-115.89	0.26	0.26	-0.00	-0.00
700.000	-116.58	-116.58	0.26	0.26	-0.00	-0.00
710.000	-117.26	-117.26	0.25	0.25	-0.00	-0.00
720.000	-117.94	-117.94	0.25	0.25	-0.00	-0.00
730.000	-118.62	-118.62	0.24	0.24	-0.00	-0.00
740.000	-119.30	-119.30	0.24	0.24	-0.00	-0.00

TABLE 7-XIII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
740.031	-119.30	-119.30	0.24	0.24	-0.00	-0.00
750.000	-119.98	-119.98	0.23	0.23	-0.00	-0.00
760.000	-120.66	-120.66	0.23	0.23	-0.00	-0.00
770.000	-121.34	-121.34	0.22	0.22	-0.00	-0.00
780.000	-122.02	-122.02	0.22	0.22	-0.00	-0.00
790.000	-122.70	-122.70	0.21	0.21	-0.00	-0.00
800.000	-123.38	-123.38	0.21	0.21	-0.00	-0.00
900.000	-130.18	-130.18	0.15	0.15	-0.00	-0.00
1000.000	-136.99	-136.99	0.10	0.10	-0.00	-0.00
1100.000	-143.79	-143.79	0.04	0.04	-0.00	-0.00
1200.000	-150.60	-150.60	-0.02	-0.02	-0.00	-0.00
1300.000	-157.40	-157.40	-0.08	-0.08	-0.00	-0.00
1400.000	-164.21	-164.21	-0.13	-0.13	-0.00	-0.00
1500.000	-171.02	-171.02	-0.19	-0.19	-0.00	-0.00
1600.000	-177.82	-177.82	-0.25	-0.25	-0.00	-0.00
1700.000	175.37	175.37	-0.30	-0.30	-0.00	-0.00
1800.000	168.56	168.56	-0.35	-0.35	-0.00	-0.00
1900.000	161.76	161.76	-0.40	-0.40	-0.00	-0.00
2000.000	154.95	154.95	-0.44	-0.44	-0.00	-0.00
2100.000	148.14	148.14	-0.48	-0.48	-0.00	-0.00
2200.000	141.34	141.34	-0.51	-0.51	-0.00	-0.00
2300.000	134.53	134.53	-0.53	-0.53	-0.00	-0.00
2400.000	127.73	127.73	-0.55	-0.55	-0.00	-0.00
2500.000	120.93	120.93	-0.56	-0.56	-0.00	-0.00
2600.000	114.12	114.12	-0.57	-0.57	-0.00	-0.00
2700.000	107.32	107.32	-0.56	-0.56	-0.00	-0.00
2800.000	100.52	100.52	-0.55	-0.55	-0.00	-0.00
2900.000	93.72	93.72	-0.53	-0.53	-0.00	-0.00
3000.000	86.92	86.92	-0.51	-0.51	-0.00	-0.00
3100.000	80.13	80.13	-0.48	-0.48	-0.00	-0.00
3200.000	73.33	73.33	-0.44	-0.44	-0.00	-0.00
3300.000	66.53	66.53	-0.39	-0.39	-0.00	-0.00
3400.000	59.74	59.74	-0.34	-0.34	43.97	43.97
3500.000	52.94	52.94	-0.29	-0.29	143.97	143.97
3600.000	26.15	26.15	-0.01	-0.01	180.00	180.00
3700.000	19.35	19.35	0.05	0.05	180.00	180.00
3800.000	12.56	12.56	0.12	0.12	180.00	180.00
3900.000	5.76	5.76	0.19	0.19	180.00	180.00
4000.000	-1.03	-1.03	0.25	0.25	180.00	180.00
4100.000	-7.83	-7.83	0.32	0.32	180.00	180.00

TABLE 7-XIII
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
4200.000	-14.62	-14.62	0.38	0.38	180.00	180.00
4300.000	-21.42	-21.42	0.43	0.43	180.00	180.00
4400.000	-28.22	-28.22	0.48	0.48	180.00	180.00
4500.000	-35.01	-35.01	0.53	0.53	180.00	180.00
4600.000	-41.81	-41.81	0.56	0.56	180.00	180.00
4700.000	-48.60	-48.60	0.60	0.60	180.00	180.00
4800.000	-55.40	-55.40	0.62	0.62	180.00	180.00
4900.000	-62.19	-62.19	0.63	0.63	180.00	180.00
5000.000	-68.99	-68.99	0.64	0.64	180.00	180.00
5100.000	-75.78	-75.78	0.64	0.64	180.00	180.00
5200.000	-82.57	-82.57	0.63	0.63	180.00	180.00
5300.000	-89.37	-89.37	0.61	0.61	180.00	180.00
5400.000	-96.16	-96.16	0.59	0.59	180.00	180.00
5500.000	-102.95	-102.95	0.55	0.55	180.00	180.00
5600.000	-109.74	-109.74	0.51	0.51	180.00	180.00
5700.000	-116.53	-116.53	0.46	0.46	180.00	180.00
5800.000	-123.33	-123.33	0.41	0.41	180.00	180.00
5900.000	-110.12	-110.12	0.53	0.53	156.03	156.03
6000.000	-116.91	-116.91	0.48	0.48	56.03	56.03
6100.000	-123.70	-123.70	0.43	0.43	-0.00	-0.00
6200.000	-130.50	-130.50	0.36	0.36	-0.00	-0.00
6300.000	-137.29	-137.29	0.30	0.30	-0.00	-0.00
6400.000	-144.08	-144.08	0.22	0.22	-0.00	-0.00
6500.000	-150.88	-150.88	0.15	0.15	-0.00	-0.00
6600.000	-157.67	-157.67	0.07	0.07	-0.00	-0.00
6700.000	-164.47	-164.47	-0.02	-0.02	-0.00	-0.00
6800.000	-171.27	-171.27	-0.10	-0.10	-0.00	-0.00
6900.000	-178.06	-178.06	-0.18	-0.18	-0.00	-0.00
7000.000	175.14	175.14	-0.26	-0.26	-0.00	-0.00
7100.000	168.34	168.34	-0.34	-0.34	-0.00	-0.00
7200.000	161.55	161.55	-0.41	-0.41	-0.00	-0.00
7300.000	154.75	154.75	-0.48	-0.48	-0.00	-0.00
7400.000	147.95	147.95	-0.55	-0.55	-0.00	-0.00
7500.000	141.16	141.16	-0.60	-0.60	-0.00	-0.00
7600.000	134.36	134.36	-0.65	-0.65	-0.00	-0.00
7700.000	127.57	127.57	-0.69	-0.69	-0.00	-0.00
7800.000	120.77	120.77	-0.73	-0.73	-0.00	-0.00
7900.000	113.98	113.98	-0.75	-0.75	-0.00	-0.00
8000.000	107.18	107.18	-0.76	-0.76	-0.00	-0.00
8100.000	100.39	100.39	-0.76	-0.76	-0.00	-0.00

TABLE 7-XIII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
8200.000	93.60	93.60	-0.76	-0.76	-0.00	-0.00
8300.000	86.81	86.81	-0.74	-0.74	-0.00	-0.00
8400.000	80.02	80.02	-0.71	-0.71	-0.00	-0.00
8500.000	73.23	73.23	-0.67	-0.67	-0.00	-0.00
8600.000	66.45	66.45	-0.63	-0.63	-0.00	-0.00
8700.000	59.66	59.66	-0.57	-0.57	-0.00	-0.00
8800.000	52.87	52.87	-0.51	-0.51	-0.00	-0.00
8900.000	46.09	46.09	-0.43	-0.43	-0.00	-0.00
9000.000	39.30	39.30	-0.36	-0.36	-0.00	-0.00
9100.000	32.51	32.51	-0.27	-0.27	-0.00	-0.00
9200.000	25.73	25.73	-0.18	-0.18	-0.00	-0.00
9300.000	18.94	18.94	-0.09	-0.09	-0.00	-0.00
9400.000	12.16	12.16	0.00	0.00	-0.00	-0.00
9500.000	5.37	5.37	0.10	0.10	-0.00	-0.00
9600.000	-1.41	-1.41	0.19	0.19	-0.00	-0.00
9700.000	-8.20	-8.20	0.29	0.29	-0.00	-0.00
9800.000	-14.99	-14.99	0.38	0.38	-0.00	-0.00
9900.000	-21.77	-21.77	0.46	0.46	-0.00	-0.00
10000.000	-28.56	-28.56	0.54	0.54	-0.00	-0.00
10100.000	-35.34	-35.34	0.62	0.62	-0.00	-0.00
10200.000	-42.13	-42.13	0.68	0.68	-0.00	-0.00
10300.000	-48.91	-48.91	0.74	0.74	-0.00	-0.00
10400.000	-55.70	-55.70	0.79	0.79	-0.00	-0.00
10500.000	-62.48	-62.48	0.83	0.83	-0.00	-0.00
10600.000	-69.27	-69.27	0.85	0.85	-0.00	-0.00
10700.000	-76.05	-76.05	0.87	0.87	-0.00	-0.00
10800.000	-82.84	-82.84	0.87	0.87	-0.00	-0.00
10900.000	-89.62	-89.62	0.86	0.86	-0.00	-0.00
11000.000	-96.41	-96.41	0.84	0.84	-0.00	-0.00
11100.000	-103.19	-103.19	0.81	0.81	-0.00	-0.00
11200.000	-109.97	-109.97	0.77	0.77	-0.00	-0.00
11300.000	-116.76	-116.76	0.72	0.72	-0.00	-0.00
11400.000	-123.54	-123.54	0.65	0.65	-0.00	-0.00
11500.000	-130.33	-130.33	0.58	0.58	-0.00	-0.00
11600.000	-137.11	-137.11	0.50	0.50	-0.00	-0.00
11700.000	-143.90	-143.90	0.41	0.41	-0.00	-0.00
11800.000	-150.69	-150.69	0.31	0.31	-0.00	-0.00
11900.000	-157.47	-157.47	0.21	0.21	-0.00	-0.00
12000.000	-164.26	-164.26	0.11	0.11	-0.00	-0.00
12100.000	-171.05	-171.05	-0.00	-0.00	-0.00	-0.00

TABLE 7-XIII
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
12200.000	-177.84	-177.84	-0.11	-0.11	-0.00	-0.00
12300.000	175.37	175.37	-0.22	-0.22	-0.00	-0.00
12400.000	168.58	168.58	-0.32	-0.32	-0.00	-0.00
12500.000	161.79	161.79	-0.42	-0.42	-0.00	-0.00
12600.000	155.00	155.00	-0.52	-0.52	-0.00	-0.00
12700.000	148.22	148.22	-0.61	-0.61	-0.00	-0.00
12800.000	141.43	141.43	-0.70	-0.70	-0.00	-0.00
12900.000	134.64	134.64	-0.77	-0.77	-0.00	-0.00
13000.000	127.85	127.85	-0.84	-0.84	-0.00	-0.00
13100.000	121.06	121.06	-0.89	-0.89	-0.00	-0.00
13200.000	114.28	114.28	-0.93	-0.93	-0.00	-0.00
13300.000	107.49	107.49	-0.96	-0.96	-0.00	-0.00
13400.000	100.71	100.71	-0.98	-0.98	-0.00	-0.00
13500.000	93.93	93.93	-0.98	-0.98	-0.00	-0.00
13600.000	87.14	87.14	-0.97	-0.97	-0.00	-0.00
13700.000	80.36	80.36	-0.95	-0.95	-0.00	-0.00
13800.000	73.58	73.58	-0.91	-0.91	-0.00	-0.00
13900.000	66.80	66.80	-0.86	-0.86	-0.00	-0.00
14000.000	60.02	60.02	-0.80	-0.80	-0.00	-0.00
14100.000	53.24	53.24	-0.73	-0.73	-0.00	-0.00
14200.000	46.46	46.46	-0.64	-0.64	-0.00	-0.00
14300.000	39.69	39.69	-0.55	-0.55	-0.00	-0.00
14400.000	32.91	32.91	-0.45	-0.45	-0.00	-0.00
14500.000	26.13	26.13	-0.34	-0.34	-0.00	-0.00
14600.000	19.35	19.35	-0.23	-0.23	-0.00	-0.00
14700.000	12.58	12.58	-0.11	-0.11	-0.00	-0.00
14800.000	5.80	5.80	0.01	0.01	-0.00	-0.00
14900.000	-0.98	-0.98	0.13	0.13	-0.00	-0.00
15000.000	-7.76	-7.76	0.25	0.25	-0.00	-0.00
15100.000	-14.53	-14.53	0.37	0.37	-0.00	-0.00
15200.000	-21.31	-21.31	0.48	0.48	-0.00	-0.00
15300.000	-28.09	-28.09	0.59	0.59	-0.00	-0.00
15400.000	-34.87	-34.87	0.69	0.69	-0.00	-0.00
15500.000	-41.64	-41.64	0.79	0.79	-0.00	-0.00
15600.000	-48.42	-48.42	0.87	0.87	-0.00	-0.00
15700.000	-55.20	-55.20	0.94	0.94	-0.00	-0.00
15800.000	-61.97	-61.97	1.00	1.00	-0.00	-0.00
15900.000	-68.75	-68.75	1.04	1.04	-0.00	-0.00
16000.000	-75.53	-75.53	1.07	1.07	-0.00	-0.00
16100.000	-82.31	-82.31	1.09	1.09	-0.00	-0.00

TABLE 7-XIII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
16200.000	-89.08	-89.08	1.09	1.09	-0.00	-0.00
16300.000	-95.86	-95.86	1.08	1.08	-0.00	-0.00
16400.000	-102.64	-102.64	1.05	1.05	-0.00	-0.00
16500.000	-109.41	-109.41	1.01	1.01	-0.00	-0.00
16550.000	-112.80	-112.80	0.98	0.98	-0.00	-0.00

TABLE 7-XIV

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
0.000	0.00	0.000	0.00	0.
5.000	0.03	89.830	0.03	89.
10.000	0.06	89.794	0.09	90.
12.000	0.08	89.777	0.11	90.
15.000	0.10	89.750	0.25	91.
20.000	0.15	89.566	0.43	87.
25.000	0.20	88.547	0.29	84.
30.000	0.25	87.056	0.19	78.
35.000	0.32	85.090	0.06	41.
40.000	0.39	82.711	0.08	-55.
45.000	0.47	79.928	0.11	-68.
50.000	0.57	76.810	0.14	-73.
55.000	0.68	73.437	0.14	-74.
60.000	0.80	69.891	0.11	-73.
65.000	0.94	66.252	0.10	-73.
70.000	1.11	62.606	0.12	-76.
75.000	1.30	59.019	0.14	-78.
80.000	1.53	55.547	0.16	-80.
82.000	1.63	54.201	0.16	-81.
85.000	1.78	52.234	0.17	-83.
90.000	2.05	49.107	0.16	-85.
95.000	2.30	46.175	0.10	-87.
100.000	2.55	43.434	0.03	-83.
105.000	2.83	40.858	0.39	90.
110.000	3.14	38.434	0.41	90.
115.000	3.46	36.235	0.18	91.
120.000	3.79	34.249	0.09	94.
125.000	4.14	32.438	0.09	96.
130.000	4.50	30.786	0.10	97.
135.000	4.88	29.281	0.12	98.
140.000	5.31	27.913	0.13	98.
145.000	5.87	26.670	0.14	99.
147.329	6.19	26.132	0.15	99.
150.000	6.51	25.544	0.16	100.
155.000	7.18	24.506	0.11	107.
159.329	7.86	23.704	0.74	-93.
159.329	7.86	23.704	0.74	-93.
159.459	7.87	23.680	0.77	-93.
160.000	7.89	23.582	0.90	-92.
163.759	8.05	22.895	2.00	-91.

TABLE 7-XIV MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
165.000	8.13	22.675	2.32	-91.
165.859	8.18	22.523	2.49	-91.
170.000	8.46	21.802	3.22	-91.
175.000	8.80	20.950	4.18	-91.
180.000	9.14	20.121	5.13	-91.
185.000	9.23	19.314	6.05	-91.
189.559	9.21	18.598	6.87	-91.
190.000	9.20	18.530	6.95	-91.
194.559	9.03	17.836	7.76	-91.
195.000	9.01	17.770	7.83	-91.
200.000	8.86	17.035	8.69	-91.
205.000	8.60	16.345	13.54	-90.
210.000	8.37	15.732	14.18	-90.
215.000	8.15	15.124	14.32	-90.
220.000	7.76	14.530	14.54	-90.
225.000	7.45	13.951	14.72	-90.
230.000	7.16	13.385	14.87	-90.
235.000	6.70	12.833	15.02	-90.
240.000	6.35	12.296	15.17	-91.
245.000	6.07	11.773	15.30	-91.
250.000	5.85	11.263	15.42	-91.
255.000	5.67	10.768	15.53	-91.
260.000	5.52	10.287	15.63	-91.
265.000	5.40	9.820	15.71	-91.
270.000	5.30	9.366	15.78	-91.
275.000	5.22	8.926	15.84	-91.
280.000	5.15	8.499	15.88	-91.
285.000	5.10	8.086	15.91	-91.
290.000	5.08	7.686	15.93	-91.
295.000	5.07	7.298	15.93	-91.
300.000	5.07	6.924	15.93	-91.
305.000	5.07	6.562	15.91	-91.
310.000	5.08	6.213	15.88	-91.
315.000	5.11	5.876	15.84	-91.
320.000	5.14	5.551	15.78	-91.
325.000	5.18	5.238	15.72	-91.
330.000	5.22	4.937	15.65	-91.
335.000	5.26	4.647	15.56	-91.
340.000	5.31	4.369	15.47	-91.
345.000	5.36	4.102	15.37	-91.

TABLE 7-XIV

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
350.000	5.42	3.846	15.25	-91.
355.000	5.48	3.602	15.13	-91.
360.000	5.55	3.368	15.00	-91.
365.000	5.61	3.145	14.86	-91.
370.000	5.68	2.932	14.71	-91.
375.000	5.75	2.730	14.55	-91.
380.000	5.82	2.538	14.39	-91.
385.000	5.90	2.356	14.22	-91.
390.000	5.98	2.184	14.04	-91.
395.000	6.05	2.022	13.85	-91.
400.000	6.14	1.869	13.66	-91.
405.000	6.22	1.727	13.46	-91.
410.000	6.31	1.593	13.26	-91.
415.000	6.40	1.470	13.05	-91.
420.000	6.49	1.355	12.83	-91.
425.000	6.58	1.250	12.61	-91.
430.000	6.68	1.154	12.38	-91.
435.000	6.78	1.067	12.15	-91.
437.627	6.83	1.025	12.03	-92.
440.000	6.87	0.972	11.93	-92.
445.000	6.95	0.866	11.72	-92.
450.000	7.04	0.768	11.52	-92.
455.000	7.13	0.677	11.31	-92.
460.000	7.22	0.594	11.09	-92.
465.000	7.31	0.519	10.88	-92.
470.000	7.41	0.451	10.66	-92.
475.000	7.51	0.390	10.45	-92.
480.000	7.61	0.337	10.23	-92.
485.000	7.71	0.292	10.00	-92.
490.000	7.82	0.255	9.78	-92.
495.000	7.92	0.225	9.56	-92.
500.000	8.03	0.202	9.33	-92.
505.000	8.15	0.187	9.11	-92.
510.000	8.26	0.180	8.88	-92.
515.000	8.38	0.180	8.65	-92.
520.000	8.50	0.188	8.41	-93.
525.000	8.63	0.204	8.18	-93.
530.000	8.75	0.227	7.94	-93.
535.000	8.88	0.258	7.70	-93.
537.424	8.95	0.276	7.57	-93.

TABLE 7-XIV MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
537.424	8.95	0.276	7.57	-93.
537.442	8.95	0.276	7.57	-93.
540.000	8.95	0.239	7.52	-93.
543.142	8.95	0.194	7.63	-93.
545.000	8.96	0.178	7.73	-93.
545.742	8.97	0.172	7.57	-93.
549.542	9.00	0.143	7.26	-93.
550.000	9.00	0.139	7.26	-93.
555.000	9.04	0.104	7.13	-93.
560.000	9.09	0.071	6.96	-94.
565.000	9.13	0.041	6.77	-94.
570.000	9.17	0.013	6.54	-94.
575.000	9.22	-0.012	6.43	-94.
580.000	9.26	-0.035	6.31	-94.
585.000	9.31	-0.055	6.20	-94.
590.000	9.36	-0.071	6.10	-94.
595.000	9.40	-0.085	6.00	-94.
600.000	9.45	-0.096	5.91	-95.
605.000	9.50	-0.104	5.82	-95.
610.000	9.55	-0.109	5.74	-95.
615.000	9.59	-0.110	5.67	-95.
620.000	9.64	-0.109	5.60	-95.
625.000	9.69	-0.104	5.53	-95.
630.000	9.74	-0.096	5.47	-95.
635.000	9.79	-0.085	5.42	-95.
640.000	9.85	-0.071	5.39	-95.
645.000	9.90	-0.053	5.37	-94.
650.000	9.95	-0.031	5.17	-92.
655.000	10.00	-0.006	5.78	-94.
656.031	10.01	0.000	5.82	-94.
656.031	10.01	0.000	5.81	-92.
660.000	10.01	0.000	1.98	-97.
670.000	10.01	0.000	0.29	-180.
680.000	10.01	0.000	0.31	-180.
690.000	10.01	0.000	0.33	-180.
700.000	10.01	0.000	0.35	-180.
710.000	10.01	0.000	0.38	-180.
720.000	10.01	0.001	0.40	-180.
730.000	10.01	0.001	0.42	-180.
740.000	10.01	0.001	0.44	-180.

TABLE 7-XIV MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
740.031	10.01	0.001	0.44	-180.
750.000	10.01	0.001	0.46	-180.
760.000	10.02	0.001	0.48	-180.
770.000	10.02	0.001	0.50	-180.
780.000	10.02	0.001	0.52	-180.
790.000	10.02	0.001	0.54	-180.
800.000	10.02	0.001	0.56	-180.
900.000	10.03	0.002	0.77	-179.
1000.000	10.04	0.003	0.96	-179.
1100.000	10.06	0.004	1.14	-179.
1200.000	10.07	0.005	1.30	-179.
1300.000	10.09	0.006	1.44	-179.
1400.000	10.10	0.007	1.57	-179.
1500.000	10.12	0.007	1.67	-180.
1600.000	10.12	0.008	1.74	-180.
1700.000	10.13	0.008	1.80	-180.
1800.000	10.13	0.009	1.82	-180.
1900.000	10.13	0.010	1.83	-180.
2000.000	10.12	0.010	1.80	-180.
2100.000	10.11	0.011	1.75	-180.
2200.000	10.09	0.013	1.68	-180.
2300.000	10.08	0.014	1.58	-180.
2400.000	10.05	0.016	1.46	-180.
2500.000	10.03	0.018	1.32	180.
2600.000	10.01	0.021	1.16	180.
2700.000	9.99	0.023	0.99	180.
2800.000	9.98	0.026	0.80	180.
2900.000	9.96	0.029	0.59	180.
3000.000	9.95	0.032	0.38	179.
3100.000	9.94	0.034	0.17	179.
3200.000	9.93	0.037	0.05	2.
3300.000	9.92	0.039	0.26	-0.
3400.000	9.91	0.040	0.48	-0.
3500.000	9.91	0.041	0.68	-0.
3600.000	9.91	0.041	20.02	87.
3700.000	9.91	0.041	20.03	86.
3800.000	9.91	0.039	20.04	86.
3900.000	9.91	0.037	20.05	85.
4000.000	9.92	0.034	20.06	85.
4100.000	9.92	0.031	20.07	85.

TABLE 7-XIV MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
4200.000	9.92	0.027	20.07	84.
4300.000	9.92	0.022	20.08	84.
4400.000	9.92	0.017	20.08	84.
4500.000	9.92	0.012	20.08	84.
4600.000	9.92	0.007	20.08	84.
4700.000	9.91	0.002	20.08	85.
4800.000	9.90	-0.003	20.07	85.
4900.000	9.90	-0.008	20.06	85.
5000.000	9.89	-0.012	20.05	86.
5100.000	9.88	-0.015	20.05	86.
5200.000	9.87	-0.018	20.04	87.
5300.000	9.87	-0.020	20.03	87.
5400.000	9.86	-0.022	20.02	88.
5500.000	9.86	-0.023	20.01	88.
5600.000	9.85	-0.023	20.00	89.
5700.000	9.86	-0.023	20.00	90.
5800.000	9.86	-0.022	20.00	90.
5900.000	9.87	-0.021	0.16	-179.
6000.000	9.87	-0.019	0.38	-179.
6100.000	9.88	-0.017	0.59	-179.
6200.000	9.90	-0.014	0.79	-179.
6300.000	9.91	-0.012	0.98	-179.
6400.000	9.93	-0.010	1.16	-179.
6500.000	9.94	-0.008	1.32	-179.
6600.000	9.95	-0.005	1.46	-179.
6700.000	9.97	-0.003	1.58	-179.
6800.000	9.98	-0.001	1.68	-179.
6900.000	9.99	0.001	1.75	-179.
7000.000	9.99	0.003	1.80	-179.
7100.000	9.99	0.005	1.83	-179.
7200.000	9.99	0.006	1.83	-179.
7300.000	9.99	0.008	1.80	-179.
7400.000	9.98	0.011	1.75	-180.
7500.000	9.97	0.013	1.67	-180.
7600.000	9.95	0.015	1.57	-180.
7700.000	9.94	0.018	1.45	-180.
7800.000	9.92	0.021	1.31	-180.
7900.000	9.90	0.024	1.15	-180.
8000.000	9.89	0.027	0.97	-180.
8100.000	9.87	0.030	0.78	180.

TABLE 7-XIV MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
8200.000	9.85	0.033	0.58	180.
8300.000	9.84	0.035	0.37	179.
8400.000	9.83	0.038	0.15	179.
8500.000	9.82	0.040	0.06	1.
8600.000	9.81	0.042	0.28	-0.
8700.000	9.80	0.043	0.49	-0.
8800.000	9.80	0.043	0.70	-0.
8900.000	9.80	0.043	0.89	-1.
9000.000	9.80	0.042	1.08	-1.
9100.000	9.80	0.040	1.25	-1.
9200.000	9.80	0.038	1.40	-1.
9300.000	9.80	0.034	1.53	-1.
9400.000	9.81	0.030	1.64	-1.
9500.000	9.81	0.026	1.72	-1.
9600.000	9.81	0.020	1.79	-1.
9700.000	9.81	0.015	1.82	-1.
9800.000	9.81	0.009	1.84	-1.
9900.000	9.80	0.004	1.82	-1.
10000.000	9.80	-0.002	1.78	-1.
10100.000	9.80	-0.007	1.72	-1.
10200.000	9.79	-0.012	1.63	-1.
10300.000	9.78	-0.017	1.52	-0.
10400.000	9.78	-0.020	1.39	-0.
10500.000	9.77	-0.023	1.23	-0.
10600.000	9.76	-0.026	1.06	-0.
10700.000	9.76	-0.027	0.88	-0.
10800.000	9.76	-0.028	0.68	-0.
10900.000	9.76	-0.028	0.48	0.
11000.000	9.76	-0.028	0.26	-0.
11100.000	9.76	-0.027	0.05	-1.
11200.000	9.77	-0.025	0.17	-179.
11300.000	9.78	-0.023	0.39	-179.
11400.000	9.79	-0.021	0.60	-179.
11500.000	9.81	-0.018	0.80	-179.
11600.000	9.82	-0.015	0.99	-179.
11700.000	9.83	-0.013	1.16	-179.
11800.000	9.85	-0.010	1.32	-179.
11900.000	9.86	-0.007	1.46	-179.
12000.000	9.88	-0.005	1.58	-179.
12100.000	9.89	-0.002	1.68	-179.

TABLE 7-XIV

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
12200.000	9.90	0.000	1.76	-179.
12300.000	9.90	0.002	1.81	-179.
12400.000	9.90	0.005	1.83	-179.
12500.000	9.90	0.007	1.83	-179.
12600.000	9.90	0.009	1.80	-179.
12700.000	9.89	0.012	1.75	-179.
12800.000	9.88	0.015	1.67	-179.
12900.000	9.86	0.017	1.57	-179.
13000.000	9.85	0.020	1.45	-180.
13100.000	9.83	0.023	1.31	-180.
13200.000	9.81	0.027	1.15	-180.
13300.000	9.79	0.030	0.97	-180.
13400.000	9.78	0.033	0.78	180.
13500.000	9.76	0.036	0.58	180.
13600.000	9.75	0.039	0.37	179.
13700.000	9.73	0.041	0.15	179.
13800.000	9.72	0.044	0.07	2.
13900.000	9.71	0.045	0.28	-0.
14000.000	9.71	0.046	0.50	-0.
14100.000	9.70	0.046	0.70	-1.
14200.000	9.70	0.046	0.90	-1.
14300.000	9.70	0.044	1.08	-1.
14400.000	9.70	0.042	1.25	-1.
14500.000	9.70	0.039	1.40	-1.
14600.000	9.71	0.035	1.53	-1.
14700.000	9.71	0.031	1.64	-1.
14800.000	9.71	0.025	1.73	-1.
14900.000	9.71	0.020	1.79	-1.
15000.000	9.71	0.014	1.83	-1.
15100.000	9.71	0.008	1.84	-1.
15200.000	9.71	0.002	1.82	-1.
15300.000	9.70	-0.004	1.79	-1.
15400.000	9.70	-0.010	1.72	-1.
15500.000	9.69	-0.015	1.63	-1.
15600.000	9.69	-0.020	1.52	-1.
15700.000	9.68	-0.024	1.39	-1.
15800.000	9.68	-0.028	1.24	-0.
15900.000	9.67	-0.030	1.07	-0.
16000.000	9.67	-0.032	0.88	-0.
16100.000	9.67	-0.033	0.69	-0.

TABLE 7-XIV

MACH NUMBER, RELATIVE FLIGHT-PATH
 ANGLE, ANGLE OF ATTACK, AND NORMAL
 FORCE ANGLE - LIFTOFF THROUGH
 PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
16200.000	9.67	-0.033	0.48	-0.
16300.000	9.67	-0.033	0.27	-0.
16400.000	9.68	-0.031	0.05	-2.
16500.000	9.69	-0.030	0.17	-179.
16550.000	9.69	-0.028	0.27	-179.

TABLE 7-XV DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (81-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
0.000	0.0	0.	0.
5.000	1.3	0.	0.
10.000	6.0	1.	610.
12.000	9.1	1.	1398.
15.000	15.3	4.	3815.
20.000	30.5	13.	14127.
25.000	52.8	15.	39880.
30.000	83.7	16.	95015.
35.000	124.1	7.	200943.
40.000	174.5	13.	388629.
45.000	234.9	27.	700675.
50.000	304.2	42.	1192211.
55.000	380.4	51.	1930808.
60.000	460.3	52.	2994293.
65.000	538.9	53.	4464320.
70.000	609.0	71.	6413901.
75.000	663.9	92.	8892117.
80.000	696.6	108.	11919594.
82.000	700.2	113.	13277206.
85.000	692.9	114.	15447162.
90.000	643.2	100.	19303873.
95.000	552.0	58.	23206299.
100.000	456.4	12.	26904050.
105.000	368.9	144.	30312156.
110.000	293.5	119.	33389166.
115.000	227.9	41.	36096566.
120.000	172.3	16.	38402480.
125.000	127.6	12.	40319556.
130.000	92.9	10.	41879982.
135.000	66.9	8.	43129326.
140.000	48.0	6.	44119886.
145.000	34.8	5.	44905452.
147.329	29.9	4.	45215460.
150.000	24.3	4.	45525235.
155.000	16.0	2.	45977586.
159.329	10.8	8.	46257535.
159.329	10.8	8.	46257535.
159.459	10.6	8.	46264544.
160.000	9.9	9.	46292613.
163.759	6.1	12.	46442588.

TABLE 7-XV DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
165.000	5.2	12.	46478403.
165.859	4.7	12.	46500193.
170.000	2.7	9.	46577827.
175.000	1.4	6.	46630409.
180.000	0.7	4.	46657662.
185.000	0.3	2.	46671146.
189.559	0.2	1.	46677293.
190.000	0.2	1.	46677697.
194.559	0.1	1.	46680665.
195.000	0.1	1.	46680865.
200.000	0.0	0.	46682485.
205.000	0.0	0.	46683372.
210.000	0.0	0.	46683891.
215.000	0.0	0.	46684197.
220.000	0.0	0.	46684384.
225.000	0.0	0.	46684502.
230.000	0.0	0.	46684582.
235.000	0.0	0.	46684635.
240.000	0.0	0.	46684673.
245.000	0.0	0.	46684701.
250.000	0.0	0.	46684723.
255.000	0.0	0.	46684741.
260.000	0.0	0.	46684755.
265.000	0.0	0.	46684768.
270.000	0.0	0.	46684778.
275.000	0.0	0.	46684787.
280.000	0.0	0.	46684795.
285.000	0.0	0.	46684802.
290.000	0.0	0.	46684810.
295.000	0.0	0.	46684816.
300.000	0.0	0.	46684821.
305.000	0.0	0.	46684826.
310.000	0.0	0.	46684831.
315.000	0.0	0.	46684836.
320.000	0.0	0.	46684841.
325.000	0.0	0.	46684846.
330.000	0.0	0.	46684851.
335.000	0.0	0.	46684856.
340.000	0.0	0.	46684861.
345.000	0.0	0.	46684866.

TABLE 7-XV

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
350.000	0.0	0.	46684871.
355.000	0.0	0.	46684876.
360.000	0.0	0.	46684881.
365.000	0.0	0.	46684886.
370.000	0.0	0.	46684891.
375.000	0.0	0.	46684896.
380.000	0.0	0.	46684901.
385.000	0.0	0.	46684906.
390.000	0.0	0.	46684911.
395.000	0.0	0.	46684916.
400.000	0.0	0.	46684921.
405.000	0.0	0.	46684926.
410.000	0.0	0.	46684931.
415.000	0.0	0.	46684936.
420.000	0.0	0.	46684941.
425.000	0.0	0.	46684946.
430.000	0.0	0.	46684951.
435.000	0.0	0.	46684959.
437.627	0.0	0.	46684962.
440.000	0.0	0.	46684966.
445.000	0.0	0.	46684973.
450.000	0.0	0.	46684981.
455.000	0.0	0.	46684988.
460.000	0.0	0.	46684996.
465.000	0.0	0.	46685003.
470.000	0.0	0.	46685011.
475.000	0.0	0.	46685018.
480.000	0.0	0.	46685027.
485.000	0.0	0.	46685037.
490.000	0.0	0.	46685047.
495.000	0.0	0.	46685057.
500.000	0.0	0.	46685067.
505.000	0.0	0.	46685077.
510.000	0.0	0.	46685087.
515.000	0.0	0.	46685100.
520.000	0.0	0.	46685112.
525.000	0.0	0.	46685125.
530.000	0.0	0.	46685137.
535.000	0.0	0.	46685151.
537.424	0.0	0.	46685158.

TABLE 7-XV DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
537.424	0.0	0.	46685158.
537.442	0.0	0.	46685158.
540.000	0.0	0.	46685165.
543.142	0.0	0.	46685174.
545.000	0.0	0.	46685180.
545.742	0.0	0.	46685182.
549.542	0.0	0.	46685193.
550.000	0.0	0.	46685194.
555.000	0.0	0.	46685209.
560.000	0.0	0.	46685224.
565.000	0.0	0.	46685239.
570.000	0.0	0.	46685254.
575.000	0.0	0.	46685269.
580.000	0.0	0.	46685284.
585.000	0.0	0.	46685299.
590.000	0.0	0.	46685314.
595.000	0.0	0.	46685329.
600.000	0.0	0.	46685346.
605.000	0.0	0.	46685364.
610.000	0.0	0.	46685381.
615.000	0.0	0.	46685399.
620.000	0.0	0.	46685416.
625.000	0.0	0.	46685434.
630.000	0.0	0.	46685451.
635.000	0.0	0.	46685469.
640.000	0.0	0.	46685488.
645.000	0.0	0.	46685508.
650.000	0.0	0.	46685528.
655.000	0.0	0.	46685548.
656.031	0.0	0.	46685552.
656.031	0.0	0.	46685552.
660.000	0.0	0.	46685552.
670.000	0.0	0.	46685552.
680.000	0.0	0.	46685552.
690.000	0.0	0.	46685552.
700.000	0.0	0.	46685552.
710.000	0.0	0.	46685552.
720.000	0.0	0.	46685552.
730.000	0.0	0.	46685552.
740.000	0.0	0.	46685552.

TABLE 7-XV

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
740.031	0.0	0.	46685552.
750.000	0.0	0.	46685552.
760.000	0.0	0.	46685552.
770.000	0.0	0.	46685552.
780.000	0.0	0.	46685552.
790.000	0.0	0.	46685552.
800.000	0.0	0.	46685552.
900.000	0.0	0.	46685552.
1000.000	0.0	0.	46685552.
1100.000	0.0	0.	46685552.
1200.000	0.0	0.	46685552.
1300.000	0.0	0.	46685552.
1400.000	0.0	0.	46685552.
1500.000	0.0	0.	46685552.
1600.000	0.0	0.	46685552.
1700.000	0.0	0.	46685552.
1800.000	0.0	0.	46685552.
1900.000	0.0	0.	46685552.
2000.000	0.0	0.	46685552.
2100.000	0.0	0.	46685552.
2200.000	0.0	0.	46685552.
2300.000	0.0	0.	46685552.
2400.000	0.0	0.	46685552.
2500.000	0.0	0.	46685552.
2600.000	0.0	0.	46685552.
2700.000	0.0	0.	46685552.
2800.000	0.0	0.	46685552.
2900.000	0.0	0.	46685552.
3000.000	0.0	0.	46685552.
3100.000	0.0	0.	46685552.
3200.000	0.0	0.	46685552.
3300.000	0.0	0.	46685552.
3400.000	0.0	0.	46685552.
3500.000	0.0	0.	46685552.
3600.000	0.0	0.	46685552.
3700.000	0.0	0.	46685552.
3800.000	0.0	0.	46685552.
3900.000	0.0	0.	46685552.
4000.000	0.0	0.	46685552.
4100.000	0.0	0.	46685552.

TABLE 7-XV

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
4200.000	0.0	0.	46685552.
4300.000	0.0	0.	46685552.
4400.000	0.0	0.	46685552.
4500.000	0.0	0.	46685552.
4600.000	0.0	0.	46685552.
4700.000	0.0	0.	46685552.
4800.000	0.0	0.	46685552.
4900.000	0.0	0.	46685552.
5000.000	0.0	0.	46685552.
5100.000	0.0	0.	46685552.
5200.000	0.0	0.	46685552.
5300.000	0.0	0.	46685552.
5400.000	0.0	0.	46685552.
5500.000	0.0	0.	46685552.
5600.000	0.0	0.	46685552.
5700.000	0.0	0.	46685552.
5800.000	0.0	0.	46685552.
5900.000	0.0	0.	46685552.
6000.000	0.0	0.	46685552.
6100.000	0.0	0.	46685552.
6200.000	0.0	0.	46685552.
6300.000	0.0	0.	46685552.
6400.000	0.0	0.	46685552.
6500.000	0.0	0.	46685552.
6600.000	0.0	0.	46685552.
6700.000	0.0	0.	46685552.
6800.000	0.0	0.	46685552.
6900.000	0.0	0.	46685552.
7000.000	0.0	0.	46685552.
7100.000	0.0	0.	46685552.
7200.000	0.0	0.	46685552.
7300.000	0.0	0.	46685552.
7400.000	0.0	0.	46685552.
7500.000	0.0	0.	46685552.
7600.000	0.0	0.	46685552.
7700.000	0.0	0.	46685552.
7800.000	0.0	0.	46685552.
7900.000	0.0	0.	46685552.
8000.000	0.0	0.	46685552.
8100.000	0.0	0.	46685552.

TABLE 7-XV

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
8200.000	0.0	0.	46685552.
8300.000	0.0	0.	46685552.
8400.000	0.0	0.	46685552.
8500.000	0.0	0.	46685552.
8600.000	0.0	0.	46685552.
8700.000	0.0	0.	46685552.
8800.000	0.0	0.	46685552.
8900.000	0.0	0.	46685552.
9000.000	0.0	0.	46685552.
9100.000	0.0	0.	46685552.
9200.000	0.0	0.	46685552.
9300.000	0.0	0.	46685552.
9400.000	0.0	0.	46685552.
9500.000	0.0	0.	46685552.
9600.000	0.0	0.	46685552.
9700.000	0.0	0.	46685552.
9800.000	0.0	0.	46685552.
9900.000	0.0	0.	46685552.
10000.000	0.0	0.	46685552.
10100.000	0.0	0.	46685552.
10200.000	0.0	0.	46685552.
10300.000	0.0	0.	46685552.
10400.000	0.0	0.	46685552.
10500.000	0.0	0.	46685552.
10600.000	0.0	0.	46685552.
10700.000	0.0	0.	46685552.
10800.000	0.0	0.	46685552.
10900.000	0.0	0.	46685552.
11000.000	0.0	0.	46685552.
11100.000	0.0	0.	46685552.
11200.000	0.0	0.	46685552.
11300.000	0.0	0.	46685552.
11400.000	0.0	0.	46685552.
11500.000	0.0	0.	46685552.
11600.000	0.0	0.	46685552.
11700.000	0.0	0.	46685552.
11800.000	0.0	0.	46685552.
11900.000	0.0	0.	46685552.
12000.000	0.0	0.	46685552.
12100.000	0.0	0.	46685552.

TABLE 7-XV

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
12200.000	0.0	0.	46685552.
12300.000	0.0	0.	46685552.
12400.000	0.0	0.	46685552.
12500.000	0.0	0.	46685552.
12600.000	0.0	0.	46685552.
12700.000	0.0	0.	46685552.
12800.000	0.0	0.	46685552.
12900.000	0.0	0.	46685552.
13000.000	0.0	0.	46685552.
13100.000	0.0	0.	46685552.
13200.000	0.0	0.	46685552.
13300.000	0.0	0.	46685552.
13400.000	0.0	0.	46685552.
13500.000	0.0	0.	46685552.
13600.000	0.0	0.	46685552.
13700.000	0.0	0.	46685552.
13800.000	0.0	0.	46685552.
13900.000	0.0	0.	46685552.
14000.000	0.0	0.	46685552.
14100.000	0.0	0.	46685552.
14200.000	0.0	0.	46685552.
14300.000	0.0	0.	46685552.
14400.000	0.0	0.	46685552.
14500.000	0.0	0.	46685552.
14600.000	0.0	0.	46685552.
14700.000	0.0	0.	46685552.
14800.000	0.0	0.	46685552.
14900.000	0.0	0.	46685552.
15000.000	0.0	0.	46685552.
15100.000	0.0	0.	46685552.
15200.000	0.0	0.	46685552.
15300.000	0.0	0.	46685552.
15400.000	0.0	0.	46685552.
15500.000	0.0	0.	46685552.
15600.000	0.0	0.	46685552.
15700.000	0.0	0.	46685552.
15800.000	0.0	0.	46685552.
15900.000	0.0	0.	46685552.
16000.000	0.0	0.	46685552.
16100.000	0.0	0.	46685552.

TABLE 7-XV DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
16200.000	0.0	0.	46685552.
16300.000	0.0	0.	46685552.
16400.000	0.0	0.	46685552.
16500.000	0.0	0.	46685552.
16550.000	0.0	0.	46685552.

TABLE 7-XVI

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
0.000	0.	12697.	6373344.	28.447
5.000	3.	1305.	6373370.	28.447
10.000	37.	5946.	6373451.	28.447
12.000	68.	8992.	6373501.	28.447
15.000	265.	14743.	6373595.	28.447
20.000	904.	20438.	6373811.	28.447
25.000	1060.	18025.	6374106.	28.447
30.000	1098.	25727.	6374492.	28.447
35.000	492.	36356.	6374979.	28.447
40.000	909.	51448.	6375577.	28.447
45.000	1907.	72571.	6376297.	28.447
50.000	3034.	103317.	6377150.	28.448
55.000	3879.	144673.	6378145.	28.448
60.000	4105.	208371.	6379290.	28.449
65.000	4410.	301246.	6380592.	28.449
70.000	5668.	415064.	6382051.	28.450
75.000	6800.	438522.	6383670.	28.452
80.000	7568.	389645.	6385451.	28.453
82.000	7808.	369261.	6386211.	28.454
85.000	7782.	332454.	6387401.	28.455
90.000	6614.	269889.	6389522.	28.458
95.000	3819.	208514.	6391820.	28.461
100.000	784.	153917.	6394297.	28.464
105.000	9467.	112011.	6396955.	28.468
110.000	7829.	79258.	6399791.	28.473
115.000	2743.	54484.	6402807.	28.479
120.000	1038.	36130.	6406006.	28.485
125.000	781.	23335.	6409394.	28.492
130.000	642.	14882.	6412974.	28.500
135.000	516.	9230.	6416755.	28.508
140.000	414.	5494.	6420744.	28.518
145.000	334.	2856.	6424954.	28.529
147.329	301.	1801.	6426994.	28.534
150.000	254.	878.	6429385.	28.541
155.000	115.	-530.	6433980.	28.554
159.329	537.	-1270.	6438093.	28.566
159.329	272.	2055.	6438093.	28.566
159.459	278.	2020.	6438218.	28.566
160.000	305.	1880.	6438739.	28.568
163.759	416.	1139.	6442295.	28.578

TABLE 7-XVI

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
165.000	440.	966.	6443445.	28.582
165.859	437.	862.	6444238.	28.584
170.000	357.	491.	6448000.	28.596
175.000	253.	243.	6452427.	28.610
180.000	163.	118.	6456727.	28.624
185.000	94.	55.	6460903.	28.639
189.559	54.	28.	6464604.	28.652
190.000	52.	26.	6464957.	28.653
194.559	30.	14.	6468549.	28.666
195.000	29.	13.	6468891.	28.668
200.000	17.	7.	6472709.	28.682
205.000	16.	4.	6476415.	28.697
210.000	9.	2.	6480021.	28.711
215.000	6.	1.	6483532.	28.726
220.000	4.	1.	6486948.	28.741
225.000	2.	1.	6490269.	28.756
230.000	2.	0.	6493498.	28.771
235.000	1.	0.	6496635.	28.785
240.000	1.	0.	6499680.	28.800
245.000	1.	0.	6502635.	28.815
250.000	0.	0.	6505501.	28.830
255.000	0.	0.	6508278.	28.845
260.000	0.	0.	6510968.	28.860
265.000	0.	0.	6513571.	28.875
270.000	0.	0.	6516089.	28.890
275.000	0.	0.	6518523.	28.905
280.000	0.	0.	6520873.	28.920
285.000	0.	0.	6523142.	28.935
290.000	0.	0.	6525329.	28.950
295.000	0.	0.	6527436.	28.965
300.000	0.	0.	6529465.	28.980
305.000	0.	0.	6531416.	28.995
310.000	0.	0.	6533290.	29.010
315.000	0.	0.	6535090.	29.025
320.000	0.	0.	6536815.	29.040
325.000	0.	0.	6538468.	29.055
330.000	0.	0.	6540050.	29.069
335.000	0.	0.	6541562.	29.084
340.000	0.	0.	6543005.	29.098
345.000	0.	0.	6544381.	29.113

TABLE 7-XVI

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
350.000	0.	0.	6545691.	29.127
355.000	0.	0.	6546937.	29.142
360.000	0.	0.	6548121.	29.156
365.000	0.	0.	6549244.	29.170
370.000	0.	0.	6550307.	29.184
375.000	0.	0.	6551313.	29.198
380.000	0.	0.	6552263.	29.211
385.000	0.	0.	6553160.	29.225
390.000	0.	0.	6554004.	29.238
395.000	0.	0.	6554798.	29.251
400.000	0.	0.	6555544.	29.264
405.000	0.	0.	6556244.	29.277
410.000	0.	0.	6556901.	29.289
415.000	0.	0.	6557517.	29.301
420.000	0.	0.	6558093.	29.313
425.000	0.	0.	6558634.	29.325
430.000	0.	0.	6559140.	29.336
435.000	0.	0.	6559615.	29.347
437.627	0.	0.	6559854.	29.352
440.000	0.	0.	6560061.	29.357
445.000	0.	0.	6560466.	29.368
450.000	0.	0.	6560831.	29.378
455.000	0.	0.	6561158.	29.387
460.000	0.	0.	6561449.	29.396
465.000	0.	0.	6561708.	29.404
470.000	0.	0.	6561936.	29.412
475.000	0.	0.	6562137.	29.420
480.000	0.	0.	6562313.	29.427
485.000	0.	0.	6562468.	29.433
490.000	0.	0.	6562603.	29.439
495.000	0.	0.	6562724.	29.444
500.000	0.	0.	6562833.	29.448
505.000	0.	0.	6562934.	29.452
510.000	0.	0.	6563030.	29.455
515.000	0.	0.	6563127.	29.458
520.000	0.	0.	6563226.	29.459
525.000	0.	0.	6563334.	29.460
530.000	0.	0.	6563454.	29.460
535.000	0.	0.	6563592.	29.459
537.424	0.	0.	6563666.	29.459

TABLE 7-XVI
 NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
 PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
537.424	0.	0.	6563666.	29.459
537.442	0.	0.	6563667.	29.459
540.000	0.	0.	6563742.	29.458
543.142	0.	0.	6563821.	29.456
545.000	0.	0.	6563861.	29.455
545.742	0.	0.	6563876.	29.454
549.542	0.	0.	6563945.	29.452
550.000	0.	0.	6563952.	29.451
555.000	0.	0.	6564023.	29.447
560.000	0.	0.	6564074.	29.441
565.000	0.	0.	6564107.	29.435
570.000	0.	0.	6564123.	29.427
575.000	0.	0.	6564123.	29.419
580.000	0.	0.	6564109.	29.409
585.000	0.	0.	6564082.	29.399
590.000	0.	0.	6564044.	29.387
595.000	0.	0.	6563996.	29.375
600.000	0.	0.	6563941.	29.361
605.000	0.	0.	6563880.	29.346
610.000	0.	0.	6563815.	29.330
615.000	0.	0.	6563747.	29.314
620.000	0.	0.	6563679.	29.295
625.000	0.	0.	6563613.	29.276
630.000	0.	0.	6563550.	29.256
635.000	0.	0.	6563493.	29.234
640.000	0.	0.	6563444.	29.212
645.000	0.	0.	6563405.	29.188
650.000	0.	0.	6563378.	29.163
655.000	0.	0.	6563365.	29.136
656.031	0.	0.	6563365.	29.131
656.031	0.	0.	6563365.	29.131
660.000	0.	0.	6563365.	29.109
670.000	0.	0.	6563365.	29.050
680.000	0.	0.	6563365.	28.987
690.000	0.	0.	6563366.	28.920
700.000	0.	0.	6563366.	28.848
710.000	0.	0.	6563366.	28.772
720.000	0.	0.	6563367.	28.692
730.000	0.	0.	6563368.	28.607
740.000	0.	0.	6563369.	28.517

TABLE 7-XVI

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
740.031	0.	0.	6563369.	28.517
750.000	0.	0.	6563370.	28.424
760.000	0.	0.	6563371.	28.326
770.000	0.	0.	6563372.	28.223
780.000	0.	0.	6563373.	28.117
790.000	0.	0.	6563375.	28.006
800.000	0.	0.	6563376.	27.891
900.000	0.	0.	6563401.	26.519
1000.000	0.	0.	6563439.	24.764
1100.000	0.	0.	6563489.	22.666
1200.000	0.	0.	6563549.	20.267
1300.000	0.	0.	6563620.	17.609
1400.000	0.	0.	6563700.	14.736
1500.000	0.	0.	6563787.	11.691
1600.000	0.	0.	6563883.	8.513
1700.000	0.	0.	6563985.	5.240
1800.000	0.	0.	6564095.	1.910
1900.000	0.	0.	6564213.	-1.440
2000.000	0.	0.	6564341.	-4.774
2100.000	0.	0.	6564481.	-8.057
2200.000	0.	0.	6564636.	-11.250
2300.000	0.	0.	6564810.	-14.317
2400.000	0.	0.	6565005.	-17.216
2500.000	0.	0.	6565227.	-19.905
2600.000	0.	0.	6565479.	-22.343
2700.000	0.	0.	6565763.	-24.486
2800.000	0.	0.	6566082.	-26.292
2900.000	0.	0.	6566437.	-27.720
3000.000	0.	0.	6566828.	-28.738
3100.000	0.	0.	6567254.	-29.318
3200.000	0.	0.	6567712.	-29.447
3300.000	0.	0.	6568199.	-29.121
3400.000	0.	0.	6568707.	-28.348
3500.000	0.	0.	6569231.	-27.149
3600.000	0.	0.	6569763.	-25.554
3700.000	0.	0.	6570291.	-23.600
3800.000	0.	0.	6570806.	-21.328
3900.000	0.	0.	6571299.	-18.781
4000.000	0.	0.	6571759.	-16.001
4100.000	0.	0.	6572177.	-13.032

TABLE 7-XVI

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
4200.000	0.	0.	6572547.	-9.914
4300.000	0.	0.	6572861.	-6.685
4400.000	0.	0.	6573114.	-3.384
4500.000	0.	0.	6573302.	-0.047
4600.000	0.	0.	6573424.	3.291
4700.000	0.	0.	6573480.	6.593
4800.000	0.	0.	6573471.	9.823
4900.000	0.	0.	6573401.	12.944
5000.000	0.	0.	6573275.	15.917
5100.000	0.	0.	6573101.	18.702
5200.000	0.	0.	6572885.	21.255
5300.000	0.	0.	6572635.	23.535
5400.000	0.	0.	6572362.	25.498
5500.000	0.	0.	6572072.	27.104
5600.000	0.	0.	6571775.	28.315
5700.000	0.	0.	6571479.	29.102
5800.000	0.	0.	6571190.	29.443
5900.000	0.	0.	6570915.	29.331
6000.000	0.	0.	6570661.	28.766
6100.000	0.	0.	6570433.	27.765
6200.000	0.	0.	6570232.	26.353
6300.000	0.	0.	6570061.	24.563
6400.000	0.	0.	6569919.	22.435
6500.000	0.	0.	6569808.	20.011
6600.000	0.	0.	6569725.	17.333
6700.000	0.	0.	6569671.	14.446
6800.000	0.	0.	6569644.	11.389
6900.000	0.	0.	6569642.	8.204
7000.000	0.	0.	6569665.	4.928
7100.000	0.	0.	6569711.	1.599
7200.000	0.	0.	6569782.	-1.747
7300.000	0.	0.	6569878.	-5.074
7400.000	0.	0.	6570000.	-8.346
7500.000	0.	0.	6570150.	-11.526
7600.000	0.	0.	6570330.	-14.576
7700.000	0.	0.	6570542.	-17.455
7800.000	0.	0.	6570789.	-20.122
7900.000	0.	0.	6571073.	-22.534
8000.000	0.	0.	6571395.	-24.648
8100.000	0.	0.	6571756.	-26.422

TABLE 7-XVI

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
8200.000	0.	0.	6572156.	-27.816
8300.000	0.	0.	6572594.	-28.799
8400.000	0.	0.	6573066.	-29.345
8500.000	0.	0.	6573569.	-29.438
8600.000	0.	0.	6574097.	-29.078
8700.000	0.	0.	6574643.	-28.275
8800.000	0.	0.	6575200.	-27.048
8900.000	0.	0.	6575757.	-25.429
9000.000	0.	0.	6576306.	-23.454
9100.000	0.	0.	6576836.	-21.165
9200.000	0.	0.	6577338.	-18.604
9300.000	0.	0.	6577801.	-15.815
9400.000	0.	0.	6578215.	-12.840
9500.000	0.	0.	6578574.	-9.718
9600.000	0.	0.	6578870.	-6.488
9700.000	0.	0.	6579097.	-3.189
9800.000	0.	0.	6579253.	0.145
9900.000	0.	0.	6579336.	3.476
10000.000	0.	0.	6579347.	6.771
10100.000	0.	0.	6579287.	9.992
10200.000	0.	0.	6579162.	13.102
10300.000	0.	0.	6578977.	16.063
10400.000	0.	0.	6578739.	18.833
10500.000	0.	0.	6578458.	21.371
10600.000	0.	0.	6578142.	23.634
10700.000	0.	0.	6577800.	25.579
10800.000	0.	0.	6577443.	27.166
10900.000	0.	0.	6577079.	28.358
11000.000	0.	0.	6576719.	29.125
11100.000	0.	0.	6576369.	29.448
11200.000	0.	0.	6576036.	29.317
11300.000	0.	0.	6575727.	28.736
11400.000	0.	0.	6575446.	27.720
11500.000	0.	0.	6575196.	26.295
11600.000	0.	0.	6574980.	24.495
11700.000	0.	0.	6574798.	22.358
11800.000	0.	0.	6574651.	19.927
11900.000	0.	0.	6574539.	17.245
12000.000	0.	0.	6574460.	14.355
12100.000	0.	0.	6574413.	11.297

TABLE 7-XVI NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
12200.000	0.	0.	6574398.	8.112
12300.000	0.	0.	6574413.	4.838
12400.000	0.	0.	6574458.	1.512
12500.000	0.	0.	6574533.	-1.831
12600.000	0.	0.	6574639.	-5.154
12700.000	0.	0.	6574776.	-8.421
12800.000	0.	0.	6574947.	-11.595
12900.000	0.	0.	6575153.	-14.638
13000.000	0.	0.	6575395.	-17.510
13100.000	0.	0.	6575676.	-20.169
13200.000	0.	0.	6575997.	-22.574
13300.000	0.	0.	6576359.	-24.680
13400.000	0.	0.	6576763.	-26.446
13500.000	0.	0.	6577207.	-27.833
13600.000	0.	0.	6577689.	-28.809
13700.000	0.	0.	6578205.	-29.348
13800.000	0.	0.	6578752.	-29.437
13900.000	0.	0.	6579322.	-29.073
14000.000	0.	0.	6579909.	-28.266
14100.000	0.	0.	6580502.	-27.038
14200.000	0.	0.	6581094.	-25.418
14300.000	0.	0.	6581672.	-23.444
14400.000	0.	0.	6582228.	-21.157
14500.000	0.	0.	6582749.	-18.599
14600.000	0.	0.	6583226.	-15.813
14700.000	0.	0.	6583650.	-12.841
14800.000	0.	0.	6584011.	-9.723
14900.000	0.	0.	6584303.	-6.498
15000.000	0.	0.	6584521.	-3.203
15100.000	0.	0.	6584661.	0.126
15200.000	0.	0.	6584722.	3.454
15300.000	0.	0.	6584704.	6.745
15400.000	0.	0.	6584611.	9.962
15500.000	0.	0.	6584446.	13.070
15600.000	0.	0.	6584216.	16.029
15700.000	0.	0.	6583930.	18.798
15800.000	0.	0.	6583595.	21.337
15900.000	0.	0.	6583222.	23.601
16000.000	0.	0.	6582822.	25.550
16100.000	0.	0.	6582403.	27.141

TABLE 7-XVI

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
16200.000	0.	0.	6581978.	28.339
16300.000	0.	0.	6581556.	29.114
16400.000	0.	0.	6581144.	29.446
16500.000	0.	0.	6580752.	29.325
16550.000	0.	0.	6580566.	29.095

TABLE 7-XVII

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
0.000	6373319.	17739.	-2810.
5.000	6373344.	18058.	-792.
10.000	6373424.	18377.	1227.
12.000	6373473.	18505.	2034.
15.000	6373567.	18696.	3244.
20.000	6373780.	19014.	5263.
25.000	6374073.	19332.	7287.
30.000	6374455.	19650.	9320.
35.000	6374938.	19967.	11373.
40.000	6375530.	20283.	13457.
45.000	6376245.	20600.	15588.
50.000	6377091.	20915.	17786.
55.000	6378078.	21231.	20074.
60.000	6379214.	21546.	22478.
65.000	6380505.	21860.	25029.
70.000	6381953.	22174.	27756.
75.000	6383557.	22488.	30691.
80.000	6385321.	22801.	33869.
82.000	6386072.	22927.	35217.
85.000	6387250.	23114.	37327.
90.000	6389347.	23427.	41105.
95.000	6391616.	23739.	45244.
100.000	6394058.	24050.	49786.
105.000	6396674.	24361.	54774.
110.000	6399460.	24671.	60254.
115.000	6402415.	24981.	66271.
120.000	6405542.	25290.	72868.
125.000	6408842.	25598.	80092.
130.000	6412318.	25905.	87993.
135.000	6415974.	26212.	96625.
140.000	6419813.	26518.	106045.
145.000	6423845.	26824.	116317.
147.329	6425790.	26966.	121413.
150.000	6428064.	27129.	127485.
155.000	6432409.	27433.	139464.
159.329	6436273.	27695.	150520.
159.329	6436273.	27695.	150520.
159.459	6436391.	27703.	150860.
160.000	6436878.	27736.	152283.
163.759	6440192.	27964.	162183.

TABLE 7-XVII

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
165.000	6441260.	28039.	165458.
165.859	6441993.	28091.	167732.
170.000	6445460.	28341.	178759.
175.000	6449499.	28642.	192235.
180.000	6453379.	28942.	205887.
185.000	6457099.	29242.	219717.
189.559	6460355.	29514.	232485.
190.000	6460663.	29541.	233727.
194.559	6463776.	29813.	246660.
195.000	6464070.	29839.	247917.
200.000	6467323.	30136.	262292.
205.000	6470423.	30433.	276852.
210.000	6473384.	30728.	291594.
215.000	6476208.	31023.	306518.
220.000	6478894.	31317.	321628.
225.000	6481441.	31611.	336925.
230.000	6483850.	31903.	352412.
235.000	6486119.	32195.	368092.
240.000	6488248.	32486.	383968.
245.000	6490236.	32775.	400041.
250.000	6492082.	33064.	416315.
255.000	6493786.	33352.	432793.
260.000	6495348.	33640.	449477.
265.000	6496765.	33926.	466370.
270.000	6498038.	34211.	483475.
275.000	6499166.	34495.	500796.
280.000	6500147.	34779.	518334.
285.000	6500981.	35061.	536093.
290.000	6501666.	35343.	554077.
295.000	6502203.	35623.	572289.
300.000	6502589.	35902.	590731.
305.000	6502823.	36181.	609407.
310.000	6502904.	36458.	628322.
315.000	6502832.	36734.	647477.
320.000	6502604.	37010.	666877.
325.000	6502220.	37284.	686526.
330.000	6501677.	37557.	706427.
335.000	6500975.	37829.	726584.
340.000	6500111.	38100.	747001.
345.000	6499085.	38370.	767682.

TABLE 7-XVII

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
350.000	6497895.	38639.	788632.
355.000	6496538.	38906.	809855.
360.000	6495014.	39173.	831354.
365.000	6493320.	39438.	853135.
370.000	6491454.	39702.	875202.
375.000	6489414.	39965.	897560.
380.000	6487198.	40227.	920214.
385.000	6484805.	40488.	943168.
390.000	6482231.	40747.	966429.
395.000	6479475.	41006.	990001.
400.000	6476533.	41263.	1013890.
405.000	6473404.	41519.	1038101.
410.000	6470085.	41773.	1062641.
415.000	6466573.	42027.	1087515.
420.000	6462866.	42279.	1112730.
425.000	6458959.	42530.	1138293.
430.000	6454851.	42779.	1164209.
435.000	6450538.	43028.	1190486.
437.627	6448189.	43158.	1204441.
440.000	6446017.	43275.	1217122.
445.000	6441282.	43521.	1244069.
450.000	6436329.	43765.	1271319.
455.000	6431156.	44009.	1298879.
460.000	6425760.	44251.	1326753.
465.000	6420136.	44491.	1354947.
470.000	6414283.	44731.	1383466.
475.000	6408196.	44969.	1412316.
480.000	6401873.	45205.	1441503.
485.000	6395309.	45441.	1471033.
490.000	6388501.	45675.	1500912.
495.000	6381444.	45908.	1531147.
500.000	6374136.	46139.	1561745.
505.000	6366571.	46369.	1592712.
510.000	6358745.	46598.	1624057.
515.000	6350654.	46826.	1655786.
520.000	6342294.	47052.	1687908.
525.000	6333659.	47277.	1720432.
530.000	6324744.	47500.	1753365.
535.000	6315544.	47722.	1786718.
537.424	6310979.	47829.	1803044.

TABLE 7-XVII

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
537.424	6310979.	47829.	1803044.
537.442	6310946.	47830.	1803163.
540.000	6306063.	47943.	1820436.
543.142	6299984.	48081.	1841639.
545.000	6296348.	48162.	1854172.
545.742	6294885.	48195.	1859184.
549.542	6287313.	48360.	1884868.
550.000	6286392.	48380.	1887963.
555.000	6276189.	48597.	1921846.
560.000	6265737.	48812.	1955818.
565.000	6255036.	49025.	1989881.
570.000	6244083.	49238.	2024034.
575.000	6232878.	49448.	2058276.
580.000	6221419.	49657.	2092608.
585.000	6209704.	49865.	2127029.
590.000	6197734.	50071.	2161539.
595.000	6185507.	50276.	2196138.
600.000	6173021.	50479.	2230826.
605.000	6160276.	50681.	2265603.
610.000	6147270.	50881.	2300468.
615.000	6134002.	51080.	2335421.
620.000	6120471.	51277.	2370463.
625.000	6106676.	51473.	2405592.
630.000	6092616.	51667.	2440810.
635.000	6078290.	51860.	2476115.
640.000	6063696.	52052.	2511509.
645.000	6048834.	52242.	2546990.
650.000	6033702.	52431.	2582559.
655.000	6018300.	52619.	2618216.
656.031	6015091.	52658.	2625580.
656.031	6015091.	52658.	2625580.
660.000	6002646.	52807.	2653904.
670.000	5970701.	53176.	2725006.
680.000	5937914.	53540.	2795724.
690.000	5904289.	53897.	2866049.
700.000	5869831.	54247.	2935970.
710.000	5834544.	54591.	3005477.
720.000	5798435.	54929.	3074561.
730.000	5761507.	55260.	3143212.
740.000	5723766.	55585.	3211420.

TABLE 7-XVII

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
740.031	5723648.	55586.	3211631.
750.000	5685218.	55903.	3279175.
760.000	5645868.	56214.	3346469.
770.000	5605721.	56518.	3413290.
780.000	5564783.	56816.	3479631.
790.000	5523060.	57106.	3545481.
800.000	5480558.	57390.	3610831.
900.000	5014050.	59840.	4234850.
1000.000	4476873.	61557.	4799225.
1100.000	3876579.	62511.	5296000.
1200.000	3221612.	62678.	5718170.
1300.000	2521194.	62048.	6059772.
1400.000	1785192.	60618.	6315977.
1500.000	1023979.	58397.	6483160.
1600.000	248289.	55402.	6558951.
1700.000	-530937.	51663.	6542273.
1800.000	-1302705.	47219.	6433356.
1900.000	-2056126.	42117.	6233736.
2000.000	-2780571.	36415.	5946231.
2100.000	-3465822.	30180.	5574906.
2200.000	-4102218.	23484.	5125007.
2300.000	-4680795.	16410.	4602892.
2400.000	-5193407.	9045.	4015936.
2500.000	-5632846.	1478.	3372425.
2600.000	-5992943.	-6192.	2681438.
2700.000	-6268648.	-13869.	1952718.
2800.000	-6456105.	-21453.	1196530.
2900.000	-6552701.	-28844.	423521.
3000.000	-6557103.	-35943.	-355435.
3100.000	-6469273.	-42656.	-1129385.
3200.000	-6290467.	-48889.	-1887454.
3300.000	-6023215.	-54556.	-2618995.
3400.000	-5671289.	-59576.	-3313737.
3500.000	-5239643.	-63876.	-3961927.
3600.000	-4734350.	-67391.	-4554468.
3700.000	-4162513.	-70065.	-5083041.
3800.000	-3532167.	-71853.	-5540228.
3900.000	-2852170.	-72722.	-5919612.
4000.000	-2132076.	-72648.	-6215866.
4100.000	-1382001.	-71621.	-6424831.

TABLE 7-XVII

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
4200.000	-612485.	-69644.	-6543576.
4300.000	165660.	-66731.	-6570434.
4400.000	941500.	-62909.	-6505033.
4500.000	1704134.	-58218.	-6348294.
4600.000	2442848.	-52709.	-6102427.
4700.000	3147265.	-46447.	-5770892.
4800.000	3807494.	-39504.	-5358353.
4900.000	4414264.	-31964.	-4870611.
5000.000	4959060.	-23921.	-4314522.
5100.000	5434239.	-15475.	-3697900.
5200.000	5833136.	-6733.	-3029406.
5300.000	6150158.	2193.	-2318423.
5400.000	6380862.	11185.	-1574931.
5500.000	6522014.	20126.	-809361.
5600.000	6571631.	28896.	-32452.
5700.000	6529017.	37377.	744900.
5800.000	6394760.	45452.	1511791.
5900.000	6170736.	53011.	2257462.
6000.000	5860075.	59945.	2971451.
6100.000	5467122.	66157.	3643733.
6200.000	4997374.	71554.	4264865.
6300.000	4457411.	76055.	4826116.
6400.000	3854798.	79590.	5319590.
6500.000	3197986.	82101.	5738338.
6600.000	2496193.	83543.	6076457.
6700.000	1759276.	83883.	6329178.
6800.000	997590.	83107.	6492929.
6900.000	221845.	81210.	6565393.
7000.000	-557045.	78207.	6545539.
7100.000	-1328121.	74125.	6433639.
7200.000	-2080531.	69008.	6231265.
7300.000	-2803689.	62914.	5941268.
7400.000	-3487420.	55913.	5567735.
7500.000	-4122111.	48091.	5115932.
7600.000	-4698843.	39544.	4592226.
7700.000	-5209520.	30379.	4003997.
7800.000	-5646982.	20715.	3359529.
7900.000	-6005101.	10675.	2667891.
8000.000	-6278873.	392.	1938810.
8100.000	-6464480.	-9999.	1182532.

TABLE 7-XVII

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
8200.000	-6559344.	-20359.	409676.
8300.000	-6562161.	-30547.	-368913.
8400.000	-6472918.	-40426.	-1142319.
8500.000	-6292889.	-49857.	-1899701.
8600.000	-6024618.	-58710.	-2630453.
8700.000	-5671880.	-66860.	-3324340.
8800.000	-5239631.	-74189.	-3971651.
8900.000	-4733936.	-80589.	-4563326.
9000.000	-4161885.	-85967.	-5091083.
9100.000	-3531498.	-90237.	-5547536.
9200.000	-2851607.	-93332.	-5926298.
9300.000	-2131738.	-95198.	-6222065.
9400.000	-1381978.	-95797.	-6430698.
9500.000	-612833.	-95109.	-6549277.
9600.000	164921.	-93130.	-6576143.
9700.000	940385.	-89874.	-6510923.
9800.000	1702695.	-85373.	-6354535.
9900.000	2441168.	-79676.	-6109175.
10000.000	3145461.	-72849.	-5778285.
10100.000	3805708.	-64972.	-5366506.
10200.000	4412665.	-56144.	-4879612.
10300.000	4957834.	-46474.	-4324427.
10400.000	5433585.	-36086.	-3708729.
10500.000	5833261.	-25114.	-3041142.
10600.000	6151272.	-13702.	-2331012.
10700.000	6383167.	-2000.	-1588279.
10800.000	6525701.	9835.	-823336.
10900.000	6576877.	21644.	-46887.
11000.000	6535971.	33266.	730205.
11100.000	6403548.	44542.	1497068.
11200.000	6181447.	55314.	2242967.
11300.000	5872763.	65431.	2957459.
11400.000	5481798.	74750.	3630537.
11500.000	5014008.	83135.	4252765.
11600.000	4475929.	90465.	4815416.
11700.000	3875082.	96628.	5310591.
11800.000	3219872.	101530.	5731331.
11900.000	2519474.	105093.	6071718.
12000.000	1783703.	107255.	6326960.
12100.000	1022876.	107973.	6493456.

TABLE 7-XVII

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
12200.000	247667.	107224.	6568856.
12300.000	-531043.	105006.	6552089.
12400.000	-1302319.	101336.	6443384.
12500.000	-2055332.	96250.	6244264.
12600.000	-2779508.	89806.	5957529.
12700.000	-3464683.	82081.	5587211.
12800.000	-4101242.	73168.	5138520.
12900.000	-4680263.	63180.	4617768.
13000.000	-5193634.	52245.	4032277.
13100.000	-5634173.	40503.	3390275.
13200.000	-5995727.	28110.	2700778.
13300.000	-6273254.	15230.	1973462.
13400.000	-6462894.	2034.	1218525.
13500.000	-6562021.	-11299.	446545.
13600.000	-6569275.	-24587.	-331671.
13700.000	-6484584.	-37650.	-1105235.
13800.000	-6309155.	-50305.	-1863332.
13900.000	-6045466.	-62378.	-2595369.
14000.000	-5697219.	-73697.	-3291119.
14100.000	-5269298.	-84101.	-3940868.
14200.000	-4767694.	-93441.	-4535544.
14300.000	-4199424.	-101581.	-5066846.
14400.000	-3572436.	-108398.	-5527357.
14500.000	-2895495.	-113789.	-5910647.
14600.000	-2178062.	-117668.	-6211366.
14700.000	-1430165.	-119969.	-6425316.
14800.000	-662258.	-120649.	-6549508.
14900.000	114926.	-119684.	-6582212.
15000.000	890524.	-117075.	-6522973.
15100.000	1653695.	-112844.	-6372623.
15200.000	2393772.	-107036.	-6133267.
15300.000	3100415.	-99718.	-5808254.
15400.000	3763747.	-90979.	-5402132.
15500.000	4374504.	-80927.	-4920579.
15600.000	4924154.	-69690.	-4370327.
15700.000	5405021.	-57412.	-3759066.
15800.000	5810392.	-44255.	-3095336.
15900.000	6134607.	-30391.	-2388406.
16000.000	6373138.	-16006.	-1648147.
16100.000	6522653.	-1292.	-884894.

TABLE 7-XVII

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
16200.000	6581057.	13551.	-109300.
16300.000	6547527.	28320.	667806.
16400.000	6422519.	42813.	1435576.
16500.000	6207763.	56827.	2183288.
16550.000	6067614.	63593.	2546342.

TABLE 7-XVIII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
0.000	0.00	63.92	403.61
5.000	10.27	63.85	403.61
10.000	22.01	63.78	403.60
12.000	27.14	63.75	403.59
15.000	35.31	63.70	403.57
20.000	50.30	63.62	404.06
25.000	67.17	63.54	405.49
30.000	86.11	63.45	408.33
35.000	107.15	63.37	413.25
40.000	130.36	63.28	420.92
45.000	155.70	63.20	432.15
50.000	183.05	63.12	447.70
55.000	212.13	63.04	468.29
60.000	242.57	62.95	494.49
65.000	273.80	62.86	526.75
70.000	305.15	62.77	565.16
75.000	336.69	62.69	610.08
80.000	369.12	62.62	662.31
82.000	382.36	62.59	685.36
85.000	402.48	62.54	722.29
90.000	436.56	62.45	790.31
95.000	471.12	62.35	866.61
100.000	505.87	62.23	951.47
105.000	540.30	62.10	1045.24
110.000	574.05	61.97	1148.25
115.000	608.08	61.84	1259.92
120.000	642.62	61.70	1380.55
125.000	677.55	61.57	1510.81
130.000	713.01	61.44	1651.40
135.000	749.32	61.30	1803.12
140.000	786.83	61.16	1967.03
145.000	825.99	61.03	2144.43
147.329	844.95	60.96	2232.13
150.000	857.29	60.89	2314.98
155.000	881.25	60.74	2478.65
159.329	904.36	60.62	2629.77
159.329	904.36	60.62	2629.77
159.459	903.11	60.62	2629.74
160.000	898.29	60.60	2630.52
163.759	864.90	60.49	2635.97

TABLE 7-XVIII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
 PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
165.000	856.42	60.45	2643.51
165.859	850.56	60.43	2648.74
170.000	823.88	60.31	2677.64
175.000	791.83	60.16	2712.79
180.000	760.00	60.01	2748.21
185.000	728.38	59.85	2783.90
189.559	699.74	59.71	2816.69
190.000	696.99	59.70	2819.89
194.559	668.65	59.56	2853.17
195.000	665.94	59.54	2856.42
200.000	635.21	59.39	2893.47
205.000	605.65	59.23	2930.38
210.000	578.57	59.07	2966.49
215.000	550.99	58.91	3003.30
220.000	523.37	58.74	3040.58
225.000	495.64	58.57	3078.36
230.000	467.79	58.40	3116.65
235.000	439.81	58.23	3155.46
240.000	411.70	58.06	3194.80
245.000	383.47	57.88	3234.68
250.000	355.09	57.70	3275.10
255.000	326.58	57.52	3316.08
260.000	297.91	57.34	3357.62
265.000	269.08	57.15	3399.74
270.000	240.08	56.96	3442.45
275.000	210.91	56.77	3485.75
280.000	181.54	56.58	3529.68
285.000	151.99	56.38	3574.22
290.000	122.23	56.18	3619.41
295.000	92.25	55.98	3665.25
300.000	62.06	55.78	3711.76
305.000	31.62	55.58	3758.95
310.000	0.94	55.37	3806.83
315.000	-29.99	55.16	3855.43
320.000	-61.19	54.95	3904.76
325.000	-92.67	54.74	3954.84
330.000	-124.43	54.52	4005.68
335.000	-156.50	54.30	4057.30
340.000	-188.88	54.08	4109.73
345.000	-221.59	53.86	4162.98

TABLE 7-XVIII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
350.000	-254.64	53.64	4217.07
355.000	-288.04	53.41	4272.03
360.000	-321.81	53.19	4327.88
365.000	-355.96	52.96	4384.64
370.000	-390.50	52.72	4442.35
375.000	-425.45	52.49	4501.01
380.000	-460.83	52.25	4560.67
385.000	-496.66	52.02	4621.35
390.000	-532.94	51.78	4683.08
395.000	-569.70	51.54	4745.90
400.000	-606.95	51.29	4809.83
405.000	-644.72	51.05	4874.92
410.000	-683.02	50.80	4941.20
415.000	-721.87	50.56	5008.72
420.000	-761.30	50.31	5077.50
425.000	-801.33	50.05	5147.61
430.000	-841.97	49.80	5219.07
435.000	-883.26	49.55	5291.96
437.627	-905.23	49.41	5330.84
440.000	-925.52	49.29	5359.15
445.000	-968.70	49.04	5419.52
450.000	-1012.48	48.78	5480.86
455.000	-1056.86	48.52	5543.23
460.000	-1101.87	48.26	5606.64
465.000	-1147.54	48.00	5671.13
470.000	-1193.87	47.74	5736.74
475.000	-1240.89	47.48	5803.51
480.000	-1288.63	47.22	5871.47
485.000	-1337.10	46.96	5940.68
490.000	-1386.34	46.69	6011.18
495.000	-1436.37	46.43	6083.02
500.000	-1487.22	46.16	6156.26
505.000	-1538.91	45.90	6230.93
510.000	-1591.48	45.63	6307.12
515.000	-1644.96	45.36	6384.88
520.000	-1699.40	45.10	6464.28
525.000	-1754.82	44.83	6545.40
530.000	-1811.27	44.56	6628.31
535.000	-1868.81	44.29	6713.09
537.424	-1897.12	44.15	6754.90

TABLE 7-XVIII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
 PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
537.424	-1897.12	44.15	6754.90
537.442	-1897.28	44.15	6754.86
540.000	-1920.31	44.01	6750.17
543.142	-1948.58	43.84	6744.33
545.000	-1966.57	43.73	6749.79
545.742	-1973.78	43.69	6751.96
549.542	-2011.33	43.47	6765.73
550.000	-2015.86	43.45	6767.39
555.000	-2065.44	43.16	6785.49
560.000	-2115.28	42.87	6803.54
565.000	-2165.38	42.58	6821.55
570.000	-2215.76	42.28	6839.51
575.000	-2266.40	41.99	6857.42
580.000	-2317.28	41.69	6875.30
585.000	-2368.38	41.40	6893.14
590.000	-2419.72	41.10	6910.94
595.000	-2471.29	40.80	6928.71
600.000	-2523.08	40.50	6946.45
605.000	-2575.11	40.19	6964.16
610.000	-2627.36	39.89	6981.83
615.000	-2679.83	39.60	6999.49
620.000	-2732.54	39.30	7017.12
625.000	-2785.46	39.01	7034.73
630.000	-2838.60	38.72	7052.32
635.000	-2891.96	38.44	7069.90
640.000	-2945.54	38.17	7087.47
645.000	-2999.33	37.92	7105.03
650.000	-3053.33	37.73	7122.59
655.000	-3107.45	37.57	7140.19
656.031	-3118.59	37.53	7143.83
656.031	-3118.59	37.53	7143.83
660.000	-3152.23	37.28	7129.07
670.000	-3236.70	36.65	7091.19
680.000	-3320.70	36.02	7052.31
690.000	-3404.24	35.38	7012.43
700.000	-3487.30	34.74	6971.56
710.000	-3569.88	34.09	6929.71
720.000	-3651.94	33.44	6886.89
730.000	-3733.51	32.78	6843.10
740.000	-3814.55	32.12	6798.36

TABLE 7-XVIII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
740.031	-3814.80	32.12	6798.22
750.000	-3895.03	31.45	6752.61
760.000	-3974.96	30.78	6705.91
770.000	-4054.33	30.10	6658.26
780.000	-4133.13	29.42	6609.68
790.000	-4211.35	28.73	6560.16
800.000	-4288.97	28.04	6509.72
900.000	-5030.23	20.89	5955.98
1000.000	-5700.71	13.40	5318.24
1100.000	-6291.07	5.63	4605.57
1200.000	-6792.87	-2.30	3827.88
1300.000	-7199.01	-10.30	2996.10
1400.000	-7503.71	-18.28	2121.95
1500.000	-7702.63	-26.12	1217.75
1600.000	-7792.91	-33.72	296.27
1700.000	-7773.26	-40.99	-629.45
1800.000	-7643.93	-47.82	-1546.33
1900.000	-7406.75	-54.12	-2441.38
2000.000	-7065.09	-59.80	-3301.93
2100.000	-6623.80	-64.78	-4115.82
2200.000	-6089.16	-68.99	-4871.54
2300.000	-5468.77	-72.35	-5558.44
2400.000	-4771.44	-74.82	-6166.85
2500.000	-4007.06	-76.35	-6688.22
2600.000	-3186.45	-76.90	-7115.26
2700.000	-2321.21	-76.47	-7442.02
2800.000	-1423.56	-75.04	-7663.97
2900.000	-506.14	-72.61	-7778.06
3000.000	418.16	-69.22	-7782.77
3100.000	1336.35	-64.88	-7678.08
3200.000	2235.56	-59.64	-7465.53
3300.000	3103.18	-53.56	-7148.15
3400.000	3927.08	-46.72	-6730.41
3500.000	4695.70	-39.17	-6218.21
3600.000	5398.30	-31.03	-5618.72
3700.000	6025.03	-22.38	-4940.37
3800.000	6567.10	-13.33	-4192.67
3900.000	7016.90	-4.00	-3386.11
4000.000	7368.11	5.50	-2532.03
4100.000	7615.80	15.03	-1642.39

TABLE 7-XVIII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
4200.000	7756.48	24.49	-729.72
4300.000	7788.17	33.73	193.18
4400.000	7710.43	42.64	1113.32
4500.000	7524.37	51.09	2017.76
4600.000	7232.60	58.97	2893.80
4700.000	6839.24	66.16	3729.12
4800.000	6349.85	72.56	4511.98
4900.000	5771.33	78.08	5231.41
5000.000	5111.83	82.62	5877.32
5100.000	4380.62	86.12	6440.66
5200.000	3587.99	88.53	6913.57
5300.000	2745.05	89.78	7289.43
5400.000	1863.63	89.86	7563.00
5500.000	956.08	88.75	7730.48
5600.000	35.11	86.45	7789.52
5700.000	-886.42	82.97	7739.31
5800.000	-1795.59	78.35	7580.54
5900.000	-2679.67	72.64	7315.42
6000.000	-3526.30	65.89	6947.62
6100.000	-4323.59	58.19	6482.26
6200.000	-5060.37	49.62	5925.81
6300.000	-5726.27	40.29	5286.03
6400.000	-6311.89	30.32	4571.85
6500.000	-6808.96	19.83	3793.26
6600.000	-7210.44	8.95	2961.17
6700.000	-7510.62	-2.16	2087.28
6800.000	-7705.22	-13.38	1183.87
6900.000	-7791.45	-24.53	263.68
7000.000	-7768.06	-35.48	-660.31
7100.000	-7635.35	-46.08	-1575.06
7200.000	-7395.19	-56.17	-2467.65
7300.000	-7050.98	-65.61	-3325.47
7400.000	-6607.60	-74.27	-4136.41
7500.000	-6071.34	-82.02	-4889.03
7600.000	-5449.80	-88.74	-5572.76
7700.000	-4751.80	-94.35	-6177.99
7800.000	-3987.21	-98.74	-6696.24
7900.000	-3166.83	-101.84	-7120.28
8000.000	-2302.24	-103.60	-7444.23
8100.000	-1405.60	-103.99	-7663.61

TABLE 7-XVIII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
 PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

VELOCITY COMPONENTS IN
 APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
8200.000	-489.51	-102.97	-7775.41
8300.000	433.18	-100.56	-7778.15
8400.000	1349.55	-96.77	-7671.86
8500.000	2246.78	-91.64	-7458.08
8600.000	3112.34	-85.22	-7139.86
8700.000	3934.14	-77.58	-6721.68
8800.000	4700.72	-68.82	-6209.42
8900.000	5401.35	-59.04	-5610.25
9000.000	6026.27	-48.36	-4932.57
9100.000	6566.74	-36.93	-4185.84
9200.000	7015.19	-24.88	-3380.53
9300.000	7365.35	-12.37	-2527.90
9400.000	7612.31	0.42	-1639.89
9500.000	7752.61	13.34	-728.92
9600.000	7784.28	26.21	192.22
9700.000	7706.87	38.85	1110.64
9800.000	7521.49	51.08	2013.45
9900.000	7230.72	62.75	2888.01
10000.000	6838.67	73.67	3722.05
10100.000	6350.85	83.70	4503.89
10200.000	5774.10	92.69	5222.60
10300.000	5116.54	100.50	5868.12
10400.000	4387.37	107.03	6431.44
10500.000	3596.83	112.17	6904.70
10600.000	2755.96	115.83	7281.31
10700.000	1876.53	117.95	7556.01
10800.000	970.82	118.49	7724.98
10900.000	51.49	117.42	7785.87
11000.000	-868.65	114.75	7737.83
11100.000	-1776.74	110.49	7581.50
11200.000	-2660.11	104.69	7319.05
11300.000	-3506.41	97.41	6954.10
11400.000	-4303.79	88.74	6491.71
11500.000	-5041.09	78.77	5938.29
11600.000	-5707.95	67.64	5301.55
11700.000	-6294.98	55.47	4590.33
11800.000	-6793.90	42.44	3814.59
11900.000	-7197.67	28.71	2985.16
12000.000	-7500.54	14.45	2113.66
12100.000	-7698.20	-0.13	1212.34

TABLE 7-XVIII

 VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
 PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
12200.000	-7787.82	-14.84	293.87
12300.000	-7768.12	-29.49	-628.83
12400.000	-7639.33	-43.86	-1542.74
12500.000	-7403.28	-57.76	-2434.99
12600.000	-7063.28	-70.99	-3292.99
12700.000	-6624.16	-83.36	-4104.67
12800.000	-6092.13	-94.70	-4858.61
12900.000	-5474.74	-104.84	-5544.21
13000.000	-4780.70	-113.63	-6151.88
13100.000	-4019.82	-120.94	-6673.11
13200.000	-3202.84	-126.65	-7100.67
13300.000	-2341.25	-130.67	-7428.63
13400.000	-1447.16	-132.94	-7652.46
13500.000	-533.10	-133.41	-7769.11
13600.000	388.13	-132.06	-7777.04
13700.000	1303.68	-128.89	-7676.20
13800.000	2200.75	-123.93	-7468.07
13900.000	3066.86	-117.23	-7155.60
14000.000	3889.93	-108.88	-6743.20
14100.000	4658.50	-98.96	-6236.64
14200.000	5361.87	-87.61	-5643.03
14300.000	5990.25	-74.97	-4970.63
14400.000	6534.88	-61.20	-4228.85
14500.000	6988.16	-46.47	-3428.03
14600.000	7343.76	-30.99	-2579.35
14700.000	7596.72	-14.96	-1694.65
14800.000	7743.50	1.41	-786.31
14900.000	7782.05	17.89	132.99
15000.000	7711.82	34.26	1050.40
15100.000	7533.80	50.29	1953.09
15200.000	7250.49	65.76	2828.44
15300.000	6865.87	80.45	3664.22
15400.000	6385.32	94.15	4448.75
15500.000	5815.57	106.67	5171.07
15600.000	5164.61	117.83	5821.12
15700.000	4441.53	127.45	6389.84
15800.000	3656.44	135.41	6869.30
15900.000	2820.30	141.56	7252.83
16000.000	1944.76	145.83	7535.10
16100.000	1042.03	148.12	7712.19

TABLE 7-XVIII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (81-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
16200.000	124.68	148.40	7781.61
16300.000	-794.52	146.65	7742.41
16400.000	-1702.75	142.86	7595.10
16500.000	-2587.38	137.09	7341.69
16550.000	-3016.96	133.47	7176.24

TABLE 7-XIX WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
0.000	6.401386E 06	7.662082E 06	49.3	0.000
5.000	6.257192E 06	7.669934E 06	75.1	0.000
10.000	6.112940E 06	7.684710E 06	156.1	0.000
12.000	6.055222E 06	7.692852E 06	205.8	0.000
15.000	5.968626E 06	7.707578E 06	300.4	0.000
20.000	5.824245E 06	7.739413E 06	515.9	0.000
25.000	5.679789E 06	7.780933E 06	811.8	0.002
30.000	5.535251E 06	7.832038E 06	1197.7	0.010
35.000	5.390626E 06	7.892950E 06	1684.2	0.028
40.000	5.245907E 06	7.963235E 06	2282.2	0.062
45.000	5.101088E 06	8.041959E 06	3002.3	0.121
50.000	4.956165E 06	8.127621E 06	3855.4	0.216
55.000	4.811133E 06	8.218253E 06	4850.6	0.359
60.000	4.665990E 06	8.311228E 06	5996.1	0.564
65.000	4.520741E 06	8.403757E 06	7297.7	0.847
70.000	4.375261E 06	8.493341E 06	8757.8	1.392
75.000	4.229469E 06	8.580864E 06	10377.2	1.829
80.000	4.083508E 06	8.663631E 06	12159.0	2.411
82.250	4.017765E 06	8.697963E 06	13015.2	2.752
85.000	3.937360E 06	8.737273E 06	14108.8	3.196
90.000	3.791011E 06	8.800116E 06	16231.1	4.112
95.000	3.644778E 06	8.851238E 06	18530.2	5.225
100.000	3.498333E 06	8.891853E 06	21008.8	6.542
105.000	3.351667E 06	8.924549E 06	23668.1	8.094
110.000	3.204773E 06	8.951733E 06	26506.0	9.940
115.000	3.057641E 06	8.975317E 06	29523.6	12.068
120.000	2.910257E 06	8.996662E 06	32725.3	14.488
125.000	2.762602E 06	9.016759E 06	36115.5	17.252
130.000	2.614658E 06	9.036328E 06	39699.3	20.378
135.000	2.466400E 06	9.055851E 06	43483.1	23.876
140.000	2.317799E 06	9.075576E 06	47476.3	27.798
145.000	2.168822E 06	9.095536E 06	51690.4	32.168
147.329	2.099290E 06	7.283890E 06	53732.8	34.363
150.000	2.035959E 06	7.238603E 06	56126.6	37.003
155.000	1.917221E 06	7.253478E 06	60726.8	42.266
159.329	1.814177E 06	7.266754E 06	64845.0	47.178
159.329	1.459482E 06	0.000000E-39	64845.0	47.178
159.459	1.459482E 06	2.742798E 05	64970.1	47.329
160.000	1.458931E 06	2.742829E 05	65491.5	47.967
163.759	1.455103E 06	1.024098E 06	69052.1	52.387

TABLE 7-XIX WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
165.000	1.452107E 06	1.024102E 06	70204.5	53.848
165.859	1.450031E 06	1.163632E 06	70998.0	54.862
170.000	1.438698E 06	1.163640E 06	74765.7	59.787
175.000	1.425012E 06	1.163645E 06	79198.3	65.811
180.000	1.411327E 06	1.163647E 06	83504.7	71.926
185.000	1.397642E 06	1.163648E 06	87687.1	78.126
189.559	1.375262E 06	1.163648E 06	91394.8	83.858
190.000	1.374056E 06	1.163649E 06	91747.6	84.415
194.559	1.352926E 06	1.163649E 06	95346.6	90.229
195.000	1.351721E 06	1.163649E 06	95689.1	90.796
200.000	1.338035E 06	1.163613E 06	99514.4	97.266
205.000	1.324350E 06	1.163607E 06	103226.6	103.831
210.000	1.310665E 06	1.163649E 06	106839.8	110.486
215.000	1.296979E 06	1.163649E 06	110357.4	117.232
220.000	1.283294E 06	1.163649E 06	113779.6	124.073
225.000	1.269608E 06	1.163649E 06	117107.4	131.008
230.000	1.255923E 06	1.163649E 06	120341.9	138.039
235.000	1.242238E 06	1.163649E 06	123483.8	145.167
240.000	1.228552E 06	1.163649E 06	126533.7	152.397
245.000	1.214867E 06	1.163649E 06	129493.4	159.727
250.000	1.201181E 06	1.163649E 06	132363.0	167.161
255.000	1.187496E 06	1.163649E 06	135143.8	174.698
260.000	1.173811E 06	1.163649E 06	137837.0	182.343
265.000	1.160125E 06	1.163649E 06	140443.3	190.096
270.000	1.146440E 06	1.163649E 06	142963.8	197.959
275.000	1.132754E 06	1.163649E 06	145399.6	205.935
280.000	1.119069E 06	1.163649E 06	147751.8	214.024
285.000	1.105384E 06	1.163649E 06	150021.4	222.229
290.000	1.091698E 06	1.163649E 06	152209.5	230.553
295.000	1.078013E 06	1.163649E 06	154317.4	238.997
300.000	1.064327E 06	1.163649E 06	156346.1	247.562
305.000	1.050642E 06	1.163649E 06	158296.7	256.252
310.000	1.036957E 06	1.163649E 06	160170.6	265.068
315.000	1.023271E 06	1.163649E 06	161968.9	274.013
320.000	1.009586E 06	1.163649E 06	163692.8	283.088
325.000	9.959004E 05	1.163649E 06	165343.6	292.297
330.000	9.822150E 05	1.163649E 06	166922.8	301.642
335.000	9.685296E 05	1.163649E 06	168431.7	311.125
340.000	9.548442E 05	1.163649E 06	169871.4	320.747
345.000	9.411588E 05	1.163649E 06	171243.8	330.514

TABLE 7-KIX WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
350.000	9.274734E 05	1.163649E 06	172549.9	340.426
355.000	9.137880E 05	1.163649E 06	173791.6	350.486
360.000	9.001026E 05	1.163649E 06	174970.1	360.698
365.000	8.864172E 05	1.163649E 06	176087.2	371.064
370.000	8.727318E 05	1.163649E 06	177144.8	381.586
375.000	8.590464E 05	1.163649E 06	178144.3	392.269
380.000	8.453610E 05	1.163649E 06	179087.5	403.114
385.000	8.316756E 05	1.163649E 06	179976.3	414.126
390.000	8.179902E 05	1.163649E 06	180812.6	425.307
395.000	8.043048E 05	1.163649E 06	181598.5	436.661
400.000	7.906194E 05	1.163649E 06	182335.8	448.190
405.000	7.769340E 05	1.163649E 06	183027.0	459.900
410.000	7.632486E 05	1.163649E 06	183674.1	471.792
415.000	7.495632E 05	1.163649E 06	184279.3	483.872
420.000	7.358778E 05	1.163649E 06	184845.3	496.142
425.000	7.221924E 05	1.163649E 06	185374.3	508.607
430.000	7.085070E 05	1.163649E 06	185869.2	521.272
435.000	6.948217E 05	1.163649E 06	186332.5	534.139
437.627	6.876303E 05	9.536950E 05	186564.2	540.983
440.000	6.823523E 05	9.536950E 05	186765.2	547.210
445.000	6.712296E 05	9.536950E 05	187157.5	560.459
450.000	6.601069E 05	9.536949E 05	187509.1	573.885
455.000	6.489841E 05	9.536950E 05	187822.2	587.491
460.000	6.378614E 05	9.536950E 05	188099.8	601.280
465.000	6.267387E 05	9.536950E 05	188343.8	615.256
470.000	6.156160E 05	9.536950E 05	188557.3	629.422
475.000	6.044932E 05	9.536950E 05	188742.7	643.783
480.000	5.933705E 05	9.536950E 05	188903.3	658.342
485.000	5.822478E 05	9.536950E 05	189041.7	673.103
490.000	5.711251E 05	9.536950E 05	189161.5	688.071
495.000	5.600024E 05	9.536950E 05	189265.5	703.250
500.000	5.488796E 05	9.536950E 05	189357.4	718.643
505.000	5.377569E 05	9.536950E 05	189441.0	734.256
510.000	5.266342E 05	9.536950E 05	189519.5	750.093
515.000	5.155115E 05	9.536950E 05	189597.5	766.160
520.000	5.043888E 05	9.536950E 05	189678.8	782.461
525.000	4.932661E 05	9.536950E 05	189767.7	799.002
530.000	4.821434E 05	9.536950E 05	189868.9	815.788
535.000	4.710206E 05	9.536950E 05	189987.1	832.824
537.424	4.656272E 05	9.536950E 05	190051.9	841.177

TABLE 7-XIX WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
537.424	3.635400E 05	0.000000E-39	190051.9	841.177
537.442	3.635400E 05	2.711470E 04	190052.5	841.238
540.000	3.632896E 05	2.711470E 04	190118.2	850.084
543.142	3.629819E 05	2.069960E 05	190184.2	860.955
545.000	3.620828E 05	2.069960E 05	190216.7	867.386
545.742	3.617234E 05	2.333470E 05	190228.9	869.960
549.542	3.595114E 05	2.333470E 05	190283.1	883.160
550.000	3.592603E 05	2.333470E 05	190288.8	884.752
555.000	3.565169E 05	2.333470E 05	190339.7	902.200
560.000	3.537720E 05	2.333470E 05	190371.1	919.731
565.000	3.510260E 05	2.333470E 05	190384.3	937.345
570.000	3.482801E 05	2.333470E 05	190380.3	955.045
575.000	3.455341E 05	2.333470E 05	190360.6	972.830
580.000	3.427882E 05	2.333470E 05	190326.6	990.701
585.000	3.400422E 05	2.333470E 05	190280.2	1008.659
590.000	3.372962E 05	2.333470E 05	190222.4	1026.705
595.000	3.345522E 05	2.333470E 05	190155.3	1044.839
600.000	3.318087E 05	2.333470E 05	190080.5	1063.063
605.000	3.290653E 05	2.333470E 05	190000.1	1081.378
610.000	3.263218E 05	2.333470E 05	189915.3	1099.783
615.000	3.235783E 05	2.333470E 05	189828.5	1118.280
620.000	3.208349E 05	2.333470E 05	189741.2	1136.870
625.000	3.180914E 05	2.333470E 05	189655.8	1155.553
630.000	3.153480E 05	2.333470E 05	189574.0	1174.330
635.000	3.126045E 05	2.333470E 05	189498.1	1193.202
640.000	3.098610E 05	2.333470E 05	189430.0	1212.171
645.000	3.071176E 05	2.333470E 05	189372.2	1231.235
650.000	3.043741E 05	2.333470E 05	189326.7	1250.397
655.000	3.016306E 05	2.333470E 05	189296.0	1269.657
655.175	3.015344E 05	2.333470E 05	189295.2	1270.335
655.175	3.015344E 05	1.400000E 02	189295.2	1270.335
660.000	3.015263E 05	1.400000E 02	189274.7	1288.970
670.000	3.015094E 05	1.400000E 02	189231.5	1327.597
680.000	3.014925E 05	1.400000E 02	189187.1	1366.223
690.000	3.014756E 05	1.400000E 02	189141.8	1404.850
700.000	3.014587E 05	1.400000E 02	189095.5	1443.477
710.000	3.014418E 05	1.400000E 02	189048.3	1482.105
720.000	3.014249E 05	1.942928E 02	189000.2	1520.733
730.000	3.014019E 05	1.930575E 02	188951.2	1559.362
739.175	3.013810E 05	5.192403E 01	188905.6	1594.805

TABLE 7-XIX WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
740.000	3.013805E 05	5.182216E 01	188901.4	1597.990
750.000	3.013748E 05	5.058683E 01	188850.7	1636.620
760.000	3.013691E 05	4.935150E 01	188799.2	1675.249
770.000	3.013636E 05	4.811617E 01	188747.2	1713.879
780.000	3.013583E 05	4.688084E 01	188694.3	1752.509
790.000	3.013531E 05	4.564551E 01	188640.9	1791.139
800.000	3.013480E 05	4.441018E 01	188586.7	1829.769
900.000	3.013106E 05	8.000000E 00	188016.5	2216.086
1000.000	3.012916E 05	5.417583E 01	187415.0	2602.423
1100.000	3.012309E 05	5.467826E 01	186813.1	2988.786
1200.000	3.011704E 05	5.383520E 01	186243.6	3375.178
1300.000	3.011111E 05	5.277039E 01	185737.1	3761.599
1400.000	3.010530E 05	5.135408E 01	185321.2	4148.048
1500.000	3.009968E 05	4.965964E 01	185018.9	4534.524
1600.000	3.009424E 05	4.796519E 01	184846.6	4921.024
1700.000	3.008900E 05	4.627075E 01	184814.5	5307.544
1800.000	3.008393E 05	4.464285E 01	184925.6	5694.082
1900.000	3.007905E 05	4.301785E 01	185176.0	6080.630
2000.000	3.007435E 05	4.139285E 01	185555.4	6467.186
2100.000	3.006983E 05	3.976785E 01	186047.2	6853.743
2200.000	3.006549E 05	3.814285E 01	186630.0	7240.296
2300.000	3.006133E 05	3.651785E 01	187279.5	7626.837
2400.000	3.005735E 05	3.489285E 01	187968.4	8013.359
2500.000	3.005355E 05	3.340475E 01	188669.7	8399.854
2600.000	3.004990E 05	3.196031E 01	189356.7	8786.311
2700.000	3.004642E 05	3.051587E 01	190006.0	9172.713
2800.000	3.004310E 05	2.915055E 01	190597.0	9559.030
2900.000	3.003988E 05	2.820610E 01	191114.6	9945.187
3000.000	3.003673E 05	2.726166E 01	191548.8	10330.873
3100.000	3.003363E 05	2.631721E 01	191895.6	10710.341
3200.000	3.003060E 05	2.537277E 01	192156.9	10492.630
3300.000	3.002764E 05	2.442832E 01	192340.6	10107.699
3400.000	3.002473E 05	2.348388E 01	192459.3	9721.885
3500.000	3.002189E 05	2.253943E 01	192530.0	9335.927
3600.000	3.001914E 05	2.195433E 01	192572.1	8949.950
3700.000	3.001648E 05	2.138489E 01	192605.7	8563.993
3800.000	3.001393E 05	2.081544E 01	192651.6	8178.069
3900.000	3.001149E 05	2.024600E 01	192730.3	7792.186
4000.000	3.000915E 05	1.967655E 01	192859.3	7406.346
4100.000	3.000691E 05	1.910711E 01	193052.9	7020.551

TABLE 7-XIX WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
4200.000	3.000478E 05	1.853767E 01	193320.1	6634.799
4300.000	3.000274E 05	1.814725E 01	193664.3	6249.089
4400.000	3.000074E 05	1.781392E 01	194083.4	5863.419
4500.000	2.999878E 05	1.748058E 01	194569.1	5477.788
4600.000	2.999685E 05	1.717802E 01	195107.5	5092.194
4700.000	2.999495E 05	1.703913E 01	195679.7	4706.636
4800.000	2.999306E 05	1.690024E 01	196263.1	4321.114
4900.000	2.999119E 05	1.683864E 01	196832.0	3935.630
5000.000	2.998931E 05	1.697753E 01	197359.5	3550.190
5100.000	2.998741E 05	1.711642E 01	197819.3	3164.804
5200.000	2.998550E 05	1.725531E 01	198186.5	2779.493
5300.000	2.998358E 05	1.739420E 01	198439.3	2394.295
5400.000	2.998162E 05	1.786581E 01	198560.5	2009.279
5500.000	2.997961E 05	1.835192E 01	198538.2	1624.590
5600.000	2.997754E 05	1.883804E 01	198367.3	1240.552
5700.000	2.997542E 05	1.932415E 01	198048.9	858.084
5800.000	2.997325E 05	1.981026E 01	197591.5	481.034
5900.000	2.997102E 05	2.029637E 01	197010.6	155.945
6000.000	2.996874E 05	2.078248E 01	196328.6	339.386
6100.000	2.996641E 05	2.119487E 01	195572.4	709.993
6200.000	2.996403E 05	2.158376E 01	194771.8	1091.394
6300.000	2.996161E 05	2.197265E 01	193959.7	1475.274
6400.000	2.995915E 05	2.232198E 01	193169.4	1860.122
6500.000	2.995666E 05	2.246087E 01	192434.0	2245.455
6600.000	2.995416E 05	2.259976E 01	191783.7	2631.072
6700.000	2.995165E 05	2.253068E 01	191245.5	3016.866
6800.000	2.994915E 05	2.242247E 01	190840.8	3402.778
6900.000	2.994666E 05	2.228358E 01	190585.3	3788.766
7000.000	2.994419E 05	2.214469E 01	190487.6	4174.798
7100.000	2.994174E 05	2.200580E 01	190549.2	4560.849
7200.000	2.993931E 05	2.168058E 01	190764.6	4946.892
7300.000	2.993691E 05	2.134725E 01	191121.8	5332.904
7400.000	2.993455E 05	2.101392E 01	191602.6	5718.857
7500.000	2.993223E 05	2.068058E 01	192184.3	6104.720
7600.000	2.992995E 05	2.034725E 01	192840.6	6490.458
7700.000	2.992771E 05	2.001392E 01	193543.6	6876.024
7800.000	2.992550E 05	1.968058E 01	194264.5	7261.355
7900.000	2.992333E 05	1.931566E 01	194976.0	7646.367
8000.000	2.992120E 05	1.894066E 01	195653.0	8030.929
8100.000	2.991911E 05	1.856566E 01	196274.7	8414.834

TABLE 7-XIX WEIGHT, THRUST, ALTITUDE, AND SURFACE
 RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
 PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
8200.000	2.991707E 05	1.819066E 01	196824.7	8797.726
8300.000	2.991506E 05	1.781566E 01	197292.5	9178.916
8400.000	2.991310E 05	1.744066E 01	197673.3	9556.891
8500.000	2.991118E 05	1.706566E 01	197968.3	9927.542
8600.000	2.990930E 05	1.672942E 01	198184.6	10275.278
8700.000	2.990746E 05	1.642387E 01	198334.0	10504.043
8800.000	2.990564E 05	1.611831E 01	198432.7	10355.300
8900.000	2.990387E 05	1.581276E 01	198499.4	10021.781
9000.000	2.990212E 05	1.550720E 01	198554.8	9655.025
9100.000	2.990042E 05	1.520165E 01	198619.9	9278.964
9200.000	2.989874E 05	1.489609E 01	198713.9	8899.179
9300.000	2.989710E 05	1.466019E 01	198853.9	8517.585
9400.000	2.989548E 05	1.454908E 01	199052.7	8135.012
9500.000	2.989386E 05	1.443797E 01	199319.1	7751.879
9600.000	2.989226E 05	1.432686E 01	199655.8	7368.421
9700.000	2.989067E 05	1.438425E 01	200060.0	6984.784
9800.000	2.988907E 05	1.449536E 01	200523.0	6601.068
9900.000	2.988745E 05	1.460647E 01	201030.8	6217.346
10000.000	2.988582E 05	1.474615E 01	201564.5	5833.679
10100.000	2.988417E 05	1.503782E 01	202101.9	5450.123
10200.000	2.988248E 05	1.532949E 01	202617.8	5066.736
10300.000	2.988076E 05	1.562115E 01	203086.4	4683.586
10400.000	2.987901E 05	1.591282E 01	203481.5	4300.757
10500.000	2.987722E 05	1.620449E 01	203780.0	3918.359
10600.000	2.987541E 05	1.649615E 01	203960.8	3536.549
10700.000	2.987356E 05	1.678782E 01	204008.4	3155.552
10800.000	2.987167E 05	1.714603E 01	203912.1	2775.719
10900.000	2.986975E 05	1.750714E 01	203668.1	2397.617
11000.000	2.986779E 05	1.786825E 01	203278.9	2022.232
11100.000	2.986578E 05	1.822937E 01	202754.3	1651.435
11200.000	2.986374E 05	1.859048E 01	202110.5	1289.208
11300.000	2.986165E 05	1.895159E 01	201369.3	945.468
11400.000	2.985952E 05	1.931270E 01	200558.1	650.237
11500.000	2.985737E 05	1.952637E 01	199707.5	498.744
11600.000	2.985519E 05	1.969304E 01	198850.8	609.663
11700.000	2.985299E 05	1.985971E 01	198021.9	889.701
11800.000	2.985077E 05	2.002637E 01	197254.2	1228.119
11900.000	2.984854E 05	2.019304E 01	196577.5	1587.970
12000.000	2.984628E 05	2.035971E 01	196019.2	1957.415
12100.000	2.984401E 05	2.052637E 01	195600.5	2331.834

TABLE 7-XIX WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
12200.000	2.984172E 05	2.058449E 01	195336.8	2709.098
12300.000	2.983944E 05	2.055671E 01	195236.5	3088.085
12400.000	2.983715E 05	2.052894E 01	195300.8	3468.145
12500.000	2.983487E 05	2.050116E 01	195524.2	3848.861
12600.000	2.983261E 05	2.020720E 01	195893.7	4229.946
12700.000	2.983038E 05	1.990165E 01	196391.3	4611.182
12800.000	2.982818E 05	1.959609E 01	196993.5	4992.387
12900.000	2.982601E 05	1.929054E 01	197674.5	5373.396
13000.000	2.982388E 05	1.898498E 01	198405.1	5754.043
13100.000	2.982179E 05	1.867942E 01	199156.7	6134.145
13200.000	2.981973E 05	1.837387E 01	199901.3	6513.485
13300.000	2.981770E 05	1.791035E 01	200613.8	6891.787
13400.000	2.981574E 05	1.739646E 01	201272.7	7268.679
13500.000	2.981383E 05	1.688257E 01	201861.5	7643.635
13600.000	2.981198E 05	1.636868E 01	202369.0	8015.867
13700.000	2.981018E 05	1.585479E 01	202789.8	8384.124
13800.000	2.980845E 05	1.534090E 01	203125.1	8746.300
13900.000	2.980677E 05	1.482701E 01	203380.5	9098.564
14000.000	2.980514E 05	1.443718E 01	203567.9	9433.323
14100.000	2.980355E 05	1.414551E 01	203702.6	9734.104
14200.000	2.980199E 05	1.385384E 01	203802.8	9963.633
14300.000	2.980047E 05	1.356218E 01	203888.4	10053.329
14400.000	2.979897E 05	1.327051E 01	203979.4	9957.567
14500.000	2.979751E 05	1.297884E 01	204095.1	9725.050
14600.000	2.979608E 05	1.268718E 01	204251.4	9423.622
14700.000	2.979469E 05	1.249005E 01	204461.2	9089.517
14800.000	2.979330E 05	1.246227E 01	204732.2	8738.737
14900.000	2.979191E 05	1.243449E 01	205067.5	8378.682
15000.000	2.979053E 05	1.240672E 01	205463.5	8013.109
15100.000	2.978915E 05	1.256850E 01	205912.0	7644.099
15200.000	2.978774E 05	1.279072E 01	206398.7	7272.902
15300.000	2.978630E 05	1.301294E 01	206905.2	6900.326
15400.000	2.978485E 05	1.329011E 01	207409.4	6526.930
15500.000	2.978334E 05	1.385956E 01	207886.5	6153.134
15600.000	2.978177E 05	1.442900E 01	208311.0	5779.281
15700.000	2.978014E 05	1.499845E 01	208657.8	5405.680
15800.000	2.977844E 05	1.556789E 01	208904.1	5032.637
15900.000	2.977668E 05	1.613733E 01	209029.7	4660.484
16000.000	2.977486E 05	1.670678E 01	209019.7	4289.617
16100.000	2.977297E 05	1.727622E 01	208864.5	3920.533

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TABLE 7-XIX WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
16200.000	2.977103E 05	1.775250E 01	208560.8	3553.899
16300.000	2.976903E 05	1.822473E 01	208112.2	3190.653
16400.000	2.976698E 05	1.869695E 01	207529.4	2832.177
16500.000	2.976488E 05	1.908956E 01	206828.9	2480.600
16550.000	2.976382E 05	1.921456E 01	206441.5	2308.400

TABLE 7-XX

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(90-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
0.000	408.637	0.00	1.900	9.8181
5.000	408.762	10.40	2.201	9.8181
10.000	409.201	22.27	2.501	9.8178
12.000	409.495	27.45	2.627	9.8177
15.000	410.092	35.70	2.822	9.8174
20.000	412.129	50.82	3.184	9.8167
25.000	415.923	67.85	3.604	9.8158
30.000	422.164	87.01	4.064	9.8146
35.000	431.712	108.48	4.593	9.8131
40.000	445.360	132.52	5.202	9.8113
45.000	463.978	159.42	5.904	9.8090
50.000	488.230	189.50	6.696	9.8064
55.000	518.562	223.06	7.573	9.8034
60.000	555.179	260.39	8.502	9.7998
65.000	597.993	301.62	9.452	9.7958
70.000	646.560	346.69	10.411	9.7913
75.000	701.074	396.37	11.605	9.7864
80.000	762.462	452.15	13.002	9.7809
82.250	792.433	479.45	13.647	9.7783
85.000	831.077	514.73	14.461	9.7749
90.000	907.084	584.50	15.977	9.7684
95.000	990.615	661.79	17.539	9.7614
100.000	1081.818	746.85	19.138	9.7538
105.000	1180.871	839.88	20.837	9.7457
110.000	1288.007	941.18	22.507	9.7371
115.000	1403.260	1051.10	24.199	9.7279
120.000	1527.073	1170.07	26.009	9.7182
125.000	1660.091	1298.67	27.957	9.7079
130.000	1803.071	1437.61	30.064	9.6970
135.000	1956.950	1587.82	32.370	9.6856
140.000	2122.896	1750.44	34.927	9.6736
145.000	2302.354	1926.90	37.796	9.6609
147.329	2391.047	2014.29	31.022	9.6547
150.000	2472.967	2094.73	31.933	9.6475
155.000	2635.008	2254.17	34.266	9.6337
159.329	2785.281	2402.46	36.372	9.6214
159.329	2785.281	2402.46	9.625	9.6214
159.459	2784.847	2401.96	9.023	9.6210
160.000	2784.033	2400.87	9.019	9.6195
163.759	2778.602	2393.53	9.143	9.6088

TABLE 7-XX

INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
 (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
165.000	2783.141	2397.47	9.139	9.6054
165.859	2786.318	2400.24	9.478	9.6030
170.000	2805.893	2417.92	9.508	9.5918
175.000	2830.370	2440.23	9.516	9.5786
180.000	2855.742	2463.56	9.528	9.5658
185.000	2881.991	2487.88	9.540	9.5535
189.559	2906.677	2510.91	9.577	9.5425
190.000	2909.125	2513.20	9.578	9.5415
194.559	2934.850	2537.38	9.615	9.5308
195.000	2937.396	2539.78	9.616	9.5298
200.000	2966.743	2567.53	9.750	9.5186
205.000	2996.666	2596.01	8.979	9.5076
210.000	3026.768	2624.84	9.169	9.4970
215.000	3057.836	2654.68	9.253	9.4867
220.000	3089.729	2685.42	9.343	9.4767
225.000	3122.464	2717.06	9.438	9.4670
230.000	3156.048	2749.61	9.537	9.4576
235.000	3190.482	2783.07	9.636	9.4484
240.000	3225.766	2817.43	9.738	9.4395
245.000	3261.903	2852.70	9.841	9.4309
250.000	3298.897	2888.87	9.947	9.4226
255.000	3336.753	2925.96	10.056	9.4146
260.000	3375.474	2963.96	10.168	9.4068
265.000	3415.067	3002.87	10.283	9.3992
270.000	3455.537	3042.71	10.400	9.3920
275.000	3496.891	3083.47	10.521	9.3849
280.000	3539.137	3125.15	10.645	9.3782
285.000	3582.283	3167.78	10.773	9.3716
290.000	3626.337	3211.35	10.904	9.3654
295.000	3671.308	3255.86	11.038	9.3593
300.000	3717.208	3301.34	11.176	9.3535
305.000	3764.046	3347.78	11.318	9.3479
310.000	3811.835	3395.21	11.463	9.3425
315.000	3860.586	3443.62	11.613	9.3374
320.000	3910.314	3493.03	11.767	9.3324
325.000	3961.032	3543.45	11.925	9.3277
330.000	4012.755	3594.91	12.087	9.3232
335.000	4065.501	3647.40	12.254	9.3189
340.000	4119.285	3700.96	12.426	9.3148
345.000	4174.126	3755.59	12.603	9.3109

TABLE 7-XX

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
350.000	4230.044	3811.31	12.785	9.3072
355.000	4287.060	3868.14	12.972	9.3036
360.000	4345.194	3926.11	13.165	9.3003
365.000	4404.470	3985.24	13.363	9.2971
370.000	4464.912	4045.54	13.567	9.2941
375.000	4526.547	4107.05	13.778	9.2913
380.000	4589.402	4169.79	13.995	9.2886
385.000	4653.505	4233.79	14.220	9.2861
390.000	4718.889	4299.08	14.451	9.2837
395.000	4785.585	4365.70	14.690	9.2815
400.000	4853.629	4433.66	14.937	9.2794
405.000	4923.056	4503.02	15.192	9.2774
410.000	4993.907	4573.81	15.456	9.2756
415.000	5066.223	4646.07	15.729	9.2738
420.000	5140.047	4719.84	16.012	9.2722
425.000	5215.427	4795.18	16.305	9.2707
430.000	5292.411	4872.12	16.609	9.2693
435.000	5371.054	4950.73	16.924	9.2680
437.627	5413.063	4992.72	14.638	9.2674
440.000	5444.404	5024.05	14.743	9.2668
445.000	5511.360	5090.97	14.968	9.2657
450.000	5579.575	5159.16	15.200	9.2647
455.000	5649.083	5228.65	15.440	9.2638
460.000	5719.920	5299.47	15.687	9.2630
465.000	5792.125	5371.66	15.942	9.2623
470.000	5865.737	5445.26	16.207	9.2617
475.000	5940.801	5520.31	16.480	9.2612
480.000	6017.361	5596.87	16.763	9.2607
485.000	6095.466	5674.97	17.056	9.2603
490.000	6175.168	5754.67	17.360	9.2599
495.000	6256.521	5836.02	17.675	9.2596
500.000	6339.585	5919.08	18.003	9.2594
505.000	6424.421	6003.92	18.344	9.2591
510.000	6511.095	6090.59	18.699	9.2589
515.000	6599.681	6179.18	19.069	9.2587
520.000	6690.252	6269.75	19.454	9.2584
525.000	6782.893	6362.40	19.857	9.2582
530.000	6877.689	6457.19	20.279	9.2579
535.000	6974.737	6554.24	20.721	9.2575
537.424	7022.637	6602.14	20.944	9.2573

TABLE 7-XX

INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
 (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
537.424	7022.637	6602.14	9.257	9.2573
537.442	7022.636	6602.14	9.186	9.2573
540.000	7024.401	6603.90	9.190	9.2571
543.142	7026.590	6606.10	10.168	9.2570
545.000	7036.844	6616.35	10.137	9.2569
545.742	7040.955	6620.46	10.494	9.2568
549.542	7064.792	6644.30	10.541	9.2567
550.000	7067.674	6647.18	10.541	9.2566
555.000	7099.314	6678.83	10.582	9.2565
560.000	7131.237	6710.76	10.627	9.2564
565.000	7163.446	6742.98	10.674	9.2563
570.000	7195.944	6775.49	10.726	9.2563
575.000	7228.731	6808.29	10.765	9.2564
580.000	7261.805	6841.37	10.807	9.2565
585.000	7295.167	6874.75	10.848	9.2566
590.000	7328.819	6908.42	10.889	9.2567
595.000	7362.764	6942.38	10.930	9.2569
600.000	7397.002	6976.63	10.971	9.2571
605.000	7431.536	7011.18	11.012	9.2573
610.000	7466.368	7046.03	11.052	9.2575
615.000	7501.500	7081.18	11.093	9.2578
620.000	7536.935	7116.63	11.133	9.2580
625.000	7572.674	7152.38	11.174	9.2582
630.000	7608.720	7188.45	11.215	9.2584
635.000	7645.075	7224.82	11.253	9.2586
640.000	7681.743	7261.50	11.293	9.2588
645.000	7718.723	7298.50	11.331	9.2590
650.000	7756.030	7335.82	11.392	9.2591
655.000	7793.631	7373.44	11.359	9.2591
655.175	7794.955	7374.76	11.360	9.2591
655.175	7794.955	7374.76	9.259	9.2591
660.000	7794.988	7374.81	9.259	9.2592
670.000	7795.058	7374.92	9.259	9.2593
680.000	7795.128	7375.02	9.259	9.2593
690.000	7795.199	7375.12	9.259	9.2594
700.000	7795.271	7375.23	9.260	9.2595
710.000	7795.343	7375.34	9.260	9.2596
720.000	7795.415	7375.45	9.260	9.2597
730.000	7795.506	7375.57	9.260	9.2598
739.175	7795.590	7375.69	9.260	9.2599

TABLE 7-XX

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
740.000	7795.594	7375.70	9.260	9.2599
750.000	7795.639	7375.78	9.260	9.2600
760.000	7795.685	7375.87	9.260	9.2601
770.000	7795.730	7375.95	9.260	9.2602
780.000	7795.776	7376.03	9.260	9.2603
790.000	7795.822	7376.12	9.260	9.2604
800.000	7795.868	7376.21	9.261	9.2606
900.000	7796.305	7377.06	9.262	9.2617
1000.000	7796.711	7377.91	9.263	9.2629
1100.000	7797.245	7378.87	9.264	9.2642
1200.000	7797.767	7379.79	9.265	9.2653
1300.000	7798.256	7380.63	9.266	9.2664
1400.000	7798.695	7381.34	9.267	9.2673
1500.000	7799.067	7381.90	9.268	9.2679
1600.000	7799.363	7382.28	9.268	9.2683
1700.000	7799.572	7382.47	9.268	9.2684
1800.000	7799.691	7382.47	9.268	9.2683
1900.000	7799.720	7382.29	9.268	9.2678
2000.000	7799.659	7381.93	9.267	9.2671
2100.000	7799.513	7381.41	9.266	9.2661
2200.000	7799.292	7380.78	9.265	9.2649
2300.000	7799.005	7380.05	9.264	9.2636
2400.000	7798.664	7379.27	9.262	9.2621
2500.000	7798.280	7378.47	9.261	9.2606
2600.000	7797.866	7377.69	9.259	9.2590
2700.000	7797.435	7376.95	9.257	9.2575
2800.000	7796.997	7376.29	9.256	9.2560
2900.000	7796.562	7375.73	9.255	9.2547
3000.000	7796.137	7375.28	9.253	9.2535
3100.000	7795.727	7374.94	9.252	9.2524
3200.000	7795.335	7374.71	9.251	9.2514
3300.000	7794.960	7374.59	9.251	9.2506
3400.000	7794.601	7374.55	9.250	9.2499
3500.000	7794.255	7374.57	9.249	9.2492
3600.000	7793.916	7374.62	9.249	9.2486
3700.000	7793.579	7374.68	9.248	9.2481
3800.000	7793.244	7374.72	9.248	9.2475
3900.000	7792.905	7374.71	9.247	9.2468
4000.000	7792.559	7374.64	9.246	9.2461
4100.000	7792.203	7374.47	9.246	9.2453

TABLE 7-XX

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
4200.000	7791.837	7374.21	9.245	9.2444
4300.000	7791.464	7373.83	9.244	9.2434
4400.000	7791.086	7373.35	9.243	9.2423
4500.000	7790.710	7372.78	9.241	9.2412
4600.000	7790.346	7372.14	9.240	9.2399
4700.000	7790.002	7371.45	9.239	9.2387
4800.000	7789.690	7370.74	9.238	9.2375
4900.000	7789.422	7370.04	9.237	9.2363
5000.000	7789.210	7369.39	9.236	9.2353
5100.000	7789.065	7368.83	9.235	9.2345
5200.000	7788.998	7368.40	9.234	9.2339
5300.000	7789.017	7368.10	9.234	9.2335
5400.000	7789.127	7367.99	9.234	9.2335
5500.000	7789.332	7368.06	9.234	9.2337
5600.000	7789.631	7368.32	9.234	9.2342
5700.000	7790.021	7368.78	9.235	9.2351
5800.000	7790.493	7369.43	9.236	9.2362
5900.000	7791.040	7370.24	9.238	9.2375
6000.000	7791.645	7371.18	9.239	9.2391
6100.000	7792.291	7372.23	9.241	9.2408
6200.000	7792.958	7373.33	9.243	9.2426
6300.000	7793.629	7374.46	9.244	9.2444
6400.000	7794.284	7375.55	9.246	9.2462
6500.000	7794.903	7376.58	9.248	9.2478
6600.000	7795.468	7377.49	9.249	9.2493
6700.000	7795.964	7378.26	9.251	9.2505
6800.000	7796.375	7378.85	9.251	9.2515
6900.000	7796.693	7379.25	9.252	9.2521
7000.000	7796.909	7379.45	9.252	9.2524
7100.000	7797.020	7379.43	9.252	9.2524
7200.000	7797.026	7379.22	9.252	9.2521
7300.000	7796.931	7378.81	9.251	9.2514
7400.000	7796.740	7378.25	9.250	9.2505
7500.000	7796.465	7377.56	9.249	9.2493
7600.000	7796.116	7376.77	9.248	9.2479
7700.000	7795.707	7375.92	9.246	9.2464
7800.000	7795.250	7375.05	9.245	9.2448
7900.000	7794.761	7374.19	9.243	9.2432
8000.000	7794.251	7373.39	9.242	9.2416
8100.000	7793.734	7372.65	9.240	9.2401

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TABLE 7-XX

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
8200.000	7793.220	7372.02	9.239	9.2386
8300.000	7792.716	7371.49	9.237	9.2373
8400.000	7792.229	7371.08	9.236	9.2361
8500.000	7791.763	7370.79	9.235	9.2350
8600.000	7791.319	7370.60	9.234	9.2341
8700.000	7790.896	7370.50	9.233	9.2333
8800.000	7790.493	7370.46	9.233	9.2326
8900.000	7790.105	7370.47	9.232	9.2319
9000.000	7789.729	7370.49	9.231	9.2313
9100.000	7789.360	7370.49	9.231	9.2306
9200.000	7788.993	7370.45	9.230	9.2300
9300.000	7788.627	7370.35	9.229	9.2292
9400.000	7788.260	7370.16	9.228	9.2284
9500.000	7787.892	7369.89	9.228	9.2275
9600.000	7787.525	7369.51	9.227	9.2266
9700.000	7787.163	7369.05	9.226	9.2255
9800.000	7786.814	7368.50	9.224	9.2244
9900.000	7786.486	7367.89	9.223	9.2233
10000.000	7786.187	7367.24	9.222	9.2222
10100.000	7785.929	7366.58	9.221	9.2211
10200.000	7785.722	7365.95	9.220	9.2201
10300.000	7785.579	7365.37	9.219	9.2193
10400.000	7785.509	7364.89	9.219	9.2186
10500.000	7785.521	7364.54	9.218	9.2182
10600.000	7785.622	7364.34	9.218	9.2181
10700.000	7785.815	7364.31	9.218	9.2182
10800.000	7786.103	7364.48	9.219	9.2186
10900.000	7786.483	7364.83	9.219	9.2193
11000.000	7786.950	7365.38	9.220	9.2204
11100.000	7787.497	7366.11	9.222	9.2217
11200.000	7788.110	7367.00	9.223	9.2232
11300.000	7788.776	7368.01	9.225	9.2249
11400.000	7789.479	7369.12	9.227	9.2268
11500.000	7790.198	7370.28	9.229	9.2287
11600.000	7790.914	7371.45	9.231	9.2306
11700.000	7791.607	7372.59	9.232	9.2325
11800.000	7792.259	7373.65	9.234	9.2342
11900.000	7792.850	7374.58	9.236	9.2358
12000.000	7793.365	7375.37	9.237	9.2370
12100.000	7793.790	7375.97	9.238	9.2380

TABLE 7-XX

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
12200.000	7794.114	7376.38	9.239	9.2387
12300.000	7794.332	7376.57	9.239	9.2390
12400.000	7794.438	7376.54	9.239	9.2390
12500.000	7794.434	7376.31	9.239	9.2387
12600.000	7794.323	7375.89	9.238	9.2380
12700.000	7794.112	7375.31	9.237	9.2370
12800.000	7793.810	7374.58	9.236	9.2358
12900.000	7793.429	7373.76	9.234	9.2343
13000.000	7792.983	7372.87	9.233	9.2327
13100.000	7792.487	7371.96	9.231	9.2311
13200.000	7791.954	7371.06	9.229	9.2294
13300.000	7791.398	7370.21	9.228	9.2277
13400.000	7790.832	7369.43	9.226	9.2260
13500.000	7790.266	7368.74	9.224	9.2245
13600.000	7789.709	7368.16	9.223	9.2230
13700.000	7789.169	7367.70	9.222	9.2217
13800.000	7788.649	7367.35	9.221	9.2205
13900.000	7788.151	7367.11	9.220	9.2195
14000.000	7787.677	7366.95	9.219	9.2186
14100.000	7787.225	7366.87	9.218	9.2178
14200.000	7786.792	7366.83	9.217	9.2170
14300.000	7786.375	7366.80	9.216	9.2163
14400.000	7785.970	7366.77	9.216	9.2156
14500.000	7785.573	7366.70	9.215	9.2148
14600.000	7785.183	7366.57	9.214	9.2141
14700.000	7784.799	7366.37	9.213	9.2132
14800.000	7784.420	7366.08	9.212	9.2124
14900.000	7784.050	7365.70	9.211	9.2114
15000.000	7783.694	7365.24	9.210	9.2104
15100.000	7783.357	7364.70	9.209	9.2093
15200.000	7783.048	7364.11	9.208	9.2082
15300.000	7782.776	7363.49	9.207	9.2072
15400.000	7782.552	7362.87	9.206	9.2062
15500.000	7782.387	7362.28	9.205	9.2054
15600.000	7782.292	7361.75	9.205	9.2046
15700.000	7782.276	7361.33	9.204	9.2041
15800.000	7782.347	7361.04	9.204	9.2039
15900.000	7782.511	7360.91	9.204	9.2039
16000.000	7782.772	7360.95	9.204	9.2041
16100.000	7783.129	7361.19	9.205	9.2047

TABLE 7-XX

INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
 (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
16200.000	7783.581	7361.62	9.206	9.2056
16300.000	7784.120	7362.24	9.207	9.2068
16400.000	7784.737	7363.04	9.208	9.2083
16500.000	7785.419	7364.00	9.210	9.2100
16550.000	7785.780	7364.53	9.211	9.2109

TABLE 7-XXI

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
0.000	0.000	90.000	28.608	-80.604
5.000	1.458	89.996	28.608	-80.604
10.000	3.120	89.991	28.608	-80.604
12.000	3.844	89.989	28.608	-80.604
15.000	4.995	89.986	28.608	-80.604
20.000	7.083	89.980	28.608	-80.604
25.000	9.386	89.974	28.608	-80.604
30.000	11.879	89.967	28.608	-80.604
35.000	14.499	89.960	28.608	-80.604
40.000	17.167	89.954	28.608	-80.604
45.000	19.775	89.949	28.608	-80.603
50.000	22.206	89.946	28.608	-80.602
55.000	24.354	89.945	28.608	-80.600
60.000	26.137	89.947	28.608	-80.597
65.000	27.502	89.953	28.608	-80.593
70.000	28.438	89.962	28.608	-80.588
75.000	29.005	89.974	28.608	-80.581
80.000	29.287	89.989	28.608	-80.572
82.250	29.333	89.996	28.608	-80.560
85.000	29.329	90.006	28.608	-80.554
90.000	29.165	90.026	28.608	-80.546
95.000	28.831	90.050	28.608	-80.528
100.000	28.354	90.077	28.608	-80.506
105.000	27.748	90.107	28.608	-80.481
110.000	27.036	90.140	28.608	-80.451
115.000	26.302	90.176	28.607	-80.416
120.000	25.567	90.215	28.607	-80.376
125.000	24.834	90.256	28.607	-80.330
130.000	24.110	90.301	28.606	-80.277
135.000	23.407	90.349	28.606	-80.218
140.000	22.732	90.400	28.605	-80.152
145.000	22.092	90.456	28.604	-80.077
147.329	21.808	90.483	28.604	-79.995
150.000	21.451	90.515	28.603	-79.953
155.000	20.812	90.577	28.602	-79.903
159.329	20.318	90.633	28.601	-79.803
159.329	20.318	90.633	28.601	-79.710
159.459	20.297	90.635	28.601	-79.710
160.000	20.211	90.642	28.601	-79.707
163.759	19.610	90.691	28.600	-79.695
				-79.611

TABLE 7-XXI

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
165.000	19.425	90.707	28.600	-79.584
165.859	19.297	90.718	28.599	-79.564
170.000	18.696	90.772	28.598	-79.471
175.000	17.985	90.838	28.596	-79.357
180.000	17.294	90.905	28.594	-79.241
185.000	16.621	90.973	28.592	-79.124
189.559	16.024	91.035	28.590	-79.015
190.000	15.967	91.041	28.590	-79.004
194.559	15.388	91.104	28.588	-78.894
195.000	15.333	91.110	28.587	-78.883
200.000	14.719	91.180	28.585	-78.761
205.000	14.144	91.251	28.582	-78.636
210.000	13.631	91.323	28.579	-78.510
215.000	13.121	91.396	28.576	-78.383
220.000	12.623	91.469	28.572	-78.253
225.000	12.136	91.544	28.569	-78.122
230.000	11.660	91.619	28.565	-77.989
235.000	11.195	91.695	28.561	-77.854
240.000	10.741	91.771	28.557	-77.717
245.000	10.299	91.849	28.552	-77.578
250.000	9.867	91.928	28.547	-77.437
255.000	9.447	92.007	28.542	-77.294
260.000	9.038	92.087	28.537	-77.150
265.000	8.639	92.168	28.531	-77.003
270.000	8.252	92.251	28.525	-76.854
275.000	7.876	92.334	28.519	-76.703
280.000	7.510	92.418	28.513	-76.550
285.000	7.155	92.503	28.506	-76.395
290.000	6.810	92.589	28.499	-76.238
295.000	6.476	92.676	28.492	-76.078
300.000	6.152	92.764	28.484	-75.916
305.000	5.839	92.853	28.476	-75.752
310.000	5.536	92.944	28.468	-75.585
315.000	5.242	93.035	28.459	-75.416
320.000	4.959	93.127	28.450	-75.245
325.000	4.686	93.221	28.440	-75.071
330.000	4.422	93.316	28.430	-74.894
335.000	4.168	93.412	28.420	-74.715
340.000	3.923	93.509	28.409	-74.534
345.000	3.688	93.607	28.397	-74.349

TABLE 7-XXI

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
350.000	3.462	93.706	28.386	-74.162
355.000	3.246	93.807	28.373	-73.972
360.000	3.039	93.909	28.361	-73.780
365.000	2.840	94.012	28.347	-73.584
370.000	2.651	94.117	28.333	-73.386
375.000	2.470	94.223	28.319	-73.185
380.000	2.299	94.330	28.304	-72.980
385.000	2.136	94.439	28.289	-72.773
390.000	1.982	94.549	28.273	-72.562
395.000	1.836	94.661	28.256	-72.349
400.000	1.699	94.774	28.238	-72.132
405.000	1.570	94.888	28.220	-71.912
410.000	1.450	95.004	28.202	-71.688
415.000	1.338	95.121	28.182	-71.461
420.000	1.234	95.240	28.162	-71.230
425.000	1.138	95.361	28.141	-70.996
430.000	1.051	95.483	28.119	-70.759
435.000	0.972	95.607	28.097	-70.517
437.627	0.934	95.673	28.084	-70.389
440.000	0.885	95.733	28.073	-70.272
445.000	0.788	95.860	28.049	-70.024
450.000	0.698	95.988	28.024	-69.772
455.000	0.615	96.117	27.998	-69.517
460.000	0.538	96.249	27.971	-69.259
465.000	0.469	96.381	27.943	-68.998
470.000	0.406	96.515	27.915	-68.733
475.000	0.351	96.651	27.885	-68.464
480.000	0.302	96.788	27.854	-68.193
485.000	0.260	96.926	27.823	-67.917
490.000	0.225	97.066	27.790	-67.638
495.000	0.198	97.208	27.756	-67.355
500.000	0.177	97.351	27.721	-67.068
505.000	0.163	97.496	27.685	-66.777
510.000	0.157	97.643	27.648	-66.483
515.000	0.158	97.791	27.609	-66.184
520.000	0.166	97.941	27.569	-65.881
525.000	0.181	98.093	27.528	-65.574
530.000	0.203	98.247	27.485	-65.263
535.000	0.233	98.402	27.442	-64.947
537.424	0.250	98.478	27.420	-64.792

TABLE 7-XXI

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
537.424	0.250	98.478	27.420	-64.792
537.442	0.250	98.478	27.420	-64.791
540.000	0.215	98.559	27.396	-64.627
543.142	0.173	98.657	27.367	-64.426
545.000	0.159	98.715	27.350	-64.307
545.742	0.153	98.738	27.343	-64.260
549.542	0.126	98.857	27.307	-64.016
550.000	0.123	98.872	27.303	-63.986
555.000	0.090	99.029	27.254	-63.664
560.000	0.060	99.186	27.205	-63.341
565.000	0.032	99.344	27.155	-63.016
570.000	0.006	99.501	27.103	-62.690
575.000	-0.018	99.660	27.051	-62.363
580.000	-0.038	99.818	26.997	-62.034
585.000	-0.056	99.977	26.942	-61.704
590.000	-0.071	100.136	26.886	-61.373
595.000	-0.084	100.295	26.829	-61.041
600.000	-0.094	100.454	26.771	-60.708
605.000	-0.100	100.614	26.712	-60.373
610.000	-0.104	100.774	26.651	-60.037
615.000	-0.105	100.934	26.589	-59.699
620.000	-0.103	101.095	26.526	-59.360
625.000	-0.098	101.256	26.462	-59.020
630.000	-0.090	101.417	26.397	-58.679
635.000	-0.079	101.578	26.330	-58.336
640.000	-0.064	101.740	26.262	-57.992
645.000	-0.047	101.902	26.193	-57.647
650.000	-0.026	102.065	26.123	-57.300
655.000	-0.001	102.227	26.051	-56.952
655.175	0.000	102.233	26.048	-56.940
655.175	0.000	102.233	26.048	-56.940
660.000	0.000	102.389	25.978	-56.603
670.000	-0.000	102.710	25.830	-55.908
680.000	-0.000	103.029	25.678	-55.214
690.000	-0.000	103.345	25.522	-54.522
700.000	-0.000	103.659	25.362	-53.832
710.000	-0.000	103.970	25.199	-53.144
720.000	-0.000	104.278	25.032	-52.457
730.000	-0.001	104.583	24.862	-51.773
739.175	-0.001	104.861	24.703	-51.147

TABLE 7-XXI INERTIAL FLIGHT-PATH ANGLEADING,
 GEODETIC LATITUDE, AND LIFTOFF
 THROUGH PARKING ORBIT (90°H AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING: (DEGREES)	LONGITUDE (DEGREES)
740.000	-0.001	104.886	-51.091
750.000	-0.001	105.185	-50.411
760.000	-0.001	105.482	-49.732
770.000	-0.001	105.776	-49.056
780.000	-0.001	106.067	-48.382
790.000	-0.001	106.355	-47.710
800.000	-0.001	106.640	-47.040
900.000	-0.001	109.316	-40.457
1000.000	-0.002	111.664	-34.084
1100.000	-0.003	113.669	-27.911
1200.000	-0.004	115.325	-21.919
1300.000	-0.004	116.631	-16.081
1400.000	-0.004	117.591	-10.365
1500.000	-0.005	118.206	-4.735
1600.000	-0.005	118.479	0.845
1700.000	-0.004	118.412	6.414
1800.000	-0.003	118.003	12.009
1900.000	-0.002	117.252	17.670
2000.000	-0.001	116.156	23.432
2100.000	0.001	114.711	29.329
2200.000	0.004	112.916	35.392
2300.000	0.007	110.773	41.645
2400.000	0.010	108.292	48.103
2500.000	0.014	105.490	54.773
2600.000	0.018	102.396	61.646
2700.000	0.022	99.054	68.700
2800.000	0.026	95.522	75.896
2900.000	0.030	91.870	83.184
3000.000	0.034	88.177	90.504
3100.000	0.037	84.524	97.791
3200.000	0.040	80.992	104.985
3300.000	0.042	77.650	112.036
3400.000	0.044	74.555	118.905
3500.000	0.045	71.751	125.570
3600.000	0.045	69.268	132.022
3700.000	0.044	67.122	138.268
3800.000	0.043	65.323	144.323
3900.000	0.040	63.873	150.212
4000.000	0.037	62.771	155.964
4100.000	0.034	62.012	161.614

TABLE 7-XXI INERTIAL FLIGHT-PATH ANGLE, INEADING,
 GEODETIC LATITUDE, AND LONGITUDOFF
 THROUGH PARKING ORBIT (90-DEGREH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	LONGITUDE (DEGREES)
4200.000	0.030	61.596	-192.802
4300.000	0.025	61.518	-187.247
4400.000	0.021	61.780	-181.682
4500.000	0.016	62.381	-176.070
4600.000	0.011	63.325	-170.372
4700.000	0.007	64.615	-164.555
4800.000	0.002	66.252	-158.586
4900.000	-0.002	68.236	-152.438
5000.000	-0.005	70.562	-146.090
5100.000	-0.009	73.217	-139.534
5200.000	-0.011	76.177	-132.769
5300.000	-0.014	79.404	-125.811
5400.000	-0.015	82.850	-118.692
5500.000	-0.017	86.449	-111.455
5600.000	-0.018	90.126	-104.158
5700.000	-0.018	93.800	-96.862
5800.000	-0.019	97.392	-89.630
5900.000	-0.019	100.826	-82.518
6000.000	-0.018	104.038	-75.569
6100.000	-0.018	106.979	-68.813
6200.000	-0.018	109.614	-62.265
6300.000	-0.017	111.918	-55.927
6400.000	-0.016	113.879	-49.786
6500.000	-0.016	115.492	-43.822
6600.000	-0.015	116.758	-38.007
6700.000	-0.014	117.677	-32.310
6800.000	-0.012	118.253	-26.696
6900.000	-0.011	118.488	-21.126
7000.000	-0.009	118.384	-15.563
7100.000	-0.007	117.939	-9.970
7200.000	-0.005	117.152	-4.307
7300.000	-0.002	116.020	1.460
7400.000	0.001	114.540	7.366
7500.000	0.004	112.712	13.439
7600.000	0.008	110.537	19.704
7700.000	0.012	108.025	26.176
7800.000	0.016	105.196	32.858
7900.000	0.020	102.079	39.741
8000.000	0.025	98.721	46.801
8100.000	0.029	95.178	53.999

TABLE 7-XXI

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
GEODEIC LATITUDE, AND LONGITUDE - LIFTOFF
THROUGH PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODEIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
8200.000	0.033	91.523	-28.577	61.283
8300.000	0.037	87.835	-28.539	68.592
8400.000	0.040	84.195	-28.064	75.863
8500.000	0.043	80.682	-27.165	83.036
8600.000	0.045	77.364	-25.865	90.062
8700.000	0.047	74.298	-24.193	96.904
8800.000	0.047	71.525	-22.186	103.541
8900.000	0.047	69.073	-19.883	109.966
9000.000	0.046	66.959	-17.325	116.186
9100.000	0.044	65.192	-14.554	122.217
9200.000	0.041	63.772	-11.610	128.085
9300.000	0.037	62.698	-8.532	133.819
9400.000	0.033	61.968	-5.359	139.454
9500.000	0.029	61.578	-2.126	-214.975
9600.000	0.024	61.526	1.129	-209.429
9700.000	0.019	61.812	4.372	-203.870
9800.000	0.013	62.438	7.566	-198.261
9900.000	0.008	63.405	10.676	-192.565
10000.000	0.003	64.717	13.663	-186.746
10100.000	-0.001	66.376	16.489	-180.774
10200.000	-0.006	68.380	19.114	-174.622
10300.000	-0.010	70.725	21.498	-168.270
10400.000	-0.013	73.397	23.599	-161.709
10500.000	-0.016	76.371	25.377	-154.941
10600.000	-0.018	79.609	26.796	-147.982
10700.000	-0.020	83.062	27.823	-140.863
10800.000	-0.022	86.663	28.434	-133.631
10900.000	-0.022	90.338	28.612	-126.342
11000.000	-0.023	94.005	28.354	-119.057
11100.000	-0.023	97.586	27.665	-111.840
11200.000	-0.023	101.005	26.563	-104.744
11300.000	-0.022	104.200	25.074	-97.813
11400.000	-0.022	107.123	23.232	-91.076
11500.000	-0.021	109.738	21.073	-84.547
11600.000	-0.020	112.023	18.638	-78.226
11700.000	-0.019	113.965	15.968	-72.101
11800.000	-0.018	115.560	13.105	-66.152
11900.000	-0.017	116.800	10.087	-60.351
12000.000	-0.015	117.710	6.954	-54.665
12100.000	-0.014	118.270	3.742	-49.059

TABLE 7-XXI INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
12200.000	-0.012	118.491	0.489	-43.497
12300.000	-0.010	118.372	-2.769	-37.940
12400.000	-0.007	117.914	-5.997	-32.351
12500.000	-0.005	117.114	-9.159	-26.691
12600.000	-0.002	115.970	-12.216	-20.926
12700.000	0.002	114.478	-15.131	-15.021
12800.000	0.006	112.638	-17.865	-8.947
12900.000	0.010	110.453	-20.375	-2.682
13000.000	0.014	107.933	-22.622	3.789
13100.000	0.019	105.096	-24.564	10.470
13200.000	0.023	101.975	-26.162	17.352
13300.000	0.028	98.613	-27.383	24.409
13400.000	0.032	95.070	-28.196	31.602
13500.000	0.037	91.417	-28.582	38.878
13600.000	0.040	87.734	-28.531	46.178
13700.000	0.044	84.100	-28.046	53.438
13800.000	0.046	80.596	-27.137	60.599
13900.000	0.048	77.287	-25.829	67.612
14000.000	0.049	74.231	-24.150	74.441
14100.000	0.050	71.468	-22.138	81.065
14200.000	0.049	69.026	-19.833	87.477
14300.000	0.048	66.922	-17.273	93.685
14400.000	0.045	65.163	-14.502	99.705
14500.000	0.042	63.751	-11.559	105.562
14600.000	0.038	62.684	-8.484	111.286
14700.000	0.034	61.960	-5.313	116.912
14800.000	0.029	61.575	-2.084	-237.524
14900.000	0.023	61.527	1.167	-231.986
15000.000	0.018	61.817	4.406	-226.434
15100.000	0.012	62.445	7.595	-220.832
15200.000	0.006	63.414	10.700	-215.143
15300.000	0.001	64.727	13.682	-209.331
15400.000	-0.004	66.386	16.503	-203.366
15500.000	-0.009	68.389	19.124	-197.221
15600.000	-0.013	70.733	21.504	-190.877
15700.000	-0.017	73.402	23.602	-184.324
15800.000	-0.020	76.372	25.378	-177.564
15900.000	-0.023	79.607	26.795	-170.613
16000.000	-0.025	83.055	27.822	-163.504
16100.000	-0.026	86.652	28.432	-156.281

TABLE 7-XXI

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
16200.000	-0.027	90.323	28.612	-149.000
16300.000	-0.027	93.986	28.356	-141.724
16400.000	-0.027	97.564	27.671	-134.514
16500.000	-0.027	100.980	26.573	-127.425
16550.000	-0.027	102.609	25.877	-123.940

TABLE 7-XXII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (90-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
0.000	-0.00	0.00	0.00	0.00	0.00	0.00
5.000	-0.00	-0.00	0.00	0.00	0.00	0.00
10.000	-0.00	0.00	0.00	0.00	0.00	0.00
12.000	-0.03	0.00	0.00	0.00	0.00	0.00
15.000	-0.45	-0.12	0.00	0.00	0.00	0.00
20.000	-1.09	-0.86	0.00	0.00	0.00	-0.00
25.000	-2.18	-1.79	0.00	0.00	0.00	-0.00
30.000	-3.68	-3.21	0.00	0.00	0.00	-0.00
35.000	-5.61	-5.04	0.00	-0.00	0.00	-0.00
40.000	-8.01	-7.35	0.00	-0.00	0.00	0.00
45.000	-10.81	-10.10	0.00	-0.00	0.00	0.00
50.000	-13.95	-13.22	0.00	-0.00	0.00	0.00
55.000	-17.35	-16.61	0.00	-0.00	0.00	0.00
60.000	-20.92	-20.20	0.00	-0.00	0.00	0.00
65.000	-24.53	-23.88	0.00	-0.00	0.00	0.00
70.000	-28.15	-27.53	0.00	0.00	0.00	0.00
75.000	-31.71	-31.12	0.00	-0.00	0.00	-0.00
80.000	-35.16	-34.60	0.00	-0.00	0.00	0.00
82.250	-36.67	-36.12	0.00	-0.01	0.00	0.00
85.000	-38.45	-37.94	0.00	-0.01	0.00	0.00
90.000	-41.57	-41.11	0.00	-0.01	0.00	0.00
95.000	-44.53	-44.13	0.00	-0.01	0.00	0.00
100.000	-47.32	-46.99	0.00	-0.00	0.00	0.00
105.000	-49.94	-50.02	0.00	-0.00	0.00	0.00
110.000	-52.41	-52.51	0.00	-0.00	0.00	-0.00
115.000	-54.66	-54.54	0.00	-0.00	0.00	-0.00
120.000	-56.71	-56.49	0.00	-0.00	0.00	-0.00
125.000	-58.58	-58.37	0.00	0.00	0.00	0.00
130.000	-60.31	-60.10	0.00	0.00	0.00	0.00
135.000	-61.89	-61.70	0.00	0.00	0.00	0.00
140.000	-63.34	-63.16	0.00	0.00	0.00	-0.00
145.000	-64.67	-64.51	0.00	0.00	0.00	-0.00
147.329	-65.26	-65.10	0.00	0.00	0.00	-0.00
150.000	-65.90	-65.75	0.00	0.00	0.00	-0.00
155.000	-66.59	-66.84	0.00	0.00	0.00	-0.00
159.329	-66.59	-66.90	0.00	0.00	0.00	0.00
159.329	-66.59	-66.90	0.00	0.00	0.00	0.00
159.459	-66.59	-66.90	0.00	0.00	0.00	0.00
160.000	-66.59	-66.87	0.00	0.00	0.00	0.00
163.759	-66.59	-66.55	0.00	-0.01	0.00	0.00

TABLE 7-XXII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
165.000	-66.59	-66.48	0.00	-0.01	0.00	0.00
165.859	-66.59	-66.48	0.00	-0.00	0.00	0.00
170.000	-66.59	-66.57	0.00	-0.00	0.00	0.00
175.000	-66.59	-66.57	0.00	-0.00	0.00	0.00
180.000	-66.59	-66.58	0.00	-0.00	0.00	0.00
185.000	-66.59	-66.59	0.00	-0.00	0.00	0.00
189.559	-66.59	-66.59	0.00	-0.00	0.00	0.00
190.000	-66.59	-66.59	0.00	-0.00	0.00	0.00
194.559	-66.59	-66.59	0.00	-0.00	0.00	0.00
195.000	-66.59	-66.59	0.00	-0.00	0.00	0.00
200.000	-65.59	-66.59	0.04	-0.00	0.00	0.00
205.000	-62.53	-62.61	0.04	0.05	0.00	-0.00
210.000	-63.06	-62.82	0.04	0.04	0.00	0.00
215.000	-63.58	-63.41	0.04	0.04	0.00	-0.00
220.000	-64.10	-63.92	0.04	0.04	0.00	-0.00
225.000	-64.64	-64.45	0.03	0.04	0.00	-0.00
230.000	-65.18	-65.00	0.03	0.03	0.00	-0.00
235.000	-65.72	-65.54	0.03	0.03	0.00	-0.00
240.000	-66.25	-66.07	0.03	0.03	0.00	-0.00
245.000	-66.78	-66.60	0.03	0.03	0.00	-0.00
250.000	-67.31	-67.13	0.03	0.03	0.00	-0.00
255.000	-67.84	-67.66	0.03	0.03	0.00	-0.00
260.000	-68.37	-68.19	0.03	0.03	0.00	-0.00
265.000	-68.90	-68.72	0.02	0.02	0.00	-0.00
270.000	-69.43	-69.25	0.02	0.02	0.00	-0.00
275.000	-69.97	-69.79	0.02	0.02	0.00	-0.00
280.000	-70.51	-70.32	0.02	0.02	0.00	-0.00
285.000	-71.04	-70.86	0.02	0.02	0.00	-0.00
290.000	-71.58	-71.40	0.02	0.02	0.00	-0.00
295.000	-72.12	-71.94	0.02	0.02	0.00	-0.00
300.000	-72.66	-72.48	0.02	0.02	0.00	-0.00
305.000	-73.21	-73.02	0.01	0.01	0.00	-0.00
310.000	-73.75	-73.57	0.01	0.01	0.00	-0.00
315.000	-74.30	-74.11	0.01	0.01	0.00	-0.00
320.000	-74.84	-74.66	0.01	0.01	0.00	-0.00
325.000	-75.39	-75.21	0.01	0.01	0.00	-0.00
330.000	-75.94	-75.75	0.01	0.01	0.00	-0.00
335.000	-76.49	-76.30	0.01	0.01	0.00	-0.00
340.000	-77.04	-76.85	0.01	0.01	0.00	-0.00
345.000	-77.59	-77.40	0.01	0.01	0.00	-0.00

TABLE 7-XXII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
350.000	-78.14	-77.95	0.00	0.00	0.00	-0.00
355.000	-78.69	-78.51	0.00	0.00	0.00	-0.00
360.000	-79.25	-79.06	0.00	0.00	0.00	-0.00
365.000	-79.80	-79.61	0.00	0.00	0.00	-0.00
370.000	-80.35	-80.17	0.00	0.00	0.00	-0.00
375.000	-80.91	-80.72	-0.00	0.00	0.00	-0.00
380.000	-81.46	-81.27	-0.00	-0.00	0.00	-0.00
385.000	-82.01	-81.83	-0.00	-0.00	0.00	0.00
390.000	-82.57	-82.38	-0.00	-0.00	0.00	0.00
395.000	-83.12	-82.94	-0.00	-0.00	0.00	0.00
400.000	-83.68	-83.49	-0.00	-0.00	0.00	0.00
405.000	-84.23	-84.04	-0.00	-0.00	0.00	0.00
410.000	-84.78	-84.60	-0.00	-0.00	0.00	0.00
415.000	-85.33	-85.15	-0.01	-0.01	0.00	0.00
420.000	-85.89	-85.70	-0.01	-0.01	0.00	0.00
425.000	-86.44	-86.25	-0.01	-0.01	0.00	0.00
430.000	-86.99	-86.80	-0.01	-0.01	0.00	0.00
435.000	-87.54	-87.35	-0.01	-0.01	0.00	0.00
437.627	-87.83	-87.64	-0.01	-0.01	0.00	0.00
440.000	-88.09	-87.90	-0.01	-0.01	0.00	0.00
445.000	-88.64	-88.45	-0.01	-0.01	0.00	0.00
450.000	-89.18	-89.00	-0.01	-0.01	0.00	0.00
455.000	-89.72	-89.54	-0.01	-0.01	0.00	0.00
460.000	-90.26	-90.08	-0.01	-0.01	0.00	0.00
465.000	-90.80	-90.62	-0.01	-0.01	0.00	0.00
470.000	-91.34	-91.16	-0.01	-0.01	0.00	0.00
475.000	-91.87	-91.69	-0.01	-0.01	0.00	0.00
480.000	-92.40	-92.23	-0.01	-0.01	0.00	0.00
485.000	-92.93	-92.76	-0.01	-0.01	0.00	0.00
490.000	-93.46	-93.28	-0.01	-0.01	0.00	0.00
495.000	-93.98	-93.81	-0.01	-0.01	0.00	0.00
500.000	-94.50	-94.33	-0.01	-0.01	0.00	0.00
505.000	-95.02	-94.85	-0.01	-0.01	0.00	0.00
510.000	-95.53	-95.36	-0.01	-0.01	0.00	0.00
515.000	-96.05	-95.87	-0.01	-0.01	0.00	0.00
520.000	-96.56	-96.39	-0.01	-0.01	0.00	0.00
525.000	-97.07	-96.90	-0.01	-0.01	0.00	0.00
530.000	-97.58	-97.41	-0.01	-0.01	0.00	0.00
535.000	-98.10	-97.92	-0.01	-0.01	0.00	0.00
537.424	-98.35	-98.18	-0.02	-0.01	0.00	0.00

TABLE 7-XXII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
537.424	-98.35	-98.18	-0.02	-0.01	0.00	0.00
537.442	-98.36	-98.18	-0.02	-0.01	0.00	0.00
540.000	-98.24	-98.42	-0.01	-0.02	0.00	0.00
543.142	-98.24	-98.55	-0.01	-0.02	0.00	0.00
545.000	-99.01	-98.58	-0.02	-0.02	0.00	0.00
545.742	-99.07	-98.79	-0.02	-0.02	0.00	0.00
549.542	-99.43	-99.36	-0.02	-0.02	0.00	0.00
550.000	-99.47	-99.39	-0.02	-0.02	0.00	-0.00
555.000	-99.99	-99.86	-0.03	-0.03	0.00	-0.00
560.000	-100.51	-100.38	-0.03	-0.03	0.00	-0.00
565.000	-101.04	-100.91	-0.03	-0.03	0.00	-0.00
570.000	-101.58	-101.47	-0.04	-0.04	0.00	-0.00
575.000	-102.03	-101.92	-0.04	-0.04	0.00	-0.00
580.000	-102.48	-102.38	-0.04	-0.04	0.00	-0.00
585.000	-102.93	-102.82	-0.04	-0.04	0.00	-0.00
590.000	-103.36	-103.26	-0.03	-0.03	0.00	-0.00
595.000	-103.79	-103.69	-0.03	-0.03	0.00	-0.00
600.000	-104.21	-104.11	-0.03	-0.03	0.00	-0.00
605.000	-104.62	-104.52	-0.03	-0.03	0.00	-0.00
610.000	-105.03	-104.93	-0.02	-0.02	0.00	-0.00
615.000	-105.43	-105.33	-0.01	-0.02	0.00	-0.00
620.000	-105.82	-105.72	-0.01	-0.01	0.00	-0.00
625.000	-106.20	-106.11	0.00	0.00	0.00	-0.00
630.000	-106.57	-106.49	0.02	0.01	0.00	-0.00
635.000	-106.94	-106.85	0.03	0.03	0.00	-0.00
640.000	-107.30	-107.20	0.06	0.05	0.00	-0.00
645.000	-107.64	-107.53	0.09	0.08	0.00	-0.00
650.000	-107.79	-107.98	0.18	0.27	0.00	0.00
655.000	-107.75	-107.72	0.14	0.12	0.00	0.00
655.175	-107.75	-107.73	0.14	0.13	0.00	0.00
655.175	-107.78	-107.78	-0.05	-0.05	-0.00	-0.00
660.000	-112.77	-112.77	-0.06	-0.06	-0.00	-0.00
670.000	-114.59	-114.59	-0.06	-0.06	-0.00	-0.00
680.000	-115.27	-115.27	-0.06	-0.06	-0.00	-0.00
690.000	-115.95	-115.95	-0.06	-0.06	-0.00	-0.00
700.000	-116.63	-116.63	-0.06	-0.06	-0.00	-0.00
710.000	-117.31	-117.31	-0.06	-0.06	-0.00	-0.00
720.000	-117.99	-117.99	-0.06	-0.06	-0.00	-0.00
730.000	-118.67	-118.67	-0.07	-0.07	-0.00	-0.00
739.175	-119.29	-119.29	-0.07	-0.07	-0.00	-0.00

TABLE 7-XXII COMMANDED AND ACTUAL VEHICLE
 ANGLES - LIFTOFF THROUGH PARK
 (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTED Y (D)	ACTUAL ROLL (DEG)
740.000	-119.35	-119.35	-0.07	-00	-0.00
750.000	-120.03	-120.03	-0.07	-00	-0.00
760.000	-120.71	-120.71	-0.07	-00	-0.00
770.000	-121.39	-121.39	-0.07	-00	-0.00
780.000	-122.07	-122.07	-0.07	-00	-0.00
790.000	-122.75	-122.75	-0.07	-00	-0.00
800.000	-123.43	-123.43	-0.07	-00	-0.00
900.000	-130.24	-130.24	-0.08	-00	-0.00
1000.000	-137.05	-137.05	-0.08	-00	-0.00
1100.000	-143.85	-143.85	-0.09	-00	-0.00
1200.000	-150.66	-150.66	-0.10	-00	-0.00
1300.000	-157.47	-157.47	-0.10	-00	-0.00
1400.000	-164.28	-164.28	-0.11	-00	-0.00
1500.000	-171.09	-171.09	-0.11	-00	-0.00
1600.000	-177.90	-177.90	-0.11	-00	-0.00
1700.000	175.30	175.30	-0.12	-00	-0.00
1800.000	168.49	168.49	-0.12	-00	-0.00
1900.000	161.68	161.68	-0.12	-00	-0.00
2000.000	154.87	154.87	-0.12	-00	-0.00
2100.000	148.06	148.06	-0.12	-00	-0.00
2200.000	141.26	141.26	-0.12	-00	-0.00
2300.000	134.45	134.45	-0.12	-00	-0.00
2400.000	127.65	127.65	-0.12	-00	-0.00
2500.000	120.84	120.84	-0.11	-00	-0.00
2600.000	114.04	114.04	-0.11	-00	-0.00
2700.000	107.23	107.23	-0.10	-00	-0.00
2800.000	100.43	100.43	-0.10	-00	-0.00
2900.000	93.63	93.63	-0.09	-00	-0.00
3000.000	86.83	86.83	-0.08	-00	-0.00
3100.000	80.03	80.03	-0.07	-00	-0.00
3200.000	73.23	73.23	-0.06	-00	-0.00
3300.000	66.43	66.43	-0.05	-00	-0.00
3400.000	59.63	59.63	-0.03	82	44.82
3500.000	52.83	52.83	-0.02	82	144.82
3600.000	26.03	26.03	0.06	00	180.00
3700.000	19.23	19.23	0.08	00	180.00
3800.000	12.43	12.43	0.09	00	180.00
3900.000	5.64	5.64	0.11	00	180.00
4000.000	-1.16	-1.16	0.12	00	180.00
4100.000	-7.96	-7.96	0.13	00	180.00

TABLE 7-XXII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
4200.000	-14.76	-14.76	0.15	0.15	180.00	180.00
4300.000	-21.56	-21.56	0.16	0.16	180.00	180.00
4400.000	-28.35	-28.35	0.17	0.17	180.00	180.00
4500.000	-35.15	-35.15	0.18	0.18	180.00	180.00
4600.000	-41.95	-41.95	0.19	0.19	180.00	180.00
4700.000	-48.74	-48.74	0.19	0.19	180.00	180.00
4800.000	-55.54	-55.54	0.19	0.19	180.00	180.00
4900.000	-62.33	-62.33	0.20	0.20	180.00	180.00
5000.000	-69.13	-69.13	0.19	0.19	180.00	180.00
5100.000	-75.92	-75.92	0.19	0.19	180.00	180.00
5200.000	-82.71	-82.71	0.18	0.18	180.00	180.00
5300.000	-89.50	-89.50	0.18	0.18	180.00	180.00
5400.000	-96.30	-96.30	0.17	0.17	180.00	180.00
5500.000	-103.09	-103.09	0.15	0.15	180.00	180.00
5600.000	-109.88	-109.88	0.14	0.14	180.00	180.00
5700.000	-116.67	-116.67	0.12	0.12	180.00	180.00
5800.000	-123.47	-123.47	0.10	0.10	180.00	180.00
5900.000	-110.26	-110.26	0.16	0.16	180.00	180.00
6000.000	-117.05	-117.05	0.14	0.14	155.18	155.18
6100.000	-123.85	-123.85	0.12	0.12	55.18	55.18
6200.000	-130.64	-130.64	0.10	0.10	-0.00	-0.00
6300.000	-137.44	-137.44	0.07	0.07	-0.00	-0.00
6400.000	-144.23	-144.23	0.04	0.04	-0.00	-0.00
6500.000	-151.03	-151.03	0.02	0.02	-0.00	-0.00
6600.000	-157.83	-157.83	-0.01	-0.01	-0.00	-0.00
6700.000	-164.63	-164.63	-0.05	-0.05	-0.00	-0.00
6800.000	-171.43	-171.43	-0.08	-0.08	-0.00	-0.00
6900.000	-178.22	-178.22	-0.11	-0.11	-0.00	-0.00
7000.000	174.98	174.98	-0.14	-0.14	-0.00	-0.00
7100.000	168.18	168.18	-0.17	-0.17	-0.00	-0.00
7200.000	161.38	161.38	-0.20	-0.20	-0.00	-0.00
7300.000	154.58	154.58	-0.22	-0.22	-0.00	-0.00
7400.000	147.78	147.78	-0.25	-0.25	-0.00	-0.00
7500.000	140.98	140.98	-0.27	-0.27	-0.00	-0.00
7600.000	134.19	134.19	-0.29	-0.29	-0.00	-0.00
7700.000	127.39	127.39	-0.30	-0.30	-0.00	-0.00
7800.000	120.60	120.60	-0.31	-0.31	-0.00	-0.00
7900.000	113.80	113.80	-0.32	-0.32	-0.00	-0.00
8000.000	107.01	107.01	-0.33	-0.33	-0.00	-0.00
8100.000	100.21	100.21	-0.33	-0.33	-0.00	-0.00

TABLE 7-XXII

COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
8200.000	93.42	93.42	-0.32	-0.32	-0.00	-0.00
8300.000	86.63	86.63	-0.31	-0.31	-0.00	-0.00
8400.000	79.84	79.84	-0.30	-0.30	-0.00	-0.00
8500.000	73.05	73.05	-0.28	-0.28	-0.00	-0.00
8600.000	66.25	66.25	-0.26	-0.26	-0.00	-0.00
8700.000	59.46	59.46	-0.23	-0.23	-0.00	-0.00
8800.000	52.67	52.67	-0.20	-0.20	-0.00	-0.00
8900.000	45.88	45.88	-0.17	-0.17	-0.00	-0.00
9000.000	39.09	39.09	-0.13	-0.13	-0.00	-0.00
9100.000	32.30	32.30	-0.09	-0.09	-0.00	-0.00
9200.000	25.52	25.52	-0.05	-0.05	-0.00	-0.00
9300.000	18.73	18.73	-0.01	-0.01	-0.00	-0.00
9400.000	11.94	11.94	0.04	0.04	-0.00	-0.00
9500.000	5.15	5.15	0.08	0.08	-0.00	-0.00
9600.000	-1.64	-1.64	0.13	0.13	-0.00	-0.00
9700.000	-8.43	-8.43	0.17	0.17	-0.00	-0.00
9800.000	-15.22	-15.22	0.21	0.21	-0.00	-0.00
9900.000	-22.00	-22.00	0.25	0.25	-0.00	-0.00
10000.000	-28.79	-28.79	0.29	0.29	-0.00	-0.00
10100.000	-35.58	-35.58	0.33	0.33	-0.00	-0.00
10200.000	-42.36	-42.36	0.36	0.36	-0.00	-0.00
10300.000	-49.15	-49.15	0.38	0.38	-0.00	-0.00
10400.000	-55.93	-55.93	0.40	0.40	-0.00	-0.00
10500.000	-62.71	-62.71	0.42	0.42	-0.00	-0.00
10600.000	-69.50	-69.50	0.43	0.43	-0.00	-0.00
10700.000	-76.28	-76.28	0.44	0.44	-0.00	-0.00
10800.000	-83.07	-83.07	0.44	0.44	-0.00	-0.00
10900.000	-89.85	-89.85	0.43	0.43	-0.00	-0.00
11000.000	-96.63	-96.63	0.42	0.42	-0.00	-0.00
11100.000	-103.42	-103.42	0.40	0.40	-0.00	-0.00
11200.000	-110.20	-110.20	0.38	0.38	-0.00	-0.00
11300.000	-116.99	-116.99	0.35	0.35	-0.00	-0.00
11400.000	-123.78	-123.78	0.31	0.31	-0.00	-0.00
11500.000	-130.56	-130.56	0.27	0.27	-0.00	-0.00
11600.000	-137.35	-137.35	0.23	0.23	-0.00	-0.00
11700.000	-144.14	-144.14	0.18	0.18	-0.00	-0.00
11800.000	-150.93	-150.93	0.13	0.13	-0.00	-0.00
11900.000	-157.72	-157.72	0.07	0.07	-0.00	-0.00
12000.000	-164.51	-164.51	0.01	0.01	-0.00	-0.00
12100.000	-171.30	-171.30	-0.04	-0.04	-0.00	-0.00

TABLE 7-XXII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
12200.000	-178.09	-178.09	-0.10	-0.10	-0.00	-0.00
12300.000	175.12	175.12	-0.16	-0.16	-0.00	-0.00
12400.000	168.33	168.33	-0.22	-0.22	-0.00	-0.00
12500.000	161.53	161.53	-0.27	-0.27	-0.00	-0.00
12600.000	154.74	154.74	-0.32	-0.32	-0.00	-0.00
12700.000	147.95	147.95	-0.37	-0.37	-0.00	-0.00
12800.000	141.16	141.16	-0.41	-0.41	-0.00	-0.00
12900.000	134.37	134.37	-0.45	-0.45	-0.00	-0.00
13000.000	127.58	127.58	-0.49	-0.49	-0.00	-0.00
13100.000	120.80	120.80	-0.51	-0.51	-0.00	-0.00
13200.000	114.01	114.01	-0.53	-0.53	-0.00	-0.00
13300.000	107.22	107.22	-0.55	-0.55	-0.00	-0.00
13400.000	100.44	100.44	-0.55	-0.55	-0.00	-0.00
13500.000	93.65	93.65	-0.55	-0.55	-0.00	-0.00
13600.000	86.87	86.87	-0.54	-0.54	-0.00	-0.00
13700.000	80.08	80.08	-0.52	-0.52	-0.00	-0.00
13800.000	73.30	73.30	-0.50	-0.50	-0.00	-0.00
13900.000	66.52	66.52	-0.47	-0.47	-0.00	-0.00
14000.000	59.74	59.74	-0.43	-0.43	-0.00	-0.00
14100.000	52.95	52.95	-0.38	-0.38	-0.00	-0.00
14200.000	46.17	46.17	-0.33	-0.33	-0.00	-0.00
14300.000	39.39	39.39	-0.28	-0.28	-0.00	-0.00
14400.000	32.61	32.61	-0.21	-0.21	-0.00	-0.00
14500.000	25.83	25.83	-0.15	-0.15	-0.00	-0.00
14600.000	19.05	19.05	-0.08	-0.08	-0.00	-0.00
14700.000	12.26	12.26	-0.01	-0.01	-0.00	-0.00
14800.000	5.48	5.48	0.06	0.06	-0.00	-0.00
14900.000	-1.30	-1.30	0.13	0.13	-0.00	-0.00
15000.000	-8.08	-8.08	0.20	0.20	-0.00	-0.00
15100.000	-14.85	-14.85	0.27	0.27	-0.00	-0.00
15200.000	-21.63	-21.63	0.34	0.34	-0.00	-0.00
15300.000	-28.41	-28.41	0.40	0.40	-0.00	-0.00
15400.000	-35.19	-35.19	0.46	0.46	-0.00	-0.00
15500.000	-41.97	-41.97	0.51	0.51	-0.00	-0.00
15600.000	-48.74	-48.74	0.56	0.56	-0.00	-0.00
15700.000	-55.52	-55.52	0.60	0.60	-0.00	-0.00
15800.000	-62.30	-62.30	0.63	0.63	-0.00	-0.00
15900.000	-69.07	-69.07	0.65	0.65	-0.00	-0.00
16000.000	-75.85	-75.85	0.66	0.66	-0.00	-0.00
16100.000	-82.63	-82.63	0.67	0.67	-0.00	-0.00

TABLE 7-XXII

COMMANDED AND ACTUAL VEHICLE ANGLE
 ANGLES - LIFTOFF THROUGH PARKING
 (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL COMMANDED YAW ROLL (DEG (DEG))	ACTUAL ROLL (DEG)
16200.000	-89.40	-89.40	0.66	0.6-0.00	-0.00
16300.000	-96.18	-96.18	0.65	0.6-0.00	-0.00
16400.000	-102.96	-102.96	0.63	0.6-0.00	-0.00
16500.000	-109.74	-109.74	0.59	0.5-0.00	-0.00
16550.000	-113.12	-113.12	0.57	0.5-0.00	-0.00

TABLE 7-XXIII

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
0.000	0.00	0.000	0.00	0.
5.000	0.03	89.830	0.03	89.
10.000	0.06	89.794	0.09	90.
12.000	0.08	89.777	0.11	90.
15.000	0.10	89.750	0.25	90.
20.000	0.15	89.607	0.43	90.
25.000	0.20	88.582	0.29	90.
30.000	0.25	87.088	0.19	90.
35.000	0.32	85.122	0.04	90.
40.000	0.39	82.742	0.06	91.
45.000	0.47	79.960	0.10	-92.
50.000	0.57	76.841	0.13	-92.
55.000	0.68	73.468	0.13	-92.
60.000	0.80	69.922	0.11	-93.
65.000	0.94	66.283	0.09	-94.
70.000	1.11	62.637	0.11	-95.
75.000	1.30	59.051	0.13	-96.
80.000	1.53	55.578	0.15	-97.
82.250	1.64	54.066	0.16	-97.
85.000	1.78	52.265	0.16	-98.
90.000	2.05	49.138	0.16	-98.
95.000	2.30	46.206	0.15	-99.
100.000	2.55	43.466	0.11	-102.
105.000	2.83	40.890	0.03	-137.
110.000	3.14	38.466	0.39	94.
115.000	3.46	36.268	0.41	94.
120.000	3.79	34.281	0.19	100.
125.000	4.14	32.471	0.10	111.
130.000	4.49	30.819	0.10	113.
135.000	4.88	29.315	0.11	112.
140.000	5.31	27.946	0.13	112.
145.000	5.87	26.704	0.14	112.
147.329	6.19	26.166	0.15	111.
150.000	6.51	25.578	0.16	111.
155.000	7.18	24.540	0.17	111.
159.329	7.86	23.738	0.12	122.
159.329	7.86	23.738	0.74	-95.
159.459	7.87	23.715	0.74	-95.
160.000	7.89	23.616	0.77	-95.
163.759	8.06	22.930	0.90	-94.
			1.99	-92.

TABLE 7-XXIII

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
165.000	8.13	22.710	2.32	
165.859	8.18	22.558	2.49	-92.
170.000	8.46	21.837	3.22	-92.
175.000	8.80	20.986	4.18	-92.
180.000	9.14	20.157	5.12	-91.
185.000	9.23	19.351	6.05	-91.
189.559	9.21	18.635	6.87	-91.
190.000	9.20	18.567	6.95	-91.
194.559	9.03	17.873	7.75	-91.
195.000	9.01	17.808	7.83	-91.
200.000	8.86	17.072	8.69	-91.
205.000	8.60	16.384	13.49	-91.
210.000	8.37	15.768	14.02	-90.
215.000	8.15	15.158	14.17	-90.
220.000	7.75	14.562	14.40	-91.
225.000	7.44	13.981	14.58	-91.
230.000	7.15	13.413	14.73	-91.
235.000	6.69	12.860	14.89	-91.
240.000	6.34	12.321	15.03	-91.
245.000	6.06	11.796	15.17	-91.
250.000	5.84	11.285	15.29	-91.
255.000	5.67	10.788	15.40	-91.
260.000	5.52	10.305	15.50	-91.
265.000	5.40	9.836	15.59	-91.
270.000	5.30	9.381	15.66	-91.
275.000	5.22	8.940	15.72	-91.
280.000	5.15	8.512	15.76	-91.
285.000	5.10	8.097	15.79	-91.
290.000	5.08	7.695	15.81	-91.
295.000	5.07	7.307	15.82	-91.
300.000	5.07	6.931	15.82	-91.
305.000	5.07	6.568	15.80	-91.
310.000	5.08	6.217	15.77	-91.
315.000	5.11	5.879	15.74	-91.
320.000	5.14	5.553	15.69	-91.
325.000	5.18	5.239	15.62	-91.
330.000	5.22	4.937	15.55	-91.
335.000	5.26	4.647	15.47	-91.
340.000	5.31	4.368	15.38	-91.
345.000	5.36	4.100	15.28	-91.

TABLE 7-XXIII

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THRU
PARKING ORBIT (90-DEGREES UNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
350.000	5.42	3.843	17	-91.
355.000	5.49	3.598	15	-91.
360.000	5.55	3.363	12	-91.
365.000	5.62	3.139	10	-91.
370.000	5.68	2.926	10	-91.
375.000	5.75	2.723	10	-91.
380.000	5.83	2.530	10	-92.
385.000	5.90	2.348	10	-92.
390.000	5.98	2.175	10	-92.
395.000	6.06	2.013	10	-92.
400.000	6.14	1.860	10	-92.
405.000	6.23	1.716	10	-92.
410.000	6.31	1.583	10	-92.
415.000	6.40	1.459	10	-92.
420.000	6.49	1.344	10	-92.
425.000	6.59	1.238	10	-92.
430.000	6.69	1.142	10	-92.
435.000	6.78	1.055	10	-92.
437.627	6.84	1.012	10	-92.
440.000	6.88	0.959	10	-92.
445.000	6.96	0.853	10	-92.
450.000	7.05	0.755	10	-92.
455.000	7.14	0.664	10	-92.
460.000	7.23	0.581	10	-92.
465.000	7.32	0.506	10	-92.
470.000	7.42	0.438	10	-92.
475.000	7.52	0.377	10	-93.
480.000	7.62	0.325	10	-93.
485.000	7.72	0.279	10	-93.
490.000	7.83	0.242	10	-93.
495.000	7.94	0.212	10	-93.
500.000	8.05	0.190	10	-93.
505.000	8.16	0.175	10	-93.
510.000	8.28	0.168	10	-93.
515.000	8.40	0.168	10	-93.
520.000	8.52	0.177	10	-93.
525.000	8.64	0.193	10	-93.
530.000	8.77	0.216	10	-94.
535.000	8.90	0.248	10	-94.
537.424	8.96	0.266	10	-94.

TABLE 7-XXIII MACH NUMBER, RELATIVE FLIGHT
ANGLE, ANGLE OF ATTACK, AND
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	AN A (DE	NORMAL FORCE ANGLE (DEGREES)
537.424	8.96	0.266	7	-94.
537.442	8.96	0.266	7	-94.
540.000	8.96	0.229	7	-94.
543.142	8.96	0.184	7	-94.
545.000	8.98	0.169	7	-94.
545.742	8.98	0.163	7	-94.
549.542	9.01	0.134	7	-94.
550.000	9.02	0.130	7	-94.
555.000	9.06	0.096	7	-94.
560.000	9.10	0.063	(	-95.
565.000	9.15	0.034	(	-95.
570.000	9.19	0.006	(	-95.
575.000	9.23	-0.019	(	-95.
580.000	9.28	-0.041	(	-95.
585.000	9.33	-0.060	(	-95.
590.000	9.37	-0.076	(	-96.
595.000	9.42	-0.089	(	-96.
600.000	9.47	-0.099	(	-96.
605.000	9.52	-0.106	(	-96.
610.000	9.57	-0.110	(	-96.
615.000	9.62	-0.111	(	-96.
620.000	9.67	-0.109	(	-96.
625.000	9.72	-0.104	(	-96.
630.000	9.77	-0.095	(	-96.
635.000	9.82	-0.083	(	-96.
640.000	9.87	-0.068	(	-96.
645.000	9.92	-0.049	(	-96.
650.000	9.97	-0.028	(	-94.
655.000	10.03	-0.001	(	-95.
655.175	10.03	0.000	(	-95.
655.175	10.03	0.000	(	-97.
660.000	10.03	0.000	(	-122.
670.000	10.03	-0.000	(	-180.
680.000	10.03	-0.000	(	-180.
690.000	10.03	-0.000	(	-180.
700.000	10.03	-0.000	(	-180.
710.000	10.04	-0.000	(	-180.
720.000	10.04	-0.000	(	-180.
730.000	10.04	-0.001	(	-180.
739.175	10.04	-0.001	(	-180.

TABLE 7-XXIII MACH NUMBER, RELATIVE FLIGHT
 ANGLE, ANGLE OF ATTACK, /
 FORCE ANGLE - LIFTOFF THRU
 PARKING ORBIT (90-DEGREE TURN)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
740.000	10.04	-0.001	-180.
750.000	10.04	-0.001	-180.
760.000	10.04	-0.001	-180.
770.000	10.04	-0.001	-180.
780.000	10.05	-0.001	-180.
790.000	10.05	-0.001	-180.
800.000	10.05	-0.001	-180.
900.000	10.06	-0.002	-180.
1000.000	10.08	-0.002	-180.
1100.000	10.10	-0.003	-180.
1200.000	10.12	-0.004	-180.
1300.000	10.13	-0.004	-180.
1400.000	10.14	-0.005	-180.
1500.000	10.15	-0.005	-180.
1600.000	10.16	-0.005	-180.
1700.000	10.16	-0.004	-180.
1800.000	10.15	-0.004	-180.
1900.000	10.15	-0.002	180.
2000.000	10.14	-0.001	180.
2100.000	10.12	0.002	180.
2200.000	10.11	0.004	180.
2300.000	10.09	0.007	180.
2400.000	10.07	0.011	180.
2500.000	10.05	0.015	180.
2600.000	10.03	0.019	180.
2700.000	10.01	0.023	180.
2800.000	10.00	0.027	180.
2900.000	9.99	0.032	179.
3000.000	9.98	0.036	1.
3100.000	9.98	0.039	0.
3200.000	9.97	0.042	0.
3300.000	9.97	0.045	0.
3400.000	9.96	0.047	-0.
3500.000	9.96	0.048	-0.
3600.000	9.96	0.048	86.
3700.000	9.96	0.047	86.
3800.000	9.96	0.045	85.
3900.000	9.96	0.043	85.
4000.000	9.96	0.040	85.
4100.000	9.95	0.036	85.

TABLE 7-XXIII

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
4200.000	9.95	0.031	20.08	85.
4300.000	9.94	0.027	20.08	85.
4400.000	9.93	0.022	20.08	85.
4500.000	9.92	0.017	20.07	85.
4600.000	9.91	0.012	20.07	85.
4700.000	9.90	0.007	20.06	85.
4800.000	9.89	0.002	20.05	86.
4900.000	9.88	-0.002	20.04	86.
5000.000	9.87	-0.006	20.03	87.
5100.000	9.86	-0.009	20.02	87.
5200.000	9.85	-0.012	20.01	88.
5300.000	9.85	-0.014	20.01	88.
5400.000	9.85	-0.016	20.00	89.
5500.000	9.85	-0.018	20.00	90.
5600.000	9.85	-0.019	20.00	90.
5700.000	9.86	-0.019	20.00	91.
5800.000	9.87	-0.020	20.00	91.
5900.000	9.88	-0.020	0.63	-180.
6000.000	9.89	-0.020	0.82	-180.
6100.000	9.90	-0.019	1.00	-180.
6200.000	9.92	-0.019	1.17	-180.
6300.000	9.94	-0.018	1.32	-180.
6400.000	9.95	-0.017	1.45	-180.
6500.000	9.97	-0.016	1.56	-180.
6600.000	9.98	-0.016	1.65	-180.
6700.000	9.99	-0.014	1.72	-180.
6800.000	10.00	-0.013	1.76	-180.
6900.000	10.01	-0.012	1.77	-180.
7000.000	10.01	-0.010	1.77	-180.
7100.000	10.01	-0.008	1.73	-180.
7200.000	10.00	-0.005	1.68	-180.
7300.000	9.99	-0.003	1.60	-180.
7400.000	9.99	0.001	1.49	-180.
7500.000	9.97	0.004	1.37	-180.
7600.000	9.96	0.008	1.23	-180.
7700.000	9.95	0.013	1.06	-180.
7800.000	9.93	0.017	0.89	180.
7900.000	9.92	0.022	0.70	180.
8000.000	9.91	0.026	0.50	180.
8100.000	9.89	0.031	0.30	180.

TABLE 7-XXIII MACH NUMBER, RELATIVE FLIGHT
ANGLE, ANGLE OF ATTACK, AND IL
FORCE ANGLE - LIFTOFF THROU
PARKING ORBIT (90-DEGREES LAZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	AN / (DE)	NORMAL FORCE ANGLE (DEGREES)
8200.000	9.88	0.035	(	179.
8300.000	9.87	0.039	(	1.
8400.000	9.87	0.043	(	0.
8500.000	9.86	0.046	(	0.
8600.000	9.86	0.048	(	-0.
8700.000	9.85	0.049	(	-0.
8800.000	9.85	0.050	(	-0.
8900.000	9.85	0.049	(	-0.
9000.000	9.85	0.048	(	-0.
9100.000	9.85	0.046	(	-0.
9200.000	9.85	0.043	(	-0.
9300.000	9.84	0.039	(	-0.
9400.000	9.84	0.035	(	-0.
9500.000	9.84	0.030	(	-0.
9600.000	9.83	0.025	(	-0.
9700.000	9.82	0.020	(	-0.
9800.000	9.81	0.014	(	-0.
9900.000	9.80	0.009	(	-0.
10000.000	9.79	0.003	(	-0.
10100.000	9.78	-0.002	(	-0.
10200.000	9.77	-0.006	(	-0.
10300.000	9.76	-0.010	(	-0.
10400.000	9.76	-0.014	(	-0.
10500.000	9.75	-0.017	(	-0.
10600.000	9.75	-0.019	(	-0.
10700.000	9.75	-0.021	(	-0.
10800.000	9.75	-0.023	(	-0.
10900.000	9.75	-0.024	(	-176.
11000.000	9.76	-0.024	(	-179.
11100.000	9.77	-0.024	(	-180.
11200.000	9.78	-0.024	(	-180.
11300.000	9.80	-0.024	(	-180.
11400.000	9.81	-0.023	(	-180.
11500.000	9.83	-0.022	(	-180.
11600.000	9.85	-0.021	(	-180.
11700.000	9.86	-0.020	(	-179.
11800.000	9.88	-0.019	(	-179.
11900.000	9.89	-0.018	(	-179.
12000.000	9.90	-0.016	(	-179.
12100.000	9.91	-0.015	(	-179.

TABLE 7-XXIII

MACH NUMBER, RELATIVE FLIGHT-
ANGLE, ANGLE OF ATTACK, AND A
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAU)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANG NORMAL FORCE ANGLE (DEGREES)
12200.000	9.91	-0.013	1. -179.
12300.000	9.92	-0.010	1. -180.
12400.000	9.92	-0.008	1. -180.
12500.000	9.91	-0.005	1. -180.
12600.000	9.90	-0.002	1. -180.
12700.000	9.89	0.002	1. -180.
12800.000	9.88	0.006	1. -180.
12900.000	9.87	0.010	1. -180.
13000.000	9.86	0.015	1. -180.
13100.000	9.84	0.020	0. -180.
13200.000	9.83	0.025	0. 180.
13300.000	9.81	0.029	0. 180.
13400.000	9.80	0.034	0. 180.
13500.000	9.79	0.039	0. 178.
13600.000	9.78	0.043	0. 1.
13700.000	9.77	0.046	0. 0.
13800.000	9.77	0.049	0. -0.
13900.000	9.76	0.051	0. -0.
14000.000	9.76	0.052	0. -0.
14100.000	9.75	0.053	0. -0.
14200.000	9.75	0.052	0. -0.
14300.000	9.75	0.050	0. -0.
14400.000	9.75	0.048	0. -0.
14500.000	9.75	0.044	0. -1.
14600.000	9.75	0.040	0. -1.
14700.000	9.74	0.036	0. -1.
14800.000	9.74	0.030	0. -1.
14900.000	9.73	0.025	0. -1.
15000.000	9.72	0.019	0. -1.
15100.000	9.71	0.013	0. -1.
15200.000	9.71	0.007	0. -1.
15300.000	9.70	0.001	0. -0.
15400.000	9.69	-0.004	0. -0.
15500.000	9.68	-0.009	0. -0.
15600.000	9.67	-0.014	0. -0.
15700.000	9.66	-0.018	0. -0.
15800.000	9.66	-0.021	0. -0.
15900.000	9.66	-0.024	0. -0.
16000.000	9.66	-0.026	0. -0.
16100.000	9.66	-0.027	0. -0.

TABLE 7-XXIII

MACH NUMBER, RELATIVE FLIGHT-PATH
 ANGLE, ANGLE OF ATTACK, AND NORMAL
 FORCE ANGLE - LIFTOFF THROUGH
 PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
16200.000	9.67	-0.028	0.02	-175.
16300.000	9.67	-0.029	0.23	-179.
16400.000	9.68	-0.029	0.44	-179.
16500.000	9.70	-0.029	0.64	-179.
16550.000	9.71	-0.028	0.73	-179.

05-15481-1

TABLE 7-XXIV

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (90-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
0.000	0.0	0.	0.
5.000	1.3	0.	0.
10.000	6.0	1.	610.
12.000	9.1	1.	1398.
15.000	15.3	4.	3815.
20.000	30.5	13.	14127.
25.000	52.8	15.	39880.
30.000	83.7	16.	95015.
35.000	124.1	5.	200934.
40.000	174.5	10.	388570.
45.000	234.9	24.	700566.
50.000	304.1	39.	1192035.
55.000	380.4	48.	1930533.
60.000	460.3	49.	2993878.
65.000	538.9	50.	4463695.
70.000	609.0	67.	6413010.
75.000	663.9	88.	8890854.
80.000	696.5	106.	11917848.
82.250	700.2	111.	13450262.
85.000	692.8	113.	15444837.
90.000	643.1	99.	19300873.
95.000	551.9	58.	23202596.
100.000	456.3	15.	26899697.
105.000	368.9	145.	30307207.
110.000	293.4	120.	33383409.
115.000	227.9	42.	36089999.
120.000	172.2	17.	38395179.
125.000	127.5	13.	40311574.
130.000	92.9	11.	41871329.
135.000	66.9	8.	43120034.
140.000	48.0	7.	44110010.
145.000	34.8	5.	44895064.
147.329	29.9	5.	45204847.
150.000	24.3	4.	45514372.
155.000	16.0	2.	45966299.
159.329	10.8	8.	46245921.
159.329	10.8	8.	46245921.
159.459	10.6	8.	46252920.
160.000	9.9	9.	46280950.
163.759	6.1	12.	46430690.

TABLE 7-XXIV

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
165.000	5.2	12.	46466443.
165.859	4.7	12.	46488193.
170.000	2.7	9.	46565672.
175.000	1.4	6.	46618131.
180.000	0.7	4.	46645306.
185.000	0.3	2.	46658743.
189.559	0.2	1.	46664866.
190.000	0.2	1.	46665267.
194.559	0.1	1.	46668223.
195.000	0.1	1.	46668421.
200.000	0.0	0.	46670033.
205.000	0.0	0.	46670916.
210.000	0.0	0.	46671430.
215.000	0.0	0.	46671734.
220.000	0.0	0.	46671919.
225.000	0.0	0.	46672036.
230.000	0.0	0.	46672114.
235.000	0.0	0.	46672168.
240.000	0.0	0.	46672205.
245.000	0.0	0.	46672233.
250.000	0.0	0.	46672255.
255.000	0.0	0.	46672273.
260.000	0.0	0.	46672287.
265.000	0.0	0.	46672300.
270.000	0.0	0.	46672310.
275.000	0.0	0.	46672319.
280.000	0.0	0.	46672327.
285.000	0.0	0.	46672334.
290.000	0.0	0.	46672342.
295.000	0.0	0.	46672348.
300.000	0.0	0.	46672353.
305.000	0.0	0.	46672358.
310.000	0.0	0.	46672363.
315.000	0.0	0.	46672368.
320.000	0.0	0.	46672373.
325.000	0.0	0.	46672378.
330.000	0.0	0.	46672383.
335.000	0.0	0.	46672388.
340.000	0.0	0.	46672393.
345.000	0.0	0.	46672398.

TABLE 7-XXIV DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
350.000	0.0	0.	46672403.
355.000	0.0	0.	46672408.
360.000	0.0	0.	46672413.
365.000	0.0	0.	46672418.
370.000	0.0	0.	46672423.
375.000	0.0	0.	46672428.
380.000	0.0	0.	46672433.
385.000	0.0	0.	46672438.
390.000	0.0	0.	46672443.
395.000	0.0	0.	46672448.
400.000	0.0	0.	46672453.
405.000	0.0	0.	46672458.
410.000	0.0	0.	46672463.
415.000	0.0	0.	46672468.
420.000	0.0	0.	46672473.
425.000	0.0	0.	46672478.
430.000	0.0	0.	46672484.
435.000	0.0	0.	46672491.
437.627	0.0	0.	46672495.
440.000	0.0	0.	46672498.
445.000	0.0	0.	46672506.
450.000	0.0	0.	46672513.
455.000	0.0	0.	46672521.
460.000	0.0	0.	46672528.
465.000	0.0	0.	46672536.
470.000	0.0	0.	46672543.
475.000	0.0	0.	46672551.
480.000	0.0	0.	46672560.
485.000	0.0	0.	46672570.
490.000	0.0	0.	46672580.
495.000	0.0	0.	46672590.
500.000	0.0	0.	46672600.
505.000	0.0	0.	46672610.
510.000	0.0	0.	46672622.
515.000	0.0	0.	46672634.
520.000	0.0	0.	46672647.
525.000	0.0	0.	46672659.
530.000	0.0	0.	46672672.
535.000	0.0	0.	46672686.
537.424	0.0	0.	46672693.

TABLE 7-XXIV DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
537.424	0.0	0.	46672693.
537.442	0.0	0.	46672693.
540.000	0.0	0.	46672701.
543.142	0.0	0.	46672710.
545.000	0.0	0.	46672715.
545.742	0.0	0.	46672717.
549.542	0.0	0.	46672728.
550.000	0.0	0.	46672729.
555.000	0.0	0.	46672744.
560.000	0.0	0.	46672759.
565.000	0.0	0.	46672774.
570.000	0.0	0.	46672789.
575.000	0.0	0.	46672804.
580.000	0.0	0.	46672819.
585.000	0.0	0.	46672834.
590.000	0.0	0.	46672851.
595.000	0.0	0.	46672868.
600.000	0.0	0.	46672886.
605.000	0.0	0.	46672903.
610.000	0.0	0.	46672921.
615.000	0.0	0.	46672938.
620.000	0.0	0.	46672956.
625.000	0.0	0.	46672973.
630.000	0.0	0.	46672992.
635.000	0.0	0.	46673012.
640.000	0.0	0.	46673032.
645.000	0.0	0.	46673052.
650.000	0.0	0.	46673072.
655.000	0.0	0.	46673092.
655.175	0.0	0.	46673092.
655.175	0.0	0.	46673092.
660.000	0.0	0.	46673092.
670.000	0.0	0.	46673092.
680.000	0.0	0.	46673092.
690.000	0.0	0.	46673092.
700.000	0.0	0.	46673092.
710.000	0.0	0.	46673092.
720.000	0.0	0.	46673092.
730.000	0.0	0.	46673092.
739.175	0.0	0.	46673092.

TABLE 7-XXIV

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
740.000	0.0	0.	46673092.
750.000	0.0	0.	46673092.
760.000	0.0	0.	46673092.
770.000	0.0	0.	46673092.
780.000	0.0	0.	46673092.
790.000	0.0	0.	46673092.
800.000	0.0	0.	46673092.
900.000	0.0	0.	46673092.
1000.000	0.0	0.	46673092.
1100.000	0.0	0.	46673092.
1200.000	0.0	0.	46673092.
1300.000	0.0	0.	46673092.
1400.000	0.0	0.	46673092.
1500.000	0.0	0.	46673092.
1600.000	0.0	0.	46673092.
1700.000	0.0	0.	46673092.
1800.000	0.0	0.	46673092.
1900.000	0.0	0.	46673092.
2000.000	0.0	0.	46673092.
2100.000	0.0	0.	46673092.
2200.000	0.0	0.	46673092.
2300.000	0.0	0.	46673092.
2400.000	0.0	0.	46673092.
2500.000	0.0	0.	46673092.
2600.000	0.0	0.	46673092.
2700.000	0.0	0.	46673092.
2800.000	0.0	0.	46673092.
2900.000	0.0	0.	46673092.
3000.000	0.0	0.	46673092.
3100.000	0.0	0.	46673092.
3200.000	0.0	0.	46673092.
3300.000	0.0	0.	46673092.
3400.000	0.0	0.	46673092.
3500.000	0.0	0.	46673092.
3600.000	0.0	0.	46673092.
3700.000	0.0	0.	46673092.
3800.000	0.0	0.	46673092.
3900.000	0.0	0.	46673092.
4000.000	0.0	0.	46673092.
4100.000	0.0	0.	46673092.

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TABLE 7-XXIV DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
4200.000	0.0	0.	46673092.
4300.000	0.0	0.	46673092.
4400.000	0.0	0.	46673092.
4500.000	0.0	0.	46673092.
4600.000	0.0	0.	46673092.
4700.000	0.0	0.	46673092.
4800.000	0.0	0.	46673092.
4900.000	0.0	0.	46673092.
5000.000	0.0	0.	46673092.
5100.000	0.0	0.	46673092.
5200.000	0.0	0.	46673092.
5300.000	0.0	0.	46673092.
5400.000	0.0	0.	46673092.
5500.000	0.0	0.	46673092.
5600.000	0.0	0.	46673092.
5700.000	0.0	0.	46673092.
5800.000	0.0	0.	46673092.
5900.000	0.0	0.	46673092.
6000.000	0.0	0.	46673092.
6100.000	0.0	0.	46673092.
6200.000	0.0	0.	46673092.
6300.000	0.0	0.	46673092.
6400.000	0.0	0.	46673092.
6500.000	0.0	0.	46673092.
6600.000	0.0	0.	46673092.
6700.000	0.0	0.	46673092.
6800.000	0.0	0.	46673092.
6900.000	0.0	0.	46673092.
7000.000	0.0	0.	46673092.
7100.000	0.0	0.	46673092.
7200.000	0.0	0.	46673092.
7300.000	0.0	0.	46673092.
7400.000	0.0	0.	46673092.
7500.000	0.0	0.	46673092.
7600.000	0.0	0.	46673092.
7700.000	0.0	0.	46673092.
7800.000	0.0	0.	46673092.
7900.000	0.0	0.	46673092.
8000.000	0.0	0.	46673092.
8100.000	0.0	0.	46673092.

TABLE 7-XXIV

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
8200.000	0.0	0.	46673092.
8300.000	0.0	0.	46673092.
8400.000	0.0	0.	46673092.
8500.000	0.0	0.	46673092.
8600.000	0.0	0.	46673092.
8700.000	0.0	0.	46673092.
8800.000	0.0	0.	46673092.
8900.000	0.0	0.	46673092.
9000.000	0.0	0.	46673092.
9100.000	0.0	0.	46673092.
9200.000	0.0	0.	46673092.
9300.000	0.0	0.	46673092.
9400.000	0.0	0.	46673092.
9500.000	0.0	0.	46673092.
9600.000	0.0	0.	46673092.
9700.000	0.0	0.	46673092.
9800.000	0.0	0.	46673092.
9900.000	0.0	0.	46673092.
10000.000	0.0	0.	46673092.
10100.000	0.0	0.	46673092.
10200.000	0.0	0.	46673092.
10300.000	0.0	0.	46673092.
10400.000	0.0	0.	46673092.
10500.000	0.0	0.	46673092.
10600.000	0.0	0.	46673092.
10700.000	0.0	0.	46673092.
10800.000	0.0	0.	46673092.
10900.000	0.0	0.	46673092.
11000.000	0.0	0.	46673092.
11100.000	0.0	0.	46673092.
11200.000	0.0	0.	46673092.
11300.000	0.0	0.	46673092.
11400.000	0.0	0.	46673092.
11500.000	0.0	0.	46673092.
11600.000	0.0	0.	46673092.
11700.000	0.0	0.	46673092.
11800.000	0.0	0.	46673092.
11900.000	0.0	0.	46673092.
12000.000	0.0	0.	46673092.
12100.000	0.0	0.	46673092.

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TABLE 7-XXIV DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
12200.000	0.0	0.	46673092.
12300.000	0.0	0.	46673092.
12400.000	0.0	0.	46673092.
12500.000	0.0	0.	46673092.
12600.000	0.0	0.	46673092.
12700.000	0.0	0.	46673092.
12800.000	0.0	0.	46673092.
12900.000	0.0	0.	46673092.
13000.000	0.0	0.	46673092.
13100.000	0.0	0.	46673092.
13200.000	0.0	0.	46673092.
13300.000	0.0	0.	46673092.
13400.000	0.0	0.	46673092.
13500.000	0.0	0.	46673092.
13600.000	0.0	0.	46673092.
13700.000	0.0	0.	46673092.
13800.000	0.0	0.	46673092.
13900.000	0.0	0.	46673092.
14000.000	0.0	0.	46673092.
14100.000	0.0	0.	46673092.
14200.000	0.0	0.	46673092.
14300.000	0.0	0.	46673092.
14400.000	0.0	0.	46673092.
14500.000	0.0	0.	46673092.
14600.000	0.0	0.	46673092.
14700.000	0.0	0.	46673092.
14800.000	0.0	0.	46673092.
14900.000	0.0	0.	46673092.
15000.000	0.0	0.	46673092.
15100.000	0.0	0.	46673092.
15200.000	0.0	0.	46673092.
15300.000	0.0	0.	46673092.
15400.000	0.0	0.	46673092.
15500.000	0.0	0.	46673092.
15600.000	0.0	0.	46673092.
15700.000	0.0	0.	46673092.
15800.000	0.0	0.	46673092.
15900.000	0.0	0.	46673092.
16000.000	0.0	0.	46673092.
16100.000	0.0	0.	46673092.

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TABLE 7-XXIV DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
16200.000	0.0	0.	46673092.
16300.000	0.0	0.	46673092.
16400.000	0.0	0.	46673092.
16500.000	0.0	0.	46673092.
16550.000	0.0	0.	46673092.

TABLE 7-XXV
 NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
 AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
 PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
0.000	0.	12697.	6373344.	28.447
5.000	3.	1305.	6373370.	28.447
10.000	37.	5946.	6373451.	28.447
12.000	69.	8992.	6373501.	28.447
15.000	266.	14743.	6373595.	28.447
20.000	907.	20438.	6373811.	28.447
25.000	1064.	18025.	6374106.	28.447
30.000	1089.	25727.	6374492.	28.447
35.000	356.	36355.	6374979.	28.447
40.000	714.	51448.	6375577.	28.447
45.000	1731.	72569.	6376297.	28.447
50.000	2845.	103313.	6377150.	28.447
55.000	3654.	144669.	6378145.	28.447
60.000	3828.	208360.	6379291.	28.447
65.000	4115.	301223.	6380592.	28.447
70.000	5382.	415034.	6382053.	28.447
75.000	6535.	438501.	6383672.	28.447
80.000	7396.	389617.	6385454.	28.447
82.250	7655.	366366.	6386310.	28.447
85.000	7654.	332424.	6387403.	28.447
90.000	6552.	269860.	6389526.	28.447
95.000	3835.	208489.	6391825.	28.447
100.000	983.	153893.	6394304.	28.447
105.000	9528.	111989.	6396963.	28.447
110.000	7881.	79240.	6399801.	28.447
115.000	2810.	54469.	6402819.	28.447
120.000	1132.	36118.	6406020.	28.447
125.000	861.	23326.	6409411.	28.446
130.000	700.	14876.	6412994.	28.446
135.000	558.	9225.	6416778.	28.446
140.000	447.	5491.	6420772.	28.445
145.000	359.	2854.	6424986.	28.444
147.329	321.	1800.	6427029.	28.444
150.000	272.	878.	6429423.	28.443
155.000	133.	-530.	6434023.	28.442
159.329	536.	-1269.	6438142.	28.441
159.329	272.	2052.	6438142.	28.441
159.459	278.	2017.	6438267.	28.441
160.000	304.	1878.	6438788.	28.441
163.759	415.	1137.	6442349.	28.440

TABLE 7-XXV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
165.000	439.	965.	644352.	28.440
165.859	435.	860.	644425.	28.440
170.000	356.	490.	644803.	28.438
175.000	252.	243.	645247.	28.437
180.000	162.	117.	645684.	28.435
185.000	93.	55.	646097.	28.433
189.559	54.	28.	646465.	28.431
190.000	51.	26.	6465048.	28.431
194.559	30.	14.	6468647.	28.429
195.000	28.	13.	6468990.	28.428
200.000	17.	7.	6472816.	28.426
205.000	15.	4.	6476529.	28.423
210.000	9.	2.	6480143.	28.420
215.000	6.	1.	6483662.	28.417
220.000	3.	1.	6487085.	28.414
225.000	2.	1.	6490414.	28.410
230.000	2.	0.	6493650.	28.407
235.000	1.	0.	6496793.	28.403
240.000	1.	0.	6499844.	28.398
245.000	1.	0.	6502805.	28.394
250.000	0.	0.	6505676.	28.389
255.000	0.	0.	6508459.	28.384
260.000	0.	0.	6511154.	28.379
265.000	0.	0.	6513762.	28.374
270.000	0.	0.	6516284.	28.368
275.000	0.	0.	6518722.	28.362
280.000	0.	0.	6521076.	28.355
285.000	0.	0.	6523347.	28.349
290.000	0.	0.	6525538.	28.342
295.000	0.	0.	6527641.	28.334
300.000	0.	0.	6529674.	28.327
305.000	0.	0.	6531631.	28.319
310.000	0.	0.	6533501.	28.310
315.000	0.	0.	6535311.	28.302
320.000	0.	0.	6537031.	28.293
325.000	0.	0.	6538691.	28.283
330.000	0.	0.	6540271.	28.273
335.000	0.	0.	6541781.	28.263
340.000	0.	0.	6543221.	28.252
345.000	0.	0.	6544601.	28.241

TABLE 7-XXV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
350.000	0.	0.	6545913.	28.229
355.000	0.	0.	6547159.	28.217
360.000	0.	0.	6548341.	28.204
365.000	0.	0.	6549463.	28.191
370.000	0.	0.	6550525.	28.177
375.000	0.	0.	6551528.	28.163
380.000	0.	0.	6552476.	28.148
385.000	0.	0.	6553370.	28.133
390.000	0.	0.	6554211.	28.117
395.000	0.	0.	6555002.	28.100
400.000	0.	0.	6555745.	28.083
405.000	0.	0.	6556442.	28.065
410.000	0.	0.	6557095.	28.046
415.000	0.	0.	6557706.	28.027
420.000	0.	0.	6558278.	28.007
425.000	0.	0.	6558814.	27.986
430.000	0.	0.	6559315.	27.964
435.000	0.	0.	6559786.	27.942
437.627	0.	0.	6560021.	27.929
440.000	0.	0.	6560225.	27.918
445.000	0.	0.	6560625.	27.894
450.000	0.	0.	6560985.	27.869
455.000	0.	0.	6561306.	27.843
460.000	0.	0.	6561591.	27.816
465.000	0.	0.	6561844.	27.789
470.000	0.	0.	6562066.	27.760
475.000	0.	0.	6562261.	27.731
480.000	0.	0.	6562431.	27.700
485.000	0.	0.	6562579.	27.669
490.000	0.	0.	6562709.	27.636
495.000	0.	0.	6562823.	27.602
500.000	0.	0.	6562926.	27.567
505.000	0.	0.	6563020.	27.531
510.000	0.	0.	6563110.	27.494
515.000	0.	0.	6563200.	27.456
520.000	0.	0.	6563294.	27.416
525.000	0.	0.	6563395.	27.375
530.000	0.	0.	6563509.	27.333
535.000	0.	0.	6563641.	27.289
537.424	0.	0.	6563712.	27.267

TABLE 7-XXV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRI RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
537.424	0.	0.	6563712.	27.267
537.442	0.	0.	6563713.	27.267
540.000	0.	0.	6563785.	27.244
543.142	0.	0.	6563860.	27.215
545.000	0.	0.	6563898.	27.198
545.742	0.	0.	6563912.	27.191
549.542	0.	0.	6563977.	27.155
550.000	0.	0.	6563984.	27.151
555.000	0.	0.	6564050.	27.103
560.000	0.	0.	6564096.	27.053
565.000	0.	0.	6564125.	27.003
570.000	0.	0.	6564136.	26.952
575.000	0.	0.	6564132.	26.900
580.000	0.	0.	6564115.	26.846
585.000	0.	0.	6564084.	26.791
590.000	0.	0.	6564043.	26.736
595.000	0.	0.	6563993.	26.679
600.000	0.	0.	6563936.	26.621
605.000	0.	0.	6563873.	26.562
610.000	0.	0.	6563807.	26.501
615.000	0.	0.	6563738.	26.440
620.000	0.	0.	6563670.	26.377
625.000	0.	0.	6563603.	26.313
630.000	0.	0.	6563541.	26.248
635.000	0.	0.	6563485.	26.182
640.000	0.	0.	6563436.	26.114
645.000	0.	0.	6563395.	26.045
650.000	0.	0.	6563374.	25.975
655.000	0.	0.	6563361.	25.904
655.175	0.	0.	6563361.	25.901
655.175	0.	0.	6563361.	25.901
660.000	0.	0.	6563361.	25.831
670.000	0.	0.	6563361.	25.683
680.000	0.	0.	6563361.	25.532
690.000	0.	0.	6563361.	25.377
700.000	0.	0.	6563361.	25.218
710.000	0.	0.	6563361.	25.055
720.000	0.	0.	6563361.	24.889
730.000	0.	0.	6563361.	24.720
739.175	0.	0.	6563361.	24.561

TABLE 7-XXV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
740.000	0.	0.	6563362.	24.547
750.000	0.	0.	6563361.	24.370
760.000	0.	0.	6563360.	24.190
770.000	0.	0.	6563359.	24.007
780.000	0.	0.	6563358.	23.820
790.000	0.	0.	6563357.	23.630
800.000	0.	0.	6563356.	23.437
900.000	0.	0.	6563340.	21.333
1000.000	0.	0.	6563316.	18.948
1100.000	0.	0.	6563282.	16.322
1200.000	0.	0.	6563239.	13.496
1300.000	0.	0.	6563187.	10.511
1400.000	0.	0.	6563129.	7.406
1500.000	0.	0.	6563068.	4.217
1600.000	0.	0.	6563005.	0.982
1700.000	0.	0.	6562946.	-2.264
1800.000	0.	0.	6562894.	-5.486
1900.000	0.	0.	6562856.	-8.646
2000.000	0.	0.	6562836.	-11.710
2100.000	0.	0.	6562841.	-14.637
2200.000	0.	0.	6562877.	-17.389
2300.000	0.	0.	6562951.	-19.926
2400.000	0.	0.	6563067.	-22.205
2500.000	0.	0.	6563231.	-24.186
2600.000	0.	0.	6563448.	-25.828
2700.000	0.	0.	6563718.	-27.097
2800.000	0.	0.	6564044.	-27.962
2900.000	0.	0.	6564424.	-28.401
3000.000	0.	0.	6564858.	-28.404
3100.000	0.	0.	6565339.	-27.970
3200.000	0.	0.	6565864.	-27.111
3300.000	0.	0.	6566425.	-25.849
3400.000	0.	0.	6567013.	-24.213
3500.000	0.	0.	6567620.	-22.239
3600.000	0.	0.	6568233.	-19.968
3700.000	0.	0.	6568842.	-17.440
3800.000	0.	0.	6569434.	-14.696
3900.000	0.	0.	6570000.	-11.778
4000.000	0.	0.	6570530.	-8.724
4100.000	0.	0.	6571015.	-5.572

TABLE 7-XXV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC
AND GEOCENTRIC LATITUDE - LIFT-OFF
PARKING ORBIT (90-DEGREES LAUNCH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC LATITUDE (METDEGREES)
4200.000	0.	0.	6571-2.359
4300.000	0.	0.	6571 0.880
4400.000	0.	0.	6572 4.108
4500.000	0.	0.	6572 7.292
4600.000	0.	0.	6572 10.393
4700.000	0.	0.	6572 13.376
4800.000	0.	0.	6572 16.203
4900.000	0.	0.	6572 18.832
5000.000	0.	0.	6572 21.224
5100.000	0.	0.	6572 23.338
5200.000	0.	0.	6572 25.132
5300.000	0.	0.	6572 26.571
5400.000	0.	0.	6572 27.620
5500.000	0.	0.	6572 28.254
5600.000	0.	0.	6572 28.457
5700.000	0.	0.	6572 28.224
5800.000	0.	0.	6572 27.561
5900.000	0.	0.	6572 26.484
6000.000	0.	0.	6572 25.019
6100.000	0.	0.	6572 23.199
6200.000	0.	0.	6572 21.063
6300.000	0.	0.	656 18.651
6400.000	0.	0.	656 16.003
6500.000	0.	0.	656 13.161
6600.000	0.	0.	656 10.164
6700.000	0.	0.	656 7.051
6800.000	0.	0.	656 3.860
6900.000	0.	0.	656 0.625
7000.000	0.	0.	656 -2.616
7100.000	0.	0.	656 -5.829
7200.000	0.	0.	656 -8.977
7300.000	0.	0.	656 -12.024
7400.000	0.	0.	656 -14.931
7500.000	0.	0.	656 -17.660
7600.000	0.	0.	656 -20.169
7700.000	0.	0.	656 -22.418
7800.000	0.	0.	656 -24.364
7900.000	0.	0.	656 -25.969
8000.000	0.	0.	656 -27.199
8100.000	0.	0.	656 -28.022

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TABLE 7-XXV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
8200.000	0.	0.	6570129.	-28.420
8300.000	0.	0.	6570608.	-28.382
8400.000	0.	0.	6571136.	-27.909
8500.000	0.	0.	6571705.	-27.014
8600.000	0.	0.	6572308.	-25.719
8700.000	0.	0.	6572933.	-24.054
8800.000	0.	0.	6573570.	-22.055
8900.000	0.	0.	6574209.	-19.764
9000.000	0.	0.	6574838.	-17.219
9100.000	0.	0.	6575445.	-14.463
9200.000	0.	0.	6576020.	-11.537
9300.000	0.	0.	6576552.	-8.478
9400.000	0.	0.	6577033.	-5.324
9500.000	0.	0.	6577455.	-2.113
9600.000	0.	0.	6577813.	1.122
9700.000	0.	0.	6578102.	4.344
9800.000	0.	0.	6578320.	7.518
9900.000	0.	0.	6578468.	10.608
10000.000	0.	0.	6578546.	13.577
10100.000	0.	0.	6578557.	16.388
10200.000	0.	0.	6578507.	18.999
10300.000	0.	0.	6578400.	21.371
10400.000	0.	0.	6578244.	23.462
10500.000	0.	0.	6578044.	25.233
10600.000	0.	0.	6577809.	26.646
10700.000	0.	0.	6577545.	27.670
10800.000	0.	0.	6577261.	28.278
10900.000	0.	0.	6576961.	28.456
11000.000	0.	0.	6576652.	28.198
11100.000	0.	0.	6576340.	27.512
11200.000	0.	0.	6576028.	26.414
11300.000	0.	0.	6575720.	24.932
11400.000	0.	0.	6575419.	23.097
11500.000	0.	0.	6575128.	20.948
11600.000	0.	0.	6574848.	18.525
11700.000	0.	0.	6574581.	15.870
11800.000	0.	0.	6574328.	13.023
11900.000	0.	0.	6574092.	10.023
12000.000	0.	0.	6573873.	6.909
12100.000	0.	0.	6573675.	3.718

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TABLE 7-XXV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
12200.000	0.	0.	6573500.	0.486
12300.000	0.	0.	6573352.	-2.751
12400.000	0.	0.	6573234.	-5.959
12500.000	0.	0.	6573152.	-9.100
12600.000	0.	0.	6573109.	-12.139
12700.000	0.	0.	6573111.	-15.038
12800.000	0.	0.	6573161.	-17.756
12900.000	0.	0.	6573266.	-20.254
13000.000	0.	0.	6573429.	-22.490
13100.000	0.	0.	6573652.	-24.423
13200.000	0.	0.	6573937.	-26.015
13300.000	0.	0.	6574285.	-27.230
13400.000	0.	0.	6574695.	-28.041
13500.000	0.	0.	6575164.	-28.425
13600.000	0.	0.	6575687.	-28.375
13700.000	0.	0.	6576259.	-27.891
13800.000	0.	0.	6576871.	-26.986
13900.000	0.	0.	6577514.	-25.683
14000.000	0.	0.	6578179.	-24.011
14100.000	0.	0.	6578853.	-22.009
14200.000	0.	0.	6579525.	-19.714
14300.000	0.	0.	6580182.	-17.168
14400.000	0.	0.	6580814.	-14.412
14500.000	0.	0.	6581408.	-11.486
14600.000	0.	0.	6581955.	-8.430
14700.000	0.	0.	6582444.	-5.279
14800.000	0.	0.	6582869.	-2.071
14900.000	0.	0.	6583224.	1.160
15000.000	0.	0.	6583503.	4.377
15100.000	0.	0.	6583706.	7.547
15200.000	0.	0.	6583833.	10.632
15300.000	0.	0.	6583883.	13.597
15400.000	0.	0.	6583862.	16.402
15500.000	0.	0.	6583773.	19.009
15600.000	0.	0.	6583623.	21.377
15700.000	0.	0.	6583419.	23.465
15800.000	0.	0.	6583168.	25.234
15900.000	0.	0.	6582878.	26.645
16000.000	0.	0.	6582557.	27.668
16100.000	0.	0.	6582213.	28.277

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TABLE 7-XXV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
16200.000	0.	0.	6581854.	28.456
16300.000	0.	0.	6581485.	28.201
16400.000	0.	0.	6581113.	27.518
16500.000	0.	0.	6580743.	26.424
16550.000	0.	0.	6580561.	25.731

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TABLE 7-XXVI

VEHICLE POSITION COORDINATES - LIFOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AIMUTH)

POSITION COORDINATE IN
APOLLO STANDARD COORDINATE STEM NO. 13.

TIME FROM LIFTOFF (SEC)	X (METERS)	Y (METERS)	Z (METERS)
0.000	6373319.	17960.	0.
5.000	6373344.	17960.	2043.
10.000	6373424.	17959.	4086.
12.000	6373473.	17959.	4903.
15.000	6373567.	17958.	6129.
20.000	6373780.	17957.	8173.
25.000	6374073.	17956.	10221.
30.000	6374455.	17954.	12280.
35.000	6374938.	17951.	14358.
40.000	6375530.	17949.	16466.
45.000	6376245.	17946.	18622.
50.000	6377091.	17942.	20844.
55.000	6378078.	17938.	23157.
60.000	6379214.	17934.	25586.
65.000	6380505.	17930.	28161.
70.000	6381953.	17925.	30912.
75.000	6383557.	17920.	33872.
80.000	6385321.	17914.	37074.
82.250	6386168.	17911.	38604.
85.000	6387250.	17908.	40556.
90.000	6389347.	17901.	44358.
95.000	6391616.	17894.	48521.
100.000	6394058.	17886.	53087.
105.000	6396674.	17878.	58099.
110.000	6399460.	17869.	63602.
115.000	6402415.	17860.	69643.
120.000	6405541.	17851.	76264.
125.000	6408842.	17841.	83512.
130.000	6412318.	17831.	91437.
135.000	6415973.	17820.	100091.
140.000	6419813.	17809.	109535.
145.000	6423844.	17798.	119831.
147.329	6425790.	17792.	124938.
150.000	6428063.	17786.	131022.
155.000	6432409.	17774.	143024.
159.329	6436273.	17763.	154100.
159.329	6436273.	17763.	154100.
159.459	6436390.	17763.	154441.
160.000	6436877.	17763.	155866.
163.759	6440191.	1775.	165783.

TABLE 7-XXVI

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

POSITION COORDINATES IN
 APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	X (METERS)	Y (METERS)	Z (METERS)
165.000	6441259.	1774	169064.
165.859	6441993.	1774	171342.
170.000	6445459.	1773	182388.
175.000	6449498.	1772	195887.
180.000	6453378.	1770	209562.
185.000	6457099.	1769	223414.
189.559	6460354.	1768	236203.
190.000	6460662.	1768	237446.
194.559	6463775.	1766	250400.
195.000	6464069.	1766	251659.
200.000	6467322.	1765	266056.
205.000	6470422.	1763	280639.
210.000	6473383.	1761	295403.
215.000	6476206.	1760	310350.
220.000	6478891.	1758	325482.
225.000	6481437.	1757	340802.
230.000	6483843.	1755	356312.
235.000	6486109.	1753	372016.
240.000	6488235.	1751	387914.
245.000	6490219.	1750	404011.
250.000	6492061.	1748	420309.
255.000	6493761.	1747	436810.
260.000	6495317.	1746	453518.
265.000	6496728.	1745	470435.
270.000	6497995.	1744	487565.
275.000	6499115.	173	504909.
280.000	6500089.	173	522472.
285.000	6500914.	173	540256.
290.000	6501591.	173	558264.
295.000	6502118.	173	576500.
300.000	6502494.	173	594967.
305.000	6502717.	172	613669.
310.000	6502788.	172	632608.
315.000	6502703.	172	651788.
320.000	6502463.	172	671213.
325.000	6502065.	172	690887.
330.000	6501509.	171	710813.
335.000	6500792.	171	730996.
340.000	6499914.	171	751439.
345.000	6498872.	171	772145.

TABLE 7-XXVI

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
350.000	6497665.	17096.	793121.
355.000	6496291.	17074.	814368.
360.000	6494749.	17051.	835893.
365.000	6493037.	17028.	857700.
370.000	6491151.	17005.	879793.
375.000	6489092.	16982.	902176.
380.000	6486856.	16958.	924855.
385.000	6484441.	16934.	947836.
390.000	6481846.	16910.	971122.
395.000	6479067.	16885.	994719.
400.000	6476102.	16860.	1018634.
405.000	6472949.	16835.	1042870.
410.000	6469605.	16809.	1067436.
415.000	6466068.	16783.	1092335.
420.000	6462334.	16757.	1117576.
425.000	6458400.	16730.	1143163.
430.000	6454265.	16703.	1169104.
435.000	6449923.	16676.	1195406.
437.627	6447559.	16661.	1209375.
440.000	6445373.	16648.	1222068.
445.000	6440608.	16620.	1249039.
450.000	6435625.	16591.	1276314.
455.000	6430420.	16563.	1303899.
460.000	6424992.	16534.	1331797.
465.000	6419337.	16504.	1360016.
470.000	6413450.	16474.	1388559.
475.000	6407330.	16444.	1417433.
480.000	6400973.	16414.	1446644.
485.000	6394374.	16383.	1476198.
490.000	6387530.	16352.	1506101.
495.000	6380438.	16320.	1536359.
500.000	6373092.	16288.	1566980.
505.000	6365490.	16256.	1597970.
510.000	6357627.	16223.	1629337.
515.000	6349497.	16190.	1661089.
520.000	6341098.	16157.	1693234.
525.000	6332423.	16123.	1725780.
530.000	6323468.	16089.	1758735.
535.000	6314227.	16055.	1792110.
537.424	6309642.	16038.	1808446.

TABLE 7-XXVI

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
537.424	6309642.	16038.	1808446.
537.442	6309609.	16038.	1808565.
540.000	6304705.	16020.	1825849.
543.142	6298600.	15998.	1847065.
545.000	6294948.	15985.	1859606.
545.742	6293479.	15979.	1864622.
549.542	6285876.	15952.	1890321.
550.000	6284950.	15949.	1893419.
555.000	6274706.	15913.	1927322.
560.000	6264212.	15877.	1961315.
565.000	6253468.	15841.	1995399.
570.000	6242473.	15804.	2029572.
575.000	6231226.	15767.	2063834.
580.000	6219724.	15729.	2098186.
585.000	6207967.	15691.	2132627.
590.000	6195955.	15653.	2167157.
595.000	6183684.	15614.	2201775.
600.000	6171156.	15575.	2236483.
605.000	6158367.	15536.	2271278.
610.000	6145318.	15496.	2306162.
615.000	6132007.	15456.	2341134.
620.000	6118433.	15415.	2376194.
625.000	6104595.	15374.	2411342.
630.000	6090492.	15333.	2446577.
635.000	6076123.	15292.	2481901.
640.000	6061486.	15251.	2517312.
645.000	6046580.	15209.	2552810.
650.000	6031406.	15168.	2588397.
655.000	6015960.	15127.	2624071.
655.175	6015414.	15125.	2625324.
655.175	6015414.	15125.	2625324.
660.000	6000272.	15086.	2659748.
670.000	5968261.	15003.	2730822.
680.000	5935408.	14919.	2801511.
690.000	5901717.	14834.	2871805.
700.000	5867193.	14748.	2941695.
710.000	5831842.	14662.	3011171.
720.000	5795667.	14574.	3080222.
730.000	5758674.	14485.	3148840.
739.175	5724016.	14402.	3211409.

TABLE 7-XXVI

VEHICLE POSITION COORDINATES - LI THROUGH
 PARKING ORBIT (90-DEGREES LAUNCH A
 (CONTINUED)

POSITION COORDINATE
 APOLLO STANDARD COORDINATE SO. 13.

TIME FROM LIFTOFF (SEC)	X (METERS)	Y (METERS)	Z (METERS)
740.000	5720868.	14395.	3217014.
750.000	5682255.	14304.	3284735.
760.000	5642840.	14212.	3351992.
770.000	5602628.	14119.	3418778.
780.000	5561626.	14025.	3485081.
790.000	5519839.	13930.	3550893.
800.000	5477273.	13834.	3616204.
900.000	5010136.	12825.	4239789.
1000.000	4472358.	11725.	4803644.
1100.000	3871502.	10541.	5299814.
1200.000	3216025.	9279.	5721293.
1300.000	2515162.	7944.	6062122.
1400.000	1778793.	6543.	6317477.
1500.000	1017304.	5082.	6483743.
1600.000	241442.	3568.	6558562.
1700.000	-537845.	2008.	6540870.
1800.000	-1309554.	411.	6430914.
1900.000	-2062793.	-1217.	6230245.
2000.000	-2786932.	-2864.	5941701.
2100.000	-3471754.	-4522.	5569361.
2200.000	-4107603.	-6178.	5118488.
2300.000	-4685517.	-7822.	4595453.
2400.000	-5197359.	-9441.	4007645.
2500.000	-5635929.	-11020.	3363360.
2600.000	-5995061.	-12547.	2671691.
2700.000	-6269715.	-14005.	1942388.
2800.000	-6456042.	-15380.	1185729.
2900.000	-6551438.	-16655.	412371.
3000.000	-6554578.	-17813.	-366799.
3100.000	-6465436.	-18840.	-1140817.
3200.000	-6285281.	-19718.	-1898797.
3300.000	-6016661.	-20432.	-2630079.
3400.000	-5663366.	-20968.	-3324381.
3500.000	-5230376.	-21310.	-3971944.
3600.000	-4723789.	-21447.	-4563666.
3700.000	-4150736.	-21367.	-5091229.
3800.000	-3519285.	-21060.	-5547221.
3900.000	-2838320.	-20521.	-5925236.
4000.000	-2117426.	-19744.	-6219967.
4100.000	-1366746.	-18726.	-6427278.

TABLE 7-XXVI

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

POSITION COORDINATES IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	X (METERS)	Y (METERS)	Z (METERS)
4200.000	-596839.	-17469.	-6544266.
4300.000	181465.	-15977.	-6569299.
4400.000	957224.	-14256.	-6502040.
4500.000	1719532.	-12317.	-6343449.
4600.000	2457681.	-10174.	-6095771.
4700.000	3161302.	-7842.	-5762502.
4800.000	3820519.	-5343.	-5348338.
4900.000	4426084.	-2699.	-4859109.
5000.000	4969502.	63.	-4301694.
5100.000	5443157.	2913.	-3683925.
5200.000	5840410.	5821.	-3014477.
5300.000	6155692.	8752.	-2302745.
5400.000	6384587.	11672.	-1558712.
5500.000	6523881.	14543.	-792815.
5600.000	6571618.	17326.	-15794.
5700.000	6527118.	19985.	761455.
5800.000	6390993.	22481.	1528027.
5900.000	6165138.	24776.	2273167.
6000.000	5852702.	26834.	2986412.
6100.000	5458053.	28620.	3657742.
6200.000	4986709.	30102.	4277719.
6300.000	4445271.	31251.	4837618.
6400.000	3841330.	32040.	5329554.
6500.000	3183360.	32447.	5746591.
6600.000	2480601.	32455.	6082845.
6700.000	1742930.	32050.	6333567.
6800.000	980721.	31226.	6495211.
6900.000	204701.	29979.	6565489.
7000.000	-574207.	28314.	6543401.
7100.000	-1345038.	26239.	6429252.
7200.000	-2096939.	23770.	6224648.
7300.000	-2819326.	20927.	5932474.
7400.000	-3502034.	17739.	5556848.
7500.000	-4135460.	14238.	5103067.
7600.000	-4710702.	10461.	4577527.
7700.000	-5219681.	6451.	3987632.
7800.000	-5655256.	2256.	3341691.
7900.000	-6011322.	-2073.	2648792.
8000.000	-6282895.	-6482.	1918683.
8100.000	-6466182.	-10913.	1161624.

TABLE 7-XXVI

VEHICLE POSITION COORDINATES - LFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

POSITION COORDINATES IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	X (METERS)	Y (METERS)	Z (METERS)
8200.000	-6558629.	-15307.	388250.
8300.000	-6558960.	-19605.	-390578.
8400.000	-6467189.	-23746.	-1163932.
8500.000	-6284620.	-27669.	-1920962.
8600.000	-6013832.	-31317.	-2651052.
8700.000	-5658635.	-34633.	-3343964.
8800.000	-5224024.	-37564.	-3989986.
8900.000	-4716106.	-40062.	-4580062.
9000.000	-4142012.	-42081.	-5105924.
9100.000	-3509803.	-43584.	-5560203.
9200.000	-2828353.	-44537.	-5936537.
9300.000	-2107224.	-44915.	-6229657.
9400.000	-1356536.	-44700.	-6435462.
9500.000	-586819.	-43881.	-6551079.
9600.000	191131.	-42457.	-6574898.
9700.000	966405.	-40432.	-6506601.
9800.000	1728136.	-37822.	-6347158.
9900.000	2465651.	-34649.	-6098820.
10000.000	3168620.	-30946.	-5765081.
10100.000	3827202.	-26751.	-5350629.
10200.000	4432180.	-22112.	-4861280.
10300.000	4975091.	-17083.	-4303897.
10400.000	5448343.	-11725.	-3686287.
10500.000	5845318.	-6104.	-3017099.
10600.000	6160465.	-293.	-2305698.
10700.000	6389375.	5633.	-1562038.
10800.000	6528842.	11595.	-796521.
10900.000	6576908.	17512.	-19856.
11000.000	6532888.	23301.	757093.
11100.000	6397383.	28881.	1523452.
11200.000	6172270.	34171.	2268493.
11300.000	5860679.	39093.	2981779.
11400.000	5466952.	43571.	3653310.
11500.000	4996581.	47536.	4273667.
11600.000	4456137.	50923.	4834137.
11700.000	3853177.	53675.	5326843.
11800.000	3196142.	55743.	5744855.
11900.000	2494239.	57084.	6082286.
2000.000	1757310.	57668.	6334378.
2100.000	995696.	57473.	6497576.

TABLE 7-XXVI

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
12200.000	220091.	56487.	6569572.
12300.000	-558611.	54711.	6549345.
12400.000	-1329472.	52155.	6437173.
12500.000	-2081661.	48841.	6234631.
12600.000	-2804614.	44803.	5944568.
12700.000	-3488180.	40084.	5571066.
12800.000	-4122766.	34738.	5119380.
12900.000	-4699473.	28829.	4595863.
13000.000	-5210220.	22430.	4007877.
13100.000	-5647857.	15622.	3363683.
13200.000	-6006266.	8493.	2672330.
13300.000	-6280443.	1136.	1943518.
13400.000	-6466567.	-6351.	1187471.
13500.000	-6562053.	-13864.	414785.
13600.000	-6565586.	-21301.	-363715.
13700.000	-6477137.	-28558.	-1137129.
13800.000	-6297963.	-35530.	-1894632.
13900.000	-6030589.	-42117.	-2625625.
14000.000	-5678774.	-48222.	-3319885.
14100.000	-5247452.	-53753.	-3967702.
14200.000	-4742671.	-58625.	-4560019.
14300.000	-4171504.	-62759.	-5088557.
14400.000	-3541951.	-66088.	-5545929.
14500.000	-2862828.	-68555.	-5925745.
14600.000	-2143642.	-70112.	-6222701.
14700.000	-1394461.	-70724.	-6432655.
14800.000	-625768.	-70370.	-6552681.
14900.000	151680.	-69041.	-6581114.
15000.000	927010.	-66742.	-6517570.
15100.000	1689381.	-63491.	-6362952.
15200.000	2428135.	-59321.	-6119436.
15300.000	3132952.	-54276.	-5790439.
15400.000	3793986.	-48416.	-5380573.
15500.000	4402010.	-41809.	-4895572.
15600.000	4948537.	-34538.	-4342222.
15700.000	5425940.	-26696.	-3728253.
15800.000	5827558.	-18383.	-3062242.
15900.000	6147787.	-9708.	-2353487.
16000.000	6382155.	-787.	-1611881.
16100.000	6527384.	8259.	-847771.

TABLE 7-XXVI

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
16200.000	6581439.	17306.	-71823.
16300.000	6543550.	26229.	705133.
16400.000	6414228.	34903.	1472249.
16500.000	6195257.	43202.	2218808.
16550.000	6053054.	47174.	2581102.

TABLE 7-XXVII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
0.000	0.00	-0.00	408.64
5.000	10.27	-0.07	408.63
10.000	22.01	-0.14	408.61
12.000	27.14	-0.17	408.59
15.000	35.31	-0.21	408.57
20.000	50.30	-0.29	409.05
25.000	67.17	-0.36	410.46
30.000	86.11	-0.43	413.29
35.000	107.15	-0.50	418.20
40.000	130.36	-0.57	425.85
45.000	155.70	-0.64	437.07
50.000	183.05	-0.72	452.62
55.000	212.13	-0.79	473.19
60.000	242.57	-0.86	499.38
65.000	273.80	-0.94	531.63
70.000	305.15	-1.01	570.02
75.000	336.68	-1.09	614.94
80.000	369.12	-1.18	667.16
82.250	384.03	-1.23	693.16
85.000	402.47	-1.29	727.12
90.000	436.55	-1.39	795.13
95.000	471.11	-1.49	871.42
100.000	505.86	-1.58	956.26
105.000	540.29	-1.67	1050.02
110.000	574.04	-1.77	1153.01
115.000	608.07	-1.85	1264.67
120.000	642.61	-1.94	1385.28
125.000	677.54	-2.01	1515.53
130.000	713.01	-2.09	1656.10
135.000	749.31	-2.16	1807.81
140.000	786.82	-2.23	1971.70
145.000	825.98	-2.30	2149.09
147.329	844.94	-2.33	2236.78
150.000	857.28	-2.37	2319.62
155.000	881.25	-2.44	2483.28
159.329	904.35	-2.50	2634.38
159.329	904.35	-2.50	2634.38
159.459	903.10	-2.50	2634.34
160.000	898.29	-2.51	2635.13
163.759	864.89	-2.56	2640.57

TABLE 7-XXVII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
 PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
165.000	856.42	-2.58	2648.10
165.859	850.55	-2.59	2653.32
170.000	823.88	-2.65	2682.21
175.000	791.83	-2.72	2717.35
180.000	760.00	-2.79	2752.75
185.000	728.38	-2.86	2788.43
189.559	699.74	-2.92	2821.19
190.000	696.99	-2.92	2824.39
194.559	668.65	-2.99	2857.66
195.000	665.94	-2.99	2860.91
200.000	635.21	-3.06	2897.94
205.000	605.66	-3.10	2934.82
210.000	578.48	-3.14	2970.97
215.000	550.80	-3.17	3007.82
220.000	523.08	-3.21	3045.13
225.000	495.25	-3.25	3082.94
230.000	467.29	-3.29	3121.26
235.000	439.21	-3.33	3160.10
240.000	411.00	-3.37	3199.47
245.000	382.66	-3.41	3239.38
250.000	354.18	-3.45	3279.83
255.000	325.55	-3.49	3320.83
260.000	296.77	-3.53	3362.40
265.000	267.83	-3.58	3404.55
270.000	238.72	-3.62	3447.28
275.000	209.43	-3.67	3490.61
280.000	179.95	-3.71	3534.56
285.000	150.28	-3.76	3579.13
290.000	120.40	-3.81	3624.34
295.000	90.30	-3.85	3670.20
300.000	59.99	-3.90	3716.72
305.000	29.43	-3.95	3763.93
310.000	-1.37	-4.00	3811.83
315.000	-32.43	-4.05	3860.45
320.000	-63.76	-4.10	3909.79
325.000	-95.36	-4.16	3959.88
330.000	-127.26	-4.21	4010.73
335.000	-159.45	-4.26	4062.37
340.000	-191.97	-4.32	4114.81
345.000	-224.81	-4.37	4168.07

TABLE 7-XXVII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
350.000	-257.99	-4.43	4222.17
355.000	-291.52	-4.49	4277.13
360.000	-325.42	-4.54	4332.99
365.000	-359.71	-4.60	4389.75
370.000	-394.39	-4.66	4447.46
375.000	-429.48	-4.72	4506.12
380.000	-465.00	-4.78	4565.78
385.000	-500.96	-4.85	4626.46
390.000	-537.39	-4.91	4688.19
395.000	-574.29	-4.97	4751.00
400.000	-611.68	-5.04	4814.93
405.000	-649.60	-5.10	4880.01
410.000	-688.04	-5.17	4946.28
415.000	-727.04	-5.23	5013.78
420.000	-766.62	-5.30	5082.55
425.000	-806.79	-5.37	5152.64
430.000	-847.59	-5.44	5224.10
435.000	-889.03	-5.51	5296.96
437.627	-911.07	-5.54	5335.84
440.000	-931.42	-5.58	5364.14
445.000	-974.73	-5.64	5424.48
450.000	-1018.63	-5.71	5485.80
455.000	-1063.14	-5.78	5548.14
460.000	-1108.28	-5.85	5611.52
465.000	-1154.06	-5.92	5675.99
470.000	-1200.52	-6.00	5741.57
475.000	-1247.67	-6.07	5808.30
480.000	-1295.53	-6.14	5876.24
485.000	-1344.13	-6.21	5945.42
490.000	-1393.49	-6.28	6015.88
495.000	-1443.64	-6.35	6087.69
500.000	-1494.61	-6.42	6160.88
505.000	-1546.43	-6.49	6235.52
510.000	-1599.12	-6.56	6311.67
515.000	-1652.73	-6.64	6389.38
520.000	-1707.28	-6.71	6468.74
525.000	-1762.82	-6.78	6549.81
530.000	-1819.40	-6.85	6632.67
535.000	-1877.05	-6.93	6717.41
537.424	-1905.42	-6.96	6759.20

TABLE 7-XXVII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
 PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
537.424	-1905.42	-6.96	6759.20
537.442	-1905.57	-6.97	6759.15
540.000	-1928.60	-6.99	6754.45
543.142	-1956.88	-7.03	6748.59
545.000	-1974.88	-7.05	6754.03
545.742	-1982.10	-7.06	6756.20
549.542	-2019.68	-7.11	6769.94
550.000	-2024.21	-7.12	6771.60
555.000	-2073.81	-7.19	6789.66
560.000	-2123.68	-7.26	6807.68
565.000	-2173.81	-7.33	6825.65
570.000	-2224.22	-7.41	6843.57
575.000	-2274.89	-7.48	6861.44
580.000	-2325.78	-7.56	6879.28
585.000	-2376.91	-7.63	6897.08
590.000	-2428.27	-7.71	6914.84
595.000	-2479.85	-7.78	6932.57
600.000	-2531.67	-7.85	6950.27
605.000	-2583.70	-7.92	6967.94
610.000	-2635.97	-7.99	6985.58
615.000	-2688.45	-8.06	7003.19
620.000	-2741.16	-8.12	7020.78
625.000	-2794.09	-8.18	7038.35
630.000	-2847.24	-8.22	7055.90
635.000	-2900.60	-8.26	7073.44
640.000	-2954.18	-8.29	7090.98
645.000	-3007.95	-8.30	7108.51
650.000	-3062.03	-8.23	7126.00
655.000	-3116.04	-8.18	7143.59
655.175	-3117.93	-8.18	7144.21
655.175	-3117.93	-8.18	7144.21
660.000	-3158.83	-8.23	7126.26
670.000	-3243.28	-8.33	7088.30
680.000	-3327.28	-8.44	7049.34
690.000	-3410.81	-8.54	7009.38
700.000	-3493.86	-8.64	6968.44
710.000	-3576.42	-8.74	6926.51
720.000	-3658.47	-8.84	6883.60
730.000	-3740.02	-8.94	6839.74
739.175	-3814.39	-9.03	6798.65

TABLE 7-XXVII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
 PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
740.000	-3821.05	-9.04	6794.91
750.000	-3901.51	-9.14	6749.08
760.000	-3981.43	-9.24	6702.30
770.000	-4060.78	-9.34	6654.58
780.000	-4139.56	-9.44	6605.91
790.000	-4217.76	-9.53	6556.31
800.000	-4295.37	-9.63	6505.79
900.000	-5036.40	-10.56	5951.21
1000.000	-5706.54	-11.43	5312.62
1100.000	-6296.45	-12.24	4599.09
1200.000	-6797.68	-12.99	3820.55
1300.000	-7203.10	-13.69	2987.97
1400.000	-7506.95	-14.32	2113.10
1500.000	-7704.89	-14.89	1208.28
1600.000	-7794.09	-15.38	286.32
1700.000	-7773.28	-15.80	-639.74
1800.000	-7642.73	-16.14	-1556.79
1900.000	-7404.31	-16.39	-2451.84
2000.000	-7061.41	-16.54	-3312.23
2100.000	-6618.91	-16.59	-4125.79
2200.000	-6083.10	-16.52	-4881.04
2300.000	-5461.60	-16.33	-5567.33
2400.000	-4763.23	-16.01	-6175.00
2500.000	-3997.87	-15.56	-6695.52
2600.000	-3176.36	-14.95	-7121.60
2700.000	-2310.30	-14.19	-7447.30
2800.000	-1411.90	-13.27	-7668.09
2900.000	-493.81	-12.20	-7780.90
3000.000	431.05	-10.95	-7784.20
3100.000	1349.68	-9.55	-7678.00
3200.000	2249.17	-7.99	-7463.81
3300.000	3116.90	-6.27	-7144.67
3400.000	3940.68	-4.41	-6725.09
3500.000	4708.94	-2.41	-6210.98
3600.000	5410.90	-0.30	-5609.57
3700.000	6036.69	1.92	-4929.32
3800.000	6577.52	4.22	-4179.82
3900.000	7025.78	6.58	-3371.62
4000.000	7375.17	8.97	-2516.09
4100.000	7620.81	11.37	-1625.29

TABLE 7-XXVII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
4200.000	7759.25	13.75	-711.75
4300.000	7788.57	16.08	211.65
4400.000	7708.40	18.32	1131.93
4500.000	7519.90	20.44	2036.14
4600.000	7225.77	22.41	2911.58
4700.000	6830.18	24.19	3745.96
4800.000	6338.74	25.76	4527.59
4900.000	5758.38	27.07	5245.52
5000.000	5097.28	28.11	5889.71
5100.000	4364.74	28.85	6451.19
5200.000	3571.02	29.25	6922.10
5300.000	2727.26	29.32	7295.89
5400.000	1845.26	29.01	7567.34
5500.000	937.36	28.34	7732.67
5600.000	16.24	27.28	7789.57
5700.000	-905.21	25.84	7737.21
5800.000	-1814.12	24.02	7576.29
5900.000	-2697.74	21.82	7309.04
6000.000	-3543.69	19.28	6939.14
6100.000	-4340.10	16.39	6471.71
6200.000	-5075.76	13.20	5913.26
6300.000	-5740.32	9.73	5271.56
6400.000	-6324.36	6.01	4555.58
6500.000	-6819.62	2.10	3775.34
6600.000	-7219.08	-1.97	2941.81
6700.000	-7517.03	-6.14	2066.71
6800.000	-7709.23	-10.36	1162.36
6900.000	-7792.94	-14.57	241.53
7000.000	-7766.93	-18.72	-682.78
7100.000	-7631.58	-22.75	-1597.51
7200.000	-7388.78	-26.60	-2489.74
7300.000	-7041.99	-30.20	-3346.87
7400.000	-6596.13	-33.51	-4156.81
7500.000	-6057.53	-36.46	-4908.14
7600.000	-5433.82	-39.01	-5590.30
7700.000	-4733.84	-41.11	-6193.72
7800.000	-3967.47	-42.71	-6709.94
7900.000	-3145.53	-43.78	-7131.76
8000.000	-2279.60	-44.30	-7453.31
8100.000	-1381.87	-44.23	-7670.12

TABLE 7-XXVII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
8200.000	-464.95	-43.56	-7779.22
8300.000	458.31	-42.29	-7779.11
8400.000	1374.94	-40.42	-7669.86
8500.000	2272.12	-37.95	-7453.03
8600.000	3137.29	-34.91	-7131.68
8700.000	3958.31	-31.32	-6710.35
8800.000	4723.71	-27.22	-6194.97
8900.000	5422.76	-22.65	-5592.76
9000.000	6045.66	-17.67	-4912.18
9100.000	6583.71	-12.33	-4162.79
9200.000	7029.34	-6.69	-3355.10
9300.000	7376.34	-0.84	-2500.45
9400.000	7619.85	5.16	-1610.85
9500.000	7756.47	11.22	-698.79
9600.000	7784.31	17.27	222.94
9700.000	7703.03	23.21	1141.39
9800.000	7513.78	28.96	2043.70
9900.000	7219.28	34.44	2917.22
10000.000	6823.68	39.56	3749.73
10100.000	6332.57	44.25	4529.60
10200.000	5752.86	48.44	5245.92
10300.000	5092.69	52.04	5888.72
10400.000	4361.30	55.01	6449.04
10500.000	3568.93	57.28	6919.09
10600.000	2726.65	58.82	7292.31
10700.000	1846.20	59.57	7563.53
10800.000	939.87	59.53	7728.94
10900.000	20.30	58.67	7786.24
11000.000	-899.70	56.98	7734.59
11100.000	-1807.27	54.48	7574.69
11200.000	-2689.76	51.18	7308.71
11300.000	-3534.80	47.12	6940.32
11400.000	-4330.57	42.33	6474.59
11500.000	-5065.88	36.86	5917.99
11600.000	-5730.39	30.79	5278.26
11700.000	-6314.72	24.17	4564.30
11800.000	-6810.61	17.11	3786.11
11900.000	-7211.03	9.67	2954.56
12000.000	-7510.29	1.97	2081.35
12100.000	-7704.13	-5.90	1178.75

TABLE 7-XXVII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

VELOCITY COMPONENTS IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
12200.000	-7789.78	-13.82	259.47
12300.000	-7766.01	-21.69	-663.54
12400.000	-7633.13	-29.40	-1577.26
12500.000	-7393.02	-36.83	-2468.81
12600.000	-7049.09	-43.87	-3325.63
12700.000	-6606.21	-50.42	-4135.65
12800.000	-6070.65	-56.39	-4887.48
12900.000	-5450.00	-61.67	-5570.57
13000.000	-4753.01	-66.18	-6175.36
13100.000	-3989.53	-69.84	-6693.40
13200.000	-3170.30	-72.59	-7117.48
13300.000	-2306.86	-74.38	-7441.69
13400.000	-1411.31	-75.17	-7661.57
13500.000	-496.22	-74.93	-7774.09
13600.000	425.61	-73.64	-7777.73
13700.000	1341.28	-71.32	-7672.49
13800.000	2237.99	-67.96	-7459.88
13900.000	3103.21	-63.62	-7142.92
14000.000	3924.86	-58.33	-6726.06
14100.000	4691.48	-52.15	-6215.16
14200.000	5392.33	-45.15	-5617.37
14300.000	6017.65	-37.42	-4941.06
14400.000	6558.70	-29.07	-4195.71
14500.000	7007.90	-20.18	-3391.76
14600.000	7359.01	-10.89	-2540.46
14700.000	7607.12	-1.32	-1653.73
14800.000	7748.78	8.41	-744.01
14900.000	7782.04	18.16	175.99
15000.000	7706.47	27.79	1093.38
15100.000	7523.15	37.17	1995.35
15200.000	7234.71	46.16	2869.27
15300.000	6845.20	54.63	3702.96
15400.000	6360.10	62.46	4484.80
15500.000	5786.22	69.53	5203.89
15600.000	5131.59	75.73	5850.23
15700.000	4405.36	80.95	6414.83
15800.000	3617.66	85.13	6889.87
15900.000	2779.46	88.18	7268.72
16000.000	1902.43	90.04	7546.14
16100.000	998.77	90.68	7718.25

TABLE 7-XXVII

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (90-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
16200.000	81.04	90.06	7782.64
16300.000	-837.98	88.19	7738.38
16400.000	-1745.49	85.07	7586.05
16500.000	-2628.85	80.72	7327.71
16550.000	-3057.61	78.11	7159.84

TABLE 7-XXVIII WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
0.000	6.401386E 06	7.662082E 06	49.3	0.000
5.000	6.257192E 06	7.669934E 06	75.1	0.000
10.000	6.112940E 06	7.684720E 06	156.1	0.000
12.000	6.055222E 06	7.692852E 06	205.8	0.000
15.000	5.968626E 06	7.707578E 06	300.4	0.000
20.000	5.824245E 06	7.739413E 06	515.9	0.000
25.000	5.679789E 06	7.780933E 06	811.8	0.002
30.000	5.535251E 06	7.832038E 06	1197.7	0.010
35.000	5.390626E 06	7.892958E 06	1684.3	0.028
40.000	5.245907E 06	7.963243E 06	2282.3	0.062
45.000	5.101088E 06	8.041959E 06	3002.3	0.122
50.000	4.956165E 06	8.127614E 06	3855.3	0.216
55.000	4.811133E 06	8.218253E 06	4850.6	0.359
60.000	4.665990E 06	8.317222E 06	5996.0	0.564
65.000	4.520741E 06	8.403751E 06	7297.6	0.848
70.000	4.375261E 06	8.493336E 06	8757.7	1.392
75.000	4.229469E 06	8.580852E 06	10377.0	1.780
80.000	4.083509E 06	8.663613E 06	12158.6	2.374
82.250	4.017766E 06	8.697950E 06	13014.8	2.720
85.000	3.937360E 06	8.737259E 06	14108.3	3.168
90.000	3.791011E 06	8.800104E 06	16230.6	4.090
95.000	3.644778E 06	8.851229E 06	18529.7	5.208
100.000	3.498333E 06	8.891845E 06	21008.0	6.515
105.000	3.351667E 06	8.924542E 06	23666.9	8.105
110.000	3.204774E 06	8.951728E 06	26504.6	9.940
115.000	3.057642E 06	8.975313E 06	29522.0	12.068
120.000	2.910257E 06	8.996659E 06	32723.0	14.495
125.000	2.762603E 06	9.016757E 06	36112.6	17.257
130.000	2.614659E 06	9.036326E 06	39695.7	20.378
135.000	2.466400E 06	9.055849E 06	43478.8	23.883
140.000	2.317799E 06	9.075575E 06	47471.0	27.808
145.000	2.168822E 06	9.095536E 06	51684.0	32.171
147.329	2.099290E 06	7.283889E 06	53725.8	34.368
150.000	2.035959E 06	7.238603E 06	56118.9	37.010
155.000	1.917221E 06	7.253477E 06	60717.7	42.272
159.329	1.814177E 06	7.266754E 06	64834.4	47.184
159.329	1.459482E 06	0.000000E-39	64834.4	47.184
159.459	1.459482E 06	2.742798E 05	64959.6	47.337
160.000	1.458931E 06	2.742828E 05	65480.8	47.974
163.759	1.455103E 06	1.024098E 06	69039.9	52.393

TABLE 7-XXVIII WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
165.000	1.452107E 06	1.024102E 06	70192.0	53.851
165.859	1.450031E 06	1.163632E 06	70985.1	54.870
170.000	1.438698E 06	1.163640E 06	74751.2	59.794
175.000	1.425012E 06	1.163645E 06	79181.9	65.821
180.000	1.411327E 06	1.163647E 06	83486.2	71.932
185.000	1.397642E 06	1.163648E 06	87666.3	78.136
189.559	1.375262E 06	1.163648E 06	91372.0	83.867
190.000	1.374056E 06	1.163649E 06	91724.7	84.426
194.559	1.352926E 06	1.163649E 06	95321.4	90.241
195.000	1.351721E 06	1.163649E 06	95663.5	90.806
200.000	1.338035E 06	1.163613E 06	99486.3	97.278
205.000	1.324350E 06	1.163607E 06	103195.8	103.843
210.000	1.310665E 06	1.163649E 06	106806.2	110.499
215.000	1.296979E 06	1.163649E 06	110320.7	117.246
220.000	1.283294E 06	1.163649E 06	113739.6	124.088
225.000	1.269608E 06	1.163649E 06	117064.2	131.023
230.000	1.255923E 06	1.163649E 06	120295.0	138.056
235.000	1.242238E 06	1.163649E 06	123433.1	145.186
240.000	1.228552E 06	1.163649E 06	126479.2	152.417
245.000	1.214867E 06	1.163649E 06	129434.6	159.748
250.000	1.201181E 06	1.163649E 06	132299.8	167.183
255.000	1.187496E 06	1.163649E 06	135076.1	174.721
260.000	1.173811E 06	1.163649E 06	137764.4	182.367
265.000	1.160125E 06	1.163649E 06	140365.8	190.122
270.000	1.146440E 06	1.163649E 06	142881.2	197.986
275.000	1.132754E 06	1.163649E 06	145311.8	205.963
280.000	1.119069E 06	1.163649E 06	147658.4	214.054
285.000	1.105384E 06	1.163649E 06	149922.0	222.261
290.000	1.091698E 06	1.163649E 06	152104.5	230.586
295.000	1.078013E 06	1.163649E 06	154206.1	239.031
300.000	1.064327E 06	1.163649E 06	156228.2	247.598
305.000	1.050642E 06	1.163649E 06	158172.5	256.290
310.000	1.036957E 06	1.163649E 06	160039.4	265.107
315.000	1.023271E 06	1.163649E 06	161830.7	274.053
320.000	1.009586E 06	1.163649E 06	163547.5	283.130
325.000	9.959004E 05	1.163649E 06	165191.0	292.341
330.000	9.822150E 05	1.163649E 06	166762.5	301.687
335.000	9.685296E 05	1.163649E 06	168263.5	311.172
340.000	9.548442E 05	1.163649E 06	169695.2	320.797
345.000	9.411588E 05	1.163649E 06	171059.5	330.565

TABLE 7-XXVIII WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
350.000	9.274734E 05	1.163649E 06	172357.1	340.479
355.000	9.137880E 05	1.163649E 06	173590.3	350.542
360.000	9.001026E 05	1.163649E 06	174760.1	360.755
365.000	8.864172E 05	1.163649E 06	175868.3	371.123
370.000	8.727318E 05	1.163649E 06	176916.6	381.647
375.000	8.590464E 05	1.163649E 06	177906.5	392.332
380.000	8.453610E 05	1.163649E 06	178840.4	403.179
385.000	8.316756E 05	1.163649E 06	179719.5	414.193
390.000	8.179902E 05	1.163649E 06	180546.0	425.376
395.000	8.043048E 05	1.163649E 06	181321.8	436.732
400.000	7.906194E 05	1.163649E 06	182049.1	448.263
405.000	7.769340E 05	1.163649E 06	182729.9	459.975
410.000	7.632486E 05	1.163649E 06	183366.3	471.870
415.000	7.495632E 05	1.163649E 06	183961.0	483.951
420.000	7.358778E 05	1.163649E 06	184516.1	496.224
425.000	7.221924E 05	1.163649E 06	185034.3	508.692
430.000	7.085070E 05	1.163649E 06	185518.0	521.358
435.000	6.948217E 05	1.163649E 06	185970.3	534.228
437.627	6.876303E 05	9.536950E 05	186196.3	541.073
440.000	6.823523E 05	9.536950E 05	186391.8	547.301
445.000	6.712296E 05	9.536950E 05	186772.6	560.553
450.000	6.601069E 05	9.536950E 05	187112.7	573.981
455.000	6.489841E 05	9.536949E 05	187414.5	587.589
460.000	6.378614E 05	9.536950E 05	187680.3	601.380
465.000	6.267387E 05	9.536950E 05	187912.7	615.358
470.000	6.156160E 05	9.536949E 05	188114.3	629.527
475.000	6.044932E 05	9.536950E 05	188288.1	643.891
480.000	5.933705E 05	9.536950E 05	188436.6	658.452
485.000	5.822478E 05	9.536950E 05	188563.1	673.216
490.000	5.711251E 05	9.536950E 05	188670.8	688.186
495.000	5.600024E 05	9.536950E 05	188763.1	703.367
500.000	5.488796E 05	9.536949E 05	188842.9	718.763
505.000	5.377569E 05	9.536950E 05	188914.6	734.379
510.000	5.266342E 05	9.536950E 05	188981.3	750.219
515.000	5.155115E 05	9.536950E 05	189047.5	766.288
520.000	5.043888E 05	9.536950E 05	189116.9	782.592
525.000	4.932661E 05	9.536950E 05	189194.2	799.135
530.000	4.821434E 05	9.536950E 05	189283.8	815.923
535.000	4.710206E 05	9.536950E 05	189390.5	832.962
537.424	4.656272E 05	9.536950E 05	189449.9	841.317

TABLE 7-XXVIII WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
537.424	3.635400E 05	0.000000E-39	189449.9	841.317
540.000	3.632896E 05	2.711470E 04	189510.4	850.224
543.142	3.629819E 05	2.069960E 05	189569.1	861.097
545.000	3.620828E 05	2.069960E 05	189597.4	867.530
545.742	3.617234E 05	2.333470E 05	189607.7	870.104
549.542	3.595114E 05	2.333470E 05	189653.3	883.305
550.000	3.592603E 05	2.333470E 05	189657.8	884.898
555.000	3.565169E 05	2.333470E 05	189697.2	902.348
560.000	3.537720E 05	2.333470E 05	189716.9	919.882
565.000	3.510260E 05	2.333470E 05	189718.2	937.499
570.000	3.482801E 05	2.333470E 05	189702.4	955.201
575.000	3.455341E 05	2.333470E 05	189670.8	972.989
580.000	3.427882E 05	2.333470E 05	189624.9	990.863
585.000	3.400422E 05	2.333470E 05	189566.3	1008.824
590.000	3.372962E 05	2.333470E 05	189496.7	1026.873
595.000	3.345522E 05	2.333470E 05	189417.8	1045.010
600.000	3.318087E 05	2.333470E 05	189331.1	1063.237
605.000	3.290653E 05	2.333470E 05	189238.5	1081.555
610.000	3.263218E 05	2.333470E 05	189141.9	1099.963
615.000	3.235783E 05	2.333470E 05	189043.0	1118.463
620.000	3.208349E 05	2.333470E 05	188943.9	1137.056
625.000	3.180914E 05	2.333470E 05	188846.4	1155.742
630.000	3.153480E 05	2.333470E 05	188752.8	1174.523
635.000	3.126045E 05	2.333470E 05	188664.9	1193.398
640.000	3.098610E 05	2.333470E 05	188585.0	1212.369
645.000	3.071176E 05	2.333470E 05	188515.3	1231.437
650.000	3.043741E 05	2.333470E 05	188458.1	1250.602
655.000	3.016306E 05	2.333470E 05	188415.5	1269.866
655.832	3.011744E 05	2.333470E 05	188410.1	1273.079
655.832	3.011744E 05	1.400000E 02	188410.1	1273.079
660.000	3.011673E 05	1.400000E 02	188384.6	1289.194
670.000	3.011504E 05	1.400000E 02	188322.9	1327.853
680.000	3.011335E 05	1.400000E 02	188260.7	1366.513
690.000	3.011166E 05	1.400000E 02	188197.9	1405.173
700.000	3.010997E 05	1.400000E 02	188134.6	1443.833
710.000	3.010828E 05	1.400000E 02	188070.9	1482.494
720.000	3.010659E 05	1.943739E 02	188006.7	1521.156
730.000	3.010430E 05	1.931385E 02	187942.1	1559.818
739.832	3.010205E 05	5.192403E 01	187878.3	1597.830

TABLE 7-XXVIII WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
740.000	3.010204E 05	5.190322F 01	187877.3	1598.481
750.000	3.010147E 05	5.066789E 01	187812.1	1637.144
760.000	3.010090F 05	4.943256E 01	187746.8	1675.808
770.000	3.010035E 05	4.819723E 01	187681.0	1714.472
780.000	3.009982E 05	4.696190E 01	187615.3	1753.136
790.000	3.009930E 05	4.572657E 01	187549.4	1791.801
800.000	3.009879E 05	4.449124E 01	187483.1	1830.466
900.000	3.009500E 05	8.000000CF 00	186824.7	2217.139
1000.000	3.009314E 05	5.416854E 01	186192.3	2603.847
1100.000	3.008707E 05	5.468009F 01	185616.5	2990.595
1200.000	3.008102F 05	5.384219E 01	185126.4	3377.386
1300.000	3.007509E 05	5.277737F 01	184745.8	3764.219
1400.000	3.006928E 05	5.137520E 01	184492.4	4151.093
1500.000	3.006366E 05	4.967076E 01	184376.8	4538.003
1600.000	3.005822E 05	4.797631E 01	184402.0	4924.946
1700.000	3.005297E 05	4.628187E 01	184564.2	5311.916
1800.000	3.004791E 05	4.465351E 01	184852.2	5698.905
1900.000	3.004302E 05	4.302851E 01	185249.2	6085.904
2000.000	3.003832E 05	4.140351E 01	185733.2	6472.904
2100.000	3.003380E 05	3.977851E 01	186279.1	6859.891
2200.000	3.002946E 05	3.815351E 01	186860.1	7246.849
2300.000	3.002530E 05	3.652851E 01	187448.9	7633.755
2400.000	3.002132E 05	3.490351E 01	188020.1	8020.578
2500.000	3.001751E 05	3.341423F 01	188550.7	8407.273
2600.000	3.001387F 05	3.196979F 01	189022.3	8793.762
2700.000	3.001039E 05	3.052534E 01	189421.8	9179.900
2800.000	3.000706E 05	2.915674E 01	189742.2	9565.373
2900.000	3.000384E 05	2.821230E 01	189982.2	9949.304
3000.000	3.000069E 05	2.726785E 01	190146.9	10327.999
3100.000	2.999759E 05	2.632341E 01	190248.0	10653.313
3200.000	2.999456E 05	2.537896E 01	190301.3	10453.925
3300.000	2.999160E 05	2.443452E 01	190327.0	10080.689
3400.000	2.998869E 05	2.349008E 01	190347.6	9698.050
3500.000	2.998585E 05	2.254563E 01	190387.1	9313.304
3600.000	2.998309F 05	2.195807E 01	190468.6	8927.796
3700.000	2.998044E 05	2.138862E 01	190611.7	8541.957
3800.000	2.997789E 05	2.081918E 01	190833.4	8155.969
3900.000	2.997544E 05	2.024974E 01	191147.1	7769.922
4000.000	2.997310E 05	1.968029E 01	191559.5	7383.870
4100.000	2.997087E 05	1.911085E 01	192071.9	6997.843

TABL

TABLE 7-XXVIII WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME F LIFTO (SEC)	TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
8200.	4200.000	2.996874E 05	1.854140E 01	192678.4	6611.864
8300.	4300.000	2.996670E 05	1.814944E 01	193366.3	6225.951
8400.	4400.000	2.996470E 05	1.781610E 01	194117.3	5840.119
8500.	4500.000	2.996273E 05	1.748277E 01	194907.4	5454.384
8600.	4600.000	2.996081E 05	1.717893E 01	195708.6	5068.761
8700.	4700.000	2.995890E 05	1.704004E 01	196490.2	4683.273
8800.	4800.000	2.995701E 05	1.690115E 01	197221.0	4297.948
8900.	4900.000	2.995514E 05	1.683773E 01	197869.4	3912.827
9000.	5000.000	2.995326E 05	1.697662E 01	198406.9	3527.968
9100.	5100.000	2.995137E 05	1.711551E 01	198808.5	3143.458
9200.	5200.000	2.994946E 05	1.725440E 01	199054.4	2759.440
9300.	5300.000	2.994753E 05	1.739329E 01	199131.5	2376.146
9400.	5400.000	2.994557E 05	1.786262E 01	199033.7	1993.993
9500.	5500.000	2.994356E 05	1.834874E 01	198762.1	1613.792
9600.	5600.000	2.994150E 05	1.883485E 01	198326.2	1237.351
9700.	5700.000	2.993938E 05	1.932096E 01	197742.3	869.583
9800.	5800.000	2.993721E 05	1.980707E 01	197033.0	528.931
9900.	5900.000	2.993498E 05	2.029318E 01	196228.0	319.144
10000.	6000.000	2.993270E 05	2.077925E 01	195361.1	471.660
10100.	6100.000	2.993037E 05	2.119232E 01	194468.4	801.017
10200.	6200.000	2.992799E 05	2.158121E 01	193586.0	1165.917
10300.	6300.000	2.992557E 05	2.197010E 01	192749.4	1541.317
10400.	6400.000	2.992311E 05	2.232107E 01	191991.5	1921.064
10500.	6500.000	2.992062E 05	2.245996E 01	191340.7	2302.993
10600.	6600.000	2.991812E 05	2.259884E 01	190820.8	2686.153
10700.	6700.000	2.991561E 05	2.253113E 01	190447.7	3070.054
10800.	6800.000	2.991311E 05	2.242338E 01	190231.3	3454.414
10900.	6900.000	2.991062E 05	2.228449E 01	190173.0	3839.051
11000.	7000.000	2.990815E 05	2.214560E 01	190267.7	4223.837
11100.	7100.000	2.990569E 05	2.200671E 01	190502.6	4608.671
11200.	7200.000	2.990326E 05	2.168277E 01	190859.5	4993.467
11300.	7300.000	2.990087E 05	2.134944E 01	191315.2	5378.140
11400.	7400.000	2.989851E 05	2.101610E 01	191843.4	5762.603
11500.	7500.000	2.989619E 05	2.068277E 01	192415.9	6146.756
11600.	7600.000	2.989391E 05	2.034944E 01	193004.5	6530.478
11700.	7700.000	2.989166E 05	2.001610E 01	193582.7	6913.614
11800.	7800.000	2.988945E 05	1.968277E 01	194126.7	7295.949
11900.	7900.000	2.988728E 05	1.931812E 01	194617.5	7677.179
12000.	8000.000	2.988515E 05	1.894312E 01	195040.9	8056.842
12100.	8100.000	2.988307E 05	1.856812E 01	195389.5	8434.193

TABLE 7-XXVIII WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
8200.000	2.988102E 05	1.819312E 01	195661.2	8807.940
8300.000	2.987902E 05	1.781812E 01	195860.5	9175.642
8400.000	2.987705E 05	1.744312E 01	195998.0	9532.103
8500.000	2.987513E 05	1.706812E 01	196088.7	9864.510
8600.000	2.987325E 05	1.673143E 01	196151.7	10135.929
8700.000	2.987141E 05	1.642587E 01	196209.1	10247.916
8800.000	2.986960E 05	1.612032E 01	196282.9	10117.214
8900.000	2.986782E 05	1.581476E 01	196395.5	9838.342
9000.000	2.986608E 05	1.550921E 01	196567.1	9503.806
9100.000	2.986437E 05	1.520365E 01	196813.9	9147.215
9200.000	2.986269E 05	1.489810E 01	197148.3	8780.352
9300.000	2.986105E 05	1.466092E 01	197576.1	8408.068
9400.000	2.985943E 05	1.454981E 01	198097.3	8032.672
9500.000	2.985782E 05	1.443870E 01	198705.0	7655.402
9600.000	2.985622E 05	1.432759E 01	199386.3	7276.985
9700.000	2.985462E 05	1.438352E 01	200121.7	6897.887
9800.000	2.985302E 05	1.449463E 01	200887.6	6518.427
9900.000	2.985140E 05	1.460574E 01	201655.8	6138.850
10000.000	2.984977E 05	1.474424E 01	202395.8	5759.356
10100.000	2.984812E 05	1.503591E 01	203076.8	5380.131
10200.000	2.984643E 05	1.532757E 01	203668.4	5001.362
10300.000	2.984471E 05	1.561924E 01	204142.7	4623.261
10400.000	2.984296E 05	1.591091E 01	204475.7	4246.084
10500.000	2.984118E 05	1.620257E 01	204649.4	3870.163
10600.000	2.983936E 05	1.649424E 01	204651.9	3495.952
10700.000	2.983751E 05	1.678591E 01	204478.4	3124.106
10800.000	2.983563E 05	1.714366E 01	204131.5	2755.612
10900.000	2.983370E 05	1.750477E 01	203622.0	2392.042
11000.000	2.983174E 05	1.786589E 01	202967.6	2036.049
11100.000	2.982973E 05	1.822700E 01	202192.5	1692.419
11200.000	2.982769E 05	1.858811E 01	201326.4	1370.469
11300.000	2.982560E 05	1.894922E 01	200402.6	1089.546
11400.000	2.982348E 05	1.931033E 01	199457.8	889.333
11500.000	2.982132E 05	1.952528E 01	198528.4	830.296
11600.000	2.981914E 05	1.969195E 01	197650.2	939.295
11700.000	2.981694E 05	1.985861E 01	196856.1	1170.135
11800.000	2.981473E 05	2.002528E 01	196175.5	1466.214
11900.000	2.981249E 05	2.019195E 01	195630.8	1795.392
12000.000	2.981024E 05	2.035861E 01	195238.9	2142.311
12100.000	2.980797E 05	2.052528E 01	195008.7	2499.432

TABLE 7-XXVIII WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
12200.000	2.980568E 05	2.058468E 01	194942.2	2862.766
12300.000	2.980339E 05	2.055690E 01	195033.2	3230.030
12400.000	2.980111E 05	2.052912E 01	195269.1	3599.818
12500.000	2.979883E 05	2.050134E 01	195631.4	3971.197
12600.000	2.979656E 05	2.020921E 01	196096.9	4343.506
12700.000	2.979433E 05	1.990365E 01	196638.7	4716.237
12800.000	2.979213E 05	1.959810E 01	197228.7	5088.963
12900.000	2.978997E 05	1.929254E 01	197838.4	5461.295
13000.000	2.978784E 05	1.898698E 01	198440.9	5822.840
13100.000	2.978574E 05	1.868143E 01	199012.7	6203.167
13200.000	2.978368E 05	1.837587E 01	199534.2	6571.767
13300.000	2.978166E 05	1.791372E 01	199991.2	6937.994
13400.000	2.977969E 05	1.739983E 01	200375.4	7300.990
13500.000	2.977778E 05	1.688594E 01	200684.9	7659.551
13600.000	2.977593E 05	1.637205E 01	200923.6	8011.911
13700.000	2.977414E 05	1.585816E 01	201101.5	8355.368
13800.000	2.977240E 05	1.534427E 01	201233.1	8685.592
13900.000	2.977072E 05	1.483038E 01	201336.9	8995.365
14000.000	2.976909E 05	1.443909E 01	201433.7	9272.304
14100.000	2.976750E 05	1.414743E 01	201545.4	9495.511
14200.000	2.976594E 05	1.385576E 01	201693.5	9633.963
14300.000	2.976442E 05	1.356409E 01	201897.2	9656.756
14400.000	2.976292E 05	1.327243E 01	202172.2	9557.837
14500.000	2.976146E 05	1.298076E 01	202530.2	9362.437
14600.000	2.976003E 05	1.268909E 01	202976.1	9103.891
14700.000	2.975864E 05	1.249023E 01	203509.6	8806.928
14800.000	2.975725E 05	1.246245E 01	204123.5	8486.599
14900.000	2.975586E 05	1.243468E 01	204804.2	8151.669
15000.000	2.975448E 05	1.240690E 01	205532.6	7807.347
15100.000	2.975310E 05	1.256704E 01	206284.6	7456.855
15200.000	2.975169E 05	1.278926E 01	207032.3	7102.287
15300.000	2.975025E 05	1.301148E 01	207745.5	6745.081
15400.000	2.974880E 05	1.328638E 01	208393.5	6386.782
15500.000	2.974729E 05	1.385582E 01	208946.4	6026.704
15600.000	2.974572E 05	1.442526E 01	209377.0	5667.032
15700.000	2.974409E 05	1.499471E 01	209662.1	5307.894
15800.000	2.974239E 05	1.556415E 01	209783.8	4949.915
15900.000	2.974063E 05	1.613360E 01	209731.3	4593.780
16000.000	2.973881E 05	1.670304E 01	209500.3	4240.287
16100.000	2.973693E 05	1.727249E 01	209094.7	3890.432

TABLE 7-XXVIII WEIGHT, THRUST, ALTITUDE, AND SURFACE
 RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
 PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
16200.000	2.973498E 05	1.774941E 01	208525.6	3545.522
16300.000	2.973298E 05	1.822163F 01	207811.9	3207.336
16400.000	2.973094E 05	1.869385E 01	206978.4	2878.397
16500.000	2.972883E 05	1.908792E 01	206055.2	2562.380
16550.000	2.972777E 05	1.921292E 01	205570.9	2410.840

TABLE 7-XXIX INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(99-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
0.000	408.637	0.00	1.900	9.8181
5.000	408.762	10.40	2.201	9.8181
10.000	409.201	22.27	2.501	9.8178
12.000	409.495	27.45	2.627	9.8177
15.000	410.092	35.70	2.822	9.8174
20.000	412.122	50.82	3.184	9.8167
25.000	415.897	67.85	3.603	9.8158
30.000	422.103	87.01	4.064	9.8146
35.000	431.592	108.48	4.592	9.8131
40.000	445.155	132.52	5.201	9.8113
45.000	463.656	159.42	5.904	9.8090
50.000	487.760	189.50	6.695	9.8064
55.000	517.913	223.07	7.571	9.8034
60.000	554.328	260.39	8.501	9.7998
65.000	596.923	301.62	9.450	9.7958
70.000	645.260	346.70	10.410	9.7913
75.000	699.542	396.38	11.604	9.7864
80.000	760.697	452.17	13.000	9.7809
82.250	790.565	479.46	13.645	9.7783
85.000	829.083	514.74	14.459	9.7749
90.000	904.866	584.52	15.976	9.7684
95.000	988.180	661.81	17.537	9.7614
100.000	1079.174	746.87	19.137	9.7538
105.000	1178.029	839.91	20.835	9.7457
110.000	1284.977	941.21	22.506	9.7371
115.000	1400.056	1051.13	24.198	9.7279
120.000	1523.708	1170.11	26.008	9.7182
125.000	1656.578	1298.71	27.956	9.7079
130.000	1799.419	1437.66	30.063	9.6970
135.000	1953.170	1587.88	32.369	9.6856
140.000	2118.999	1750.51	34.926	9.6736
145.000	2298.348	1926.97	37.795	9.6609
147.329	2386.992	2014.36	31.021	9.6547
150.000	2468.866	2094.80	31.932	9.6475
155.000	2630.825	2254.26	34.265	9.6337
159.329	2781.031	2402.55	36.371	9.6214
159.329	2781.031	2402.55	9.625	9.6214
159.459	2780.596	2402.05	9.023	9.6210
160.000	2779.779	2400.96	9.018	9.6195
163.759	2774.326	2393.63	9.142	9.6088

TABLE 7-XXIX

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
165.000	2778.857	2397.57	9.138	9.6054
165.859	2782.027	2400.34	9.478	9.6030
170.000	2801.573	2418.03	9.507	9.5918
175.000	2826.018	2440.35	9.515	9.5786
180.000	2851.357	2463.69	9.527	9.5659
185.000	2877.576	2488.02	9.539	9.5535
189.559	2902.235	2511.06	9.576	9.5425
190.000	2904.681	2513.35	9.577	9.5415
194.559	2930.381	2537.53	9.614	9.5308
195.000	2932.924	2539.93	9.615	9.5298
200.000	2962.245	2567.70	9.750	9.5186
205.000	2992.141	2596.18	8.979	9.5077
210.000	3022.223	2625.03	9.171	9.4971
215.000	3053.272	2654.89	9.255	9.4868
220.000	3085.146	2685.64	9.344	9.4767
225.000	3117.864	2717.30	9.439	9.4670
230.000	3151.431	2749.86	9.539	9.4576
235.000	3185.850	2783.34	9.638	9.4485
240.000	3221.119	2817.71	9.739	9.4396
245.000	3257.243	2853.00	9.843	9.4310
250.000	3294.224	2889.19	9.949	9.4227
255.000	3332.067	2926.30	10.058	9.4146
260.000	3370.777	2964.31	10.170	9.4069
265.000	3410.360	3003.25	10.284	9.3993
270.000	3450.820	3043.10	10.402	9.3921
275.000	3492.165	3083.87	10.523	9.3851
280.000	3534.403	3125.58	10.647	9.3783
285.000	3577.540	3168.22	10.774	9.3718
290.000	3621.587	3211.81	10.905	9.3655
295.000	3666.552	3256.35	11.039	9.3595
300.000	3712.445	3301.84	11.177	9.3536
305.000	3759.277	3348.30	11.319	9.3481
310.000	3807.060	3395.74	11.464	9.3427
315.000	3855.806	3444.17	11.614	9.3376
320.000	3905.529	3493.60	11.767	9.3327
325.000	3956.242	3544.05	11.925	9.3280
330.000	4007.962	3595.52	12.088	9.3235
335.000	4060.703	3648.03	12.254	9.3192
340.000	4114.483	3701.61	12.426	9.3151
345.000	4169.321	3756.25	12.603	9.3112

TABLE 7-XXIX

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
350.000	4225.235	3811.99	12.784	9.3075
355.000	4282.247	3868.85	12.971	9.3040
360.000	4340.377	3926.83	13.164	9.3006
365.000	4399.650	3985.97	13.362	9.2975
370.000	4460.089	4046.30	13.567	9.2945
375.000	4521.720	4107.82	13.777	9.2917
380.000	4584.571	4170.58	13.994	9.2890
385.000	4648.671	4234.59	14.218	9.2865
390.000	4714.051	4299.90	14.450	9.2842
395.000	4780.743	4366.52	14.688	9.2819
400.000	4848.783	4434.50	14.935	9.2799
405.000	4918.206	4503.88	15.190	9.2779
410.000	4989.053	4574.68	15.454	9.2761
415.000	5061.363	4646.95	15.727	9.2744
420.000	5135.182	4720.74	16.009	9.2728
425.000	5210.557	4796.08	16.302	9.2714
430.000	5287.536	4873.04	16.606	9.2700
435.000	5366.174	4951.66	16.921	9.2687
437.627	5408.179	4993.65	14.635	9.2680
440.000	5439.518	5024.98	14.740	9.2675
445.000	5506.471	5091.92	14.965	9.2664
450.000	5574.682	5160.12	15.197	9.2654
455.000	5644.186	5229.62	15.436	9.2645
460.000	5715.019	5300.45	15.683	9.2638
465.000	5787.219	5372.65	15.938	9.2631
470.000	5860.827	5446.26	16.202	9.2625
475.000	5935.885	5521.32	16.475	9.2620
480.000	6012.440	5597.88	16.758	9.2616
485.000	6090.539	5675.95	17.051	9.2612
490.000	6170.235	5755.70	17.355	9.2609
495.000	6251.582	5837.06	17.670	9.2606
500.000	6334.639	5920.13	17.998	9.2604
505.000	6419.467	6004.97	18.338	9.2601
510.000	6506.134	6091.65	18.693	9.2599
515.000	6594.711	6180.24	19.062	9.2597
520.000	6685.274	6270.82	19.448	9.2595
525.000	6777.905	6363.47	19.850	9.2593
530.000	6872.693	6458.27	20.272	9.2590
535.000	6969.731	6555.32	20.714	9.2587
537.424	7017.625	6603.22	20.936	9.2585

TABLE 7-XXIX

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
537.424	7017.625	6603.22	9.259	9.2585
537.442	7017.624	6603.21	9.187	9.2585
540.000	7019.392	6604.99	9.191	9.2583
543.142	7021.585	6607.19	10.164	9.2581
545.000	7031.841	6617.45	10.133	9.2581
545.742	7035.951	6621.56	10.490	9.2580
549.542	7059.790	6645.41	10.536	9.2579
550.000	7062.672	6648.29	10.537	9.2579
555.000	7094.313	6679.95	10.578	9.2577
560.000	7126.239	6711.90	10.622	9.2577
565.000	7158.450	6744.12	10.669	9.2576
570.000	7190.950	6776.64	10.721	9.2577
575.000	7223.739	6809.45	10.759	9.2577
580.000	7256.814	6842.55	10.802	9.2578
585.000	7290.179	6875.94	10.842	9.2580
590.000	7323.833	6909.62	10.883	9.2581
595.000	7357.780	6943.59	10.924	9.2583
600.000	7392.021	6977.85	10.964	9.2586
605.000	7426.557	7012.41	11.005	9.2588
610.000	7461.391	7047.27	11.046	9.2591
615.000	7496.525	7082.43	11.086	9.2593
620.000	7531.961	7117.89	11.127	9.2596
625.000	7567.702	7153.66	11.167	9.2598
630.000	7603.749	7189.73	11.209	9.2601
635.000	7640.106	7226.11	11.248	9.2603
640.000	7676.776	7262.81	11.286	9.2605
645.000	7713.759	7299.81	11.321	9.2607
650.000	7751.067	7337.15	11.401	9.2608
655.000	7788.672	7374.77	11.350	9.2609
655.832	7794.955	7381.06	11.356	9.2609
655.832	7794.955	7381.06	9.260	9.2609
660.000	7794.988	7381.11	9.261	9.2609
670.000	7795.068	7381.24	9.261	9.2611
680.000	7795.148	7381.37	9.261	9.2612
690.000	7795.229	7381.49	9.261	9.2613
700.000	7795.311	7381.62	9.261	9.2614
710.000	7795.392	7381.75	9.262	9.2616
720.000	7795.475	7381.88	9.262	9.2617
730.000	7795.575	7382.03	9.262	9.2618
739.832	7795.674	7382.18	9.262	9.2620

TABLE 7-XXIX INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
740.000	7795.675	7382.18	9.262	9.2620
750.000	7795.729	7382.28	9.262	9.2621
760.000	7795.784	7382.38	9.262	9.2622
770.000	7795.838	7382.48	9.262	9.2624
780.000	7795.893	7382.59	9.262	9.2625
790.000	7795.947	7382.69	9.263	9.2626
800.000	7796.001	7382.79	9.263	9.2628
900.000	7796.510	7383.76	9.264	9.2641
1000.000	7796.966	7384.64	9.265	9.2654
1100.000	7797.532	7385.57	9.267	9.2667
1200.000	7798.064	7386.38	9.268	9.2678
1300.000	7798.547	7387.04	9.269	9.2687
1400.000	7798.966	7387.53	9.269	9.2693
1500.000	7799.309	7387.84	9.270	9.2697
1600.000	7799.572	7387.96	9.270	9.2698
1700.000	7799.750	7387.89	9.270	9.2697
1800.000	7799.845	7387.65	9.269	9.2692
1900.000	7799.861	7387.26	9.269	9.2686
2000.000	7799.804	7386.76	9.268	9.2677
2100.000	7799.683	7386.17	9.267	9.2667
2200.000	7799.507	7385.53	9.266	9.2656
2300.000	7799.287	7384.88	9.264	9.2644
2400.000	7799.033	7384.25	9.263	9.2632
2500.000	7798.755	7383.67	9.262	9.2620
2600.000	7798.462	7383.18	9.261	9.2609
2700.000	7798.161	7382.77	9.260	9.2598
2800.000	7797.856	7382.47	9.259	9.2589
2900.000	7797.550	7382.27	9.258	9.2581
3000.000	7797.244	7382.18	9.257	9.2573
3100.000	7796.937	7382.16	9.257	9.2567
3200.000	7796.624	7382.21	9.256	9.2561
3300.000	7796.300	7382.30	9.256	9.2555
3400.000	7795.959	7382.39	9.255	9.2550
3500.000	7795.596	7382.45	9.254	9.2543
3600.000	7795.204	7382.46	9.254	9.2536
3700.000	7794.778	7382.38	9.253	9.2528
3800.000	7794.321	7382.19	9.252	9.2518
3900.000	7793.831	7381.88	9.251	9.2507
4000.000	7793.309	7381.43	9.250	9.2494
4100.000	7792.760	7380.85	9.248	9.2479

TABLE 7-XXIX

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
4200.000	7792.191	7380.14	9.247	9.2463
4300.000	7791.611	7379.31	9.245	9.2446
4400.000	7791.033	7378.40	9.243	9.2429
4500.000	7790.470	7377.44	9.241	9.2411
4600.000	7789.938	7376.45	9.239	9.2393
4700.000	7789.453	7375.49	9.238	9.2376
4800.000	7789.030	7374.59	9.236	9.2361
4900.000	7788.684	7373.79	9.235	9.2347
5000.000	7788.430	7373.13	9.234	9.2337
5100.000	7788.278	7372.66	9.233	9.2329
5200.000	7788.236	7372.38	9.233	9.2325
5300.000	7788.309	7372.33	9.233	9.2324
5400.000	7788.499	7372.50	9.233	9.2327
5500.000	7788.803	7372.90	9.234	9.2334
5600.000	7789.215	7373.52	9.235	9.2344
5700.000	7789.724	7374.33	9.236	9.2357
5800.000	7790.317	7375.31	9.237	9.2373
5900.000	7790.978	7376.41	9.239	9.2391
6000.000	7791.686	7377.60	9.241	9.2410
6100.000	7792.420	7378.83	9.243	9.2430
6200.000	7793.157	7380.04	9.245	9.2450
6300.000	7793.877	7381.19	9.247	9.2469
6400.000	7794.560	7382.23	9.249	9.2486
6500.000	7795.189	7383.14	9.250	9.2502
6600.000	7795.747	7383.88	9.251	9.2515
6700.000	7796.222	7384.42	9.252	9.2525
6800.000	7796.605	7384.76	9.253	9.2532
6900.000	7796.891	7384.89	9.254	9.2535
7000.000	7797.077	7384.83	9.254	9.2536
7100.000	7797.166	7384.58	9.253	9.2533
7200.000	7797.163	7384.17	9.253	9.2528
7300.000	7797.076	7383.63	9.252	9.2520
7400.000	7796.913	7383.00	9.251	9.2510
7500.000	7796.686	7382.32	9.250	9.2499
7600.000	7796.407	7381.61	9.249	9.2487
7700.000	7796.089	7380.92	9.248	9.2475
7800.000	7795.741	7380.29	9.246	9.2463
7900.000	7795.374	7379.72	9.245	9.2451
8000.000	7794.995	7379.25	9.244	9.2440
8100.000	7794.612	7378.88	9.243	9.2430

TABLE 7-XXIX

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
8200.000	7794.226	7378.61	9.242	9.2420
8300.000	7793.841	7378.44	9.241	9.2412
8400.000	7793.455	7378.35	9.240	9.2404
8500.000	7793.065	7378.33	9.240	9.2397
8600.000	7792.669	7378.35	9.239	9.2391
8700.000	7792.261	7378.37	9.238	9.2384
8800.000	7791.838	7378.37	9.238	9.2377
8900.000	7791.393	7378.32	9.237	9.2369
9000.000	7790.925	7378.18	9.236	9.2360
9100.000	7790.430	7377.95	9.235	9.2349
9200.000	7789.910	7377.60	9.234	9.2338
9300.000	7789.366	7377.12	9.232	9.2324
9400.000	7788.803	7376.51	9.231	9.2310
9500.000	7788.231	7375.79	9.229	9.2294
9600.000	7787.657	7374.97	9.228	9.2277
9700.000	7787.096	7374.07	9.226	9.2260
9800.000	7786.560	7373.13	9.224	9.2243
9900.000	7786.065	7372.18	9.223	9.2226
10000.000	7785.626	7371.26	9.221	9.2210
10100.000	7785.258	7370.42	9.220	9.2196
10200.000	7784.976	7369.69	9.218	9.2185
10300.000	7784.791	7369.11	9.218	9.2176
10400.000	7784.715	7368.72	9.217	9.2170
10500.000	7784.753	7368.53	9.217	9.2168
10600.000	7784.909	7368.57	9.217	9.2169
10700.000	7785.183	7368.84	9.217	9.2174
10800.000	7785.570	7369.34	9.218	9.2183
10900.000	7786.063	7370.05	9.219	9.2195
11000.000	7786.650	7370.95	9.221	9.2210
11100.000	7787.316	7372.00	9.223	9.2228
11200.000	7788.043	7373.18	9.225	9.2247
11300.000	7788.811	7374.44	9.227	9.2268
11400.000	7789.600	7375.72	9.229	9.2289
11500.000	7790.388	7376.98	9.231	9.2310
11600.000	7791.152	7378.18	9.233	9.2331
11700.000	7791.874	7379.26	9.235	9.2349
11800.000	7792.534	7380.20	9.237	9.2366
11900.000	7793.118	7380.96	9.238	9.2379
12000.000	7793.613	7381.52	9.239	9.2390
12100.000	7794.010	7381.87	9.240	9.2397

TABLE 7-XXIX

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
12200.000	7794.304	7382.00	9.240	9.2401
12300.000	7794.493	7381.93	9.240	9.2402
12400.000	7794.579	7381.68	9.240	9.2399
12500.000	7794.567	7381.26	9.239	9.2394
12600.000	7794.466	7380.70	9.239	9.2386
12700.000	7794.283	7380.05	9.238	9.2376
12800.000	7794.032	7379.34	9.236	9.2364
12900.000	7793.723	7378.61	9.235	9.2351
13000.000	7793.370	7377.89	9.234	9.2338
13100.000	7792.984	7377.21	9.233	9.2325
13200.000	7792.575	7376.61	9.231	9.2313
13300.000	7792.151	7376.09	9.230	9.2301
13400.000	7791.719	7375.67	9.229	9.2289
13500.000	7791.282	7375.35	9.228	9.2279
13600.000	7790.844	7375.13	9.227	9.2270
13700.000	7790.404	7374.99	9.226	9.2261
13800.000	7789.960	7374.91	9.225	9.2253
13900.000	7789.510	7374.87	9.224	9.2245
14000.000	7789.050	7374.84	9.224	9.2237
14100.000	7788.576	7374.79	9.223	9.2229
14200.000	7788.085	7374.69	9.222	9.2220
14300.000	7787.575	7374.51	9.221	9.2210
14400.000	7787.043	7374.24	9.220	9.2199
14500.000	7786.492	7373.85	9.219	9.2186
14600.000	7785.923	7373.34	9.217	9.2173
14700.000	7785.342	7372.72	9.216	9.2158
14800.000	7784.758	7371.98	9.214	9.2142
14900.000	7784.181	7371.15	9.213	9.2125
15000.000	7783.624	7370.26	9.211	9.2108
15100.000	7783.099	7369.32	9.209	9.2091
15200.000	7782.623	7368.39	9.208	9.2075
15300.000	7782.211	7367.50	9.206	9.2061
15400.000	7781.877	7366.70	9.205	9.2048
15500.000	7781.635	7366.01	9.204	9.2037
15600.000	7781.498	7365.48	9.203	9.2029
15700.000	7781.475	7365.15	9.202	9.2025
15800.000	7781.571	7365.03	9.202	9.2024
15900.000	7781.790	7365.13	9.203	9.2027
6000.000	7782.130	7365.47	9.203	9.2033
6100.000	7782.587	7366.04	9.204	9.2044

TABLE 7-XXIX

INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
 (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
16200.000	7783.151	7366.82	9.206	9.2057
16300.000	7783.808	7367.80	9.207	9.2074
16400.000	7784.544	7368.93	9.209	9.2093
16500.000	7785.340	7370.18	9.211	9.2114
16550.000	7785.753	7370.84	9.213	9.2126

TABLE 7-XXX INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
0.000	-0.000	90.000	28.608	-80.604
5.000	1.458	89.996	28.608	-80.604
10.000	3.120	89.991	28.608	-80.604
12.000	3.844	89.989	28.608	-80.604
15.000	4.995	89.986	28.608	-80.604
20.000	7.083	89.992	28.608	-80.604
25.000	9.387	90.018	28.608	-80.604
30.000	11.881	90.075	28.608	-80.604
35.000	14.504	90.174	28.608	-80.604
40.000	17.177	90.327	28.608	-80.603
45.000	19.791	90.544	28.608	-80.602
50.000	22.231	90.831	28.608	-80.600
55.000	24.390	91.184	28.607	-80.597
60.000	26.184	91.595	28.607	-80.594
65.000	27.561	92.049	28.606	-80.588
70.000	28.507	92.526	28.605	-80.581
75.000	29.082	93.011	28.604	-80.572
80.000	29.370	93.494	28.602	-80.561
82.250	29.418	93.708	28.601	-80.555
85.000	29.416	93.965	28.600	-80.546
90.000	29.254	94.418	28.597	-80.529
95.000	28.920	94.849	28.594	-80.508
100.000	28.442	95.254	28.591	-80.483
105.000	27.833	95.630	28.586	-80.453
110.000	27.118	95.978	28.581	-80.419
115.000	26.380	96.298	28.576	-80.379
120.000	25.641	96.592	28.569	-80.333
125.000	24.904	96.863	28.561	-80.282
130.000	24.176	97.115	28.553	-80.223
135.000	23.469	97.350	28.543	-80.158
140.000	22.790	97.571	28.532	-80.085
145.000	22.147	97.781	28.519	-80.003
147.325	21.860	97.875	28.513	-79.962
150.000	21.502	97.965	28.506	-79.913
155.000	20.860	98.131	28.491	-79.815
159.329	20.364	98.273	28.477	-79.723
159.329	20.364	98.273	28.477	-79.723
159.459	20.343	98.274	28.476	-79.720
160.000	20.256	98.282	28.474	-79.708
163.759	19.655	98.333	28.462	-79.626

TABLE 7-XXX INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
165.000	19.469	98.352	28.457	-79.599
165.859	19.341	98.366	28.455	-79.580
170.000	18.738	98.435	28.440	-79.488
175.000	18.027	98.518	28.423	-79.376
180.000	17.333	98.602	28.404	-79.262
185.000	16.659	98.686	28.386	-79.146
189.559	16.060	98.763	28.369	-79.040
190.000	16.003	98.770	28.367	-79.029
194.559	15.423	98.848	28.350	-78.921
195.000	15.368	98.855	28.348	-78.910
200.000	14.752	98.941	28.328	-78.790
205.000	14.176	99.027	28.308	-78.668
210.000	13.661	99.114	28.288	-78.544
215.000	13.150	99.201	28.267	-78.419
220.000	12.650	99.289	28.245	-78.292
225.000	12.162	99.377	28.224	-78.164
230.000	11.685	99.466	28.201	-78.033
235.000	11.219	99.555	28.178	-77.901
240.000	10.764	99.645	28.155	-77.767
245.000	10.320	99.736	28.131	-77.631
250.000	9.887	99.827	28.107	-77.494
255.000	9.466	99.918	28.082	-77.354
260.000	9.055	100.011	28.057	-77.213
265.000	8.656	100.104	28.031	-77.070
270.000	8.267	100.197	28.005	-76.924
275.000	7.890	100.292	27.978	-76.777
280.000	7.523	100.386	27.950	-76.628
285.000	7.167	100.482	27.922	-76.477
290.000	6.821	100.578	27.893	-76.323
295.000	6.486	100.675	27.863	-76.168
300.000	6.162	100.773	27.833	-76.010
305.000	5.847	100.872	27.803	-75.850
310.000	5.543	100.971	27.771	-75.688
315.000	5.249	101.071	27.739	-75.524
320.000	4.965	101.172	27.706	-75.357
325.000	4.691	101.273	27.673	-75.188
330.000	4.426	101.376	27.638	-75.017
335.000	4.172	101.479	27.603	-74.843
340.000	3.927	101.583	27.567	-74.667
345.000	3.691	101.688	27.531	-74.488

TABLE 7-XXX INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
350.000	3.465	101.794	27.493	-74.307
355.000	3.247	101.901	27.455	-74.123
360.000	3.040	102.008	27.416	-73.937
365.000	2.841	102.117	27.376	-73.748
370.000	2.651	102.227	27.335	-73.556
375.000	2.470	102.337	27.293	-73.361
380.000	2.298	102.449	27.250	-73.164
385.000	2.135	102.561	27.206	-72.964
390.000	1.980	102.675	27.161	-72.761
395.000	1.834	102.789	27.115	-72.555
400.000	1.697	102.905	27.068	-72.345
405.000	1.568	103.021	27.020	-72.133
410.000	1.447	103.135	26.971	-71.918
415.000	1.335	103.258	26.921	-71.699
420.000	1.231	103.378	26.869	-71.478
425.000	1.136	103.495	26.817	-71.253
430.000	1.049	103.622	26.763	-71.024
435.000	0.970	103.745	26.707	-70.792
437.627	0.931	103.811	26.678	-70.669
440.000	0.883	103.869	26.651	-70.557
445.000	0.786	103.993	26.593	-70.319
450.000	0.695	104.118	26.534	-70.078
455.000	0.612	104.244	26.474	-69.834
460.000	0.535	104.371	26.412	-69.587
465.000	0.466	104.499	26.349	-69.337
470.000	0.403	104.628	26.285	-69.083
475.000	0.348	104.758	26.220	-68.827
480.000	0.299	104.889	26.153	-68.567
485.000	0.258	105.022	26.084	-68.304
490.000	0.223	105.155	26.014	-68.038
495.000	0.195	105.289	25.943	-67.768
500.000	0.175	105.425	25.870	-67.495
505.000	0.162	105.561	25.795	-67.218
510.000	0.155	105.699	25.719	-66.938
515.000	0.156	105.838	25.641	-66.654
520.000	0.164	105.978	25.561	-66.366
525.000	0.180	106.119	25.479	-66.074
530.000	0.203	106.262	25.396	-65.779
535.000	0.233	106.405	25.311	-65.479
537.424	0.250	106.475	25.269	-65.332

TABLE 7-XXX INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
GEODETTIC LATITUDE, AND LONGITUDE - LIFTOFF
THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETTIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
537.424	0.250	106.475	25.269	-65.332
537.442	0.250	106.476	25.268	-65.331
540.000	0.215	106.547	25.224	-65.176
543.142	0.173	106.633	25.168	-64.986
545.000	0.158	106.685	25.136	-64.873
545.742	0.152	106.706	25.122	-64.828
549.542	0.125	106.812	25.055	-64.597
550.000	0.122	106.824	25.047	-64.569
555.000	0.089	106.964	24.956	-64.264
560.000	0.058	107.103	24.865	-63.958
565.000	0.030	107.242	24.773	-63.651
570.000	0.004	107.381	24.679	-63.343
575.000	-0.019	107.520	24.584	-63.035
580.000	-0.040	107.659	24.489	-62.725
585.000	-0.058	107.798	24.391	-62.414
590.000	-0.074	107.937	24.293	-62.102
595.000	-0.086	108.075	24.194	-61.789
600.000	-0.096	108.214	24.093	-61.475
605.000	-0.103	108.352	23.991	-61.160
610.000	-0.107	108.491	23.888	-60.844
615.000	-0.108	108.629	23.784	-60.527
620.000	-0.106	108.767	23.678	-60.209
625.000	-0.101	108.905	23.571	-59.890
630.000	-0.093	109.042	23.463	-59.570
635.000	-0.082	109.180	23.354	-59.248
640.000	-0.067	109.317	23.243	-58.926
645.000	-0.050	109.455	23.131	-58.603
650.000	-0.030	109.593	23.018	-58.278
655.000	-0.005	109.730	22.903	-57.952
655.832	0.000	109.753	22.884	-57.898
655.832	0.000	109.753	22.884	-57.898
660.000	0.000	109.865	22.787	-57.626
670.000	-0.000	110.131	22.554	-56.976
680.000	-0.000	110.393	22.317	-56.328
690.000	-0.001	110.652	22.077	-55.682
700.000	-0.001	110.908	21.835	-55.038
710.000	-0.001	111.160	21.589	-54.397
720.000	-0.001	111.408	21.341	-53.758
730.000	-0.001	111.653	21.090	-53.121
739.832	-0.002	111.890	20.841	-52.497

TABLE 7-XXX

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
740.000	-0.002	111.894	20.836	-52.487
750.000	-0.002	112.132	20.580	-51.855
760.000	-0.002	112.366	20.321	-51.225
770.000	-0.002	112.596	20.059	-50.597
780.000	-0.002	112.823	19.795	-49.971
790.000	-0.003	113.046	19.529	-49.348
800.000	-0.003	113.265	19.260	-48.727
900.000	-0.005	115.259	16.445	-42.630
1000.000	-0.007	116.886	13.434	-36.724
1100.000	-0.009	118.150	10.267	-30.976
1200.000	-0.010	119.054	6.984	-25.350
1300.000	-0.012	119.604	3.625	-19.808
1400.000	-0.013	119.803	0.226	-14.309
1500.000	-0.014	119.651	-3.175	-8.813
1600.000	-0.014	119.148	-6.543	-3.278
1700.000	-0.013	118.290	-9.839	2.337
1800.000	-0.012	117.073	-13.025	8.070
1900.000	-0.010	115.493	-16.061	13.957
2000.000	-0.008	113.546	-18.906	20.032
2100.000	-0.004	111.234	-21.516	26.319
2200.000	-0.001	108.564	-23.848	32.836
2300.000	0.004	105.557	-25.857	39.585
2400.000	0.008	102.244	-27.502	46.557
2500.000	0.013	98.675	-28.745	53.723
2600.000	0.018	94.914	-29.555	61.036
2700.000	0.024	91.042	-29.910	68.438
2800.000	0.029	87.145	-29.802	75.858
2900.000	0.033	83.315	-29.233	83.226
3000.000	0.038	79.636	-28.219	90.474
3100.000	0.041	76.181	-26.785	97.550
3200.000	0.044	73.007	-24.968	104.415
3300.000	0.047	70.156	-22.805	111.051
3400.000	0.048	67.653	-20.342	117.453
3500.000	0.049	65.511	-17.621	123.631
3600.000	0.048	63.735	-14.687	129.607
3700.000	0.047	62.325	-11.581	135.411
3800.000	0.045	61.274	-8.346	141.075
3900.000	0.043	60.580	-5.018	146.638
4000.000	0.039	60.237	-1.637	152.140
4100.000	0.036	60.244	1.762	157.621

TABLE 7-XXX INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
4200.000	0.031	60.599	5.141	-196.877
4300.000	0.027	61.306	8.464	-191.315
4400.000	0.023	62.368	11.693	-185.651
4500.000	0.018	63.790	14.789	-179.850
4600.000	0.014	65.575	17.713	-173.877
4700.000	0.010	67.725	20.422	-167.702
4800.000	0.006	70.234	22.872	-161.306
4900.000	0.002	73.088	25.021	-154.679
5000.000	-0.001	76.263	26.825	-147.824
5100.000	-0.004	79.716	28.246	-140.762
5200.000	-0.006	83.389	29.248	-133.530
5300.000	-0.009	87.211	29.807	-126.181
5400.000	-0.011	91.098	29.908	-118.782
5500.000	-0.012	94.959	29.548	-111.402
5600.000	-0.014	98.708	28.735	-104.110
5700.000	-0.015	102.266	27.493	-96.966
5800.000	-0.017	105.568	25.850	-90.015
5900.000	-0.018	108.567	23.845	-83.284
6000.000	-0.019	111.230	21.519	-76.785
6100.000	-0.020	113.538	18.916	-70.513
6200.000	-0.021	115.482	16.078	-64.452
6300.000	-0.022	117.062	13.049	-58.576
6400.000	-0.022	118.280	9.871	-52.853
6500.000	-0.023	119.140	6.581	-47.248
6600.000	-0.023	119.646	3.220	-41.721
6700.000	-0.022	119.803	-0.177	-36.232
6800.000	-0.022	119.610	-3.572	-30.741
6900.000	-0.020	119.066	-6.929	-25.206
7000.000	-0.018	118.169	-10.210	-19.587
7100.000	-0.016	116.912	-13.377	-13.846
7200.000	-0.013	115.293	-16.390	-7.946
7300.000	-0.009	113.307	-19.208	-1.857
7400.000	-0.005	110.958	-21.787	4.447
7500.000	-0.000	108.254	-24.083	10.981
7600.000	0.005	105.215	-26.052	17.747
7700.000	0.010	101.876	-27.654	24.732
7800.000	0.016	98.288	-28.851	31.907
7900.000	0.021	94.516	-29.613	39.223
8000.000	0.027	90.642	-29.920	46.620
8100.000	0.032	86.753	-29.765	54.029

TABLE 7-XXX

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
8200.000	0.037	82.939	-29.151	61.377
8300.000	0.041	79.284	-28.095	68.600
8400.000	0.045	75.859	-26.625	75.647
8500.000	0.048	72.719	-24.774	82.481
8600.000	0.050	69.903	-22.584	89.085
8700.000	0.051	67.437	-20.098	95.456
8800.000	0.051	65.332	-17.359	101.606
8900.000	0.050	63.593	-14.412	107.556
9000.000	0.049	62.216	-11.297	113.337
9100.000	0.046	61.199	-8.056	118.982
9200.000	0.043	60.537	-4.727	124.530
9300.000	0.039	60.224	-1.348	130.020
9400.000	0.035	60.260	2.045	135.493
9500.000	0.030	60.644	5.416	-219.010
9600.000	0.026	61.379	8.728	-213.449
9700.000	0.021	62.468	11.944	-207.785
9800.000	0.016	63.916	15.024	-201.980
9900.000	0.011	65.727	17.928	-196.001
10000.000	0.007	67.901	20.615	-189.819
10100.000	0.002	70.433	23.041	-183.416
10200.000	-0.002	73.308	25.164	-176.781
10300.000	-0.005	76.500	26.939	-169.920
10400.000	-0.008	79.966	28.329	-162.854
10500.000	-0.011	83.647	29.301	-155.622
10600.000	-0.013	87.472	29.829	-148.278
10700.000	-0.015	91.354	29.898	-140.888
10800.000	-0.017	95.206	29.508	-133.521
10900.000	-0.019	98.940	28.669	-126.247
11000.000	-0.020	102.479	27.402	-119.123
11100.000	-0.021	105.760	25.738	-112.194
11200.000	-0.022	108.736	23.715	-105.485
11300.000	-0.023	111.376	21.374	-99.008
11400.000	-0.024	113.660	18.758	-92.756
11500.000	-0.025	115.581	15.912	-86.713
11600.000	-0.025	117.139	12.877	-80.854
11700.000	-0.025	118.335	9.695	-75.145
11800.000	-0.025	119.175	6.404	-69.552
11900.000	-0.025	119.663	3.044	-64.034
12000.000	-0.024	119.801	-0.350	-58.553
2100.000	-0.023	119.591	-3.741	-53.067

TABLE 7-XXX

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
12200.000	-0.021	119.031	-7.091	-47.535
12300.000	-0.019	118.117	-10.364	-41.917
12400.000	-0.016	116.845	-13.522	-36.176
12500.000	-0.013	115.210	-16.524	-30.274
12600.000	-0.008	113.210	-19.328	-24.183
12700.000	-0.004	110.847	-21.893	-17.876
12800.000	0.001	108.131	-24.173	-11.340
12900.000	0.007	105.082	-26.126	-4.572
13000.000	0.012	101.736	-27.710	2.414
13100.000	0.018	98.143	-28.889	9.587
13200.000	0.024	94.370	-29.633	16.899
13300.000	0.030	90.497	-29.923	24.289
13400.000	0.035	86.614	-29.751	31.688
13500.000	0.040	82.809	-29.122	39.024
13600.000	0.044	79.165	-28.052	46.233
13700.000	0.048	75.752	-26.570	53.265
13800.000	0.051	72.625	-24.710	60.084
13900.000	0.053	69.824	-22.513	66.672
14000.000	0.053	67.371	-20.022	73.028
14100.000	0.053	65.279	-17.280	79.164
14200.000	0.052	63.551	-14.331	85.101
14300.000	0.051	62.186	-11.217	90.870
14400.000	0.048	61.179	-7.977	96.505
14500.000	0.044	60.526	-4.651	102.044
14600.000	0.040	60.221	-1.275	107.526
14700.000	0.036	60.264	2.114	112.991
14800.000	0.031	60.655	5.480	-241.519
14900.000	0.025	61.395	8.786	-235.964
15000.000	0.020	62.489	11.996	-230.305
15100.000	0.015	63.941	15.069	-224.505
15200.000	0.009	65.754	17.967	-218.531
15300.000	0.004	67.931	20.648	-212.355
15400.000	-0.000	70.464	23.067	-205.958
15500.000	-0.005	73.339	25.183	-199.329
15600.000	-0.008	76.530	26.953	-192.475
15700.000	-0.012	79.993	28.339	-185.417
15800.000	-0.015	83.672	29.306	-178.193
15900.000	-0.017	87.492	29.830	-170.857
16000.000	-0.020	91.370	29.898	-163.476
16100.000	-0.022	95.217	29.506	-156.118

TABLE 7-XXX INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
16200.000	-0.023	98.947	28.667	-148.853
16300.000	-0.024	102.482	27.401	-141.738
16400.000	-0.026	105.759	25.738	-134.817
16500.000	-0.026	108.733	23.717	-128.116
16550.000	-0.027	110.094	22.585	-124.851

TABLE 7-XXXI COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (99-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
0.000	-0.00	0.00	0.00	0.00	9.00	9.00
5.000	-0.00	-0.00	0.00	-0.00	9.00	9.00
10.000	-0.00	0.00	0.00	0.00	9.00	9.00
12.000	-0.03	0.00	0.00	0.00	9.00	9.00
15.000	-0.45	-0.12	0.00	0.00	5.00	5.31
20.000	-1.09	-0.86	0.00	0.00	0.00	0.58
25.000	-2.18	-1.79	0.00	0.01	0.00	0.31
30.000	-3.68	-3.21	0.00	0.00	0.00	0.07
35.000	-5.61	-5.04	0.00	-0.00	0.00	0.01
40.000	-8.01	-7.35	0.00	-0.00	0.00	0.00
45.000	-10.81	-10.10	0.00	-0.00	0.00	0.00
50.000	-13.95	-13.22	0.00	-0.00	0.00	0.00
55.000	-17.35	-16.61	0.00	-0.00	0.00	0.00
60.000	-20.92	-20.20	0.00	-0.00	0.00	0.00
65.000	-24.53	-23.88	0.00	0.00	0.00	0.00
70.000	-28.15	-27.53	0.00	0.00	0.00	0.00
75.000	-31.71	-31.12	0.00	-0.01	0.00	-0.00
80.000	-35.16	-34.60	0.00	-0.02	0.00	0.00
82.250	-36.67	-36.12	0.00	-0.02	0.00	0.00
85.000	-38.45	-37.94	0.00	-0.02	0.00	0.00
90.000	-41.57	-41.11	0.00	-0.02	0.00	0.00
95.000	-44.53	-44.13	0.00	-0.01	0.00	0.00
100.000	-47.32	-46.99	0.00	-0.00	0.00	0.00
105.000	-49.94	-50.02	0.00	-0.00	0.00	0.00
110.000	-52.41	-52.51	0.00	-0.00	0.00	-0.00
115.000	-54.66	-54.54	0.00	-0.00	0.00	-0.00
120.000	-56.71	-56.49	0.00	0.00	0.00	0.00
125.000	-58.58	-58.37	0.00	0.00	0.00	0.00
130.000	-60.31	-60.10	0.00	0.00	0.00	0.00
135.000	-61.89	-61.70	0.00	0.00	0.00	0.00
140.000	-63.34	-63.16	0.00	0.00	0.00	-0.00
145.000	-64.67	-64.51	0.00	0.00	0.00	-0.00
147.329	-65.26	-65.10	0.00	0.00	0.00	-0.00
150.000	-65.90	-65.75	0.00	0.00	0.00	-0.00
155.000	-66.59	-66.84	0.00	0.00	0.00	-0.00
159.329	-66.59	-66.90	0.00	0.00	0.00	0.00
159.329	-66.59	-66.90	0.00	0.00	0.00	0.00
159.459	-66.59	-66.90	0.00	0.00	0.00	0.00
160.000	-66.59	-66.87	0.00	0.00	0.00	0.00
163.759	-66.59	-66.55	0.00	-0.01	0.00	0.00

TABLE 7-XXXI

COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
165.000	-66.59	-66.48	0.00	-0.01	0.00	0.00
165.859	-66.59	-66.47	0.00	-0.01	0.00	0.00
170.000	-66.59	-66.57	0.00	-0.00	0.00	0.00
175.000	-66.59	-66.57	0.00	-0.00	0.00	0.00
180.000	-66.59	-66.58	0.00	-0.00	0.00	0.00
185.000	-66.59	-66.59	0.00	-0.00	0.00	0.00
189.559	-66.59	-66.59	0.00	-0.00	0.00	0.00
190.000	-66.59	-66.59	0.00	-0.00	0.00	0.00
194.559	-66.59	-66.59	0.00	-0.00	0.00	-0.00
195.000	-66.59	-66.59	0.00	-0.00	0.00	-0.00
200.000	-65.59	-66.59	0.07	-0.00	0.00	-0.00
205.000	-62.55	-62.61	0.07	0.08	0.00	0.00
210.000	-63.08	-62.84	0.06	0.06	0.00	-0.00
215.000	-63.59	-63.43	0.06	0.06	0.00	-0.00
220.000	-64.11	-63.93	0.06	0.06	0.00	-0.00
225.000	-64.66	-64.47	0.06	0.06	0.00	-0.00
230.000	-65.20	-65.02	0.06	0.06	0.00	-0.00
235.000	-65.73	-65.55	0.06	0.06	0.00	-0.00
240.000	-66.26	-66.08	0.05	0.05	0.00	-0.00
245.000	-66.79	-66.61	0.05	0.05	0.00	-0.00
250.000	-67.32	-67.14	0.05	0.05	0.00	-0.00
255.000	-67.85	-67.67	0.05	0.05	0.00	-0.00
260.000	-68.38	-68.20	0.05	0.05	0.00	-0.00
265.000	-68.91	-68.73	0.04	0.04	0.00	-0.00
270.000	-69.44	-69.26	0.04	0.04	0.00	-0.00
275.000	-69.98	-69.80	0.04	0.04	0.00	-0.00
280.000	-70.51	-70.33	0.04	0.04	0.00	-0.00
285.000	-71.05	-70.87	0.04	0.04	0.00	-0.00
290.000	-71.59	-71.41	0.04	0.04	0.00	-0.00
295.000	-72.13	-71.95	0.03	0.03	0.00	-0.00
300.000	-72.67	-72.49	0.03	0.03	0.00	-0.00
305.000	-73.21	-73.03	0.03	0.03	0.00	-0.00
310.000	-73.76	-73.57	0.03	0.03	0.00	-0.00
315.000	-74.30	-74.12	0.03	0.03	0.00	-0.00
320.000	-74.85	-74.66	0.02	0.02	0.00	-0.00
325.000	-75.39	-75.21	0.02	0.02	0.00	-0.00
330.000	-75.94	-75.75	0.02	0.02	0.00	-0.00
335.000	-76.49	-76.30	0.02	0.02	0.00	-0.00
340.000	-77.04	-76.85	0.02	0.02	0.00	-0.00
345.000	-77.59	-77.40	0.02	0.02	0.00	-0.00

TABLE 7-XXXI COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
350.000	-78.14	-77.95	0.01	0.01	0.00	-0.00
355.000	-78.69	-78.50	0.01	0.01	0.00	-0.00
360.000	-79.24	-79.05	0.01	0.01	0.00	-0.00
365.000	-79.79	-79.60	0.01	0.01	0.00	-0.00
370.000	-80.34	-80.16	0.01	0.01	0.00	-0.00
375.000	-80.89	-80.71	0.01	0.01	0.00	-0.00
380.000	-81.45	-81.26	0.01	0.01	0.00	-0.00
385.000	-82.00	-81.81	0.00	0.00	0.00	-0.00
390.000	-82.55	-82.37	0.00	0.00	0.00	-0.00
395.000	-83.11	-82.92	0.00	0.00	0.00	-0.00
400.000	-83.66	-83.47	-0.00	0.00	0.00	-0.00
405.000	-84.21	-84.02	-0.00	-0.00	0.00	0.00
410.000	-84.76	-84.58	-0.00	-0.00	0.00	0.00
415.000	-85.31	-85.13	-0.00	-0.00	0.00	0.00
420.000	-85.86	-85.68	-0.00	-0.00	0.00	0.00
425.000	-86.41	-86.23	-0.01	-0.01	0.00	0.00
430.000	-86.96	-86.78	-0.01	-0.01	0.00	0.00
435.000	-87.51	-87.33	-0.01	-0.01	0.00	0.00
437.627	-87.80	-87.61	-0.01	-0.01	0.00	0.00
440.000	-88.06	-87.87	-0.01	-0.01	0.00	0.00
445.000	-88.60	-88.42	-0.01	-0.01	0.00	0.00
450.000	-89.15	-88.97	-0.01	-0.01	0.00	0.00
455.000	-89.69	-89.51	-0.01	-0.01	0.00	0.00
460.000	-90.23	-90.05	-0.01	-0.01	0.00	0.00
465.000	-90.77	-90.59	-0.01	-0.01	0.00	0.00
470.000	-91.30	-91.12	-0.01	-0.01	0.00	0.00
475.000	-91.83	-91.65	-0.01	-0.01	0.00	0.00
480.000	-92.36	-92.18	-0.02	-0.02	0.00	0.00
485.000	-92.89	-92.71	-0.02	-0.02	0.00	0.00
490.000	-93.41	-93.24	-0.02	-0.02	0.00	0.00
495.000	-93.93	-93.76	-0.02	-0.02	0.00	0.00
500.000	-94.45	-94.28	-0.02	-0.02	0.00	0.00
505.000	-94.97	-94.80	-0.02	-0.02	0.00	0.00
510.000	-95.48	-95.31	-0.02	-0.02	0.00	0.00
515.000	-95.99	-95.82	-0.02	-0.02	0.00	0.00
520.000	-96.50	-96.33	-0.02	-0.02	0.00	0.00
525.000	-97.01	-96.84	-0.02	-0.02	0.00	0.00
530.000	-97.52	-97.35	-0.02	-0.02	0.00	0.00
535.000	-98.04	-97.86	-0.02	-0.02	0.00	0.00
537.424	-98.29	-98.12	-0.03	-0.02	0.00	0.00

TABLE 7-XXXI
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
537.424	-98.29	-98.12	-0.03	-0.02	0.00	0.00
537.442	-98.29	-98.12	-0.03	-0.02	0.00	0.00
540.000	-98.18	-98.36	-0.02	-0.03	0.00	0.00
543.142	-98.18	-98.48	-0.02	-0.03	0.00	0.00
545.000	-98.95	-98.51	-0.03	-0.03	0.00	0.00
545.742	-99.00	-98.73	-0.03	-0.03	0.00	0.00
549.542	-99.36	-99.29	-0.03	-0.03	0.00	0.00
550.000	-99.41	-99.32	-0.03	-0.03	0.00	0.00
555.000	-99.92	-99.79	-0.04	-0.03	0.00	0.00
560.000	-100.43	-100.31	-0.04	-0.04	0.00	-0.00
565.000	-100.97	-100.84	-0.05	-0.05	0.00	-0.00
570.000	-101.51	-101.40	-0.05	-0.05	0.00	-0.00
575.000	-101.96	-101.84	-0.05	-0.05	0.00	-0.00
580.000	-102.41	-102.30	-0.05	-0.05	0.00	-0.00
585.000	-102.85	-102.74	-0.05	-0.05	0.00	-0.00
590.000	-103.28	-103.18	-0.05	-0.05	0.00	-0.00
595.000	-103.71	-103.60	-0.05	-0.05	0.00	-0.00
600.000	-104.12	-104.02	-0.05	-0.05	0.00	-0.00
605.000	-104.53	-104.44	-0.04	-0.04	0.00	-0.00
610.000	-104.94	-104.84	-0.04	-0.04	0.00	-0.00
615.000	-105.34	-105.24	-0.03	-0.03	0.00	-0.00
620.000	-105.73	-105.64	-0.02	-0.03	0.00	-0.00
625.000	-106.11	-106.02	-0.01	-0.02	0.00	-0.00
630.000	-106.48	-106.40	-0.00	-0.01	0.00	-0.00
635.000	-106.86	-106.76	0.01	0.01	0.00	-0.00
640.000	-107.19	-107.11	0.04	0.03	0.00	-0.00
645.000	-107.51	-107.43	0.07	0.06	0.00	-0.00
650.000	-107.77	-108.00	0.14	0.23	0.00	0.00
655.000	-107.68	-107.63	0.10	0.07	0.00	0.00
655.832	-107.68	-107.66	0.10	0.09	0.00	0.00
655.832	-107.82	-107.82	-0.41	-0.41	-0.00	-0.00
660.000	-112.13	-112.13	-0.40	-0.40	-0.00	-0.00
670.000	-114.58	-114.58	-0.39	-0.39	-0.00	-0.00
680.000	-115.26	-115.26	-0.39	-0.39	-0.00	-0.00
690.000	-115.94	-115.94	-0.39	-0.39	-0.00	-0.00
700.000	-116.62	-116.62	-0.38	-0.38	-0.00	-0.00
710.000	-117.31	-117.31	-0.38	-0.38	-0.00	-0.00
720.000	-117.99	-117.99	-0.38	-0.38	-0.00	-0.00
730.000	-118.67	-118.67	-0.37	-0.37	-0.00	-0.00
739.832	-119.34	-119.34	-0.37	-0.37	-0.00	-0.00

TABLE 7-XXXI COMMANDED AND ACTUAL VEHICLE
 ANGLES - LIFTOFF THROUGH PAI
 (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	AIDED (G)	ACTUAL ROLL (DEG)
740.000	-119.35	-119.35	-0.37	.00	-0.00
750.000	-120.03	-120.03	-0.36	.00	-0.00
760.000	-120.71	-120.71	-0.36	.00	-0.00
770.000	-121.39	-121.39	-0.36	.00	-0.00
780.000	-122.07	-122.07	-0.35	.00	-0.00
790.000	-122.75	-122.75	-0.35	.00	-0.00
800.000	-123.43	-123.43	-0.35	.00	-0.00
900.000	-130.24	-130.24	-0.31	.00	-0.00
1000.000	-137.05	-137.05	-0.26	.00	-0.00
1100.000	-143.86	-143.86	-0.22	.00	-0.00
1200.000	-150.67	-150.67	-0.17	.00	-0.00
1300.000	-157.48	-157.48	-0.12	.00	-0.00
1400.000	-164.29	-164.29	-0.07	.00	-0.00
1500.000	-171.10	-171.10	-0.02	.00	-0.00
1600.000	-177.90	-177.90	0.03	.00	-0.00
1700.000	175.29	175.29	0.07	.00	-0.00
1800.000	168.48	168.48	0.12	.00	-0.00
1900.000	161.67	161.67	0.16	.00	-0.00
2000.000	154.86	154.86	0.20	.00	-0.00
2100.000	148.05	148.05	0.24	.00	-0.00
2200.000	141.25	141.25	0.27	.00	-0.00
2300.000	134.44	134.44	0.30	.00	-0.00
2400.000	127.63	127.63	0.32	.00	-0.00
2500.000	120.83	120.83	0.34	.00	-0.00
2600.000	114.02	114.02	0.35	.00	-0.00
2700.000	107.22	107.22	0.36	.00	-0.00
2800.000	100.42	100.42	0.36	.00	-0.00
2900.000	93.61	93.61	0.36	.00	-0.00
3000.000	86.81	86.81	0.35	.00	-0.00
3100.000	80.01	80.01	0.34	.00	-0.00
3200.000	73.21	73.21	0.32	.00	-0.00
3300.000	66.40	66.40	0.30	.00	-0.00
3400.000	59.60	59.60	0.28	.17	44.17
3500.000	52.80	52.80	0.25	.17	144.17
3600.000	26.00	26.00	0.14	.00	180.00
3700.000	19.20	19.20	0.10	.00	180.00
3800.000	12.40	12.40	0.06	.00	180.00
3900.000	5.60	5.60	0.02	.00	180.00
4000.000	-1.20	-1.20	-0.02	.00	180.00
4100.000	-8.00	-8.00	-0.05	.00	180.00

TABLE 7-XXXI
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
4200.000	-14.80	-14.80	-0.09	-0.09	180.00	180.00
4300.000	-21.60	-21.60	-0.12	-0.12	180.00	180.00
4400.000	-28.40	-28.40	-0.15	-0.15	180.00	180.00
4500.000	-35.20	-35.20	-0.18	-0.18	180.00	180.00
4600.000	-41.99	-41.99	-0.20	-0.20	180.00	180.00
4700.000	-48.79	-48.79	-0.22	-0.22	180.00	180.00
4800.000	-55.58	-55.58	-0.24	-0.24	180.00	180.00
4900.000	-62.38	-62.38	-0.25	-0.25	180.00	180.00
5000.000	-69.17	-69.17	-0.26	-0.26	180.00	180.00
5100.000	-75.96	-75.96	-0.27	-0.27	180.00	180.00
5200.000	-82.75	-82.75	-0.27	-0.27	180.00	180.00
5300.000	-89.55	-89.55	-0.27	-0.27	180.00	180.00
5400.000	-96.34	-96.34	-0.26	-0.26	180.00	180.00
5500.000	-103.13	-103.13	-0.25	-0.25	180.00	180.00
5600.000	-109.92	-109.92	-0.24	-0.24	180.00	180.00
5700.000	-116.72	-116.72	-0.23	-0.23	180.00	180.00
5800.000	-123.51	-123.51	-0.21	-0.21	180.00	180.00
5900.000	-110.31	-110.31	-0.22	-0.22	180.00	180.00
6000.000	-117.10	-117.10	-0.20	-0.20	155.83	155.83
6100.000	-123.90	-123.90	-0.19	-0.19	55.83	55.83
6200.000	-130.69	-130.69	-0.17	-0.17	-0.00	-0.00
6300.000	-137.49	-137.49	-0.15	-0.15	-0.00	-0.00
6400.000	-144.29	-144.29	-0.13	-0.13	-0.00	-0.00
6500.000	-151.09	-151.09	-0.11	-0.11	-0.00	-0.00
6600.000	-157.89	-157.89	-0.09	-0.09	-0.00	-0.00
6700.000	-164.69	-164.69	-0.07	-0.07	-0.00	-0.00
6800.000	-171.49	-171.49	-0.05	-0.05	-0.00	-0.00
6900.000	-178.29	-178.29	-0.03	-0.03	-0.00	-0.00
7000.000	174.91	174.91	-0.01	-0.01	-0.00	-0.00
7100.000	168.12	168.12	0.01	0.01	-0.00	-0.00
7200.000	161.32	161.32	0.03	0.03	-0.00	-0.00
7300.000	154.52	154.52	0.05	0.05	-0.00	-0.00
7400.000	147.72	147.72	0.06	0.06	-0.00	-0.00
7500.000	140.92	140.92	0.08	0.08	-0.00	-0.00
7600.000	134.12	134.12	0.09	0.09	-0.00	-0.00
7700.000	127.33	127.33	0.10	0.10	-0.00	-0.00
7800.000	120.53	120.53	0.11	0.11	-0.00	-0.00
7900.000	113.74	113.74	0.11	0.11	-0.00	-0.00
8000.000	106.94	106.94	0.12	0.12	-0.00	-0.00
8100.000	100.15	100.15	0.12	0.12	-0.00	-0.00

TABLE 7-XXXI COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
8200.000	93.35	93.35	0.13	0.13	-0.00	-0.00
8300.000	86.56	86.56	0.13	0.13	-0.00	-0.00
8400.000	79.76	79.76	0.12	0.12	-0.00	-0.00
8500.000	72.97	72.97	0.12	0.12	-0.00	-0.00
8600.000	66.18	66.18	0.12	0.12	-0.00	-0.00
8700.000	59.39	59.39	0.11	0.11	-0.00	-0.00
8800.000	52.59	52.59	0.11	0.11	-0.00	-0.00
8900.000	45.80	45.80	0.10	0.10	-0.00	-0.00
9000.000	39.01	39.01	0.10	0.10	-0.00	-0.00
9100.000	32.22	32.22	0.09	0.09	-0.00	-0.00
9200.000	25.42	25.42	0.08	0.08	-0.00	-0.00
9300.000	18.63	18.63	0.08	0.08	-0.00	-0.00
9400.000	11.84	11.84	0.07	0.07	-0.00	-0.00
9500.000	5.05	5.05	0.06	0.06	-0.00	-0.00
9600.000	-1.74	-1.74	0.05	0.05	-0.00	-0.00
9700.000	-8.53	-8.53	0.05	0.05	-0.00	-0.00
9800.000	-15.31	-15.31	0.04	0.04	-0.00	-0.00
9900.000	-22.10	-22.10	0.04	0.04	-0.00	-0.00
10000.000	-28.89	-28.89	0.03	0.03	-0.00	-0.00
10100.000	-35.67	-35.67	0.02	0.02	-0.00	-0.00
10200.000	-42.46	-42.46	0.02	0.02	-0.00	-0.00
10300.000	-49.24	-49.24	0.01	0.01	-0.00	-0.00
10400.000	-56.03	-56.03	0.01	0.01	-0.00	-0.00
10500.000	-62.81	-62.81	0.01	0.01	-0.00	-0.00
10600.000	-69.59	-69.59	0.00	0.00	-0.00	-0.00
10700.000	-76.38	-76.38	-0.00	-0.00	-0.00	-0.00
10800.000	-83.16	-83.16	-0.01	-0.01	-0.00	-0.00
10900.000	-89.95	-89.95	-0.01	-0.01	-0.00	-0.00
11000.000	-96.73	-96.73	-0.02	-0.02	-0.00	-0.00
11100.000	-103.52	-103.52	-0.02	-0.02	-0.00	-0.00
11200.000	-110.30	-110.30	-0.03	-0.03	-0.00	-0.00
11300.000	-117.09	-117.09	-0.03	-0.03	-0.00	-0.00
11400.000	-123.88	-123.88	-0.04	-0.04	-0.00	-0.00
11500.000	-130.66	-130.66	-0.04	-0.04	-0.00	-0.00
11600.000	-137.45	-137.45	-0.05	-0.05	-0.00	-0.00
11700.000	-144.24	-144.24	-0.05	-0.05	-0.00	-0.00
11800.000	-151.04	-151.04	-0.06	-0.06	-0.00	-0.00
11900.000	-157.83	-157.83	-0.07	-0.07	-0.00	-0.00
12000.000	-164.62	-164.62	-0.07	-0.07	-0.00	-0.00
12100.000	-171.41	-171.41	-0.08	-0.08	-0.00	-0.00

TABLE 7-XXXI
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
12200.000	-178.20	-178.20	-0.09	-0.09	-0.00	-0.00
12300.000	175.00	175.00	-0.09	-0.09	-0.00	-0.00
12400.000	168.21	168.21	-0.10	-0.10	-0.00	-0.00
12500.000	161.42	161.42	-0.11	-0.11	-0.00	-0.00
12600.000	154.63	154.63	-0.11	-0.11	-0.00	-0.00
12700.000	147.84	147.84	-0.12	-0.12	-0.00	-0.00
12800.000	141.05	141.05	-0.12	-0.12	-0.00	-0.00
12900.000	134.26	134.26	-0.12	-0.12	-0.00	-0.00
13000.000	127.47	127.47	-0.12	-0.12	-0.00	-0.00
13100.000	120.68	120.68	-0.12	-0.12	-0.00	-0.00
13200.000	113.89	113.89	-0.12	-0.12	-0.00	-0.00
13300.000	107.11	107.11	-0.12	-0.12	-0.00	-0.00
13400.000	100.32	100.32	-0.11	-0.11	-0.00	-0.00
13500.000	93.53	93.53	-0.11	-0.11	-0.00	-0.00
13600.000	86.75	86.75	-0.10	-0.10	-0.00	-0.00
13700.000	79.96	79.96	-0.09	-0.09	-0.00	-0.00
13800.000	73.18	73.18	-0.08	-0.08	-0.00	-0.00
13900.000	66.39	66.39	-0.06	-0.06	-0.00	-0.00
14000.000	59.61	59.61	-0.05	-0.05	-0.00	-0.00
14100.000	52.82	52.82	-0.03	-0.03	-0.00	-0.00
14200.000	46.04	46.04	-0.02	-0.02	-0.00	-0.00
14300.000	39.25	39.25	0.00	0.00	-0.00	-0.00
14400.000	32.47	32.47	0.02	0.02	-0.00	-0.00
14500.000	25.68	25.68	0.04	0.04	-0.00	-0.00
14600.000	18.90	18.90	0.06	0.06	-0.00	-0.00
14700.000	12.12	12.12	0.09	0.09	-0.00	-0.00
14800.000	5.34	5.34	0.11	0.11	-0.00	-0.00
14900.000	-1.44	-1.44	0.13	0.13	-0.00	-0.00
15000.000	-8.22	-8.22	0.15	0.15	-0.00	-0.00
15100.000	-15.00	-15.00	0.16	0.16	-0.00	-0.00
15200.000	-21.78	-21.78	0.18	0.18	-0.00	-0.00
15300.000	-28.56	-28.56	0.20	0.20	-0.00	-0.00
15400.000	-35.34	-35.34	0.21	0.21	-0.00	-0.00
15500.000	-42.12	-42.12	0.22	0.22	-0.00	-0.00
15600.000	-48.89	-48.89	0.23	0.23	-0.00	-0.00
15700.000	-55.67	-55.67	0.24	0.24	-0.00	-0.00
15800.000	-62.44	-62.44	0.24	0.24	-0.00	-0.00
15900.000	-69.22	-69.22	0.24	0.24	-0.00	-0.00
16000.000	-76.00	-76.00	0.23	0.23	-0.00	-0.00
16100.000	-82.77	-82.77	0.23	0.23	-0.00	-0.00

TABLE 7-XXXI
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
16200.000	-89.55	-89.55	0.22	0.22	-0.00	-0.00
16300.000	-96.33	-96.33	0.20	0.20	-0.00	-0.00
16400.000	-103.10	-103.10	0.19	0.19	-0.00	-0.00
16500.000	-109.88	-109.88	0.17	0.17	-0.00	-0.00
16550.000	-113.27	-113.27	0.16	0.16	-0.00	-0.00

TABLE 7-XXXII

MACH NUMBER, RELATIVE FLIGHT-PATH
 ANGLE, ANGLE OF ATTACK, AND NORMAL
 FORCE ANGLE - LIFTOFF THROUGH
 PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
0.000	0.00	0.000	0.00	0.
5.000	0.03	89.830	0.03	89.
10.000	0.06	89.794	0.09	90.
12.000	0.08	89.777	0.11	90.
15.000	0.10	89.750	0.25	89.
20.000	0.15	89.644	0.43	93.
25.000	0.20	88.609	0.29	96.
30.000	0.25	87.113	0.19	102.
35.000	0.32	85.145	0.06	140.
40.000	0.39	82.764	0.08	-127.
45.000	0.47	79.981	0.12	-114.
50.000	0.57	76.862	0.14	-110.
55.000	0.68	73.488	0.14	-110.
60.000	0.80	69.942	0.12	-114.
65.000	0.94	66.303	0.11	-116.
70.000	1.11	62.657	0.12	-114.
75.000	1.30	59.070	0.15	-114.
80.000	1.53	55.598	0.17	-113.
82.250	1.64	54.086	0.17	-113.
85.000	1.78	52.285	0.18	-112.
90.000	2.05	49.157	0.17	-111.
95.000	2.30	46.225	0.12	-116.
100.000	2.55	43.485	0.06	-154.
105.000	2.83	40.909	0.39	98.
110.000	3.14	38.484	0.41	98.
115.000	3.46	36.286	0.19	109.
120.000	3.79	34.299	0.11	126.
125.000	4.14	32.488	0.12	127.
130.000	4.50	30.837	0.13	126.
135.000	4.88	29.331	0.14	125.
140.000	5.31	27.963	0.15	123.
145.000	5.87	26.720	0.17	122.
147.329	6.19	26.182	0.17	121.
150.000	6.51	25.593	0.18	121.
155.000	7.18	24.555	0.14	134.
159.329	7.86	23.754	0.74	-98.
159.329	7.86	23.754	0.74	-98.
159.459	7.87	23.730	0.77	-98.
160.000	7.89	23.631	0.91	-97.
163.759	8.05	22.945	2.00	-94.

TABLE 7-XXXII

MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
165.000	8.13	22.725	2.32	-93.
165.859	8.18	22.573	2.50	-93.
170.000	8.46	21.852	3.22	-92.
175.000	8.80	21.000	4.19	-92.
180.000	9.14	20.170	5.13	-92.
185.000	9.23	19.363	6.05	-92.
189.559	9.22	18.647	6.87	-91.
190.000	9.20	18.579	6.95	-91.
194.559	9.03	17.885	7.76	-91.
195.000	9.01	17.819	7.84	-91.
200.000	8.86	17.084	8.70	-91.
205.000	8.60	16.395	13.49	-91.
210.000	8.37	15.779	14.01	-91.
215.000	8.15	15.167	14.17	-91.
220.000	7.76	14.571	14.39	-91.
225.000	7.45	13.989	14.57	-91.
230.000	7.16	13.421	14.72	-91.
235.000	6.70	12.867	14.88	-91.
240.000	6.35	12.327	15.03	-91.
245.000	6.07	11.802	15.16	-91.
250.000	5.85	11.290	15.29	-91.
255.000	5.67	10.793	15.40	-91.
260.000	5.53	10.309	15.50	-91.
265.000	5.41	9.840	15.58	-91.
270.000	5.31	9.384	15.66	-91.
275.000	5.22	8.942	15.72	-91.
280.000	5.16	8.514	15.76	-91.
285.000	5.10	8.098	15.80	-91.
290.000	5.09	7.696	15.82	-91.
295.000	5.08	7.307	15.83	-91.
300.000	5.07	6.931	15.82	-91.
305.000	5.07	6.568	15.81	-91.
310.000	5.08	6.217	15.78	-91.
315.000	5.11	5.878	15.74	-91.
320.000	5.15	5.552	15.70	-91.
325.000	5.19	5.238	15.64	-91.
330.000	5.23	4.935	15.56	-92.
335.000	5.27	4.645	15.48	-92.
340.000	5.31	4.365	15.39	-92.
345.000	5.37	4.097	15.29	-92.

TABLE 7-XXXII

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
350.000	5.43			
355.000	5.49	3.841	15.18	-92.
360.000	5.55	3.595	15.06	-92.
365.000	5.62	3.360	14.93	-92.
370.000	5.69	3.136	14.80	-92.
375.000	5.76	2.922	14.65	-92.
380.000	5.83	2.719	14.50	-92.
385.000	5.91	2.526	14.34	-92.
390.000	5.98	2.344	14.17	-92.
395.000	6.06	2.171	14.00	-92.
400.000	6.15	2.008	13.81	-92.
405.000	6.23	1.856	13.63	-92.
410.000	6.32	1.712	13.43	-92.
415.000	6.41	1.579	13.23	-92.
420.000	6.50	1.454	13.02	-92.
425.000	6.60	1.340	12.81	-92.
430.000	6.69	1.234	12.59	-92.
435.000	6.79	1.138	12.37	-92.
437.627	6.85	1.051	12.14	-93.
440.000	6.89	1.009	12.02	-93.
445.000	6.97	0.956	11.92	-93.
450.000	7.06	0.849	11.72	-93.
455.000	7.15	0.751	11.52	-93.
460.000	7.24	0.660	11.31	-93.
465.000	7.33	0.577	11.10	-93.
470.000	7.43	0.502	10.89	-93.
475.000	7.53	0.434	10.68	-93.
480.000	7.63	0.374	10.46	-93.
485.000	7.73	0.321	10.25	-93.
490.000	7.84	0.276	10.03	-93.
495.000	7.95	0.239	9.81	-93.
500.000	8.06	0.209	9.59	-94.
505.000	8.17	0.187	9.37	-94.
510.000	8.29	0.173	9.14	-94.
515.000	8.41	0.166	8.92	-94.
520.000	8.53	0.167	8.69	-94.
525.000	8.66	0.175	8.46	-94.
530.000	8.78	0.192	8.23	-94.
535.000	8.91	0.216	8.00	-94.
537.424	8.98	0.247	7.76	-95.
		0.266	7.64	-95.

TABLE 7-XXXII

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
537.424	8.98	0.266	7.64	-95.
537.442	8.98	0.265	7.63	-95.
540.000	8.98	0.229	7.59	-95.
543.142	8.98	0.183	7.70	-95.
545.000	8.99	0.168	7.80	-95.
545.742	9.00	0.162	7.64	-95.
549.542	9.03	0.133	7.34	-95.
550.000	9.03	0.129	7.34	-95.
555.000	9.07	0.094	7.22	-95.
560.000	9.12	0.062	7.04	-95.
565.000	9.16	0.032	6.86	-96.
570.000	9.21	0.004	6.64	-96.
575.000	9.25	-0.021	6.54	-96.
580.000	9.30	-0.043	6.42	-96.
585.000	9.34	-0.062	6.31	-97.
590.000	9.39	-0.078	6.22	-97.
595.000	9.44	-0.091	6.12	-97.
600.000	9.49	-0.102	6.04	-97.
605.000	9.54	-0.109	5.96	-97.
610.000	9.59	-0.113	5.88	-97.
615.000	9.64	-0.114	5.81	-97.
620.000	9.69	-0.112	5.74	-97.
625.000	9.74	-0.107	5.68	-97.
630.000	9.79	-0.098	5.63	-97.
635.000	9.84	-0.086	5.58	-97.
640.000	9.89	-0.071	5.56	-97.
645.000	9.95	-0.053	5.55	-97.
650.000	10.00	-0.031	5.28	-96.
655.000	10.05	-0.005	5.97	-97.
655.832	10.06	0.000	6.00	-97.
655.832	10.06	0.000	5.91	-101.
660.000	10.06	0.000	2.12	-124.
670.000	10.06	-0.000	1.18	180.
680.000	10.06	-0.000	1.20	180.
690.000	10.07	-0.001	1.22	180.
700.000	10.07	-0.001	1.23	180.
710.000	10.07	-0.001	1.25	180.
720.000	10.07	-0.001	1.26	180.
730.000	10.07	-0.001	1.29	180.
739.832	10.08	-0.002	1.30	180.

TABLE 7-XXXII

MACH NUMBER, RELATIVE FLIGHT-PATH
 ANGLE, ANGLE OF ATTACK, AND NORMAL
 FORCE ANGLE - LIFTOFF THROUGH
 PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
740.000	10.08	-0.002	1.30	180.
750.000	10.08	-0.002	1.31	180.
760.000	10.08	-0.002	1.33	180.
770.000	10.08	-0.002	1.34	180.
780.000	10.08	-0.002	1.36	180.
790.000	10.08	-0.003	1.37	180.
800.000	10.09	-0.003	1.39	180.
900.000	10.11	-0.005	1.52	180.
1000.000	10.12	-0.007	1.63	180.
1100.000	10.14	-0.009	1.72	180.
1200.000	10.15	-0.011	1.79	180.
1300.000	10.17	-0.013	1.83	180.
1400.000	10.17	-0.014	1.85	180.
1500.000	10.18	-0.014	1.83	180.
1600.000	10.18	-0.014	1.80	180.
1700.000	10.17	-0.014	1.73	180.
1800.000	10.16	-0.013	1.65	180.
1900.000	10.15	-0.011	1.54	180.
2000.000	10.14	-0.008	1.40	180.
2100.000	10.12	-0.005	1.25	180.
2200.000	10.11	-0.001	1.08	180.
2300.000	10.09	0.004	0.90	180.
2400.000	10.07	0.009	0.70	180.
2500.000	10.06	0.014	0.49	180.
2600.000	10.05	0.019	0.28	180.
2700.000	10.04	0.025	0.06	179.
2800.000	10.03	0.030	0.16	0.
2900.000	10.02	0.035	0.38	0.
3000.000	10.02	0.040	0.59	0.
3100.000	10.02	0.044	0.79	0.
3200.000	10.01	0.047	0.99	0.
3300.000	10.01	0.049	1.16	0.
3400.000	10.01	0.051	1.33	0.
3500.000	10.01	0.051	1.47	0.
3600.000	10.01	0.051	20.06	86.
3700.000	10.01	0.050	20.07	85.
3800.000	10.00	0.048	20.08	85.
3900.000	10.00	0.045	20.08	85.
4000.000	9.99	0.041	20.08	85.
4100.000	9.98	0.038	20.08	85.

TABLE 7-XXXII MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
4200.000	9.97	0.033	20.08	85.
4300.000	9.95	0.029	20.08	85.
4400.000	9.94	0.024	20.07	85.
4500.000	9.92	0.019	20.06	86.
4600.000	9.91	0.015	20.05	86.
4700.000	9.89	0.010	20.04	86.
4800.000	9.88	0.006	20.03	87.
4900.000	9.87	0.003	20.02	87.
5000.000	9.86	-0.001	20.01	88.
5100.000	9.85	-0.004	20.01	88.
5200.000	9.84	-0.007	20.00	89.
5300.000	9.84	-0.009	20.00	90.
5400.000	9.84	-0.011	20.00	90.
5500.000	9.85	-0.013	20.00	91.
5600.000	9.86	-0.015	20.01	91.
5700.000	9.87	-0.016	20.01	92.
5800.000	9.88	-0.018	20.02	93.
5900.000	9.90	-0.019	1.09	-180.
6000.000	9.92	-0.020	1.25	180.
6100.000	9.93	-0.021	1.41	180.
6200.000	9.95	-0.022	1.54	180.
6300.000	9.97	-0.023	1.65	180.
6400.000	9.98	-0.024	1.74	180.
6500.000	10.00	-0.024	1.80	180.
6600.000	10.01	-0.024	1.84	180.
6700.000	10.01	-0.024	1.85	180.
6800.000	10.02	-0.023	1.83	180.
6900.000	10.02	-0.021	1.79	180.
7000.000	10.02	-0.019	1.73	180.
7100.000	10.01	-0.017	1.64	180.
7200.000	10.01	-0.014	1.52	180.
7300.000	10.00	-0.010	1.39	180.
7400.000	9.99	-0.005	1.24	180.
7500.000	9.98	-0.001	1.06	180.
7600.000	9.96	0.005	0.88	180.
7700.000	9.95	0.011	0.68	180.
7800.000	9.94	0.016	0.47	180.
7900.000	9.93	0.022	0.26	180.
8000.000	9.92	0.028	0.04	178.
8100.000	9.92	0.034	0.18	0.

TABLE 7-XXXII MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
8200.000	9.91	0.039	0.40	0.
8300.000	9.91	0.043	0.61	0.
8400.000	9.91	0.047	0.81	0.
8500.000	9.90	0.050	1.00	0.
8600.000	9.90	0.052	1.18	0.
8700.000	9.90	0.053	1.34	0.
8800.000	9.90	0.054	1.48	0.
8900.000	9.90	0.053	1.60	0.
9000.000	9.90	0.051	1.70	0.
9100.000	9.89	0.049	1.78	0.
9200.000	9.88	0.045	1.83	0.
9300.000	9.88	0.041	1.85	0.
9400.000	9.87	0.037	1.85	0.
9500.000	9.85	0.032	1.82	0.
9600.000	9.84	0.027	1.76	0.
9700.000	9.83	0.022	1.69	0.
9800.000	9.81	0.017	1.58	0.
9900.000	9.80	0.012	1.46	0.
10000.000	9.78	0.007	1.31	0.
10100.000	9.77	0.002	1.15	0.
10200.000	9.76	-0.002	0.97	0.
10300.000	9.75	-0.005	0.78	0.
10400.000	9.74	-0.009	0.57	0.
10500.000	9.74	-0.012	0.36	0.
10600.000	9.74	-0.014	0.14	0.
10700.000	9.74	-0.016	0.08	-0.
10800.000	9.75	-0.018	0.30	-179.
10900.000	9.76	-0.020	0.51	-180.
11000.000	9.77	-0.021	0.72	-180.
11100.000	9.79	-0.022	0.91	-180.
11200.000	9.80	-0.024	1.10	-180.
11300.000	9.82	-0.024	1.27	-180.
11400.000	9.84	-0.025	1.42	-180.
11500.000	9.86	-0.026	1.55	-180.
11600.000	9.88	-0.026	1.66	-180.
11700.000	9.89	-0.027	1.74	-180.
11800.000	9.90	-0.027	1.80	-180.
11900.000	9.92	-0.026	1.84	-180.
12000.000	9.92	-0.025	1.85	-180.
12100.000	9.93	-0.024	1.83	-180.

TABLE 7-XXXII MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
12200.000	9.93	-0.022	1.79	-180.
12300.000	9.93	-0.020	1.73	-180.
12400.000	9.92	-0.017	1.63	-180.
12500.000	9.92	-0.013	1.52	-180.
12600.000	9.91	-0.009	1.38	-180.
12700.000	9.90	-0.004	1.23	180.
12800.000	9.88	0.001	1.06	180.
12900.000	9.87	0.007	0.87	180.
13000.000	9.86	0.013	0.67	180.
13100.000	9.85	0.019	0.46	180.
13200.000	9.84	0.025	0.25	180.
13300.000	9.83	0.031	0.03	176.
13400.000	9.82	0.037	0.19	0.
13500.000	9.82	0.042	0.41	0.
13600.000	9.81	0.047	0.62	0.
13700.000	9.81	0.051	0.82	0.
13800.000	9.81	0.053	1.01	-0.
13900.000	9.81	0.055	1.19	-0.
14000.000	9.80	0.056	1.35	-0.
14100.000	9.80	0.056	1.49	-0.
14200.000	9.80	0.055	1.61	-0.
14300.000	9.80	0.053	1.71	-0.
14400.000	9.79	0.050	1.78	-0.
14500.000	9.78	0.047	1.83	-0.
14600.000	9.78	0.042	1.85	-0.
14700.000	9.77	0.038	1.85	-0.
14800.000	9.75	0.032	1.82	-0.
14900.000	9.74	0.027	1.77	-0.
15000.000	9.73	0.021	1.69	-0.
15100.000	9.71	0.015	1.58	-0.
15200.000	9.70	0.010	1.46	-0.
15300.000	9.69	0.005	1.31	-0.
15400.000	9.68	-0.000	1.15	-0.
15500.000	9.66	-0.005	0.97	-0.
15600.000	9.66	-0.009	0.78	-0.
15700.000	9.65	-0.013	0.57	-0.
15800.000	9.65	-0.016	0.36	-0.
15900.000	9.65	-0.018	0.14	-0.
16000.000	9.65	-0.021	0.08	-179.
16100.000	9.66	-0.023	0.30	-180.

TABLE 7-XXXII

MACH NUMBER, RELATIVE FLIGHT-PATH
 ANGLE, ANGLE OF ATTACK, AND NORMAL
 FORCE ANGLE - LIFTOFF THROUGH
 PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
16200.000	9.67	-0.024	0.51	-180.
16300.000	9.69	-0.026	0.72	-180.
16400.000	9.70	-0.027	0.91	-180.
16500.000	9.72	-0.028	1.10	-180.
16550.000	9.73	-0.028	1.18	-180.

TABLE 7-XXXIII DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (99-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
0.000	0.0	0.	0.
5.000	1.3	0.	0.
10.000	6.0	1.	610.
12.000	9.1	1.	1398.
15.000	15.3	4.	3815.
20.000	30.5	13.	14127.
25.000	52.8	15.	39880.
30.000	83.7	16.	95015.
35.000	124.1	7.	200944.
40.000	174.5	13.	388632.
45.000	234.9	27.	700688.
50.000	304.2	42.	1192237.
55.000	380.4	53.	1930859.
60.000	460.3	54.	2994395.
65.000	538.9	57.	4464521.
70.000	609.0	75.	6414248.
75.000	663.9	98.	8892696.
80.000	696.6	116.	11920543.
82.250	700.2	121.	13453423.
85.000	692.9	123.	15448616.
90.000	643.2	107.	19305850.
95.000	552.0	64.	23208774.
100.000	456.4	25.	26907309.
105.000	369.0	146.	30316023.
110.000	293.5	120.	33393182.
115.000	227.9	44.	36100803.
120.000	172.3	19.	38407157.
125.000	127.6	15.	40324760.
130.000	92.9	12.	41885637.
135.000	66.9	9.	43135346.
140.000	48.0	7.	44126199.
145.000	34.8	6.	44912006.
147.329	29.9	5.	45222113.
150.000	24.3	4.	45531988.
155.000	16.0	2.	45984496.
159.329	10.8	8.	46264555.
159.329	10.8	8.	46264555.
159.459	10.6	8.	46271565.
160.000	9.9	9.	46299638.
163.759	6.1	12.	46449635.

TABLE 7-XXXIII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
165.000	5.2	12.	46485456.
165.859	4.7	12.	46507249.
170.000	2.7	9.	46584894.
175.000	1.4	6.	46637487.
180.000	0.7	4.	46664746.
185.000	0.3	2.	46678235.
189.559	0.2	1.	46684384.
190.000	0.2	1.	46684787.
194.559	0.1	1.	46687757.
195.000	0.1	1.	46687956.
200.000	0.0	0.	46689576.
205.000	0.0	0.	46690464.
210.000	0.0	0.	46690981.
215.000	0.0	0.	46691287.
220.000	0.0	0.	46691473.
225.000	0.0	0.	46691592.
230.000	0.0	0.	46691671.
235.000	0.0	0.	46691725.
240.000	0.0	0.	46691762.
245.000	0.0	0.	46691791.
250.000	0.0	0.	46691813.
255.000	0.0	0.	46691830.
260.000	0.0	0.	46691845.
265.000	0.0	0.	46691857.
270.000	0.0	0.	46691867.
275.000	0.0	0.	46691877.
280.000	0.0	0.	46691884.
285.000	0.0	0.	46691892.
290.000	0.0	0.	46691899.
295.000	0.0	0.	46691905.
300.000	0.0	0.	46691910.
305.000	0.0	0.	46691915.
310.000	0.0	0.	46691920.
315.000	0.0	0.	46691925.
320.000	0.0	0.	46691930.
325.000	0.0	0.	46691935.
330.000	0.0	0.	46691940.
335.000	0.0	0.	46691945.
340.000	0.0	0.	46691950.
345.000	0.0	0.	46691955.

TABLE 7-XXXIII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
350.000	0.0	0.	46691960.
355.000	0.0	0.	46691965.
360.000	0.0	0.	46691970.
365.000	0.0	0.	46691975.
370.000	0.0	0.	46691980.
375.000	0.0	0.	46691985.
380.000	0.0	0.	46691990.
385.000	0.0	0.	46691995.
390.000	0.0	0.	46692000.
395.000	0.0	0.	46692005.
400.000	0.0	0.	46692010.
405.000	0.0	0.	46692015.
410.000	0.0	0.	46692020.
415.000	0.0	0.	46692025.
420.000	0.0	0.	46692030.
425.000	0.0	0.	46692035.
430.000	0.0	0.	46692042.
435.000	0.0	0.	46692050.
437.627	0.0	0.	46692054.
440.000	0.0	0.	46692057.
445.000	0.0	0.	46692065.
450.000	0.0	0.	46692072.
455.000	0.0	0.	46692080.
460.000	0.0	0.	46692087.
465.000	0.0	0.	46692095.
470.000	0.0	0.	46692102.
475.000	0.0	0.	46692110.
480.000	0.0	0.	46692120.
485.000	0.0	0.	46692130.
490.000	0.0	0.	46692140.
495.000	0.0	0.	46692150.
500.000	0.0	0.	46692160.
505.000	0.0	0.	46692170.
510.000	0.0	0.	46692183.
515.000	0.0	0.	46692195.
520.000	0.0	0.	46692208.
525.000	0.0	0.	46692220.
530.000	0.0	0.	46692233.
535.000	0.0	0.	46692248.
537.424	0.0	0.	46692255.

TABLE 7-XXXIII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
537.424	0.0	0.	46692255.
537.442	0.0	0.	46692255.
540.000	0.0	0.	46692263.
543.142	0.0	0.	46692272.
545.000	0.0	0.	46692277.
545.742	0.0	0.	46692279.
549.542	0.0	0.	46692290.
550.000	0.0	0.	46692291.
555.000	0.0	0.	46692306.
560.000	0.0	0.	46692321.
565.000	0.0	0.	46692336.
570.000	0.0	0.	46692351.
575.000	0.0	0.	46692366.
580.000	0.0	0.	46692387.
585.000	0.0	0.	46692399.
590.000	0.0	0.	46692417.
595.000	0.0	0.	46692434.
600.000	0.0	0.	46692452.
605.000	0.0	0.	46692469.
610.000	0.0	0.	46692487.
615.000	0.0	0.	46692504.
620.000	0.0	0.	46692522.
625.000	0.0	0.	46692542.
630.000	0.0	0.	46692562.
635.000	0.0	0.	46692582.
640.000	0.0	0.	46692602.
645.000	0.0	0.	46692622.
650.000	0.0	0.	46692642.
655.000	0.0	0.	46692662.
655.832	0.0	0.	46692665.
655.832	0.0	0.	46692665.
660.000	0.0	0.	46692665.
670.000	0.0	0.	46692665.
680.000	0.0	0.	46692665.
690.000	0.0	0.	46692665.
700.000	0.0	0.	46692665.
710.000	0.0	0.	46692665.
720.000	0.0	0.	46692665.
730.000	0.0	0.	46692665.
739.832	0.0	0.	46692665.

TABLE 7-XXXIII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
740.000	0.0	0.	46692665.
750.000	0.0	0.	46692665.
760.000	0.0	0.	46692665.
770.000	0.0	0.	46692665.
780.000	0.0	0.	46692665.
790.000	0.0	0.	46692665.
800.000	0.0	0.	46692665.
900.000	0.0	0.	46692665.
1000.000	0.0	0.	46692665.
1100.000	0.0	0.	46692665.
1200.000	0.0	0.	46692665.
1300.000	0.0	0.	46692665.
1400.000	0.0	0.	46692665.
1500.000	0.0	0.	46692665.
1600.000	0.0	0.	46692665.
1700.000	0.0	0.	46692665.
1800.000	0.0	0.	46692665.
1900.000	0.0	0.	46692665.
2000.000	0.0	0.	46692665.
2100.000	0.0	0.	46692665.
2200.000	0.0	0.	46692665.
2300.000	0.0	0.	46692665.
2400.000	0.0	0.	46692665.
2500.000	0.0	0.	46692665.
2600.000	0.0	0.	46692665.
2700.000	0.0	0.	46692665.
2800.000	0.0	0.	46692665.
2900.000	0.0	0.	46692665.
3000.000	0.0	0.	46692665.
3100.000	0.0	0.	46692665.
3200.000	0.0	0.	46692665.
3300.000	0.0	0.	46692665.
3400.000	0.0	0.	46692665.
3500.000	0.0	0.	46692665.
3600.000	0.0	0.	46692665.
3700.000	0.0	0.	46692665.
3800.000	0.0	0.	46692665.
3900.000	0.0	0.	46692665.
4000.000	0.0	0.	46692665.
4100.000	0.0	0.	46692665.

TABLE 7-XXXIII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT) ²)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT) ²)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT) ²)
4200.000	0.0	0.	46692665.
4300.000	0.0	0.	46692665.
4400.000	0.0	0.	46692665.
4500.000	0.0	0.	46692665.
4600.000	0.0	0.	46692665.
4700.000	0.0	0.	46692665.
4800.000	0.0	0.	46692665.
4900.000	0.0	0.	46692665.
5000.000	0.0	0.	46692665.
5100.000	0.0	0.	46692665.
5200.000	0.0	0.	46692665.
5300.000	0.0	0.	46692665.
5400.000	0.0	0.	46692665.
5500.000	0.0	0.	46692665.
5600.000	0.0	0.	46692665.
5700.000	0.0	0.	46692665.
5800.000	0.0	0.	46692665.
5900.000	0.0	0.	46692665.
6000.000	0.0	0.	46692665.
6100.000	0.0	0.	46692665.
6200.000	0.0	0.	46692665.
6300.000	0.0	0.	46692665.
6400.000	0.0	0.	46692665.
6500.000	0.0	0.	46692665.
6600.000	0.0	0.	46692665.
6700.000	0.0	0.	46692665.
6800.000	0.0	0.	46692665.
6900.000	0.0	0.	46692665.
7000.000	0.0	0.	46692665.
7100.000	0.0	0.	46692665.
7200.000	0.0	0.	46692665.
7300.000	0.0	0.	46692665.
7400.000	0.0	0.	46692665.
7500.000	0.0	0.	46692665.
7600.000	0.0	0.	46692665.
7700.000	0.0	0.	46692665.
7800.000	0.0	0.	46692665.
7900.000	0.0	0.	46692665.
8000.000	0.0	0.	46692665.
8100.000	0.0	0.	46692665.

TABLE 7- DYNAMIC PRESSURE, DYNAMIC PRESSURE TIMES ALPHA, AND AERODYNAMIC HEATING INDICATOR - LIFTOFF THROUGH PARKING BIT (99-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	C	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
8200.000	0.0	0.	46692665.
8300.000	0.0	0.	46692665.
8400.000	0.0	0.	46692665.
8500.000	0.0	0.	46692665.
8600.000	0.0	0.	46692665.
8700.000	0.0	0.	46692665.
8800.000	0.0	0.	46692665.
8900.000	0.0	0.	46692665.
9000.000	0.0	0.	46692665.
9100.000	0.0	0.	46692665.
9200.000	0.0	0.	46692665.
9300.000	0.0	0.	46692665.
9400.000	0.0	0.	46692665.
9500.000	0.0	0.	46692665.
9600.000	0.0	0.	46692665.
9700.000	0.0	0.	46692665.
9800.000	0.0	0.	46692665.
9900.000	1.0	0.	46692665.
10000.000	2.0	0.	46692665.
10100.000	3.0	0.	46692665.
10200.000	0.0	0.	46692665.
10300.000	0.0	0.	46692665.
10400.000	0.0	0.	46692665.
10500.000	0.0	0.	46692665.
10600.000	0.0	0.	46692665.
10700.000	0.0	0.	46692665.
10800.000	0.0	0.	46692665.
10900.000	0.0	0.	46692665.
11000.000	0.0	0.	46692665.
11100.000	0.0	0.	46692665.
11200.000	0.0	0.	46692665.
11300.000	0.0	0.	46692665.
11400.000	0.0	0.	46692665.
11500.000	0.0	0.	46692665.
11600.000	0.0	0.	46692665.
11700.000	0.0	0.	46692665.
11800.000	0.0	0.	46692665.
11900.000	0.0	0.	46692665.
12000.000	0.0	0.	46692665.
12100.000	0.0	0.	46692665.

TABLE 7-XXXIII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
12200.000	0.0	0.	46692665.
12300.000	0.0	0.	46692665.
12400.000	0.0	0.	46692665.
12500.000	0.0	0.	46692665.
12600.000	0.0	0.	46692665.
12700.000	0.0	0.	46692665.
12800.000	0.0	0.	46692665.
12900.000	0.0	0.	46692665.
13000.000	0.0	0.	46692665.
13100.000	0.0	0.	46692665.
13200.000	0.0	0.	46692665.
13300.000	0.0	0.	46692665.
13400.000	0.0	0.	46692665.
13500.000	0.0	0.	46692665.
13600.000	0.0	0.	46692665.
13700.000	0.0	0.	46692665.
13800.000	0.0	0.	46692665.
13900.000	0.0	0.	46692665.
14000.000	0.0	0.	46692665.
14100.000	0.0	0.	46692665.
14200.000	0.0	0.	46692665.
14300.000	0.0	0.	46692665.
14400.000	0.0	0.	46692665.
14500.000	0.0	0.	46692665.
14600.000	0.0	0.	46692665.
14700.000	0.0	0.	46692665.
14800.000	0.0	0.	46692665.
14900.000	0.0	0.	46692665.
15000.000	0.0	0.	46692665.
15100.000	0.0	0.	46692665.
15200.000	0.0	0.	46692665.
15300.000	0.0	0.	46692665.
15400.000	0.0	0.	46692665.
15500.000	0.0	0.	46692665.
15600.000	0.0	0.	46692665.
15700.000	0.0	0.	46692665.
15800.000	0.0	0.	46692665.
15900.000	0.0	0.	46692665.
16000.000	0.0	0.	46692665.
16100.000	0.0	0.	46692665.

TABLE 7-XXXIII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
16200.000	0.0	0.	46692665.
16300.000	0.0	0.	46692665.
16400.000	0.0	0.	46692665.
16500.000	0.0	0.	46692665.
16550.000	0.0	0.	46692665.

TABLE 7-XXXIV NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
0.000	0.	12697.	6373344.	28.447
5.000	3.	1305.	6373370.	28.447
10.000	37.	5946.	6373451.	28.447
12.000	68.	8992.	6373501.	28.447
15.000	265.	14743.	6373595.	28.447
20.000	904.	20438.	6373811.	28.447
25.000	1060.	18025.	6374106.	28.447
30.000	1099.	25727.	6374492.	28.447
35.000	507.	36355.	6374979.	28.447
40.000	936.	51448.	6375577.	28.447
45.000	1936.	72571.	6376297.	28.447
50.000	3094.	103317.	6377150.	28.446
55.000	3986.	144674.	6378146.	28.446
60.000	4274.	208373.	6379291.	28.446
65.000	4677.	301247.	6380593.	28.445
70.000	6010.	415061.	6382053.	28.444
75.000	7269.	438526.	6383673.	28.443
80.000	8130.	389653.	6385455.	28.441
82.250	8384.	366396.	6386312.	28.440
85.000	8340.	332458.	6387406.	28.439
90.000	7062.	269893.	6389529.	28.436
95.000	4245.	208514.	6391829.	28.433
100.000	1651.	153919.	6394308.	28.430
105.000	9563.	112014.	6396968.	28.426
110.000	7912.	79259.	6399808.	28.421
115.000	2895.	54484.	6402827.	28.415
120.000	1273.	36131.	6406030.	28.408
125.000	976.	23336.	6409422.	28.401
130.000	783.	14883.	6413008.	28.392
135.000	619.	9230.	6416794.	28.383
140.000	489.	5494.	6420789.	28.372
145.000	389.	2856.	6425006.	28.360
147.329	348.	1802.	6427050.	28.353
150.000	293.	879.	6429445.	28.346
155.000	154.	-530.	6434049.	28.331
159.329	542.	-1270.	6438170.	28.317
159.329	274.	2055.	6438170.	28.317
159.459	281.	2020.	6438295.	28.317
160.000	307.	1881.	6438817.	28.315
163.759	416.	1139.	6442380.	28.302

TABLE 7-XXXIV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
165.000	441.	967.	6443534.	28.298
165.859	437.	862.	6444328.	28.295
170.000	357.	491.	6448098.	28.281
175.00C	253.	243.	6452534.	28.264
180.000	163.	118.	6456844.	28.246
185.00C	94.	55.	6461030.	28.228
189.559	55.	28.	6464741.	28.211
190.000	52.	26.	6465094.	28.209
194.559	30.	14.	6468696.	28.192
195.00C	29.	13.	6469039.	28.190
200.000	17.	7.	6472868.	28.170
205.00C	16.	4.	6476584.	28.150
210.000	9.	2.	6480200.	28.130
215.000	6.	1.	6483721.	28.109
220.000	3.	1.	6487147.	28.088
225.000	2.	1.	6490478.	28.066
230.000	2.	0.	6493716.	28.044
235.000	1.	0.	6496861.	28.022
240.000	1.	0.	6499914.	27.998
245.000	1.	0.	6502877.	27.975
250.000	0.	0.	6505750.	27.951
255.000	0.	0.	6508534.	27.926
260.000	0.	0.	6511230.	27.901
265.000	0.	0.	6513839.	27.875
270.000	0.	0.	6516363.	27.849
275.000	0.	0.	6518801.	27.822
280.000	0.	0.	6521157.	27.795
285.000	0.	0.	6523429.	27.766
290.000	0.	0.	6525620.	27.738
295.00C	0.	0.	6527731.	27.709
300.000	0.	0.	6529762.	27.679
305.000	0.	0.	6531716.	27.648
310.00C	0.	0.	6533593.	27.617
315.00C	0.	0.	6535394.	27.585
320.00C	0.	0.	6537121.	27.552
325.000	0.	0.	6538774.	27.519
330.000	0.	0.	6540356.	27.485
335.000	0.	0.	6541868.	27.450
340.000	0.	0.	6543311.	27.414
345.000	0.	0.	6544686.	27.377

TABLE 7-XXXIV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
350.000	0.	0.	654599	27.340
355.000	0.	0.	654724	27.302
360.000	0.	0.	654842	27.263
365.000	0.	0.	654954	27.223
370.000	0.	0.	655060	27.182
375.000	0.	0.	655160	27.141
380.000	0.	0.	655255	27.098
385.000	0.	0.	655344	27.054
390.000	0.	0.	655428	27.009
395.000	0.	0.	655507	26.964
400.000	0.	0.	655581	26.917
405.000	0.	0.	655651	26.869
410.000	0.	0.	655716	26.820
415.000	0.	0.	655777	26.770
420.000	0.	0.	655834	26.719
425.000	0.	0.	655887	26.666
430.000	0.	0.	655937	26.613
435.000	0.	0.	655984	26.558
437.627	0.	0.	656008	26.528
440.000	0.	0.	656028	26.501
445.000	0.	0.	656068	26.444
450.000	0.	0.	656103	26.385
455.000	0.	0.	656131	26.325
460.000	0.	0.	656161	26.264
465.000	0.	0.	656181	26.201
470.000	0.	0.	656211	26.137
475.000	0.	0.	656231	26.072
480.000	0.	0.	656241	26.005
485.000	0.	0.	656261	25.937
490.000	0.	0.	656271	25.867
495.000	0.	0.	656281	25.796
500.000	0.	0.	656291	25.723
505.000	0.	0.	656301	25.649
510.000	0.	0.	656311	25.573
515.000	0.	0.	656321	25.495
520.000	0.	0.	656331	25.416
525.000	0.	0.	656341	25.335
530.000	0.	0.	656351	25.252
535.000	0.	0.	656361	25.167
537.424	0.	0.	656371	25.125

TABLE 7-XXXIV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
537.424	0.	0.	6563745.	25.125
537.442	0.	0.	6563746.	25.124
540.000	0.	0.	6563818.	25.080
543.142	0.	0.	6563893.	25.025
545.000	0.	0.	6563931.	24.992
545.742	0.	0.	6563945.	24.979
549.542	0.	0.	6564010.	24.912
550.000	0.	0.	6564017.	24.904
555.000	0.	0.	6564082.	24.814
560.000	0.	0.	6564127.	24.723
565.000	0.	0.	6564155.	24.631
570.000	0.	0.	6564165.	24.538
575.000	0.	0.	6564160.	24.443
580.000	0.	0.	6564141.	24.348
585.000	0.	0.	6564110.	24.251
590.000	0.	0.	6564068.	24.153
595.000	0.	0.	6564016.	24.054
600.000	0.	0.	6563957.	23.954
605.000	0.	0.	6563893.	23.853
610.000	0.	0.	6563825.	23.750
615.000	0.	0.	6563755.	23.646
620.000	0.	0.	6563684.	23.541
625.000	0.	0.	6563616.	23.435
630.000	0.	0.	6563552.	23.327
635.000	0.	0.	6563493.	23.218
640.000	0.	0.	6563443.	23.108
645.000	0.	0.	6563404.	22.996
650.000	0.	0.	6563377.	22.884
655.000	0.	0.	6563365.	22.769
655.832	0.	0.	6563365.	22.750
655.832	0.	0.	6563365.	22.750
660.000	0.	0.	6563365.	22.654
670.000	0.	0.	6563365.	22.421
680.000	0.	0.	6563364.	22.186
690.000	0.	0.	6563364.	21.947
700.000	0.	0.	6563363.	21.706
710.000	0.	0.	6563362.	21.462
720.000	0.	0.	6563360.	21.215
730.000	0.	0.	6563359.	20.965
739.832	0.	0.	6563357.	20.717

TABLE 7-XXXIV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
740.000	0.	0.	6563357.	20.712
750.000	0.	0.	6563354.	20.457
760.000	0.	0.	6563352.	20.200
770.000	0.	0.	6563349.	19.939
780.000	0.	0.	6563346.	19.677
790.000	0.	0.	6563343.	19.411
800.000	0.	0.	6563339.	19.144
810.000	0.	0.	6563289.	16.344
820.000	0.	0.	6563212.	13.349
830.000	0.	0.	6563108.	10.201
840.000	0.	0.	6562978.	6.939
850.000	0.	0.	6562826.	3.601
860.000	0.	0.	6562657.	0.225
870.000	0.	0.	6562477.	-3.155
880.000	0.	0.	6562292.	-6.501
890.000	0.	0.	6562110.	-9.776
900.000	0.	0.	6561940.	-12.943
910.000	0.	0.	6561790.	-15.962
920.000	0.	0.	6561670.	-18.791
930.000	0.	0.	6561588.	-21.389
940.000	0.	0.	6561554.	-23.710
950.000	0.	0.	6561574.	-25.711
960.000	0.	0.	6561655.	-27.349
970.000	0.	0.	6561802.	-28.588
980.000	0.	0.	6562018.	-29.395
990.000	0.	0.	6562303.	-29.749
1000.000	0.	0.	6562658.	-29.641
1010.000	0.	0.	6563080.	-29.074
1020.000	0.	0.	6563561.	-28.063
1030.000	0.	0.	6564091.	-26.635
1040.000	0.	0.	6564681.	-24.825
1050.000	0.	0.	6565301.	-22.672
1060.000	0.	0.	6565941.	-20.220
1070.000	0.	0.	6566601.	-17.513
1080.000	0.	0.	6567271.	-14.595
1090.000	0.	0.	6567921.	-11.508
1100.000	0.	0.	6568551.	-8.292
1110.000	0.	0.	6569151.	-4.986
1120.000	0.	0.	6569701.	-1.626
1130.000	0.	0.	6570211.	1.750

TABLE 7-XXXIV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
4200.000	0.	0.	6570673.	5.108
4300.000	0.	0.	6571072.	8.409
4400.000	0.	0.	6571411.	11.619
4500.000	0.	0.	6571690.	14.697
4600.000	0.	0.	6571909.	17.605
4700.000	0.	0.	6572071.	20.300
4800.000	0.	0.	6572178.	22.739
4900.000	0.	0.	6572235.	24.878
5000.000	0.	0.	6572246.	26.675
5100.000	0.	0.	6572215.	28.090
5200.000	0.	0.	6572147.	29.089
5300.000	0.	0.	6572046.	29.647
5400.000	0.	0.	6571916.	29.747
5500.000	0.	0.	6571760.	29.388
5600.000	0.	0.	6571581.	28.578
5700.000	0.	0.	6571380.	27.340
5800.000	0.	0.	6571160.	25.704
5900.000	0.	0.	6570923.	23.708
6000.000	0.	0.	6570670.	21.392
6100.000	0.	0.	6570403.	18.802
6200.000	0.	0.	6570123.	15.979
6300.000	0.	0.	6569833.	12.968
6400.000	0.	0.	6569533.	9.808
6500.000	0.	0.	6569227.	6.539
6600.000	0.	0.	6568919.	3.199
6700.000	0.	0.	6568612.	-0.176
6800.000	0.	0.	6568314.	-3.549
6900.000	0.	0.	6568029.	-6.884
7000.000	0.	0.	6567766.	-10.145
7100.000	0.	0.	6567532.	-13.293
7200.000	0.	0.	6567335.	-16.290
7300.000	0.	0.	6567183.	-19.092
7400.000	0.	0.	6567084.	-21.658
7500.000	0.	0.	6567045.	-23.944
7600.000	0.	0.	6567073.	-25.905
7700.000	0.	0.	6567171.	-27.501
7800.000	0.	0.	6567345.	-28.693
7900.000	0.	0.	6567594.	-29.453
8000.000	0.	0.	6567919.	-29.759
8100.000	0.	0.	6568318.	-29.604

TABLE 7-XXXIV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
8200.000	0.	0.	6568785.	-28.993
8300.000	0.	0.	6569314.	-27.941
8400.000	0.	0.	6569897.	-26.475
8500.000	0.	0.	6570525.	-24.632
8600.000	0.	0.	6571185.	-22.452
8700.000	0.	0.	6571868.	-19.978
8800.000	0.	0.	6572559.	-17.253
8900.000	0.	0.	6573246.	-14.322
9000.000	0.	0.	6573918.	-11.226
9100.000	0.	0.	6574562.	-8.005
9200.000	0.	0.	6575169.	-4.697
9300.000	0.	0.	6575729.	-1.339
9400.000	0.	0.	6576235.	2.032
9500.000	0.	0.	6576681.	5.382
9600.000	0.	0.	6577063.	8.673
9700.000	0.	0.	6577378.	11.869
9800.000	0.	0.	6577627.	14.931
9900.000	0.	0.	6577810.	17.819
10000.000	0.	0.	6577929.	20.493
10100.000	0.	0.	6577989.	22.907
10200.000	0.	0.	6577994.	25.020
10300.000	0.	0.	6577948.	26.789
10400.000	0.	0.	6577857.	28.174
10500.000	0.	0.	6577726.	29.142
10600.000	0.	0.	6577560.	29.668
10700.000	0.	0.	6577364.	29.738
10800.000	0.	0.	6577142.	29.349
10900.000	0.	0.	6576897.	28.512
11000.000	0.	0.	6576633.	27.250
11100.000	0.	0.	6576352.	25.592
11200.000	0.	0.	6576057.	23.577
11300.000	0.	0.	6575748.	21.247
11400.000	0.	0.	6575428.	18.645
11500.000	0.	0.	6575098.	15.814
11600.000	0.	0.	6574761.	12.796
11700.000	0.	0.	6574420.	9.633
11800.000	0.	0.	6574077.	6.363
11900.000	0.	0.	6573736.	3.024
12000.000	0.	0.	6573403.	-0.348
12100.000	0.	0.	6573083.	-3.717

TABLE 7-XXXIV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
12200.000	0.	0.	6572784.	-7.046
12300.000	0.	0.	6572512.	-10.299
12400.000	0.	0.	6572274.	-13.437
12500.000	0.	0.	6572080.	-16.422
12600.000	0.	0.	6571937.	-19.212
12700.000	0.	0.	6571852.	-21.764
12800.000	0.	0.	6571833.	-24.034
12900.000	0.	0.	6571885.	-25.979
13000.000	0.	0.	6572013.	-27.557
13100.000	0.	0.	6572219.	-28.731
13200.000	0.	0.	6572505.	-29.473
13300.000	0.	0.	6572869.	-29.762
13400.000	0.	0.	6573308.	-29.590
13500.000	0.	0.	6573818.	-28.963
13600.000	0.	0.	6574390.	-27.898
13700.000	0.	0.	6575017.	-26.421
13800.000	0.	0.	6575687.	-24.569
13900.000	0.	0.	6576389.	-22.382
14000.000	0.	0.	6577110.	-19.902
14100.000	0.	0.	6577838.	-17.175
14200.000	0.	0.	6578559.	-14.242
14300.000	0.	0.	6579260.	-11.146
14400.000	0.	0.	6579929.	-7.926
14500.000	0.	0.	6580556.	-4.621
14600.000	0.	0.	6581131.	-1.267
14700.000	0.	0.	6581646.	2.100
14800.000	0.	0.	6582095.	5.445
14900.000	0.	0.	6582474.	8.730
15000.000	0.	0.	6582781.	11.920
15100.000	0.	0.	6583015.	14.976
15200.000	0.	0.	6583178.	17.858
15300.000	0.	0.	6583271.	20.525
15400.000	0.	0.	6583299.	22.933
15500.000	0.	0.	6583266.	25.040
15600.000	0.	0.	6583178.	26.803
15700.000	0.	0.	6583040.	28.183
15800.000	0.	0.	6582858.	29.147
15900.000	0.	0.	6582638.	29.670
16000.000	0.	0.	6582386.	29.737
16100.000	0.	0.	6582105.	29.347

TABLE 7-XXXIV

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
16200.000	0.	0.	6581801.	28.510
16300.000	0.	0.	6581478.	27.249
16400.000	0.	0.	6581138.	25.593
16500.000	0.	0.	6580785.	23.581
16550.000	0.	0.	6580604.	22.454

TABLE 7-XXXV

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
0.000	6373319.	17739.	2810.
5.000	6373344.	17419.	4828.
10.000	6373424.	17099.	6845.
12.000	6373473.	16971.	7653.
15.000	6373567.	16778.	8863.
20.000	6373780.	16458.	10881.
25.000	6374073.	16137.	12904.
30.000	6374455.	15815.	14938.
35.000	6374938.	15494.	16990.
40.000	6375530.	15172.	19073.
45.000	6376245.	14850.	21203.
50.000	6377091.	14527.	23400.
55.000	6378078.	14204.	25686.
60.000	6379214.	13881.	28090.
65.000	6380505.	13558.	30639.
70.000	6381953.	13234.	33364.
75.000	6383557.	12910.	36298.
80.000	6385321.	12585.	39474.
82.250	6386168.	12439.	40992.
85.000	6387250.	12260.	42930.
90.000	6389347.	11935.	46707.
95.000	6391616.	11608.	50843.
100.000	6394058.	11282.	55383.
105.000	6396674.	10955.	60368.
110.000	6399460.	10628.	65846.
115.000	6402415.	10300.	71860.
120.000	6405542.	9973.	78455.
125.000	6408842.	9645.	85676.
130.000	6412318.	9317.	93575.
135.000	6415974.	8989.	102203.
140.000	6419813.	8661.	111620.
145.000	6423845.	8333.	121890.
147.329	6425790.	8181.	126984.
150.000	6428064.	8006.	133054.
155.000	6432410.	7678.	145030.
159.329	6436274.	7394.	156082.
159.329	6436274.	7394.	156082.
159.459	6436391.	7385.	156423.
160.000	6436878.	7350.	157845.
163.759	6440192.	7103.	167742.

TABLE 7-XXXV

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMJTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
165.000	6441260.	7022.	171016.
165.859	6441993.	6966.	173290.
170.000	6445460.	6694.	184314.
175.000	6449499.	6367.	197786.
180.000	6453379.	6039.	211434.
185.000	6457100.	5711.	225261.
189.559	6460355.	5413.	238025.
190.000	6460663.	5384.	239266.
194.559	6463776.	5085.	252195.
195.000	6464070.	5056.	253452.
200.000	6467323.	4729.	267822.
205.000	6470423.	4402.	282378.
210.000	6473384.	4076.	297116.
215.000	6476207.	3749.	312036.
220.000	6478892.	3423.	327141.
225.000	6481438.	3098.	342434.
230.000	6483844.	2773.	357918.
235.000	6486110.	2449.	373594.
240.000	6488235.	2124.	389467.
245.000	6490219.	1801.	405537.
250.000	6492061.	1477.	421808.
255.000	6493760.	1155.	438283.
260.000	6495315.	832.	454964.
265.000	6496726.	511.	471854.
270.000	6497992.	189.	488957.
275.000	6499112.	-132.	506275.
280.000	6500085.	-452.	523811.
285.000	6500910.	-772.	541569.
290.000	6501586.	-1091.	559550.
295.000	6502112.	-1410.	577760.
300.000	6502487.	-1729.	596200.
305.000	6502710.	-2047.	614875.
310.000	6502779.	-2364.	633788.
315.000	6502694.	-2681.	652942.
320.000	6502453.	-2997.	672341.
325.000	6502054.	-3313.	691988.
330.000	6501497.	-3629.	711888.
335.000	6500779.	-3944.	732044.
340.000	6499900.	-4258.	752460.
345.000	6498857.	-4572.	773140.

TABLE 7-XXXV

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
350.000	6497650.	-4885.	794089.
355.000	6496275.	-5198.	815310.
360.000	6494732.	-5510.	836809.
365.000	6493019.	-5821.	858599.
370.000	6491133.	-6132.	880655.
375.000	6489072.	-6443.	903012.
380.000	6486836.	-6753.	925665.
385.000	6484420.	-7062.	948619.
390.000	6481824.	-7371.	971879.
395.000	6479045.	-7679.	995450.
400.000	6476079.	-7987.	1019338.
405.000	6472926.	-8294.	1043548.
410.000	6469582.	-8601.	1068087.
415.000	6466044.	-8907.	1092960.
420.000	6462311.	-9212.	1118174.
425.000	6458377.	-9517.	1143735.
430.000	6454242.	-9821.	1169650.
435.000	6449901.	-10125.	1195925.
437.627	6447537.	-10284.	1209880.
440.000	6445351.	-10428.	1222561.
445.000	6440587.	-10731.	1249505.
450.000	6435605.	-11033.	1276754.
455.000	6430402.	-11334.	1304312.
460.000	6424975.	-11635.	1332185.
465.000	6419321.	-11935.	1360377.
470.000	6413436.	-12235.	1388894.
475.000	6407318.	-12534.	1417742.
480.000	6400963.	-12832.	1446927.
485.000	6394366.	-13130.	1476454.
490.000	6387525.	-13427.	1506331.
495.000	6380436.	-13723.	1536563.
500.000	6373094.	-14019.	1567158.
505.000	6365495.	-14314.	1598122.
510.000	6357636.	-14609.	1629464.
515.000	6349511.	-14903.	1661190.
520.000	6341116.	-15196.	1693308.
525.000	6332446.	-15489.	1725828.
530.000	6323497.	-15781.	1758758.
535.000	6314262.	-16072.	1792107.
537.424	6309680.	-16213.	1808432.

TABLE 7-XXXV

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
537.424	6309680.	-16213.	1808432.
537.442	6309647.	-16214.	1808550.
540.000	6304746.	-16363.	1825821.
543.142	6298645.	-16545.	1847021.
545.000	6294996.	-16652.	1859553.
545.742	6293528.	-16695.	1864565.
549.542	6285930.	-16915.	1890245.
550.000	6285005.	-16942.	1893340.
555.000	6274767.	-17230.	1927218.
560.000	6264280.	-17517.	1961186.
565.000	6253544.	-17804.	1995244.
570.000	6242556.	-18090.	2029392.
575.000	6231316.	-18376.	2063630.
580.000	6219822.	-18660.	2097957.
585.000	6208073.	-18944.	2132373.
590.000	6196068.	-19227.	2166878.
595.000	6183806.	-19509.	2201472.
600.000	6171285.	-19791.	2236154.
605.000	6158505.	-20071.	2270925.
610.000	6145465.	-20351.	2305785.
615.000	6132163.	-20630.	2340732.
620.000	6118598.	-20908.	2375768.
625.000	6104769.	-21185.	2410892.
630.000	6090676.	-21462.	2446103.
635.000	6076316.	-21737.	2481403.
640.000	6061689.	-22011.	2516790.
645.000	6046794.	-22284.	2552265.
650.000	6031630.	-22556.	2587828.
655.000	6016195.	-22826.	2623478.
655.832	6013602.	-22871.	2629416.
655.832	6013602.	-22871.	2629416.
660.000	6000510.	-23095.	2659154.
670.000	5968505.	-23630.	2730228.
680.000	5935657.	-24161.	2800918.
690.000	5901972.	-24687.	2871213.
700.000	5867453.	-25209.	2941104.
710.000	5832106.	-25726.	3010581.
720.000	5795936.	-26239.	3079633.
730.000	5758947.	-26747.	3148252.
739.832	5721759.	-27242.	3215283.

TABLE 7-XXXV

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
740.000	5721145.	-27251.	3216427.
750.000	5682536.	-27750.	3284149.
760.000	5643124.	-28244.	3351409.
770.000	5602916.	-28733.	3418195.
780.000	5561917.	-29217.	3484500.
790.000	5520132.	-29697.	3550313.
800.000	5477569.	-30171.	3615626.
900.000	5010442.	-34628.	4239225.
1000.000	4472652.	-38527.	4803088.
1100.000	3871764.	-41826.	5299252.
1200.000	3216241.	-44491.	5720707.
1300.000	2515325.	-46499.	6061490.
1400.000	1778903.	-47835.	6316778.
1500.000	1017368.	-48495.	6482955.
1600.000	241471.	-48485.	6557668.
1700.000	-537833.	-47818.	6539857.
1800.000	-1309541.	-46517.	6429774.
1900.000	-2062760.	-44616.	6228974.
2000.000	-2786859.	-42153.	5940299.
2100.000	-3471625.	-39175.	5567830.
2200.000	-4107401.	-35734.	5116832.
2300.000	-4685229.	-31888.	4593677.
2400.000	-5196971.	-27700.	4005751.
2500.000	-5635426.	-23234.	3361351.
2600.000	-5994426.	-18559.	2669567.
2700.000	-6268928.	-13743.	1940151.
2800.000	-6455077.	-8855.	1183381.
2900.000	-6550265.	-3965.	409920.
3000.000	-6553162.	862.	-369342.
3100.000	-6463740.	5561.	-1143431.
3200.000	-6283267.	10072.	-1901450.
3300.000	-6014293.	14338.	-2632730.
3400.000	-5660615.	18307.	-3326977.
3500.000	-5227220.	21934.	-3974421.
3600.000	-4720219.	25178.	-4565953.
3700.000	-4146760.	28007.	-5093250.
3800.000	-3514923.	30392.	-5548897.
3900.000	-2833615.	32315.	-5926492.
4000.000	-2112432.	33762.	-6220735.
4100.000	-1361534.	34728.	-6427501.

TABLE 7-XXXV

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
4200.000	-591491.	35213.	-6543901.
4300.000	186859.	35226.	-6568320.
4400.000	962570.	34779.	-6500438.
4500.000	1724737.	33894.	-6341233.
4600.000	2462656.	32595.	-6092968.
4700.000	3165966.	30912.	-5759151.
4800.000	3824802.	28881.	-5344491.
4900.000	4429925.	26539.	-4854826.
5000.000	4972855.	23928.	-4297041.
5100.000	5445985.	21091.	-3678969.
5200.000	5842687.	18073.	-3009285.
5300.000	6157402.	14921.	-2297383.
5400.000	6385717.	11680.	-1553244.
5500.000	6524424.	8397.	-787301.
5600.000	6571571.	5117.	-10293.
5700.000	6526479.	1881.	766884.
5800.000	6389762.	-1269.	1533324.
5900.000	6163318.	-4294.	2278270.
6000.000	5850302.	-7161.	2991257.
6100.000	5455085.	-9838.	3662260.
6200.000	4983195.	-12298.	4281839.
6300.000	4441242.	-14517.	4841267.
6400.000	3836828.	-16477.	5332658.
6500.000	3178438.	-18163.	5749082.
6600.000	2475325.	-19566.	6084659.
6700.000	1737378.	-20679.	6334648.
6800.000	974980.	-21502.	6495514.
6900.000	198865.	-22038.	6564981.
7000.000	-580040.	-22292.	6542065.
7100.000	-1350766.	-22276.	6427084.
7200.000	-2102462.	-22003.	6221660.
7300.000	-2824547.	-21489.	5928690.
7400.000	-3506861.	-20753.	5552305.
7500.000	-4139809.	-19815.	5097811.
7600.000	-4714494.	-18699.	4571612.
7700.000	-5222846.	-17426.	3981121.
7800.000	-5657728.	-16022.	3334648.
7900.000	-6013042.	-14511.	2641290.
8000.000	-6283809.	-12917.	1910797.
8100.000	-6466239.	-11263.	1153437.

TABLE 7-XX XV

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
8200.000	-6557786.	-9571.	379852.
8300.000	-6557175.	-7864.	-399093.
8400.000	-6464430.	-6162.	-1172458.
8500.000	-6280864.	-4482.	-1929385.
8600.000	-6009066.	-2842.	-2659248.
8700.000	-5652863.	-1254.	-3351803.
8800.000	-5217268.	267.	-3997329.
8900.000	-4708407.	1712.	-4586770.
9000.000	-4133436.	3072.	-5111858.
9100.000	-3500437.	4342.	-5565231.
9200.000	-2818306.	5517.	-5940536.
9300.000	-2096629.	6596.	-6232521.
9400.000	-1345541.	7576.	-6437106.
9500.000	-575588.	8458.	-6551440.
9600.000	202425.	9246.	-6573941.
9700.000	977586.	9941.	-6504316.
9800.000	1739030.	10547.	-6343567.
9900.000	2476090.	11068.	-6093967.
10000.000	3178447.	11510.	-5759036.
10100.000	3836274.	11876.	-5343482.
10200.000	4440372.	12170.	-4853138.
10300.000	4982295.	12398.	-4294878.
10400.000	5454469.	12561.	-3676521.
10500.000	5850295.	12665.	-3006719.
10600.000	6164237.	12710.	-2294844.
10700.000	6391903.	12697.	-1550848.
10800.000	6530099.	12628.	-785137.
10900.000	6576880.	12502.	-8419.
11000.000	6531573.	12317.	768441.
11100.000	6394792.	12071.	1534570.
11200.000	6168425.	11762.	2279236.
11300.000	5855617.	11386.	2992003.
11400.000	5460723.	10939.	3662873.
11500.000	4989252.	10417.	4282426.
11600.000	4447793.	9816.	4841955.
11700.000	3843921.	9131.	5333590.
11800.000	3186094.	8359.	5750410.
11900.000	2483537.	7498.	6086542.
12000.000	1746108.	6544.	6337247.
12100.000	984160.	5497.	6498987.

TABLE 7-XXXV

 VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
12200.000	208397.	4358.	6569478.
12300.000	-570283.	3127.	6547723.
12400.000	-1340938.	1809.	6434025.
12500.000	-2092741.	409.	6229982.
12600.000	-2815134.	-1066.	5938466.
12700.000	-3497974.	-2607.	5563579.
12800.000	-4131680.	-4202.	5110596.
12900.000	-4707364.	-5837.	4585887.
13000.000	-5216960.	-7498.	3996826.
13100.000	-5653332.	-9167.	3351688.
13200.000	-6010374.	-10825.	2659530.
13300.000	-6283096.	-12451.	1930064.
13400.000	-6467691.	-14024.	1173523.
13500.000	-6561587.	-15522.	400511.
13600.000	-6563485.	-16920.	-378136.
13700.000	-6473372.	-18196.	-1151510.
13800.000	-6292524.	-19326.	-1908777.
13900.000	-6023488.	-20286.	-2639332.
14000.000	-5670046.	-21055.	-3332944.
14100.000	-5237160.	-21613.	-3979904.
14200.000	-4730907.	-21939.	-4571157.
14300.000	-4158387.	-22019.	-5098430.
14400.000	-3527633.	-21837.	-5554349.
14500.000	-2847487.	-21383.	-5932544.
14600.000	-2127483.	-20649.	-6227734.
14700.000	-1377711.	-19632.	-6435805.
14800.000	-608671.	-18330.	-6552866.
14900.000	168871.	-16749.	-6580287.
15000.000	944037.	-14897.	-6514720.
15100.000	1705987.	-12786.	-6358108.
15200.000	2444074.	-10433.	-6112661.
15300.000	3147990.	-7860.	-5781830.
15400.000	3807909.	-5092.	-5370254.
15500.000	4414624.	-2158.	-4883696.
15600.000	4959672.	909.	-4328959.
15700.000	5435453.	4073.	-3713791.
15800.000	5835331.	7295.	-3046782.
15900.000	6153726.	10533.	-2337238.
16000.000	6386189.	13745.	-1595057.
16100.000	6529467.	16886.	-830593.

TABLE 7-XXXV

VEHICLE POSITION COORDINATES - LIFTOFF THROUGH
 PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
16200.000	6581546.	19909.	-54511.
16300.000	6541677.	22771.	722355.
16400.000	6410394.	25427.	1489156.
16500.000	6189502.	27832.	2235177.
16550.000	6046361.	28928.	2597119.

TABLE 7-XXXVI

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
0.000	-0.00	-63.92	403.61
5.000	10.27	-63.99	403.59
10.000	22.01	-64.06	403.56
12.000	27.14	-64.09	403.54
15.000	35.31	-64.13	403.51
20.000	50.30	-64.19	403.97
25.000	67.17	-64.24	405.38
30.000	86.11	-64.30	408.19
35.00 C	107.15	-64.35	413.10
40.000	130.36	-64.41	420.74
45.000	155.70	-64.47	431.95
50.000	183.05	-64.53	447.48
55.00 C	212.13	-64.59	468.04
60.000	242.57	-64.66	494.23
65.000	273.80	-64.72	526.46
70.000	305.15	-64.77	564.85
75.000	336.69	-64.85	609.75
80.000	369.12	-64.96	661.96
82.250	384.03	-65.01	687.96
85.000	402.48	-65.08	721.91
90.000	436.56	-65.20	789.91
95.000	471.12	-65.30	866.19
100.000	505.87	-65.36	951.02
105.000	540.30	-65.41	1044.77
110.00 C	574.05	-65.46	1147.76
115.000	608.08	-65.50	1259.40
120.000	642.62	-65.53	1380.01
125.000	677.55	-65.55	1510.26
130.000	713.02	-65.57	1650.82
135.000	749.32	-65.57	1802.52
140.000	786.83	-65.58	1966.41
145.000	825.99	-65.57	2143.79
147.329	844.95	-65.57	2231.48
150.000	857.29	-65.57	2314.32
155.000	881.26	-65.57	2477.97
159.329	904.36	-65.56	2629.06
159.329	904.36	-65.56	2629.06
159.459	903.11	-65.56	2629.03
160.000	898.30	-65.56	2629.82
163.759	864.90	-65.56	2635.25

TABLE 7-XXXVI

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
165.000	856.43	-65.56	2642.78
165.859	850.56	-65.56	2648.00
170.000	823.89	-65.55	2676.89
175.000	791.84	-65.54	2712.02
180.000	760.01	-65.52	2747.42
185.000	728.39	-65.50	2783.09
189.559	699.75	-65.49	2815.85
190.000	697.00	-65.48	2819.06
194.559	668.67	-65.46	2852.32
195.000	665.95	-65.46	2855.57
200.000	635.22	-65.44	2892.60
205.000	605.68	-65.37	2929.47
210.000	578.48	-65.29	2965.63
215.000	550.79	-65.21	3002.47
220.000	523.06	-65.12	3039.79
225.000	495.22	-65.04	3077.60
230.000	467.25	-64.95	3115.92
235.000	439.16	-64.87	3154.77
240.000	410.94	-64.78	3194.14
245.000	382.59	-64.69	3234.05
250.000	354.10	-64.60	3274.50
255.000	325.46	-64.51	3315.51
260.000	296.67	-64.41	3357.08
265.000	267.72	-64.32	3399.23
270.000	238.60	-64.23	3441.96
275.000	209.30	-64.13	3485.30
280.000	179.82	-64.03	3529.24
285.000	150.14	-63.94	3573.82
290.000	120.25	-63.84	3619.03
295.000	90.15	-63.74	3664.89
300.000	59.82	-63.64	3711.42
305.000	29.26	-63.54	3758.63
310.000	-1.54	-63.43	3806.53
315.000	-32.61	-63.33	3855.15
320.000	-61.93	-63.23	3904.49
325.000	-95.54	-63.12	3954.58
330.000	-127.44	-63.02	4005.44
335.000	-159.64	-62.91	4057.08
340.000	-192.15	-62.81	4109.51
345.000	-224.99	-62.70	4162.77

TABLE 7-XXXVI

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
350.000	-258.17	-62.59	4216.88
355.000	-291.70	-62.48	4271.84
360.000	-325.59	-62.37	4327.70
365.000	-359.87	-62.27	4384.47
370.000	-394.55	-62.16	4442.17
375.000	-429.63	-62.05	4500.84
380.000	-465.14	-61.93	4560.49
385.000	-501.09	-61.82	4621.17
390.000	-537.50	-61.71	4682.90
395.000	-574.38	-61.60	4745.71
400.000	-611.76	-61.49	4809.64
405.000	-649.65	-61.37	4874.72
410.000	-688.08	-61.26	4941.00
415.000	-727.05	-61.15	5008.50
420.000	-766.60	-61.03	5077.27
425.000	-806.75	-60.92	5147.36
430.000	-847.51	-60.80	5218.82
435.000	-888.92	-60.69	5291.69
437.627	-910.95	-60.63	5330.56
440.000	-931.28	-60.57	5358.86
445.000	-974.56	-60.45	5419.21
450.000	-1018.42	-60.33	5480.53
455.000	-1062.89	-60.21	5542.88
460.000	-1107.99	-60.09	5606.26
465.000	-1153.74	-59.97	5670.73
470.000	-1200.15	-59.85	5736.32
475.000	-1247.25	-59.73	5803.06
480.000	-1295.06	-59.61	5871.00
485.000	-1343.61	-59.48	5940.19
490.000	-1392.92	-59.36	6010.66
495.000	-1443.01	-59.23	6082.47
500.000	-1493.91	-59.10	6155.68
505.000	-1545.66	-58.98	6230.33
510.000	-1598.28	-58.85	6306.49
515.000	-1651.81	-58.72	6384.22
520.000	-1706.29	-58.59	6463.59
525.000	-1761.75	-58.46	6544.68
530.000	-1818.23	-58.33	6627.56
535.000	-1875.80	-58.20	6712.31
537.424	-1904.11	-58.14	6754.11

TABLE 7-XXXVI

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
537.424	-1904.11	-58.14	6754.11
537.442	-1904.27	-58.14	6754.07
540.000	-1927.30	-58.06	6749.37
543.142	-1955.58	-57.95	6743.51
545.000	-1973.57	-57.89	6748.96
545.742	-1980.79	-57.87	6751.13
549.542	-2018.34	-57.75	6764.88
550.000	-2022.87	-57.74	6766.54
555.000	-2072.45	-57.59	6784.61
560.000	-2122.29	-57.43	6802.64
565.000	-2172.38	-57.28	6820.62
570.000	-2222.76	-57.13	6838.56
575.000	-2273.40	-56.98	6856.44
580.000	-2324.26	-56.83	6874.30
585.000	-2375.35	-56.68	6892.11
590.000	-2426.67	-56.53	6909.89
595.000	-2478.22	-56.37	6927.64
600.000	-2529.99	-56.21	6945.36
605.000	-2581.99	-56.05	6963.04
610.000	-2634.21	-55.88	6980.70
615.000	-2686.65	-55.71	6998.33
620.000	-2739.32	-55.53	7015.95
625.000	-2792.21	-55.34	7033.54
630.000	-2845.31	-55.15	7051.11
635.000	-2898.63	-54.95	7068.68
640.000	-2952.16	-54.73	7086.23
645.000	-3005.90	-54.50	7103.78
650.000	-3059.93	-54.20	7121.30
655.000	-3113.93	-53.91	7138.90
655.832	-3122.90	-53.87	7141.84
655.832	-3122.90	-53.87	7141.84
660.000	-3158.25	-53.70	7126.32
670.000	-3242.72	-53.27	7088.37
680.000	-3326.74	-52.84	7049.42
690.000	-3410.30	-52.40	7009.47
700.000	-3493.37	-51.96	6968.54
710.000	-3575.95	-51.51	6926.62
720.000	-3658.03	-51.05	6883.72
730.000	-3739.61	-50.59	6839.87
739.832	-3819.30	-50.13	6795.81

TABLE 7-XXXVI

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
740.000	-3820.66	-50.12	6795.04
750.000	-3901.15	-49.65	6749.22
760.000	-3981.09	-49.17	6702.45
770.000	-4060.47	-48.68	6654.77
780.000	-4139.28	-48.19	6606.06
790.000	-4217.50	-47.69	6556.46
800.000	-4295.13	-47.19	6505.94
900.000	-5036.41	-41.86	5951.34
1000.000	-5706.77	-36.05	5312.64
1100.000	-6296.85	-29.87	4598.94
1200.000	-6798.18	-23.40	3820.20
1300.000	-7203.64	-16.74	2987.41
1400.000	-7507.46	-9.98	2112.31
1500.000	-7705.30	-3.23	1207.30
1600.000	-7794.36	3.42	285.19
1700.000	-7773.36	9.88	-640.98
1800.000	-7642.62	16.07	-1558.09
1900.000	-7404.01	21.89	-2453.16
2000.000	-7060.93	27.29	-3313.53
2100.000	-6618.26	32.19	-4127.06
2200.000	-6082.31	36.53	-4882.26
2300.000	-5460.67	40.28	-5568.51
2400.000	-4762.15	43.38	-6176.16
2500.000	-3996.64	45.82	-6696.67
2600.000	-3174.95	47.57	-7122.74
2700.000	-2308.65	48.63	-7448.43
2800.000	-1409.97	49.00	-7669.17
2900.000	-491.56	48.70	-7781.89
3000.000	433.66	47.73	-7785.03
3100.000	1352.67	46.15	-7678.57
3200.000	2252.54	43.97	-7464.01
3300.000	3120.60	41.26	-7144.40
3400.000	3944.64	38.05	-6724.23
3500.000	4713.06	34.42	-6209.45
3600.000	5415.03	30.41	-5607.30
3700.000	6040.68	26.11	-4926.27
3800.000	6581.19	21.57	-4175.99
3900.000	7028.97	16.87	-3367.06
4000.000	7377.73	12.07	-2510.90
4100.000	7622.60	7.25	-1619.60

TABLE 7-XXXVI

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
4200.000	7760.17	2.47	-705.71
4300.000	7788.56	-2.20	217.87
4400.000	7707.45	-6.70	1138.14
4500.000	7518.03	-10.97	2042.18
4600.000	7223.05	-14.96	2917.28
4700.000	6826.70	-18.63	3751.20
4800.000	6334.60	-21.93	4532.26
4900.000	5753.71	-24.84	5249.55
5000.000	5092.20	-27.32	5893.08
5100.000	4359.34	-29.35	6453.88
5200.000	3565.42	-30.93	6924.12
5300.000	2721.51	-32.04	7297.27
5400.000	1839.43	-32.69	7568.10
5500.000	931.47	-32.89	7732.84
5600.000	10.32	-32.65	7789.14
5700.000	-911.14	-31.99	7736.19
5800.000	-1820.02	-30.94	7574.67
5900.000	-2703.59	-29.52	7306.78
6000.000	-3549.44	-27.77	6936.22
6100.000	-4345.68	-25.72	6468.09
6200.000	-5081.09	-23.43	5908.91
6300.000	-5745.28	-20.92	5266.48
6400.000	-6328.84	-18.25	4549.79
6500.000	-6823.51	-15.46	3768.88
6600.000	-7222.24	-12.59	2934.74
6700.000	-7519.37	-9.68	2059.13
6800.000	-7710.67	-6.78	1154.39
6900.000	-7793.40	-3.94	233.31
7000.000	-7766.39	-1.17	-691.11
7100.000	-7630.02	1.47	-1605.80
7200.000	-7386.24	3.97	-2497.85
7300.000	-7038.51	6.28	-3354.67
7400.000	-6591.76	8.40	-4164.18
7500.000	-6052.35	10.31	-4915.01
7600.000	-5427.89	11.98	-5596.59
7700.000	-4727.23	13.42	-6199.37
7800.000	-3960.24	14.62	-6714.90
7900.000	-3137.73	15.57	-7135.98
8000.000	-2271.28	16.28	-7456.74
8100.000	-1373.08	16.76	-7672.70

TABLE 7-XXXVI

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)VELOCITY COMPONENTS IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
8200.000	-455.72	17.03	-7780.87
8300.000	467.90	17.08	-7779.76
8400.000	1384.82	16.94	-7669.41
8500.000	2282.18	16.63	-7451.39
8600.000	3147.39	16.16	-7128.77
8700.000	3968.30	15.56	-6706.10
8800.000	4733.38	14.85	-6189.32
8900.000	5431.90	14.04	-5585.71
9000.000	6054.04	13.16	-4903.76
9100.000	6591.09	12.23	-4153.09
9200.000	7035.52	11.27	-3344.25
9300.000	7381.11	10.29	-2488.64
9400.000	7623.05	9.31	-1598.30
9500.000	7757.98	8.35	-685.74
9600.000	7784.07	7.41	236.21
9700.000	7701.02	6.50	1154.61
9800.000	7510.06	5.63	2056.59
9900.000	7213.92	4.81	2929.53
10000.000	6816.82	4.03	3761.24
10100.000	6324.37	3.29	4540.11
10200.000	5743.49	2.60	5255.30
10300.000	5082.33	1.95	5896.85
10400.000	4350.14	1.33	6455.86
10500.000	3557.14	0.74	6924.53
10600.000	2714.38	0.16	7296.37
10700.000	1833.60	-0.41	7566.17
10800.000	927.07	-0.98	7730.18
10900.000	7.42	-1.55	7786.06
11000.000	-912.53	-2.15	7732.99
11100.000	-1819.95	-2.77	7571.66
11200.000	-2702.14	-3.42	7304.25
11300.000	-3546.75	-4.11	6934.41
11400.000	-4341.93	-4.84	6467.26
11500.000	-5076.49	-5.61	5909.26
11600.000	-5740.06	-6.42	5268.18
11700.000	-6323.27	-7.28	4552.97
11800.000	-6817.86	-8.16	3773.63
11900.000	-7216.82	-9.07	2941.10
12000.000	-7514.48	-10.00	2067.09
12100.000	-7706.61	-10.93	1163.90

TABLE 7-XXXVI

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
12200.000	-7790.47	-11.86	244.26
12300.000	-7764.86	-12.75	-678.86
12400.000	-7630.16	-13.60	-1592.44
12500.000	-7388.28	-14.39	-2483.62
12600.000	-7042.65	-15.10	-3339.85
12700.000	-6598.16	-15.70	-4149.08
12800.000	-6061.12	-16.17	-4899.95
12900.000	-5439.11	-16.51	-5581.93
13000.000	-4740.91	-16.68	-6185.48
13100.000	-3976.34	-16.67	-6702.17
13200.000	-3156.17	-16.46	-7124.78
13300.000	-2291.91	-16.04	-7447.45
13400.000	-1395.69	-15.39	-7665.68
13500.000	-480.07	-14.52	-7776.47
13600.000	442.14	-13.41	-7778.28
13700.000	1358.00	-12.07	-7671.12
13800.000	2254.70	-10.49	-7456.52
13900.000	3119.70	-8.68	-7137.50
14000.000	3940.86	-6.67	-6718.54
14100.000	4706.71	-4.45	-6205.54
14200.000	5406.51	-2.06	-5605.70
14300.000	6030.47	0.49	-4927.45
14400.000	6569.86	3.16	-4180.31
14500.000	7017.14	5.93	-3374.77
14600.000	7366.09	8.75	-2522.16
14700.000	7611.83	11.60	-1634.44
14800.000	7751.00	14.42	-724.06
14900.000	7781.69	17.18	196.22
15000.000	7703.54	19.84	1113.53
15100.000	7517.70	22.35	2015.03
15200.000	7226.84	24.67	2888.15
15300.000	6835.08	26.75	3720.73
15400.000	6347.93	28.56	4501.17
15500.000	5772.24	30.06	5218.64
15600.000	5116.05	31.22	5863.17
15700.000	4388.50	32.00	6425.84
15800.000	3599.74	32.37	6898.82
15900.000	2760.72	32.32	7275.55
16000.000	1883.11	31.84	7550.79
16100.000	979.09	30.90	7720.69

TABLE 7-XXXVI

VEHICLE VELOCITY COMPONENTS - LIFTOFF THROUGH
 PARKING ORBIT (99-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
16200.000	61.23	29.50	7782.85
16300.000	-857.71	27.66	7736.36
16400.000	-1764.94	25.37	7581.79
16500.000	-2647.78	22.66	7321.22
16550.000	-3076.19	21.15	7152.24

TABLE 7-XXXVII WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
0.000	6.401386E 06	7.662082E 06	49.3	0.000
5.000	6.257192E 06	7.669934E 06	75.1	0.000
10.000	6.112940E 06	7.684720E 06	156.1	0.000
12.000	6.055222E 06	7.692852E 06	205.8	0.000
15.000	5.968626E 06	7.707578E 06	300.4	0.000
20.000	5.824245E 06	7.739413E 06	515.9	0.000
25.000	5.679789E 06	7.780933E 06	811.8	0.002
30.000	5.535251E 06	7.832047E 06	1197.8	0.010
35.000	5.390626E 06	7.892958E 06	1684.3	0.028
40.000	5.245907E 06	7.963227E 06	2282.1	0.063
45.000	5.101088E 06	8.041959E 06	3002.3	0.122
50.000	4.956165E 06	8.127613E 06	3855.3	0.217
55.000	4.811133E 06	8.218240E 06	4850.4	0.360
60.000	4.665990E 06	8.311215E 06	5995.9	0.565
65.000	4.520741E 06	8.403739E 06	7297.5	0.849
70.000	4.375261E 06	8.493309E 06	8757.3	1.392
75.000	4.229469E 06	8.580823E 06	10376.3	1.877
80.000	4.083509E 06	8.663586E 06	12157.9	2.447
82.000	4.025073E 06	8.694198E 06	12917.2	2.687
85.000	3.937360E 06	8.737229E 06	14107.3	3.168
90.000	3.791011E 06	8.800075E 06	16229.3	4.112
95.000	3.644779E 06	8.851203E 06	18528.0	5.191
100.000	3.498333E 06	8.891823E 06	21005.7	6.542
105.000	3.351668E 06	8.924524E 06	23664.0	8.105
110.000	3.204774E 06	8.951712E 06	26500.6	9.948
115.000	3.057642E 06	8.975300E 06	29516.7	12.075
120.000	2.910258E 06	8.996649E 06	32716.5	14.501
125.000	2.762603E 06	9.016749E 06	36104.3	17.272
130.000	2.614659E 06	9.036320E 06	39685.4	20.386
135.000	2.466401E 06	9.055845E 06	43466.1	23.890
140.000	2.317800E 06	9.075572E 06	47455.7	27.817
145.000	2.168823E 06	9.095534E 06	51665.3	32.185
147.329	2.099288E 06	7.283888E 06	53705.7	34.380
150.000	2.035959E 06	7.238602E 06	56096.7	37.027
155.000	1.917221E 06	7.253477E 06	60691.0	42.289
159.329	1.814177E 06	7.266754E 06	64803.7	47.203
159.329	1.459482E 06	0.000000E-39	64803.7	47.203
159.459	1.459482E 06	2.742796E 05	64928.6	47.354
160.000	1.458931E 06	2.742827E 05	65449.3	47.989
163.759	1.455103E 06	1.024098E 06	69004.8	52.413

TABLE 7-XXXVII WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
165.000	1.452107E 06	1.024102E 06	70155.4	53.871
165.859	1.450031E 06	1.163632E 06	70947.5	54.889
170.000	1.438698E 06	1.163640E 06	74709.3	59.816
175.000	1.425012E 06	1.163645E 06	79134.2	65.844
180.000	1.411327E 06	1.163647E 06	83432.4	71.958
185.000	1.397642E 06	1.163648E 06	87606.1	78.164
189.559	1.375262E 06	1.163648E 06	91305.5	83.899
190.000	1.374056E 06	1.163649E 06	91657.7	84.458
194.559	1.352926E 06	1.163649E 06	95247.8	90.273
195.000	1.351721E 06	1.163649E 06	95589.4	90.839
200.000	1.338035E 06	1.163613E 06	99404.7	97.314
205.000	1.324350E 06	1.163606E 06	103106.4	103.882
210.000	1.310665E 06	1.163649E 06	106708.6	110.540
215.000	1.296979E 06	1.163649E 06	110215.1	117.291
220.000	1.283294E 06	1.163649E 06	113626.1	124.134
225.000	1.269608E 06	1.163649E 06	116942.5	131.072
230.000	1.255923E 06	1.163649E 06	120165.5	138.107
235.000	1.242238E 06	1.163649E 06	123295.6	145.240
240.000	1.228552E 06	1.163649E 06	126333.7	152.472
245.000	1.214867E 06	1.163649E 06	129281.1	159.806
250.000	1.201181E 06	1.163649E 06	132138.5	167.242
255.000	1.187496E 06	1.163649E 06	134906.9	174.784
260.000	1.173811E 06	1.163649E 06	137587.2	182.432
265.000	1.160125E 06	1.163649E 06	140180.6	190.189
270.000	1.146440E 06	1.163649E 06	142688.0	198.056
275.000	1.132754E 06	1.163649E 06	145110.3	206.034
280.000	1.119069E 06	1.163649E 06	147449.1	214.127
285.000	1.105384E 06	1.163649E 06	149705.1	222.336
290.000	1.091698E 06	1.163649E 06	151879.4	230.663
295.000	1.078013E 06	1.163649E 06	153973.0	239.110
300.000	1.064327E 06	1.163649E 06	155987.4	247.679
305.000	1.050642E 06	1.163649E 06	157923.5	256.372
310.000	1.036957E 06	1.163649E 06	159782.7	265.192
315.000	1.023271E 06	1.163649E 06	161566.0	274.139
320.000	1.009586E 06	1.163649E 06	163274.9	283.218
325.000	9.959004E 05	1.163649E 06	164910.4	292.431
330.000	9.822150E 05	1.163649E 06	166474.2	301.778
335.000	9.685296E 05	1.163649E 06	167967.2	311.265
340.000	9.548442E 05	1.163649E 06	169391.3	320.891
345.000	9.411588E 05	1.163649E 06	170747.4	330.660

TABLE 7-XXXVII WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH).
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
350.000	9.274734E 05	1.163649E 06	172037.5	340.576
355.000	9.137880E 05	1.163649E 06	173262.7	350.639
360.000	9.001026E 05	1.163649E 06	174424.9	360.854
365.000	8.864172E 05	1.163649E 06	175525.5	371.223
370.000	8.727318E 05	1.163649E 06	176566.1	381.749
375.000	8.590464E 05	1.163649E 06	177548.7	392.434
380.000	8.453610E 05	1.163649E 06	178474.9	403.282
385.000	8.316756E 05	1.163649E 06	179346.4	414.297
390.000	8.179902E 05	1.163649E 06	180165.6	425.481
395.000	8.043048E 05	1.163649E 06	180934.1	436.838
400.000	7.906194E 05	1.163649E 06	181654.2	448.370
405.000	7.769340E 05	1.163649E 06	182327.8	460.083
410.000	7.632486E 05	1.163649E 06	182957.2	471.978
415.000	7.495632E 05	1.163649E 06	183545.0	484.060
420.000	7.358778E 05	1.163649E 06	184093.2	496.333
425.000	7.221924E 05	1.163649E 06	184604.7	508.801
430.000	7.085070E 05	1.163649E 06	185082.0	521.468
435.000	6.948217E 05	1.163649E 06	185527.6	534.338
437.627	6.876303E 05	9.536950E 05	185750.3	541.184
440.000	6.823523E 05	9.536950E 05	185942.9	547.411
445.000	6.712296E 05	9.536950E 05	186317.5	560.663
450.000	6.601069E 05	9.536950E 05	186651.5	574.091
455.000	6.489841E 05	9.536950E 05	186947.3	587.699
460.000	6.378614E 05	9.536950E 05	187206.8	601.490
465.000	6.267387E 05	9.536950E 05	187433.3	615.468
470.000	6.156160E 05	9.536950E 05	187629.0	629.637
475.000	6.044932E 05	9.536950E 05	187797.0	644.000
480.000	5.933705E 05	9.536950E 05	187939.9	658.561
485.000	5.822478E 05	9.536950E 05	188060.9	673.325
490.000	5.711251E 05	9.536950E 05	188163.1	688.294
495.000	5.600024E 05	9.536950E 05	188250.0	703.475
500.000	5.488796E 05	9.536950E 05	188324.8	718.870
505.000	5.377569E 05	9.536950E 05	188391.4	734.485
510.000	5.266342E 05	9.536950E 05	188453.5	750.324
515.000	5.155115E 05	9.536950E 05	188515.0	766.392
520.000	5.043888E 05	9.536950E 05	188580.1	782.695
525.000	4.932661E 05	9.536950E 05	188653.3	799.237
530.000	4.821434E 05	9.536950E 05	188739.2	816.024
535.000	4.710206E 05	9.536950E 05	188842.3	833.062
537.424	4.656272E 05	9.536950E 05	188899.9	841.416

TABLE 7-XXXVII WEIGHT, THRUST, ALTITUDE, AND
 RANGE FROM CAPE KENNEDY - HIGH
 PARKING ORBIT (108-DEGREES LTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	SURFACE RANGE (NMI)
537.424	3.635400E 05	0.000000E-39	841.416
537.442	3.635400E 05	2.711470E 04	841.476
540.000	3.632896E 05	2.711470E 04	850.323
543.142	3.629819E 05	2.069960E 05	861.195
545.000	3.620828E 05	2.069960E 05	867.627
545.742	3.617234E 05	2.333470E 05	870.201
549.542	3.595114E 05	2.333470E 05	883.401
550.000	3.592603E 05	2.333470E 05	884.994
555.000	3.565169E 05	2.333470E 05	902.443
560.000	3.537720E 05	2.333470E 05	919.975
565.000	3.510260E 05	2.333470E 05	937.591
570.000	3.482801E 05	2.333470E 05	955.292
575.000	3.455341E 05	2.333470E 05	973.078
580.000	3.427882E 05	2.333470E 05	990.950
585.000	3.400422E 05	2.333470E 05	1008.910
590.000	3.372962E 05	2.333470E 05	1026.958
595.000	3.345522E 05	2.333470E 05	1045.094
600.000	3.318087E 05	2.333470E 05	1063.319
605.000	3.290653E 05	2.333470E 05	1081.635
610.000	3.263218E 05	2.333470E 05	1100.042
615.000	3.235783E 05	2.333470E 05	1118.541
620.000	3.208349E 05	2.333470E 05	1137.132
625.000	3.180914E 05	2.333470E 05	1155.817
630.000	3.153480E 05	2.333470E 05	1174.596
635.000	3.126045E 05	2.333470E 05	1193.470
640.000	3.098610E 05	2.333470E 05	1212.440
645.000	3.071176E 05	2.333470E 05	1231.507
650.000	3.043741E 05	2.333470E 05	1250.671
655.000	3.016306E 05	2.333470E 05	1269.934
657.981	2.999952E 05	2.333470E 05	1281.464
657.981	2.999952E 05	1.400000E 02	1281.464
660.000	2.999917E 05	1.400000E 02	1289.287
670.000	2.999748E 05	1.400000E 02	1328.029
680.000	2.999579E 05	1.400000E 02	1366.772
690.000	2.999410E 05	1.400000E 02	1405.516
700.000	2.999241E 05	1.400000E 02	1444.260
710.000	2.999072E 05	1.400000E 02	1483.005
720.000	2.998903E 05	1.946394E 02	1521.750
730.000	2.998674E 05	1.934040E 02	1560.496
740.000	2.998445E 05	1.921687E 02	1599.243

TABLE 7-XXXVII

WEIGHT, THRUST, ALTITUDE
 RANGE FROM CAPE KENNEDOUGH
 PARKING ORBIT (108-DEG (MUTH))
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	SURFACE RANGE (NMI)
741.981	2.998400E 05	5.192403E 0	1606.918
750.000	2.998354E 05	5.093338E 0	1637.990
760.000	2.998297E 05	4.969805E 0	1676.738
770.000	2.998242E 05	4.846272E 0	1715.487
780.000	2.998188E 05	4.722739E 0	1754.235
790.000	2.998136E 05	4.599206E 0	1792.984
800.000	2.998085E 05	4.475673E 0	1831.734
900.000	2.997686E 05	8.000000E 0	2219.257
1000.000	2.997511E 05	5.414466E 0	2606.822
1100.000	2.996905E 05	5.468606E 0	2994.432
1200.000	2.996300E 05	5.386507E 0	3382.089
1300.000	2.995706E 05	5.280026E 0	3769.787
1400.000	2.995125E 05	5.140162E 0	4157.524
1500.000	2.994562E 05	4.970717E 0	4545.292
1600.000	2.994018E 05	4.801273E 0	4933.082
1700.000	2.993493E 05	4.631828E 0	5320.883
1800.000	2.992986E 05	4.468844E 0	5708.682
1900.000	2.992498E 05	4.306344E 0	6096.462
2000.000	2.992027E 05	4.143844E 0	6484.201
2100.000	2.991574E 05	3.981344E 0	6871.871
2200.000	2.991140E 05	3.818844E 0	7259.435
2300.000	2.990723E 05	3.656344E 0	7646.840
2400.000	2.990325E 05	3.493844E 0	8034.007
2500.000	2.989944E 05	3.344528E 0	8420.813
2600.000	2.989579E 05	3.200083E 0	8807.043
2700.000	2.989231E 05	3.055639E 0	9192.287
2800.000	2.988898E 05	2.917704E 0	9575.631
2900.000	2.988576E 05	2.823259E 0	9954.528
3000.000	2.988260E 05	2.728815E 0	10318.469
3100.000	2.987951E 05	2.634371E 0	10576.159
3200.000	2.987648E 05	2.539926E 0	10388.460
3300.000	2.987351E 05	2.445482E 0	10032.228
3400.000	2.987060E 05	2.351037E 0	9655.351
3500.000	2.986776E 05	2.256593E 0	9273.116
3600.000	2.986500E 05	2.197031E 0	8888.805
3700.000	2.986234E 05	2.140086E 0	8503.524
3800.000	2.985979E 05	2.083142E 0	8117.751
3900.000	2.985734E 05	2.026197E 0	7731.730
4000.000	2.985500E 05	1.969253E 0	7345.602
4100.000	2.985277E 05	1.912308E 0	6959.456

TABLE 7-XXXVII WEIGHT, THRUST, ALTITUDE, AND SURFACE
RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
4200.000	2.985063E 05	1.855364E 01	193078.9	6573.359
4300.000	2.984859E 05	1.815660E 01	194073.0	6187.359
4400.000	2.984659E 05	1.782327E 01	195100.9	5801.505
4500.000	2.984462E 05	1.748994E 01	196124.7	5415.841
4600.000	2.984270E 05	1.718192E 01	197104.8	5030.418
4700.000	2.984079E 05	1.704303E 01	198001.9	4645.300
4800.000	2.983890E 05	1.690414E 01	198779.5	4260.565
4900.000	2.983703E 05	1.683475E 01	199404.9	3876.322
5000.000	2.983515E 05	1.697364E 01	199851.6	3492.728
5100.000	2.983326E 05	1.711253E 01	200100.7	3110.011
5200.000	2.983135E 05	1.725142E 01	200141.7	2728.532
5300.000	2.982942E 05	1.739030E 01	199973.5	2348.879
5400.000	2.982747E 05	1.785218E 01	199603.6	1972.094
5500.000	2.982546E 05	1.833829E 01	199049.0	1600.189
5600.000	2.982339E 05	1.882440E 01	198334.4	1237.549
5700.000	2.982127E 05	1.931051E 01	197491.4	895.469
5800.000	2.981910E 05	1.979662E 01	196557.5	609.555
5900.000	2.981688E 05	2.028273E 01	195573.4	490.441
6000.000	2.981460E 05	2.076884E 01	194582.9	639.298
6100.000	2.981227E 05	2.118396E 01	193627.9	935.923
6200.000	2.980989E 05	2.157285E 01	192747.2	1281.456
6300.000	2.980747E 05	2.196174E 01	191974.9	1645.310
6400.000	2.980501E 05	2.231808E 01	191339.1	2017.535
6500.000	2.980252E 05	2.245697E 01	190860.3	2394.160
6600.000	2.980002E 05	2.259586E 01	190550.3	2773.320
6700.000	2.979751E 05	2.253263E 01	190412.7	3154.017
6800.000	2.979501E 05	2.242636E 01	190441.8	3535.659
6900.000	2.979252E 05	2.228747E 01	190623.8	3917.864
7000.000	2.979005E 05	2.214858E 01	190938.5	4300.357
7100.000	2.978759E 05	2.200970E 01	191359.4	4682.927
7200.000	2.978516E 05	2.168994E 01	191855.9	5065.388
7300.000	2.978277E 05	2.135660E 01	192396.0	5447.564
7400.000	2.978041E 05	2.102327E 01	192947.5	5829.271
7500.000	2.977809E 05	2.068993E 01	193479.6	6210.296
7600.000	2.977581E 05	2.035660E 01	193965.6	6590.382
7700.000	2.977356E 05	2.002327E 01	194383.6	6969.192
7800.000	2.977135E 05	1.968993E 01	194718.4	7346.268
7900.000	2.976918E 05	1.932618E 01	194962.2	7720.946
8000.000	2.976705E 05	1.895118E 01	195114.4	8092.224
8100.000	2.976496E 05	1.857618E 01	195182.2	8458.496

TABLE 7-XXXVII WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
8200.000	2.976291E 05	1.820118E 01	195179.5	8817.022
8300.000	2.976091E 05	1.782618E 01	195126.4	9162.774
8400.000	2.975894E 05	1.745118E 01	195048.2	9485.747
8500.000	2.975702E 05	1.707618E 01	194972.3	9764.586
8600.000	2.975514E 05	1.673800E 01	194928.2	9954.707
8700.000	2.975330E 05	1.643244E 01	194944.3	9991.266
8800.000	2.975148E 05	1.612688E 01	195046.7	9856.567
8900.000	2.974971E 05	1.582133E 01	195257.4	9607.573
9000.000	2.974796E 05	1.551577E 01	195592.1	9300.425
9100.000	2.974625E 05	1.521022E 01	196059.7	8964.321
9200.000	2.974458E 05	1.490466E 01	196661.0	8612.793
9300.000	2.974294E 05	1.466331E 01	197389.1	8252.438
9400.000	2.974131E 05	1.455220E 01	198228.1	7886.747
9500.000	2.973970E 05	1.444109E 01	199155.4	7517.726
9600.000	2.973810E 05	1.432998E 01	200141.2	7146.618
9700.000	2.973650E 05	1.438113E 01	201151.0	6774.246
9800.000	2.973490E 05	1.449224E 01	202147.0	6401.203
9900.000	2.973328E 05	1.460335E 01	203089.9	6027.945
10000.000	2.973165E 05	1.473797E 01	203941.0	5654.864
10100.000	2.973000E 05	1.502964E 01	204664.2	5282.324
10200.000	2.972832E 05	1.532131E 01	205228.3	4910.701
10300.000	2.972660E 05	1.561297E 01	205607.6	4540.418
10400.000	2.972485E 05	1.590464E 01	205784.9	4171.989
10500.000	2.972306E 05	1.619631E 01	205751.1	3806.077
10600.000	2.972125E 05	1.648797E 01	205506.3	3443.583
10700.000	2.971940E 05	1.677964E 01	205059.6	3085.787
10800.000	2.971752E 05	1.713590E 01	204429.7	2734.587
10900.000	2.971559E 05	1.749701E 01	203642.3	2392.922
11000.000	2.971363E 05	1.785812E 01	202730.5	2065.537
11100.000	2.971163E 05	1.821924E 01	201732.4	1760.399
11200.000	2.970958E 05	1.858035E 01	200689.7	1491.169
11300.000	2.970750E 05	1.894146E 01	199645.1	1280.590
11400.000	2.970537E 05	1.930257E 01	198640.4	1160.862
11500.000	2.970321E 05	1.952170E 01	197714.9	1160.243
11600.000	2.970104E 05	1.968837E 01	196903.0	1278.664
11700.000	2.969884E 05	1.985503E 01	196232.7	1487.715
11800.000	2.969662E 05	2.002170E 01	195724.3	1755.045
11900.000	2.969439E 05	2.018836E 01	195390.0	2057.799
12000.000	2.969214E 05	2.035503E 01	195232.6	2382.231
12100.000	2.968986E 05	2.052170E 01	195246.4	2720.303

TABLE 7-XXXVII WEIGHT, THRUST, ALTITUDE, AND
 RANGE FROM CAPE KENNEDY - HIGH
 PARKING ORBIT (108-DEGREES LAH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	SURFACE RANGE (NMI)
12200.000	2.968758E 05	2.058527E 01	3067.199
12300.000	2.968529E 05	2.055749E 01	3419.899
12400.000	2.968301E 05	2.052972E 01	3776.413
12500.000	2.968072E 05	2.050194E 01	4135.352
12600.000	2.967846E 05	2.021577E 01	4495.684
12700.000	2.967623E 05	1.991022E 01	4856.586
12800.000	2.967403E 05	1.960466E 01	5217.346
12900.000	2.967186E 05	1.929911E 01	5577.295
13000.000	2.966973E 05	1.899355E 01	5935.747
13100.000	2.966764E 05	1.868800E 01	6291.941
13200.000	2.966557E 05	1.838244E 01	6644.973
13300.000	2.966355E 05	1.792476E 01	6993.705
13400.000	2.966158E 05	1.741087E 01	7336.635
13500.000	2.965967E 05	1.689698E 01	7671.705
13600.000	2.965782E 05	1.638310E 01	7995.995
13700.000	2.965602E 05	1.586921E 01	8305.247
13800.000	2.965428E 05	1.535532E 01	8593.136
13900.000	2.965260E 05	1.484143E 01	8850.244
14000.000	2.965097E 05	1.444536E 01	9062.988
14100.000	2.964938E 05	1.415369E 01	9213.640
14200.000	2.964782E 05	1.386203E 01	9283.874
14300.000	2.964630E 05	1.357036E 01	9262.986
14400.000	2.964480E 05	1.327869E 01	9154.840
14500.000	2.964334E 05	1.298703E 01	8975.300
14600.000	2.964191E 05	1.269536E 01	8743.405
14700.000	2.964051E 05	1.249083E 01	8475.207
14800.000	2.963913E 05	1.246305E 01	8182.287
14900.000	2.963774E 05	1.243527E 01	7872.520
15000.000	2.963636E 05	1.240749E 01	7551.205
15100.000	2.963497E 05	1.256226E 01	7221.964
15200.000	2.963357E 05	1.278449E 01	6887.349
15300.000	2.963213E 05	1.300671E 01	6549.232
15400.000	2.963068E 05	1.327414E 01	6209.054
15500.000	2.962917E 05	1.384358E 01	5867.995
15600.000	2.962760E 05	1.441303E 01	5527.091
15700.000	2.962597E 05	1.498247E 01	5187.320
15800.000	2.962428E 05	1.555192E 01	4849.684
15900.000	2.962252E 05	1.612136E 01	4515.281
16000.000	2.962070E 05	1.669080E 01	4185.395
16100.000	2.961881E 05	1.726025E 01	3861.600

TABLE 7-XXXVII

WEIGHT, THRUST, ALTITUDE, AND SURFACE
 RANGE FROM CAPE KENNEDY - LIFTOFF THROUGH
 PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
16200.000	2.961687E 05	1.773926E 01	208573.0	3545.907
16300.000	2.961488E 05	1.821148E 01	207601.7	3240.960
16400.000	2.961283E 05	1.868370E 01	206544.7	2950.307
16500.000	2.961073E 05	1.908255E 01	205444.5	2678.758
16550.000	2.960967E 05	1.920755E 01	204891.7	2552.101

TABLE 7-XXXVIII

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(108-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/S)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
0.000	408.637	0.00	1.90	9.8181
5.000	408.762	10.40	2.20	9.8181
10.000	409.201	22.27	2.50	9.8178
12.000	409.495	27.45	2.62	9.8177
15.000	410.092	35.70	2.82	9.8174
20.000	412.103	50.82	3.18	9.8167
25.000	415.823	67.85	3.60	9.8158
30.000	421.922	87.01	4.00	9.8146
35.000	431.232	108.48	4.50	9.8131
40.000	444.540	132.52	5.20	9.8113
45.000	462.697	159.42	5.90	9.8090
50.000	486.365	189.51	6.60	9.8064
55.000	515.998	223.08	7.50	9.8034
60.000	551.823	260.41	8.50	9.7998
65.000	593.777	301.64	9.40	9.7958
70.000	641.446	346.72	10.40	9.7913
75.000	695.052	396.41	11.60	9.7864
80.000	755.531	452.20	12.90	9.7809
82.000	781.740	476.39	13.50	9.7786
85.000	823.252	514.79	14.40	9.7749
90.000	898.389	584.57	15.40	9.7684
95.000	981.078	661.87	17.00	9.7614
100.000	1071.476	746.94	19.00	9.7538
105.000	1169.766	839.99	20.00	9.7457
110.000	1276.184	941.30	22.00	9.7371
115.000	1390.773	1051.23	24.00	9.7279
120.000	1513.976	1170.23	26.00	9.7182
125.000	1646.432	1298.84	27.00	9.7079
130.000	1788.893	1437.81	30.00	9.6971
135.000	1942.295	1588.05	32.00	9.6856
140.000	2107.803	1750.69	34.00	9.6736
145.000	2286.857	1927.17	37.00	9.6609
147.329	2375.377	2014.58	31.00	9.6548
150.000	2457.127	2095.03	31.00	9.6476
155.000	2618.869	2254.50	34.00	9.6338
159.329	2768.902	2402.82	36.00	9.6215
159.329	2768.902	2402.82	9.00	9.6215
159.459	2768.466	2402.32	9.00	9.6211
160.000	2767.641	2401.23	9.00	9.6195
163.759	2762.136	2393.91	9.00	9.6089

TABLE 7-XXXVIII

INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, RELATIVE
 ACCELERATION - LIFT-OFF (KING ORBIT
 (108-DEGREES LAUNCH A
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
165.000	2766.646	2397.86	9.6055
165.859	2769.803	2400.64	9.6031
170.000	2789.281	2418.35	9.5919
175.000	2813.647	2440.69	9.5787
180.000	2838.913	2464.05	9.5660
185.000	2865.062	2488.41	9.5536
189.559	2889.662	2511.47	9.5426
190.000	2892.102	2513.77	9.5416
194.559	2917.746	2537.98	9.5310
195.000	2920.284	2540.38	9.5300
200.000	2949.548	2568.18	9.5187
205.000	2979.394	2596.69	9.5079
210.000	3009.400	2625.54	9.4973
215.000	3040.377	2655.41	9.4870
220.000	3072.182	2686.17	9.4770
225.000	3104.830	2717.83	9.4673
230.000	3138.330	2750.40	9.4579
235.000	3172.681	2783.88	9.4488
240.000	3207.885	2818.26	9.4399
245.000	3243.944	2853.55	9.4313
250.000	3280.862	2889.74	9.4230
255.000	3318.643	2926.85	9.4150
260.000	3357.292	2964.86	9.4073
265.000	3396.814	3003.80	9.3997
270.000	3437.214	3043.65	9.3925
275.000	3478.501	3084.42	9.3855
280.000	3520.681	3126.12	9.3788
285.000	3563.761	3168.76	9.3723
290.000	3607.751	3212.34	9.3660
295.000	3652.660	3256.87	9.3600
300.000	3698.498	3302.36	9.3542
305.000	3745.276	3348.82	9.3486
310.000	3793.005	3396.25	9.3433
315.000	3841.697	3444.67	9.3382
320.000	3891.367	3494.09	9.3333
325.000	3942.028	3544.53	9.3286
330.000	3993.695	3595.99	9.3241
335.000	4046.384	3648.49	9.3198
340.000	4100.113	3702.05	9.3158
345.000	4154.900	3756.69	9.3119

TABLE 7-XXXVIII

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
350.000	4210.763	3812.41	12.769	9.3082
355.000	4267.724	3869.25	12.956	9.3047
360.000	4325.805	3927.22	13.149	9.3014
365.000	4385.027	3986.35	13.347	9.2982
370.000	4445.416	4046.66	13.551	9.2953
375.000	4506.997	4108.16	13.761	9.2924
380.000	4569.798	4170.90	13.978	9.2898
385.000	4633.849	4234.90	14.202	9.2873
390.000	4699.179	4300.19	14.433	9.2850
395.000	4765.821	4366.79	14.672	9.2828
400.000	4833.811	4434.75	14.918	9.2807
405.000	4903.185	4504.11	15.173	9.2788
410.000	4973.982	4574.89	15.437	9.2770
415.000	5046.243	4647.14	15.710	9.2753
420.000	5120.012	4720.90	15.992	9.2737
425.000	5195.336	4796.22	16.285	9.2723
430.000	5272.266	4873.15	16.588	9.2709
435.000	5350.853	4951.75	16.903	9.2696
437.627	5392.832	4993.73	14.618	9.2690
440.000	5424.151	5025.05	14.723	9.2684
445.000	5491.063	5091.97	14.948	9.2673
450.000	5559.233	5160.15	15.179	9.2664
455.000	5628.696	5229.63	15.419	9.2655
460.000	5699.489	5300.44	15.665	9.2648
465.000	5771.648	5372.62	15.921	9.2641
470.000	5845.215	5446.21	16.184	9.2635
475.000	5920.232	5521.25	16.457	9.2630
480.000	5996.746	5597.79	16.740	9.2626
485.000	6074.804	5675.88	17.033	9.2622
490.000	6154.459	5755.56	17.336	9.2619
495.000	6235.765	5836.90	17.651	9.2616
500.000	6318.780	5919.94	17.979	9.2614
505.000	6403.567	6004.76	18.319	9.2612
510.000	6490.193	6091.42	18.674	9.2610
515.000	6578.728	6179.99	19.043	9.2608
520.000	6669.250	6270.54	19.428	9.2606
525.000	6761.839	6363.16	19.831	9.2604
530.000	6856.584	6457.93	20.252	9.2601
535.000	6953.580	6554.96	20.694	9.2598
537.424	7001.454	6602.84	20.916	9.2596

TABLE 7-XXXVIII

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
537.424	7001.454	6602.84	9.260	9.2596
537.442	7001.453	6602.84	9.186	9.2596
540.000	7003.219	6604.62	9.190	9.2594
543.142	7005.411	6606.82	10.153	9.2592
545.000	7015.661	6617.08	10.123	9.2591
545.742	7019.770	6621.19	10.477	9.2591
549.542	7043.599	6645.04	10.524	9.2590
550.000	7046.479	6647.92	10.525	9.2590
555.000	7078.109	6679.58	10.565	9.2588
560.000	7110.023	6711.52	10.610	9.2588
565.000	7142.223	6743.75	10.657	9.2587
570.000	7174.713	6776.26	10.709	9.2588
575.000	7207.493	6809.07	10.747	9.2589
580.000	7240.561	6842.17	10.789	9.2590
585.000	7273.917	6875.56	10.830	9.2591
590.000	7307.565	6909.24	10.870	9.2593
595.000	7341.506	6943.21	10.911	9.2595
600.000	7375.741	6977.48	10.952	9.2598
605.000	7410.272	7012.04	10.992	9.2600
610.000	7445.102	7046.90	11.033	9.2603
615.000	7480.232	7082.07	11.074	9.2606
620.000	7515.665	7117.53	11.115	9.2609
625.000	7551.404	7153.30	11.155	9.2611
630.000	7587.450	7189.38	11.197	9.2614
635.000	7623.807	7225.77	11.235	9.2617
640.000	7660.475	7262.47	11.276	9.2619
645.000	7697.459	7299.49	11.313	9.2621
650.000	7734.762	7336.82	11.398	9.2623
655.000	7772.391	7374.48	11.348	9.2624
657.981	7794.955	7397.06	11.367	9.2624
657.981	7794.955	7397.06	9.262	9.2624
660.000	7794.972	7397.09	9.262	9.2625
670.000	7795.059	7397.23	9.263	9.2626
680.000	7795.146	7397.37	9.263	9.2628
690.000	7795.234	7397.52	9.263	9.2629
700.000	7795.322	7397.66	9.263	9.2631
710.000	7795.409	7397.80	9.263	9.2632
720.000	7795.498	7397.94	9.263	9.2633
730.000	7795.604	7398.10	9.264	9.2635
740.000	7795.710	7398.26	9.264	9.2636

TABLE 7-XXXVII VELOCITY, RELATIVE VELOCITY,
ACCELERATION, AND GRAVITATIONAL
ION - LIFTOFF THROUGH PARKING ORBIT
(SEE LAUNCH AZIMUTH)
(D)

TIME FROM LIFTOFF (SEC)	INE VEL (M)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
741.981	779	798.29	9.264	9.2637
750.000	779	798.38	9.264	9.2638
760.000	779	798.49	9.264	9.2639
770.000	779	798.60	9.264	9.2641
780.000	779	798.71	9.264	9.2642
790.000	779	798.81	9.264	9.2644
800.000	779	798.92	9.265	9.2645
900.000	779	799.90	9.266	9.2659
1000.000	779	7400.70	9.267	9.2672
1100.000	779	7401.46	9.268	9.2682
1200.000	779	7402.05	9.269	9.2690
1300.000	779	7402.44	9.270	9.2696
1400.000	779	7402.62	9.270	9.2698
1500.000	779	7402.59	9.270	9.2698
1600.000	779	7402.39	9.269	9.2695
1700.000	779	7402.02	9.269	9.2690
1800.000	779	7401.52	9.268	9.2682
1900.000	779	7400.94	9.267	9.2673
2000.000	779	7400.31	9.266	9.2663
2100.000	779	7399.68	9.265	9.2652
2200.000	779	7399.09	9.264	9.2642
2300.000	779	7398.56	9.263	9.2632
2400.000	779	7398.14	9.262	9.2623
2500.000	779	7397.84	9.262	9.2615
2600.000	779	7397.66	9.261	9.2608
2700.000	779	7397.61	9.260	9.2603
2800.000	779	7397.68	9.260	9.2599
2900.000	779	7397.86	9.260	9.2596
3000.000	779	7397.63	9.259	9.2593
3100.000	779	7397.41	9.259	9.2591
3200.000	779	7397.16	9.259	9.2588
3300.000	779	7396.87	9.258	9.2584
3400.000	779	7396.53	9.258	9.2579
3500.000	779	7396.14	9.257	9.2572
3600.000	779	7395.68	9.256	9.2562
3700.000	779	7395.17	9.255	9.2551
3800.000	779	7394.59	9.254	9.2537
3900.000	779	7393.95	9.252	9.2520
4000.000	779	7393.27	9.250	9.2502
4100.000	779	7392.53	9.248	9.2481

TABLE 7-XXXVIII INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
4200.000	7791.826	7394.60	9.246	9.2459
4300.000	7791.084	7393.38	9.244	9.2436
4400.000	7790.359	7392.11	9.241	9.2413
4500.000	7789.669	7390.84	9.239	9.2390
4600.000	7789.035	7389.62	9.237	9.2369
4700.000	7788.477	7388.51	9.235	9.2350
4800.000	7788.014	7387.55	9.234	9.2333
4900.000	7787.662	7386.79	9.232	9.2320
5000.000	7787.432	7386.26	9.231	9.2311
5100.000	7787.336	7385.98	9.231	9.2306
5200.000	7787.375	7385.98	9.231	9.2305
5300.000	7787.551	7386.25	9.231	9.2309
5400.000	7787.858	7386.78	9.232	9.2317
5500.000	7788.288	7387.56	9.233	9.2329
5600.000	7788.827	7388.55	9.235	9.2344
5700.000	7789.458	7389.70	9.236	9.2362
5800.000	7790.160	7390.97	9.238	9.2382
5900.000	7790.914	7392.31	9.240	9.2403
6000.000	7791.694	7393.66	9.243	9.2425
6100.000	7792.474	7394.96	9.245	9.2447
6200.000	7793.232	7396.16	9.247	9.2467
6300.000	7793.948	7397.22	9.248	9.2485
6400.000	7794.603	7398.11	9.250	9.2501
6500.000	7795.183	7398.78	9.251	9.2513
6600.000	7795.676	7399.24	9.252	9.2523
6700.000	7796.076	7399.47	9.253	9.2529
6800.000	7796.379	7399.48	9.253	9.2532
6900.000	7796.586	7399.30	9.253	9.2531
7000.000	7796.703	7398.93	9.253	9.2528
7100.000	7796.736	7398.44	9.252	9.2522
7200.000	7796.695	7397.84	9.251	9.2514
7300.000	7796.593	7397.19	9.251	9.2505
7400.000	7796.440	7396.53	9.250	9.2496
7500.000	7796.249	7395.90	9.249	9.2486
7600.000	7796.031	7395.33	9.248	9.2476
7700.000	7795.796	7394.85	9.247	9.2466
7800.000	7795.550	7394.49	9.246	9.2458
7900.000	7795.298	7394.25	9.245	9.2451
8000.000	7795.043	7394.14	9.244	9.2445
8100.000	7794.783	7394.14	9.244	9.2440

TABLE 7-XXXVIII

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
8200.000	7794.515	7394.24	9.244	9.2436
8300.000	7794.234	7394.40	9.243	9.2432
8400.000	7793.933	7394.60	9.243	9.2428
8500.000	7793.604	7394.80	9.242	9.2424
8600.000	7793.238	7394.96	9.242	9.2419
8700.000	7792.830	7395.04	9.241	9.2412
8800.000	7792.372	7395.00	9.240	9.2404
8900.000	7791.861	7394.82	9.239	9.2394
9000.000	7791.295	7394.48	9.238	9.2382
9100.000	7790.677	7393.96	9.237	9.2367
9200.000	7790.011	7393.25	9.235	9.2350
9300.000	7789.307	7392.38	9.233	9.2331
9400.000	7788.577	7391.36	9.231	9.2310
9500.000	7787.836	7390.22	9.229	9.2288
9600.000	7787.101	7389.00	9.227	9.2266
9700.000	7786.393	7387.74	9.224	9.2243
9800.000	7785.731	7386.50	9.222	9.2221
9900.000	7785.135	7385.32	9.220	9.2201
10000.000	7784.626	7384.26	9.218	9.2183
10100.000	7784.220	7383.37	9.217	9.2168
10200.000	7783.933	7382.68	9.216	9.2157
10300.000	7783.776	7382.23	9.215	9.2149
10400.000	7783.756	7382.05	9.215	9.2146
10500.000	7783.877	7382.14	9.215	9.2148
10600.000	7784.136	7382.51	9.215	9.2153
10700.000	7784.528	7383.14	9.216	9.2163
10800.000	7785.041	7384.01	9.218	9.2177
10900.000	7785.661	7385.09	9.219	9.2194
11000.000	7786.369	7386.32	9.221	9.2214
11100.000	7787.145	7387.67	9.224	9.2236
11200.000	7787.964	7389.08	9.226	9.2259
11300.000	7788.803	7390.49	9.228	9.2282
11400.000	7789.639	7391.85	9.231	9.2305
11500.000	7790.447	7393.10	9.233	9.2327
11600.000	7791.208	7394.21	9.235	9.2346
11700.000	7791.901	7395.12	9.236	9.2363
11800.000	7792.514	7395.83	9.238	9.2376
11900.000	7793.034	7396.30	9.239	9.2387
12000.000	7793.454	7396.55	9.239	9.2393
12100.000	7793.773	7396.58	9.240	9.2396

TABLE 7-XXXVIII

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
(108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
12200.000	7793.991	7396.39	9.240	9.2396
12300.000	7794.112	7396.04	9.239	9.2393
12400.000	7794.144	7395.53	9.239	9.2388
12500.000	7794.097	7394.93	9.238	9.2380
12600.000	7793.982	7394.27	9.237	9.2371
12700.000	7793.812	7393.59	9.236	9.2361
12800.000	7793.598	7392.94	9.235	9.2350
12900.000	7793.351	7392.34	9.234	9.2340
13000.000	7793.082	7391.84	9.233	9.2330
13100.000	7792.798	7391.44	9.232	9.2321
13200.000	7792.504	7391.16	9.231	9.2313
13300.000	7792.203	7391.00	9.231	9.2306
13400.000	7791.893	7390.96	9.230	9.2299
13500.000	7791.573	7391.00	9.229	9.2294
13600.000	7791.238	7391.11	9.229	9.2289
13700.000	7790.880	7391.26	9.228	9.2284
13800.000	7790.495	7391.40	9.228	9.2279
13900.000	7790.073	7391.50	9.227	9.2272
14000.000	7789.610	7391.52	9.226	9.2265
14100.000	7789.100	7391.43	9.226	9.2256
14200.000	7788.541	7391.19	9.224	9.2245
14300.000	7787.932	7390.80	9.223	9.2231
14400.000	7787.276	7390.24	9.222	9.2216
14500.000	7786.578	7389.50	9.220	9.2198
14600.000	7785.848	7388.60	9.218	9.2179
14700.000	7785.099	7387.56	9.216	9.2158
14800.000	7784.346	7386.40	9.214	9.2135
14900.000	7783.608	7385.18	9.211	9.2113
15000.000	7782.903	7383.92	9.209	9.2091
15100.000	7782.252	7382.69	9.207	9.2069
15200.000	7781.676	7381.53	9.205	9.2050
15300.000	7781.193	7380.50	9.203	9.2033
15400.000	7780.820	7379.64	9.202	9.2019
15500.000	7780.573	7379.00	9.201	9.2008
15600.000	7780.463	7378.60	9.200	9.2002
15700.000	7780.496	7378.47	9.200	9.2000
15800.000	7780.675	7378.62	9.200	9.2003
15900.000	7780.997	7379.06	9.201	9.2010
16000.000	7781.456	7379.76	9.202	9.2022
16100.000	7782.038	7380.70	9.204	9.2037

TABLE 7-XXXVIII

INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - LIFTOFF THROUGH PARKING ORBIT
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
16200.000	7782.729	7381.85	9.206	9.2056
16300.000	7783.508	7383.17	9.208	9.2078
16400.000	7784.354	7384.59	9.210	9.2101
16500.000	7785.243	7386.07	9.213	9.2126
16550.000	7785.695	7386.82	9.214	9.2138

TABLE 7-XXXIX

INERTIAL FLIGHT, INERTIAL HEADING,
GEODETTIC LATITUDE - LIFTOFF
THROUGH PARK (8-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT-PATH ANGLE (DEGREES)		GEODETTIC (LATITUDE DEGREES)	LONGITUDE (DEGREES)
0.000	0.000		8.608	-80.604
5.000	1.458		8.608	-80.604
10.000	3.120		8.608	-80.604
12.000	3.844		8.608	-80.604
15.000	4.995		8.608	-80.604
20.000	7.084		8.608	-80.604
25.000	9.389		8.608	-80.604
30.000	11.886		8.608	-80.604
35.000	14.517		8.608	-80.604
40.000	17.202		8.608	-80.604
45.000	19.835		8.608	-80.603
50.000	22.300		8.608	-80.602
55.000	24.489		8.607	-80.600
60.000	26.315		8.606	-80.598
65.000	27.723		8.605	-80.594
70.000	28.696		8.604	-80.589
75.000	29.292	9	8.602	-80.582
80.000	29.596	9	8.599	-80.573
82.000	29.646	9	8.596	-80.562
85.000	29.651	9	8.594	-80.557
90.000	29.492	9	8.592	-80.549
95.000	29.156	98	8.587	-80.532
100.000	28.671	99	8.581	-80.511
105.000	28.053	100	8.574	-80.487
110.000	27.326	101	8.566	-80.459
115.000	26.575	101	8.556	-80.426
120.000	25.823	102	8.544	-80.388
125.000	25.072	102	8.531	-80.344
130.000	24.331	103	8.517	-80.294
135.000	23.610	103	8.500	-80.238
140.000	22.920	104	8.481	-80.175
145.000	22.265	104	8.460	-80.105
147.329	21.974	105.2	8.437	-80.027
150.000	21.610	105.3	8.425	-79.987
155.000	20.959	105.1	8.411	-79.940
159.329	20.456	105.19	8.402	-79.846
159.329	20.456	105.23	8.395	-79.758
159.459	20.435	105.23	8.395	-79.758
160.000	20.348	105.25	8.395	-79.755
163.759	19.743	105.33	8.395	-79.744
		105.85	8.395	-79.665

TABLE 7-XXXIX

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
165.000	19.556	106.008	28.319	-79.638
165.859	19.427	106.025	28.314	-79.620
170.000	18.820	106.107	28.287	-79.532
175.000	18.104	106.206	28.254	-79.425
180.000	17.406	106.305	28.220	-79.315
185.000	16.727	106.404	28.186	-79.205
189.559	16.124	106.494	28.154	-79.103
190.000	16.067	106.503	28.151	-79.093
194.559	15.482	106.593	28.118	-78.989
195.000	15.427	106.602	28.115	-78.979
200.000	14.807	106.701	28.079	-78.864
205.000	14.226	106.802	28.042	-78.747
210.000	13.710	106.901	28.005	-78.629
215.000	13.196	107.001	27.967	-78.509
220.000	12.695	107.102	27.928	-78.388
225.000	12.204	107.202	27.888	-78.265
230.000	11.725	107.303	27.848	-78.141
235.000	11.257	107.404	27.807	-78.015
240.000	10.800	107.505	27.766	-77.887
245.000	10.354	107.607	27.723	-77.758
250.000	9.920	107.709	27.680	-77.626
255.000	9.497	107.811	27.636	-77.494
260.000	9.085	107.914	27.591	-77.359
265.000	8.684	108.016	27.546	-77.223
270.000	8.294	108.120	27.500	-77.084
275.000	7.915	108.223	27.453	-76.944
280.000	7.546	108.327	27.404	-76.802
285.000	7.189	108.432	27.356	-76.659
290.000	6.842	108.536	27.306	-76.513
295.000	6.506	108.642	27.255	-76.365
300.000	6.180	108.747	27.204	-76.216
305.000	5.865	108.853	27.151	-76.064
310.000	5.559	108.960	27.097	-75.910
315.000	5.264	109.066	27.043	-75.755
320.000	4.979	109.174	26.987	-75.597
325.000	4.704	109.282	26.931	-75.437
330.000	4.439	109.390	26.873	-75.274
335.000	4.184	109.499	26.814	-75.110
340.000	3.938	109.608	26.755	-74.943
345.000	3.702	109.718	26.694	-74.774

TABLE 7-XXXIX

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
350.000	3.475	109.828	26.632	-74.603
355.000	3.257	109.939	26.568	-74.430
360.000	3.049	110.051	26.504	-74.254
365.000	2.850	110.163	26.438	-74.075
370.000	2.659	110.276	26.371	-73.894
375.000	2.478	110.389	26.303	-73.711
380.000	2.306	110.503	26.233	-73.525
385.000	2.142	110.617	26.163	-73.336
390.000	1.987	110.733	26.090	-73.145
395.000	1.841	110.848	26.017	-72.951
400.000	1.704	110.965	25.941	-72.754
405.000	1.575	111.082	25.865	-72.555
410.000	1.454	111.200	25.787	-72.352
415.000	1.342	111.319	25.707	-72.147
420.000	1.238	111.438	25.626	-71.939
425.000	1.143	111.558	25.543	-71.728
430.000	1.056	111.679	25.458	-71.514
435.000	0.977	111.801	25.372	-71.296
437.627	0.939	111.865	25.326	-71.181
440.000	0.890	111.921	25.284	-71.076
445.000	0.793	112.041	25.194	-70.853
450.000	0.702	112.161	25.103	-70.627
455.000	0.619	112.282	25.011	-70.399
460.000	0.542	112.403	24.916	-70.167
465.000	0.473	112.525	24.820	-69.934
470.000	0.410	112.648	24.722	-69.697
475.000	0.355	112.771	24.623	-69.457
480.000	0.306	112.895	24.521	-69.215
485.000	0.264	113.019	24.418	-68.970
490.000	0.230	113.144	24.313	-68.721
495.000	0.203	113.270	24.206	-68.470
500.000	0.182	113.397	24.097	-68.215
505.000	0.169	113.524	23.986	-67.958
510.000	0.163	113.652	23.873	-67.697
515.000	0.165	113.780	23.758	-67.432
520.000	0.173	113.909	23.640	-67.165
525.000	0.189	114.039	23.521	-66.894
530.000	0.212	114.170	23.399	-66.619
535.000	0.243	114.301	23.274	-66.341
537.424	0.260	114.365	23.213	-66.205

TABLE 7-XXXIX INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
537.424	0.260	114.365	23.213	-66.205
537.442	0.260	114.365	23.213	-66.204
540.000	0.224	114.426	23.148	-66.060
543.142	0.181	114.501	23.068	-65.883
545.000	0.166	114.546	23.021	-65.779
545.742	0.160	114.564	23.002	-65.737
549.542	0.132	114.657	22.904	-65.523
550.000	0.129	114.668	22.892	-65.497
555.000	0.095	114.789	22.763	-65.214
560.000	0.063	114.910	22.632	-64.931
565.000	0.034	115.031	22.500	-64.647
570.000	0.008	115.151	22.367	-64.362
575.000	-0.017	115.271	22.233	-64.076
580.000	-0.039	115.390	22.097	-63.790
585.000	-0.058	115.509	21.961	-63.502
590.000	-0.074	115.628	21.823	-63.214
595.000	-0.087	115.746	21.683	-62.925
600.000	-0.098	115.864	21.543	-62.635
605.000	-0.106	115.982	21.401	-62.345
610.000	-0.110	116.099	21.258	-62.053
615.000	-0.112	116.215	21.114	-61.761
620.000	-0.111	116.331	20.968	-61.467
625.000	-0.107	116.447	20.821	-61.173
630.000	-0.100	116.563	20.673	-60.878
635.000	-0.089	116.677	20.524	-60.582
640.000	-0.076	116.792	20.373	-60.286
645.000	-0.059	116.906	20.221	-59.988
650.000	-0.039	117.020	20.067	-59.689
655.000	-0.017	117.134	19.913	-59.390
657.981	0.000	117.201	19.820	-59.211
657.981	0.000	117.201	19.820	-59.211
660.000	0.000	117.245	19.756	-59.090
670.000	-0.000	117.459	19.442	-58.490
680.000	-0.001	117.669	19.126	-57.893
690.000	-0.001	117.875	18.807	-57.299
700.000	-0.001	118.077	18.486	-56.707
710.000	-0.002	118.275	18.163	-56.117
720.000	-0.002	118.469	17.838	-55.530
730.000	-0.002	118.659	17.511	-54.945
740.000	-0.003	118.845	17.182	-54.362

TABLE 7-XXXIX

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
741.981	-0.003	118.881	17.116	-54.246
750.000	-0.003	119.026	16.851	-53.781
760.000	-0.003	119.204	16.518	-53.202
770.000	-0.003	119.377	16.183	-52.626
780.000	-0.004	119.547	15.846	-52.051
790.000	-0.004	119.712	15.508	-51.479
800.000	-0.004	119.874	15.168	-50.909
900.000	-0.007	121.269	11.683	-45.305
1000.000	-0.011	122.274	8.074	-39.851
1100.000	-0.013	122.899	4.381	-34.501
1200.000	-0.016	123.149	0.644	-29.206
1300.000	-0.018	123.027	-3.101	-23.919
1400.000	-0.019	122.531	-6.814	-18.592
1500.000	-0.020	121.657	-10.458	-13.177
1600.000	-0.020	120.396	-13.992	-7.626
1700.000	-0.019	118.737	-17.375	-1.895
1800.000	-0.017	116.669	-20.561	4.059
1900.000	-0.014	114.187	-23.502	10.270
2000.000	-0.011	111.289	-26.150	16.766
2100.000	-0.007	107.987	-28.451	23.558
2200.000	-0.002	104.310	-30.355	30.639
2300.000	0.004	100.310	-31.814	37.980
2400.000	0.009	96.061	-32.788	45.524
2500.000	0.015	91.658	-33.248	53.197
2600.000	0.021	87.212	-33.181	60.905
2700.000	0.027	82.839	-32.588	68.552
2800.000	0.033	78.645	-31.487	76.049
2900.000	0.037	74.723	-29.911	83.325
3000.000	0.042	71.139	-27.903	90.331
3100.000	0.045	67.940	-25.511	97.044
3200.000	0.048	65.148	-22.786	103.461
3300.000	0.050	62.772	-19.781	109.599
3400.000	0.051	60.810	-16.544	115.488
3500.000	0.050	59.253	-13.123	121.164
3600.000	0.049	58.090	-9.562	126.670
3700.000	0.048	57.311	-5.901	132.052
3800.000	0.045	56.909	-2.182	137.357
3900.000	0.042	56.878	1.559	142.633
4000.000	0.038	57.218	5.284	147.929
4100.000	0.034	57.933	8.954	153.291

TABLE 7-XXXIX

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
4200.000	0.030	59.030	12.531	158.767
4300.000	0.026	60.517	15.975	-195.597
4400.000	0.022	62.407	19.241	-189.757
4500.000	0.018	64.706	22.284	-183.677
4600.000	0.015	67.420	25.055	-177.324
4700.000	0.011	70.542	27.504	-170.681
4800.000	0.008	74.050	29.579	-163.745
4900.000	0.005	77.905	31.233	-156.537
5000.000	0.002	82.042	32.420	-149.098
5100.000	-0.000	86.377	33.108	-141.497
5200.000	-0.002	90.804	33.276	-133.818
5300.000	-0.005	95.210	32.918	-126.156
5400.000	-0.007	99.484	32.046	-118.605
5500.000	-0.009	103.529	30.685	-111.242
5600.000	-0.011	107.264	28.873	-104.128
5700.000	-0.013	110.636	26.657	-97.297
5800.000	-0.015	113.612	24.085	-90.759
5900.000	-0.018	116.176	21.209	-84.507
6000.000	-0.020	118.326	18.079	-78.517
6100.000	-0.022	120.069	14.742	-72.755
6200.000	-0.024	121.413	11.245	-67.181
6300.000	-0.026	122.370	7.629	-61.751
6400.000	-0.027	122.948	3.934	-56.418
6500.000	-0.028	123.154	0.199	-51.135
6600.000	-0.029	122.988	-3.539	-45.853
6700.000	-0.029	122.449	-7.241	-40.526
6800.000	-0.028	121.532	-10.870	-35.104
6900.000	-0.027	120.228	-14.385	-29.543
7000.000	-0.024	118.525	-17.743	-23.796
7100.000	-0.021	116.414	-20.901	-17.823
7200.000	-0.017	113.888	-23.809	-11.589
7300.000	-0.013	110.949	-26.418	-5.069
7400.000	-0.007	107.608	-28.675	1.746
7500.000	-0.001	103.899	-30.532	8.848
7600.000	0.005	99.873	-31.939	16.203
7700.000	0.011	95.608	-32.860	23.756
7800.000	0.018	91.201	-33.266	31.427
7900.000	0.024	86.763	-33.144	39.123
8000.000	0.030	82.409	-32.500	46.749
8100.000	0.036	78.244	-31.352	54.217

TABLE 7-XXXIX

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
8200.000	0.041	74.357	-29.733	61.458
8300.000	0.045	70.814	-27.688	68.427
8400.000	0.049	67.656	-25.265	75.101
8500.000	0.051	64.907	-22.515	81.482
8600.000	0.053	62.573	-19.490	87.587
8700.000	0.053	60.651	-16.239	93.446
8800.000	0.053	59.133	-12.808	99.096
8900.000	0.051	58.006	-9.242	104.581
9000.000	0.049	57.262	-5.580	109.947
9100.000	0.046	56.892	-1.862	115.240
9200.000	0.042	56.892	1.874	120.508
9300.000	0.038	57.263	5.590	125.799
9400.000	0.034	58.008	9.249	131.160
9500.000	0.030	59.134	12.812	136.639
9600.000	0.025	60.651	16.238	-217.719
9700.000	0.020	62.569	19.484	-211.871
9800.000	0.016	64.897	22.504	-205.779
9900.000	0.012	67.638	25.249	-199.415
10000.000	0.008	70.784	27.668	-192.760
10100.000	0.004	74.315	29.712	-185.814
10200.000	0.001	78.186	31.331	-178.598
10300.000	-0.002	82.335	32.484	-171.156
10400.000	-0.005	86.673	33.136	-163.557
10500.000	-0.007	91.097	33.269	-155.887
10600.000	-0.009	95.492	32.877	-148.240
10700.000	-0.012	99.749	31.974	-140.709
10800.000	-0.014	103.771	30.585	-133.370
10900.000	-0.016	107.481	28.749	-126.282
11000.000	-0.018	110.826	26.512	-119.477
11100.000	-0.020	113.774	23.924	-112.965
11200.000	-0.022	116.311	21.035	-106.737
11300.000	-0.024	118.435	17.896	-100.768
11400.000	-0.026	120.153	14.553	-95.025
11500.000	-0.028	121.475	11.052	-89.467
11600.000	-0.029	122.410	7.435	-84.050
11700.000	-0.030	122.968	3.741	-78.727
11800.000	-0.031	123.154	0.009	-73.451
11900.000	-0.031	122.970	-3.724	-68.174
12000.000	-0.031	122.414	-7.419	-62.849
12100.000	-0.029	121.479	-11.039	-57.429

TABLE 7-XXXIX

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
12200.000	-0.028	120.157	-14.544	-51.866
12300.000	-0.025	118.438	-17.891	-46.116
12400.000	-0.021	116.311	-21.035	-40.139
12500.000	-0.017	113.770	-23.928	-33.900
12600.000	-0.012	110.816	-26.520	-27.375
12700.000	-0.006	107.463	-28.760	-20.555
12800.000	0.000	103.744	-30.597	-13.450
12900.000	0.007	99.711	-31.985	-6.094
13000.000	0.014	95.443	-32.885	1.456
13100.000	0.020	91.038	-33.271	9.121
13200.000	0.027	86.606	-33.130	16.807
13300.000	0.033	82.261	-32.468	24.420
13400.000	0.039	78.109	-31.305	31.872
13500.000	0.044	74.237	-29.674	39.096
13600.000	0.048	70.709	-27.618	46.048
13700.000	0.052	67.568	-25.187	52.705
13800.000	0.054	64.834	-22.432	59.070
13900.000	0.056	62.515	-19.403	65.159
14000.000	0.056	60.606	-16.151	71.004
14100.000	0.055	59.099	-12.720	76.643
14200.000	0.054	57.984	-9.155	82.117
14300.000	0.051	57.249	-5.496	87.473
14400.000	0.048	56.888	-1.782	92.758
14500.000	0.044	56.896	1.949	98.018
14600.000	0.039	57.274	5.660	103.303
14700.000	0.035	58.025	9.313	108.659
14800.000	0.030	59.156	12.869	114.133
14900.000	0.025	60.677	16.288	-240.229
15000.000	0.020	62.599	19.527	-234.386
15100.000	0.015	64.929	22.540	-228.300
15200.000	0.010	67.671	25.278	-221.941
15300.000	0.006	70.818	27.691	-215.291
15400.000	0.002	74.347	29.728	-208.352
15500.000	-0.002	78.217	31.342	-201.143
15600.000	-0.005	82.362	32.489	-193.710
15700.000	-0.008	86.696	33.138	-186.120
15800.000	-0.011	91.114	33.268	-178.459
15900.000	-0.013	95.504	32.875	-170.822
16000.000	-0.016	99.756	31.972	-163.300
16100.000	-0.018	103.772	30.584	-155.971

TABLE 7-XXXIX INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - LIFTOFF
 THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
16200.000	-0.020	107.478	28.751	-148.891
16300.000	-0.022	110.820	26.517	-142.094
16400.000	-0.024	113.766	23.932	-135.589
16500.000	-0.026	116.301	21.047	-129.367
16550.000	-0.027	117.414	19.508	-126.355

TABLE 7-XL COMMANDED AND ACTUAL VEHICLE ATTITUDE ANGLES - LIFTOFF THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
0.000	-0.00	0.00	0.00	0.00	18.00	18.00
5.000	-0.00	-0.00	0.00	-0.00	18.00	18.00
10.000	-0.00	0.00	0.00	0.00	18.00	18.00
12.000	-0.03	0.00	0.00	0.00	17.00	18.00
15.000	-0.45	-0.12	0.00	-0.00	14.00	14.31
20.000	-1.09	-0.86	0.00	0.00	9.00	9.58
25.000	-2.18	-1.79	0.00	0.01	4.00	4.61
30.000	-3.68	-3.20	0.00	0.02	0.00	-0.39
35.000	-5.61	-5.04	0.00	0.01	0.00	0.01
40.000	-8.01	-7.34	0.00	0.00	0.00	0.02
45.000	-10.81	-10.10	0.00	-0.00	0.00	0.01
50.000	-13.95	-13.22	0.00	-0.00	0.00	0.00
55.000	-17.35	-16.61	0.00	-0.00	0.00	0.00
60.000	-20.92	-20.20	0.00	-0.00	0.00	0.00
65.000	-24.53	-23.88	0.00	0.00	0.00	0.00
70.000	-28.15	-27.53	0.00	0.00	0.00	-0.00
75.000	-31.71	-31.12	0.00	-0.02	0.00	0.00
80.000	-35.16	-34.60	0.00	-0.03	0.00	0.00
82.000	-36.50	-35.95	0.00	-0.04	0.00	0.00
85.000	-38.45	-37.93	0.00	-0.04	0.00	0.00
90.000	-41.57	-41.10	0.00	-0.03	0.00	0.00
95.000	-44.53	-44.13	0.00	-0.01	0.00	0.00
100.000	-47.32	-46.99	0.00	-0.00	0.00	0.00
105.000	-49.94	-50.02	0.00	-0.00	0.00	-0.00
110.000	-52.41	-52.51	0.00	-0.00	0.00	-0.00
115.000	-54.66	-54.54	0.00	0.00	0.00	0.00
120.000	-56.71	-56.49	0.00	0.00	0.00	0.00
125.000	-58.58	-58.37	0.00	0.00	0.00	0.00
130.000	-60.31	-60.10	0.00	0.00	0.00	-0.00
135.000	-61.89	-61.70	0.00	0.00	0.00	-0.00
140.000	-63.34	-63.16	0.00	0.00	0.00	-0.00
145.000	-64.67	-64.51	0.00	0.00	0.00	-0.00
147.329	-65.26	-65.10	0.00	0.00	0.00	-0.00
150.000	-65.90	-65.75	0.00	0.00	0.00	-0.00
155.000	-66.59	-66.84	0.00	0.00	0.00	0.00
159.329	-66.59	-66.90	0.00	0.00	0.00	0.00
159.329	-66.59	-66.90	0.00	0.00	0.00	0.00
159.459	-66.59	-66.90	0.00	0.00	0.00	0.00
160.000	-66.59	-66.87	0.00	0.00	0.00	0.00
163.759	-66.59	-66.55	0.00	-0.01	0.00	0.00

TABLE 7-XL COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
165.000	-66.59	-66.48	0.00	-0.01	0.00	0.00
165.859	-66.59	-66.47	0.00	-0.01	0.00	0.00
170.000	-66.59	-66.57	0.00	-0.00	0.00	0.00
175.000	-66.59	-66.57	0.00	-0.00	0.00	0.00
180.000	-66.59	-66.58	0.00	-0.00	0.00	0.00
185.000	-66.59	-66.59	0.00	-0.00	0.00	0.00
189.559	-66.59	-66.59	0.00	-0.00	0.00	0.00
190.000	-66.59	-66.59	0.00	-0.00	0.00	0.00
194.559	-66.59	-66.59	0.00	-0.00	0.00	0.00
195.000	-66.59	-66.59	0.00	-0.00	0.00	0.00
200.000	-65.59	-66.59	0.08	-0.00	0.00	0.00
205.000	-62.43	-62.58	0.08	0.09	0.00	0.00
210.000	-62.96	-62.71	0.08	0.08	0.00	-0.00
215.000	-63.47	-63.31	0.08	0.08	0.00	-0.00
220.000	-63.99	-63.82	0.08	0.08	0.00	-0.00
225.000	-64.54	-64.35	0.07	0.07	0.00	-0.00
230.000	-65.08	-64.90	0.07	0.07	0.00	-0.00
235.000	-65.61	-65.43	0.07	0.07	0.00	-0.00
240.000	-66.14	-65.96	0.07	0.07	0.00	-0.00
245.000	-66.67	-66.49	0.07	0.07	0.00	-0.00
250.000	-67.20	-67.02	0.06	0.06	0.00	-0.00
255.000	-67.73	-67.55	0.06	0.06	0.00	-0.00
260.000	-68.26	-68.08	0.06	0.06	0.00	-0.00
265.000	-68.79	-68.61	0.06	0.06	0.00	-0.00
270.000	-69.32	-69.14	0.05	0.06	0.00	-0.00
275.000	-69.85	-69.67	0.05	0.05	0.00	-0.00
280.000	-70.39	-70.21	0.05	0.05	0.00	-0.00
285.000	-70.93	-70.74	0.05	0.05	0.00	-0.00
290.000	-71.46	-71.28	0.05	0.05	0.00	-0.00
295.000	-72.00	-71.82	0.04	0.04	0.00	-0.00
300.000	-72.54	-72.36	0.04	0.04	0.00	-0.00
305.000	-73.08	-72.90	0.04	0.04	0.00	-0.00
310.000	-73.62	-73.44	0.04	0.04	0.00	-0.00
315.000	-74.17	-73.98	0.03	0.04	0.00	-0.00
320.000	-74.71	-74.53	0.03	0.03	0.00	-0.00
325.000	-75.26	-75.07	0.03	0.03	0.00	-0.00
330.000	-75.80	-75.62	0.03	0.03	0.00	-0.00
335.000	-76.35	-76.17	0.03	0.03	0.00	-0.00
340.000	-76.90	-76.71	0.02	0.03	0.00	-0.00
345.000	-77.45	-77.26	0.02	0.02	0.00	-0.00

TABLE 7-XL COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
350.000	-78.00	-77.81				
355.000	-78.55	-78.36	0.02	0.02	0.00	-0.00
360.000	-79.10	-78.91	0.02	0.02	0.00	-0.00
365.000	-79.65	-79.46	0.02	0.02	0.00	-0.00
370.000	-80.20	-80.01	0.01	0.02	0.00	-0.00
375.000	-80.75	-80.56	0.01	0.01	0.00	-0.00
380.000	-81.30	-81.12	0.01	0.01	0.00	-0.00
385.000	-81.85	-81.67	0.01	0.01	0.00	-0.00
390.000	-82.40	-82.22	0.01	0.01	0.00	-0.00
395.000	-82.96	-82.77	0.01	0.01	0.00	-0.00
400.000	-83.51	-83.32	0.00	0.00	0.00	-0.00
405.000	-84.06	-83.87	0.00	0.00	0.00	-0.00
410.000	-84.61	-84.42	0.00	0.00	0.00	-0.00
415.000	-85.16	-84.97	-0.00	-0.00	0.00	0.00
420.000	-85.71	-85.52	-0.00	-0.00	0.00	0.00
425.000	-86.25	-86.07	-0.01	-0.01	0.00	0.00
430.000	-86.80	-86.62	-0.01	-0.01	0.00	0.00
435.000	-87.35	-87.16	-0.01	-0.01	0.00	0.00
437.627	-87.63	-87.45	-0.01	-0.01	0.00	0.00
440.000	-87.90	-87.71	-0.01	-0.01	0.00	0.00
445.000	-88.44	-88.26	-0.01	-0.01	0.00	0.00
450.000	-88.98	-88.80	-0.01	-0.01	0.00	0.00
455.000	-89.52	-89.34	-0.01	-0.01	0.00	0.00
460.000	-90.06	-89.88	-0.01	-0.01	0.00	0.00
465.000	-90.60	-90.42	-0.02	-0.01	0.00	0.00
470.000	-91.13	-90.95	-0.02	-0.02	0.00	0.00
475.000	-91.66	-91.48	-0.02	-0.02	0.00	0.00
480.000	-92.19	-92.01	-0.02	-0.02	0.00	0.00
485.000	-92.71	-92.54	-0.02	-0.02	0.00	0.00
490.000	-93.24	-93.06	-0.02	-0.02	0.00	0.00
495.000	-93.76	-93.58	-0.02	-0.02	0.00	0.00
500.000	-94.27	-94.10	-0.02	-0.02	0.00	0.00
505.000	-94.79	-94.61	-0.02	-0.02	0.00	0.00
510.000	-95.30	-95.13	-0.02	-0.02	0.00	0.00
515.000	-95.81	-95.64	-0.02	-0.02	0.00	0.00
520.000	-96.32	-96.15	-0.03	-0.02	0.00	0.00
525.000	-96.83	-96.66	-0.03	-0.03	0.00	0.00
530.000	-97.34	-97.16	-0.03	-0.03	0.00	0.00
535.000	-97.85	-97.67	-0.03	-0.03	0.00	0.00
537.424	-98.10	-97.93	-0.03	-0.03	0.00	0.00

TABLE 7-XL
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
537.424	-98.10	-97.93	-0.03	-0.03	0.00	0.00
537.442	-98.10	-97.93	-0.03	-0.03	0.00	0.00
540.000	-97.99	-98.17	-0.03	-0.03	0.00	0.00
543.142	-97.99	-98.29	-0.03	-0.03	0.00	0.00
545.000	-98.76	-98.32	-0.03	-0.03	0.00	0.00
545.742	-98.81	-98.54	-0.03	-0.03	0.00	0.00
549.542	-99.17	-99.10	-0.03	-0.03	0.00	0.00
550.000	-99.21	-99.13	-0.04	-0.03	0.00	0.00
555.000	-99.72	-99.60	-0.04	-0.04	0.00	0.00
560.000	-100.24	-100.11	-0.05	-0.05	0.00	0.00
565.000	-100.78	-100.64	-0.06	-0.05	0.00	-0.00
570.000	-101.31	-101.20	-0.07	-0.07	0.00	-0.00
575.000	-101.76	-101.65	-0.07	-0.07	0.00	-0.00
580.000	-102.21	-102.11	-0.07	-0.07	0.00	-0.00
585.000	-102.65	-102.55	-0.06	-0.06	0.00	-0.00
590.000	-103.08	-102.98	-0.06	-0.06	0.00	-0.00
595.000	-103.51	-103.41	-0.06	-0.06	0.00	-0.00
600.000	-103.93	-103.83	-0.06	-0.06	0.00	-0.00
605.000	-104.34	-104.24	-0.05	-0.05	0.00	-0.00
610.000	-104.75	-104.65	-0.05	-0.05	0.00	-0.00
615.000	-105.15	-105.05	-0.04	-0.04	0.00	-0.00
620.000	-105.54	-105.44	-0.03	-0.04	0.00	-0.00
625.000	-105.92	-105.83	-0.03	-0.03	0.00	-0.00
630.000	-106.29	-106.21	-0.02	-0.02	0.00	-0.00
635.000	-106.67	-106.57	-0.00	-0.01	0.00	-0.00
640.000	-107.03	-106.93	0.01	0.01	0.00	-0.00
645.000	-107.35	-107.26	0.04	0.03	0.00	-0.00
650.000	-107.88	-107.87	0.16	0.15	0.00	-0.00
655.000	-107.67	-107.62	0.08	0.07	0.00	0.00
657.981	-107.67	-107.65	0.08	0.07	0.00	-0.00
657.981	-107.90	-107.90	-0.77	-0.77	0.00	-0.00
660.000	-109.99	-109.99	-0.75	-0.75	-0.00	-0.00
670.000	-114.52	-114.52	-0.71	-0.71	-0.00	-0.00
680.000	-115.20	-115.20	-0.71	-0.71	-0.00	-0.00
690.000	-115.88	-115.88	-0.70	-0.70	-0.00	-0.00
700.000	-116.56	-116.56	-0.69	-0.69	-0.00	-0.00
710.000	-117.25	-117.25	-0.68	-0.68	-0.00	-0.00
720.000	-117.93	-117.93	-0.68	-0.68	-0.00	-0.00
730.000	-118.61	-118.61	-0.67	-0.67	-0.00	-0.00
740.000	-119.29	-119.29	-0.66	-0.66	-0.00	-0.00

TABLE 7-XL
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
741.981	-119.42	-119.42	-0.66	-0.66	-0.00	-0.00
750.000	-119.97	-119.97	-0.65	-0.65	-0.00	-0.00
760.000	-120.65	-120.65	-0.65	-0.65	-0.00	-0.00
770.000	-121.33	-121.33	-0.64	-0.64	-0.00	-0.00
780.000	-122.01	-122.01	-0.63	-0.63	-0.00	-0.00
790.000	-122.69	-122.69	-0.62	-0.62	-0.00	-0.00
800.000	-123.37	-123.37	-0.61	-0.61	-0.00	-0.00
900.000	-130.18	-130.18	-0.53	-0.53	-0.00	-0.00
1000.000	-136.99	-136.99	-0.44	-0.44	-0.00	-0.00
1100.000	-143.80	-143.80	-0.34	-0.34	-0.00	-0.00
1200.000	-150.61	-150.61	-0.24	-0.24	-0.00	-0.00
1300.000	-157.42	-157.42	-0.14	-0.14	-0.00	-0.00
1400.000	-164.23	-164.23	-0.04	-0.04	-0.00	-0.00
1500.000	-171.04	-171.04	0.06	0.06	-0.00	-0.00
1600.000	-177.85	-177.85	0.16	0.16	-0.00	-0.00
1700.000	175.34	175.34	0.26	0.26	-0.00	-0.00
1800.000	168.53	168.53	0.35	0.35	-0.00	-0.00
1900.000	161.73	161.73	0.44	0.44	-0.00	-0.00
2000.000	154.92	154.92	0.52	0.52	-0.00	-0.00
2100.000	148.11	148.11	0.59	0.59	-0.00	-0.00
2200.000	141.31	141.31	0.65	0.65	-0.00	-0.00
2300.000	134.50	134.50	0.71	0.71	-0.00	-0.00
2400.000	127.70	127.70	0.75	0.75	-0.00	-0.00
2500.000	120.89	120.89	0.78	0.78	-0.00	-0.00
2600.000	114.09	114.09	0.80	0.80	-0.00	-0.00
2700.000	107.28	107.28	0.81	0.81	-0.00	-0.00
2800.000	100.48	100.48	0.81	0.81	-0.00	-0.00
2900.000	93.67	93.67	0.80	0.80	-0.00	-0.00
3000.000	86.87	86.87	0.77	0.77	-0.00	-0.00
3100.000	80.06	80.06	0.74	0.74	-0.00	-0.00
3200.000	73.26	73.26	0.70	0.70	-0.00	-0.00
3300.000	66.46	66.46	0.64	0.64	-0.00	-0.00
3400.000	59.65	59.65	0.58	0.58	42.02	42.02
3500.000	52.85	52.85	0.52	0.52	142.02	142.02
3600.000	26.05	26.05	0.20	0.20	180.00	180.00
3700.000	19.24	19.24	0.11	0.11	180.00	180.00
3800.000	12.44	12.44	0.02	0.02	180.00	180.00
3900.000	5.64	5.64	-0.07	-0.07	180.00	180.00
4000.000	-1.16	-1.16	-0.16	-0.16	180.00	180.00
4100.000	-7.96	-7.96	-0.24	-0.24	180.00	180.00

TABLE 7-XL
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
4200.000	-14.76	-14.76	-0.32	-0.32	180.00	180.00
4300.000	-21.56	-21.56	-0.40	-0.40	180.00	180.00
4400.000	-28.35	-28.35	-0.47	-0.47	180.00	180.00
4500.000	-35.15	-35.15	-0.53	-0.53	180.00	180.00
4600.000	-41.95	-41.95	-0.58	-0.58	180.00	180.00
4700.000	-48.74	-48.74	-0.63	-0.63	180.00	180.00
4800.000	-55.53	-55.53	-0.67	-0.67	180.00	180.00
4900.000	-62.33	-62.33	-0.69	-0.69	180.00	180.00
5000.000	-69.12	-69.12	-0.71	-0.71	180.00	180.00
5100.000	-75.91	-75.91	-0.72	-0.72	180.00	180.00
5200.000	-82.70	-82.70	-0.71	-0.71	180.00	180.00
5300.000	-89.50	-89.50	-0.70	-0.70	180.00	180.00
5400.000	-96.29	-96.29	-0.68	-0.68	180.00	180.00
5500.000	-103.08	-103.08	-0.65	-0.65	180.00	180.00
5600.000	-109.87	-109.87	-0.61	-0.61	180.00	180.00
5700.000	-116.67	-116.67	-0.56	-0.56	180.00	180.00
5800.000	-123.46	-123.46	-0.51	-0.51	180.00	180.00
5900.000	-110.26	-110.26	-0.59	-0.59	157.98	157.98
6000.000	-117.05	-117.05	-0.54	-0.54	57.98	57.98
6100.000	-123.85	-123.85	-0.49	-0.49	-0.00	-0.00
6200.000	-130.65	-130.65	-0.43	-0.43	-0.00	-0.00
6300.000	-137.45	-137.45	-0.37	-0.37	-0.00	-0.00
6400.000	-144.24	-144.24	-0.30	-0.30	-0.00	-0.00
6500.000	-151.04	-151.04	-0.23	-0.23	-0.00	-0.00
6600.000	-157.84	-157.84	-0.16	-0.16	-0.00	-0.00
6700.000	-164.64	-164.64	-0.09	-0.09	-0.00	-0.00
6800.000	-171.44	-171.44	-0.02	-0.02	-0.00	-0.00
6900.000	-178.24	-178.24	0.06	0.06	-0.00	-0.00
7000.000	174.96	174.96	0.13	0.13	-0.00	-0.00
7100.000	168.16	168.16	0.19	0.19	-0.00	-0.00
7200.000	161.36	161.36	0.26	0.26	-0.00	-0.00
7300.000	154.56	154.56	0.32	0.32	-0.00	-0.00
7400.000	147.76	147.76	0.37	0.37	-0.00	-0.00
7500.000	140.97	140.97	0.42	0.42	-0.00	-0.00
7600.000	134.17	134.17	0.47	0.47	-0.00	-0.00
7700.000	127.37	127.37	0.50	0.50	-0.00	-0.00
7800.000	120.58	120.58	0.53	0.53	-0.00	-0.00
7900.000	113.78	113.78	0.55	0.55	-0.00	-0.00
8000.000	106.99	106.99	0.56	0.56	-0.00	-0.00
8100.000	100.19	100.19	0.57	0.57	-0.00	-0.00

TABLE 7-XL
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
8200.000	93.40	93.40	0.57	0.57	-0.00	-0.00
8300.000	86.60	86.60	0.56	0.56	-0.00	-0.00
8400.000	79.81	79.81	0.54	0.54	-0.00	-0.00
8500.000	73.01	73.01	0.52	0.52	-0.00	-0.00
8600.000	66.22	66.22	0.49	0.49	-0.00	-0.00
8700.000	59.42	59.42	0.45	0.45	-0.00	-0.00
8800.000	52.63	52.63	0.41	0.41	-0.00	-0.00
8900.000	45.83	45.83	0.36	0.36	-0.00	-0.00
9000.000	39.04	39.04	0.31	0.31	-0.00	-0.00
9100.000	32.25	32.25	0.26	0.26	-0.00	-0.00
9200.000	25.45	25.45	0.20	0.20	-0.00	-0.00
9300.000	18.66	18.66	0.15	0.15	-0.00	-0.00
9400.000	11.87	11.87	0.09	0.09	-0.00	-0.00
9500.000	5.08	5.08	0.03	0.03	-0.00	-0.00
9600.000	-1.71	-1.71	-0.03	-0.03	-0.00	-0.00
9700.000	-8.50	-8.50	-0.09	-0.09	-0.00	-0.00
9800.000	-15.28	-15.28	-0.14	-0.14	-0.00	-0.00
9900.000	-22.07	-22.07	-0.19	-0.19	-0.00	-0.00
10000.000	-28.85	-28.85	-0.24	-0.24	-0.00	-0.00
10100.000	-35.64	-35.64	-0.29	-0.29	-0.00	-0.00
10200.000	-42.42	-42.42	-0.33	-0.33	-0.00	-0.00
10300.000	-49.21	-49.21	-0.36	-0.36	-0.00	-0.00
10400.000	-55.99	-55.99	-0.39	-0.39	-0.00	-0.00
10500.000	-62.77	-62.77	-0.41	-0.41	-0.00	-0.00
10600.000	-69.55	-69.55	-0.43	-0.43	-0.00	-0.00
10700.000	-76.34	-76.34	-0.45	-0.45	-0.00	-0.00
10800.000	-83.12	-83.12	-0.45	-0.45	-0.00	-0.00
10900.000	-89.91	-89.91	-0.45	-0.45	-0.00	-0.00
11000.000	-96.69	-96.69	-0.45	-0.45	-0.00	-0.00
11100.000	-103.48	-103.48	-0.44	-0.44	-0.00	-0.00
11200.000	-110.26	-110.26	-0.42	-0.42	-0.00	-0.00
11300.000	-117.05	-117.05	-0.40	-0.40	-0.00	-0.00
11400.000	-123.84	-123.84	-0.38	-0.38	-0.00	-0.00
11500.000	-130.63	-130.63	-0.34	-0.34	-0.00	-0.00
11600.000	-137.42	-137.42	-0.31	-0.31	-0.00	-0.00
11700.000	-144.21	-144.21	-0.27	-0.27	-0.00	-0.00
11800.000	-151.01	-151.01	-0.23	-0.23	-0.00	-0.00
11900.000	-157.80	-157.80	-0.19	-0.19	-0.00	-0.00
12000.000	-164.59	-164.59	-0.15	-0.15	-0.00	-0.00
12100.000	-171.38	-171.38	-0.10	-0.10	-0.00	-0.00

TABLE 7-XL
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
12200.000	-178.18	-178.18	-0.06	-0.06	-0.00	-0.00
12300.000	175.03	175.03	-0.01	-0.01	-0.00	-0.00
12400.000	168.24	168.24	0.03	0.03	-0.00	-0.00
12500.000	161.45	161.45	0.07	0.07	-0.00	-0.00
12600.000	154.66	154.66	0.11	0.11	-0.00	-0.00
12700.000	147.87	147.87	0.15	0.15	-0.00	-0.00
12800.000	141.08	141.08	0.19	0.19	-0.00	-0.00
12900.000	134.29	134.29	0.22	0.22	-0.00	-0.00
13000.000	127.50	127.50	0.25	0.25	-0.00	-0.00
13100.000	120.71	120.71	0.28	0.28	-0.00	-0.00
13200.000	113.93	113.93	0.30	0.30	-0.00	-0.00
13300.000	107.14	107.14	0.32	0.32	-0.00	-0.00
13400.000	100.35	100.35	0.33	0.33	-0.00	-0.00
13500.000	93.57	93.57	0.34	0.34	-0.00	-0.00
13600.000	86.78	86.78	0.35	0.35	-0.00	-0.00
13700.000	79.99	79.99	0.35	0.35	-0.00	-0.00
13800.000	73.20	73.20	0.34	0.34	-0.00	-0.00
13900.000	66.42	66.42	0.34	0.34	-0.00	-0.00
14000.000	59.63	59.63	0.32	0.32	-0.00	-0.00
14100.000	52.84	52.84	0.31	0.31	-0.00	-0.00
14200.000	46.06	46.06	0.29	0.29	-0.00	-0.00
14300.000	39.27	39.27	0.27	0.27	-0.00	-0.00
14400.000	32.49	32.49	0.25	0.25	-0.00	-0.00
14500.000	25.70	25.70	0.22	0.22	-0.00	-0.00
14600.000	18.92	18.92	0.19	0.19	-0.00	-0.00
14700.000	12.14	12.14	0.16	0.16	-0.00	-0.00
14800.000	5.35	5.35	0.13	0.13	-0.00	-0.00
14900.000	-1.43	-1.43	0.10	0.10	-0.00	-0.00
15000.000	-8.21	-8.21	0.07	0.07	-0.00	-0.00
15100.000	-14.99	-14.99	0.04	0.04	-0.00	-0.00
15200.000	-21.76	-21.76	0.01	0.01	-0.00	-0.00
15300.000	-28.54	-28.54	-0.03	-0.03	-0.00	-0.00
15400.000	-35.32	-35.32	-0.06	-0.06	-0.00	-0.00
15500.000	-42.09	-42.09	-0.08	-0.08	-0.00	-0.00
15600.000	-48.87	-48.87	-0.11	-0.11	-0.00	-0.00
15700.000	-55.64	-55.64	-0.14	-0.14	-0.00	-0.00
15800.000	-62.42	-62.42	-0.16	-0.16	-0.00	-0.00
15900.000	-69.19	-69.19	-0.18	-0.18	-0.00	-0.00
16000.000	-75.97	-75.97	-0.20	-0.20	-0.00	-0.00
16100.000	-82.74	-82.74	-0.22	-0.22	-0.00	-0.00

TABLE 7-XL

COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - LIFTOFF THROUGH PARKING ORBIT
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
16200.000	-89.52	-89.52	-0.23	-0.23	0.00	-0.00
16300.000	-96.30	-96.30	-0.24	-0.24	0.00	-0.00
16400.000	-103.08	-103.08	-0.25	-0.25	0.00	-0.00
16500.000	-109.86	-109.86	-0.26	-0.26	0.00	-0.00
16550.000	-113.25	-113.25	-0.26	-0.26	0.00	-0.00

TABLE 7-XLI MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
0.000	0.00	0.000	0.00	0.
5.000	0.03	89.830	0.03	89.
10.000	0.06	89.794	0.09	90.
12.000	0.08	89.777	0.11	90.
15.000	0.10	89.750	0.25	85.
20.000	0.15	89.671	0.43	87.
25.000	0.20	88.626	0.29	97.
30.000	0.25	87.128	0.19	111.
35.000	0.32	85.159	0.09	161.
40.000	0.39	82.777	0.12	-145.
45.000	0.47	79.993	0.15	-132.
50.000	0.57	76.873	0.17	-126.
55.000	0.68	73.498	0.17	-125.
60.000	0.80	69.951	0.15	-129.
65.000	0.94	66.312	0.13	-131.
70.000	1.11	62.665	0.15	-128.
75.000	1.30	59.078	0.18	-127.
80.000	1.53	55.606	0.20	-125.
82.000	1.63	54.260	0.20	-125.
85.000	1.78	52.293	0.21	-123.
90.000	2.05	49.165	0.19	-121.
95.000	2.30	46.233	0.14	-126.
100.000	2.55	43.491	0.08	-159.
105.000	2.83	40.914	0.39	102.
110.000	3.14	38.489	0.41	102.
115.000	3.46	36.289	0.20	117.
120.000	3.79	34.301	0.13	138.
125.000	4.14	32.490	0.13	139.
130.000	4.50	30.837	0.14	137.
135.000	4.88	29.331	0.15	135.
140.000	5.31	27.962	0.17	134.
145.000	5.87	26.718	0.18	132.
147.329	6.19	26.180	0.19	131.
150.000	6.51	25.591	0.19	131.
155.000	7.18	24.552	0.16	144.
159.329	7.86	23.749	0.76	-100.
159.329	7.86	23.749	0.76	-100.
159.459	7.86	23.725	0.79	-100.
160.000	7.89	23.627	0.92	-99.
163.759	8.05	22.939	2.01	-95.

TABLE 7-XLI MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
165.000	8.13	22.719	2.33	-94.
165.859	8.18	22.566	2.51	-94.
170.000	8.46	21.844	3.23	-93.
175.000	8.80	20.991	4.20	-93.
180.000	9.15	20.160	5.14	-92.
185.000	9.24	19.352	6.06	-92.
189.559	9.22	18.635	6.89	-92.
190.000	9.20	18.567	6.97	-92.
194.559	9.03	17.871	7.77	-92.
195.000	9.02	17.805	7.85	-92.
200.000	8.86	17.069	8.71	-92.
205.000	8.61	16.378	13.54	-91.
210.000	8.38	15.763	14.15	-91.
215.000	8.17	15.152	14.29	-91.
220.000	7.78	14.556	14.51	-91.
225.000	7.46	13.975	14.69	-91.
230.000	7.19	13.408	14.85	-91.
235.000	6.72	12.854	15.00	-91.
240.000	6.37	12.315	15.15	-91.
245.000	6.09	11.790	15.29	-91.
250.000	5.87	11.279	15.41	-91.
255.000	5.69	10.782	15.52	-91.
260.000	5.54	10.299	15.62	-91.
265.000	5.42	9.830	15.71	-91.
270.000	5.32	9.375	15.78	-91.
275.000	5.24	8.933	15.84	-91.
280.000	5.17	8.505	15.88	-91.
285.000	5.12	8.091	15.92	-91.
290.000	5.10	7.689	15.94	-92.
295.000	5.09	7.301	15.95	-92.
300.000	5.08	6.925	15.94	-92.
305.000	5.08	6.562	15.93	-92.
310.000	5.09	6.211	15.90	-92.
315.000	5.12	5.873	15.86	-92.
320.000	5.15	5.547	15.81	-92.
325.000	5.19	5.233	15.75	-92.
330.000	5.23	4.931	15.68	-92.
335.000	5.28	4.641	15.60	-92.
340.000	5.32	4.362	15.51	-92.
345.000	5.37	4.095	15.41	-92.

TABLE 7-XLI MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
350.000	5.43	3.838	15.30	
355.000	5.50	3.593	15.18	-92.
360.000	5.56	3.358	15.05	-92.
365.000	5.63	3.135	14.92	-92.
370.000	5.69	2.922	14.77	-92.
375.000	5.77	2.719	14.62	-92.
380.000	5.84	2.526	14.46	-92.
385.000	5.91	2.344	14.29	-92.
390.000	5.99	2.172	14.12	-92.
395.000	6.07	2.010	13.94	-92.
400.000	6.15	1.857	13.75	-92.
405.000	6.24	1.714	13.55	-93.
410.000	6.33	1.581	13.35	-93.
415.000	6.42	1.457	13.14	-93.
420.000	6.51	1.343	12.93	-93.
425.000	6.60	1.238	12.71	-93.
430.000	6.70	1.142	12.49	-93.
435.000	6.80	1.055	12.26	-93.
437.627	6.85	1.014	12.14	-93.
440.000	6.89	0.961	12.05	-93.
445.000	6.98	0.855	11.84	-93.
450.000	7.07	0.756	11.64	-93.
455.000	7.16	0.666	11.44	-93.
460.000	7.25	0.583	11.23	-93.
465.000	7.34	0.508	11.02	-94.
470.000	7.44	0.440	10.81	-94.
475.000	7.54	0.380	10.59	-94.
480.000	7.64	0.328	10.38	-94.
485.000	7.74	0.283	10.16	-94.
490.000	7.85	0.246	9.94	-94.
495.000	7.96	0.216	9.72	-94.
500.000	8.07	0.195	9.50	-94.
505.000	8.18	0.180	9.28	-94.
510.000	8.30	0.174	9.05	-94.
515.000	8.42	0.175	8.83	-95.
520.000	8.54	0.184	8.60	-95.
525.000	8.67	0.201	8.37	-95.
530.000	8.79	0.225	8.13	-95.
535.000	8.92	0.257	7.89	-95.
537.424	8.99	0.276	7.77	-95.

TABLE 7-XLI

MACH NUMBER, RELATIVE FLIGHT-PATH
 ANGLE, ANGLE OF ATTACK, AND NORMAL
 FORCE ANGLE - LIFTOFF THROUGH
 PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
537.424	8.99			
537.442	8.99	0.276	7.77	-95.
540.000	8.99	0.275	7.77	-95.
543.142	8.99	0.238	7.73	-95.
545.000	9.00	0.192	7.84	-95.
545.742	9.01	0.176	7.94	-95.
549.542	9.04	0.170	7.78	-96.
550.000	9.04	0.140	7.48	-96.
555.000	9.09	0.137	7.48	-96.
560.000	9.13	0.101	7.36	-96.
565.000	9.17	0.067	7.19	-96.
570.000	9.22	0.036	7.00	-97.
575.000	9.26	0.008	6.79	-97.
580.000	9.31	-0.018	6.68	-97.
585.000	9.36	-0.041	6.56	-97.
590.000	9.41	-0.061	6.46	-97.
595.000	9.45	-0.078	6.37	-98.
600.000	9.50	-0.092	6.27	-98.
605.000	9.55	-0.103	6.19	-98.
610.000	9.60	-0.112	6.11	-98.
615.000	9.65	-0.117	6.03	-98.
620.000	9.70	-0.119	5.96	-98.
625.000	9.76	-0.117	5.89	-98.
630.000	9.81	-0.113	5.83	-98.
635.000	9.86	-0.105	5.77	-99.
640.000	9.91	-0.094	5.73	-99.
645.000	9.97	-0.080	5.69	-99.
650.000	10.02	-0.062	5.68	-98.
655.000	10.07	-0.041	5.37	-98.
657.981	10.10	-0.018	5.94	-98.
657.981	10.10	0.000	6.09	-98.
660.000	10.10	0.000	6.01	-106.
670.000	10.10	0.000	4.17	-113.
680.000	10.11	-0.000	1.61	179.
690.000	10.11	-0.001	1.63	179.
700.000	10.11	-0.001	1.64	179.
710.000	10.11	-0.001	1.66	179.
720.000	10.12	-0.002	1.67	179.
730.000	10.12	-0.002	1.68	179.
740.000	10.12	-0.002	1.70	179.
		-0.003	1.71	179.

TABLE 7-XLI

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
741.981	10.12	-0.003	1.71	179.
750.000	10.12	-0.003	1.72	179.
760.000	10.12	-0.003	1.74	179.
770.000	10.13	-0.004	1.75	179.
780.000	10.13	-0.004	1.76	179.
790.000	10.13	-0.004	1.77	179.
800.000	10.13	-0.005	1.78	179.
900.000	10.15	-0.008	1.88	179.
1000.000	10.17	-0.011	1.96	179.
1100.000	10.18	-0.014	2.01	179.
1200.000	10.19	-0.017	2.03	179.
1300.000	10.20	-0.019	2.02	179.
1400.000	10.20	-0.020	1.98	179.
1500.000	10.19	-0.021	1.91	179.
1600.000	10.19	-0.021	1.82	179.
1700.000	10.17	-0.020	1.70	179.
1800.000	10.16	-0.018	1.56	179.
1900.000	10.15	-0.015	1.39	179.
2000.000	10.13	-0.011	1.21	179.
2100.000	10.11	-0.007	1.01	179.
2200.000	10.10	-0.002	0.79	179.
2300.000	10.08	0.004	0.56	179.
2400.000	10.07	0.010	0.33	180.
2500.000	10.06	0.016	0.09	179.
2600.000	10.06	0.023	0.15	0.
2700.000	10.05	0.029	0.39	0.
2800.000	10.05	0.034	0.62	0.
2900.000	10.05	0.040	0.85	0.
3000.000	10.06	0.044	1.06	0.
3100.000	10.06	0.048	1.26	0.
3200.000	10.06	0.050	1.44	0.
3300.000	10.07	0.052	1.60	1.
3400.000	10.07	0.053	1.73	1.
3500.000	10.07	0.053	1.85	1.
3600.000	10.06	0.052	20.09	85.
3700.000	10.05	0.050	20.10	85.
3800.000	10.04	0.047	20.10	85.
3900.000	10.03	0.044	20.10	85.
4000.000	10.02	0.040	20.10	85.
4100.000	10.00	0.036	20.09	85.

TABLE 7-XLI MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
4200.000	9.98	0.032	20.08	85.
4300.000	9.96	0.028	20.08	86.
4400.000	9.94	0.023	20.06	86.
4500.000	9.92	0.019	20.05	86.
4600.000	9.90	0.015	20.04	87.
4700.000	9.88	0.012	20.03	87.
4800.000	9.87	0.008	20.02	88.
4900.000	9.86	0.005	20.01	88.
5000.000	9.85	0.003	20.00	89.
5100.000	9.84	-0.000	20.00	90.
5200.000	9.84	-0.002	20.00	90.
5300.000	9.85	-0.005	20.00	91.
5400.000	9.85	-0.007	20.01	91.
5500.000	9.86	-0.009	20.01	92.
5600.000	9.88	-0.012	20.02	93.
5700.000	9.89	-0.014	20.03	93.
5800.000	9.91	-0.016	20.04	94.
5900.000	9.93	-0.019	1.53	180.
6000.000	9.95	-0.021	1.68	180.
6100.000	9.97	-0.023	1.80	180.
6200.000	9.99	-0.025	1.90	180.
6300.000	10.00	-0.027	1.97	180.
6400.000	10.02	-0.029	2.01	179.
6500.000	10.03	-0.030	2.03	179.
6600.000	10.03	-0.030	2.02	179.
6700.000	10.04	-0.030	1.97	179.
6800.000	10.04	-0.030	1.91	179.
6900.000	10.03	-0.028	1.81	179.
7000.000	10.03	-0.026	1.69	179.
7100.000	10.02	-0.022	1.54	179.
7200.000	10.01	-0.018	1.38	179.
7300.000	10.00	-0.013	1.19	179.
7400.000	9.99	-0.008	0.99	180.
7500.000	9.97	-0.002	0.77	180.
7600.000	9.97	0.005	0.54	180.
7700.000	9.96	0.012	0.31	180.
7800.000	9.95	0.019	0.07	179.
7900.000	9.95	0.025	0.18	0.
8000.000	9.94	0.032	0.41	0.
8100.000	9.94	0.038	0.65	0.

TABLE 7-XLI MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE, ANGLE OF ATTACK, AND NORMAL FORCE ANGLE - LIFTOFF THROUGH PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT-PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
8200.000	9.94	0.043	0.87	0.
8300.000	9.94	0.048	1.08	0.
8400.000	9.94	0.051	1.28	0.
8500.000	9.95	0.054	1.46	0.
8600.000	9.95	0.055	1.61	0.
8700.000	9.95	0.056	1.75	0.
8800.000	9.94	0.055	1.86	0.
8900.000	9.94	0.054	1.94	0.
9000.000	9.93	0.052	2.00	0.
9100.000	9.93	0.048	2.03	1.
9200.000	9.91	0.045	2.03	1.
9300.000	9.90	0.040	2.00	1.
9400.000	9.88	0.036	1.94	1.
9500.000	9.87	0.031	1.86	1.
9600.000	9.85	0.026	1.75	1.
9700.000	9.83	0.021	1.62	1.
9800.000	9.81	0.017	1.46	1.
9900.000	9.79	0.013	1.28	1.
10000.000	9.77	0.008	1.09	0.
10100.000	9.76	0.005	0.88	0.
10200.000	9.75	0.001	0.65	0.
10300.000	9.74	-0.002	0.42	0.
10400.000	9.74	-0.005	0.18	0.
10500.000	9.74	-0.007	0.06	-179.
10600.000	9.74	-0.010	0.30	-180.
10700.000	9.75	-0.012	0.54	-180.
10800.000	9.77	-0.014	0.76	-180.
10900.000	9.78	-0.017	0.98	-180.
11000.000	9.80	-0.019	1.19	-180.
11100.000	9.82	-0.021	1.37	180.
11200.000	9.84	-0.023	1.54	180.
11300.000	9.86	-0.025	1.69	180.
11400.000	9.88	-0.027	1.81	180.
11500.000	9.89	-0.029	1.90	180.
11600.000	9.91	-0.031	1.98	180.
11700.000	9.92	-0.032	2.02	180.
11800.000	9.93	-0.033	2.03	180.
11900.000	9.94	-0.033	2.02	180.
12000.000	9.94	-0.032	1.97	180.
12100.000	9.94	-0.031	1.90	180.

TABLE 7-XLI

MACH NUMBER, RELATIVE FLIGHT-PATH
ANGLE, ANGLE OF ATTACK, AND NORMAL
FORCE ANGLE - LIFTOFF THROUGH
PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
12200.000	9.94	-0.029	1.81	180.
12300.000	9.93	-0.026	1.68	180.
12400.000	9.93	-0.022	1.54	180.
12500.000	9.92	-0.018	1.37	180.
12600.000	9.91	-0.012	1.18	180.
12700.000	9.89	-0.006	0.98	180.
12800.000	9.88	0.000	0.76	180.
12900.000	9.87	0.007	0.53	180.
13000.000	9.87	0.014	0.30	180.
13100.000	9.86	0.021	0.06	180.
13200.000	9.85	0.028	0.18	179.
13300.000	9.85	0.035	0.42	0.
13400.000	9.85	0.041	0.66	0.
13500.000	9.85	0.047	0.88	0.
13600.000	9.85	0.051	1.09	0.
13700.000	9.85	0.055	1.28	0.
13800.000	9.85	0.057	1.46	0.
13900.000	9.85	0.059	1.62	0.
14000.000	9.85	0.059	1.75	0.
14100.000	9.85	0.058	1.86	0.
14200.000	9.84	0.056	1.95	0.
14300.000	9.83	0.054	2.00	0.
14400.000	9.83	0.050	2.03	0.
14500.000	9.81	0.046	2.03	0.
14600.000	9.80	0.041	2.00	0.
14700.000	9.78	0.036	1.95	0.
14800.000	9.77	0.031	1.86	0.
14900.000	9.75	0.026	1.75	0.
15000.000	9.73	0.021	1.62	0.
15100.000	9.71	0.016	1.46	0.
15200.000	9.69	0.011	1.28	0.
15300.000	9.68	0.006	1.09	0.
15400.000	9.67	0.002	0.87	0.
15500.000	9.66	-0.002	0.65	0.
15600.000	9.65	-0.005	0.42	0.
15700.000	9.65	-0.009	0.18	0.
15800.000	9.65	-0.012	0.06	0.
15900.000	9.65	-0.014	0.30	-179.
16000.000	9.66	-0.017	0.54	-180.
16100.000	9.68	-0.019	0.76	-180.

TABLE 7-XLI MACH NUMBER, RELATIVE FLIGHT-
 ANGLE, ANGLE OF ATTACK, AND N
 FORCE ANGLE - LIFTOFF THROUGH
 PARKING ORBIT (108-DEGREES LA(ZIMUTH)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	AIF / (D)	NORMAL FORCE ANGLE (DEGREES)
16200.000	9.69	-0.021	(	-180.
16300.000	9.71	-0.024	|	-180.
16400.000	9.73	-0.026	|	-180.
16500.000	9.75	-0.028	|	-180.
16550.000	9.76	-0.029	|	-180.

TABLE 7-XLII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (108-DEGREES LAUNCH AZIMUTH)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
0.000	0.0	0.	0.
5.000	1.3	0.	0.
10.000	6.0	1.	0.
12.000	9.1	1.	610.
15.000	15.3	4.	1398.
20.000	30.5	13.	3815.
25.000	52.8	15.	14127.
30.000	83.7	16.	39879.
35.000	124.1	11.	95013.
40.000	174.6	21.	200956.
45.000	234.9	36.	388749.
50.000	304.2	52.	700960.
55.000	380.4	64.	1192738.
60.000	460.3	68.	1931702.
65.000	539.0	73.	2995758.
70.000	609.1	92.	4466643.
75.000	664.0	120.	6417402.
80.000	696.8	139.	8897340.
82.000	700.4	143.	11927190.
85.000	693.1	143.	13285924.
90.000	643.5	121.	15457713.
95.000	552.2	75.	19317688.
100.000	456.7	37.	23223492.
105.000	369.2	146.	26925196.
110.000	293.7	120.	30336731.
115.000	228.2	45.	33416486.
120.000	172.5	22.	36126892.
125.000	127.8	17.	38436291.
130.000	93.1	13.	40356938.
135.000	67.1	10.	41920655.
140.000	48.1	8.	43172943.
145.000	34.9	6.	44166105.
147.329	30.0	6.	44953909.
150.000	24.4	6.	45264892.
155.000	16.1	5.	45575691.
159.329	10.8	3.	46029767.
159.329	10.8	8.	46311006.
159.459	10.7	8.	46311006.
160.000	9.9	8.	46318047.
163.759	6.1	9.	46346249.
		12.	46496987.

TABLE 7-XLII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
165.000	5.2	12.	46533005.
165.859	4.7	12.	46554924.
170.000	2.7	9.	46633058.
175.000	1.4	6.	46686042.
180.000	0.7	4.	46713545.
185.000	0.3	2.	46727182.
189.559	0.2	1.	46733408.
190.000	0.2	1.	46733817.
194.559	0.1	1.	46736828.
195.000	0.1	1.	46737031.
200.000	0.0	0.	46738675.
205.000	0.0	0.	46739577.
210.000	0.0	0.	46740103.
215.000	0.0	0.	46740415.
220.000	0.0	0.	46740605.
225.000	0.0	0.	46740726.
230.000	0.0	0.	46740807.
235.000	0.0	0.	46740862.
240.000	0.0	0.	46740901.
245.000	0.0	0.	46740929.
250.000	0.0	0.	46740951.
255.000	0.0	0.	46740969.
260.000	0.0	0.	46740984.
265.000	0.0	0.	46740996.
270.000	0.0	0.	46741007.
275.000	0.0	0.	46741017.
280.000	0.0	0.	46741024.
285.000	0.0	0.	46741032.
290.000	0.0	0.	46741039.
295.000	0.0	0.	46741046.
300.000	0.0	0.	46741051.
305.000	0.0	0.	46741056.
310.000	0.0	0.	46741061.
315.000	0.0	0.	46741066.
320.000	0.0	0.	46741071.
325.000	0.0	0.	46741076.
330.000	0.0	0.	46741081.
335.000	0.0	0.	46741086.
340.000	0.0	0.	46741091.
345.000	0.0	0.	46741096.

TABLE 7-XLII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARK
ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (1/RAD*(FT)SQ)
350.000	0.0	0.	6741101.
355.000	0.0	0.	6741106.
360.000	0.0	0.	6741111.
365.000	0.0	0.	6741116.
370.000	0.0	0.	6741121.
375.000	0.0	0.	6741126.
380.000	0.0	0.	6741131.
385.000	0.0	0.	6741136.
390.000	0.0	0.	6741141.
395.000	0.0	0.	6741146.
400.000	0.0	0.	6741151.
405.000	0.0	0.	6741156.
410.000	0.0	0.	6741161.
415.000	0.0	0.	6741166.
420.000	0.0	0.	6741171.
425.000	0.0	0.	6741177.
430.000	0.0	0.	6741184.
435.000	0.0	0.	6741192.
437.627	0.0	0.	6741196.
440.000	0.0	0.	6741199.
445.000	0.0	0.	6741207.
450.000	0.0	0.	6741214.
455.000	0.0	0.	6741222.
460.000	0.0	0.	6741229.
465.000	0.0	0.	6741237.
470.000	0.0	0.	6741244.
475.000	0.0	0.	6741253.
480.000	0.0	0.	6741263.
485.000	0.0	0.	6741273.
490.000	0.0	0.	6741283.
495.000	0.0	0.	6741293.
500.000	0.0	0.	6741303.
505.000	0.0	0.	6741314.
510.000	0.0	0.	6741327.
515.000	0.0	0.	6741339.
520.000	0.0	0.	6741352.
525.000	0.0	0.	6741364.
530.000	0.0	0.	6741379.
535.000	0.0	0.	6741394.
537.424	0.0	0.	6741401.

TABLE 7-XLII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
537.424	0.0	0.	46741401.
537.442	0.0	0.	46741401.
540.000	0.0	0.	46741408.
543.142	0.0	0.	46741417.
545.000	0.0	0.	46741423.
545.742	0.0	0.	46741425.
549.542	0.0	0.	46741436.
550.000	0.0	0.	46741437.
555.000	0.0	0.	46741452.
560.000	0.0	0.	46741467.
565.000	0.0	0.	46741482.
570.000	0.0	0.	46741497.
575.000	0.0	0.	46741513.
580.000	0.0	0.	46741531.
585.000	0.0	0.	46741548.
590.000	0.0	0.	46741566.
595.000	0.0	0.	46741583.
600.000	0.0	0.	46741601.
605.000	0.0	0.	46741618.
610.000	0.0	0.	46741636.
615.000	0.0	0.	46741654.
620.000	0.0	0.	46741674.
625.000	0.0	0.	46741694.
630.000	0.0	0.	46741714.
635.000	0.0	0.	46741734.
640.000	0.0	0.	46741754.
645.000	0.0	0.	46741774.
650.000	0.0	0.	46741795.
655.000	0.0	0.	46741817.
657.981	0.0	0.	46741829.
657.981	0.0	0.	46741829.
660.000	0.0	0.	46741829.
670.000	0.0	0.	46741829.
680.000	0.0	0.	46741829.
690.000	0.0	0.	46741829.
700.000	0.0	0.	46741829.
710.000	0.0	0.	46741829.
720.000	0.0	0.	46741829.
730.000	0.0	0.	46741829.
740.000	0.0	0.	46741829.

TABLE 7-XLII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
741.981	0.0	0.	46741829.
750.000	0.0	0.	46741829.
760.000	0.0	0.	46741829.
770.000	0.0	0.	46741829.
780.000	0.0	0.	46741829.
790.000	0.0	0.	46741829.
800.000	0.0	0.	46741829.
900.000	0.0	0.	46741829.
1000.000	0.0	0.	46741829.
1100.000	0.0	0.	46741829.
1200.000	0.0	0.	46741829.
1300.000	0.0	0.	46741829.
1400.000	0.0	0.	46741829.
1500.000	0.0	0.	46741829.
1600.000	0.0	0.	46741829.
1700.000	0.0	0.	46741829.
1800.000	0.0	0.	46741829.
1900.000	0.0	0.	46741829.
2000.000	0.0	0.	46741829.
2100.000	0.0	0.	46741829.
2200.000	0.0	0.	46741829.
2300.000	0.0	0.	46741829.
2400.000	0.0	0.	46741829.
2500.000	0.0	0.	46741829.
2600.000	0.0	0.	46741829.
2700.000	0.0	0.	46741829.
2800.000	0.0	0.	46741829.
2900.000	0.0	0.	46741829.
3000.000	0.0	0.	46741829.
3100.000	0.0	0.	46741829.
3200.000	0.0	0.	46741829.
3300.000	0.0	0.	46741829.
3400.000	0.0	0.	46741829.
3500.000	0.0	0.	46741829.
3600.000	0.0	0.	46741829.
3700.000	0.0	0.	46741829.
3800.000	0.0	0.	46741829.
3900.000	0.0	0.	46741829.
4000.000	0.0	0.	46741829.
4100.000	0.0	0.	46741829.

TABLE 7-XLII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
4200.000	0.0	0.	46741829.
4300.000	0.0	0.	46741829.
4400.000	0.0	0.	46741829.
4500.000	0.0	0.	46741829.
4600.000	0.0	0.	46741829.
4700.000	0.0	0.	46741829.
4800.000	0.0	0.	46741829.
4900.000	0.0	0.	46741829.
5000.000	0.0	0.	46741829.
5100.000	0.0	0.	46741829.
5200.000	0.0	0.	46741829.
5300.000	0.0	0.	46741829.
5400.000	0.0	0.	46741829.
5500.000	0.0	0.	46741829.
5600.000	0.0	0.	46741829.
5700.000	0.0	0.	46741829.
5800.000	0.0	0.	46741829.
5900.000	0.0	0.	46741829.
6000.000	0.0	0.	46741829.
6100.000	0.0	0.	46741829.
6200.000	0.0	0.	46741829.
6300.000	0.0	0.	46741829.
6400.000	0.0	0.	46741829.
6500.000	0.0	0.	46741829.
6600.000	0.0	0.	46741829.
6700.000	0.0	0.	46741829.
6800.000	0.0	0.	46741829.
6900.000	0.0	0.	46741829.
7000.000	0.0	0.	46741829.
7100.000	0.0	0.	46741829.
7200.000	0.0	0.	46741829.
7300.000	0.0	0.	46741829.
7400.000	0.0	0.	46741829.
7500.000	0.0	0.	46741829.
7600.000	0.0	0.	46741829.
7700.000	0.0	0.	46741829.
7800.000	0.0	0.	46741829.
7900.000	0.0	0.	46741829.
8000.000	0.0	0.	46741829.
8100.000	0.0	0.	46741829.

TABLE 7-XLII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
8200.000	0.0	0.	46741829.
8300.000	0.0	0.	46741829.
8400.000	0.0	0.	46741829.
8500.000	0.0	0.	46741829.
8600.000	0.0	0.	46741829.
8700.000	0.0	0.	46741829.
8800.000	0.0	0.	46741829.
8900.000	0.0	0.	46741829.
9000.000	0.0	0.	46741829.
9100.000	0.0	0.	46741829.
9200.000	0.0	0.	46741829.
9300.000	0.0	0.	46741829.
9400.000	0.0	0.	46741829.
9500.000	0.0	0.	46741829.
9600.000	0.0	0.	46741829.
9700.000	0.0	0.	46741829.
9800.000	0.0	0.	46741829.
9900.000	0.0	0.	46741829.
10000.000	0.0	0.	46741829.
10100.000	0.0	0.	46741829.
10200.000	0.0	0.	46741829.
10300.000	0.0	0.	46741829.
10400.000	0.0	0.	46741829.
10500.000	0.0	0.	46741829.
10600.000	0.0	0.	46741829.
10700.000	0.0	0.	46741829.
10800.000	0.0	0.	46741829.
10900.000	0.0	0.	46741829.
11000.000	0.0	0.	46741829.
11100.000	0.0	0.	46741829.
11200.000	0.0	0.	46741829.
11300.000	0.0	0.	46741829.
11400.000	0.0	0.	46741829.
11500.000	0.0	0.	46741829.
11600.000	0.0	0.	46741829.
11700.000	0.0	0.	46741829.
11800.000	0.0	0.	46741829.
11900.000	0.0	0.	46741829.
12000.000	0.0	0.	46741829.
12100.000	0.0	0.	46741829.

TABLE 7-XLII

DYNAMIC PRESSURE, DYNAMIC P
 TIMES ALPHA, AND AERODYNAMIC
 INDICATOR - LIFTOFF THROUGH
 ORBIT (108-DEGREES LAUNCH AZ
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC INDICATOR (/RAD*(FT)SQ)
12200.000	0.0	0.	46741829.
12300.000	0.0	0.	46741829.
12400.000	0.0	0.	46741829.
12500.000	0.0	0.	46741829.
12600.000	0.0	0.	46741829.
12700.000	0.0	0.	46741829.
12800.000	0.0	0.	46741829.
12900.000	0.0	0.	46741829.
13000.000	0.0	0.	46741829.
13100.000	0.0	0.	46741829.
13200.000	0.0	0.	46741829.
13300.000	0.0	0.	46741829.
13400.000	0.0	0.	46741829.
13500.000	0.0	0.	46741829.
13600.000	0.0	0.	46741829.
13700.000	0.0	0.	46741829.
13800.000	0.0	0.	46741829.
13900.000	0.0	0.	46741829.
14000.000	0.0	0.	46741829.
14100.000	0.0	0.	46741829.
14200.000	0.0	0.	46741829.
14300.000	0.0	0.	46741829.
14400.000	0.0	0.	46741829.
14500.000	0.0	0.	46741829.
14600.000	0.0	0.	46741829.
14700.000	0.0	0.	46741829.
14800.000	0.0	0.	46741829.
14900.000	0.0	0.	46741829.
15000.000	0.0	0.	46741829.
15100.000	0.0	0.	46741829.
15200.000	0.0	0.	46741829.
15300.000	0.0	0.	46741829.
15400.000	0.0	0.	46741829.
15500.000	0.0	0.	46741829.
15600.000	0.0	0.	46741829.
15700.000	0.0	0.	46741829.
15800.000	0.0	0.	46741829.
15900.000	0.0	0.	46741829.
16000.000	0.0	0.	46741829.
16100.000	0.0	0.	46741829.

TABLE 7-XLII

DYNAMIC PRESSURE, DYNAMIC PRESSURE
TIMES ALPHA, AND AERODYNAMIC HEATING
INDICATOR - LIFTOFF THROUGH PARKING
ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	DYNAMIC PRESSURE (LBS/(FT)SQ)	DYNAMIC PRESSURE TIMES ALPHA (LBS*DEG/(FT)SQ)	AERODYNAMIC HEATING INDICATOR (FT*LBS/RAD*(FT)SQ)
16200.000	0.0	0.	46741829.
16300.000	0.0	0.	46741829.
16400.000	0.0	0.	46741829.
16500.000	0.0	0.	46741829.
16550.000	0.0	0.	46741829.

TABLE 7-XLIII NORMAL FORCE, AXIAL FORCE, GEOMETRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFT THROUGH
PARKING ORBIT (108-DEGREES LOCAL AZIMUTH)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
0.000	0.	12697.	63733	28.447
5.000	3.	1305.	63733	28.447
10.000	37.	5946.	63734	28.447
12.000	68.	8992.	63735	28.447
15.000	263.	14743.	63735	28.447
20.000	896.	20438.	63738	28.447
25.000	1049.	18025.	63741	28.447
30.000	1093.	25727.	63744	28.447
35.000	765.	36356.	63749	28.447
40.000	1454.	51451.	63755	28.447
45.000	2542.	72575.	63762	28.446
50.000	3818.	103326.	63771	28.446
55.000	4851.	144692.	63781	28.445
60.000	5397.	208406.	63792	28.444
65.000	5993.	301314.	63805	28.443
70.000	7425.	415147.	63820	28.441
75.000	8834.	438595.	63831	28.438
80.000	9697.	389724.	6385	28.435
82.000	9893.	369336.	6386	28.433
85.000	9725.	332538.	6387	28.431
90.000	8001.	269978.	6389	28.426
95.000	4926.	208594.	6391	28.420
100.000	2428.	153993.	6394	28.413
105.000	9564.	112074.	6396	28.405
110.000	7915.	79315.	6399	28.395
115.000	2993.	54530.	6402	28.384
120.000	1452.	36166.	6405	28.371
125.000	1109.	23364.	6408	28.357
130.000	882.	14904.	641	28.340
135.000	691.	9245.	641	28.321
140.000	539.	5505.	642	28.300
145.000	423.	2867.	642	28.277
147.329	377.	1806.	642	28.265
150.000	317.	881.	642	28.251
155.000	177.	-531.	643	28.223
159.329	553.	-1275.	643	28.197
159.329	280.	2064.	643	28.197
159.459	286.	2029.	643	28.196
160.000	312.	1889.	643	28.192
163.759	422.	1145.	643	28.168

TABLE 7-XLIII NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
165.000	447.	972.	6443540.	28.160
165.859	443.	867.	6444334.	28.155
170.000	361.	495.	6448104.	28.178
175.000	256.	245.	6452539.	28.095
180.000	165.	119.	6456848.	28.062
185.000	95.	56.	6461032.	28.028
189.559	55.	28.	6464741.	27.996
190.000	52.	26.	6465094.	27.993
194.559	30.	14.	6468694.	27.961
195.000	29.	13.	6469037.	27.958
200.000	17.	7.	6472863.	27.922
205.000	16.	4.	6476576.	27.885
210.000	10.	2.	6480190.	27.848
215.000	6.	1.	6483708.	27.810
220.000	4.	1.	6487131.	27.772
225.000	2.	1.	6490460.	27.732
230.000	2.	0.	6493695.	27.692
235.000	1.	0.	6496838.	27.652
240.000	1.	0.	6499889.	27.610
245.000	1.	0.	6502849.	27.568
250.000	0.	0.	6505720.	27.525
255.000	0.	0.	6508501.	27.482
260.000	0.	0.	6511195.	27.437
265.000	0.	0.	6513803.	27.392
270.000	0.	0.	6516324.	27.346
275.000	0.	0.	6518761.	27.299
280.000	0.	0.	6521114.	27.251
285.000	0.	0.	6523385.	27.202
290.000	0.	0.	6525574.	27.153
295.000	0.	0.	6527683.	27.102
300.000	0.	0.	6529713.	27.051
305.000	0.	0.	6531665.	26.999
310.000	0.	0.	6533540.	26.945
315.000	0.	0.	6535340.	26.891
320.000	0.	0.	6537066.	26.836
325.000	0.	0.	6538718.	26.780
330.000	0.	0.	6540299.	26.722
335.000	0.	0.	6541810.	26.664
340.000	0.	0.	6543252.	26.604
345.000	0.	0.	6544626.	26.544

TABLE 7-XLIII NORMAL FORCE, AXIAL FORCE, CENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - OFF THROUGH
PARKING ORBIT (108-DEGREE EACH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (S)	GEOCENTRIC LATITUDE (DEGREES)
350.000	0.	0.	65.	26.482
355.000	0.	0.	69.	26.419
360.000	0.	0.	60.	26.355
365.000	0.	0.	60.	26.289
370.000	0.	0.	61.	26.223
375.000	0.	0.	61.	26.155
380.000	0.	0.	61.	26.085
385.000	0.	0.	6.	26.015
390.000	0.	0.	6.	25.943
395.000	0.	0.	6.	25.869
400.000	0.	0.	6.	25.795
405.000	0.	0.	6.	25.718
410.000	0.	0.	6.	25.640
415.000	0.	0.	6.	25.561
420.000	0.	0.	6.	25.480
425.000	0.	0.	6.	25.398
430.000	0.	0.	6.	25.313
435.000	0.	0.	6.	25.228
437.627	0.	0.	6.	25.182
440.000	0.	0.	6.	25.140
445.000	0.	0.	6.	25.051
450.000	0.	0.	6.	24.960
455.000	0.	0.	6.	24.868
460.000	0.	0.	6.	24.774
465.000	0.	0.	6.	24.678
470.000	0.	0.	.	24.581
475.000	0.	0.	.	24.481
480.000	0.	0.	.	24.380
485.000	0.	0.	.	24.278
490.000	0.	0.	.	24.173
495.000	0.	0.	.	24.067
500.000	0.	0.	.	23.958
505.000	0.	0.	.	23.847
510.000	0.	0.	.	23.735
515.000	0.	0.	.	23.620
520.000	0.	0.	.	23.503
525.000	0.	0.	.	23.384
530.000	0.	0.	.	23.263
535.000	0.	0.	.	23.139
537.424	0.	0.	.	23.078

TABLE 7-XLIII

NORMAL FORCE, AXIAL FORCE, US,
AND GEOCENTRIC LATITUDE -
PARKING ORBIT (108-DEGREES)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC LATITUDE (DEGREES)
537.424	0.	0.	(23.078
537.442	0.	0.	(23.078
540.000	0.	0.	(23.013
543.142	0.	0.	(22.934
545.000	0.	0.	(22.886
545.742	0.	0.	(22.868
549.542	0.	0.	(22.770
550.000	0.	0.	(22.759
555.000	0.	0.	(22.630
560.000	0.	0.	(22.500
565.000	0.	0.	(22.368
570.000	0.	0.	(22.236
575.000	0.	0.	(22.102
580.000	0.	0.	(21.967
585.000	0.	0.	(21.831
590.000	0.	0.	(21.694
595.000	0.	0.	21.555
600.000	0.	0.	21.415
605.000	0.	0.	21.274
610.000	0.	0.	21.132
615.000	0.	0.	20.989
620.000	0.	0.	20.844
625.000	0.	0.	20.698
630.000	0.	0.	20.550
635.000	0.	0.	20.401
640.000	0.	0.	20.251
645.000	0.	0.	20.100
650.000	0.	0.	19.947
655.000	0.	0.	19.793
657.981	0.	0.	19.701
657.981	0.	0.	19.701
660.000	0.	0.	19.638
670.000	0.	0.	19.325
680.000	0.	0.	19.010
690.000	0.	0.	18.693
700.000	0.	0.	18.374
710.000	0.	0.	18.053
720.000	0.	0.	17.729
730.000	0.	0.	17.404
740.000	0.	0.	17.077

TABLE 7-XLIII

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METS)	GEOCENTRIC LATITUDE (DEGREES)
741.981	0.	0.	65630.	17.011
750.000	0.	0.	65637.	16.747
760.000	0.	0.	65633.	16.416
770.000	0.	0.	65639.	16.083
780.000	0.	0.	6563.	15.748
790.000	0.	0.	6563.	15.412
800.000	0.	0.	6563.	15.074
900.000	0.	0.	6563.	11.609
1000.000	0.	0.	6563.	8.022
1100.000	0.	0.	6563.	4.353
1200.000	0.	0.	6563.	0.639
1300.000	0.	0.	6563.	-3.081
1400.000	0.	0.	6563.	-6.770
1500.000	0.	0.	6563.	-10.391
1600.000	0.	0.	6563.	-13.905
1700.000	0.	0.	6563.	-17.268
1800.000	0.	0.	6563.	-20.438
1900.000	0.	0.	6563.	-23.366
2000.000	0.	0.	6563.	-26.002
2100.000	0.	0.	6563.	-28.294
2200.000	0.	0.	6563.	-30.192
2300.000	0.	0.	6563.	-31.646
2400.000	0.	0.	6563.	-32.618
2500.000	0.	0.	6563.	-33.077
2600.000	0.	0.	6563.	-33.010
2700.000	0.	0.	6563.	-32.418
2800.000	0.	0.	6563.	-31.321
2900.000	0.	0.	6563.	-29.750
3000.000	0.	0.	6563.	-27.749
3100.000	0.	0.	6563.	-25.366
3200.000	0.	0.	6563.	-22.653
3300.000	0.	0.	6563.	-19.662
3400.000	0.	0.	6563.	-16.442
3500.000	0.	0.	6563.	-13.041
3600.000	0.	0.	6563.	-9.501
3700.000	0.	0.	6563.	-5.863
3800.000	0.	0.	6563.	-2.168
3900.000	0.	0.	6563.	1.549
4000.000	0.	0.	6563.	5.250
4100.000	0.	0.	6563.	8.897

TABLE 7-XLIII NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
4200.000	0.	0.	6570245.	12.452
4300.000	0.	0.	6570631.	15.876
4400.000	0.	0.	6570961.	19.125
4500.000	0.	0.	6571237.	22.153
4600.000	0.	0.	6571461.	24.912
4700.000	0.	0.	6571637.	27.351
4800.000	0.	0.	6571767.	29.419
4900.000	0.	0.	6571856.	31.067
5000.000	0.	0.	6571907.	32.252
5100.000	0.	0.	6571923.	32.938
5200.000	0.	0.	6571907.	33.105
5300.000	0.	0.	6571861.	32.748
5400.000	0.	0.	6571785.	31.879
5500.000	0.	0.	6571680.	30.522
5600.000	0.	0.	6571545.	28.716
5700.000	0.	0.	6571381.	26.507
5800.000	0.	0.	6571186.	23.946
5900.000	0.	0.	6570960.	21.083
6000.000	0.	0.	6570704.	17.969
6100.000	0.	0.	6570419.	14.651
6200.000	0.	0.	6570106.	11.174
6300.000	0.	0.	6569766.	7.580
6400.000	0.	0.	6569404.	3.908
6500.000	0.	0.	6569025.	0.197
6600.000	0.	0.	6568635.	-3.516
6700.000	0.	0.	6568241.	-7.195
6800.000	0.	0.	6567852.	-10.801
6900.000	0.	0.	6567479.	-14.295
7000.000	0.	0.	6567133.	-17.635
7100.000	0.	0.	6566823.	-20.776
7200.000	0.	0.	6566561.	-23.671
7300.000	0.	0.	6566357.	-26.269
7400.000	0.	0.	6566221.	-28.518
7500.000	0.	0.	6566160.	-30.368
7600.000	0.	0.	6566182.	-31.772
7700.000	0.	0.	6566290.	-32.690
7800.000	0.	0.	6566487.	-33.095
7900.000	0.	0.	6566772.	-32.974
8000.000	0.	0.	6567143.	-32.331
8100.000	0.	0.	6567594.	-31.186

TABLE 7-XLIII NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
8200.000	0.	0.	6568118.	-29.573
8300.000	0.	0.	6568705.	-27.535
8400.000	0.	0.	6569344.	-25.121
8500.000	0.	0.	6570024.	-22.384
8600.000	0.	0.	6570730.	-19.373
8700.000	0.	0.	6571450.	-16.139
8800.000	0.	0.	6572169.	-12.728
8900.000	0.	0.	6572875.	-9.183
9000.000	0.	0.	6573557.	-5.544
9100.000	0.	0.	6574202.	-1.850
9200.000	0.	0.	6574803.	1.861
9300.000	0.	0.	6575353.	5.554
9400.000	0.	0.	6575845.	9.190
9500.000	0.	0.	6576277.	12.731
9600.000	0.	0.	6576647.	16.138
9700.000	0.	0.	6576955.	19.367
9800.000	0.	0.	6577202.	22.372
9900.000	0.	0.	6577391.	25.105
10000.000	0.	0.	6577525.	27.515
10100.000	0.	0.	6577609.	29.552
10200.000	0.	0.	6577647.	31.166
10300.000	0.	0.	6577642.	32.315
10400.000	0.	0.	6577598.	32.966
10500.000	0.	0.	6577519.	33.098
10600.000	0.	0.	6577407.	32.707
10700.000	0.	0.	6577265.	31.807
10800.000	0.	0.	6577093.	30.422
10900.000	0.	0.	6576892.	28.592
11000.000	0.	0.	6576663.	26.363
11100.000	0.	0.	6576405.	23.786
11200.000	0.	0.	6576120.	20.910
11300.000	0.	0.	6575806.	17.787
11400.000	0.	0.	6575466.	14.463
11500.000	0.	0.	6575100.	10.982
11600.000	0.	0.	6574713.	7.387
11700.000	0.	0.	6574307.	3.717
11800.000	0.	0.	6573889.	0.009
11900.000	0.	0.	6573465.	-3.700
12000.000	0.	0.	6573044.	-7.372
12100.000	0.	0.	6572634.	-10.970

TABLE 7-XLIII NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - LIFTOFF THROUGH
PARKING ORBIT (108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
16200.000	0.	0.	6581822.	28.594
16300.000	0.	0.	6581533.	26.368
16400.000	0.	0.	6581215.	23.794
16500.000	0.	0.	6580871.	20.923
16550.000	0.	0.	6580690.	19.391