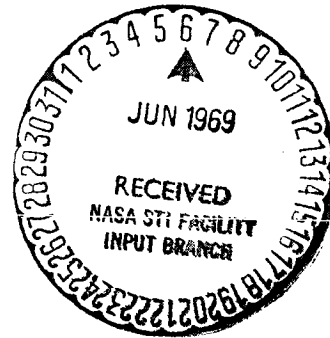


BOEING

FACILITY FORM 802

N69-77086	
(ACCESSION NUMBER)	(THRU)
99	NONE
(PAGES)	(CODE)
CR-105765	
(NASA CR OR TMX OR AD NUMBER)	(CATEGORY)



ISSUE NO.

ISSUED TO

AEROSPACE GROUP

SOUTHEAST DIVISION

D5-15481-1

H-1 CRS

SATURN V AS-504
LAUNCH VEHICLE
REFERENCE TRAJECTORY
VOLUME II OF II
BOOK 2

MAY 15, 1967

DOCUMENT NO. D5-15481-1 Volume II of II,
Book 2

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

ORIGINAL RELEASE - MAY 15, 1967



D. B. JACOBS
CHIEF ENGINEER

ISSUE NO. H-32

ISSUED TO *NASA Scientific & Tech.
Inf. Facility*
Attn: Acquisitions Branch

CONTENTS

	PAGE
CONTENTS	ii
ILLUSTRATIONS AND TABLES	iii
VOLUME II OF II	
BOOK 2	
SECTION 8 - EXPENDED S-IC AND S-II STAGE TRAJECTORY DATA	8-1
SECTION 9 - NOMINAL TRAJECTORIES FOR PERFORMANCE ANALYSIS	9-1

ILLUSTRATIONS
(VOLUME II, BOOK 2)

FIGURE		PAGE
8-1	Variation of S-IC and S-II Stage Tumbling Drag Coefficients with Mach Number	8-3
8-2	Altitude-Range Profile During S-IC Expended-Stage Trajectory	8-4
8-3	Altitude-Range Profile During S-II Expended-Stage Trajectory	8-5
8-4	S-IC and S-II Stage Impact Locations	8-7

TABLES

TABLE		
8-I	Expended-Stage Separation and Impact Locations	8-6
8-II	Altitude, Range from Cape Kennedy, Geodetic Latitude, and Longitude - S-IC Expended-Stage Trajectory (72-Degrees Launch Azimuth)	8-8
8-III	Inertial Velocity, Relative Velocity, Inertial Flight-Path Angle, and Inertial Acceleration - S-IC Expended-Stage Trajectory (72-Degrees Launch Azimuth)	8-10
8-IV	Vehicle Position Coordinates - S-IC Expended-Stage Trajectory (72-Degrees Launch Azimuth)	8-12
8-V	Vehicle Velocity Components - S-IC Expended-Stage Trajectory (72-Degrees Launch Azimuth)	8-14
8-VI	Altitude, Range from Cape Kennedy, Geodetic Latitude, and Longitude - S-IC Expended-Stage Trajectory (81-Degrees Launch Azimuth)	8-16
8-VII	Inertial Velocity, Relative Velocity, Inertial Flight-Path Angle, and Inertial Acceleration - S-IC Expended-Stage Trajectory (81-Degrees Launch Azimuth)	8-18

TABLES (Continued)
(VOLUME II, BOOK 2)

TABLE		PAGE
8-VIII	Vehicle Position Coordinates - S-IC Expended-Stage Trajectory (81-Degrees Launch Azimuth)	8-20
8-IX	Vehicle Velocity Components - S-IC Expended-Stage Trajectory (81-Degrees Launch Azimuth)	8-22
8-X	Altitude, Range from Cape Kennedy, Geodetic Latitude, and Longitude - S-IC Expended-Stage Trajectory (90-Degrees Launch Azimuth)	8-24
8-XI	Inertial Velocity, Relative Velocity, Inertial Flight-Path Angle, and Inertial Acceleration - S-IC Expended-Stage Trajectory (90-Degrees Launch Azimuth)	8-26
8-XII	Vehicle Position Coordinates - S-IC Expended-Stage Trajectory (90-Degrees Launch Azimuth)	8-28
8-XIII	Vehicle Velocity Components - S-IC Expended- Stage Trajectory (90-Degrees Launch Azimuth)	8-30
8-XIV	Altitude, Range from Cape Kennedy, Geodetic Latitude, and Longitude - S-IC Expended- Stage Trajectory (99-Degrees Launch Azimuth)	8-32
8-XV	Inertial Velocity, Relative Velocity, Inertial Flight-Path Angle, and Inertial Acceleration - S-IC Expended-Stage Trajectory (99-Degrees Launch Azimuth)	8-34
8-XVI	Vehicle Position Coordinates - S-IC Expended- Stage Trajectory (99-Degrees Launch Azimuth)	8-36
8-XVII	Vehicle Velocity Components - S-IC Expended- Stage Trajectory (99-Degrees Launch Azimuth)	8-38
8-XVIII	Altitude, Range from Cape Kennedy, Geodetic Latitude, and Longitude - S-IC Expended- Stage Trajectory (108-Degrees Launch Azimuth)	8-40

TABLES (Continued)
(VOLUME II, BOOK 2)

TABLE		PAGE
8-XIX	Inertial Velocity, Relative Velocity, Inertial Flight-Path Angle, and Inertial Acceleration - S-IC Expanded-Stage Trajectory (108-Degrees Launch Azimuth)	8-42
8-XX	Vehicle Position Coordinates - S-IC Expanded- Stage Trajectory (108-Degrees Launch Azimuth)	8-44
8-XXI	Vehicle Velocity Components - S-IC Expanded- Stage Trajectory (108-Degrees Launch Azimuth)	8-46
8-XXII	Altitude, Range from Cape Kennedy, Geodetic Latitude, and Longitude - S-II Expanded- Stage Trajectory (72-Degrees Launch Azimuth)	8-48
8-XXIII	Inertial Velocity, Relative Velocity, Inertial Flight-Path Angle, and Inertial Acceleration - S-II Expanded-Stage Trajectory (72-Degrees Launch Azimuth)	8-52
8-XXIV	Vehicle Position Coordinates - S-II Expanded-Stage Trajectory (72-Degrees Launch Azimuth)	8-56
8-XXV	Vehicle Velocity Components - S-II Expanded-Stage Trajectory (72-Degrees Launch Azimuth)	8-60
8-XXVI	Altitude, Range from Cape Kennedy, Geodetic Latitude, and Longitude - S-II Expanded-Stage Trajectory (81-Degrees Launch Azimuth)	8-64
8-XXVII	Inertial Velocity, Relative Velocity, Inertial Flight-Path Angle, and Inertial Acceleration - S-II Expanded-Stage Trajectory (81-Degrees Launch Azimuth)	8-68
8-XVIII	Vehicle Position Coordinates - S-II Expanded-Stage Trajectory (81-Degrees Launch Azimuth)	8-72
8-XXIX	Vehicle Velocity Components - S-II Expanded-Stage Trajectory (81-Degrees Launch Azimuth)	8-76

TABLES (Continued)
(VOLUME II, BOOK 2)

TABLE		PAGE
8-XXX	Altitude, Range from Cape Kennedy, Geodetic Latitude, and Longitude - S-II Expended-Stage Trajectory (90-Degrees Launch Azimuth)	8-80
8-XXXI	Inertial Velocity, Relative Velocity, Inertial Flight-Path Angle, and Inertial Acceleration - S-II Expended-Stage Trajectory (90-Degrees Launch Azimuth)	8-84
8-XXXII	Vehicle Position Coordinates - S-II Expended-Stage Trajectory (90-Degrees Launch Azimuth)	8-88
8-XXXIII	Vehicle Velocity Components - S-II Expended-Stage Trajectory (90-Degrees Launch Azimuth)	8-92
8-XXXIV	Altitude, Range from Cape Kennedy, Geodetic Latitude, and Longitude - S-II Expended-Stage Trajectory (99-Degrees Launch Azimuth)	8-96
8-XXXV	Inertial Velocity, Relative Velocity, Inertial Flight-Path Angle, and Inertial Acceleration - S-II Expended-Stage Trajectory (99-Degrees Launch Azimuth)	8-100
8-XXXVI	Vehicle Position Coordinates - S-II Expended-Stage Trajectory (99-Degrees Launch Azimuth)	8-104
8-XXXVII	Vehicle Velocity Components - S-II Expended-Stage Trajectory (99-Degrees Launch Azimuth)	8-108
8-XXXVIII	Altitude, Range from Cape Kennedy, Geodetic Latitude, and Longitude - S-II Expended-Stage Trajectory (108-Degrees Launch Azimuth)	8-112
8-XXXIX	Inertial Velocity, Relative Velocity, Inertial Flight-Path Angle, and Inertial Acceleration - S-II Expended-Stage Trajectory (108-Degrees Launch Azimuth)	8-116
8-XL	Vehicle Position Coordinates - S-II Expended-Stage Trajectory (108-Degrees Launch Azimuth)	8-120

TABLES (Continued)
(VOLUME II, BOOK 2)

TABLE		PAGE
8-XLI	Vehicle Velocity Components - S-II Expended-Stage Trajectory (108-Degrees Launch Azimuth)	8-124
9-I	Summary of Trajectory Characteristics at Significant Event Times During the Zero-FGR and FPR Nominal-Trajectory Injection Boosts	9-4
9-II	Sequence of Major Events During the Zero-FGR and FPR Nominal-Trajectory Injection Boosts	9-5
9-III	AS-504 Weights Summary During the Zero-FGR and FPR Nominal-Trajectory Parking Orbits and Injection Boosts	9-6
9-IV	Summary of the Specific Injection-Boost Targeting and Guidance-Presetting Values Required for the Zero-FGR and FPR Nominal Trajectories	9-8
9-V	Weight, Thrust, Altitude, and Surface Range from Cape Kennedy - Preignition Sequence Initiation to J-2 Cutoff (Zero-FGR Nominal Trajectory)	9-9
9-VI	Inertial Velocity, Relative Velocity, Inertial Acceleration, and Gravitational Acceleration - Preignition Sequence Initiation to J-2 Cutoff (Zero-FGR Nominal Trajectory)	9-13
9-VII	Inertial Flight-Path Angle, Inertial Heading, Geodetic Latitude, and Longitude-- Preignition Sequence Initiation to J-2 Cutoff (Zero-FGR Nominal Trajectory)	9-17
9-VIII	Commanded and Actual Vehicle Attitude Angles - Preignition Sequence Initiation to J-2 Cutoff (Zero-FGR Nominal Trajectory)	9-21
9-IX	Mach Number, Relative Flight-Path Angle, Angle of Attack, and Normal Force Angle-- Preignition Sequence Initiation to J-2 Cutoff (Zero-FGR Nominal Trajectory)	9-25

TABLES (Continued)
(VOLUME II, BOOK 2)

TABLE		PAGE
9-X	Dynamic Pressure, Dynamic Pressure Times Alpha, and Aerodynamic Heating Indicator - Preignition Sequence Initiation to J-2 Cutoff (Zero-FGR Nominal Trajectory)	9-29
9-XI	Normal Force, Axial Force, Geocentric Radius, and Geocentric Latitude - Preignition Sequence Initiation to J-2 Cutoff (Zero-FGR Nominal Trajectory)	9-33
9-XII	Vehicle Position Coordinates - Preignition Sequence Initiation to J-2 Cutoff (Zero-FGR Nominal Trajectory)	9-37
9-XIII	Vehicle Velocity Components - Preignition Sequence Initiation to J-2 Cutoff (Zero-FGR Nominal Trajectory)	9-41
9-XIV	Weight, Thrust, Altitude, and Surface Range from Cape Kennedy - Preignition Sequence Initiation to J-2 Cutoff (FPR Nominal Trajectory)	9-45
9-XV	Inertial Velocity, Relative Velocity, Inertial Acceleration, and Gravitational Acceleration - Preignition Sequence Initiation to J-2 Cutoff (FPR Nominal Trajectory)	9-50
9-XVI	Inertial Flight-Path Angle, Inertial Heading, Geodetic Latitude, and Longitude - Preignition Sequence Initiation to J-2 Cutoff (FPR Nominal Trajectory)	9-55
9-XVII	Commanded and Actual Vehicle Attitude Angles - Preignition Sequence Initiation to J-2 Cutoff (FPR Nominal Trajectory)	9-60
9-XVIII	Mach Number, Relative Flight-Path Angle, Angle of Attack, and Normal Force Angle - Preignition Sequence Initiation to J-2 Cutoff (FPR Nominal Trajectory)	9-65

TABLES (Continued)
(VOLUME II, BOOK 2)

TABLE		PAGE
9-XIX	Dynamic Pressure, Dynamic Pressure Times Alpha, and Aerodynamic Heating Indicator - Preignition Sequence Initiation to J-2 Cutoff (FPR Nominal Trajectory)	9-70
9-XX	Normal Force, Axial Force, Geocentric Radius, and Geocentric Latitude - Preignition Sequence Initiation to J-2 Cutoff (FPR Nominal Trajectory)	9-75
9-XXI	Vehicle Position Coordinates - Preignition Sequence Initiation to J-2 Cutoff (FPR Nominal Trajectory)	9-80
9-XXII	Vehicle Velocity Components - Preignition Sequence Initiation to J-2 Cutoff (FPR Nominal Trajectory)	9-85

SECTION 8

EXPENDED S-IC AND S-II STAGE TRAJECTORY DATA

This section contains the trajectories of the expended S-IC and S-II stages after stage separation for the five launch azimuths considered in this study. These trajectory data will be used in Reference 20 to establish the look-angle increments between the flight vehicle and the jettisoned stage as seen by the tracking stations. These expended-stage trajectories also provide preliminary information for the preparation of the Reference 21 range-safety study.

The expended-stage trajectories are initiated at S-IC/S-II first-plane separation and at S-II/S-IVB separation. In this simulation separation occurs at the flight time of stage thrust termination; S-IC thrust termination and separation occur at a flight time of 159.329 seconds and S-II thrust termination and separation occur at a flight time of 537.424 seconds. During expended-stage flight, only aerodynamic and gravitational accelerations are simulated; retro-rocket deceleration at separation causes only minor perturbations in the descent trajectory and impact area, and is not included in this simulation.

During descent the expended stages are assumed to tumble. Aerodynamic drag coefficients for tumbling S-IC and S-II stages were obtained from Reference 5 and are given in Figure 8-1.

Figures 8-2 and 8-3 contain the altitude histories of the jettisoned S-IC and S-II stages as functions of the range from Cape Kennedy. Table 8-I summarizes the separation and impact locations for the ten simulated trajectories. Figure 8-4 shows the geographical impact locations in the Atlantic Ocean for the two stages.

Expended-stage trajectory data are contained in Tables 8-II through 8-XLI. Four data tables are provided for each trajectory and the tables are grouped as follows:

<u>Stage</u>	<u>Azimuth</u>	<u>Table Group</u>
S-IC	72	8-II through 8-V
S-IC	81	8-VI through 8-IX
S-IC	90	8-X through 8-XIII
S-IC	99	8-XIV through 8-XVII
S-IC	108	8-XVIII through 8-XXI

<u>Stage</u>	<u>Azimuth</u>	<u>Table Group (Continued)</u>
S-II	72	8-XXII through 8-XXV
S-II	81	8-XXVI through 8-XXIX
S-II	90	8-XXX through 8-XXXIII
S-II	99	8-XXXIV through 8-XXXVII
S-II	108	8-XXXVIII through 8-LXI

Data are given at 5-second intervals during expended-stage flight. The definitions of the trajectory parameters contained in these tables are given in Section 7. The trajectory parameters contained in each table are as follows:

- a. Tables 8-II, 8-VI, 8-X, 8-XIV, 8-XVIII, 8-XXII, 8-XXVI, 8-XXX, 8-XXXIV, and 8-XXXVIII contain altitude, range from Cape Kennedy, geodetic latitude, and longitude.
- b. Tables 8-III, 8-VII, 8-XI, 8-XV, 8-XIX, 8-XXIII, 8-XXVII, 8-XXXI, 8-XXXV, and 8-XXXIX contain inertial velocity, relative velocity, inertial flight-path angle, and inertial acceleration.
- c. Tables 8-IV, 8-VIII, 8-XII, 8-XVI, 8-XX, 8-XXIV, 8-XXVIII, 8-XXXII, 8-XXXVI, and 8-XL contain the vehicle inertial position coordinates in Project Apollo Standard Coordinate System 13 (Figure 7-3).
- d. Tables 8-V, 8-IX, 8-XIII, 8-XVII, 8-XXI, 8-XXV, 8-XXIX, 8-XXXIII, 8-XXXVII, and 8-XLI contain the vehicle inertial velocity components measured in Project Apollo Standard Coordinate System 13 (Figure 7-3).

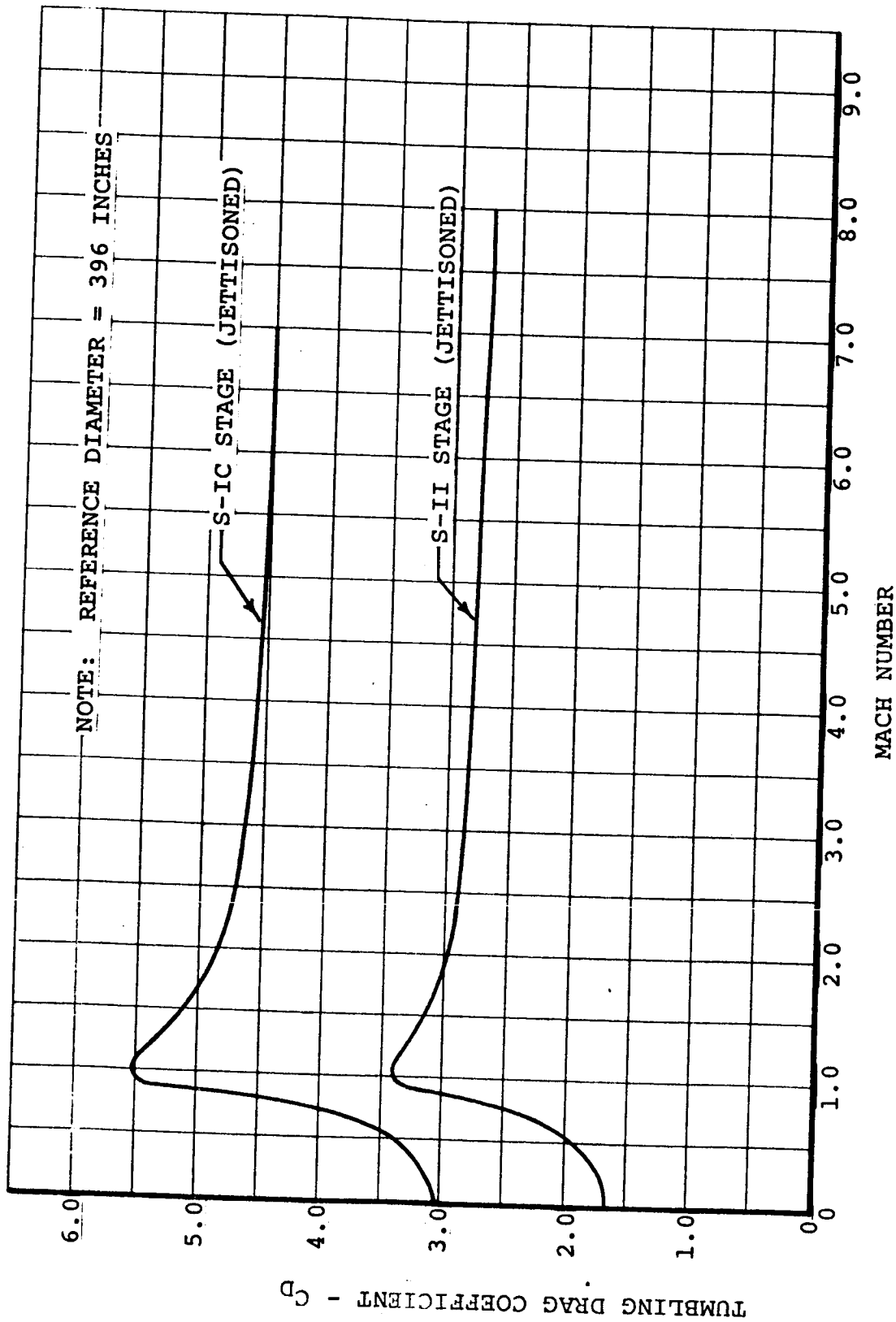


FIGURE 8-1. VARIATION OF S-IC AND S-II STAGE TUMBLING DRAG COEFFICIENTS WITH MACH NUMBER

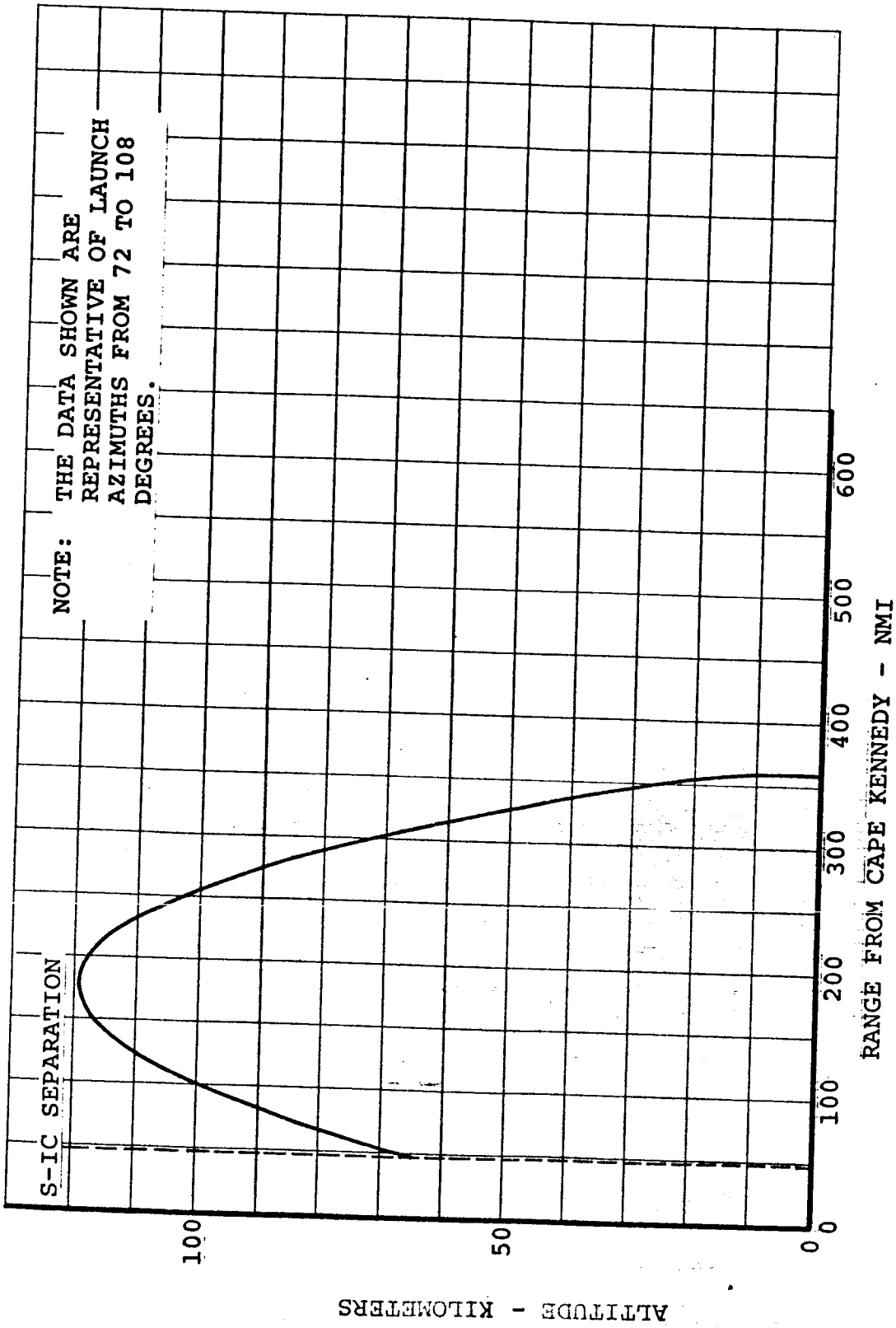


FIGURE 8-2. ALTITUDE-RANGE PROFILE DURING S-IC EXPENDED-STAGE TRAJECTORY

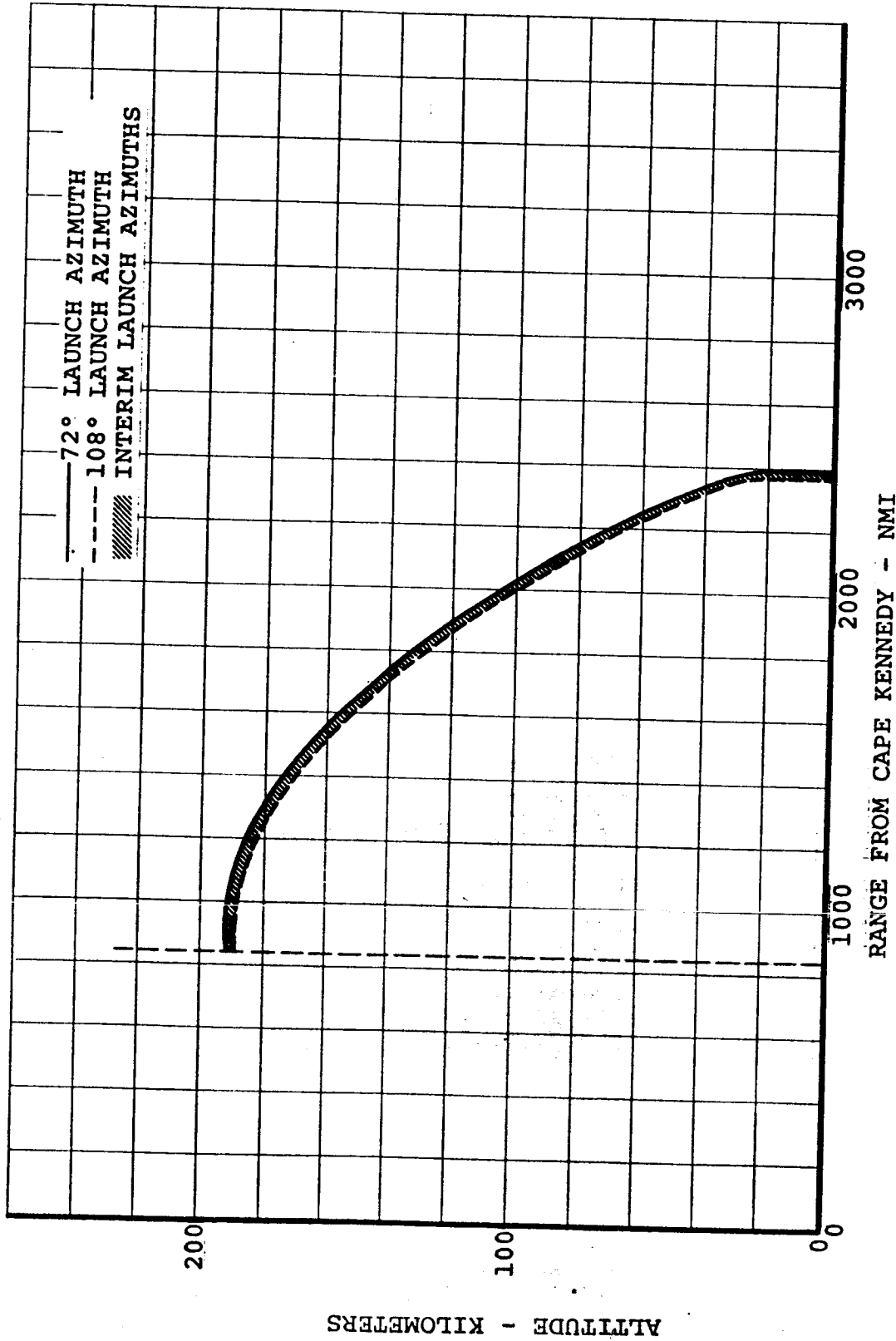


FIGURE 8-3. ALTITUDE-RANGE PROFILE DURING S-II EXPENDED-STAGE TRAJECTORY

TABLE 8-I. EXPENDED-STAGE SEPARATION AND IMPACT LOCATIONS

STAGE	AZIMUTH (DEGREES)	SEPARATION GEODETTIC LATITUDE (DEGREES N)	SEPARATION LONGITUDE (DEGREES E)	SEPARATION ALTITUDE (KM)	IMPACT GEODETTIC LATITUDE (DEGREES N)	IMPACT LONGITUDE (DEGREES E)
S-IC	72	28.848	-79.751	64.805	30.233	-74.003
S-IC	81	28.726	-79.719	64.835	29.298	-73.815
S-IC	90	28.601	-79.710	64.844	28.348	-73.804
S-IC	99	28.477	-79.723	64.834	27.409	-73.967
S-IC	108	28.355	-79.758	64.803	26.506	-74.293
S-II	72	31.814	-64.826	191.346	31.528	-34.419
S-II	81	29.619	-64.615	190.691	25.855	-35.623
S-II	90	27.420	-64.792	190.051	20.365	-37.554
S-II	99	25.269	-65.332	189.449	15.157	-40.128
S-II	108	23.213	-66.205	188.900	10.321	-43.281

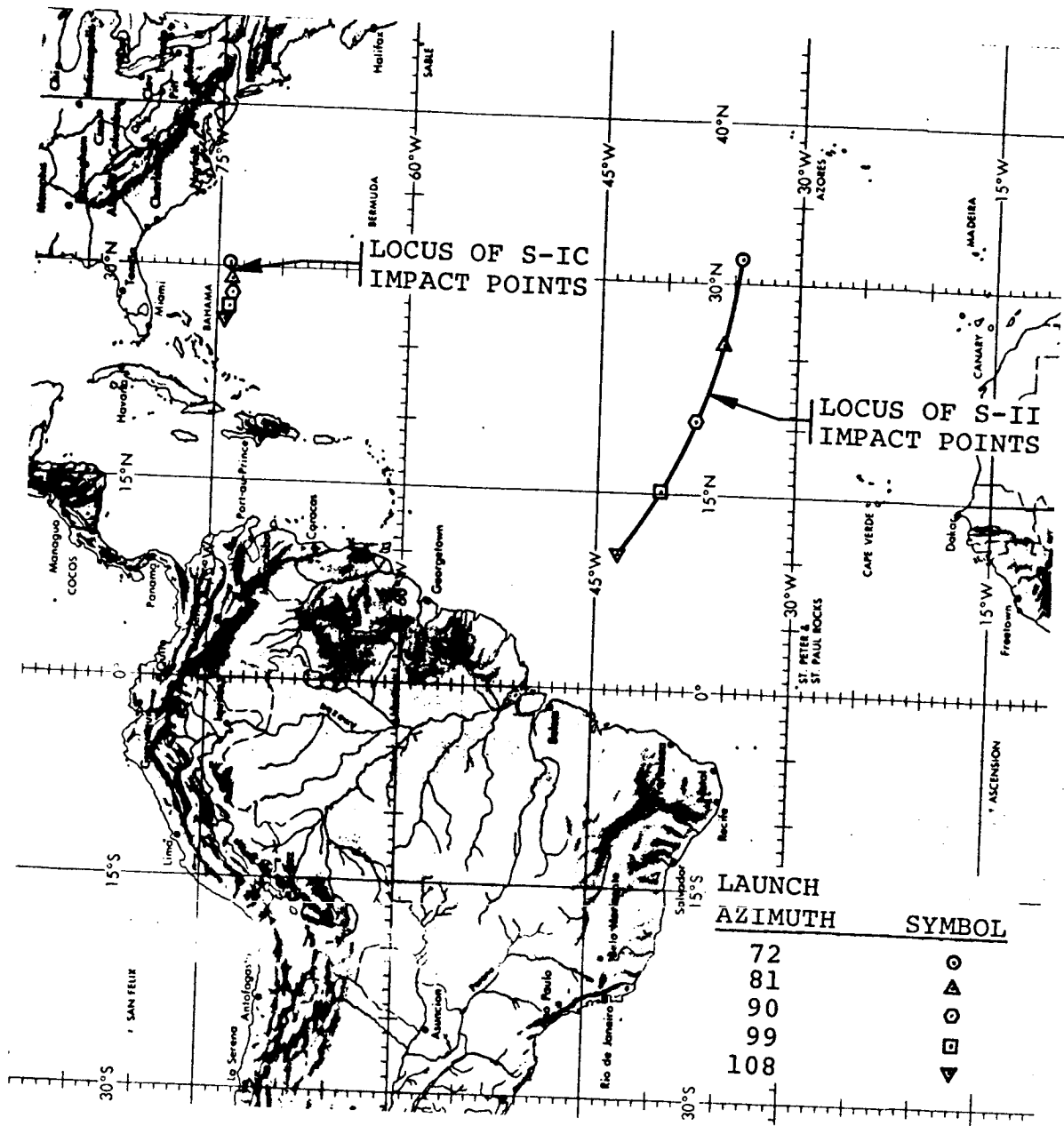


FIGURE 8-4. S-IC AND S-II STAGE IMPACT LOCATIONS

TABLE 8-II

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-IC EXPENDED-STAGE
 TRAJECTORY (72 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
SEP	159.329	64804.5	47.3		
	160.329	65765.9	48.5	28.848	-79.751
	165.000	70137.4	53.9	28.854	-79.729
	170.000	74605.0	59.8	28.881	-79.630
	175.000	78855.7	65.6	28.910	-79.524
	180.000	82891.6	71.5	28.939	-79.418
	185.000	86713.2	77.3	28.967	-79.312
	190.000	90321.6	83.1	28.996	-79.207
	195.000	93716.6	88.9	29.024	-79.101
	200.000	96899.0	94.7	29.052	-78.995
	205.000	99868.6	100.5	29.080	-78.890
	210.000	102625.9	106.2	29.108	-78.785
	215.000	105171.0	112.0	29.136	-78.679
	220.000	107504.0	117.8	29.164	-78.574
	225.000	109625.0	123.6	29.191	-78.468
	230.000	111534.4	129.3	29.218	-78.363
	235.000	113232.0	135.1	29.246	-78.258
	240.000	114718.1	140.8	29.273	-78.153
	245.000	115992.8	146.6	29.300	-78.047
	250.000	117056.0	152.3	29.326	-77.942
	255.000	117907.8	158.1	29.353	-77.837
	260.000	118548.5	163.8	29.380	-77.731
	265.000	118977.9	169.6	29.406	-77.626
	270.000	119196.1	175.3	29.432	-77.521
	275.000	119203.1	181.1	29.459	-77.415
	280.000	118999.0	186.8	29.485	-77.310
	285.000	118583.6	192.6	29.511	-77.204
	290.000	117956.8	198.3	29.537	-77.098
	295.000	117119.1	204.0	29.562	-76.993
	300.000	116069.8	209.8	29.588	-76.887
	305.000	114809.2	215.5	29.613	-76.781
	310.000	113337.2	221.3	29.639	-76.675
	315.000	111653.7	227.1	29.664	-76.568
	320.000	109758.5	232.8	29.689	-76.462
	325.000	107651.4	238.6	29.714	-76.356
	330.000	105332.5	244.3	29.739	-76.249
	335.000	102801.6	250.1	29.764	-76.142
	340.000	100058.4	255.9	29.789	-76.035
	345.000	97103.0	261.7	29.814	-75.928
	350.000	93934.9	267.5	29.838	-75.821
	355.000	90554.3	273.3	29.863	-75.714
				29.887	-75.606

TABLE 8-II

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-IC EXPENDED-STAGE
 TRAJECTORY (72 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
360.000	86960.8	279.1	29.911	-75.498
365.000	83154.4	284.9	29.936	-75.390
370.000	79135.2	290.7	29.960	-75.282
375.000	74903.6	296.5	29.984	-75.174
380.000	70460.5	302.4	30.007	-75.065
385.000	65808.3	308.2	30.031	-74.956
390.000	60951.7	314.0	30.055	-74.848
395.000	55900.1	319.9	30.078	-74.739
400.000	50671.2	325.6	30.101	-74.631
405.000	45300.4	331.4	30.124	-74.524
410.000	39860.8	336.9	30.146	-74.420
415.000	34507.9	342.2	30.167	-74.322
420.000	29526.6	346.9	30.186	-74.234
425.000	25291.6	350.7	30.200	-74.162
430.000	22028.3	353.5	30.211	-74.110
435.000	19645.0	355.4	30.218	-74.076
440.000	17887.4	356.6	30.223	-74.053
445.000	16532.2	357.3	30.226	-74.038
450.000	15428.2	357.9	30.228	-74.029
455.000	14447.8	358.2	30.229	-74.022
460.000	13502.4	358.5	30.230	-74.017
465.000	12573.3	358.7	30.231	-74.013
470.000	11661.3	358.9	30.232	-74.010
475.000	10770.6	359.0	30.232	-74.008
480.000	9904.6	359.1	30.233	-74.006
485.000	9066.6	359.1	30.233	-74.005
490.000	8258.3	359.2	30.233	-74.005
495.000	7479.0	359.2	30.233	-74.004
500.000	6727.5	359.2	30.233	-74.004
505.000	6002.4	359.2	30.233	-74.003
510.000	5301.8	359.2	30.233	-74.003
515.000	4624.4	359.2	30.233	-74.003
520.000	3968.7	359.2	30.233	-74.003
525.000	3333.9	359.2	30.233	-74.003
530.000	2719.2	359.2	30.233	-74.003
535.000	2123.7	359.2	30.233	-74.003
540.000	1545.6	359.3	30.233	-74.003
545.000	984.2	359.3	30.233	-74.003
550.000	437.9	359.3	30.233	-74.003
SPLASH 554.104	-.1	359.3	30.233	-74.003

TABLE 8-III

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-IC EXPENDED-STAGE TRAJECTORY
(72 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
360.000	2683.6741	2303.6662	-16.04	9.545
365.000	2696.9683	2319.1199	-16.90	9.544
370.000	2710.7159	2335.1107	-17.76	9.532
375.000	2724.6814	2351.3979	-18.60	9.496
380.000	2738.4122	2367.5236	-19.43	9.417
385.000	2751.0691	2382.6430	-20.26	9.267
390.000	2761.1254	2395.2237	-21.07	9.020
395.000	2765.8018	2402.4789	-21.87	8.741
400.000	2759.9809	2399.2824	-22.65	8.940
405.000	2733.4389	2375.3929	-23.41	11.793
410.000	2662.7973	2307.3891	-24.11	22.034
415.000	2504.8068	2151.9216	-24.70	43.468
420.000	2208.3813	1857.6977	-25.04	71.464
425.000	1785.0957	1436.0109	-24.93	84.754
430.000	1356.4785	1008.3626	-24.25	71.596
435.000	1030.9265	683.7584	-23.16	49.322
440.000	816.6347	471.3216	-21.95	31.736
445.000	679.6920	337.7410	-20.83	20.475
450.000	594.8666	258.4468	-20.07	11.582
455.000	550.2445	223.2633	-20.35	6.455
460.000	522.5446	206.3552	-21.01	4.736
465.000	501.7722	195.4373	-21.55	3.696
470.000	485.1627	186.8131	-21.83	2.920
475.000	471.8015	179.4149	-21.88	2.334
480.000	460.9077	172.4301	-21.71	1.938
485.000	452.0428	165.6694	-21.36	1.626
490.000	444.9324	159.2745	-20.90	1.383
495.000	439.2735	153.2999	-20.39	1.195
500.000	434.7756	147.7442	-19.85	1.051
505.000	431.1860	142.5806	-19.30	.940
510.000	428.2958	137.7721	-18.76	.854
515.000	425.9399	133.2831	-18.23	.784
520.000	423.9724	129.0243	-17.72	.756
525.000	422.2752	124.8915	-17.20	.717
530.000	420.8124	120.9715	-16.71	.670
535.000	419.5466	117.3000	-16.24	.622
540.000	418.4440	113.8839	-15.79	.573
545.000	417.4778	110.7227	-15.38	.526
550.000	416.6272	107.8119	-15.00	.480
SPLASH 554.104	416.0079	105.6199	-14.71	.445

TABLE 8-IV

VEHICLE POSITION COORDINATES - S-IC
 EXPANDED-STAGE TRAJECTORY
 (72 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	X M	Y M	Z M
SEP	159.329	6436275.625	36942.195	145430.506
	160.329	6437175.063	37064.412	148045.490
	165.000	6441244.188	37634.642	160244.826
	170.000	6445363.063	38244.001	173285.486
	175.000	6449239.500	38852.220	186312.229
	180.000	6452875.500	39459.327	199328.953
	185.000	6456271.625	40065.254	212335.883
	190.000	6459428.875	40670.029	225334.484
	195.000	6462347.375	41273.583	238323.703
	200.000	6465027.688	41875.945	251304.326
	205.000	6467469.875	42477.047	264274.961
	210.000	6469674.438	43076.915	277236.230
	215.000	6471641.375	43675.482	290186.664
	220.000	6473371.063	44272.776	303126.848
	225.000	6474863.625	44868.729	316055.309
	230.000	6476119.250	45463.366	328972.613
	235.000	6477138.063	46056.622	341877.277
	240.000	6477920.250	46648.522	354769.867
	245.000	6478466.000	47239.000	367648.895
	250.000	6478775.313	47828.082	380514.926
	255.000	6478848.375	48415.699	393366.477
	260.000	6478685.250	49001.879	406204.105
	265.000	6478286.063	49586.554	419026.328
	270.000	6477650.813	50169.750	431833.699
	275.000	6476779.563	50751.398	444624.738
	280.000	6475672.375	51331.526	457399.996
	285.000	6474329.188	51910.064	470157.988
	290.000	6472750.063	52487.040	482899.266
	295.000	6470935.063	53062.384	495622.348
	300.000	6468884.000	53636.124	508327.766
	305.000	6466597.000	54208.189	521014.039
	310.000	6464073.813	54778.606	533681.695
	315.000	6461314.625	55347.307	546329.750
	320.000	6458319.125	55914.314	558957.242
	325.000	6455087.375	56479.562	571564.188
	330.000	6451619.063	57043.073	584150.594
	335.000	6447914.375	57604.780	596714.969
	340.000	6443972.813	58164.706	609257.805
	345.000	6439794.563	58722.782	621777.594
	350.000	6435379.188	59279.032	634274.797
	355.000	6430726.875	59833.387	646747.828

TABLE 8-IV

VEHICLE POSITION COORDINATES - S-IC
 EXPENDED-STAGE TRAJECTORY
 (72 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
360.000	6425837.063	60385.869	659196.969
365.000	6420710.250	60936.408	671620.336
370.000	6415346.125	61485.022	684017.625
375.000	6409745.688	62031.640	696385.781
380.000	6403909.938	62576.271	708722.305
385.000	6397842.188	63118.830	721020.102
390.000	6391548.125	63659.298	733269.180
395.000	6385040.000	64197.540	745448.875
400.000	6378339.750	64733.449	757524.711
405.000	6371491.625	65266.719	769430.711
410.000	6364585.875	65796.880	781037.883
415.000	6357813.875	66322.867	792083.609
420.000	6351524.063	66842.931	802111.539
425.000	6346170.688	67354.855	810566.570
430.000	6342022.063	67857.700	817189.055
435.000	6338959.125	68352.562	822232.523
440.000	6336667.813	68841.533	826169.430
445.000	6334874.250	69326.308	829388.406
450.000	6333392.875	69808.107	832147.313
455.000	6332071.813	70287.647	834627.625
460.000	6330807.313	70765.372	836939.883
465.000	6329574.375	71241.537	839130.945
470.000	6328370.125	71716.443	841229.844
475.000	6327195.938	72190.279	843258.313
480.000	6326053.000	72663.271	845234.023
485.000	6324943.063	73135.540	847170.695
490.000	6323865.875	73607.242	849079.391
495.000	6322820.063	74078.425	850968.352
500.000	6321803.438	74549.187	852843.984
505.000	6320813.938	75019.533	854710.758
510.000	6319849.313	75489.531	856572.125
515.000	6318907.813	75959.164	858430.305
520.000	6317987.813	76428.483	860287.078
525.000	6317088.375	76897.464	862143.508
530.000	6316208.563	77366.153	864000.531
535.000	6315347.188	77834.514	865858.461
540.000	6314502.813	78302.584	867717.703
545.000	6313674.250	78770.321	869578.234
550.000	6312860.188	79237.759	871440.234
SPLASH 554.104	6312201.875	79621.217	872969.680

D5-15481-1

TABLE 8-V

VEHICLE VELOCITY COMPONENTS - S-1C
EXPENDED STAGE TRAJECTORY
(72 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
SEP	159.329	904.380	122.226	2615.347
	160.329	894.350	122.183	2614.122
	165.000	848.150	121.980	2609.742
	170.000	799.459	121.759	2606.606
	175.000	751.202	121.533	2604.285
	180.000	703.188	121.304	2602.240
	185.000	655.325	121.071	2600.548
	190.000	607.560	120.834	2598.788
	195.000	559.872	120.592	2596.995
	200.000	512.243	120.347	2595.139
	205.000	464.669	120.098	2593.205
	210.000	417.141	119.844	2591.186
	215.000	369.658	119.587	2589.078
	220.000	322.215	119.325	2586.881
	225.000	274.811	119.060	2584.593
	230.000	227.439	118.790	2582.213
	235.000	180.100	118.516	2579.741
	240.000	132.788	118.239	2577.178
	245.000	85.502	117.957	2574.522
	250.000	38.238	117.671	2571.774
	255.000	-9.005	117.381	2568.934
	260.000	-56.234	117.086	2566.001
	265.000	-103.447	116.788	2562.976
	270.000	-150.651	116.485	2559.858
	275.000	-197.846	116.178	2556.646
	280.000	-245.037	115.868	2553.342
	285.000	-292.224	115.552	2549.944
	290.000	-339.414	115.233	2546.452
	295.000	-386.605	114.909	2542.866
	300.000	-433.805	114.581	2539.186
	305.000	-481.013	114.249	2535.411
	310.000	-528.235	113.913	2531.541
	315.000	-575.470	113.572	2527.575
	320.000	-622.724	113.227	2523.513
	325.000	-669.998	112.877	2519.354
	330.000	-717.297	112.523	2515.097
	335.000	-764.620	112.164	2510.741
	340.000	-811.974	111.801	2506.283
	345.000	-859.355	111.434	2501.721
	350.000	-906.768	111.061	2497.046
	355.000	-954.207	110.685	2492.246

TABLE 8-V

VEHICLE VELOCITY COMPONENTS - S-IC
 EXPENDED STAGE TRAJECTORY
 (72 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
360.000	-1001.662	110.303	2487.290
365.000	-1049.106	109.916	2482.123
370.000	-1096.484	109.524	2476.632
375.000	-1143.684	109.126	2470.621
380.000	-1190.485	108.721	2463.702
385.000	-1236.447	108.305	2455.168
390.000	-1280.752	107.875	2443.737
395.000	-1321.848	107.422	2427.105
400.000	-1356.810	106.930	2401.068
405.000	-1379.650	106.367	2357.317
410.000	-1376.453	105.661	2276.994
415.000	-1320.623	104.678	2125.807
420.000	-1178.638	103.263	1864.698
425.000	-952.088	101.469	1506.585
430.000	-711.177	99.702	1150.791
435.000	-524.334	98.314	882.167
440.000	-400.809	97.326	704.821
445.000	-322.149	96.625	590.648
450.000	-275.091	96.116	518.607
455.000	-256.925	95.716	477.071
460.000	-249.414	95.380	449.164
465.000	-243.735	95.099	428.164
470.000	-237.865	94.867	412.072
475.000	-231.771	94.677	399.894
480.000	-225.298	94.522	390.823
485.000	-218.657	94.394	384.216
490.000	-212.218	94.286	379.524
495.000	-206.157	94.193	376.282
500.000	-200.531	94.110	374.113
505.000	-195.335	94.034	372.724
510.000	-190.535	93.963	371.893
515.000	-186.092	93.895	371.454
520.000	-181.908	93.830	371.292
525.000	-177.874	93.767	371.329
530.000	-174.069	93.705	371.487
535.000	-170.523	93.643	371.715
540.000	-167.239	93.581	371.980
545.000	-164.213	93.518	372.258
550.000	-161.440	93.453	372.534
SPLASH 554.104	-159.362	93.400	372.750

TABLE 8-VI

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
LATITUDE, AND LONGITUDE - S-IC EXPENDED-STAGE
TRAJECTORY (81 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
SEP	159.329	64834.6	47.2	28.726	-79.719
	160.329	65796.9	48.4	28.729	-79.697
	165.000	70173.4	53.9	28.742	-79.594
	170.000	74646.1	59.7	28.756	-79.485
	175.000	78902.4	65.6	28.769	-79.375
	180.000	82944.0	71.4	28.783	-79.266
	185.000	86771.7	77.2	28.796	-79.156
	190.000	90386.3	83.0	28.810	-79.047
	195.000	93787.9	88.8	28.823	-78.938
	200.000	96976.9	94.6	28.836	-78.829
	205.000	99953.5	100.4	28.849	-78.721
	210.000	102718.2	106.2	28.861	-78.612
	215.000	105270.7	112.0	28.874	-78.503
	220.000	107611.4	117.7	28.886	-78.395
	225.000	109740.4	123.5	28.899	-78.286
	230.000	111657.9	129.3	28.911	-78.178
	235.000	113363.9	135.0	28.923	-78.069
	240.000	114858.8	140.8	28.935	-77.961
	245.000	116142.3	146.5	28.947	-77.852
	250.000	117214.7	152.3	28.958	-77.744
	255.000	118076.0	158.0	28.970	-77.636
	260.000	118726.2	163.7	28.981	-77.527
	265.000	119165.5	169.5	28.993	-77.419
	270.000	119393.8	175.2	29.004	-77.311
	275.000	119411.2	181.0	29.015	-77.202
	280.000	119217.5	186.7	29.026	-77.094
	285.000	118813.0	192.4	29.037	-76.985
	290.000	118197.6	198.2	29.048	-76.877
	295.000	117371.0	203.9	29.058	-76.768
	300.000	116333.3	209.7	29.069	-76.660
	305.000	115084.5	215.4	29.079	-76.551
	310.000	113624.6	221.2	29.089	-76.442
	315.000	111953.4	226.9	29.099	-76.333
	320.000	110070.6	232.7	29.109	-76.224
	325.000	107976.5	238.4	29.119	-76.115
	330.000	105670.6	244.2	29.129	-76.006
	335.000	103153.0	250.0	29.139	-75.897
	340.000	100423.4	255.8	29.148	-75.787
	345.000	97481.8	261.5	29.158	-75.678
	350.000	94327.8	267.3	29.167	-75.568
	355.000	90961.6	273.1	29.176	-75.458

TABLE 8-VI

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-IC EXPENDED-STAGE
 TRAJECTORY (81 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
360.000	87382.6	278.9	29.185	-75.348
365.000	83591.1	284.7	29.194	-75.238
370.000	79586.7	290.6	29.203	-75.128
375.000	75370.4	296.4	29.212	-75.017
380.000	70942.7	302.2	29.220	-74.907
385.000	66305.8	308.1	29.229	-74.796
390.000	61463.9	313.9	29.237	-74.685
395.000	56426.0	319.7	29.245	-74.575
400.000	51208.9	325.5	29.254	-74.465
405.000	45845.2	331.2	29.261	-74.356
410.000	40402.8	336.8	29.269	-74.250
415.000	35026.9	342.1	29.276	-74.148
420.000	29989.1	346.9	29.282	-74.058
425.000	25663.2	350.8	29.287	-73.983
430.000	22302.3	353.7	29.291	-73.929
435.000	19842.9	355.6	29.293	-73.892
440.000	18035.1	356.9	29.295	-73.868
445.000	16648.4	357.7	29.296	-73.852
450.000	15525.4	358.3	29.297	-73.842
455.000	14538.3	358.6	29.297	-73.835
460.000	13590.8	358.9	29.297	-73.830
465.000	12660.4	359.1	29.298	-73.826
470.000	11746.6	359.3	29.298	-73.823
475.000	10853.7	359.4	29.298	-73.821
480.000	9985.2	359.5	29.298	-73.819
485.000	9144.7	359.5	29.298	-73.818
490.000	8333.5	359.6	29.298	-73.817
495.000	7551.6	359.6	29.298	-73.816
500.000	6797.7	359.6	29.298	-73.816
505.000	6070.0	359.7	29.298	-73.816
510.000	5367.1	359.7	29.298	-73.815
515.000	4687.5	359.7	29.298	-73.815
520.000	4029.9	359.7	29.298	-73.815
525.000	3393.2	359.7	29.298	-73.815
530.000	2776.7	359.7	29.298	-73.815
535.000	2179.4	359.7	29.298	-73.815
540.000	1599.9	359.7	29.298	-73.815
545.000	1036.9	359.7	29.298	-73.815
550.000	489.3	359.7	29.298	-73.815
SPLASH 554.581	-.1	359.7	29.298	-73.815

TABLE 8-VII INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION - S-IC EXPENDED-STAGE TRAJECTORY (81 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
SEP	159.329	2781.5831	2402.5427	20.32	10.138
	160.329	2777.1776	2397.6175	20.15	10.063
	165.000	2758.4677	2376.5166	19.38	9.828
	170.000	2740.8706	2356.4288	18.55	9.699
	175.000	2724.9314	2338.0745	17.71	9.631
	180.000	2710.1827	2320.9909	16.86	9.592
	185.000	2696.3928	2304.9514	16.00	9.568
	190.000	2683.4380	2289.8371	15.14	9.551
	195.000	2671.2596	2275.5944	14.27	9.538
	200.000	2659.8300	2262.2005	13.39	9.527
	205.000	2649.1409	2249.6518	12.50	9.518
	210.000	2639.1902	2237.9510	11.60	9.510
	215.000	2629.9811	2227.1057	10.71	9.502
	220.000	2621.5162	2217.1227	9.80	9.495
	225.000	2613.8002	2208.0110	8.89	9.489
	230.000	2606.8367	2199.7777	7.97	9.483
	235.000	2600.6300	2192.4309	7.05	9.478
	240.000	2595.1835	2185.9769	6.13	9.474
	245.000	2590.5006	2180.4221	5.20	9.470
	250.000	2586.5839	2175.7718	4.27	9.467
	255.000	2583.4362	2172.0307	3.34	9.464
	260.000	2581.0591	2169.2021	2.40	9.462
	265.000	2579.4543	2167.2893	1.47	9.461
	270.000	2578.6227	2166.2939	.53	9.460
	275.000	2578.5649	2166.2170	-.41	9.460
	280.000	2579.2809	2167.0587	-1.34	9.461
	285.000	2580.7702	2168.8180	-2.28	9.462
	290.000	2583.0318	2171.4932	-3.22	9.464
	295.000	2586.0642	2175.0814	-4.15	9.466
	300.000	2589.8656	2179.5794	-5.08	9.469
	305.000	2594.4332	2184.9822	-6.01	9.473
	310.000	2599.7645	2191.2848	-6.93	9.477
	315.000	2605.8556	2198.4806	-7.85	9.482
	320.000	2612.7030	2206.5630	-8.77	9.488
	325.000	2620.3017	2215.5233	-9.68	9.494
	330.000	2628.6472	2225.3536	-10.59	9.500
	335.000	2637.7330	2236.0432	-11.49	9.508
	340.000	2647.5530	2247.5818	-12.38	9.515
	345.000	2658.0974	2259.9551	-13.27	9.523
	350.000	2669.3549	2273.1475	-14.15	9.532

05-15481-1

TABLE 8-VII INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION - S-IC EXPENDED-STAGE TRAJECTORY (81 -DEGREES LAUNCH AZIMUTH) (CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
360.000	2693.9119	2301.8721	-15.89	9.544
365.000	2707.1104	2317.2937	-16.75	9.544
370.000	2720.7763	2333.2689	-17.60	9.534
375.000	2734.6900	2349.5730	-18.44	9.501
380.000	2748.4275	2365.7769	-19.27	9.428
385.000	2761.1996	2381.0861	-20.09	9.286
390.000	2771.5687	2394.0578	-20.90	9.049
395.000	2776.9167	2402.0679	-21.70	8.763
400.000	2772.4314	2400.2970	-22.48	8.858
405.000	2748.6635	2379.2843	-23.23	11.256
410.000	2683.9091	2317.2965	-23.94	20.545
415.000	2536.8953	2172.9900	-24.53	40.855
420.000	2255.1176	1893.7109	-24.89	68.956
425.000	1839.6138	1480.2828	-24.81	84.718
430.000	1404.3327	1046.6346	-24.16	73.670
435.000	1065.9553	709.9661	-23.06	51.324
440.000	841.2217	487.8525	-21.84	33.151
445.000	697.3585	348.0720	-20.70	21.434
450.000	607.2381	263.9780	-19.89	12.306
455.000	559.0957	225.5041	-20.07	6.692
460.000	529.9894	207.6383	-20.73	4.871
465.000	508.3388	196.3500	-21.29	3.785
470.000	491.0726	187.5614	-21.60	2.989
475.000	477.1880	180.0734	-21.68	2.384
480.000	465.8993	173.0770	-21.53	1.975
485.000	456.7096	166.2879	-21.20	1.655
490.000	449.3412	159.8557	-20.76	1.405
495.000	443.4836	153.8416	-20.26	1.212
500.000	438.8367	148.2484	-19.72	1.064
505.000	435.1376	143.0499	-19.18	.950
510.000	432.1681	138.2091	-18.65	.861
515.000	429.7560	133.6913	-18.12	.790
520.000	427.7535	129.4193	-17.61	.758
525.000	426.0318	125.2706	-17.10	.721
530.000	424.5507	121.3287	-16.61	.675
535.000	423.2718	117.6333	-16.14	.626
540.000	422.1598	114.1936	-15.69	.577
545.000	421.1868	111.0088	-15.28	.530
550.000	420.3311	108.0747	-14.90	.484
SPLASH 554.581	419.6525	105.6627	-14.58	.454

TABLE 2-VIII VEHICLE POSITION COORDINATES - S-IC
EXPENDED-STAGE TRAJECTORY
(81 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	X M	Y M	Z M
SFP	159.329	6436273.438	27695.350	150519.789
	160.329	6437172.813	27755.961	153149.193
	165.000	6441241.938	28038.652	165415.852
	170.000	6445360.688	28340.554	178528.506
	175.000	6449237.125	28641.700	191627.137
	180.000	6452873.063	28942.109	204715.637
	185.000	6456269.188	29241.748	217794.201
	190.000	6459426.438	29540.631	230864.301
	195.000	6462344.938	29838.726	243924.865
	200.000	6465025.250	30136.047	256976.686
	205.000	6467467.500	30432.560	270018.352
	210.000	6469672.125	30728.280	283050.500
	215.000	6471639.125	31023.172	296071.648
	220.000	6473368.875	31317.252	309082.387
	225.000	6474861.500	31610.485	322081.223
	230.000	6476117.188	31902.885	335068.738
	235.000	6477136.125	32194.418	348043.438
	240.000	6477918.500	32485.099	361005.891
	245.000	6478464.375	32774.894	373954.602
	250.000	6478773.938	33063.815	386890.133
	255.000	6478847.188	33351.832	399811.000
	260.000	6478684.313	33638.954	412717.766
	265.000	6478285.375	33925.150	425608.938
	270.000	6477650.375	34210.434	438485.078
	275.000	6476779.438	34494.770	451344.691
	280.000	6475672.563	34778.172	464188.328
	285.000	6474329.813	35060.608	477014.504
	290.000	6472751.063	35342.089	489823.770
	295.000	6470936.500	35622.583	502614.633
	300.000	6468885.875	35902.101	515387.641
	305.000	6466599.375	36180.611	528141.281
	310.000	6464076.750	36458.124	540876.109
	315.000	6461318.125	36734.607	553590.633
	320.000	6458323.188	37010.073	566285.383
	325.000	6455092.125	37284.488	578958.867
	330.000	6451624.500	37557.862	591611.586
	335.000	6447920.563	37830.164	604242.063
	340.000	6443979.813	38101.404	616850.789
	345.000	6439802.375	38371.549	629436.242
	350.000	6435387.875	38640.609	641998.883
	355.000	6430736.500	38908.551	654537.133

TABLE 8-VIII

VEHICLE POSITION COORDINATES - S-IC
EXPENDED-STAGE TRAJECTORY
(81 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	X M	Y M	Z M
360.000	6425847.688	39175.384	667051.305
365.000	6420721.875	39441.073	679539.547
370.000	6415358.688	39705.623	692001.578
375.000	6409759.250	39968.992	704434.461
380.000	6403924.250	40231.171	716835.906
385.000	6397856.938	40492.095	729199.164
390.000	6391562.500	40751.705	741514.898
395.000	6385052.438	41009.846	753763.602
400.000	6378347.438	41266.296	765912.875
405.000	6371488.813	41520.593	777900.797
410.000	6364560.500	41771.871	789607.539
415.000	6357741.250	42018.291	800787.242
420.000	6351363.750	42256.573	811003.258
425.000	6345882.750	42482.389	819696.258
430.000	6341600.562	42693.258	826559.172
435.000	6338432.313	42890.652	831802.211
440.000	6336068.750	43078.167	835894.180
445.000	6334226.313	43258.950	839237.359
450.000	6332712.125	43435.167	842099.977
455.000	6331372.625	43608.313	844669.203
460.000	6330095.563	43779.338	847063.375
465.000	6328851.375	43948.675	849332.875
470.000	6327635.938	44116.636	851507.742
475.000	6326450.438	44283.444	853610.234
480.000	6325296.125	44449.309	855658.414
485.000	6324174.750	44614.376	857666.305
490.000	6323086.313	44778.784	859645.250
495.000	6322029.375	44942.616	861603.695
500.000	6321001.813	45105.956	863548.266
505.000	6320001.563	45268.841	865483.531
510.000	6319026.438	45431.325	867413.086
515.000	6318074.563	45593.419	869339.203
520.000	6317144.313	45755.157	871263.742
525.000	6316234.750	45916.540	873187.781
530.000	6315344.875	46077.589	875112.297
535.000	6314473.500	46238.299	877037.633
540.000	6313619.313	46398.684	878964.219
545.000	6312781.062	46558.730	880892.031
550.000	6311957.375	46718.450	882821.266
SPLASH 554.581	6311214.438	46864.488	884589.938

D5-15481-1

TABLE 8-IX

VEHICLE VELOCITY COMPONENTS - S-IC
EXPENDED STAGE TRAJECTORY
(81 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
SFP	159.329	904.356	60.620	2629.766
	160.329	894.327	60.590	2628.540
	165.000	848.134	60.453	2624.149
	170.000	799.448	60.305	2620.996
	175.000	751.195	60.156	2618.652
	180.000	703.183	60.005	2616.682
	185.000	655.323	59.853	2614.862
	190.000	607.561	59.698	2613.072
	195.000	559.875	59.542	2611.249
	200.000	512.248	59.384	2609.362
	205.000	464.676	59.224	2607.396
	210.000	417.151	59.062	2605.345
	215.000	369.672	58.898	2603.205
	220.000	322.231	58.732	2600.974
	225.000	274.830	58.564	2598.652
	230.000	227.462	58.394	2596.237
	235.000	180.127	58.222	2593.731
	240.000	132.818	58.048	2591.132
	245.000	85.537	57.872	2588.441
	250.000	38.277	57.694	2585.657
	255.000	-8.962	57.514	2582.780
	260.000	-56.186	57.332	2579.811
	265.000	-103.393	57.148	2576.748
	270.000	-150.592	56.962	2573.591
	275.000	-197.781	56.774	2570.342
	280.000	-244.966	56.584	2566.998
	285.000	-292.147	56.392	2563.561
	290.000	-339.331	56.198	2560.029
	295.000	-386.516	56.002	2556.403
	300.000	-433.709	55.803	2552.682
	305.000	-480.909	55.603	2548.866
	310.000	-528.123	55.400	2544.954
	315.000	-575.350	55.195	2540.946
	320.000	-622.597	54.988	2536.842
	325.000	-669.862	54.779	2532.640
	330.000	-717.153	54.568	2528.340
	335.000	-764.467	54.355	2523.940
	340.000	-811.811	54.139	2519.438
	345.000	-859.183	53.921	2514.832
	350.000	-906.587	53.701	2510.114
	355.000	-954.017	53.478	2505.272

D5-15481-1

TABLE 8-IX

VEHICLE VELOCITY COMPONENTS - S-IC
 EXPENDED STAGE TRAJECTORY
 (81 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
360.000	-1001.465	53.253	2500.279
365.000	-1048.906	53.025	2495.082
370.000	-1096.289	52.793	2489.576
375.000	-1143.508	52.556	2483.577
380.000	-1190.359	52.312	2476.724
385.000	-1236.428	52.057	2468.351
390.000	-1280.946	51.781	2457.253
395.000	-1322.453	51.470	2441.257
400.000	-1358.701	51.094	2416.414
405.000	-1382.658	50.599	2375.047
410.000	-1382.915	49.852	2299.658
415.000	-1333.662	48.607	2157.504
420.000	-1200.787	46.546	1908.271
425.000	-979.714	43.680	1556.416
430.000	-735.700	40.713	1195.508
435.000	-541.756	38.364	917.195
440.000	-412.506	36.740	732.218
445.000	-330.187	35.640	613.201
450.000	-280.101	34.893	537.647
455.000	-259.698	34.397	493.925
460.000	-251.732	34.025	465.148
465.000	-245.976	33.721	443.584
470.000	-240.114	33.470	427.057
475.000	-234.024	33.261	414.530
480.000	-227.586	33.088	405.181
485.000	-220.936	32.944	398.354
490.000	-214.464	32.821	393.491
495.000	-208.362	32.715	390.119
500.000	-202.694	32.621	387.851
505.000	-197.459	32.536	386.389
510.000	-192.622	32.457	385.503
515.000	-188.147	32.383	385.023
520.000	-183.948	32.312	384.827
525.000	-179.897	32.243	384.838
530.000	-176.069	32.176	384.977
535.000	-172.500	32.109	385.191
540.000	-169.193	32.043	385.443
545.000	-166.145	31.977	385.709
550.000	-163.349	31.910	385.975
SPLASH 554.581	-161.065	31.849	386.202

TABLE 8-X

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
LATITUDE, AND LONGITUDE - S-IC EXPENDED-STAGE
TRAJECTORY (90 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
SEP	159.329	64844.5	47.2	28.601	-79.710
	160.329	65807.1	48.4	28.601	-79.688
	165.000	70185.2	53.9	28.600	-79.584
	170.000	74659.7	59.7	28.598	-79.473
	175.000	78917.8	65.6	28.596	-79.363
	180.000	82961.3	71.4	28.594	-79.253
	185.000	86791.0	77.2	28.592	-79.143
	190.000	90407.7	83.0	28.590	-79.033
	195.000	93811.3	88.8	28.588	-78.923
	200.000	97002.6	94.6	28.586	-78.813
	205.000	99981.5	100.4	28.583	-78.704
	210.000	102748.4	106.1	28.581	-78.595
	215.000	105303.5	111.9	28.578	-78.485
	220.000	107646.6	117.7	28.575	-78.376
	225.000	109778.3	123.5	28.572	-78.267
	230.000	111698.4	129.2	28.569	-78.158
	235.000	113407.2	135.0	28.566	-78.049
	240.000	114904.9	140.7	28.563	-77.941
	245.000	116191.3	146.5	28.559	-77.832
	250.000	117266.5	152.2	28.556	-77.723
	255.000	118131.0	158.0	28.552	-77.615
	260.000	118784.4	163.7	28.548	-77.506
	265.000	119226.8	169.4	28.545	-77.397
	270.000	119458.4	175.2	28.541	-77.289
	275.000	119479.3	180.9	28.536	-77.180
	280.000	119289.0	186.7	28.532	-77.072
	285.000	118888.0	192.4	28.528	-76.963
	290.000	118276.1	198.1	28.523	-76.855
	295.000	117453.2	203.9	28.519	-76.746
	300.000	116419.4	209.6	28.514	-76.638
	305.000	115174.5	215.4	28.509	-76.529
	310.000	113718.4	221.1	28.504	-76.420
	315.000	112051.2	226.9	28.499	-76.312
	320.000	110172.6	232.6	28.494	-76.203
	325.000	108082.6	238.4	28.488	-76.094
	330.000	105780.9	244.2	28.483	-75.985
	335.000	103267.7	249.9	28.477	-75.876
	340.000	100542.5	255.7	28.472	-75.767
	345.000	97605.4	261.5	28.466	-75.658
	350.000	94455.9	267.3	28.460	-75.549
	355.000	91094.3	273.1	28.454	-75.439

TABLE 8-X

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-IC EXPENDED-STAGE
 TRAJECTORY (90 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
360.000	87520.0	278.9		
365.000	83733.4	284.7	28.448	-75.330
370.000	79734.0	290.5	28.441	-75.220
375.000	75522.5	296.3	28.435	-75.111
380.000	71099.6	302.2	28.428	-75.001
385.000	66467.7	308.0	28.421	-74.891
390.000	61630.6	313.8	28.414	-74.781
395.000	56597.3	319.7	28.408	-74.671
400.000	51383.9	325.5	28.400	-74.561
405.000	46022.5	331.2	28.393	-74.452
410.000	40579.6	336.8	28.386	-74.344
415.000	35196.9	342.1	28.379	-74.238
420.000	30141.3	346.9	28.372	-74.138
425.000	25786.5	350.9	28.366	-74.047
430.000	22393.5	353.8	28.360	-73.973
435.000	19908.8	355.7	28.356	-73.918
440.000	18084.2	357.0	28.354	-73.882
445.000	16686.8	357.8	28.352	-73.858
450.000	15557.6	358.4	28.351	-73.842
455.000	14568.1	358.8	28.350	-73.832
460.000	13620.0	359.0	28.350	-73.824
465.000	12689.1	359.3	28.349	-73.819
470.000	11774.9	359.4	28.349	-73.815
475.000	10881.4	359.5	28.349	-73.812
480.000	10012.0	359.6	28.348	-73.810
485.000	9170.6	359.7	28.348	-73.808
490.000	8358.6	359.7	28.348	-73.807
495.000	7575.7	359.8	28.348	-73.806
500.000	6820.9	359.8	28.348	-73.806
505.000	6092.5	359.8	28.348	-73.805
510.000	5389.0	359.8	28.348	-73.805
515.000	4708.7	359.8	28.348	-73.805
520.000	4050.4	359.8	28.348	-73.805
525.000	3413.1	359.8	28.348	-73.805
530.000	2796.0	359.8	28.348	-73.805
535.000	2198.2	359.8	28.348	-73.804
540.000	1618.0	359.8	28.348	-73.804
545.000	1054.6	359.8	28.348	-73.804
550.000	506.5	359.8	28.348	-73.804
SPLASH 554.740	-.1	359.8	28.348	-73.804

TABLE 8-XI

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-IC EXPENDED-STAGE TRAJECTORY
(90 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
SEP	159.329	2785.2809	2402.4606	20.32	10.137
	160.329	2780.8783	2397.5356	20.15	10.063
	165.000	2762.1800	2376.4339	19.38	9.828
	170.000	2744.5926	2356.3427	18.55	9.699
	175.000	2728.6608	2337.9834	17.71	9.631
	180.000	2713.9175	2320.8935	16.87	9.592
	185.000	2700.1314	2304.8467	16.01	9.568
	190.000	2687.1788	2289.7246	15.15	9.551
	195.000	2675.0012	2275.4733	14.28	9.538
	200.000	2663.5710	2262.0704	13.40	9.527
	205.000	2652.8799	2249.5123	12.51	9.518
	210.000	2642.9260	2237.8018	11.62	9.509
	215.000	2633.7122	2226.9462	10.72	9.502
	220.000	2625.2413	2216.9527	9.82	9.495
	225.000	2617.5179	2207.8301	8.91	9.489
	230.000	2610.5457	2199.5855	7.99	9.483
	235.000	2604.3289	2192.2271	7.08	9.478
	240.000	2598.8708	2185.7612	6.15	9.473
	245.000	2594.1750	2180.1943	5.23	9.470
	250.000	2590.2439	2175.5314	4.30	9.467
	255.000	2587.0804	2171.7773	3.37	9.464
	260.000	2584.6861	2168.9357	2.44	9.462
	265.000	2583.0627	2167.0094	1.50	9.461
	270.000	2582.2111	2166.0002	.57	9.460
	275.000	2582.1318	2165.9093	-.37	9.460
	280.000	2582.8251	2166.7367	-1.31	9.461
	285.000	2584.2901	2168.4814	-2.24	9.462
	290.000	2586.5263	2171.1419	-3.17	9.464
	295.000	2589.5318	2174.7152	-4.11	9.466
	300.000	2593.3051	2179.1979	-5.03	9.469
	305.000	2597.8434	2184.5853	-5.96	9.473
	310.000	2603.1441	2190.8723	-6.88	9.477
	315.000	2609.2034	2198.0523	-7.80	9.482
	320.000	2616.0178	2206.1187	-8.72	9.487
	325.000	2623.5824	2215.0629	-9.63	9.493
	330.000	2631.8928	2224.8770	-10.53	9.500
	335.000	2640.9425	2235.5503	-11.43	9.507
	340.000	2650.7254	2247.0725	-12.33	9.515
	345.000	2661.2320	2259.4295	-13.21	9.523
	350.000	2672.4511	2272.6057	-14.09	9.531

TABLE 8-XI

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-IC EXPENDED-STAGE TRAJECTORY
(90 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
360.000	2696.9316	2301.3009	-15.83	9.544
365.000	2710.0943	2316.7112	-16.69	9.544
370.000	2723.7290	2332.6804	-17.54	9.534
375.000	2737.6210	2348.9886	-18.38	9.503
380.000	2751.3552	2365.2157	-19.21	9.432
385.000	2764.1583	2380.5829	-20.03	9.293
390.000	2774.6208	2393.6756	-20.84	9.059
395.000	2780.1758	2401.9206	-21.63	8.771
400.000	2776.1065	2400.5941	-22.41	8.836
405.000	2753.2003	2380.4719	-23.17	11.098
410.000	2690.2865	2320.3538	-23.87	20.086
415.000	2546.7588	2179.5632	-24.47	40.025
420.000	2269.8122	1905.1432	-24.83	68.113
425.000	1857.2469	1494.6716	-24.76	84.642
430.000	1420.2807	1059.3265	-24.11	74.331
435.000	1078.0492	718.7470	-23.01	51.982
440.000	850.1734	493.4003	-21.78	33.622
445.000	704.3137	351.5224	-20.62	21.745
450.000	612.7398	265.8489	-19.78	12.556
455.000	563.5766	226.2221	-19.92	6.770
460.000	534.1597	208.0526	-20.56	4.916
465.000	512.3413	196.6454	-21.12	3.815
470.000	494.9620	187.8053	-21.43	3.013
475.000	480.9906	180.2879	-21.51	2.400
480.000	469.6439	173.2885	-21.37	1.988
485.000	460.4066	166.4906	-21.05	1.665
490.000	453.0012	160.0466	-20.61	1.413
495.000	447.1162	154.0195	-20.11	1.218
500.000	442.4500	148.4134	-19.58	1.068
505.000	438.7382	143.2032	-19.04	.954
510.000	435.7614	138.3524	-18.51	.864
515.000	433.3456	133.8254	-17.99	.792
520.000	431.3433	129.5492	-17.48	.759
525.000	429.6235	125.3954	-16.97	.722
530.000	428.1447	121.4464	-16.48	.676
535.000	426.8684	117.7431	-16.01	.627
540.000	425.7592	114.2951	-15.57	.579
545.000	424.7890	111.1023	-15.16	.531
550.000	423.9359	108.1603	-14.78	.485
SPLASH 554.740	423.2398	105.6699	-14.46	.456

TABLE 8-XII

 VEHICLE POSITION COORDINATES - S-1C
 EXPENDED-STAGE TRAJECTORY
 (90 -DEGREES LAUNCH AZIMUTH)

	TIME SEC.	X M	Y M	Z M
SFP	159.329	6436272.750	17763.447	154099.760
	160.329	6437172.125	17760.939	156733.773
	165.000	6441241.188	17749.029	169021.932
	170.000	6445360.000	17735.931	182157.539
	175.000	6449236.375	17722.482	195279.053
	180.000	6452872.313	17708.687	208390.355
	185.000	6456268.500	17694.550	221491.645
	190.000	6459425.750	17680.074	234584.387
	195.000	6462344.250	17665.260	247667.508
	200.000	6465024.625	17650.109	260741.795
	205.000	6467466.875	17634.624	273805.844
	210.000	6469671.500	17618.804	286860.281
	215.000	6471638.563	17602.652	299903.625
	220.000	6473368.375	17586.167	312936.477
	225.000	6474861.063	17569.350	325957.332
	230.000	6476116.875	17552.202	338966.773
	235.000	6477135.875	17534.726	351963.305
	240.000	6477918.375	17516.919	364947.504
	245.000	6478464.313	17498.785	377917.859
	250.000	6478773.938	17480.322	390874.953
	255.000	6478847.313	17461.534	403817.281
	260.000	6478684.563	17442.418	416745.414
	265.000	6478285.813	17422.978	429657.852
	270.000	6477650.938	17403.213	442555.156
	275.000	6476780.188	17383.125	455435.826
	280.000	6475673.500	17362.712	468300.445
	285.000	6474330.938	17341.978	481147.488
	290.000	6472752.375	17320.921	493977.523
	295.000	6470938.063	17299.544	506789.051
	300.000	6468887.688	17277.845	519582.621
	305.000	6466601.438	17255.828	532356.734
	310.000	6464079.063	17233.490	545111.922
	315.000	6461320.750	17210.834	557846.703
	320.000	6458326.125	17187.860	570561.602
	325.000	6455095.375	17164.569	583255.125
	330.000	6451628.125	17140.959	595927.789
	335.000	6447924.500	17117.035	608578.102
	340.000	6443984.125	17092.793	621206.555
	345.000	6439807.125	17068.237	633811.633
	350.000	6435393.063	17043.365	646393.805
	355.000	6430742.125	17018.177	658951.477

TABLE 8-XII

 VEHICLE POSITION COORDINATES - S-IC
 EXPENDED-STAGE TRAJECTORY
 (90 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
360.000	6425853.813	16992.672	671484.969
365.000	6420728.438	16966.849	683992.422
370.000	6415365.813	16940.699	696473.594
375.000	6409766.750	16914.212	708925.578
380.000	6403932.188	16887.361	721346.156
385.000	6397865.250	16860.096	733728.664
390.000	6391570.875	16832.322	746063.969
395.000	6385060.438	16803.861	758332.945
400.000	6378354.188	16774.374	770503.852
405.000	6371492.500	16743.236	782516.008
410.000	6364557.375	16709.172	794252.430
415.000	6357723.625	16669.548	805472.539
420.000	6351318.688	16619.515	815746.227
425.000	6345796.875	16552.607	824513.648
430.000	6341470.813	16464.805	831452.969
435.000	6338267.563	16357.973	836759.570
440.000	6335879.813	16237.234	840900.445
445.000	6334021.063	16107.207	844282.031
450.000	6332495.938	15971.016	847176.242
455.000	6331150.250	15830.929	849772.016
460.000	6329869.063	15688.423	852190.313
465.000	6328621.125	15544.123	854482.750
470.000	6327401.938	15398.352	856679.734
475.000	6326212.688	15251.369	858803.672
480.000	6325054.563	15103.362	860872.750
485.000	6323929.313	14954.501	862901.078
490.000	6322837.000	14804.904	864900.117
495.000	6321776.313	14654.685	866878.375
500.000	6320745.063	14503.913	868842.516
505.000	6319741.125	14352.661	870797.188
510.000	6318762.438	14200.961	872745.992
515.000	6317807.063	14048.859	874691.250
520.000	6316873.313	13896.366	876634.836
525.000	6315960.250	13743.511	878577.828
530.000	6315066.938	13590.292	880521.219
535.000	6314192.188	13436.730	882465.367
540.000	6313334.625	13282.817	884410.719
545.000	6312493.000	13128.568	886357.234
550.000	6311666.000	12973.975	888305.109
554.740	6310894.438	12827.121	890152.703

SPLASH

TABLE 8-XIII VEHICLE VELOCITY COMPONENTS - S-IC
EXPENDED STAGE TRAJECTORY
(90 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
SEP	159.329	904.345	-2.500	2634.376
	160.329	894.321	-2.515	2633.148
	165.000	848.131	-2.584	2628.746
	170.000	799.447	-2.655	2625.579
	175.000	751.195	-2.725	2623.221
	180.000	703.185	-2.793	2621.235
	185.000	655.326	-2.861	2619.399
	190.000	607.564	-2.929	2617.592
	195.000	559.880	-2.996	2615.752
	200.000	512.254	-3.064	2613.847
	205.000	464.684	-3.131	2611.864
	210.000	417.160	-3.197	2609.794
	215.000	369.682	-3.264	2607.636
	220.000	322.243	-3.330	2605.387
	225.000	274.843	-3.396	2603.046
	230.000	227.477	-3.462	2600.614
	235.000	180.143	-3.528	2598.089
	240.000	132.837	-3.594	2595.471
	245.000	85.558	-3.660	2592.761
	250.000	38.300	-3.725	2589.958
	255.000	-8.937	-3.790	2587.062
	260.000	-56.158	-3.856	2584.073
	265.000	-103.364	-3.921	2580.991
	270.000	-150.560	-3.985	2577.815
	275.000	-197.746	-4.050	2574.546
	280.000	-244.929	-4.115	2571.182
	285.000	-292.107	-4.179	2567.725
	290.000	-339.288	-4.243	2564.173
	295.000	-386.470	-4.308	2560.527
	300.000	-433.659	-4.372	2556.785
	305.000	-480.856	-4.436	2552.949
	310.000	-528.067	-4.499	2549.016
	315.000	-575.291	-4.563	2544.988
	320.000	-622.534	-4.627	2540.862
	325.000	-669.795	-4.690	2536.639
	330.000	-717.081	-4.753	2532.317
	335.000	-764.392	-4.817	2527.896
	340.000	-811.732	-4.880	2523.373
	345.000	-859.099	-4.943	2518.746
	350.000	-906.499	-5.006	2514.007
	355.000	-953.925	-5.069	2509.144

TABLE 8-XIII

VEHICLE VELOCITY COMPONENTS - S-IC
EXPENDED STAGE TRAJECTORY
(90 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
360.000	-1001.370	-5.133	2504.131
365.000	-1048.808	-5.197	2498.917
370.000	-1096.191	-5.263	2493.399
375.000	-1143.415	-5.333	2487.397
380.000	-1190.280	-5.409	2480.556
385.000	-1236.381	-5.500	2472.226
390.000	-1280.964	-5.616	2461.724
395.000	-1322.598	-5.780	2445.420
400.000	-1358.591	-6.034	2420.942
405.000	-1383.548	-6.461	2380.308
410.000	-1384.880	-7.249	2306.446
415.000	-1337.701	-8.764	2167.132
420.000	-1207.791	-11.485	1921.759
425.000	-988.668	-15.440	1572.152
430.000	-743.814	-19.623	1209.774
435.000	-547.634	-22.942	928.311
440.000	-416.422	-25.208	740.778
445.000	-332.866	-26.709	620.117
450.000	-281.793	-27.697	543.393
455.000	-260.599	-28.290	498.905
460.000	-252.497	-28.695	469.839
465.000	-246.722	-29.017	448.085
470.000	-240.867	-29.283	431.408
475.000	-234.780	-29.505	416.760
480.000	-228.357	-29.692	409.313
485.000	-221.706	-29.850	402.405
490.000	-215.225	-29.985	397.479
495.000	-209.110	-30.102	394.055
500.000	-203.429	-30.204	391.748
505.000	-198.181	-30.297	390.254
510.000	-193.334	-30.381	389.342
515.000	-188.849	-30.460	388.840
520.000	-184.646	-30.535	388.626
525.000	-180.590	-30.608	388.622
530.000	-176.756	-30.678	388.747
535.000	-173.179	-30.748	388.947
540.000	-169.865	-30.816	389.188
545.000	-166.810	-30.884	389.443
550.000	-164.008	-30.952	389.698
SPLASH 554.740	-161.651	-31.015	389.922

TABLE 8-XIV ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
LATITUDE, AND LONGITUDE - S-IC EXPENDED-STAGE
TRAJECTORY (99 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
SEP	159.329	64834.1	47.2	28.477	-79.723
	160.329	65796.2	48.4	28.473	-79.701
	165.000	70172.6	53.9	28.458	-79.599
	170.000	74645.3	59.7	28.441	-79.490
	175.000	78901.4	65.5	28.423	-79.381
	180.000	82942.9	71.4	28.406	-79.273
	185.000	86770.4	77.2	28.389	-79.165
	190.000	90384.9	83.0	28.372	-79.057
	195.000	93786.3	88.8	28.354	-78.949
	200.000	96975.2	94.6	28.337	-78.842
	205.000	99951.6	100.4	28.319	-78.734
	210.000	102716.0	106.1	28.301	-78.627
	215.000	105268.3	111.9	28.283	-78.520
	220.000	107608.8	117.7	28.265	-78.413
	225.000	109737.6	123.4	28.247	-78.306
	230.000	111654.8	129.2	28.229	-78.199
	235.000	113360.6	135.0	28.211	-78.093
	240.000	114855.1	140.7	28.192	-77.986
	245.000	116138.4	146.5	28.174	-77.880
	250.000	117210.5	152.2	28.155	-77.774
	255.000	118071.4	157.9	28.137	-77.667
	260.000	118721.4	163.7	28.118	-77.561
	265.000	119160.4	169.4	28.099	-77.455
	270.000	119388.4	175.2	28.080	-77.349
	275.000	119405.4	180.9	28.061	-77.243
	280.000	119211.5	186.7	28.041	-77.137
	285.000	118806.6	192.4	28.022	-77.031
	290.000	118190.8	198.1	28.002	-76.925
	295.000	117363.9	203.9	27.983	-76.819
	300.000	116325.7	209.6	27.963	-76.714
	305.000	115076.6	215.4	27.943	-76.608
	310.000	113616.3	221.1	27.923	-76.502
	315.000	111944.6	226.9	27.903	-76.396
	320.000	110061.5	232.6	27.883	-76.290
	325.000	107966.8	238.4	27.862	-76.184
	330.000	105660.6	244.2	27.842	-76.078
	335.000	103142.5	249.9	27.821	-75.972
	340.000	100412.3	255.7	27.801	-75.866
	345.000	97470.4	261.5	27.780	-75.760
	350.000	94315.8	267.3	27.759	-75.654
	355.000	90949.2	273.1	27.738	-75.548

TABLE 8-XIV

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-IC EXPENDED-STAGE
 TRAJECTORY (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
360.000	87369.6	278.9	27.716	-75.441
365.000	83577.5	284.7	27.695	-75.335
370.000	79572.7	290.5	27.673	-75.228
375.000	75355.9	296.4	27.652	-75.122
380.000	70927.4	302.2	27.630	-75.015
385.000	66290.0	308.0	27.608	-74.908
390.000	61447.6	313.9	27.586	-74.802
395.000	56409.2	319.7	27.564	-74.695
400.000	51191.6	325.5	27.541	-74.590
405.000	45827.6	331.2	27.519	-74.485
410.000	40385.2	336.8	27.498	-74.383
415.000	35010.1	342.1	27.477	-74.286
420.000	29973.9	346.9	27.459	-74.199
425.000	25650.8	350.8	27.443	-74.128
430.000	22293.2	353.7	27.432	-74.075
435.000	19836.3	355.6	27.425	-74.040
440.000	18030.3	356.9	27.420	-74.018
445.000	16644.4	357.7	27.417	-74.003
450.000	15522.3	358.2	27.414	-73.993
455.000	14535.3	358.6	27.413	-73.986
460.000	13588.1	358.9	27.412	-73.981
465.000	12657.6	359.1	27.411	-73.977
470.000	11744.0	359.3	27.410	-73.974
475.000	10851.3	359.4	27.410	-73.972
480.000	9982.8	359.5	27.410	-73.971
485.000	9142.5	359.5	27.409	-73.969
490.000	8331.5	359.6	27.409	-73.969
495.000	7549.7	359.6	27.409	-73.968
500.000	6795.6	359.6	27.409	-73.968
505.000	6068.2	359.6	27.409	-73.967
510.000	5365.5	359.7	27.409	-73.967
515.000	4686.1	359.7	27.409	-73.967
520.000	4028.4	359.7	27.409	-73.967
525.000	3391.8	359.7	27.409	-73.967
530.000	2775.5	359.7	27.409	-73.967
535.000	2178.2	359.7	27.409	-73.967
540.000	1598.7	359.7	27.409	-73.967
545.000	1035.9	359.7	27.409	-73.967
550.000	488.2	359.7	27.409	-73.967
SPLASH 554.572	-.1	359.7	27.409	-73.967

TABLE 8-XV

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-IC EXPENDED-STAGE TRAJECTORY
(99 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC2
SEP	159.329	2781.0313	2402.5525	20.36	10.138
	160.329	2776.6217	2397.6276	20.20	10.064
	165.000	2757.8929	2376.5278	19.43	9.829
	170.000	2740.2755	2356.4415	18.60	9.699
	175.000	2724.3160	2338.0889	17.76	9.631
	180.000	2709.5470	2321.0071	16.91	9.592
	185.000	2695.7368	2304.9697	16.05	9.568
	190.000	2682.7618	2289.8576	15.18	9.551
	195.000	2670.5632	2275.6172	14.31	9.538
	200.000	2659.1136	2262.2256	13.43	9.527
	205.000	2648.4045	2249.6794	12.54	9.518
	210.000	2638.4340	2237.9812	11.65	9.509
	215.000	2629.2051	2227.1384	10.75	9.502
	220.000	2620.7206	2217.1581	9.84	9.495
	225.000	2612.9852	2208.0491	8.93	9.489
	230.000	2606.0025	2199.8186	8.02	9.483
	235.000	2599.7768	2192.4746	7.10	9.478
	240.000	2594.3114	2186.0234	6.17	9.474
	245.000	2589.6100	2180.4716	5.24	9.470
	250.000	2585.6750	2175.8241	4.31	9.467
	255.000	2582.5091	2172.0858	3.38	9.464
	260.000	2580.1142	2169.2601	2.44	9.462
	265.000	2578.4919	2167.3501	1.51	9.461
	270.000	2577.6431	2166.3575	.57	9.460
	275.000	2577.5684	2166.2832	-.37	9.460
	280.000	2578.2678	2167.1276	-1.30	9.461
	285.000	2579.7408	2168.8894	-2.24	9.462
	290.000	2581.9865	2171.5671	-3.18	9.464
	295.000	2585.0034	2175.1578	-4.11	9.466
	300.000	2588.7897	2179.6582	-5.04	9.469
	305.000	2593.3426	2185.0632	-5.97	9.473
	310.000	2598.6595	2191.3680	-6.89	9.477
	315.000	2604.7365	2198.5656	-7.82	9.482
	320.000	2611.5703	2206.6498	-8.73	9.487
	325.000	2619.1558	2215.6120	-9.65	9.493
	330.000	2627.4885	2225.4438	-10.55	9.500
	335.000	2636.5620	2236.1349	-11.45	9.507
	340.000	2646.3699	2247.6748	-12.35	9.515
	345.000	2656.9028	2260.0493	-13.24	9.523
	350.000	2668.1492	2273.2426	-14.12	9.531

TABLE 8-XV

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-1C EXPENDED-STAGE TRAJECTORY
(99 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC2
360.000	2692.6849	2301.9685	-15.86	9.544
365.000	2705.8730	2317.3900	-16.72	9.544
370.000	2719.5286	2333.3645	-17.57	9.533
375.000	2733.4315	2349.6667	-18.41	9.501
380.000	2747.1571	2365.8666	-19.24	9.428
385.000	2759.9151	2381.1683	-20.06	9.286
390.000	2770.2656	2394.1259	-20.87	9.049
395.000	2775.5868	2402.1103	-21.67	8.763
400.000	2771.0591	2400.2924	-22.45	8.863
405.000	2747.2141	2379.1872	-23.21	11.276
410.000	2682.3062	2317.0074	-23.91	20.597
415.000	2535.0243	2172.3421	-24.50	40.944
420.000	2252.9568	1892.5700	-24.86	69.045
425.000	1837.5641	1478.8421	-24.78	84.729
430.000	1403.1462	1045.3657	-24.12	73.607
435.000	1066.0860	709.0839	-23.01	51.262
440.000	842.7109	487.2918	-21.76	33.106
445.000	700.0761	347.7193	-20.59	21.407
450.000	611.0007	263.7831	-19.73	12.284
455.000	563.5746	225.4257	-19.89	6.688
460.000	534.9345	207.5895	-20.52	4.871
465.000	513.6578	196.3121	-21.05	3.786
470.000	496.7078	187.5287	-21.34	2.991
475.000	483.0896	180.0440	-21.39	2.386
480.000	472.0231	173.0479	-21.23	1.977
485.000	463.0181	166.2603	-20.89	1.656
490.000	455.7995	159.8299	-20.45	1.406
495.000	450.0612	153.8178	-19.94	1.213
500.000	445.5080	148.2255	-19.41	1.064
505.000	441.8826	143.0283	-18.87	.950
510.000	438.9712	138.1894	-18.34	.861
515.000	436.6049	133.6730	-17.83	.789
520.000	434.6390	129.4018	-17.32	.758
525.000	432.9477	125.2537	-16.82	.721
530.000	431.4920	121.3127	-16.33	.674
535.000	430.2344	117.6183	-15.87	.625
540.000	429.1405	114.1795	-15.43	.577
545.000	428.1830	110.9957	-15.02	.529
550.000	427.3405	108.0622	-14.65	.483
SPLASH 554.572	426.6735	105.6552	-14.34	.453

D5-15481-1

TABLE 8-XVI

VEHICLE POSITION COORDINATES - S-IC
 EXPANDED-STAGE TRAJECTORY
 (99 -DEGREES LAUNCH AZIMUTH)

SEP	TIME SEC	X M	Y M	Z M
	159.329	6436273.563	7393.781	156082.490
	160.329	6437172.938	7328.209	158711.189
	165.000	6441242.063	7021.963	170974.492
	170.000	6445360.875	6694.157	184083.449
	175.000	6449237.313	6366.412	197178.279
	180.000	6452873.313	6038.721	210262.867
	185.000	6456269.438	5711.126	223337.414
	190.000	6459426.750	5383.615	236403.393
	195.000	6462345.313	5056.226	249459.729
	200.000	6465025.688	4728.945	262507.211
	205.000	6467468.000	4401.812	275544.445
	210.000	6469672.625	4074.810	288572.047
	215.000	6471639.688	3747.979	301588.547
	220.000	6473369.563	3421.303	314594.531
	225.000	6474862.250	3094.820	327588.516
	230.000	6476118.063	2768.515	340571.066
	235.000	6477137.125	2442.427	353540.699
	240.000	6477919.563	2116.540	366497.984
	245.000	6478465.562	1790.891	379441.426
	250.000	6478775.250	1465.468	392371.586
	255.000	6478848.625	1140.307	405286.980
	260.000	6478685.938	815.393	418188.176
	265.000	6478287.125	490.765	431073.676
	270.000	6477652.313	166.407	443944.035
	275.000	6476781.562	-157.643	456797.770
	280.000	6475674.875	-481.399	469635.426
	285.000	6474332.313	-804.824	482455.523
	290.000	6472753.813	-1127.931	495258.605
	295.000	6470939.438	-1450.684	508043.184
	300.000	6468889.063	-1773.096	520809.805
	305.000	6466602.813	-2095.131	533556.961
	310.000	6464080.438	-2416.800	546285.211
	315.000	6461322.125	-2738.068	558993.055
	320.000	6458327.500	-3058.948	571681.016
	325.000	6455096.688	-3379.403	584347.609
	330.000	6451629.438	-3699.445	596993.352
	335.000	6447925.813	-4019.038	609616.750
	340.000	6443985.375	-4338.195	622218.297
	345.000	6439808.375	-4656.879	634796.469
	350.000	6435394.250	-4975.103	647351.742
	355.000	6430743.250	-5292.831	659882.523

TABLE 8-XVI

 VEHICLE POSITION COORDINATES - S-IC
 EXPENDED-STAGE TRAJECTORY
 (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC.	X M	Y M	Z M
360.000	6425854.813	-5610.077	672389.133
365.000	6420729.438	-5926.809	684869.703
370.000	6415366.750	-6243.047	697323.961
375.000	6409767.750	-6558.773	709748.969
380.000	6403933.250	-6874.034	722142.438
385.000	6397866.438	-7188.861	734497.594
390.000	6391572.563	-7503.395	746805.078
395.000	6385063.188	-7817.846	759045.344
400.000	6378358.875	-8132.679	771185.953
405.000	6371501.188	-8448.714	783164.828
410.000	6364574.188	-8767.697	794861.867
415.000	6357757.000	-9093.182	806030.680
420.000	6351382.813	-9431.741	816233.961
425.000	6345906.375	-9791.967	824912.453
430.000	6341628.750	-10179.065	831760.570
435.000	6338464.125	-10590.413	836990.008
440.000	6336102.938	-11019.316	841069.719
445.000	6334262.000	-11459.783	844401.602
450.000	6332748.813	-11907.823	847253.500
455.000	6331409.688	-12360.443	849812.391
460.000	6330132.813	-12815.706	852196.367
465.000	6328888.750	-13272.833	854455.672
470.000	6327673.375	-13731.497	856620.313
475.000	6326487.938	-14191.409	858712.531
480.000	6325333.688	-14652.405	860750.383
485.000	6324212.375	-15114.293	862747.867
490.000	6323123.875	-15576.978	864716.336
495.000	6322066.938	-16040.314	866664.219
500.000	6321039.313	-16504.251	868598.109
505.000	6320039.000	-16968.684	870522.602
510.000	6319063.813	-17433.597	872441.273
515.000	6318111.875	-17898.916	874356.414
520.000	6317181.500	-18364.649	876269.859
525.000	6316271.813	-18830.743	878182.695
530.000	6315381.813	-19297.222	880095.906
535.000	6314510.250	-19764.039	882009.828
540.000	6313655.875	-20231.223	883924.891
545.000	6312817.438	-20698.730	885841.070
550.000	6311993.500	-21166.592	887758.555
554.572	6311251.938	-21594.643	889512.727

SPI ASH

TABLE 8-XVII VEHICLE VELOCITY COMPONENTS - S-IC
EXPENDED STAGE TRAJECTORY
(99 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
SFP	159.329	904.359	-65.565	2679.063
	160.329	894.331	-65.565	2627.832
	165.000	848.135	-65.563	2623.421
	170.000	799.453	-65.556	2620.246
	175.000	751.201	-65.544	2617.881
	180.000	703.190	-65.529	2615.889
	185.000	655.331	-65.511	2614.048
	190.000	607.569	-65.491	2612.237
	195.000	559.885	-65.467	2610.393
	200.000	512.259	-65.442	2608.485
	205.000	464.689	-65.414	2606.498
	210.000	417.165	-65.384	2604.426
	215.000	369.687	-65.351	2602.265
	220.000	322.248	-65.316	2600.013
	225.000	274.848	-65.279	2597.670
	230.000	227.481	-65.240	2595.235
	235.000	180.148	-65.198	2592.708
	240.000	132.841	-65.154	2590.089
	245.000	85.562	-65.108	2587.377
	250.000	38.304	-65.059	2584.573
	255.000	-8.933	-65.008	2581.675
	260.000	-56.155	-64.955	2578.685
	265.000	-103.361	-64.899	2575.602
	270.000	-150.557	-64.841	2572.425
	275.000	-197.744	-64.781	2569.155
	280.000	-244.927	-64.719	2565.792
	285.000	-292.106	-64.654	2562.334
	290.000	-339.287	-64.587	2558.782
	295.000	-386.469	-64.517	2555.136
	300.000	-433.660	-64.445	2551.395
	305.000	-480.858	-64.371	2547.559
	310.000	-528.069	-64.294	2543.627
	315.000	-575.293	-64.215	2539.600
	320.000	-622.537	-64.134	2535.475
	325.000	-669.800	-64.050	2531.253
	330.000	-717.087	-63.964	2526.933
	335.000	-764.398	-63.876	2522.514
	340.000	-811.739	-63.785	2517.992
	345.000	-859.108	-63.691	2513.366
	350.000	-906.509	-63.596	2508.629
	355.000	-953.935	-63.498	2503.767

D5-15481-1

TABLE 8-XVII

VEHICLE VELOCITY COMPONENTS - S-IC
 EXPENDED STAGE TRAJECTORY
 (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
360.000	-1001.380	-63.398	2498.754
365.000	-1048.817	-63.297	2493.537
370.000	-1096.196	-63.196	2488.010
375.000	-1143.412	-63.098	2481.990
380.000	-1190.257	-63.006	2475.114
385.000	-1236.319	-62.931	2466.716
390.000	-1280.826	-62.888	2455.586
395.000	-1322.317	-62.909	2439.549
400.000	-1358.038	-63.049	2414.648
405.000	-1382.443	-63.422	2373.187
410.000	-1382.594	-64.284	2297.622
415.000	-1333.140	-66.133	2155.160
420.000	-1199.986	-69.604	1905.519
425.000	-978.749	-74.698	1553.420
430.000	-734.857	-80.056	1192.642
435.000	-541.207	-84.265	914.622
440.000	-412.128	-87.106	729.880
445.000	-329.947	-88.963	611.005
450.000	-279.970	-90.158	535.547
455.000	-259.654	-90.827	491.881
460.000	-251.706	-91.255	463.111
465.000	-245.957	-91.589	441.544
470.000	-240.099	-91.866	425.008
475.000	-234.013	-92.097	412.470
480.000	-227.578	-92.293	403.108
485.000	-220.932	-92.462	396.265
490.000	-214.465	-92.606	391.385
495.000	-208.368	-92.730	387.994
500.000	-202.704	-92.839	385.707
505.000	-197.472	-92.936	384.224
510.000	-192.640	-93.025	383.317
515.000	-188.169	-93.106	382.815
520.000	-183.973	-93.183	382.599
525.000	-179.925	-93.258	382.588
530.000	-176.101	-93.330	382.705
535.000	-172.534	-93.401	382.897
540.000	-169.231	-93.470	383.127
545.000	-166.186	-93.537	383.371
550.000	-163.394	-93.604	383.615
554.572	-161.116	-93.663	383.822

SPLASH

D5-15481-1

TABLE 8-XVIII

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-IC EXPENDED-STAGE
 TRAJECTORY (108-DEGREES LAUNCH AZIMUTH)

	TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
SEP	159.329	64803.3	47.2	28.355	-79.758
	160.329	65764.6	48.4	28.349	-79.737
	165.000	70136.1	53.9	28.319	-79.639
	170.000	74603.3	59.7	28.287	-79.534
	175.000	78853.8	65.6	28.255	-79.430
	180.000	82889.5	71.4	28.223	-79.326
	185.000	86710.7	77.2	28.191	-79.223
	190.000	90318.7	83.0	28.159	-79.120
	195.000	93713.3	88.8	28.127	-79.016
	200.000	96895.4	94.6	28.094	-78.913
	205.000	99864.6	100.4	28.062	-78.811
	210.000	102621.4	106.2	28.030	-78.708
	215.000	105166.2	111.9	27.997	-78.606
	220.000	107498.7	117.7	27.964	-78.504
	225.000	109619.4	123.5	27.932	-78.402
	230.000	111528.1	129.2	27.899	-78.300
	235.000	113225.3	135.0	27.866	-78.198
	240.000	114710.9	140.7	27.833	-78.096
	245.000	115984.9	146.5	27.800	-77.995
	250.000	117047.6	152.2	27.767	-77.893
	255.000	117898.9	158.0	27.733	-77.792
	260.000	118538.9	163.7	27.700	-77.691
	265.000	118967.7	169.5	27.666	-77.590
	270.000	119185.4	175.2	27.633	-77.489
	275.000	119191.7	181.0	27.599	-77.388
	280.000	118986.9	186.7	27.565	-77.287
	285.000	118570.8	192.4	27.531	-77.186
	290.000	117943.4	198.2	27.497	-77.086
	295.000	117104.8	203.9	27.463	-76.985
	300.000	116054.8	209.7	27.429	-76.884
	305.000	114793.5	215.4	27.395	-76.784
	310.000	113320.7	221.2	27.360	-76.683
	315.000	111636.2	227.0	27.326	-76.582
	320.000	109740.1	232.7	27.291	-76.482
	325.000	107632.2	238.5	27.256	-76.381
	330.000	105312.4	244.3	27.221	-76.281
	335.000	102780.6	250.0	27.186	-76.180
	340.000	100036.4	255.8	27.151	-76.080
	345.000	97080.1	261.6	27.116	-75.979
	350.000	93911.0	267.4	27.080	-75.878
	355.000	90529.4	273.2	27.045	-75.778

D5-15481-1

TABLE 8-XVIII

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-IC EXPENDED-STAGE
 TRAJECTORY (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
360.000	86934.9	279.0	27.009	-75.677
365.000	83127.4	284.8	26.973	-75.576
370.000	79107.2	290.6	26.937	-75.475
375.000	74874.5	296.5	26.901	-75.374
380.000	70430.2	302.3	26.864	-75.273
385.000	65777.1	308.2	26.828	-75.172
390.000	60919.3	314.0	26.791	-75.072
395.000	55866.7	319.8	26.755	-74.971
400.000	50636.9	325.6	26.719	-74.871
405.000	45265.5	331.3	26.682	-74.773
410.000	39826.0	336.9	26.647	-74.677
415.000	34474.6	342.2	26.614	-74.586
420.000	29497.0	346.9	26.584	-74.505
425.000	25267.7	350.7	26.560	-74.439
430.000	22010.7	353.5	26.542	-74.392
435.000	19632.4	355.3	26.530	-74.360
440.000	17877.9	356.5	26.523	-74.339
445.000	16524.8	357.3	26.518	-74.326
450.000	15422.1	357.8	26.514	-74.317
455.000	14442.1	358.2	26.512	-74.311
460.000	13496.9	358.5	26.510	-74.306
465.000	12568.0	358.7	26.509	-74.303
470.000	11656.2	358.8	26.508	-74.300
475.000	10765.6	358.9	26.507	-74.298
480.000	9899.9	359.0	26.507	-74.297
485.000	9062.2	359.1	26.506	-74.296
490.000	8254.2	359.1	26.506	-74.295
495.000	7475.2	359.2	26.506	-74.294
500.000	6723.8	359.2	26.506	-74.294
505.000	5998.9	359.2	26.506	-74.294
510.000	5298.4	359.2	26.506	-74.294
515.000	4621.2	359.2	26.506	-74.294
520.000	3965.6	359.2	26.506	-74.293
525.000	3331.1	359.2	26.506	-74.293
530.000	2716.6	359.2	26.506	-74.293
535.000	2121.1	359.2	26.506	-74.293
540.000	1543.4	359.2	26.506	-74.293
545.000	982.1	359.2	26.506	-74.293
550.000	436.0	359.2	26.506	-74.293
554.087	.0	359.2	26.506	-74.293

SPLASH

TABLE 8-XIX

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-IC EXPENDED-STAGE TRAJECTORY
(108-DEGREES LAUNCH AZIMUTH)

	TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
SEP	159.329	2768.9023	2402.8165	20.46	10.140
	160.329	2764.4760	2397.8914	20.29	10.066
	165.000	2745.6744	2376.7962	19.52	9.830
	170.000	2727.9873	2356.7225	18.68	9.700
	175.000	2711.9651	2338.3883	17.83	9.631
	180.000	2697.1393	2321.3290	16.98	9.593
	185.000	2683.2773	2305.3170	16.12	9.568
	190.000	2670.2553	2290.2328	15.25	9.551
	195.000	2658.0141	2276.0221	14.37	9.538
	200.000	2646.5262	2262.6620	13.48	9.528
	205.000	2635.7830	2250.1487	12.59	9.518
	210.000	2625.7826	2238.4846	11.69	9.510
	215.000	2616.5282	2227.6774	10.79	9.502
	220.000	2608.0225	2217.7337	9.88	9.495
	225.000	2600.2704	2208.6625	8.96	9.489
	230.000	2593.2754	2200.4708	8.04	9.483
	235.000	2587.0421	2193.1668	7.11	9.478
	240.000	2581.5738	2186.7567	6.18	9.474
	245.000	2576.8741	2181.2469	5.25	9.470
	250.000	2572.9456	2176.6423	4.31	9.467
	255.000	2569.7911	2172.9480	3.37	9.464
	260.000	2567.4123	2170.1671	2.43	9.463
	265.000	2565.8109	2168.3026	1.49	9.461
	270.000	2564.9878	2167.3563	.55	9.461
	275.000	2564.9436	2167.3292	-.40	9.461
	280.000	2565.6784	2168.2213	-1.34	9.461
	285.000	2567.1916	2170.0315	-2.28	9.462
	290.000	2569.4821	2172.7582	-3.22	9.464
	295.000	2572.5485	2176.3983	-4.16	9.467
	300.000	2576.3889	2180.9485	-5.10	9.470
	305.000	2581.0004	2186.4037	-6.03	9.473
	310.000	2586.3804	2192.7591	-6.96	9.478
	315.000	2592.5250	2200.0078	-7.89	9.483
	320.000	2599.4305	2208.1431	-8.81	9.488
	325.000	2607.0918	2217.1566	-9.73	9.494
	330.000	2615.5044	2227.0399	-10.64	9.501
	335.000	2624.6616	2237.7825	-11.55	9.508
	340.000	2634.5568	2249.3735	-12.45	9.516
	345.000	2645.1800	2261.7987	-13.34	9.524
	350.000	2656.5193	2275.0417	-14.23	9.532

TABLE 8-XIX

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
 FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
 S-IC EXPENDED-STAGE TRAJECTORY
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
360.000	2681.2413	2303.8570	-15.98	9.544
365.000	2694.5150	2319.3106	-16.84	9.543
370.000	2708.2422	2335.2999	-17.69	9.531
375.000	2722.1863	2351.5830	-18.54	9.495
380.000	2735.8934	2367.7003	-19.38	9.416
385.000	2748.5217	2382.8037	-20.20	9.266
390.000	2758.5400	2395.3547	-21.02	9.019
395.000	2763.1607	2402.5557	-21.82	8.743
400.000	2757.2514	2399.2599	-22.60	8.951
405.000	2730.5452	2375.1727	-23.35	11.838
410.000	2659.5781	2306.7599	-24.06	22.143
415.000	2501.0345	2150.5436	-24.64	43.648
420.000	2204.0659	1855.3416	-24.98	71.631
425.000	1781.1365	1433.1442	-24.87	84.758
430.000	1354.3580	1005.9058	-24.17	71.466
435.000	1031.4696	682.0814	-23.04	49.199
440.000	819.8622	470.2604	-21.78	31.652
445.000	685.3302	337.0785	-20.59	20.420
450.000	602.5298	258.1007	-19.76	11.546
455.000	559.2350	223.1115	-19.98	6.448
460.000	532.4287	206.2598	-20.58	4.736
465.000	512.3751	195.3625	-21.06	3.698
470.000	496.3732	186.7487	-21.30	2.923
475.000	483.5216	179.3559	-21.31	2.338
480.000	473.0531	172.3723	-21.11	1.942
485.000	464.5404	165.6144	-20.74	1.629
490.000	457.7151	159.2230	-20.28	1.385
495.000	452.2831	153.2521	-19.77	1.196
500.000	447.9639	147.6999	-19.23	1.052
505.000	444.5145	142.5391	-18.69	.941
510.000	441.7345	137.7330	-18.16	.854
515.000	439.4660	133.2465	-17.65	.783
520.000	437.5686	128.9887	-17.14	.755
525.000	435.9300	124.8574	-16.64	.716
530.000	434.5162	120.9394	-16.16	.669
535.000	433.2917	117.2698	-15.70	.620
540.000	432.2243	113.8561	-15.27	.571
545.000	431.2881	110.6969	-14.87	.524
550.000	430.4635	107.7878	-14.50	.478
SPLASH 554.087	429.8647	105.6041	-14.22	.443

05-15481-1

TABLE 8-XX

VEHICLE POSITION COORDINATES - S-IC
 EXPANDED-STAGE TRAJECTORY
 (108-DEGREES LAUNCH AZIMUTH)

	TIME SEC	X M	Y M	Z M
SEP	159.329	6436275.875	-3155.632	156418.996
	160.329	6437175.313	-3282.643	159032.588
	165.000	6441244.500	-3875.641	171225.301
	170.000	6445363.428	-4510.039	184258.660
	175.000	6449239.875	-5143.965	197277.895
	180.000	6452875.938	-5777.438	210286.898
	185.000	6456272.188	-6410.381	223285.896
	190.000	6459429.500	-7042.819	236276.359
	195.000	6462348.063	-7674.678	249257.230
	200.000	6465028.500	-8305.985	262229.301
	205.000	6467470.813	-8936.667	275191.172
	210.000	6469675.438	-9566.754	288143.469
	215.000	6471642.563	-10196.172	301084.730
	220.000	6473372.375	-10824.950	314015.535
	225.000	6474865.063	-11453.016	326934.410
	230.000	6476120.875	-12080.397	339841.918
	235.000	6477139.875	-12707.023	352736.586
	240.000	6477922.313	-13332.920	365618.977
	245.000	6478468.250	-13958.018	378487.602
	250.000	6478777.875	-14582.344	391343.027
	255.000	6478851.188	-15205.826	404183.766
	260.000	6478688.375	-15828.491	417010.387
	265.000	6478289.500	-16450.269	429821.398
	270.000	6477654.563	-17071.186	442617.359
	275.000	6476783.688	-17691.171	455396.793
	280.000	6475676.813	-18310.251	468160.238
	285.000	6474334.063	-18928.355	480906.219
	290.000	6472755.375	-19545.510	493635.289
	295.000	6470940.813	-20161.643	506345.957
	300.000	6468890.188	-20776.781	519038.770
	305.000	6466603.688	-21390.852	531712.234
	310.000	6464081.063	-22003.884	544366.891
	315.000	6461322.375	-22615.804	557001.250
	320.000	6458327.438	-23226.638	569615.844
	325.000	6455096.313	-23836.315	582209.195
	330.000	6451628.625	-24444.859	594781.813
	335.000	6447924.563	-25052.198	607332.203
	340.000	6443983.688	-25658.360	619860.859
	345.000	6439806.188	-26263.271	632366.273
	350.000	6435391.563	-26866.958	644848.906
	355.000	6430740.000	-27469.348	657307.172

TABLE 8-XX

VEHICLE POSITION COORDINATES - S-IC
 EXPANDED-STAGE TRAJECTORY
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
360.000	6425851.063	-28070.470	669741.352
365.000	6420725.063	-28670.257	682149.563
370.000	6415361.813	-29268.744	694531.492
375.000	6409762.313	-29865.885	706884.070
380.000	6403927.500	-30461.749	719204.813
385.000	6397860.875	-31056.355	731486.586
390.000	6391567.938	-31649.898	743719.344
395.000	6385061.063	-32242.630	755882.383
400.000	6378362.313	-32835.176	767941.055
405.000	6371516.000	-33428.599	779879.109
410.000	6364613.000	-34025.245	791416.961
415.000	6357845.313	-34629.815	802440.859
420.000	6351562.250	-35250.866	812443.211
425.000	6346218.000	-35899.011	820869.320
430.000	6342078.375	-36579.893	827462.672
435.000	6339022.375	-37289.487	832479.516
440.000	6336735.500	-38019.501	836392.445
445.000	6334944.813	-38767.818	839589.242
450.000	6333465.188	-39514.753	842327.070
455.000	6332144.813	-40271.667	844787.039
460.000	6330880.625	-41031.324	847079.172
465.000	6329647.938	-41792.864	849250.117
470.000	6328443.875	-42555.976	851328.828
475.000	6327269.813	-43320.347	853337.023
480.000	6326126.938	-44085.841	855292.328
485.000	6325017.063	-44852.248	857208.445
490.000	6323939.938	-45619.494	859096.438
495.000	6322894.125	-46387.406	860964.500
500.000	6321877.375	-47155.951	862819.055
505.000	6320887.750	-47924.993	864664.539
510.000	6319922.938	-48694.535	866504.422
515.000	6318981.313	-49464.476	868340.906
520.000	6318061.063	-50234.845	870175.773
525.000	6317161.375	-51005.563	872010.086
530.000	6316281.250	-51776.681	873844.766
535.000	6315419.500	-52548.121	875680.148
540.000	6314574.813	-53319.936	877516.617
545.000	6313745.875	-54092.053	879354.164
550.000	6312931.375	-54864.525	881192.961
554.087	6312275.500	-55496.103	882696.656

SPLASH

D5-15481-1

TABLE 8-XXI

VEHICLE VELOCITY COMPONENTS - S-IC
EXPENDED STAGE TRAJECTORY
(108-DEGREES LAUNCH AZIMUTH)

	TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
SEP	159.329	904.387	-127.006	2613.957
	160.329	894.357	-126.991	2612.724
	165.000	848.158	-126.919	2608.304
	170.000	799.468	-126.834	2605.126
	175.000	751.212	-126.741	2602.762
	180.000	703.200	-126.643	2600.775
	185.000	655.339	-126.539	2598.941
	190.000	607.577	-126.430	2597.139
	195.000	559.891	-126.317	2595.305
	200.000	512.264	-126.200	2593.407
	205.000	464.692	-126.078	2591.432
	210.000	417.167	-125.951	2589.371
	215.000	369.687	-125.820	2587.223
	220.000	322.247	-125.685	2584.984
	225.000	274.845	-125.546	2582.655
	230.000	227.477	-125.407	2580.234
	235.000	180.141	-125.253	2577.721
	240.000	132.832	-125.100	2575.117
	245.000	85.551	-124.943	2572.421
	250.000	38.290	-124.782	2569.633
	255.000	-8.950	-124.616	2566.752
	260.000	-56.174	-124.445	2563.779
	265.000	-103.382	-124.270	2560.714
	270.000	-150.583	-124.091	2557.555
	275.000	-197.773	-123.907	2554.304
	280.000	-244.960	-123.719	2550.959
	285.000	-292.142	-123.527	2547.522
	290.000	-339.328	-123.330	2543.990
	295.000	-386.514	-123.128	2540.365
	300.000	-433.709	-122.922	2536.645
	305.000	-480.912	-122.711	2532.830
	310.000	-528.128	-122.496	2528.921
	315.000	-575.358	-122.276	2524.915
	320.000	-622.607	-122.052	2520.814
	325.000	-669.875	-121.823	2516.616
	330.000	-717.168	-121.589	2512.320
	335.000	-764.485	-121.351	2507.924
	340.000	-811.833	-121.108	2503.428
	345.000	-859.208	-120.861	2498.826
	350.000	-906.615	-120.609	2494.113
	355.000	-954.046	-120.352	2489.273

TABLE 8-XXI

VEHICLE VELOCITY COMPONENTS - S-IC
 EXPENDED STAGE TRAJECTORY
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
360.000	-1001.495	-120.092	2484.279
365.000	-1048.937	-119.828	2479.071
370.000	-1096.302	-119.563	2473.540
375.000	-1143.494	-119.299	2467.486
380.000	-1190.284	-119.044	2460.522
385.000	-1236.231	-118.808	2451.936
390.000	-1280.515	-118.614	2440.442
395.000	-1321.577	-118.502	2423.726
400.000	-1356.482	-118.547	2397.569
405.000	-1379.212	-118.900	2353.617
410.000	-1375.788	-119.907	2272.924
415.000	-1319.539	-122.215	2121.097
420.000	-1177.002	-126.595	1859.179
425.000	-950.177	-132.896	1500.650
430.000	-709.549	-139.322	1145.171
435.000	-523.216	-144.248	877.136
440.000	-400.095	-147.530	700.237
445.000	-321.698	-149.660	586.336
450.000	-274.861	-150.997	514.484
455.000	-256.839	-151.699	473.038
460.000	-249.364	-152.137	445.143
465.000	-243.697	-152.475	424.136
470.000	-237.836	-152.756	408.027
475.000	-231.749	-152.993	395.827
480.000	-225.282	-153.195	386.728
485.000	-218.649	-153.370	380.090
490.000	-212.219	-153.520	375.364
495.000	-206.168	-153.649	372.084
500.000	-200.551	-153.761	369.876
505.000	-195.363	-153.861	368.447
510.000	-190.571	-153.950	367.575
515.000	-186.134	-154.032	367.094
520.000	-181.957	-154.110	366.890
525.000	-177.929	-154.184	366.883
530.000	-174.130	-154.257	366.998
535.000	-170.551	-154.326	367.184
540.000	-167.314	-154.394	367.405
545.000	-164.295	-154.460	367.639
550.000	-161.529	-154.524	367.872
SPLASH 554.087	-159.462	-154.575	368.052

TABLE 8-XXII

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (72 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
SEP	537.424	191346.0			
	540.424	191449.0	841.6	31.814	-64.826
	545.000	191574.7	852.0	31.840	-64.625
	550.000	191668.8	867.8	31.878	-64.318
	555.000	191717.9	885.1	31.919	-63.983
	560.000	191721.9	902.4	31.959	-63.648
	565.000	191680.7	919.7	31.997	-63.312
	570.000	191594.5	937.0	32.035	-62.976
	575.000	191463.0	954.3	32.072	-62.640
	580.000	191286.4	971.6	32.108	-62.304
	585.000	191064.8	988.8	32.143	-61.967
	590.000	190798.0	1006.1	32.176	-61.630
	595.000	190486.1	1023.4	32.209	-61.292
	600.000	190129.0	1040.7	32.241	-60.955
	605.000	189726.8	1058.0	32.272	-60.617
	610.000	189279.7	1075.3	32.301	-60.278
	615.000	188787.3	1092.6	32.330	-59.940
	620.000	188249.9	1109.9	32.358	-59.601
	625.000	187667.4	1127.2	32.384	-59.262
	630.000	187039.8	1144.5	32.410	-58.923
	635.000	186367.2	1161.8	32.435	-58.583
	640.000	185649.5	1179.1	32.458	-58.243
	645.000	184886.8	1196.4	32.481	-57.903
	650.000	184079.0	1213.8	32.503	-57.563
	655.000	183226.2	1231.1	32.523	-57.222
	660.000	182328.4	1248.4	32.543	-56.881
	665.000	181385.5	1265.7	32.561	-56.540
	670.000	180397.7	1283.1	32.578	-56.199
	675.000	179364.9	1300.4	32.595	-55.857
	680.000	178287.1	1317.8	32.610	-55.515
	685.000	177164.5	1335.1	32.625	-55.173
	690.000	175996.8	1352.5	32.638	-54.831
	695.000	174784.3	1369.9	32.650	-54.488
	700.000	173526.8	1387.2	32.661	-54.145
	705.000	172224.7	1404.6	32.671	-53.802
	710.000	170877.3	1422.0	32.680	-53.459
	715.000	169485.4	1439.4	32.689	-53.115
	720.000	168048.6	1456.8	32.695	-52.772
	725.000	166567.1	1474.2	32.701	-52.428
	730.000	165040.7	1491.7	32.706	-52.084
	735.000	163469.6	1509.1	32.710	-51.740
			1526.5	32.713	-51.395

TABLE 8-XXII

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (72 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
740.000	161853.6	1544.0		
745.000	160193.2	1561.4	32.715	-51.050
750.000	158488.0	1578.9	32.715	-50.705
755.000	156738.0	1596.4	32.715	-50.360
760.000	154943.6	1613.9	32.713	-50.015
765.000	153104.6	1631.4	32.711	-49.670
770.000	151220.8	1648.9	32.707	-49.324
775.000	149292.6	1666.4	32.702	-48.978
780.000	147320.0	1683.9	32.697	-48.632
785.000	145302.8	1701.5	32.690	-48.286
790.000	143241.1	1719.0	32.682	-47.940
795.000	141135.1	1736.6	32.673	-47.593
800.000	138984.6	1754.1	32.663	-47.247
805.000	136789.9	1771.7	32.652	-46.900
810.000	134550.7	1789.3	32.639	-46.553
815.000	132267.5	1806.9	32.626	-46.206
820.000	129939.7	1824.6	32.612	-45.859
825.000	127567.8	1842.2	32.596	-45.512
830.000	125151.8	1859.9	32.580	-45.164
835.000	122691.7	1877.5	32.562	-44.816
840.000	120187.4	1895.2	32.543	-44.469
845.000	117639.1	1912.9	32.523	-44.121
850.000	115046.7	1930.6	32.502	-43.773
855.000	112410.7	1948.4	32.480	-43.425
860.000	109730.4	1966.1	32.457	-43.077
865.000	107006.4	1983.9	32.433	-42.728
870.000	104238.4	2001.6	32.408	-42.380
875.000	101426.9	2019.4	32.381	-42.031
880.000	98571.5	2037.2	32.354	-41.683
885.000	95672.6	2055.0	32.325	-41.334
890.000	92730.3	2072.9	32.295	-40.985
895.000	89744.7	2090.7	32.264	-40.637
900.000	86716.1	2108.6	32.232	-40.288
905.000	83645.3	2126.5	32.199	-39.939
910.000	80532.9	2144.3	32.165	-39.590
915.000	77380.8	2162.2	32.130	-39.242
920.000	74190.9	2180.1	32.094	-38.894
925.000	70967.4	2197.8	32.056	-38.546
930.000	67715.6	2215.6	32.018	-38.200
935.000	64444.1	2233.1	31.979	-37.856
940.000	61165.2	2250.4	31.939	-37.515
			31.899	-37.179

TABLE 8-XXII

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (72 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
945.000	57896.1	2267.4	31.859	-36.851
950.000	54659.4	2283.9	31.818	-36.532
955.000	51484.8	2299.6	31.779	-36.227
960.000	48407.2	2314.4	31.742	-35.941
965.000	45466.7	2328.1	31.706	-35.678
970.000	42707.6	2340.2	31.674	-35.443
975.000	40168.3	2350.8	31.646	-35.239
980.000	37870.1	2359.7	31.622	-35.068
985.000	35811.9	2366.9	31.602	-34.928
990.000	33972.6	2372.7	31.586	-34.817
995.000	32321.2	2377.3	31.573	-34.729
1000.000	30820.6	2380.9	31.563	-34.660
1005.000	29435.1	2383.7	31.555	-34.606
1010.000	28135.2	2385.9	31.549	-34.564
1015.000	26899.3	2387.6	31.544	-34.531
1020.000	25712.3	2388.9	31.540	-34.505
1025.000	24567.6	2390.0	31.537	-34.485
1030.000	23462.6	2390.8	31.535	-34.469
1035.000	22397.4	2391.4	31.533	-34.457
1040.000	21363.0	2391.9	31.532	-34.448
1045.000	20336.8	2392.3	31.531	-34.441
1050.000	19317.3	2392.6	31.530	-34.435
1055.000	18313.9	2392.8	31.529	-34.431
1060.000	17337.8	2393.0	31.529	-34.428
1065.000	16398.7	2393.1	31.528	-34.425
1070.000	15501.8	2393.2	31.528	-34.423
1075.000	14647.6	2393.3	31.528	-34.422
1080.000	13834.6	2393.3	31.528	-34.421
1085.000	13060.9	2393.4	31.528	-34.421
1090.000	12322.6	2393.4	31.528	-34.420
1095.000	11615.8	2393.4	31.528	-34.420
1100.000	10936.9	2393.4	31.528	-34.420
1105.000	10282.5	2393.4	31.528	-34.419
1110.000	9650.0	2393.4	31.528	-34.419
1115.000	9037.5	2393.4	31.528	-34.419
1120.000	8444.0	2393.4	31.528	-34.419
1125.000	7868.6	2393.4	31.528	-34.419
1130.000	7310.1	2393.4	31.528	-34.419
1135.000	6767.5	2393.4	31.528	-34.419
1140.000	6239.6	2393.4	31.528	-34.419
1145.000	5725.8	2393.4	31.528	-34.419

D5-15481-1

TABLE 8-XXII

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (72 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
1150.000	5224.9	2393.4	31.528	-34.419
1155.000	4736.5	2393.4	31.528	-34.419
1160.000	4259.9	2393.4	31.528	-34.419
1165.000	3794.5	2393.4	31.528	-34.419
1170.000	3339.8	2393.4	31.528	-34.419
1175.000	2895.1	2393.4	31.528	-34.419
1180.000	2460.2	2393.4	31.528	-34.419
1185.000	2034.4	2393.4	31.528	-34.419
1190.000	1617.4	2393.4	31.528	-34.419
1195.000	1208.6	2393.4	31.528	-34.419
1200.000	807.6	2393.4	31.528	-34.419
1205.000	413.9	2393.4	31.528	-34.419
1210.000	27.0	2393.4	31.528	-34.419
SPLASH 1210.353	.0	2393.4	31.528	-34.419

TABLE 8-XXIII INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-II EXPENDED-STAGE TRAJECTORY
(72 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
SEP	537.424	6998.9879	6595.7817	.28	9.255
	540.424	6998.8574	6595.6367	.24	9.255
	545.000	6998.6996	6595.4595	.17	9.254
	550.000	6998.5842	6595.3264	.10	9.254
	555.000	6998.5283	6595.2564	.02	9.254
	560.000	6998.5318	6595.2496	-.05	9.254
	565.000	6998.5947	6595.3058	-.12	9.254
	570.000	6998.7170	6595.4254	-.20	9.254
	575.000	6998.8989	6595.6080	-.27	9.255
	580.000	6999.1400	6595.8538	-.34	9.255
	585.000	6999.4407	6596.1628	-.42	9.256
	590.000	6999.8008	6596.5351	-.49	9.257
	595.000	7000.2203	6596.9704	-.56	9.257
	600.000	7000.6993	6597.4689	-.64	9.258
	605.000	7001.2377	6598.0306	-.71	9.260
	610.000	7001.8355	6598.6555	-.78	9.261
	615.000	7002.4928	6599.3434	-.86	9.262
	620.000	7003.2096	6600.0947	-.93	9.264
	625.000	7003.9857	6600.9089	-1.00	9.265
	630.000	7004.8213	6601.7866	-1.08	9.267
	635.000	7005.7163	6602.7272	-1.15	9.269
	640.000	7006.6708	6603.7311	-1.22	9.271
	645.000	7007.6847	6604.7981	-1.30	9.273
	650.000	7008.7581	6605.9283	-1.37	9.276
	655.000	7009.8909	6607.1217	-1.44	9.278
	660.000	7011.0833	6608.3783	-1.51	9.281
	665.000	7012.3350	6609.6981	-1.59	9.283
	670.000	7013.6462	6611.0811	-1.66	9.286
	675.000	7015.0168	6612.5270	-1.73	9.289
	680.000	7016.4470	6614.0363	-1.80	9.292
	685.000	7017.9364	6615.6086	-1.88	9.295
	690.000	7019.4854	6617.2440	-1.95	9.299
	695.000	7021.0938	6618.9425	-2.02	9.302
	700.000	7022.7616	6620.7043	-2.09	9.306
	705.000	7024.4889	6622.5292	-2.17	9.309
	710.000	7026.2757	6624.4172	-2.24	9.313
	715.000	7028.1219	6626.3683	-2.31	9.317
	720.000	7030.0276	6628.3826	-2.38	9.321
	725.000	7031.9926	6630.4598	-2.45	9.325
	730.000	7034.0172	6632.6003	-2.53	9.330

TABLE 8-XXIII

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-II EXPENDED-STAGE TRAJECTORY
(72 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
740.000	7038.2446	6637.0705	-2.67	9.339
745.000	7040.4474	6639.4001	-2.74	9.344
750.000	7042.7098	6641.7930	-2.81	9.348
755.000	7045.0316	6644.2488	-2.88	9.353
760.000	7047.4128	6646.7677	-2.95	9.359
765.000	7049.8534	6649.3495	-3.02	9.364
770.000	7052.3535	6651.9945	-3.10	9.369
775.000	7054.9128	6654.7024	-3.17	9.375
780.000	7057.5317	6657.4733	-3.24	9.381
785.000	7060.2099	6660.3071	-3.31	9.386
790.000	7062.9474	6663.2038	-3.38	9.392
795.000	7065.7441	6666.1634	-3.45	9.398
800.000	7068.6003	6669.1858	-3.52	9.405
805.000	7071.5154	6672.2708	-3.59	9.411
810.000	7074.4897	6675.4185	-3.66	9.417
815.000	7077.5230	6678.6286	-3.73	9.424
820.000	7080.6152	6681.9012	-3.80	9.431
825.000	7083.7658	6685.2358	-3.87	9.438
830.000	7086.9748	6688.6321	-3.94	9.445
835.000	7090.2411	6692.0892	-4.00	9.452
840.000	7093.5643	6695.6068	-4.07	9.459
845.000	7096.9423	6699.1826	-4.14	9.466
850.000	7100.3740	6702.8155	-4.21	9.474
855.000	7103.8558	6706.5020	-4.28	9.481
860.000	7107.3821	6710.2363	-4.35	9.489
865.000	7110.9443	6714.0100	-4.42	9.496
870.000	7114.5292	6717.8098	-4.48	9.504
875.000	7118.1114	6721.6103	-4.55	9.510
880.000	7121.6458	6725.3663	-4.62	9.517
885.000	7125.0572	6729.0027	-4.69	9.521
890.000	7128.2031	6732.3770	-4.75	9.524
895.000	7130.8069	6735.2126	-4.82	9.523
900.000	7132.4099	6737.0507	-4.89	9.521
905.000	7132.2315	6737.1109	-4.95	9.529
910.000	7128.9839	6734.1052	-5.02	9.587
915.000	7120.8945	6726.2612	-5.09	9.798
920.000	7105.0586	6710.6746	-5.16	10.413
925.000	7077.1583	6683.0273	-5.23	11.909
930.000	7031.0102	6637.1367	-5.30	14.962
935.000	6958.1347	6564.5238	-5.38	20.246

TABLE 8-XXIII INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-II EXPENDED-STAGE TRAJECTORY
(72 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
945.000	6685.4499	6292.3840	-5.57	39.413
950.000	6457.1545	6064.3753	-5.68	53.605
955.000	6148.5899	5756.1113	-5.82	70.202
960.000	5750.6428	5358.4843	-6.00	87.966
965.000	5256.9787	4865.1680	-6.21	106.071
970.000	4677.3877	4285.9654	-6.49	119.362
975.000	4046.9329	3655.9605	-6.84	123.713
980.000	3416.9200	3026.4937	-7.29	117.784
985.000	2837.0889	2447.3579	-7.85	104.213
990.000	2335.1782	1946.3694	-8.54	87.743
995.000	1922.3217	1534.7756	-9.37	70.651
1000.000	1594.9851	1209.1978	-10.36	55.414
1005.000	1340.6474	957.3132	-11.49	43.045
1010.000	1143.5445	763.5872	-12.76	33.574
1015.000	990.2378	614.8273	-14.12	26.391
1020.000	869.6994	500.2204	-15.52	21.119
1025.000	773.3841	411.3304	-16.89	16.948
1030.000	696.1297	342.9514	-18.15	13.629
1035.000	634.4138	291.3001	-19.24	10.557
1040.000	590.2815	258.6324	-20.38	7.412
1045.000	558.2487	238.6917	-21.51	5.878
1050.000	532.1557	223.8972	-22.38	4.828
1055.000	509.8924	211.1989	-22.88	4.022
1060.000	490.6689	199.2848	-22.99	3.397
1065.000	474.3497	187.9705	-22.77	2.893
1070.000	460.8455	177.4079	-22.32	2.416
1075.000	450.0257	167.9197	-21.73	2.042
1080.000	441.3644	159.1866	-21.05	1.743
1085.000	434.5721	151.3633	-20.34	1.469
1090.000	429.3256	144.4991	-19.64	1.237
1095.000	425.2891	138.5039	-18.99	1.050
1100.000	422.1688	133.2449	-18.39	.904
1105.000	419.7343	128.6063	-17.84	.790
1110.000	417.7900	124.4276	-17.33	.706
1115.000	416.1857	120.5583	-16.84	.675
1120.000	414.7993	116.8327	-16.36	.636
1125.000	413.6025	113.3274	-15.90	.591
1130.000	412.5609	110.0537	-15.47	.548
1135.000	411.6425	106.9944	-15.07	.510
1140.000	410.8220	104.1249	-14.68	.477

TABLE 8-XXIII

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-II EXPENDED-STAGE TRAJECTORY
(72 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
1150.000	409.4029	98.8705	-13.97	.421
1155.000	408.7799	96.4514	-13.65	.397
1160.000	408.2036	94.1542	-13.34	.375
1165.000	407.6685	91.9704	-13.04	.355
1170.000	407.1703	89.8926	-12.75	.336
1175.000	406.7057	87.9157	-12.48	.318
1180.000	406.2722	86.0358	-12.23	.300
1185.000	405.8675	84.2501	-11.98	.283
1190.000	405.4900	82.5561	-11.75	.267
1195.000	405.1381	80.9524	-11.53	.250
1200.000	404.8105	79.4378	-11.32	.234
1205.000	404.5061	78.0117	-11.12	.219
1210.000	404.2238	76.6736	-10.93	.203
SPLASH 1210.353	404.2101	76.6084	-10.93	.209

TABLE 8-XXIV VEHICLE POSITION COORDINATES - S-II
EXPENDED-STAGE TRAJECTORY
(72 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	X M	Y M	Z M
740.000	5754519.313	95384.851	3093070.938
745.000	5736376.875	95742.505	3123198.281
750.000	5717928.563	96097.077	3153215.094
755.000	5699326.313	96448.524	3183117.906
760.000	5680519.188	96796.859	3212907.844
765.000	5661509.250	97142.038	3242581.438
770.000	5642295.375	97484.077	3272139.844
775.000	5622879.688	97822.931	3301579.594
780.000	5603261.125	98158.612	3330901.875
785.000	5583441.813	98491.080	3360103.188
790.000	5563420.625	98820.347	3389184.656
795.000	5543199.750	99146.369	3418142.813
800.000	5522778.125	99469.159	3446978.813
805.000	5502157.813	99788.676	3475689.188
810.000	5481337.875	100104.931	3504275.031
815.000	5460320.375	100417.881	3532732.969
820.000	5439104.250	100727.539	3561064.063
825.000	5417691.750	101033.866	3589264.906
830.000	5396081.750	101336.870	3617336.563
835.000	5374276.500	101636.514	3645275.563
840.000	5352274.875	101932.804	3673083.031
845.000	5330079.188	102225.703	3700755.625
850.000	5307688.313	102515.222	3728294.281
855.000	5285104.625	102801.319	3755695.656
860.000	5262326.938	103084.002	3782960.656
865.000	5239357.688	103363.232	3810085.906
870.000	5216195.813	103639.018	3837072.281
875.000	5192843.813	103911.317	3863916.313
880.000	5169300.875	104180.133	3890618.688
885.000	5145569.813	104445.418	3917175.531
890.000	5121650.250	104707.164	3943586.906
895.000	5097546.250	104965.308	3969847.906
900.000	5073259.375	105219.799	3995956.469
905.000	5048797.000	105470.505	4021904.313
910.000	5024166.438	105717.270	4047683.500
915.000	4999384.125	105959.786	4073276.844
920.000	4974470.938	106197.633	4098663.156
925.000	4949464.688	106430.096	4123804.813
930.000	4924418.000	106656.131	4148650.438
935.000	4899414.625	106874.139	4173119.906
940.000	4874570.500	107081.858	4197104.250

05-15481-1

TABLE 8-XXIV

VEHICLE POSITION COORDINATES - S-II
 EXPANDED-STAGE TRAJECTORY
 (72 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
945.000	4850051.813	107276.103	4220450.000
950.000	4826075.625	107452.671	4242960.688
955.000	4802920.125	107606.248	4264389.625
960.000	4780907.938	107730.659	4284458.438
965.000	4760397.563	107819.149	4302866.625
970.000	4741752.313	107864.932	4319323.063
975.000	4725259.750	107862.866	4333616.750
980.000	4711043.063	107811.071	4345691.188
985.000	4699032.313	107711.528	4355660.313
990.000	4689001.313	107569.202	4363768.688
995.000	4680652.813	107390.453	4370313.063
1000.000	4673666.563	107181.943	4375597.688
1005.000	4667751.375	106949.731	4379892.125
1010.000	4662667.000	106698.776	4383415.750
1015.000	4658229.375	106432.981	4386337.125
1020.000	4654299.000	106155.329	4388785.813
1025.000	4650775.375	105868.148	4390860.438
1030.000	4647582.250	105573.259	4392639.625
1035.000	4644659.938	105272.204	4394187.438
1040.000	4641946.875	104966.263	4395556.938
1045.000	4639374.750	104656.502	4396787.688
1050.000	4636912.500	104343.657	4397910.563
1055.000	4634547.438	104028.401	4398952.938
1060.000	4632271.938	103711.280	4399939.500
1065.000	4630079.313	103392.816	4400891.313
1070.000	4627961.000	103073.384	4401824.938
1075.000	4625907.000	102753.300	4402751.938
1080.000	4623907.563	102432.755	4403680.375
1085.000	4621954.688	102111.929	4404615.875
1090.000	4620040.313	101790.887	4405561.375
1095.000	4618157.813	101469.707	4406518.313
1100.000	4616301.625	101148.392	4407487.000
1105.000	4614467.375	100826.976	4408467.313
1110.000	4612651.813	100505.438	4409458.938
1115.000	4610852.500	100183.798	4410461.563
1120.000	4609068.063	99862.039	4411475.188
1125.000	4607297.438	99540.182	4412499.688
1130.000	4605539.375	99218.192	4413534.625
1135.000	4603793.063	98896.083	4414579.375
1140.000	4602057.375	98573.820	4415633.438
1145.000	4600331.813	98251.416	4416696.313

TABLE 8-XXIV

VEHICLE POSITION COORDINATES - S-II
 EXPENDED-STAGE TRAJECTORY
 (72 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
1150.000	4598615.563	97928.834	4417767.375
1155.000	4596908.250	97606.090	4418846.250
1160.000	4595209.186	97283.149	4419932.625
1165.000	4593518.125	96960.028	4421026.063
1170.000	4591834.500	96636.693	4422126.188
1175.000	4590158.000	96313.162	4423232.563
1180.000	4588488.250	95989.403	4424345.063
1185.000	4586824.938	95665.432	4425463.250
1190.000	4585167.625	95341.217	4426586.813
1195.000	4583516.125	95016.776	4427715.375
1200.000	4581869.938	94692.080	4428848.688
1205.000	4580228.875	94367.144	4429986.438
1210.000	4578592.500	94041.938	4431128.313
SPLASH 1210.353	4578477.250	94018.993	4431209.000

05-15481-1

TABLE 8-XXV

 VEHICLE VELOCITY COMPONENTS - S-II
 EXPENDED STAGE TRAJECTORY
 (72 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
SFP	537.424	-1879.393		
	540.424	-1906.089	94.288	6741.278
	545.000	-1946.754	93.993	6733.646
	550.000	-1991.123	93.541	6721.845
	555.000	-2035.419	93.044	6708.722
	560.000	-2079.644	92.544	6695.365
	565.000	-2123.794	92.041	6681.771
	570.000	-2167.873	91.534	6667.942
	575.000	-2211.876	91.024	6653.877
	580.000	-2255.807	90.511	6639.578
	585.000	-2299.660	89.995	6625.043
	590.000	-2343.439	89.476	6610.275
	595.000	-2387.139	88.953	6595.271
	600.000	-2430.764	88.428	6580.033
	605.000	-2474.309	87.899	6564.560
	610.000	-2517.777	87.367	6548.854
	615.000	-2561.164	86.832	6532.914
	620.000	-2604.472	86.294	6516.740
	625.000	-2647.698	85.753	6500.332
	630.000	-2690.845	85.209	6483.691
	635.000	-2733.907	84.661	6466.816
	640.000	-2776.889	84.111	6449.708
	645.000	-2819.785	83.557	6432.367
	650.000	-2862.595	83.001	6414.793
	655.000	-2905.327	82.441	6396.985
	660.000	-2947.970	81.878	6378.945
	665.000	-2990.525	81.312	6360.672
	670.000	-3032.996	80.743	6342.167
	675.000	-3075.376	80.171	6323.428
	680.000	-3117.671	79.596	6304.458
	685.000	-3159.874	79.017	6285.254
	690.000	-3201.989	78.436	6265.818
	695.000	-3244.011	77.852	6246.149
	700.000	-3285.944	77.264	6226.249
	705.000	-3327.784	76.674	6206.116
	710.000	-3369.532	76.080	6185.751
	715.000	-3411.184	75.484	6165.153
	720.000	-3452.745	74.884	6144.323
	725.000	-3494.208	74.282	6123.261
	730.000	-3535.577	73.676	6101.967
	735.000	-3576.847	73.068	6080.440
			72.456	6058.682

TABLE 8-XXV

VEHICLE VELOCITY COMPONENTS - S-II
 EXPENDED STAGE TRAJECTORY
 (72 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
740.000	-3618.022	71.841	6036.691
745.000	-3659.097	71.224	6014.469
750.000	-3700.075	70.603	5992.013
755.000	-3740.951	69.979	5969.327
760.000	-3781.728	69.353	5946.407
765.000	-3822.402	68.723	5923.255
770.000	-3862.975	68.090	5899.871
775.000	-3903.443	67.455	5876.255
780.000	-3943.810	66.816	5852.406
785.000	-3984.065	66.174	5828.326
790.000	-4024.225	65.530	5804.011
795.000	-4064.272	64.882	5779.466
800.000	-4104.214	64.231	5754.686
805.000	-4144.045	63.578	5729.675
810.000	-4183.769	62.921	5704.430
815.000	-4223.381	62.262	5678.953
820.000	-4262.883	61.600	5653.242
825.000	-4302.271	60.934	5627.298
830.000	-4341.548	60.266	5601.120
835.000	-4380.708	59.594	5574.708
840.000	-4419.753	58.920	5548.059
845.000	-4458.679	58.243	5521.176
850.000	-4497.486	57.562	5494.053
855.000	-4536.168	56.879	5466.691
860.000	-4574.724	56.193	5439.083
865.000	-4613.143	55.503	5411.225
870.000	-4651.419	54.810	5383.105
875.000	-4689.531	54.113	5354.706
880.000	-4727.451	53.411	5325.993
885.000	-4765.122	52.705	5296.912
890.000	-4802.448	51.991	5267.359
895.000	-4839.236	51.267	5237.134
900.000	-4875.166	50.525	5205.908
905.000	-4909.686	49.755	5173.126
910.000	-4941.886	48.940	5137.877
915.000	-4970.493	48.055	5098.924
920.000	-4993.416	47.060	5054.250
925.000	-5007.516	45.893	5000.885
930.000	-5008.265	44.468	4934.613
935.000	-4989.392	42.663	4849.720
940.000	-4942.623	40.319	4738.823

TABLE 8-XXV

VEHICLE VELOCITY COMPONENTS - S-II
 EXPANDED STAGE TRAJECTORY
 (72 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
945.000	-4857.742		
950.000	-4723.243	37.240	4593.060
955.000	-4528.090	33.208	4402.808
960.000	-4264.573	28.014	4159.420
965.000	-3926.776	21.522	3857.829
970.000	-3520.647	13.633	3495.150
975.000	-3071.272	4.489	3079.445
980.000	-2616.645	-5.398	2635.323
985.000	-2194.525	-15.272	2197.335
990.000	-1826.654	-24.394	1797.927
995.000	-1522.606	-32.344	1454.423
1000.000	-1280.838	-38.951	1172.807
1005.000	-1092.699	-44.264	949.458
1010.000	-946.637	-48.467	775.239
1015.000	-832.671	-51.792	639.445
1020.000	-742.445	-54.435	533.167
1025.000	-669.358	-56.552	449.394
1030.000	-609.638	-58.264	382.999
1035.000	-560.899	-59.641	330.728
1040.000	-526.880	-60.740	290.144
1045.000	-502.796	-61.599	258.912
1050.000	-482.412	-62.283	234.432
1055.000	-463.811	-62.830	215.687
1060.000	-446.504	-63.255	202.158
1065.000	-430.754	-63.573	193.257
1070.000	-416.857	-63.801	188.117
1075.000	-405.053	-63.959	185.791
1080.000	-394.944	-64.068	185.328
1085.000	-386.469	-64.140	186.300
1090.000	-379.471	-64.188	188.082
1095.000	-373.701	-64.222	190.258
1100.000	-368.908	-64.249	192.589
1105.000	-364.885	-64.272	194.942
1110.000	-361.421	-64.295	197.236
1115.000	-358.338	-64.317	199.466
1120.000	-355.467	-64.339	201.655
1125.000	-352.829	-64.361	203.861
1130.000	-350.407	-64.384	205.995
1135.000	-348.174	-64.409	208.021
1140.000	-346.100	-64.436	209.934
1145.000	-344.162	-64.466	211.739
		-64.498	213.444

TABLE 8-XXV

VEHICLE VELOCITY COMPONENTS - S-II
 EXPANDED STAGE TRAJECTORY
 (72 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
1150.000	-342.341	-64.531	215.055
1155.000	-340.624	-64.567	216.582
1160.000	-338.998	-64.605	218.029
1165.000	-337.458	-64.644	219.400
1170.000	-335.997	-64.686	220.702
1175.000	-334.611	-64.728	221.935
1180.000	-333.297	-64.772	223.103
1185.000	-332.051	-64.818	224.208
1190.000	-330.874	-64.865	225.250
1195.000	-329.762	-64.913	226.230
1200.000	-328.716	-64.962	227.151
1205.000	-327.734	-65.013	228.011
1210.000	-326.817	-65.065	228.810
SPLASH 1210.353	-326.774	-65.069	228.847

TABLE 8-XXVI

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (81 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
SEP	537.424	190690.7	841.9	29.619	-64.615
	540.424	190777.9	852.2	29.618	-64.416
	545.000	190880.2	868.1	29.615	-64.113
	550.000	190949.5	885.4	29.612	-63.783
	555.000	190974.7	902.7	29.607	-63.452
	560.000	190955.9	920.0	29.602	-63.121
	565.000	190892.7	937.3	29.595	-62.791
	570.000	190785.4	954.6	29.588	-62.460
	575.000	190633.8	971.9	29.580	-62.129
	580.000	190438.0	989.2	29.570	-61.799
	585.000	190198.0	1006.5	29.560	-61.468
	590.000	189913.9	1023.8	29.549	-61.138
	595.000	189585.5	1041.1	29.537	-60.808
	600.000	189213.1	1058.4	29.524	-60.477
	605.000	188796.4	1075.7	29.511	-60.147
	610.000	188335.6	1093.0	29.496	-59.817
	615.000	187830.7	1110.3	29.480	-59.486
	620.000	187281.4	1127.6	29.464	-59.156
	625.000	186688.3	1144.9	29.446	-58.826
	630.000	186050.8	1162.3	29.428	-58.496
	635.000	185369.3	1179.6	29.408	-58.166
	640.000	184643.6	1196.9	29.388	-57.836
	645.000	183874.0	1214.3	29.367	-57.507
	650.000	183060.1	1231.6	29.345	-57.177
	655.000	182202.1	1248.9	29.321	-56.847
	660.000	181300.2	1266.3	29.297	-56.518
	665.000	180354.2	1283.6	29.273	-56.188
	670.000	179364.2	1301.0	29.247	-55.858
	675.000	178330.1	1318.4	29.220	-55.529
	680.000	177252.0	1335.7	29.192	-55.200
	685.000	176130.0	1353.1	29.164	-54.870
	690.000	174964.0	1370.5	29.134	-54.541
	695.000	173753.9	1387.9	29.104	-54.212
	700.000	172500.1	1405.3	29.072	-53.883
	705.000	171202.3	1422.7	29.040	-53.554
	710.000	169860.5	1440.1	29.007	-53.225
	715.000	168475.1	1457.5	28.973	-52.896
	720.000	167045.5	1475.0	28.938	-52.568
	725.000	165572.5	1492.4	28.902	-52.239
	730.000	164055.4	1509.8	28.865	-51.910
	735.000	162494.6	1527.3	28.827	-51.582

TABLE 8-XXVI

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
TRAJECTORY (81 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
740.000	160890.1	1544.8	28.788	-51.254
745.000	159241.8	1562.2	28.748	-50.925
750.000	157549.6	1579.7	28.708	-50.597
755.000	155814.1	1597.2	28.666	-50.269
760.000	154034.8	1614.7	28.624	-49.941
765.000	152211.9	1632.2	28.581	-49.613
770.000	150345.4	1649.7	28.536	-49.285
775.000	148435.4	1667.3	28.491	-48.957
780.000	146481.8	1684.8	28.445	-48.630
785.000	144484.8	1702.4	28.398	-48.302
790.000	142444.3	1719.9	28.350	-47.975
795.000	140360.2	1737.5	28.301	-47.647
800.000	138232.9	1755.1	28.252	-47.320
805.000	136062.4	1772.7	28.201	-46.993
810.000	133848.2	1790.3	28.149	-46.666
815.000	131591.0	1807.9	28.097	-46.339
820.000	129290.3	1825.6	28.043	-46.012
825.000	126946.5	1843.2	27.989	-45.685
830.000	124559.7	1860.9	27.934	-45.358
835.000	122129.7	1878.6	27.878	-45.032
840.000	119656.4	1896.3	27.820	-44.705
845.000	117140.2	1914.0	27.762	-44.379
850.000	114581.1	1931.7	27.704	-44.053
855.000	111979.0	1949.5	27.644	-43.726
860.000	109334.0	1967.2	27.583	-43.400
865.000	106646.0	1985.0	27.521	-43.074
870.000	103915.2	2002.8	27.459	-42.749
875.000	101141.9	2020.6	27.395	-42.423
880.000	98325.8	2038.4	27.331	-42.097
885.000	95467.0	2056.2	27.265	-41.772
890.000	92565.8	2074.1	27.199	-41.446
895.000	89622.6	2091.9	27.132	-41.121
900.000	86637.3	2109.8	27.064	-40.796
905.000	83610.8	2127.7	26.995	-40.471
910.000	80543.7	2145.6	26.925	-40.147
915.000	77437.7	2163.5	26.855	-39.823
920.000	74295.0	2181.3	26.784	-39.500
925.000	71119.1	2199.1	26.712	-39.178
930.000	67915.4	2216.8	26.639	-38.858
935.000	64692.0	2234.4	26.567	-38.542
940.000	61460.0	2251.8	26.494	-38.230

TABLE 8-XXVI

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (81 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
945.000	58235.7	2268.8	26.423	-37.924
950.000	55040.4	2285.3	26.352	-37.628
955.000	51901.9	2301.1	26.284	-37.344
960.000	48852.4	2316.0	26.219	-37.076
965.000	45929.9	2329.8	26.159	-36.830
970.000	43176.0	2342.2	26.104	-36.608
975.000	40629.2	2353.1	26.056	-36.415
980.000	38312.9	2362.2	26.015	-36.252
985.000	36230.0	2369.7	25.981	-36.118
990.000	34363.8	2375.8	25.954	-36.011
995.000	32686.1	2380.6	25.932	-35.925
1000.000	31162.1	2384.3	25.915	-35.858
1005.000	29757.3	2387.3	25.902	-35.806
1010.000	28441.6	2389.6	25.891	-35.765
1015.000	27192.5	2391.4	25.883	-35.733
1020.000	25994.3	2392.8	25.876	-35.707
1025.000	24839.2	2393.9	25.871	-35.688
1030.000	23723.7	2394.8	25.867	-35.672
1035.000	22648.1	2395.5	25.864	-35.660
1040.000	21607.8	2396.0	25.862	-35.651
1045.000	20580.1	2396.4	25.860	-35.644
1050.000	19557.7	2396.7	25.859	-35.639
1055.000	18549.2	2396.9	25.857	-35.634
1060.000	17565.6	2397.1	25.857	-35.631
1065.000	16617.1	2397.2	25.856	-35.629
1070.000	15709.9	2397.3	25.856	-35.627
1075.000	14845.8	2397.4	25.855	-35.626
1080.000	14023.2	2397.5	25.855	-35.625
1085.000	13240.5	2397.5	25.855	-35.624
1090.000	12494.4	2397.5	25.855	-35.624
1095.000	11780.6	2397.5	25.855	-35.624
1100.000	11095.3	2397.5	25.855	-35.623
1105.000	10435.5	2397.6	25.855	-35.623
1110.000	9798.1	2397.6	25.855	-35.623
1115.000	9181.1	2397.6	25.855	-35.623
1120.000	8583.2	2397.6	25.855	-35.623
1125.000	8003.8	2397.6	25.855	-35.623
1130.000	7441.5	2397.6	25.855	-35.623
1135.000	6895.2	2397.6	25.855	-35.623
1140.000	6364.0	2397.6	25.855	-35.623
1145.000	5847.0	2397.6	25.855	-35.623

TABLE 8-XXVI

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (81 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
1150.000	5343.2	2397.6	25.855	-35.623
1155.000	4852.0	2397.6	25.855	-35.623
1160.000	4372.9	2397.6	25.855	-35.623
1165.000	3904.9	2397.6	25.855	-35.623
1170.000	3447.7	2397.6	25.855	-35.623
1175.000	3000.9	2397.6	25.855	-35.623
1180.000	2563.7	2397.6	25.855	-35.623
1185.000	2135.8	2397.6	25.855	-35.623
1190.000	1716.9	2397.6	25.855	-35.623
1195.000	1306.1	2397.6	25.855	-35.623
1200.000	903.2	2397.6	25.855	-35.623
1205.000	507.9	2397.6	25.855	-35.623
1210.000	119.6	2397.6	25.855	-35.623
SPLASH 1211.558	-.1	2397.6	25.855	-35.623

TABLE 8-XXVII INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-II EXPENDED-STAGE TRAJECTORY
(81 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
SEP	537.424	7016.3877	6599.6509		
	540.424	7016.2723	6599.5288	.26	9.256
	545.000	7016.1364	6599.3854	.22	9.256
	550.000	7016.0436	6599.2880	.15	9.256
	555.000	7016.0089	6599.2524	.08	9.255
	560.000	7016.0322	6599.2786	.01	9.255
	565.000	7016.1138	6599.3667	-.06	9.255
	570.000	7016.2534	6599.5166	-.14	9.256
	575.000	7016.4510	6599.7283	-.21	9.256
	580.000	7016.7068	6600.0020	-.28	9.256
	585.000	7017.0206	6600.3372	-.35	9.257
	590.000	7017.3926	6600.7345	-.42	9.257
	595.000	7017.8228	6601.1935	-.49	9.258
	600.000	7018.3109	6601.7144	-.57	9.259
	605.000	7018.8571	6602.2971	-.64	9.260
	610.000	7019.4615	6602.9415	-.71	9.261
	615.000	7020.1240	6603.6478	-.78	9.263
	620.000	7020.8445	6604.4159	-.85	9.264
	625.000	7021.6232	6605.2458	-.92	9.266
	630.000	7022.4599	6606.1376	-.99	9.267
	635.000	7023.3547	6607.0911	-1.07	9.269
	640.000	7024.3077	6608.1064	-1.14	9.271
	645.000	7025.3187	6609.1835	-1.21	9.273
	650.000	7026.3879	6610.3223	-1.28	9.275
	655.000	7027.5150	6611.5229	-1.35	9.278
	660.000	7028.7004	6612.7855	-1.42	9.280
	665.000	7029.9437	6614.1097	-1.49	9.283
	670.000	7031.2453	6615.4957	-1.56	9.285
	675.000	7032.6049	6616.9434	-1.64	9.288
	680.000	7034.0225	6618.4530	-1.71	9.291
	685.000	7035.4983	6620.0243	-1.78	9.294
	690.000	7037.0322	6621.6572	-1.85	9.297
	695.000	7038.6241	6623.3520	-1.92	9.301
	700.000	7040.2743	6625.1085	-1.99	9.304
	705.000	7041.9824	6626.9267	-2.06	9.307
	710.000	7043.7488	6628.8066	-2.13	9.311
	715.000	7045.5731	6630.7483	-2.20	9.315
	720.000	7047.4554	6632.7516	-2.27	9.319
	725.000	7049.3958	6634.8165	-2.34	9.323
	730.000	7051.3945	6636.9432	-2.41	9.327
				-2.48	9.332

TABLE 8-XXVII

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-II EXPENDED-STAGE TRAJECTORY
(81 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
740.000	7055.5658	6641.3815	-2.62	9.341
745.000	7057.7385	6643.6930	-2.69	9.345
750.000	7059.9694	6646.0663	-2.76	9.350
755.000	7062.2582	6648.5011	-2.83	9.355
760.000	7064.6052	6650.9976	-2.90	9.360
765.000	7067.0102	6653.5555	-2.97	9.365
770.000	7069.4732	6656.1750	-3.04	9.371
775.000	7071.9943	6658.8562	-3.11	9.376
780.000	7074.5733	6661.5989	-3.18	9.382
785.000	7077.2102	6664.4029	-3.25	9.388
790.000	7079.9052	6667.2684	-3.32	9.393
795.000	7082.6580	6670.1952	-3.38	9.399
800.000	7085.4686	6673.1834	-3.45	9.406
805.000	7088.3369	6676.2327	-3.52	9.412
810.000	7091.2631	6679.3431	-3.59	9.418
815.000	7094.2466	6682.5145	-3.66	9.425
820.000	7097.2875	6685.7468	-3.73	9.431
825.000	7100.3855	6689.0394	-3.79	9.438
830.000	7103.5403	6692.3923	-3.86	9.445
835.000	7106.7509	6695.8043	-3.93	9.452
840.000	7110.0165	6699.2747	-4.00	9.459
845.000	7113.3356	6702.8020	-4.06	9.466
850.000	7116.7066	6706.3845	-4.13	9.474
855.000	7120.1256	6710.0184	-4.20	9.481
860.000	7123.5866	6713.6976	-4.26	9.489
865.000	7127.0810	6717.4135	-4.33	9.496
870.000	7130.5948	6721.1520	-4.40	9.503
875.000	7134.1016	6724.8869	-4.46	9.510
880.000	7137.5547	6728.5714	-4.53	9.516
885.000	7140.8776	6732.1288	-4.59	9.520
890.000	7143.9246	6735.4138	-4.66	9.523
895.000	7146.4163	6738.1466	-4.73	9.522
900.000	7147.8990	6739.8735	-4.79	9.520
905.000	7147.5989	6739.8208	-4.86	9.530
910.000	7144.2563	6736.7288	-4.92	9.589
915.000	7136.1499	6728.8759	-4.99	9.796
920.000	7120.4707	6713.4533	-5.06	10.389
925.000	7093.0663	6686.3083	-5.13	11.821
930.000	7048.0152	6641.5196	-5.20	14.731
935.000	6977.2232	6570.9927	-5.28	19.768

TABLE 8-XXVII INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-II EXPENDED-STAGE TRAJECTORY
(81 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
1150.000	430.9563	99.4476	-13.34	.424
1155.000	430.3488	96.9988	-13.03	.400
1160.000	429.7876	94.6745	-12.73	.378
1165.000	429.2668	92.4652	-12.44	.357
1170.000	428.7821	90.3634	-12.17	.338
1175.000	428.3302	88.3636	-11.91	.319
1180.000	427.9085	86.4615	-11.66	.302
1185.000	427.5147	84.6541	-11.42	.285
1190.000	427.1472	82.9388	-11.20	.268
1195.000	426.8044	81.3141	-10.98	.252
1200.000	426.4851	79.7786	-10.78	.236
1205.000	426.1881	78.3317	-10.59	.220
1210.000	425.9124	76.9730	-10.41	.204
SPLASH 1211.558	425.8382	76.6045	-10.36	.209

TABLE 8-XXVII INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
 FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
 S-II EXPENDED-STAGE TRAJECTORY
 (81 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
945.000	6713.8546	6308.1627	-5.46	38.075
950.000	6494.0318	6088.6139	-5.57	51.679
955.000	6197.0389	5791.8987	-5.71	67.681
960.000	5813.6326	5408.7757	-5.87	84.744
965.000	5337.8350	4933.2681	-6.08	102.620
970.000	4775.7064	4371.4401	-6.35	116.474
975.000	4157.8427	3753.8969	-6.69	122.226
980.000	3532.0194	3128.4356	-7.11	118.060
985.000	2947.6444	2544.5048	-7.65	105.713
990.000	2436.1399	2033.5926	-8.30	90.200
995.000	2010.3344	1608.6306	-9.09	73.321
1000.000	1669.8212	1269.3641	-10.03	57.897
1005.000	1403.8138	1005.2067	-11.11	45.111
1010.000	1197.3722	801.4537	-12.31	35.270
1015.000	1036.7174	644.5810	-13.60	27.738
1020.000	910.6894	523.6651	-14.94	22.118
1025.000	810.1684	429.7215	-16.25	17.780
1030.000	729.6232	357.2277	-17.46	14.321
1035.000	665.0896	302.0066	-18.49	11.357
1040.000	617.0912	264.6621	-19.50	7.892
1045.000	583.4441	242.7805	-20.57	6.176
1050.000	556.5256	227.1387	-21.43	5.043
1055.000	533.7510	214.0875	-21.95	4.194
1060.000	514.1737	202.0753	-22.10	3.549
1065.000	497.4752	190.6009	-21.91	3.010
1070.000	483.5857	179.7975	-21.47	2.524
1075.000	472.4316	170.0687	-20.91	2.112
1080.000	463.5205	161.1537	-20.24	1.811
1085.000	456.5088	153.1021	-19.54	1.528
1090.000	451.0904	146.0165	-18.86	1.285
1095.000	446.9290	139.8286	-18.22	1.088
1100.000	443.7233	134.4087	-17.63	.933
1105.000	441.2339	129.6383	-17.08	.810
1110.000	439.2602	125.3600	-16.58	.722
1115.000	437.6534	121.4445	-16.11	.679
1120.000	436.2741	117.6766	-15.65	.644
1125.000	435.0856	114.1171	-15.21	.599
1130.000	434.0549	110.7906	-14.79	.555
1135.000	433.1499	107.6834	-14.39	.516
1140.000	432.3441	104.7719	-14.02	.482

TABLE 8-XXVIII VEHICLE POSITION COORDINATES - S-II
 EXPANDED-STAGE TRAJECTORY
 (81 -)DEGREES LAUNCH AZIMUTH)

	TIME SEC	X M	Y M	Z M
SEP	537.424	6310978.938	47829.398	1803044.422
	540.424	6305246.938	47961.620	1823299.656
	545.000	6296351.125	48162.308	1854145.844
	550.000	6286417.688	48380.274	1887790.438
	555.000	6276263.063	48596.831	1921367.141
	560.000	6265886.750	48811.986	1954877.453
	565.000	6255289.938	49025.716	1988317.500
	570.000	6244472.250	49238.031	2021688.797
	575.000	6233434.875	49448.904	2054987.516
	580.000	6222177.250	49658.347	2088215.109
	585.000	6210700.688	49866.334	2121367.688
	590.000	6199004.625	50072.875	2154446.844
	595.000	6187090.438	50277.945	2187448.688
	600.000	6174957.563	50481.554	2220374.688
	605.000	6162607.313	50683.676	2253221.063
	610.000	6150039.063	50884.322	2285989.250
	615.000	6137254.313	51083.467	2318675.469
	620.000	6124252.375	51281.120	2351281.156
	625.000	6111034.688	51477.257	2383802.531
	630.000	6097600.625	51671.888	2416240.969
	635.000	6083951.750	51864.989	2448592.813
	640.000	6070087.250	52056.567	2480859.375
	645.000	6056008.688	52246.601	2513037.031
	650.000	6041715.375	52435.097	2545127.031
	655.000	6027208.938	52622.034	2577125.781
	660.000	6012488.563	52807.419	2609034.594
	665.000	5997555.938	52991.229	2640849.813
	670.000	5982410.188	53173.473	2672572.750
	675.000	5967053.125	53354.128	2704199.719
	680.000	5951483.813	53533.201	2735732.125
	685.000	5935704.000	53710.671	2767166.250
	690.000	5919712.938	53886.545	2798503.438
	695.000	5903512.250	54060.800	2829740.000
	700.000	5887101.188	54233.445	2860877.344
	705.000	5870481.500	54404.457	2891911.750
	710.000	5853652.313	54573.842	2922844.563
	715.000	5836615.438	54741.582	2953672.125
	720.000	5819370.000	54907.680	2984395.719
	725.000	5801917.875	55072.117	3015011.813
	730.000	5784258.125	55234.899	3045521.625
	735.000	5766392.688	55396.005	3075921.531

TABLE 8-XXVIII VEHICLE POSITION COORDINATES - S-II
 EXPENDED-STAGE TRAJECTORY
 (81 -DFGRFFS LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
740.000	5748320.563	55555.441	3106212.844
745.000	5730043.688	55713.188	3136391.938
750.000	5711561.125	55869.249	3166460.125
755.000	5692874.875	56023.606	3196413.813
760.000	5673983.938	56176.265	3226254.219
765.000	5654890.313	56327.205	3255977.813
770.000	5635593.063	56476.431	3285585.750
775.000	5616094.125	56623.925	3315074.625
780.000	5596392.563	56769.690	3344445.531
785.000	5576490.438	56913.709	3373695.000
790.000	5556386.688	57055.985	3402824.188
795.000	5536083.500	57196.501	3431829.594
800.000	5515579.750	57335.259	3460712.406
805.000	5494877.625	57472.242	3489469.094
810.000	5473976.000	57607.453	3518100.613
815.000	5452877.125	57740.876	3546604.156
820.000	5431579.938	57872.513	3574980.156
825.000	5410086.563	58002.346	3603225.438
830.000	5388396.000	58130.379	3631341.094
835.000	5366510.500	58256.595	3659323.688
840.000	5344428.875	58380.996	3687174.250
845.000	5322153.500	58503.564	3714889.406
850.000	5299683.250	58624.303	3742470.156
855.000	5277020.438	58743.194	3769913.156
860.000	5254163.938	58860.240	3797219.375
865.000	5231116.250	58975.422	3824385.344
870.000	5207876.250	59088.740	3851411.969
875.000	5184446.563	59200.175	3878295.719
880.000	5160826.250	59309.721	3905037.250
885.000	5137018.188	59417.351	3931632.781
890.000	5113022.125	59523.045	3958082.281
895.000	5088842.063	59626.752	3984380.644
900.000	5064479.625	59728.405	4010526.375
905.000	5039942.250	59827.874	4036510.531
910.000	5015237.250	59924.958	4062325.500
915.000	4990380.875	60019.319	4087954.188
920.000	4965393.563	60110.445	4113375.969
925.000	4940312.250	60197.518	4138554.063
930.000	4915188.125	60279.301	4163438.813
935.000	4890102.000	60353.946	4187952.875
940.000	4865165.375	60418.805	4211991.500

TABLE 8-XXVIII VEHICLE POSITION COORDINATES - S-II
 EXPANDED-STAGE TRAJECTORY
 (81 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
945.000	4840538.062	60470.190	4235407.625
950.000	4816428.125	60503.207	4258013.125
955.000	4793102.938	60511.679	4279571.375
960.000	4770873.625	60488.358	4299813.688
965.000	4750086.250	60425.328	4318450.688
970.000	4731097.375	60314.432	4335195.625
975.000	4714203.688	60149.122	4349828.375
980.000	4699553.438	59926.347	4362268.813
985.000	4687110.000	59647.547	4372601.625
990.000	4676673.875	59317.905	4381048.438
995.000	4667964.875	58944.547	4387891.500
1000.000	4660669.625	58535.210	4393430.750
1005.000	4654494.938	58097.168	4397938.125
1010.000	4649192.813	57636.475	4401639.688
1015.000	4644571.250	57157.943	4404710.688
1020.000	4640483.250	56665.230	4407286.688
1025.000	4636821.750	56161.183	4409471.000
1030.000	4633506.625	55647.943	4411345.063
1035.000	4630475.625	55127.329	4412975.438
1040.000	4627670.625	54600.839	4414417.313
1045.000	4625020.063	54069.960	4415713.125
1050.000	4622484.563	53535.607	4416894.875
1055.000	4620048.813	52998.493	4417990.375
1060.000	4617704.250	52459.129	4419024.938
1065.000	4615444.500	51918.039	4420020.438
1070.000	4613261.188	51375.589	4420994.563
1075.000	4611144.750	50832.154	4421960.000
1080.000	4609084.875	50287.954	4422925.438
1085.000	4607073.375	49743.225	4423896.938
1090.000	4605102.125	49198.066	4424878.063
1095.000	4603164.188	48652.616	4425870.313
1100.000	4601253.563	48106.896	4426874.313
1105.000	4599365.875	47560.988	4427890.000
1110.000	4597497.438	47014.877	4428917.125
1115.000	4595645.688	46468.619	4429955.313
1120.000	4593809.000	45922.182	4431004.500
1125.000	4591986.313	45375.614	4432064.563
1130.000	4590176.438	44828.872	4433135.125
1135.000	4588378.375	44281.994	4434215.625
1140.000	4586591.125	43734.933	4435305.563
1145.000	4584814.063	43187.725	4436404.375

TABLE 8-XXVIII VEHICLE POSITION COORDINATES - S-II
 EXPENDED-STAGE TRAJECTORY
 (81 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
1150.000	4583046.438	42640.322	4437511.500
1155.000	4581287.813	42092.760	4438626.438
1160.000	4579537.500	41544.992	4439748.938
1165.000	4577795.188	40997.053	4440878.438
1170.000	4576060.375	40448.897	4442014.750
1175.000	4574332.813	39900.561	4443157.375
1180.000	4572611.938	39351.997	4444306.125
1185.000	4570897.500	38803.244	4445460.563
1190.000	4569189.125	38254.256	4446620.375
1195.000	4567486.563	37705.069	4447785.188
1200.000	4565789.375	37155.639	4448954.750
1205.000	4564097.375	36606.002	4450128.813
1210.000	4562410.063	36056.116	4451307.125
SPLASH 1211.558	4561885.125	35884.691	4451675.125

TABLE 8-XXIX

 VEHICLE VELOCITY COMPONENTS - S-II
 EXPANDED STAGE TRAJECTORY
 (81 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
SFP	537.424	-1897.120	44.153	6754.901
	540.424	-1923.810	43.987	6747.229
	545.000	-1964.464	43.732	6735.365
	550.000	-2008.822	43.453	6722.173
	555.000	-2053.106	43.172	6708.746
	560.000	-2097.319	42.889	6695.082
	565.000	-2141.458	42.605	6681.182
	570.000	-2185.524	42.319	6667.046
	575.000	-2229.514	42.032	6652.675
	580.000	-2273.431	41.743	6638.068
	585.000	-2317.271	41.453	6623.226
	590.000	-2361.036	41.161	6608.148
	595.000	-2404.721	40.868	6592.836
	600.000	-2448.331	40.573	6577.288
	605.000	-2491.861	40.277	6561.506
	610.000	-2535.312	39.979	6545.489
	615.000	-2578.684	39.680	6529.239
	620.000	-2621.976	39.380	6512.753
	625.000	-2665.184	39.077	6496.034
	630.000	-2708.313	38.774	6479.080
	635.000	-2751.357	38.468	6461.893
	640.000	-2794.320	38.162	6444.472
	645.000	-2837.196	37.853	6426.818
	650.000	-2879.990	37.544	6408.929
	655.000	-2922.696	37.233	6390.808
	660.000	-2965.318	36.920	6372.453
	665.000	-3007.852	36.606	6353.865
	670.000	-3050.295	36.290	6335.043
	675.000	-3092.656	35.973	6315.989
	680.000	-3134.925	35.655	6296.701
	685.000	-3177.103	35.335	6277.181
	690.000	-3219.192	35.013	6257.427
	695.000	-3261.188	34.690	6237.442
	700.000	-3303.094	34.366	6217.222
	705.000	-3344.904	34.040	6196.771
	710.000	-3386.623	33.713	6176.087
	715.000	-3428.246	33.384	6155.170
	720.000	-3469.775	33.054	6134.020
	725.000	-3511.206	32.722	6112.638
	730.000	-3552.542	32.389	6091.023
	735.000	-3593.775	32.055	6069.176

TABLE 8-XXIX

VEHICLE VELOCITY COMPONENTS - S-II
 EXPENDED STAGE TRAJECTORY
 (81 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
740.000	-3634.919	31.719	6047.096
745.000	-3675.958	31.381	6024.784
750.000	-3716.899	31.042	6002.239
755.000	-3757.737	30.702	5979.462
760.000	-3798.475	30.360	5956.451
765.000	-3839.109	30.017	5933.209
770.000	-3879.641	29.672	5909.734
775.000	-3920.068	29.326	5886.027
780.000	-3960.391	28.979	5862.086
785.000	-4000.606	28.630	5837.914
790.000	-4040.716	28.280	5813.508
795.000	-4080.717	27.928	5788.870
800.000	-4120.611	27.575	5763.998
805.000	-4160.393	27.220	5738.894
810.000	-4200.067	26.864	5713.557
815.000	-4239.627	26.506	5687.987
820.000	-4279.077	26.147	5662.182
825.000	-4318.411	25.787	5636.145
830.000	-4357.633	25.425	5609.873
835.000	-4396.736	25.062	5583.368
840.000	-4435.722	24.697	5556.625
845.000	-4474.589	24.331	5529.648
850.000	-4513.335	23.963	5502.431
855.000	-4551.955	23.594	5474.974
860.000	-4590.445	23.223	5447.271
865.000	-4628.797	22.851	5419.317
870.000	-4667.004	22.476	5391.099
875.000	-4705.043	22.099	5362.601
880.000	-4742.885	21.718	5333.785
885.000	-4780.473	21.334	5304.598
890.000	-4817.709	20.942	5274.932
895.000	-4854.395	20.539	5244.587
900.000	-4890.217	20.118	5213.236
905.000	-4924.627	19.664	5180.332
910.000	-4956.732	19.158	5144.982
915.000	-4985.295	18.570	5105.990
920.000	-5008.291	17.853	5061.404
925.000	-5022.698	16.936	5008.374
930.000	-5024.176	15.716	4942.866
935.000	-5006.731	14.055	4859.434
940.000	-4962.471	11.766	4751.048

TABLE 8-XXIX
 VEHICLE VELOCITY COMPONENTS - S-II
 EXPANDED STAGE TRAJECTORY
 (81 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
945.000	-4881.642	8.625	4609.266
950.000	-4753.210	4.374	4424.865
955.000	-4566.422	-1.232	4189.400
960.000	-4313.514	-8.364	3897.673
965.000	-3988.885	-17.139	3546.969
970.000	-3595.745	-27.460	3142.807
975.000	-3155.828	-38.792	2706.825
980.000	-2704.400	-50.292	2271.310
985.000	-2278.858	-61.075	1808.604
990.000	-1903.675	-70.570	1518.493
995.000	-1589.615	-78.536	1228.170
1000.000	-1337.525	-84.970	996.047
1005.000	-1140.117	-90.060	814.074
1010.000	-986.544	-94.067	671.998
1015.000	-866.580	-97.235	560.684
1020.000	-771.825	-99.759	472.958
1025.000	-695.210	-101.796	403.352
1030.000	-632.664	-103.440	348.406
1035.000	-581.383	-104.761	305.554
1040.000	-543.417	-105.778	272.600
1045.000	-517.827	-106.548	246.799
1050.000	-496.755	-107.166	226.862
1055.000	-477.754	-107.665	212.248
1060.000	-460.151	-108.060	202.383
1065.000	-443.986	-108.366	196.506
1070.000	-429.557	-108.598	193.670
1075.000	-417.328	-108.771	192.868
1080.000	-406.843	-108.898	193.575
1085.000	-398.003	-108.992	195.230
1090.000	-390.692	-109.063	197.352
1095.000	-384.671	-109.118	199.668
1100.000	-379.683	-109.163	202.026
1105.000	-375.512	-109.202	204.335
1110.000	-371.943	-109.237	206.580
1115.000	-368.808	-109.269	208.762
1120.000	-365.897	-109.300	210.969
1125.000	-363.218	-109.330	213.118
1130.000	-360.761	-109.361	215.163
1135.000	-358.499	-109.393	217.095
1140.000	-356.402	-109.426	218.917
1145.000	-354.446	-109.460	220.636

TABLE 8-XXIX VEHICLE VELOCITY COMPONENTS - S-II
 EXPENDED STAGE TRAJECTORY
 (81 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
1150.000	-352.611	-109.496	222.260
1155.000	-350.882	-109.532	223.797
1160.000	-349.247	-109.570	225.252
1165.000	-347.658	-109.609	226.631
1170.000	-346.230	-109.649	227.939
1175.000	-344.837	-109.689	229.178
1180.000	-343.516	-109.731	230.351
1185.000	-342.265	-109.774	231.459
1190.000	-341.081	-109.817	232.505
1195.000	-339.964	-109.861	233.489
1200.000	-338.911	-109.906	234.413
1205.000	-337.924	-109.952	235.276
1210.000	-337.000	-109.998	236.078
SPLASH 1211.558	-336.753	-110.012	236.291

TABLE 8-XXX

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (90 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
SEP	537.424	190051.4			
	540.424	190127.1	842.0	27.420	
	545.000	190212.1	852.4	27.392	-64.792
	550.000	190263.3	868.3	27.350	-64.600
	555.000	190270.4	885.6	27.303	-64.308
	560.000	190233.8	902.9	27.255	-63.988
	565.000	190153.3	920.2	27.206	-63.669
	570.000	190029.0	937.5	27.157	-63.350
	575.000	189860.8	954.8	27.107	-63.031
	580.000	189648.9	972.1	27.055	-62.713
	585.000	189393.1	989.4	27.004	-62.395
	590.000	189093.6	1006.7	26.951	-62.077
	595.000	188750.1	1024.0	26.897	-61.759
	600.000	188363.0	1041.3	26.843	-61.442
	605.000	187932.0	1058.7	26.788	-61.125
	610.000	187457.3	1076.0	26.732	-60.808
	615.000	186938.6	1093.3	26.675	-60.492
	620.000	186376.3	1110.6	26.617	-60.176
	625.000	185770.2	1128.0	26.559	-59.860
	630.000	185120.4	1145.3	26.499	-59.544
	635.000	184426.9	1162.6	26.439	-59.229
	640.000	183689.5	1180.0	26.379	-58.914
	645.000	182908.6	1197.3	26.317	-58.600
	650.000	182083.7	1214.6	26.255	-58.285
	655.000	181215.4	1232.0	26.191	-57.971
	660.000	180303.4	1249.3	26.127	-57.657
	665.000	179347.6	1266.7	26.063	-57.344
	670.000	178348.2	1284.1	25.997	-57.030
	675.000	177305.2	1301.4	25.931	-56.717
	680.000	176218.6	1318.8	25.931	-56.405
	685.000	175088.4	1336.2	25.863	-56.092
	690.000	173914.7	1353.6	25.796	-55.780
	695.000	172697.4	1371.0	25.727	-55.468
	700.000	171436.6	1388.4	25.657	-55.156
	705.000	170132.3	1405.8	25.587	-54.845
	710.000	168784.4	1423.2	25.516	-54.534
	715.000	167393.1	1440.6	25.444	-54.223
	720.000	165958.3	1458.1	25.371	-53.912
	725.000	164480.2	1475.5	25.298	-53.602
	730.000	162958.6	1493.0	25.224	-53.292
	735.000	161393.7	1510.4	25.149	-52.982
			1527.9	25.073	-52.673
				24.997	-52.363

D5-15481-1

TABLE 8-XXX

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (90 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
740.000	159785.4	1545.4	24.920	-52.054
745.000	158133.9	1562.8	24.842	-51.745
750.000	156438.9	1580.3	24.763	-51.437
755.000	154700.8	1597.8	24.683	-51.128
760.000	152919.5	1615.3	24.603	-50.820
765.000	151094.9	1632.9	24.522	-50.512
770.000	149227.2	1650.4	24.440	-50.205
775.000	147316.4	1667.9	24.357	-49.897
780.000	145362.2	1685.5	24.274	-49.590
785.000	143365.3	1703.1	24.190	-49.283
790.000	141325.0	1720.6	24.105	-48.977
795.000	139242.0	1738.2	24.019	-48.670
800.000	137116.0	1755.8	23.933	-48.364
805.000	134946.9	1773.5	23.846	-48.058
810.000	132735.1	1791.1	23.758	-47.752
815.000	130480.3	1808.7	23.670	-47.447
820.000	128182.7	1826.4	23.580	-47.141
825.000	125842.3	1844.0	23.490	-46.836
830.000	123459.2	1861.7	23.399	-46.531
835.000	121033.4	1879.4	23.308	-46.227
840.000	118564.8	1897.1	23.215	-45.922
845.000	116053.9	1914.8	23.122	-45.618
850.000	113500.2	1932.6	23.028	-45.314
855.000	110904.1	1950.3	22.934	-45.010
860.000	108265.3	1968.1	22.838	-44.706
865.000	105584.3	1985.9	22.742	-44.402
870.000	102860.8	2003.7	22.646	-44.099
875.000	100095.2	2021.5	22.548	-43.796
880.000	97287.3	2039.3	22.450	-43.493
885.000	94437.2	2057.2	22.351	-43.190
890.000	91545.2	2075.0	22.251	-42.887
895.000	88611.6	2092.9	22.151	-42.585
900.000	85636.5	2110.8	22.050	-42.283
905.000	82620.8	2128.7	21.948	-41.981
910.000	79565.5	2146.6	21.846	-41.680
915.000	76472.2	2164.4	21.743	-41.379
920.000	73343.3	2182.3	21.639	-41.080
925.000	70183.3	2200.1	21.536	-40.781
930.000	66997.3	2217.8	21.432	-40.485
935.000	63794.7	2235.3	21.329	-40.193
940.000	60587.3	2252.5	21.226	-39.904

TABLE 8-XXX

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (90 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
945.000	57392.7	2269.4	21.126	-39.623
950.000	54233.1	2285.8	21.028	-39.351
955.000	51136.7	2301.4	20.934	-39.091
960.000	48136.8	2316.1	20.845	-38.848
965.000	45271.3	2329.5	20.763	-38.625
970.000	42581.0	2341.5	20.690	-38.426
975.000	40101.0	2352.0	20.626	-38.254
980.000	37849.8	2360.7	20.572	-38.109
985.000	35825.7	2367.9	20.528	-37.990
990.000	34009.0	2373.6	20.493	-37.896
995.000	32370.9	2378.2	20.465	-37.821
1000.000	30876.9	2381.8	20.443	-37.762
1005.000	29493.7	2384.6	20.425	-37.716
1010.000	28193.4	2386.7	20.412	-37.679
1015.000	26955.5	2388.5	20.401	-37.651
1020.000	25765.9	2389.8	20.393	-37.629
1025.000	24618.0	2390.9	20.386	-37.611
1030.000	23509.9	2391.7	20.381	-37.598
1035.000	22441.7	2392.3	20.377	-37.587
1040.000	21405.4	2392.8	20.374	-37.579
1045.000	20378.3	2393.2	20.372	-37.573
1050.000	19357.9	2393.5	20.370	-37.568
1055.000	18353.4	2393.7	20.368	-37.564
1060.000	17375.8	2393.9	20.367	-37.562
1065.000	16435.2	2394.0	20.367	-37.560
1070.000	15536.7	2394.1	20.366	-37.558
1075.000	14680.9	2394.2	20.366	-37.557
1080.000	13866.5	2394.2	20.365	-37.556
1085.000	13091.3	2394.3	20.365	-37.556
1090.000	12351.9	2394.3	20.365	-37.555
1095.000	11644.2	2394.3	20.365	-37.555
1100.000	10964.3	2394.3	20.365	-37.555
1105.000	10309.2	2394.3	20.365	-37.555
1110.000	9676.0	2394.3	20.365	-37.555
1115.000	9062.9	2394.3	20.365	-37.554
1120.000	8468.7	2394.3	20.365	-37.554
1125.000	7892.7	2394.3	20.365	-37.554
1130.000	7333.7	2394.3	20.365	-37.554
1135.000	6790.6	2394.3	20.365	-37.554
1140.000	6262.4	2394.3	20.365	-37.554
1145.000	5748.0	2394.3	20.365	-37.554

TABLE 8-XXX

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (90 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
1150.000	5246.9	2394.3	20.365	
1155.000	4758.2	2394.3	20.365	-37.554
1160.000	4281.3	2394.3	20.365	-37.554
1165.000	3815.6	2394.3	20.365	-37.554
1170.000	3360.5	2394.4	20.365	-37.554
1175.000	2915.6	2394.4	20.365	-37.554
1180.000	2480.4	2394.4	20.365	-37.554
1185.000	2054.3	2394.4	20.365	-37.554
1190.000	1636.9	2394.4	20.365	-37.554
1195.000	1227.9	2394.4	20.365	-37.554
1200.000	826.6	2394.4	20.365	-37.554
1205.000	432.6	2394.4	20.365	-37.554
1210.000	45.7	2394.4	20.365	-37.554
SPLASH 1210.596	.0	2394.4	20.365	-37.554

TABLE 8-XXXI

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-II EXPENDED-STAGE TRAJECTORY
(90 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
SEP	537.424	7022.6370	6602.1407		
	540.424	7022.5311	6602.0352	.25	9.257
	545.000	7022.4096	6601.9167	.21	9.257
	550.000	7022.3319	6601.8459	.14	9.257
	555.000	7022.3120	6601.8365	.07	9.257
	560.000	7022.3495	6601.8883	-.00	9.257
	565.000	7022.4447	6602.0014	-.07	9.257
	570.000	7022.5976	6602.1758	-.14	9.257
	575.000	7022.8080	6602.4115	-.21	9.257
	580.000	7023.0760	6602.7084	-.28	9.258
	585.000	7023.4017	6603.0667	-.36	9.258
	590.000	7023.7850	6603.4861	-.43	9.259
	595.000	7024.2258	6603.9670	-.50	9.260
	600.000	7024.7244	6604.5091	-.57	9.261
	605.000	7025.2806	605.1125	-.64	9.262
	610.000	7025.8944	6605.7770	-.71	9.263
	615.000	7026.5657	6606.5028	-.78	9.264
	620.000	7027.2947	6607.2900	-.85	9.266
	625.000	7028.0813	6608.1382	-.92	9.268
	630.000	7028.9255	6609.0477	-1.00	9.269
	635.000	7029.8272	6610.0185	-1.07	9.271
	640.000	7030.7867	6611.0505	-1.14	9.273
	645.000	7031.8037	6612.1437	-1.21	9.275
	650.000	7032.8782	6613.2981	-1.28	9.277
	655.000	7034.0104	6614.5137	-1.35	9.280
	660.000	7035.2003	6615.7905	-1.42	9.282
	665.000	7036.4478	6617.1285	-1.49	9.285
	670.000	7037.7528	6618.5277	-1.56	9.287
	675.000	7039.1154	6619.9880	-1.63	9.290
	680.000	7040.5356	6621.5096	-1.70	9.293
	685.000	7042.0135	6623.0922	-1.77	9.296
	690.000	7043.5490	6624.7361	-1.84	9.299
	695.000	7045.1420	6626.4410	-1.91	9.303
	700.000	7046.7927	6628.2072	-1.98	9.306
	705.000	7048.5009	6630.0343	-2.05	9.310
	710.000	7050.2667	6631.9227	-2.12	9.313
	715.000	7052.0900	6633.8721	-2.19	9.317
	720.000	7053.9711	6635.8826	-2.26	9.321
	725.000	7055.9096	6637.9542	-2.33	9.325
	730.000	7057.9059	6640.0869	-2.40	9.329
				-2.47	9.334

TABLE 8-XXXI

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-II EXPENDED-STAGE TRAJECTORY
(90 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC2
740.000	7062.0709	6644.5353	-2.61	9.343
745.000	7064.2397	6646.8510	-2.68	9.347
750.000	7066.4662	6649.2279	-2.75	9.352
755.000	7068.7502	6651.6655	-2.82	9.357
760.000	7071.0918	6654.1642	-2.89	9.362
765.000	7073.4907	6656.7238	-2.96	9.368
770.000	7075.9473	6659.3445	-3.02	9.373
775.000	7078.4614	6662.0259	-3.09	9.378
780.000	7081.0330	6664.7683	-3.16	9.384
785.000	7083.6619	6667.5714	-3.23	9.390
790.000	7086.3483	6670.4353	-3.30	9.396
795.000	7089.0920	6673.3599	-3.37	9.402
800.000	7091.8931	6676.3451	-3.43	9.408
805.000	7094.7513	6679.3908	-3.50	9.414
810.000	7097.6667	6682.4969	-3.57	9.420
815.000	7100.6389	6685.6634	-3.64	9.427
820.000	7103.6680	6688.8899	-3.70	9.433
825.000	7106.7534	6692.1760	-3.77	9.440
830.000	7109.8948	6695.5214	-3.84	9.447
835.000	7113.0911	6698.9249	-3.91	9.454
840.000	7116.3431	6702.3856	-3.97	9.461
845.000	7119.6440	6705.9019	-4.04	9.468
850.000	7122.9966	6709.4714	-4.11	9.476
855.000	7126.3948	6713.0896	-4.17	9.483
860.000	7129.8313	6716.7495	-4.24	9.490
865.000	7133.2964	6720.4410	-4.30	9.498
870.000	7136.7725	6724.1467	-4.37	9.505
875.000	7140.2265	6727.8334	-4.44	9.511
880.000	7143.6039	6731.4466	-4.50	9.517
885.000	7146.8099	6734.8915	-4.57	9.521
890.000	7149.6637	6737.9873	-4.63	9.522
895.000	7151.8281	6740.3967	-4.70	9.520
900.000	7152.7838	6741.6002	-4.76	9.521
905.000	7151.5947	6740.6617	-4.83	9.541
910.000	7146.9222	6736.2422	-4.89	9.631
915.000	7136.7663	6726.3417	-4.96	9.923
920.000	7117.9869	6707.8193	-5.03	10.709
925.000	7086.0130	6676.1035	-5.10	12.496
930.000	7034.4201	6624.7688	-5.17	15.933
935.000	6954.5646	6545.1702	-5.25	21.622

TABLE 8-XXXI

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
 FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
 S-II EXPENDED-STAGE TRAJECTORY
 (90 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
945.000	6663.6999	6254.8081	-5.44	41.347
950.000	6425.3669	6016.7151	-5.55	55.508
955.000	6107.8106	5699.3864	-5.70	71.733
960.000	5703.5635	5295.3497	-5.87	88.924
965.000	5207.6050	4799.5758	-6.10	105.950
970.000	4632.0197	4224.1403	-6.38	117.986
975.000	4011.7766	3604.0085	-6.73	121.377
980.000	3395.6924	2988.0067	-7.18	115.144
985.000	2829.9785	2422.3810	-7.74	101.974
990.000	2339.6293	1932.1868	-8.42	86.018
995.000	1935.3837	1528.2761	-9.24	69.530
1000.000	1613.8841	1207.4636	-10.19	54.776
1005.000	1363.3321	958.1768	-11.28	42.728
1010.000	1168.7320	765.6762	-12.48	33.447
1015.000	1017.1799	617.3320	-13.76	26.371
1020.000	898.0309	502.7364	-15.05	21.143
1025.000	802.9115	413.6359	-16.29	16.996
1030.000	726.7505	344.9451	-17.40	13.693
1035.000	666.0112	292.9041	-18.34	10.710
1040.000	622.3742	259.5600	-19.30	7.470
1045.000	590.9621	239.3501	-20.28	5.916
1050.000	565.5075	224.4251	-21.01	4.857
1055.000	543.8883	211.6634	-21.40	4.045
1060.000	525.3208	199.7483	-21.43	3.417
1065.000	509.5883	188.3887	-21.16	2.910
1070.000	496.6086	177.7737	-20.67	2.431
1075.000	486.2436	168.2442	-20.08	2.051
1080.000	477.9741	159.4767	-19.40	1.752
1085.000	471.5045	151.6153	-18.71	1.475
1090.000	466.5190	144.7155	-18.05	1.241
1095.000	462.6927	138.6904	-17.43	1.053
1100.000	459.7422	133.4066	-16.86	.905
1105.000	457.4461	128.7485	-16.34	.789
1110.000	455.6173	124.5543	-15.86	.704
1115.000	454.1141	120.6780	-15.41	.671
1120.000	452.8186	116.9458	-14.97	.633
1125.000	451.7020	113.4323	-14.54	.588
1130.000	450.7317	110.1509	-14.15	.545
1135.000	449.8773	107.0848	-13.77	.507
1140.000	449.1147	104.2095	-13.42	.473

TABLE 8-XXXI

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
 FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
 S-II EXPENDED-STAGE TRAJECTORY
 (90 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
1150.000	447.7970	98.9458	-12.77	.417
1155.000	447.2189	96.5230	-12.46	.393
1160.000	446.6841	94.2226	-12.18	.371
1165.000	446.1875	92.0355	-11.90	.351
1170.000	445.7250	89.9543	-11.64	.332
1175.000	445.2936	87.9743	-11.39	.314
1180.000	444.8909	86.0912	-11.16	.296
1185.000	444.5148	84.3023	-10.93	.279
1190.000	444.1637	82.6051	-10.72	.263
1195.000	443.8363	80.9981	-10.52	.246
1200.000	443.5312	79.4804	-10.32	.230
1205.000	443.2475	78.0510	-10.14	.215
1210.000	442.9842	76.7096	-9.97	.199
SPLASH 1210.596	442.9616	76.5938	-9.96	.207

TABLE 8-XXXII

VEHICLE POSITION COORDINATES - S-II
 EXPANDED-STAGE TRAJECTORY
 (90 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	X M	Y M	Z M
SEP	537.424	6309641.813	16037.687	1808446.438
	540.424	6303884.938	16016.740	1828714.531
	545.000	6294951.125	15984.602	1859580.234
	550.000	6284976.250	15949.216	1893246.000
	555.000	6274780.125	15913.554	1926843.703
	560.000	6264362.375	15877.614	1960374.875
	565.000	6253724.188	15841.400	1993835.625
	570.000	6242865.063	15804.909	2027227.453
	575.000	6231786.188	15768.146	2060546.531
	580.000	6220487.188	15731.108	2093794.313
	585.000	6208969.188	15693.799	2126966.938
	590.000	6197231.813	15656.216	2160065.938
	595.000	6185276.250	15618.364	2193087.438
	600.000	6173101.938	15580.240	2226032.906
	605.000	6160710.375	15541.849	2258898.594
	610.000	6148100.813	15503.187	2291685.938
	615.000	6135274.688	15464.258	2324391.125
	620.000	6122231.438	15425.061	2357015.531
	625.000	6108972.500	15385.600	2389555.469
	630.000	6095497.188	15345.871	2422012.375
	635.000	6081807.000	15305.878	2454382.438
	640.000	6067901.250	15265.621	2486667.031
	645.000	6053781.500	15225.101	2518862.531
	650.000	6039447.000	15184.317	2550970.250
	655.000	6024899.375	15143.274	2582986.500
	660.000	6010137.875	15101.967	2614912.656
	665.000	5995164.063	15060.402	2646744.969
	670.000	5979977.250	15018.576	2678484.781
	675.000	5964579.063	14976.493	2710128.500
	680.000	5948968.688	14934.150	2741677.375
	685.000	5933147.875	14891.551	2773127.813
	690.000	5917115.813	14848.695	2804481.094
	695.000	5900874.188	14805.584	2835733.563
	700.000	5884422.188	14762.217	2866886.563
	705.000	5867761.625	14718.597	2897936.438
	710.000	5850891.563	14674.722	2928884.563
	715.000	5833813.875	14630.595	2959727.219
	720.000	5816527.688	14586.215	2990465.688
	725.000	5799034.813	14541.586	3021096.406
	730.000	5781334.375	14496.704	3051620.656
	735.000	5763428.188	14451.574	3082034.813

TABLE 8-XXXII

 VEHICLE POSITION COORDINATES - S-II
 EXPENDED-STAGE TRAJECTORY
 (90 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
740.000	5745315.438	14406.193	3112340.188
745.000	5726998.063	14360.566	3142533.125
750.000	5708475.000	14314.689	3172614.906
755.000	5689748.250	14268.568	3202581.969
760.000	5670816.938	14222.198	3232435.563
765.000	5651683.000	14175.584	3262172.094
770.000	5632345.375	14128.724	3291792.750
775.000	5612806.250	14081.622	3321294.063
780.000	5593064.500	14034.274	3350677.219
785.000	5573122.250	13986.686	3379938.688
790.000	5552978.438	13938.854	3409079.688
795.000	5532635.250	13890.783	3438096.688
800.000	5512091.563	13842.469	3466990.844
805.000	5491349.625	13793.917	3495758.656
810.000	5470408.250	13745.125	3524401.313
815.000	5449269.688	13696.095	3552915.344
820.000	5427932.875	13646.826	3581301.781
825.000	5406400.000	13597.322	3609557.281
830.000	5384670.000	13547.578	3637682.906
835.000	5362745.063	13497.601	3665675.188
840.000	5340624.188	13447.386	3693535.250
845.000	5318309.688	13396.938	3721259.688
850.000	5295800.313	13346.252	3748849.438
855.000	5273098.563	13295.333	3776301.188
860.000	5250203.250	13244.175	3803615.875
865.000	5227116.875	13192.782	3830790.031
870.000	5203838.375	13141.147	3857824.563
875.000	5180370.313	13089.268	3884715.875
880.000	5156711.938	13037.132	3911464.625
885.000	5132866.188	12984.727	3938066.813
890.000	5108833.000	12932.021	3964522.219
895.000	5084616.750	12878.965	3990825.563
900.000	5060219.563	12825.458	4016974.156
905.000	5035649.938	12771.344	4042958.750
910.000	5010916.500	12716.341	4068770.000
915.000	4986037.625	12660.016	4094388.938
920.000	4961036.875	12601.675	4119791.719
925.000	4935955.625	12540.245	4144937.344
930.000	4910851.313	12474.095	4169770.156
935.000	4885813.063	12400.839	4194205.156
940.000	4860962.688	12317.066	4218128.250

TABLE A-XXXII

VEHICLE POSITION COORDINATES - S-II
 EXPANDED-STAGE TRAJECTORY
 (90 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
945.000	4836471.875	12218.120	4241381.750
950.000	4812561.250	12097.888	4263767.000
955.000	4789508.688	11948.827	4285038.875
960.000	4767630.313	11762.253	4304926.063
965.000	4747273.750	11528.812	4323139.813
970.000	4728783.313	11239.200	4339406.875
975.000	4712423.063	10886.564	4353537.875
980.000	4698297.063	10468.421	4365492.500
985.000	4686327.938	9987.458	4375390.250
990.000	4676294.500	9450.188	4383469.875
995.000	4667910.188	8865.016	4390017.563
1000.000	4660866.188	8240.749	4395327.250
1005.000	4654880.750	7585.499	4399659.625
1010.000	4649720.125	6905.880	4403228.250
1015.000	4645204.250	6207.140	4406198.188
1020.000	4641195.750	5493.212	4408697.063
1025.000	4637595.000	4767.150	4410822.438
1030.000	4634326.375	4031.232	4412652.313
1035.000	4631330.438	3287.408	4414250.438
1040.000	4628546.625	2537.368	4415669.813
1045.000	4625905.875	1782.868	4416950.125
1050.000	4623375.938	1024.831	4418122.188
1055.000	4620943.813	263.944	4419213.250
1060.000	4618601.500	-499.350	4420248.000
1065.000	4616342.438	-1264.559	4421247.500
1070.000	4614158.000	-2031.356	4422228.563
1075.000	4612038.188	-2799.344	4423202.750
1080.000	4609973.250	-3568.306	4424178.313
1085.000	4607955.063	-4337.968	4425160.750
1090.000	4605975.563	-5108.220	4426153.188
1095.000	4604028.125	-5878.879	4427157.000
1100.000	4602106.938	-6649.914	4428172.563
1105.000	4600207.938	-7421.201	4429199.625
1110.000	4598327.438	-8192.756	4430237.938
1115.000	4596463.313	-8964.491	4431287.125
1120.000	4594613.875	-9736.449	4432347.313
1125.000	4592778.313	-10508.562	4433418.250
1130.000	4590955.188	-11280.883	4434499.625
1135.000	4589143.750	-12053.349	4435590.688
1140.000	4587342.938	-12826.019	4436691.125
1145.000	4585552.125	-13598.834	4437700.188

TABLE 8-XXXII

VEHICLE POSITION COORDINATES - S-II
 EXPENDED-STAGE TRAJECTORY
 (90 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
1150.000	4583770.625	-14371.854	4438917.500
1155.000	4581997.875	-15145.021	4440042.500
1160.000	4580233.375	-15918.398	4441174.938
1165.000	4578476.813	-16691.926	4442314.188
1170.000	4576727.563	-17465.666	4443460.063
1175.000	4574985.438	-18239.562	4444612.188
1180.000	4573249.938	-19013.674	4445770.250
1185.000	4571520.813	-19787.945	4446933.875
1190.000	4569797.625	-20562.434	4448102.750
1195.000	4568080.125	-21337.086	4449276.625
1200.000	4566367.938	-22111.959	4450455.188
1205.000	4564660.750	-22886.994	4451638.000
1210.000	4562958.250	-23662.252	4452825.000
SPLASH 1210.596	4562755.563	-23754.703	4452966.750

TABLE 8-XXXIII VEHICLE VELOCITY COMPONENTS - S-II
 EXPANDED STAGE TRAJECTORY
 (90 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
SFP	537.424	-1905.418	-6.965	6759.199
	540.424	-1932.106	-6.998	6751.508
	545.000	-1972.755	-7.049	6739.615
	550.000	-2017.115	-7.105	6726.392
	555.000	-2061.357	-7.160	6712.932
	560.000	-2105.605	-7.215	6699.235
	565.000	-2149.745	-7.271	6685.303
	570.000	-2193.805	-7.325	6671.134
	575.000	-2237.798	-7.380	6656.729
	580.000	-2281.713	-7.435	6642.088
	585.000	-2325.550	-7.489	6627.212
	590.000	-2369.312	-7.543	6612.099
	595.000	-2412.996	-7.598	6596.753
	600.000	-2456.603	-7.652	6581.170
	605.000	-2500.130	-7.705	6565.353
	610.000	-2543.575	-7.759	6549.301
	615.000	-2586.947	-7.813	6533.014
	620.000	-2630.235	-7.866	6516.492
	625.000	-2673.441	-7.919	6499.737
	630.000	-2716.566	-7.972	6482.746
	635.000	-2759.607	-8.025	6465.522
	640.000	-2802.565	-8.078	6448.064
	645.000	-2845.438	-8.130	6430.372
	650.000	-2888.227	-8.183	6412.445
	655.000	-2930.929	-8.235	6394.286
	660.000	-2973.546	-8.287	6375.892
	665.000	-3016.075	-8.339	6357.265
	670.000	-3058.517	-8.391	6338.404
	675.000	-3100.865	-8.443	6319.311
	680.000	-3143.133	-8.494	6299.983
	685.000	-3185.305	-8.546	6280.423
	690.000	-3227.388	-8.597	6260.629
	695.000	-3269.377	-8.648	6240.603
	700.000	-3311.276	-8.699	6220.343
	705.000	-3353.080	-8.750	6199.851
	710.000	-3394.791	-8.800	6179.124
	715.000	-3436.406	-8.851	6158.166
	720.000	-3477.927	-8.901	6136.974
	725.000	-3519.350	-8.951	6115.550
	730.000	-3560.678	-9.001	6093.893
	735.000	-3601.906	-9.051	6072.003

TABLE 8-XXXIII VEHICLE VELOCITY COMPONENT
EXPANDED STAGE TRAJECTORY
(9C -DEGREES LAUNCH AZIMU
(CONTINUED)

TIME SEC	XDOT M/SEC	YDOTDOT M/SEC/SEC
740.000	-3643.036	
745.000	-3684.066	-9.10.880
750.000	-3724.997	-9.17.525
755.000	-3765.824	-9.24.937
760.000	-3806.552	-9.22.116
765.000	-3847.175	-9.29.062
770.000	-3887.695	-9.345.776
775.000	-3928.110	-9.352.256
780.000	-3968.420	-9.448.504
785.000	-4008.623	-9.494.519
790.000	-4048.720	-9.540.301
795.000	-4088.707	-9.595.850
800.000	-4128.586	-9.6391.167
805.000	-4168.354	-9.6856.249
810.000	-4208.013	-9.7341.100
815.000	-4247.557	-9.7815.716
820.000	-4286.991	-9.8300.100
825.000	-4326.308	-9.8764.249
830.000	-4365.512	-9.9238.165
835.000	-4404.598	-9.9711.845
840.000	-4443.566	-10.0185.292
845.000	-4482.412	-10.0658.501
850.000	-4521.136	-10.1131.475
855.000	-4559.733	-10.1604.208
860.000	-4598.197	-10.20876.700
865.000	-4636.521	-10.25548.942
870.000	-4674.692	-10.30320.931
875.000	-4712.686	-10.35192.650
880.000	-4750.466	-10.401364.077
885.000	-4787.965	-10.453335.170
890.000	-4825.060	-10.510305.862
895.000	-4861.512	-10.574276.019
900.000	-4896.961	-10.652245.401
905.000	-4930.742	-10.755213.634
910.000	-4961.909	-10.900180.054
915.000	-4989.015	-11.115143.718
920.000	-5009.809	-11.438103.233
925.000	-5020.946	-11.933056.423
930.000	-5017.714	-12.693000.152
935.000	-4993.701	-13.8461930.053
940.000	-4940.615	-15.5701840.318
		-18.0941723.604

TABLE 8-XXXIII VEHICLE VELOCITY COMPONENTS - S-II
 EXPANDED STAGE TRAJECTORY
 (90 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
945.000	-4848.457	-21.690	4571.312
950.000	-4706.292	-26.657	4374.408
955.000	-4504.092	-33.265	4125.215
960.000	-4235.353	-41.682	3819.775
965.000	-3895.141	-52.028	3456.056
970.000	-3491.161	-64.071	3043.566
975.000	-3048.515	-77.097	2606.716
980.000	-2603.410	-90.096	2178.271
985.000	-2190.984	-102.095	1788.279
990.000	-1830.874	-112.558	1452.273
995.000	-1532.331	-121.244	1175.999
1000.000	-1293.918	-128.209	956.013
1005.000	-1107.523	-133.690	783.706
1010.000	-962.185	-137.993	648.911
1015.000	-848.357	-141.387	543.098
1020.000	-757.988	-144.088	459.513
1025.000	-684.618	-146.270	393.155
1030.000	-624.562	-148.033	340.844
1035.000	-575.438	-149.450	300.177
1040.000	-540.753	-150.498	268.861
1045.000	-516.401	-151.279	244.297
1050.000	-495.873	-151.911	225.459
1055.000	-477.184	-152.434	211.835
1060.000	-459.841	-152.864	202.833
1065.000	-444.015	-153.213	197.628
1070.000	-430.041	-153.489	195.259
1075.000	-418.178	-153.703	194.771
1080.000	-408.023	-153.868	195.707
1085.000	-399.507	-153.996	197.473
1090.000	-392.478	-154.094	199.639
1095.000	-386.688	-154.172	201.960
1100.000	-381.883	-154.233	204.305
1105.000	-377.855	-154.285	206.588
1110.000	-374.392	-154.329	208.807
1115.000	-371.318	-154.369	210.980
1120.000	-368.458	-154.407	213.171
1125.000	-365.831	-154.443	215.290
1130.000	-363.421	-154.478	217.303
1135.000	-361.201	-154.513	219.301
1140.000	-359.140	-154.548	220.991
1145.000	-357.216	-154.583	222.680

TABLE 8-XXXIII VEHICLE VELOCITY COMPONENTS - S-II
 EXPENDED STAGE TRAJECTORY
 (90 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
1150.000	-355.410	-154.618	224.275
1155.000	-353.707	-154.654	225.784
1160.000	-352.096	-154.690	227.213
1165.000	-350.571	-154.726	228.567
1170.000	-349.124	-154.763	229.851
1175.000	-347.753	-154.800	231.066
1180.000	-346.452	-154.838	232.215
1185.000	-345.221	-154.876	233.301
1190.000	-344.057	-154.914	234.324
1195.000	-342.959	-154.952	235.286
1200.000	-341.927	-154.990	236.186
1205.000	-340.958	-155.029	237.027
1210.000	-340.054	-155.068	237.807
SPLASH 1210.596	-339.979	-155.071	237.870

TABLE 8-XXXIV

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (99 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
SEP	537.424	189449.3			
	540.424	189518.1	842.2	25.269	-65.332
	545.000	189592.8	852.6	25.216	-65.150
	550.000	189632.1	868.4	25.136	-64.873
	555.000	189627.4	885.7	25.047	-64.571
	560.000	189578.6	903.0	24.958	-64.268
	565.000	189486.0	920.3	24.868	-63.967
	570.000	189349.2	937.7	24.777	-63.666
	575.000	189168.3	955.0	24.685	-63.365
	580.000	188943.5	972.3	24.593	-63.065
	585.000	188674.7	989.6	24.501	-62.765
	590.000	188361.7	1006.9	24.407	-62.466
	595.000	188004.9	1024.2	24.313	-62.167
	600.000	187604.1	1041.6	24.218	-61.868
	605.000	187159.2	1058.9	24.122	-61.570
	610.000	186670.4	1076.2	24.026	-61.273
	615.000	186137.7	1093.5	23.929	-60.975
	620.000	185560.9	1110.9	23.832	-60.679
	625.000	184940.4	1128.2	23.734	-60.382
	630.000	184275.7	1145.5	23.635	-60.086
	635.000	183567.2	1162.9	23.535	-59.791
	640.000	182814.8	1180.2	23.435	-59.496
	645.000	182018.5	1197.6	23.334	-59.201
	650.000	181178.1	1214.9	23.232	-58.907
	655.000	180294.0	1232.3	23.130	-58.613
	660.000	179366.1	1249.6	23.027	-58.320
	665.000	178394.3	1267.0	22.924	-58.027
	670.000	177378.6	1284.4	22.820	-57.734
	675.000	176319.3	1301.7	22.715	-57.442
	680.000	175216.0	1319.1	22.609	-57.150
	685.000	174069.1	1336.5	22.503	-56.858
	690.000	172878.3	1353.9	22.397	-56.567
	695.000	171643.9	1371.3	22.289	-56.276
	700.000	170365.8	1388.7	22.181	-55.986
	705.000	169044.0	1406.1	22.073	-55.696
	710.000	167678.5	1423.6	21.963	-55.406
	715.000	166269.4	1441.0	21.854	-55.117
	720.000	164816.7	1458.4	21.743	-54.828
	725.000	163320.3	1475.9	21.632	-54.539
	730.000	161780.5	1493.3	21.520	-54.250
	735.000	160197.0	1510.8	21.408	-53.962
			1528.3	21.295	-53.675

TABLE 8-XXXIV

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
740.000	158570.1	1545.7	21.181	-53.387
745.000	156899.7	1563.2	21.067	-53.100
750.000	155185.8	1580.7	20.952	-52.813
755.000	153428.6	1598.3	20.836	-52.527
760.000	151627.9	1615.8	20.720	-52.241
765.000	149783.8	1633.3	20.604	-51.955
770.000	147896.3	1650.8	20.486	-51.669
775.000	145965.8	1668.4	20.368	-51.384
780.000	143991.8	1686.0	20.250	-51.099
785.000	141974.6	1703.5	20.131	-50.815
790.000	139914.1	1721.1	20.011	-50.530
795.000	137810.6	1738.7	19.890	-50.246
800.000	135663.9	1756.3	19.769	-49.962
805.000	133474.1	1774.0	19.648	-49.678
810.000	131241.3	1791.6	19.526	-49.395
815.000	128965.4	1809.2	19.403	-49.112
820.000	126646.5	1826.9	19.280	-48.829
825.000	124284.7	1844.6	19.156	-48.546
830.000	121880.0	1862.3	19.031	-48.264
835.000	119432.6	1880.0	18.906	-47.982
840.000	116942.1	1897.7	18.780	-47.700
845.000	114409.0	1915.4	18.654	-47.418
850.000	111833.2	1933.2	18.527	-47.136
855.000	109214.7	1950.9	18.400	-46.855
860.000	106553.5	1968.7	18.272	-46.574
865.000	103850.0	1986.5	18.143	-46.293
870.000	101103.7	2004.3	18.014	-46.012
875.000	98315.1	2022.1	17.884	-45.732
880.000	95484.2	2040.0	17.754	-45.451
885.000	92611.1	2057.8	17.623	-45.171
890.000	89695.9	2075.7	17.491	-44.891
895.000	86739.1	2093.6	17.359	-44.611
900.000	83741.2	2111.5	17.227	-44.332
905.000	80702.9	2129.4	17.094	-44.053
910.000	77625.9	2147.2	16.960	-43.774
915.000	74512.1	2165.1	16.827	-43.497
920.000	71364.9	2182.9	16.693	-43.220
925.000	68189.5	2200.7	16.560	-42.945
930.000	64993.4	2218.2	16.427	-42.673
935.000	61787.5	2235.6	16.295	-42.404
940.000	58586.9	2252.7	16.166	-42.141

TABLE 8-XXXIV

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
945.000	55412.2	2269.2	16.039	-41.886
950.000	52289.1	2285.2	15.918	-41.641
955.000	49249.5	2300.2	15.803	-41.409
960.000	46328.9	2314.1	15.696	-41.195
965.000	43568.4	2326.7	15.599	-41.002
970.000	41006.0	2337.8	15.514	-40.833
975.000	38667.9	2347.1	15.441	-40.689
980.000	36559.8	2354.9	15.381	-40.571
985.000	34667.9	2361.1	15.333	-40.475
990.000	32966.5	2366.1	15.294	-40.399
995.000	31422.4	2370.0	15.264	-40.339
1000.000	30001.2	2373.1	15.240	-40.293
1005.000	28672.6	2375.5	15.222	-40.256
1010.000	27413.3	2377.4	15.207	-40.227
1015.000	26206.7	2378.9	15.195	-40.204
1020.000	25043.7	2380.0	15.186	-40.187
1025.000	23920.8	2380.9	15.179	-40.173
1030.000	22837.8	2381.6	15.174	-40.162
1035.000	21792.3	2382.2	15.170	-40.154
1040.000	20763.3	2382.6	15.166	-40.148
1045.000	19739.5	2382.9	15.164	-40.143
1050.000	18727.8	2383.2	15.162	-40.139
1055.000	17739.0	2383.4	15.161	-40.136
1060.000	16783.9	2383.5	15.159	-40.134
1065.000	15869.4	2383.6	15.159	-40.132
1070.000	14997.8	2383.7	15.158	-40.131
1075.000	14168.2	2383.7	15.158	-40.130
1080.000	13378.6	2383.8	15.157	-40.130
1085.000	12626.5	2383.8	15.157	-40.129
1090.000	11907.4	2383.8	15.157	-40.129
1095.000	11217.4	2383.8	15.157	-40.129
1100.000	10553.4	2383.8	15.157	-40.129
1105.000	9912.2	2383.8	15.157	-40.129
1110.000	9291.8	2383.9	15.157	-40.128
1115.000	8690.7	2383.9	15.157	-40.128
1120.000	8108.0	2383.9	15.157	-40.128
1125.000	7542.8	2383.9	15.157	-40.128
1130.000	6993.9	2383.9	15.157	-40.128
1135.000	6460.2	2383.9	15.157	-40.128
1140.000	5940.7	2383.9	15.157	-40.128
1145.000	5434.7	2383.9	15.157	-40.128

TABLE 8-XXXIV

ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
1150.000	4941.4	2383.9	15.157	-40.128
1155.000	4460.1	2383.9	15.157	-40.128
1160.000	3990.3	2383.9	15.157	-40.128
1165.000	3531.3	2383.9	15.157	-40.128
1170.000	3082.7	2383.9	15.157	-40.128
1175.000	2643.9	2383.9	15.157	-40.128
1180.000	2214.3	2383.9	15.157	-40.128
1185.000	1793.8	2383.9	15.157	-40.128
1190.000	1381.7	2383.9	15.157	-40.128
1195.000	977.6	2383.9	15.157	-40.128
1200.000	581.0	2383.9	15.157	-40.128
1205.000	191.4	2383.9	15.157	-40.128
SPLASH 1207.491	.0	2383.9	15.157	-40.128

TABLE 8-XXXV

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-II EXPENDED-STAGE TRAJECTORY
(99 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
SEP	537.424	7017.6251	6603.2155	.25	9.259
	540.424	7017.5233	6603.1199	.21	9.258
	545.000	7017.4084	6603.0169	.14	9.258
	550.000	7017.3386	6602.9633	.07	9.258
	555.000	7017.3265	6602.9713	-.00	9.258
	560.000	7017.3725	6603.0408	-.07	9.258
	565.000	7017.4766	6603.1718	-.15	9.258
	570.000	7017.6385	6603.3644	-.22	9.259
	575.000	7017.8586	6603.6185	-.29	9.259
	580.000	7018.1366	6603.9341	-.36	9.260
	585.000	7018.4725	6604.3113	-.43	9.260
	590.000	7018.8666	6604.7501	-.50	9.261
	595.000	7019.3186	6605.2502	-.58	9.262
	600.000	7019.8286	6605.8120	-.65	9.263
	605.000	7020.3965	6606.4353	-.72	9.265
	610.000	7021.0225	6607.1200	-.79	9.266
	615.000	7021.7065	6607.8663	-.86	9.268
	620.000	7022.4485	6608.6740	-.93	9.269
	625.000	7023.2484	6609.5432	-1.00	9.271
	630.000	7024.1063	6610.4738	-1.08	9.273
	635.000	7025.0223	6611.4660	-1.15	9.275
	640.000	7025.9962	6612.5196	-1.22	9.277
	645.000	7027.0280	6613.6346	-1.29	9.279
	650.000	7028.1180	6614.8112	-1.36	9.281
	655.000	7029.2658	6616.0491	-1.43	9.284
	660.000	7030.4716	6617.3484	-1.50	9.286
	665.000	7031.7355	6618.7092	-1.57	9.289
	670.000	7033.0573	6620.1315	-1.65	9.292
	675.000	7034.4371	6621.6151	-1.72	9.295
	680.000	7035.8748	6623.1600	-1.79	9.298
	685.000	7037.3705	6624.7664	-1.86	9.301
	690.000	7038.9244	6626.4341	-1.93	9.305
	695.000	7040.5360	6628.1632	-2.00	9.308
	700.000	7042.2057	6629.9537	-2.07	9.312
	705.000	7043.9332	6631.8054	-2.14	9.316
	710.000	7045.7189	6633.7186	-2.21	9.319
	715.000	7047.5524	6635.6930	-2.28	9.323
	720.000	7049.4641	6637.7287	-2.35	9.328
	725.000	7051.4235	6639.8257	-2.42	9.332
	730.000	7053.4409	6641.9841	-2.49	9.336

TABLE 8-XXXV

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-II EXPENDED-STAGE TRAJECTORY
(99 -DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
740.000	7057.6498	6646.4845	-2.63	9.345
745.000	7059.8410	6648.8265	-2.70	9.350
750.000	7062.0903	6651.2298	-2.77	9.355
755.000	7064.3973	6653.6942	-2.84	9.360
760.000	7066.7625	6656.2199	-2.91	9.365
765.000	7069.1854	6658.8066	-2.98	9.370
770.000	7071.6663	6661.4546	-3.05	9.376
775.000	7074.2050	6664.1635	-3.12	9.381
780.000	7076.8016	6666.9337	-3.19	9.387
785.000	7079.4559	6669.7647	-3.26	9.393
790.000	7082.1681	6672.6567	-3.32	9.399
795.000	7084.9379	6675.6096	-3.39	9.405
800.000	7087.7653	6678.6234	-3.46	9.411
805.000	7090.6502	6681.6976	-3.53	9.417
810.000	7093.5927	6684.8326	-3.60	9.424
815.000	7096.5922	6688.0278	-3.67	9.430
820.000	7099.6487	6691.2831	-3.73	9.437
825.000	7102.7617	6694.5979	-3.80	9.444
830.000	7105.9304	6697.9717	-3.87	9.451
835.000	7109.1538	6701.4032	-3.94	9.458
840.000	7112.4307	6704.8912	-4.00	9.465
845.000	7115.7588	6708.4334	-4.07	9.472
850.000	7119.1349	6712.0268	-4.14	9.480
855.000	7122.5523	6715.6644	-4.21	9.487
860.000	7126.0031	6719.3386	-4.27	9.494
865.000	7129.4727	6723.0344	-4.34	9.501
870.000	7132.9352	6726.7261	-4.40	9.508
875.000	7136.3442	6730.3672	-4.47	9.514
880.000	7139.6244	6733.8825	-4.54	9.518
885.000	7142.6329	6737.1289	-4.60	9.521
890.000	7145.0978	6739.8344	-4.67	9.520
895.000	7146.5768	6741.5566	-4.73	9.519
900.000	7146.3249	6741.5502	-4.80	9.528
905.000	7143.1170	6738.5898	-4.87	9.583
910.000	7135.2993	6731.0209	-4.93	9.777
915.000	7120.1782	6716.1491	-5.00	10.331
920.000	7093.7661	6689.9854	-5.07	11.672
925.000	7050.3878	6646.8528	-5.14	14.416
930.000	6982.2677	6578.9730	-5.22	19.200
935.000	6879.2642	6476.2005	-5.30	26.534

TABLE 8-XXXV

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
 FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
 S-II EXPENDED-STAGE TRAJECTORY
 (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
945.000	6517.2536	6114.6015		
950.000	6230.7102	5828.2223	-5.51	49.896
955.000	5859.6475	5457.2807	-5.64	65.484
960.000	5398.3693	4996.0621	-5.81	82.210
965.000	4849.9597	4447.6234	-6.01	99.901
970.000	4241.5085	3839.0280	-6.27	114.308
975.000	3618.3224	3215.5643	-6.60	121.250
980.000	3029.6548	2626.4905	-7.01	118.520
985.000	2510.1063	2106.4443	-7.53	107.325
990.000	2073.9245	1669.7533	-8.17	92.363
995.000	1723.3097	1318.7769	-8.93	75.609
1000.000	1448.7310	1044.2102	-9.83	59.982
1005.000	1235.9666	832.1057	-10.87	46.835
1010.000	1070.7751	668.5144	-12.02	36.671
1015.000	941.8079	542.3750	-13.26	28.834
1020.000	839.5816	444.3859	-14.53	22.918
1025.000	758.0616	368.5890	-15.77	18.454
1030.000	692.9682	310.5774	-16.90	14.866
1035.000	643.6017	269.7394	-17.85	11.841
1040.000	609.6757	246.0568	-18.70	8.351
1045.000	583.0874	229.6468	-19.67	6.420
1050.000	560.8258	216.2839	-20.45	5.214
1055.000	541.7661	204.1373	-20.93	4.328
1060.000	525.5101	192.5621	-21.05	3.665
1065.000	511.9588	181.6181	-20.85	3.095
1070.000	501.0370	171.6915	-20.41	2.604
1075.000	492.3379	162.6618	-19.84	2.161
1080.000	485.4663	154.4422	-19.18	1.861
1085.000	480.1481	147.1879	-18.49	1.573
1090.000	476.0629	140.8497	-17.82	1.322
1095.000	472.9188	135.3041	-17.20	1.117
1100.000	470.4802	130.4278	-16.62	.954
1105.000	468.5540	126.0727	-16.09	.825
1110.000	466.9951	122.1124	-15.61	.732
1115.000	465.6640	118.3165	-15.16	.679
1120.000	464.5158	114.7165	-14.72	.647
1125.000	463.5212	111.3495	-14.30	.603
1130.000	462.6493	108.2055	-13.90	.559
1135.000	461.8744	105.2617	-13.53	.519
1140.000	461.1770	102.4943	-13.17	.484
			-12.84	.453

TABLE 8-XXXV

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
 FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
 S-II EXPENDED-STAGE TRAJECTORY
 (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
1150.000	459.9604	97.4115	-12.23	.400
1155.000	459.4229	95.0663	-11.94	.378
1160.000	458.9244	92.8376	-11.67	.357
1165.000	458.4606	90.7179	-11.41	.337
1170.000	458.0280	88.7006	-11.17	.319
1175.000	457.6241	86.7817	-10.93	.301
1180.000	457.2470	84.9578	-10.71	.284
1185.000	456.8948	83.2263	-10.50	.267
1190.000	456.5661	81.5857	-10.29	.251
1195.000	456.2596	80.0347	-10.10	.235
1200.000	455.9744	78.5723	-9.92	.219
1205.000	455.7093	77.1980	-9.75	.203
SPLASH 1207.491	455.5909	76.5789	-9.68	.204

TABLE R-XXXVI

VEHICLE POSITION COORDINATES - S-II
EXPENDED-STAGE TRAJECTORY
(99 -DEGREES LAUNCH AZIMUTH)

	TIME SEC	X M	Y M	Z M
SFP	537.424	6309680.000	-16212.961	1808431.656
	540.424	6303927.000	-16387.254	1828684.484
	545.000	6294999.188	-16652.483	1859526.938
	550.000	6285030.688	-16941.500	1893167.328
	555.000	6274841.000	-17229.650	1926739.703
	560.000	6264429.563	-17516.946	1960245.563
	565.000	6253797.688	-17803.354	1993681.031
	570.000	6242944.875	-18088.890	2027047.609
	575.000	6231872.250	-18373.521	2060341.453
	580.000	6220579.438	-18657.259	2093564.031
	585.000	6209067.625	-18940.075	2126711.469
	590.000	6197336.313	-19221.980	2159785.313
	595.000	6185386.750	-19502.944	2192781.688
	600.000	6173218.500	-19782.980	2225702.125
	605.000	6160832.875	-20062.056	2258542.781
	610.000	6148229.188	-20340.185	2291305.125
	615.000	6135408.938	-20617.335	2323985.344
	620.000	6122371.500	-20893.522	2356584.844
	625.000	6109118.313	-21168.712	2389099.875
	630.000	6095648.688	-21442.920	2421531.875
	635.000	6081964.125	-21716.113	2453877.063
	640.000	6068064.000	-21988.305	2486136.844
	645.000	6053949.750	-22259.465	2518307.500
	650.000	6039620.750	-22529.606	2550390.406
	655.000	6025078.500	-22798.697	2582381.844
	660.000	6010322.375	-23066.750	2614283.188
	665.000	5995353.875	-23333.737	2646090.781
	670.000	5980172.250	-23599.667	2677805.969
	675.000	5964779.188	-23864.513	2709425.000
	680.000	5949173.938	-24128.285	2740949.313
	685.000	5933358.125	-24390.954	2772375.156
	690.000	5917331.000	-24652.531	2803703.875
	695.000	5901094.250	-24912.988	2834931.813
	700.000	5884647.063	-25172.336	2866060.313
	705.000	5867991.250	-25430.546	2897085.719
	710.000	5851125.875	-25687.630	2928009.313
	715.000	5834052.750	-25943.558	2958827.500
	720.000	5816771.063	-26198.341	2989541.563
	725.000	5799282.625	-26451.952	3020147.906
	730.000	5781586.563	-26704.400	3050647.813
	735.000	5763684.688	-26955.657	3081037.625

TABLE 8-XXXVI VEHICLE POSITION COORDINATES - S-II
 EXPANDED-STAGE TRAJECTORY
 (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
740.000	5745576.188	-27205.735	3111318.656
745.000	5727262.875	-27454.605	3141487.344
750.000	5708743.813	-27702.278	3171544.875
755.000	5690021.063	-27948.726	3201487.656
760.000	5671093.563	-28193.959	3231317.031
765.000	5651963.375	-28437.950	3261029.344
770.000	5632629.438	-28680.708	3290625.844
775.000	5613093.875	-28922.207	3320103.031
780.000	5593355.625	-29162.456	3349462.031
785.000	5573416.813	-29401.428	3378699.406
790.000	5553276.313	-29639.134	3407816.219
795.000	5532936.313	-29875.545	3436809.094
800.000	5512395.750	-30110.673	3465679.156
805.000	5491656.750	-30344.490	3494422.875
810.000	5470718.313	-30577.005	3523041.406
815.000	5449582.563	-30808.192	3551531.281
820.000	5428248.438	-31038.061	3579893.625
825.000	5406718.188	-31266.586	3608125.063
830.000	5384990.625	-31493.775	3636226.594
835.000	5363068.125	-31719.604	3664194.813
840.000	5340949.563	-31944.081	3692030.813
845.000	5318637.188	-32167.181	3719731.125
850.000	5296129.938	-32388.914	3747296.813
855.000	5273430.188	-32609.255	3774724.406
860.000	5250536.813	-32828.215	3802014.844
865.000	5227452.375	-33045.773	3829164.750
870.000	5204175.750	-33261.942	3856174.813
875.000	5180709.688	-33476.706	3883041.469
880.000	5157053.438	-33690.088	3909765.156
885.000	5133210.313	-33902.093	3936341.563
890.000	5109180.688	-34112.777	3962770.094
895.000	5084969.813	-34322.204	3989044.406
900.000	5060581.125	-34530.537	4015160.531
905.000	5036025.500	-34738.013	4041106.688
910.000	5011314.875	-34945.067	4066870.219
915.000	4986472.750	-35152.344	4092427.000
920.000	4961530.563	-35360.899	4117745.375
925.000	4936541.250	-35572.314	4142773.188
930.000	4911578.313	-35788.983	4167439.469
935.000	4886752.250	-36014.312	4191639.188
940.000	4862212.000	-36253.086	4215233.375

TABLE 8-XXXVI

 VEHICLE POSITION COORDINATES - S-II
 EXPENDED-STAGE TRAJECTORY
 (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
545.000	4838160.938	-36511.645	4238036.000
550.000	4814852.563	-36798.058	4259819.813
555.000	4792592.188	-37121.836	4280317.875
560.000	4771712.688	-37493.478	4299247.875
565.000	4752568.500	-37923.919	4316320.313
570.000	4735461.000	-38422.495	4331306.188
575.000	4720562.125	-38994.175	4344102.313
580.000	4707860.500	-39638.249	4354771.250
585.000	4697181.438	-40348.671	4363515.563
590.000	4688257.563	-41116.657	4370610.750
595.000	4680783.813	-41932.135	4376354.000
1000.000	4674464.875	-42785.581	4381023.000
1005.000	4669048.938	-43668.737	4384850.438
1010.000	4664336.875	-44575.207	4388019.563
1015.000	4660177.250	-45499.940	4390671.313
1020.000	4656457.188	-46439.268	4392914.250
1025.000	4653094.375	-47390.301	4394832.750
1030.000	4650024.000	-48350.873	4396495.938
1035.000	4647190.063	-49318.983	4397960.875
1040.000	4644521.188	-50292.583	4399272.750
1045.000	4641971.113	-51270.165	4400464.750
1050.000	4639522.563	-52251.068	4401565.500
1055.000	4637166.063	-53234.714	4402600.625
1060.000	4634895.313	-54220.766	4403592.938
1065.000	4632702.438	-55208.762	4404560.625
1070.000	4630577.875	-56198.411	4405517.313
1075.000	4628511.625	-57189.305	4406472.250
1080.000	4626494.938	-58181.260	4407432.125
1085.000	4624520.063	-59173.980	4408400.938
1090.000	4622579.438	-60167.365	4409380.563
1095.000	4620667.188	-61161.199	4410371.563
1100.000	4618778.438	-62155.459	4411374.188
1105.000	4616909.563	-63149.996	4412388.063
1110.000	4615057.688	-64144.833	4413412.938
1115.000	4613221.125	-65139.864	4414448.563
1120.000	4611398.625	-66135.150	4415495.063
1125.000	4609589.188	-67130.603	4416552.000
1130.000	4607791.688	-68126.283	4417618.938
1135.000	4606005.188	-69122.108	4418695.125
1140.000	4604228.875	-70118.148	4419780.125
1145.000	4602462.188	-71114.323	4420873.500

TABLE 8-XXXVI

VEHICLE POSITION COORDINATES - S-II
 EXPENDED-STAGE TRAJECTORY
 (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
1150.000	4600704.313	-72110.707	4421974.750
1155.000	4598955.000	-73107.219	4423083.375
1160.000	4597213.625	-74103.936	4424199.125
1165.000	4595479.875	-75100.777	4425321.500
1170.000	4593753.188	-76097.821	4426450.188
1175.000	4592033.438	-77094.988	4427584.875
1180.000	4590320.000	-78092.354	4428725.125
1185.000	4588612.813	-79089.842	4429870.750
1190.000	4586911.250	-80087.524	4431021.500
1195.000	4585215.188	-81085.325	4432176.938
1200.000	4583524.188	-82083.317	4433336.750
1205.000	4581838.063	-83081.422	4434500.688
SPLASH 1207.491	4580999.688	-83578.758	4435082.063

TABLE 8-XXXVII VEHICLE VELOCITY COMPONENTS - S-II
 EXPENDED STAGE TRAJECTORY
 (99 -DEGREES LAUNCH AZIMUTH)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
SEP 537.424	-1904.114	-58.142	6754.112
540.424	-1930.807	-58.042	6746.425
545.000	-1971.467	-57.888	6734.537
550.000	-2015.831	-57.717	6721.320
555.000	-2060.121	-57.545	6707.866
560.000	-2104.340	-57.371	6694.175
565.000	-2148.485	-57.195	6680.248
570.000	-2192.558	-57.017	6666.085
575.000	-2236.555	-56.838	6651.686
580.000	-2280.479	-56.656	6637.051
585.000	-2324.325	-56.473	6622.181
590.000	-2368.097	-56.288	6607.075
595.000	-2411.790	-56.101	6591.734
600.000	-2455.407	-55.912	6576.157
605.000	-2498.943	-55.721	6560.346
610.000	-2542.403	-55.529	6544.300
615.000	-2585.781	-55.334	6528.020
620.000	-2629.080	-55.138	6511.504
625.000	-2672.296	-54.940	6494.754
630.000	-2715.432	-54.741	6477.770
635.000	-2758.484	-54.539	6460.552
640.000	-2801.454	-54.336	6443.099
645.000	-2844.339	-54.131	6425.413
650.000	-2887.140	-53.924	6407.492
655.000	-2929.854	-53.715	6389.339
660.000	-2972.484	-53.504	6370.951
665.000	-3015.025	-53.292	6352.330
670.000	-3057.479	-53.078	6333.474
675.000	-3099.844	-52.862	6314.387
680.000	-3142.122	-52.645	6295.064
685.000	-3184.307	-52.425	6275.510
690.000	-3226.404	-52.204	6255.721
695.000	-3268.408	-51.981	6235.700
700.000	-3310.321	-51.756	6215.445
705.000	-3352.139	-51.530	6194.958
710.000	-3393.865	-51.302	6174.237
715.000	-3435.496	-51.072	6153.284
720.000	-3477.032	-50.840	6132.096
725.000	-3518.471	-50.606	6110.677
730.000	-3559.814	-50.371	6089.024
735.000	-3601.058	-50.134	6067.139

TABLE 8-XXXVII VEHICLE VELOCITY COMPONENTS - S-II
 EXPANDED STAGE TRAJECTORY
 (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
740.000	-3642.206	-49.895	6045.020
745.000	-3683.252	-49.655	6022.669
750.000	-3724.200	-49.413	6000.085
755.000	-3765.045	-49.169	5977.268
760.000	-3805.790	-48.923	5954.217
765.000	-3846.431	-48.675	5930.935
770.000	-3886.970	-48.426	5907.418
775.000	-3927.402	-48.175	5883.669
780.000	-3967.732	-47.923	5859.687
785.000	-4007.953	-47.668	5835.472
790.000	-4048.069	-47.412	5811.023
795.000	-4088.076	-47.154	5786.342
800.000	-4127.975	-46.895	5761.427
805.000	-4167.763	-46.634	5736.279
810.000	-4207.442	-46.371	5710.897
815.000	-4247.007	-46.106	5685.282
820.000	-4286.461	-45.840	5659.431
825.000	-4325.799	-45.572	5633.348
830.000	-4365.024	-45.302	5607.028
835.000	-4404.130	-45.031	5580.473
840.000	-4443.118	-44.758	5553.681
845.000	-4481.984	-44.484	5526.650
850.000	-4520.727	-44.208	5499.378
855.000	-4559.339	-43.931	5471.860
860.000	-4597.816	-43.652	5444.089
865.000	-4636.145	-43.373	5416.056
870.000	-4674.311	-43.093	5387.739
875.000	-4712.277	-42.815	5359.106
880.000	-4749.936	-42.538	5330.100
885.000	-4787.365	-42.267	5300.619
890.000	-4824.198	-42.008	5270.462
895.000	-4860.185	-41.770	5239.314
900.000	-4894.807	-41.570	5206.640
905.000	-4927.196	-41.436	5171.571
910.000	-4956.173	-41.406	5132.946
915.000	-4979.803	-41.541	5088.887
920.000	-4995.204	-41.933	5036.635
925.000	-4998.233	-42.714	4972.304
930.000	-4983.168	-44.066	4890.620
935.000	-4942.461	-46.227	4784.791
940.000	-4866.734	-49.494	4646.584

TABLE 8-XXXVII VEHICLE VELOCITY COMPONENTS - S-II
 EXPENDED STAGE TRAJECTORY
 (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
945.000			
950.000	-4745.307	-54.203	4466.958
955.000	-4567.547	-60.685	4237.403
960.000	-4325.450	-69.185	3952.362
965.000	-4013.673	-79.859	3609.216
970.000	-3633.187	-92.660	3211.460
975.000	-3202.943	-106.967	2778.509
980.000	-2756.058	-121.717	2341.279
985.000	-2329.490	-135.736	1932.320
990.000	-1949.910	-148.182	1573.698
995.000	-1629.027	-158.697	1273.676
1000.000	-1369.686	-167.204	1032.376
1005.000	-1165.655	-173.915	842.511
1010.000	-1006.796	-179.158	694.174
1015.000	-882.622	-183.270	577.884
1020.000	-784.700	-186.516	486.272
1025.000	-705.753	-189.123	413.573
1030.000	-641.331	-191.230	356.067
1035.000	-588.405	-192.934	311.063
1040.000	-547.797	-194.242	276.427
1045.000	-520.977	-195.150	249.408
1050.000	-499.459	-195.868	228.402
1055.000	-480.248	-196.470	212.806
1060.000	-462.464	-196.983	202.076
1065.000	-446.064	-197.417	195.483
1070.000	-431.370	-197.777	192.109
1075.000	-418.749	-198.064	190.934
1080.000	-408.000	-198.293	191.345
1085.000	-398.880	-198.474	192.821
1090.000	-391.321	-198.616	194.838
1095.000	-385.096	-198.726	197.092
1100.000	-379.948	-198.812	199.413
1105.000	-375.652	-198.881	201.701
1110.000	-371.955	-198.938	203.927
1115.000	-368.807	-198.987	206.083
1120.000	-365.863	-199.032	208.263
1125.000	-363.148	-199.074	210.400
1130.000	-360.660	-199.113	212.439
1135.000	-358.372	-199.151	214.366
1140.000	-356.255	-199.186	216.183
1145.000	-354.283	-199.221	217.895
	-352.436	-199.256	219.512

TABLE 8-XXXVII VEHICLE VELOCITY COMPONENTS - S-II
 EXPENDED STAGE TRAJECTORY
 (99 -DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
1150.000	-350.657	-199.289	221.041
1155.000	-349.055	-199.323	222.488
1160.000	-347.500	-199.356	223.858
1165.000	-346.028	-199.388	225.156
1170.000	-344.631	-199.421	226.385
1175.000	-343.307	-199.453	227.549
1180.000	-342.054	-199.485	228.648
1185.000	-340.868	-199.517	229.684
1190.000	-339.749	-199.548	230.659
1195.000	-338.696	-199.579	231.573
1200.000	-337.707	-199.610	232.427
1205.000	-336.784	-199.639	233.221
SPLASH 1207.491	-336.371	-199.654	233.572

TABLE 8-XXXVIII ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (108-DEGREES LAUNCH AZIMUTH)

	TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
SEP	537.424	188899.5	842.3	23.213	-66.205
	540.424	188966.3	852.7	23.137	-66.036
	545.000	189037.2	868.5	23.021	-65.779
	550.000	189071.6	885.8	22.893	-65.498
	555.000	189061.4	903.1	22.765	-65.218
	560.000	189006.3	920.5	22.636	-64.939
	565.000	188906.5	937.8	22.506	-64.660
	570.000	188761.9	955.1	22.376	-64.382
	575.000	188572.6	972.4	22.246	-64.104
	580.000	188338.3	989.7	22.114	-63.827
	585.000	188059.4	1007.0	21.983	-63.550
	590.000	187735.7	1024.3	21.850	-63.274
	595.000	187367.3	1041.7	21.718	-62.998
	600.000	186954.1	1059.0	21.584	-62.723
	605.000	186496.1	1076.3	21.450	-62.449
	610.000	185993.4	1093.6	21.316	-62.174
	615.000	185446.0	1111.0	21.181	-61.901
	620.000	184853.9	1128.3	21.045	-61.628
	625.000	184217.1	1145.6	20.909	-61.355
	630.000	183535.7	1163.0	20.773	-61.083
	635.000	182809.4	1180.3	20.636	-60.811
	640.000	182038.6	1197.7	20.498	-60.540
	645.000	181223.1	1215.0	20.360	-60.269
	650.000	180363.0	1232.4	20.221	-59.998
	655.000	179458.3	1249.8	20.082	-59.728
	660.000	178508.9	1267.1	19.942	-59.459
	665.000	177515.0	1284.5	19.802	-59.190
	670.000	176476.5	1301.9	19.661	-58.921
	675.000	175393.6	1319.3	19.520	-58.653
	680.000	174266.0	1336.7	19.378	-58.385
	685.000	173093.8	1354.1	19.236	-58.117
	690.000	171877.2	1371.5	19.093	-57.850
	695.000	170616.3	1388.9	18.950	-57.584
	700.000	169310.7	1406.3	18.806	-57.317
	705.000	167960.7	1423.7	18.662	-57.051
	710.000	166566.5	1441.1	18.517	-56.786
	715.000	165127.7	1458.6	18.372	-56.521
	720.000	163644.7	1476.0	18.226	-56.256
	725.000	162117.3	1493.5	18.080	-55.991
	730.000	160545.5	1511.0	17.933	-55.727
	735.000	158929.6	1528.4	17.786	-55.463

TABLE 8-XXXVIII ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
740.000	157269.3	1545.9	17.638	-55.200
745.000	155564.9	1563.4	17.490	-54.937
750.000	153816.2	1580.9	17.341	-54.674
755.000	152023.4	1598.4	17.192	-54.411
760.000	150186.4	1616.0	17.042	-54.149
765.000	148305.4	1633.5	16.892	-53.887
770.000	146380.1	1651.1	16.741	-53.625
775.000	144410.9	1668.6	16.590	-53.364
780.000	142397.8	1686.2	16.438	-53.102
785.000	140340.6	1703.8	16.286	-52.842
790.000	138239.4	1721.4	16.134	-52.581
795.000	136094.5	1739.0	15.981	-52.320
800.000	133905.5	1756.6	15.827	-52.060
805.000	131672.7	1774.2	15.673	-51.800
810.000	129396.3	1791.9	15.519	-51.541
815.000	127075.9	1809.5	15.364	-51.281
820.000	124711.8	1827.2	15.209	-51.022
825.000	122304.2	1844.9	15.053	-50.763
830.000	119852.8	1862.6	14.897	-50.504
835.000	117358.0	1880.3	14.740	-50.245
840.000	114819.4	1898.0	14.583	-49.987
845.000	112237.5	1915.7	14.425	-49.729
850.000	109612.0	1933.5	14.267	-49.470
855.000	106943.4	1951.3	14.108	-49.212
860.000	104231.1	1969.1	13.949	-48.955
865.000	101475.7	1986.9	13.790	-48.697
870.000	98677.1	2004.7	13.630	-48.439
875.000	95835.4	2022.5	13.470	-48.182
880.000	92950.4	2040.4	13.309	-47.925
885.000	90022.8	2058.2	13.148	-47.668
890.000	87052.7	2076.1	12.986	-47.411
895.000	84040.7	2094.0	12.824	-47.154
900.000	80987.4	2111.9	12.662	-46.898
905.000	77894.5	2129.7	12.499	-46.642
910.000	74763.7	2147.6	12.337	-46.387
915.000	71598.7	2165.4	12.174	-46.132
920.000	68404.2	2183.2	12.012	-45.879
925.000	65188.1	2200.8	11.851	-45.629
930.000	61960.8	2218.1	11.692	-45.381
935.000	58737.9	2235.2	11.535	-45.139
940.000	55539.5	2251.8	11.382	-44.903

TABLE 8-XXXVIII ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
945.000	52392.3	2267.8	11.236	-44.677
950.000	49328.0	2282.9	11.096	-44.464
955.000	46384.0	2296.8	10.967	-44.266
960.000	43601.2	2309.5	10.851	-44.087
965.000	41019.6	2320.6	10.748	-43.931
970.000	38665.5	2330.0	10.661	-43.798
975.000	36545.9	2337.7	10.589	-43.689
980.000	34646.2	2344.0	10.531	-43.600
985.000	32940.2	2349.0	10.485	-43.530
990.000	31393.9	2352.9	10.449	-43.475
995.000	29972.1	2355.9	10.420	-43.432
1000.000	28643.7	2358.3	10.398	-43.398
1005.000	27385.0	2360.2	10.381	-43.372
1010.000	26179.7	2361.7	10.367	-43.351
1015.000	25018.0	2362.9	10.356	-43.335
1020.000	23896.8	2363.8	10.348	-43.322
1025.000	22815.2	2364.5	10.341	-43.312
1030.000	21770.9	2365.0	10.336	-43.305
1035.000	20742.4	2365.4	10.333	-43.299
1040.000	19719.2	2365.7	10.330	-43.294
1045.000	18708.0	2366.0	10.327	-43.291
1050.000	17720.0	2366.2	10.325	-43.288
1055.000	16765.7	2366.3	10.324	-43.286
1060.000	15852.1	2366.4	10.323	-43.285
1065.000	14981.5	2366.5	10.322	-43.284
1070.000	14152.5	2366.6	10.322	-43.283
1075.000	13364.1	2366.6	10.322	-43.282
1080.000	12612.4	2366.6	10.321	-43.282
1085.000	11894.0	2366.6	10.321	-43.282
1090.000	11204.7	2366.6	10.321	-43.282
1095.000	10541.1	2366.7	10.321	-43.281
1100.000	9900.4	2366.7	10.321	-43.281
1105.000	9280.5	2366.7	10.321	-43.281
1110.000	8679.7	2366.7	10.321	-43.281
1115.000	8097.5	2366.7	10.321	-43.281
1120.000	7532.6	2366.7	10.321	-43.281
1125.000	6984.0	2366.7	10.321	-43.281
1130.000	6450.6	2366.7	10.321	-43.281
1135.000	5931.5	2366.7	10.321	-43.281
1140.000	5425.8	2366.7	10.321	-43.281
1145.000	4932.7	2366.7	10.321	-43.281

TABLE 8-XXXVIII ALTITUDE, RANGE FROM CAPE KENNEDY, GEODETIC
 LATITUDE, AND LONGITUDE - S-II EXPENDED-STAGE
 TRAJECTORY (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	ALTITUDE M	RANGE NMI	LATITUDE DEG	LONGITUDE DEG
1150.000	4451.7	2366.7		
1155.000	3982.1	2366.7	10.321	-43.281
1160.000	3523.4	2366.7	10.321	-43.281
1165.000	3074.9	2366.7	10.321	-43.281
1170.000	2636.3	2366.7	10.321	-43.281
1175.000	2207.1	2366.7	10.321	-43.281
1180.000	1786.7	2366.7	10.321	-43.281
1185.000	1374.8	2366.7	10.321	-43.281
1190.000	970.8	2366.7	10.321	-43.281
1195.000	574.4	2366.7	10.321	-43.281
1200.000	185.1	2366.7	10.321	-43.281
SPLASH 1202.407	-.1	2366.7	10.321	-43.281

TABLE 8-XXXIX INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION - S-II EXPENDED-STAGE TRAJECTORY (108-DEGREES LAUNCH AZIMUTH)

	TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
SEP	537.424	7001.4539	6602.8423		
	540.424	7001.3510	6602.7501	.26	9.260
	545.000	7001.2350	6602.6528	.22	9.259
	550.000	7001.1651	6602.6066	.15	9.259
	555.000	7001.1544	6602.6228	.08	9.259
	560.000	7001.2028	6602.7018	.00	9.259
	565.000	7001.3106	6602.8432	-.07	9.259
	570.000	7001.4775	6603.0473	-.14	9.259
	575.000	7001.7037	6603.3140	-.22	9.260
	580.000	7001.9892	6603.6433	-.29	9.260
	585.000	7002.3339	6604.0352	-.36	9.261
	590.000	7002.7379	6604.4896	-.44	9.262
	595.000	7003.2010	6605.0067	-.51	9.263
	600.000	7003.7234	6605.5863	-.58	9.264
	605.000	7004.3050	6606.2284	-.66	9.265
	610.000	7004.9458	6606.9330	-.73	9.266
	615.000	7005.6459	6607.7003	-.80	9.267
	620.000	7006.4053	6608.5301	-.88	9.269
	625.000	7007.2238	6609.4223	-.95	9.271
	630.000	7008.1015	6610.3771	-1.02	9.272
	635.000	7009.0385	6611.3943	-1.10	9.274
	640.000	7010.0347	6612.4742	-1.17	9.276
	645.000	7011.0901	6613.6165	-1.24	9.278
	650.000	7012.2048	6614.8212	-1.31	9.281
	655.000	7013.3786	6616.0884	-1.39	9.283
	660.000	7014.6118	6617.4182	-1.46	9.286
	665.000	7015.9041	6618.8103	-1.53	9.288
	670.000	7017.2557	6620.2650	-1.61	9.291
	675.000	7018.6664	6621.7820	-1.68	9.294
	680.000	7020.1365	6623.3616	-1.75	9.297
	685.000	7021.6657	6625.0035	-1.82	9.300
	690.000	7023.2542	6626.7079	-1.90	9.304
	695.000	7024.9018	6628.4745	-1.97	9.307
	700.000	7026.6087	6630.3036	-2.04	9.311
	705.000	7028.3748	6632.1951	-2.11	9.314
	710.000	7030.2001	6634.1491	-2.18	9.318
	715.000	7032.0847	6636.1653	-2.26	9.322
	720.000	7034.0284	6638.2439	-2.33	9.326
	725.000	7036.0314	6640.3848	-2.40	9.330
	730.000	7038.0935	6642.5881	-2.47	9.335
				-2.54	9.339

TABLE 8-XXXIX

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-II EXPENDED-STAGE TRAJECTORY
(108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
740.000	7042.3955	6647.1815	-2.69	9.348
745.000	7044.6353	6649.5715	-2.76	9.353
750.000	7046.9342	6652.0239	-2.83	9.358
755.000	7049.2923	6654.5385	-2.90	9.363
760.000	7051.7096	6657.1154	-2.97	9.369
765.000	7054.1860	6659.7545	-3.04	9.374
770.000	7056.7217	6662.4557	-3.11	9.380
775.000	7059.3163	6665.2189	-3.18	9.385
780.000	7061.9700	6668.0443	-3.25	9.391
785.000	7064.6827	6670.9316	-3.33	9.397
790.000	7067.4545	6673.8810	-3.40	9.403
795.000	7070.2850	6676.8921	-3.47	9.409
800.000	7073.1746	6679.9653	-3.54	9.415
805.000	7076.1228	6683.0999	-3.61	9.422
810.000	7079.1295	6686.2961	-3.68	9.428
815.000	7082.1943	6689.5533	-3.74	9.435
820.000	7085.3173	6692.8715	-3.81	9.442
825.000	7088.4973	6696.2496	-3.88	9.449
830.000	7091.7335	6699.6868	-3.95	9.456
835.000	7095.0244	6703.1816	-4.02	9.463
840.000	7098.3686	6706.7326	-4.09	9.470
845.000	7101.7625	6710.3362	-4.16	9.478
850.000	7105.2004	6713.9865	-4.23	9.485
855.000	7108.6740	6717.6754	-4.30	9.492
860.000	7112.1705	6721.3898	-4.36	9.500
865.000	7115.6652	6725.1053	-4.43	9.506
870.000	7119.1150	6728.7787	-4.50	9.512
875.000	7122.4486	6732.3385	-4.57	9.517
880.000	7125.5333	6735.6520	-4.64	9.520
885.000	7128.1138	6738.4638	-4.70	9.519
890.000	7129.7618	6740.3452	-4.77	9.518
895.000	7129.7731	6740.5917	-4.84	9.524
900.000	7126.9483	6738.0032	-4.91	9.572
905.000	7119.6805	6730.9720	-4.97	9.747
910.000	7105.3464	6716.8733	-5.04	10.261
915.000	7080.0335	6691.7924	-5.11	11.528
920.000	7038.1338	6650.1181	-5.19	14.167
925.000	6971.9330	6584.1315	-5.27	18.835
930.000	6871.2873	6483.6824	-5.35	26.065
935.000	6723.6783	6336.2435	-5.45	36.214

TABLE 8-XXXIX

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
S-II EXPENDED-STAGE TRAJECTORY
(108-DEGREES LAUNCH AZIMUTH)
(CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
945.000	6231.0795	5843.8514	-5.69	65.033
950.000	5861.9918	5474.7617	-5.86	81.963
955.000	5401.7000	5014.3573	-6.06	99.908
960.000	4852.5533	4464.9379	-6.32	114.685
965.000	4241.6418	3853.5405	-6.65	121.934
970.000	3614.8453	3225.9979	-7.07	119.330
975.000	3022.6085	2632.7341	-7.59	108.057
980.000	2500.3891	2109.2235	-8.23	92.903
985.000	2062.8092	1670.1553	-9.01	75.946
990.000	1711.9388	1317.7678	-9.91	60.154
995.000	1438.0233	1042.5572	-10.96	46.900
1000.000	1226.4712	830.2386	-12.12	36.674
1005.000	1062.8501	666.7050	-13.35	28.806
1010.000	935.6106	540.7295	-14.62	22.878
1015.000	835.1900	442.9546	-15.84	18.410
1020.000	755.4774	367.3831	-16.94	14.822
1025.000	692.1511	309.6078	-17.85	11.795
1030.000	644.4934	269.1267	-18.66	8.300
1035.000	611.8808	245.6495	-19.58	6.394
1040.000	586.3692	229.3325	-20.32	5.195
1045.000	565.0420	216.0128	-20.75	4.313
1050.000	546.8028	203.8909	-20.83	3.652
1055.000	531.2566	192.3292	-20.60	3.084
1060.000	518.3045	181.4017	-20.13	2.593
1065.000	507.8734	171.4998	-19.54	2.153
1070.000	499.5579	162.4825	-18.88	1.854
1075.000	492.9871	154.2830	-18.18	1.566
1080.000	487.8964	147.0480	-17.51	1.316
1085.000	483.9801	140.7268	-16.89	1.111
1090.000	480.9600	135.1957	-16.32	.950
1095.000	478.6118	130.3314	-15.80	.821
1100.000	476.7516	125.9853	-15.32	.729
1105.000	475.2413	122.0314	-14.88	.677
1110.000	473.9468	118.2383	-14.45	.645
1115.000	472.8278	114.6432	-14.03	.601
1120.000	471.8564	111.2807	-13.64	.557
1125.000	471.0033	108.1410	-13.27	.517
1130.000	470.2440	105.2010	-12.93	.482
1135.000	469.5600	102.4372	-12.60	.451
1140.000	468.9371	99.8293	-12.29	.423

TABLE 8-XXXIX

INERTIAL VELOCITY, RELATIVE VELOCITY, INERTIAL
 FLIGHT-PATH ANGLE, AND INERTIAL ACCELERATION -
 S-II EXPENDED-STAGE TRAJECTORY
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	VINERTIAL M/SEC	VRELATIVE M/SEC	PATH ANG DEG	INERTIAL ACC M/SEC ²
1150.000	467.8371	95.0180	-11.72	.376
1155.000	467.3470	92.7916	-11.45	.355
1160.000	466.8908	90.6738	-11.20	.336
1165.000	466.4653	88.6587	-10.96	.317
1170.000	466.0681	86.7419	-10.73	.300
1175.000	465.6970	84.9200	-10.51	.282
1180.000	465.3504	83.1906	-10.30	.266
1185.000	465.0269	81.5520	-10.10	.249
1190.000	464.7253	80.0028	-9.91	.233
1195.000	464.4445	78.5421	-9.74	.217
1200.000	464.1835	77.1694	-9.57	.202
SPLASH 1202.407	464.0700	76.5679	-9.50	.202

TABLE P-XI

VEHICLE POSITION COORDINATES - S-II
 EXPANDED-STAGE TRAJECTORY
 (108-DEGREES LAUNCH AZIMUTH)

	TIME SEC	X M	Y M	Z M
SFP	537.424	6311093.750	-48106.106	1803000.016
	540.424	6305373.375	-48429.820	1823209.828
	545.000	6296495.188	-48922.163	1853986.797
	550.000	6286580.875	-49458.299	1887555.844
	555.000	6276445.313	-49992.441	1921057.078
	560.000	6266087.938	-50524.614	1954492.016
	565.000	6255509.938	-51054.758	1987856.797
	570.000	6244710.938	-51582.896	2021152.906
	575.000	6233692.063	-52108.971	2054376.516
	580.000	6222452.875	-52633.005	2087529.094
	585.000	6210994.625	-53154.941	2120606.781
	590.000	6199316.688	-53674.802	2153611.094
	595.000	6187420.563	-54192.528	2186538.219
	600.000	6175305.500	-54708.145	2219389.563
	605.000	6162972.938	-55221.593	2252161.375
	610.000	6150422.313	-55732.896	2284855.063
	615.000	6137654.938	-56241.998	2317466.875
	620.000	6124670.250	-56748.921	2349998.250
	625.000	6111469.688	-57253.605	2382445.406
	630.000	6098052.625	-57756.076	2414809.781
	635.000	6084420.438	-58256.277	2447087.594
	640.000	6070572.563	-58754.229	2479280.250
	645.000	6056510.438	-59249.877	2511084.031
	650.000	6042233.438	-59743.241	2543400.281
	655.000	6027743.063	-60234.266	2575325.344
	660.000	6013038.563	-60722.975	2607160.594
	665.000	5998121.625	-61209.311	2638902.281
	670.000	5982991.438	-61693.296	2670551.750
	675.000	5967649.688	-62174.873	2702105.406
	680.000	5952095.500	-62654.066	2733564.531
	685.000	5936330.625	-63130.818	2764925.438
	690.000	5920354.250	-63605.152	2796189.500
	695.000	5904168.125	-64077.013	2827353.063
	700.000	5887771.375	-64546.420	2858417.438
	705.000	5871165.750	-65013.320	2889378.969
	710.000	5854350.438	-65477.735	2920238.969
	715.000	5837327.250	-65939.608	2950993.875
	720.000	5820095.250	-66398.962	2981644.844
	725.000	5802656.250	-66855.742	3012188.344
	730.000	5785009.438	-67309.968	3042625.625
	735.000	5767156.688	-67761.586	3072953.156

TABLE 8-XL

VEHICLE POSITION COORDINATES - S-II
 EXPANDED-STAGE TRAJECTORY
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
740.000	5749097.000	-68210.618	3103172.125
745.000	5730832.375	-68657.010	3133278.969
750.000	5712361.813	-69100.781	3163274.938
755.000	5693687.250	-69541.881	3193156.438
760.000	5674807.813	-69980.326	3222924.688
765.000	5655725.375	-70416.066	3252576.219
770.000	5636439.000	-70849.119	3282112.188
775.000	5616950.688	-71279.435	3311529.031
780.000	5597259.500	-71707.028	3340828.000
785.000	5577367.500	-72131.853	3370005.594
790.000	5557273.563	-72553.923	3399062.938
795.000	5536979.875	-72973.190	3427996.563
800.000	5516485.313	-73389.671	3456807.531
805.000	5495792.125	-73803.315	3485492.438
810.000	5474899.125	-74214.143	3514052.438
815.000	5453808.563	-74622.101	3542484.063
820.000	5432519.375	-75027.207	3570788.375
825.000	5411033.750	-75429.412	3598961.969
830.000	5389350.563	-75828.734	3627005.938
835.000	5367472.125	-76225.125	3654916.813
840.000	5345397.313	-76618.600	3682695.656
845.000	5323128.438	-77009.112	3710339.063
850.000	5300664.375	-77396.680	3737848.031
855.000	5278007.563	-77781.255	3765219.094
860.000	5255156.875	-78162.858	3792453.156
865.000	5232114.813	-78541.447	3819546.688
870.000	5208880.563	-78917.048	3846500.406
875.000	5185456.938	-79289.629	3873310.438
880.000	5161843.438	-79659.233	3899976.938
885.000	5138044.063	-80025.867	3926494.938
890.000	5114060.125	-80389.638	3952862.656
895.000	5089898.625	-80750.666	3979072.063
900.000	5065566.063	-81109.245	4005115.844
905.000	5041077.625	-81465.792	4030977.688
910.000	5016452.188	-81821.044	4056638.094
915.000	4991723.875	-82176.102	4082062.063
920.000	4966940.125	-82532.733	4107202.344
925.000	4942176.375	-82893.518	4131984.906
930.000	4917536.813	-83262.264	4156309.344
935.000	4893171.875	-83644.231	4180033.375
940.000	4869278.813	-84046.543	4202973.938

TABLE 8-XL

VEHICLE POSITION COORDINATES - S-II
 EXPENDED-STAGE TRAJECTORY
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
945.000	4846113.313	-84478.198	4224898.438
950.000	4823976.750	-84949.992	4245539.563
955.000	4803206.938	-85473.771	4264606.500
960.000	4784158.125	-86062.097	4281805.500
965.000	4767140.188	-86725.659	4296896.500
970.000	4752327.500	-87470.436	4309772.313
975.000	4739714.313	-88295.725	4320491.438
980.000	4729124.250	-89194.943	4329260.438
985.000	4720289.875	-90158.101	4336358.563
990.000	4712902.938	-91174.012	4342089.563
995.000	4706667.813	-92231.817	4346735.063
1000.000	4701330.938	-93322.410	4350532.000
1005.000	4696694.125	-94438.475	4353665.438
1010.000	4692605.313	-95574.558	4356278.438
1015.000	4688952.813	-96726.436	4358480.063
1020.000	4685654.188	-97891.116	4360355.688
1025.000	4682645.500	-99066.077	4361974.500
1030.000	4679870.438	-100249.311	4363394.125
1035.000	4677258.063	-101438.285	4364660.000
1040.000	4674763.125	-102631.500	4365805.750
1045.000	4672368.438	-103828.121	4366859.813
1050.000	4670065.188	-105027.773	4367847.938
1055.000	4667847.250	-106229.995	4368792.813
1060.000	4665706.625	-107434.513	4369712.875
1065.000	4663634.188	-108640.856	4370621.688
1070.000	4661619.625	-109848.764	4371528.375
1075.000	4659654.750	-111057.854	4372439.813
1080.000	4657731.250	-112267.969	4373359.813
1085.000	4655842.125	-113478.801	4374290.313
1090.000	4653981.188	-114690.273	4375232.188
1095.000	4652143.813	-115902.168	4376185.313
1100.000	4650326.125	-117114.479	4377149.688
1105.000	4648525.563	-118327.049	4378124.875
1110.000	4646740.250	-119539.932	4379110.750
1115.000	4644969.125	-120753.014	4380107.313
1120.000	4643211.000	-121966.365	4381114.188
1125.000	4641464.813	-123179.877	4382130.875
1130.000	4639729.625	-124393.625	4383156.938
1135.000	4638004.750	-125607.506	4384191.688
1140.000	4636289.313	-126821.604	4385234.688
1145.000	4634582.875	-128035.814	4386285.438

TABLE 8-XL

VEHICLE POSITION COORDINATES - S-II
 EXPENDED-STAGE TRAJECTORY
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	X M	Y M	Z M
1150.000	4632884.875	-129250.230	4387343.500
1155.000	4631194.938	-130464.748	4388408.563
1160.000	4629512.500	-131679.459	4389480.313
1165.000	4627837.313	-132894.270	4390558.250
1170.000	4626168.813	-134109.264	4391642.125
1175.000	4624506.813	-135324.344	4392731.563
1180.000	4622850.875	-136539.604	4393826.375
1185.000	4621200.750	-137754.939	4394926.125
1190.000	4619555.938	-138970.443	4396030.563
1195.000	4617916.375	-140186.018	4397139.313
1200.000	4616281.438	-141401.748	4398252.125
SPLASH 1202.407	4615495.938	-141987.102	4398789.250

TABLE 8-XLI

 VEHICLE VELOCITY COMPONENTS - S-II
 EXPANDED STAGE TRAJECTORY
 (108-DEGREES LAUNCH AZIMUTH)

	TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
SEP	537.424	-1893.242	-108.010	6739.757
	540.424	-1919.545	-107.778	6732.096
	545.000	-1960.621	-107.422	6720.247
	550.000	-2005.001	-107.029	6707.073
	555.000	-2049.309	-106.632	6693.663
	560.000	-2093.546	-106.233	6680.016
	565.000	-2137.710	-105.829	6666.134
	570.000	-2181.801	-105.422	6652.016
	575.000	-2225.818	-105.012	6637.663
	580.000	-2269.761	-104.598	6623.073
	585.000	-2313.628	-104.181	6608.249
	590.000	-2357.420	-103.760	6593.189
	595.000	-2401.134	-103.335	6577.895
	600.000	-2444.773	-102.908	6562.365
	605.000	-2488.332	-102.476	6546.602
	610.000	-2531.814	-102.042	6530.603
	615.000	-2575.216	-101.603	6514.370
	620.000	-2618.539	-101.162	6497.902
	625.000	-2661.780	-100.717	6481.201
	630.000	-2704.941	-100.268	6464.266
	635.000	-2748.018	-99.816	6447.056
	640.000	-2791.015	-99.361	6429.693
	645.000	-2833.927	-98.902	6412.056
	650.000	-2876.756	-98.440	6394.185
	655.000	-2919.458	-97.974	6376.081
	660.000	-2962.157	-97.505	6357.743
	665.000	-3004.728	-97.033	6339.172
	670.000	-3047.213	-96.557	6320.368
	675.000	-3089.609	-96.078	6301.330
	680.000	-3131.919	-95.596	6282.059
	685.000	-3174.137	-95.110	6262.555
	690.000	-3216.268	-94.620	6242.818
	695.000	-3258.306	-94.128	6222.848
	700.000	-3300.254	-93.632	6202.644
	705.000	-3342.108	-93.132	6182.208
	710.000	-3383.871	-92.630	6161.538
	715.000	-3425.539	-92.124	6140.636
	720.000	-3467.114	-91.614	6119.500
	725.000	-3508.592	-91.102	6098.133
	730.000	-3549.976	-90.586	6076.531
	735.000	-3591.261	-90.066	6054.697

TABLE 8-XL I

VEHICLE VELOCITY COMPONENTS - S-II
 EXPENDED STAGE TRAJECTORY
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
740.000	-3632.450	-89.544	6032.630
745.000	-3673.539	-89.017	6010.330
750.000	-3714.531	-88.488	5987.797
755.000	-3755.421	-87.956	5965.032
760.000	-3796.211	-87.420	5942.032
765.000	-3836.899	-86.880	5918.801
770.000	-3877.485	-86.338	5895.335
775.000	-3917.966	-85.792	5871.637
780.000	-3958.345	-85.243	5847.706
785.000	-3998.617	-84.690	5823.541
790.000	-4038.784	-84.135	5799.143
795.000	-4078.843	-83.576	5774.511
800.000	-4118.796	-83.014	5749.646
805.000	-4158.638	-82.448	5724.548
810.000	-4198.372	-81.879	5699.214
815.000	-4237.994	-81.307	5673.648
820.000	-4277.505	-80.732	5647.846
825.000	-4316.901	-80.154	5621.809
830.000	-4356.183	-79.572	5595.536
835.000	-4395.348	-78.987	5569.026
840.000	-4434.395	-78.400	5542.277
845.000	-4473.318	-77.809	5515.288
850.000	-4512.117	-77.215	5488.052
855.000	-4550.781	-76.619	5460.565
860.000	-4589.304	-76.020	5432.815
865.000	-4627.666	-75.420	5404.786
870.000	-4665.839	-74.818	5376.444
875.000	-4703.772	-74.218	5347.738
880.000	-4741.376	-73.622	5318.568
885.000	-4778.473	-73.037	5288.750
890.000	-4814.769	-72.474	5257.970
895.000	-4849.772	-71.950	5225.724
900.000	-4882.644	-71.495	5191.153
905.000	-4912.243	-71.151	5153.121
910.000	-4936.701	-70.985	5109.784
915.000	-4953.204	-71.099	5058.419
920.000	-4957.691	-71.638	4995.147
925.000	-4944.516	-72.805	4914.704
930.000	-4906.185	-74.868	4810.232
935.000	-4833.335	-78.160	4673.394
940.000	-4715.184	-83.066	4494.906

TABLE 8-XLI

VEHICLE VELOCITY COMPONENTS - S-II
 EXPANDED STAGE TRAJECTORY
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC.	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
945.000	-4540.911	-89.966	4265.956
950.000	-4302.137	-99.152	3980.544
955.000	-3993.334	-110.809	3635.845
960.000	-3614.880	-124.907	3234.860
965.000	-3185.546	-140.759	2797.143
970.000	-2738.629	-157.162	2354.213
975.000	-2311.720	-172.771	1939.655
980.000	-1931.981	-186.622	1576.251
985.000	-1611.345	-198.301	1272.567
990.000	-1352.579	-207.722	1028.647
995.000	-1149.359	-215.125	837.022
1000.000	-991.359	-220.885	687.495
1005.000	-868.036	-225.381	570.410
1010.000	-770.878	-228.918	478.238
1015.000	-692.603	-231.751	405.136
1020.000	-628.758	-234.040	347.326
1025.000	-576.338	-235.893	302.095
1030.000	-536.296	-237.302	267.295
1035.000	-509.852	-238.253	240.177
1040.000	-488.572	-239.002	219.097
1045.000	-469.528	-239.641	203.441
1050.000	-451.867	-240.200	192.649
1055.000	-435.556	-240.686	185.995
1060.000	-420.932	-241.099	182.557
1065.000	-408.371	-241.436	181.320
1070.000	-397.657	-241.709	181.670
1075.000	-388.568	-241.928	183.091
1080.000	-381.030	-242.101	185.057
1085.000	-374.821	-242.235	187.265
1090.000	-369.683	-242.340	189.548
1095.000	-365.393	-242.423	191.803
1100.000	-361.739	-242.490	194.000
1105.000	-358.551	-242.546	196.131
1110.000	-355.603	-242.597	198.289
1115.000	-352.886	-242.644	200.404
1120.000	-350.399	-242.687	202.422
1125.000	-348.105	-242.726	204.330
1130.000	-345.986	-242.763	206.128
1135.000	-344.013	-242.798	207.824
1140.000	-342.164	-242.831	209.425
1145.000	-340.424	-242.863	210.938

TABLE 8-XI.I

VEHICLE VELOCITY COMPONENTS - S-II
 EXPENDED STAGE TRAJECTORY
 (108-DEGREES LAUNCH AZIMUTH)
 (CONTINUED)

TIME SEC	XDOT M/SEC	YDOT M/SEC	ZDOT M/SEC
1150.000	-338.781	-242.894	212.371
1155.000	-337.227	-242.924	213.728
1160.000	-335.754	-242.953	215.013
1165.000	-334.357	-242.981	216.230
1170.000	-333.034	-243.008	217.381
1175.000	-331.782	-243.034	218.469
1180.000	-330.558	-243.060	219.495
1185.000	-329.481	-243.084	220.459
1190.000	-328.430	-243.108	221.364
1195.000	-327.444	-243.131	222.208
1200.000	-326.523	-243.152	222.993
SPLASH 1202.407	-326.124	-243.161	223.331

D5-15481-1

THIS PAGE LEFT BLANK INTENTIONALLY

SECTION 9

NOMINAL TRAJECTORIES FOR PERFORMANCE ANALYSIS

This section defines two nominal trajectories for performance analysis studies. These trajectories provide reference conditions for use in determining the propellant reserves required because of profile geometry variations or vehicle characteristic perturbations.

These trajectories are identical from liftoff through S-IVB reignition and differ only during the translunar injection boost. Flight is along a launch azimuth of 72 degrees, and the vehicle remains in parking orbit for three full revolutions. Preignition-sequence initiation (t_{BG}) occurs at a flight time of 16,550 seconds.

In the first trajectory, the vehicle does not perform a plane change during the S-IVB second burn, and injection occurs at a vis-viva energy (C_3) of $-1.4986 \text{ Km}^2/\text{sec}^2$. This trajectory is used in Reference 22 as the nominal trajectory for establishing Flight Geometry Reserve (FGR) propellant requirements. The FGR propellant consumed in this nominal trajectory is defined to be zero. The FGR propellant consumed during any other trajectory that is simulated using nominal vehicle characteristics is the injection weight of that trajectory minus the injection weight of this zero-FGR trajectory.

In the second trajectory, injection occurs at a vis-viva energy of $-1.225 \text{ Km}^2/\text{sec}^2$, and a large plane change is performed during the boost. This injection energy is the maximum energy required for any free-return translunar trajectory. The plane-change angle executed during the boost is the angle that, together with the high injection energy, requires the consumption of an amount of FGR propellant equivalent to a velocity increment of 80.0 meters/second. The amount of plane change performed during the second-trajectory injection boost is 2.8355 degrees. The direction of plane change selected is to the north of the orbital plane; after three revolutions of parking orbit the vehicle position is in the northern hemisphere where a northward plane change results in slightly larger gravity losses than a southward plane change. The FGR propellant consumed during the second trajectory is 2625.0 pounds. This second trajectory is used in Reference 22 as the nominal trajectory for establishing Flight Performance Reserve (FPR) propellant requirements.

The FPR propellant allotment must be sized to assure that the vehicle can successfully complete the assigned mission with sub-nominal vehicle performance. The injection energy and plane-change angle of this second trajectory represent worse

performance requirements than are required for any actual two-injection-opportunity translunar trajectory. Therefore, FPR propellant requirements determined by using sub-nominal vehicle characteristics and these injection conditions are adequate for use during any lunar landing mission that is based on present profile ground rules.

Table 9-I summarizes the trajectory characteristics of these two nominal trajectories at S-IVB preignition-sequence initiation (t_{B_6}), at the flight time of 90-percent J-2 thrust, and at J-2 cutoff. (The cutoff signal and cutoff occur simultaneously in this simulation.) Table 9-II summarizes the sequence of major events after t_{B_6} for these two trajectories. The only difference in event times between these two trajectories occurs at cutoff. Trajectory characteristics and major-event times prior to t_{B_6} are identical to the data of Sections 1 and 3 for a 72-degree-launch-azimuth trajectory. Trajectory characteristics after injection are not presented because these trajectories are not intended to satisfy lunar-oriented objectives.

These trajectories remain in parking orbit longer than the trajectories for explicit lunar arrival conditions, and consequently have significantly different weight summaries for flight after parking orbit insertion. Table 9-III shows the weight summaries for these two trajectories after parking orbit insertion. Prior to parking orbit insertion, the trajectory weight summaries are identical to Table 3-III.

Special sets of targeting parameters are required to enable the vehicle to fly to the desired injection hypersurfaces. The selected values of these parameters cause the appropriate injection energy, an optimum boost profile for nominal vehicle operating characteristics, no plane change for the zero-FGR trajectory, and the maximum plane change associated with the consumption of 2625.0 pounds of FGR for the FPR nominal trajectory. The targeting and guidance parameters used to prepare the boost to parking orbit and the parking orbit coast phases of these two nominal trajectories are identical to those defined in Section 11. Targeting and guidance parameters for the translunar injection boosts of these two trajectories are given in Table 9-IV. Definitions of these parameters are given in Section 11.

Trajectory data from liftoff through the preignition-sequence-initiation flight time of these two nominal trajectories (16,550 seconds) are given in Tables 7-I through 7-IX. The data in these tables define the pre- t_{B_6} phases of the zero-FGR and FPR nominal trajectories. Post- t_{B_6} phase data for these trajectories are contained in Tables 9-V through 9-XXII. The data in Tables 9-V through 9-XXII originate at a flight time

of 16,550 seconds and continue to the flight time of J-2 engine cutoff. At 16,550 seconds the data of Tables 9-V through 9-XXII are identical to the corresponding data in Tables 7-I through 7-IX.

Injection boost data for the zero-FGR nominal trajectory are contained in Tables 9-V through 9-XIII and data for the FPR-nominal injection boost are contained in Tables 9-XIV through 9-XXII. Data are given at 5-second intervals during this period of flight. The definitions of the trajectory parameters contained in these tables are given in Section 7. The trajectory parameters contained in each table are as follows:

- a. Tables 9-V and 9-XIV contain vehicle weight, thrust, altitude, and surface range from Cape Kennedy.
- b. Tables 9-VI and 9-XV contain inertial velocity, relative velocity, inertial acceleration, and gravitational acceleration.
- c. Tables 9-VII and 9-XVI contain inertial flight-path angle, inertial heading, geodetic latitude, and longitude.
- d. Tables 9-VIII and 9-XVII contain the guidance-commanded and actual vehicle pitch, yaw, and roll attitude angles.
- e. Tables 9-IX and 9-XVIII contain Mach number, relative flight-path angle, angle of attack, and normal force angle.
- f. Tables 9-X and 9-XIX contain aerodynamic dynamic pressure, the product of dynamic pressure and angle of attack, and the aerodynamic heating indicator.
- g. Tables 9-XI and 9-XX contain aerodynamic normal force, aerodynamic axial force, geocentric radius, and geocentric latitude.
- h. Tables 9-XII and 9-XXI contain the vehicle inertial position coordinates in Project Apollo Standard Coordinate System 13.
- i. Tables 9-XIII and 9-XXII contain the vehicle inertial velocity components measured in Project Apollo Standard Coordinate System 13.

TABLE 9-I

SUMMARY OF TRAJECTORY CHARACTERISTICS AT
SIGNIFICANT EVENT TIMES DURING THE ZERO-FGR
AND FPR NOMINAL-TRAJECTORY INJECTION BOOSTS

PARAMETERS	PREIGNITION SEQUENCE INI- TIATION (t_{B6})	J-2 AT 90° THRUST	J-2 CUTOFF - ZERO-FGR NOMINAL TRAJECTORY	J-2 CUT- OFF - FPR NOMINAL TRAJECTORY
FLIGHT TIME (SECONDS)	16550.000	17010.000	17318.570	17324.017
WEIGHT (POUNDS)	295,878	294,742	138,801	136,176
ALTITUDE (KM)	208.625	206.386	312.635	363.183
RADIUS (KM)	6580.629	6579.526	6688.289	6738.796
INERTIAL VELOCITY (M/SEC)	7785.762	7794.650	10848.768	10820.164
INERTIAL FLIGHT-PATH ANGLE (DEGREES)	-0.028	-0.009	6.524	8.270
GEODEIC LATITUDE (DEGREES NORTH)	32.571	29.098	20.118	20.289
LONGITUDE (DEGREES EAST)	-124.207	-89.917	-65.977	-65.507
INERTIAL HEADING (DEGREES)	86.636	105.626	116.250	113.606
PLANE CHANGE ANGLE (DEGREES)	0.00	0.00	0.00	2.8355
VIS-VIVA ENERGY, C_3 (KM^2/SEC^2)	-60.5263	-60.4081	-1.4986	-1.225
ECCENTRICITY	0.0012	0.0012	0.975183	0.979722
TRUE ANOMALY (DEGREES)	--	--	13.214	16.712
INCLINATION (DEGREES)	32.5645	32.5645	32.5649	30.6694

TABLE 9-II SEQUENCE OF MAJOR EVENTS DURING
THE ZERO-FGR AND FPR NOMINAL-
TRAJECTORY INJECTION BOOSTS

FLIGHT TIME AND TIME-BASE-REFERENCED
SEQUENCE TIME - SECONDS

EVENT	ZERO-FGR NOMINAL TRAJECTORY	FPR NOMINAL TRAJECTORY
PREIGNITION-SEQUENCE INITIATION	16550.0 ($t_{B6} + 0.0$)	16550.0 ($t_{B6} + 0.0$)
CLOSE CONTINUOUS H ₂ VENT - IGNITE O ₂ /H ₂ BURNER	16635.0 ($t_{B6} + 85.0$)	16635.0 ($t_{B6} + 85.0$)
BEGIN APS ULLAGE	16896.0 ($t_{B6} + 346.0$)	16896.0 ($t_{B6} + 346.0$)
O ₂ /H ₂ BURNER CUTOFF	16897.0 ($t_{B6} + 347.0$)	16897.0 ($t_{B6} + 347.0$)
INITIATE J-2 START SEQUENCE	17000.0 ($t_{B6} + 450.0$)	17000.0 ($t_{B6} + 450.0$)
J-2 AT 90% THRUST (ALSO DESIGNATED IN THIS SIMULATION AS "STAGE LIFTOFF" AND "J-2 AT OPERATING THRUST LEVEL")	17010.0 ($t_{B6} + 460.0$)	17010.0 ($t_{B6} + 460.0$)
UNLOCK PU VALVE - VALVE MOVES TO STOP	17012.6 ($t_{B6} + 462.6$)	17012.6 ($t_{B6} + 462.6$)
INITIATE IGM	17016.0 ($t_{B6} + 466.0$)	17016.0 ($t_{B6} + 466.0$)
*MIXTURE-RATIO SHIFT - PU VALVE LEAVES STOP	17120.910	17120.910
J-2 CUTOFF SIGNAL - THRUST BECOMES ZERO INSTANTANEOUSLY	17318.570 ($t_{B7} + 0.0$)	17324.017 ($t_{B7} + 0.0$)

* NOT A TIME-BASE-REFERENCED EVENT

TABLE 9-III AS-504 WEIGHTS SUMMARY DURING THE
ZERO-FGR AND FPR NOMINAL-TRAJECTORY
PARKING ORBITS AND INJECTION BOOSTS

	ZERO-FGR TRAJECTORY EVENT WEIGHTS (POUNDS)	ZERO-FGR TRAJECTORY WEIGHT LOSSES (POUNDS)	FPR TRAJECTORY EVENT WEIGHTS (POUNDS)	FPR TRAJECTORY WEIGHT LOSSES (POUNDS)
AT PARKING ORBIT INSERTION	299,777		299,777	
PROPELLANT BELOW ENGINE VALVE		39		39
APS PROPELLANT LOSSES IN ORBIT		420		420
LOX/HYDROGEN BURNER PROPELLANT		16		16
OXIDIZER VENTED IN ORBIT		265		265
H ₂ +He VENTED IN ORBIT		3775		3775
START TANK		2		2
FUEL LEAD LOSS		30		30
S-IVB H ₂ IN START TANK		4		4
S-IVB THRUST BUILDUP PROPELLANT		483		483
J-2 AT 90% THRUST AFTER REIGNITION (STAGE LIFTOFF)	294,743		294,743	
S-IVB MAINSTAGE PROPELLANT CON- SUMED TO INJECTION		155,855		155,855
FLIGHT GEOMETRY RESERVE PROPELLANT CONSUMED TO INJEC- TION		0		2625

TABLE 9-III. AS-504 WEIGHTS SUMMARY DURING THE
ZERO-FGR AND FPR NOMINAL-TRAJECTORY
PARKING ORBITS AND INJECTION BOOSTS
(Continued)

	ZERO-FGR TRAJECTORY EVENT WEIGHTS (POUNDS)	ZERO-FGR TRAJECTORY WEIGHT LOSSES (POUNDS)	FPR TRAJECTORY EVENT WEIGHTS (POUNDS)	FPR TRAJECTORY WEIGHT LOSSES (POUNDS)
FLIGHT PERFORMANCE RESERVE PROPELLANT CONSUMED TO INJECTION		0		0
S-IVB THRUST-DECAY PROPELLANT		87		87
AT J-2 SECOND CUTOFF	138,801		136,176	
APS POWER-ROLL PROPELLANT LOSSES DURING INJECTION BOOST		32		32
PROPELLANT BELOW ENGINE VALVE		39		39
USABLE PROPELLANT NOT NEEDED FOR MISSION (INCLUDING RESERVES)		9,101		6,476
APS POWER-ROLL PROPELLANT LOSSES DURING TRANSLUNAR COAST		32		32
S-IVB STAGE AT SEPARATION (EMPTY, WET)		27,447		27,447
INSTRUMENT UNIT		4,150		4,150
SPACECRAFT AND SLA		98,000		98,000

TABLE 9-IV SUMMARY OF THE SPECIFIC INJECTION-BOOST TARGETING AND GUIDANCE-PRESETTING VALUES REQUIRED FOR THE ZERO-FGR AND FPR NOMINAL TRAJECTORIES

PARAMETER	UNIT	ZERO-FGR TRAJECTORY VALUES	FPR TRAJECTORY VALUES
T_{LO}	SECONDS	0.0	0.0
T_L	SECONDS	0.0	0.0
$RA_{\hat{T}}$	DEGREES	67.57195	63.94862
$DEC_{\hat{T}}$	DEGREES	27.37102	27.59450
* T_X	-	0.3388107	0.3892197
* T_Y	-	0.8208755	0.7962058
* T_Z	-	0.4597507	0.4632110
e_N	-	0.9751832	0.9797230
C_3	M ² /SEC ²	-1.4986X10 ⁶	-1.225X10 ⁶
$\cos\sigma$	-	0.99452	0.99452
θ_{E_0}	DEGREES	0.0	0.0
α_{TS}	DEGREES	14.48262	15.45041
β	DEGREES	51.03499	48.85233
β_1	DEGREES	19.84413	17.66147
r_N	FEET	21586374.	21586374.
T_{ST}	SECONDS	16530.	16530.
ϕ_{TR}	DEGREES	-52.	-52.
τ_{2N}	SECONDS	537.161	537.161
T_{2R}	SECONDS	106.	106.
T_{3R}	SECONDS	203.	203.
V_{EX2R}	FT/SEC	13682.979	13682.979
τ_{3R}	SECONDS	490.371	490.371

* T_X , T_Y , AND T_Z ARE COMPUTED FROM $RA_{\hat{T}}$ AND $DEC_{\hat{T}}$.

TABLE 9-V WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - PREIGNITION SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
16550.000	2.958783E 05	1.920655E 01	208624.7	2253.011
16555.000	2.958772E 05	1.921905E 01	208612.6	2233.744
16560.000	2.958761E 05	1.923155E 01	208600.2	2214.477
16565.000	2.958751E 05	1.924405E 01	208587.3	2195.211
16570.000	2.958740E 05	1.925655E 01	208574.2	2175.946
16575.000	2.958729E 05	1.926905E 01	208560.9	2156.681
16580.000	2.958718E 05	1.928155E 01	208547.1	2137.416
16585.000	2.958708E 05	1.929405E 01	208533.2	2118.152
16590.000	2.958697E 05	1.930655E 01	208518.9	2098.888
16595.000	2.958686E 05	1.931905E 01	208504.3	2079.625
16600.000	2.958675E 05	1.933155E 01	208489.3	2060.363
16605.000	2.958665E 05	1.934405E 01	208474.2	2041.101
16610.000	2.958654E 05	1.935655E 01	208458.7	2021.839
16615.000	2.958643E 05	1.936905E 01	208442.9	2002.579
16620.000	2.958632E 05	1.938155E 01	208426.8	1983.319
16625.000	2.958622E 05	1.939405E 01	208410.5	1964.059
16630.000	2.958611E 05	1.940655E 01	208393.7	1944.801
16635.000	2.958595E 05	1.500000E 01	208376.8	1925.543
16640.000	2.958446E 05	1.557167E 01	208359.6	1906.286
16645.000	2.958298E 05	1.614335E 01	208342.0	1887.029
16650.000	2.958149E 05	1.671502E 01	208324.1	1867.774
16655.000	2.958000E 05	1.728670E 01	208306.1	1848.519
16660.000	2.957851E 05	1.785837E 01	208287.6	1829.265
16665.000	2.957702E 05	1.843005E 01	208268.9	1810.012
16670.000	2.957553E 05	1.900172E 01	208249.9	1790.760
16675.000	2.957404E 05	1.957340E 01	208230.5	1771.509
16680.000	2.957255E 05	2.014507E 01	208211.1	1752.259
16685.000	2.957106E 05	2.071675E 01	208191.0	1733.011
16690.000	2.956957E 05	2.128842E 01	208170.8	1713.763
16695.000	2.956808E 05	2.186010E 01	208150.6	1694.516
16700.000	2.956659E 05	2.243177E 01	208129.7	1675.271
16705.000	2.956510E 05	2.300345E 01	208108.7	1656.026
16710.000	2.956362E 05	2.357512E 01	208087.5	1636.784
16715.000	2.956213E 05	2.414680E 01	208065.9	1617.542
16720.000	2.956064E 05	2.471847E 01	208044.2	1598.302
16725.000	2.955915E 05	2.529015E 01	208021.9	1579.063
16730.000	2.955766E 05	2.586182E 01	207999.7	1559.826
16735.000	2.955617E 05	2.643350E 01	207976.9	1540.590
16740.000	2.955468E 05	2.700517E 01	207954.0	1521.356
16745.000	2.955319E 05	2.757685E 01	207931.0	1502.123

TABLE 9-V WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE
FROM CAPE KENNEDY - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
16750.000	2.955170E 05	2.814852E 01	207907.4	1482.893
16755.000	2.955021E 05	2.872020E 01	207883.7	1463.664
16760.000	2.954872E 05	2.929187E 01	207859.7	1444.437
16765.000	2.954723E 05	2.986355E 01	207835.5	1425.212
16770.000	2.954574E 05	3.043522E 01	207811.0	1405.989
16775.000	2.954426E 05	3.100690E 01	207786.2	1386.769
16780.000	2.954277E 05	3.157857E 01	207761.3	1367.550
16785.000	2.954128E 05	3.215025E 01	207735.9	1348.335
16790.000	2.953979E 05	3.272192E 01	207710.5	1329.121
16795.000	2.953830E 05	3.329360E 01	207684.8	1309.910
16800.000	2.953681E 05	3.386527E 01	207658.9	1290.702
16805.000	2.953532E 05	3.443695E 01	207632.7	1271.497
16810.000	2.953383E 05	3.500862E 01	207606.2	1252.295
16815.000	2.953234E 05	3.558030E 01	207579.5	1233.096
16820.000	2.953085E 05	3.615197E 01	207552.7	1213.900
16825.000	2.952936E 05	3.672365E 01	207525.4	1194.708
16830.000	2.952787E 05	3.729532E 01	207498.1	1175.519
16835.000	2.952638E 05	3.786700E 01	207470.5	1156.335
16840.000	2.952489E 05	3.843867E 01	207442.6	1137.154
16845.000	2.952341E 05	3.901035E 01	207414.7	1117.978
16850.000	2.952192E 05	3.958202E 01	207386.4	1098.806
16855.000	2.952043E 05	4.015370E 01	207357.8	1079.638
16860.000	2.951894E 05	4.072537E 01	207329.2	1060.476
16865.000	2.951745E 05	4.129705E 01	207300.3	1041.319
16870.000	2.951596E 05	4.186872E 01	207271.3	1022.168
16875.000	2.951447E 05	4.244040E 01	207241.9	1003.023
16880.000	2.951298E 05	4.301207E 01	207212.4	983.884
16885.000	2.951149E 05	4.358375E 01	207182.7	964.751
16890.000	2.951000E 05	4.415542E 01	207152.9	945.626
16895.000	2.950851E 05	4.472710E 01	207122.8	926.508
16900.000	2.950702E 05	1.400000E 02	207092.6	907.398
16905.000	2.950553E 05	1.400000E 02	207062.1	888.296
16910.000	2.950404E 05	1.400000E 02	207031.4	869.204
16915.000	2.950256E 05	1.400000E 02	207000.7	850.121
16920.000	2.950107E 05	1.400000E 02	206969.8	831.049
16925.000	2.949958E 05	1.400000E 02	206938.6	811.987
16930.000	2.949809E 05	1.400000E 02	206907.4	792.938
16935.000	2.949660E 05	1.400000E 02	206875.8	773.901
16940.000	2.949511E 05	1.400000E 02	206844.2	754.878
16945.000	2.949362E 05	1.400000E 02	206812.4	735.870

TABLE 9-V WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE FROM CAPE KENNEDY - PREIGNITION SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY) (CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
16950.000	2.949213E 05	1.400000E 02	206780.6	716.878
16955.000	2.949064E 05	1.400000E 02	206748.5	697.904
16960.000	2.948915E 05	1.400000E 02	206716.4	678.948
16965.000	2.948766E 05	1.400000E 02	206684.1	660.013
16970.000	2.948617E 05	1.400000E 02	206651.7	641.099
16975.000	2.948468E 05	1.400000E 02	206619.0	622.211
16980.000	2.948320E 05	1.400000E 02	206586.4	603.349
16985.000	2.948171E 05	1.400000E 02	206553.7	584.516
16990.000	2.948022E 05	1.400000E 02	206520.7	565.715
16995.000	2.947873E 05	1.400000E 02	206487.8	546.950
17000.000	2.947724E 05	1.825100E 04	206454.8	528.224
17005.000	2.947575E 05	1.825100E 04	206421.0	509.538
17010.000	2.947426E 05	1.825100E 04	206386.4	490.893
17010.000	2.947426E 05	1.825100E 04	206386.4	490.893
17010.000	2.947426E 05	2.073030E 05	206386.4	490.893
17012.600	2.934824E 05	2.333470E 05	206366.5	481.205
17015.000	2.921654E 05	2.333470E 05	206345.7	472.254
17016.000	2.916167E 05	2.333470E 05	206336.4	468.521
17020.000	2.894220E 05	2.333470E 05	206295.7	453.579
17025.000	2.866785E 05	2.333470E 05	206237.2	434.876
17030.000	2.839350E 05	2.333470E 05	206172.5	416.153
17035.000	2.811916E 05	2.333470E 05	206104.3	397.424
17040.000	2.784481E 05	2.333470E 05	206035.8	378.702
17045.000	2.757047E 05	2.333470E 05	205969.2	360.004
17050.000	2.729612E 05	2.333470E 05	205907.8	341.354
17055.000	2.702178E 05	2.333470E 05	205854.7	322.778
17060.000	2.674743E 05	2.333470E 05	205812.8	304.311
17065.000	2.647308E 05	2.333470E 05	205785.2	285.996
17070.000	2.619874E 05	2.333470E 05	205775.2	267.890
17075.000	2.592439E 05	2.333470E 05	205786.6	250.064
17080.000	2.565005E 05	2.333470E 05	205822.0	232.613
17085.000	2.537570E 05	2.333470E 05	205885.4	215.661
17090.000	2.510136E 05	2.333470E 05	205980.1	199.368
17095.000	2.482701E 05	2.333470E 05	206109.8	183.952
17100.000	2.455267E 05	2.333470E 05	206278.4	169.693
17105.000	2.427832E 05	2.333470E 05	206489.4	156.958
17110.000	2.400397E 05	2.333470E 05	206747.0	146.194
17115.000	2.372963E 05	2.333470E 05	207054.6	137.922
17120.000	2.345528E 05	2.333470E 05	207416.7	132.668
17120.910	2.340537E 05	2.060472E 05	207488.9	132.073

TABLE 9-V WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE
FROM CAPE KENNEDY - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
17125.000	2.320826E 05	2.060472E 05	207837.4	130.858
17130.000	2.296731E 05	2.060472E 05	208320.6	132.692
17135.000	2.272636E 05	2.060472E 05	208870.3	138.075
17140.000	2.248541E 05	2.060472E 05	209490.1	146.672
17145.000	2.224446E 05	2.060472E 05	210183.7	158.000
17150.000	2.200350E 05	2.060472E 05	210955.0	171.569
17155.000	2.176255E 05	2.060472E 05	211807.8	186.928
17160.000	2.152160E 05	2.060472E 05	212745.9	203.714
17165.000	2.128065E 05	2.060472E 05	213773.3	221.638
17170.000	2.103970E 05	2.060472E 05	214894.2	240.477
17175.000	2.079875E 05	2.060472E 05	216112.6	260.065
17180.000	2.055780E 05	2.060472E 05	217432.7	280.274
17185.000	2.031685E 05	2.060472E 05	218858.7	301.006
17190.000	2.007590E 05	2.060472E 05	220394.9	322.187
17195.000	1.983495E 05	2.060472E 05	222045.9	343.757
17200.000	1.959400E 05	2.060472E 05	223815.7	365.672
17205.000	1.935305E 05	2.060472E 05	225709.2	387.896
17210.000	1.911210E 05	2.060472E 05	227730.6	410.399
17215.000	1.887115E 05	2.060472E 05	229884.9	433.159
17220.000	1.863020E 05	2.060472E 05	232176.5	456.157
17225.000	1.838925E 05	2.060472E 05	234610.2	479.378
17230.000	1.814830E 05	2.060472E 05	237190.9	502.808
17235.000	1.790735E 05	2.060472E 05	239923.5	526.439
17240.000	1.766640E 05	2.060472E 05	242812.7	550.260
17245.000	1.742545E 05	2.060472E 05	245863.6	574.264
17250.000	1.718450E 05	2.060472E 05	249080.9	598.447
17255.000	1.694355E 05	2.060472E 05	252469.8	622.801
17260.000	1.670260E 05	2.060472E 05	256035.5	647.324
17265.000	1.646165E 05	2.060472E 05	259782.8	672.011
17270.000	1.622069E 05	2.060472E 05	263717.0	696.859
17275.000	1.597974E 05	2.060472E 05	267842.8	721.866
17280.000	1.573879E 05	2.060472E 05	272165.6	747.029
17285.000	1.549784E 05	2.060472E 05	276690.0	772.347
17290.000	1.525689E 05	2.060472E 05	281421.4	797.818
17295.000	1.501594E 05	2.060472E 05	286364.1	823.441
17300.000	1.477499E 05	2.060472E 05	291522.9	849.214
17305.000	1.453404E 05	2.060472E 05	296902.3	875.137
17310.000	1.429309E 05	2.060472E 05	302503.6	901.210
17315.000	1.405214E 05	2.060472E 05	308331.6	927.432
17318.570	1.388012E 05	2.060472E 05	312635.3	946.243

TABLE 9-VI INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
16550.000	7785.762	7381.34	9.207	9.2065
16555.000	7785.784	7381.36	9.207	9.2066
16560.000	7785.805	7381.38	9.207	9.2066
16565.000	7785.827	7381.40	9.207	9.2066
16570.000	7785.849	7381.42	9.207	9.2067
16575.000	7785.871	7381.44	9.207	9.2067
16580.000	7785.893	7381.46	9.207	9.2068
16585.000	7785.915	7381.48	9.207	9.2068
16590.000	7785.938	7381.50	9.207	9.2068
16595.000	7785.960	7381.52	9.207	9.2069
16600.000	7785.983	7381.54	9.207	9.2069
16605.000	7786.005	7381.56	9.207	9.2070
16610.000	7786.028	7381.59	9.207	9.2070
16615.000	7786.050	7381.61	9.207	9.2071
16620.000	7786.073	7381.63	9.207	9.2071
16625.000	7786.096	7381.65	9.207	9.2072
16630.000	7786.119	7381.68	9.207	9.2072
16635.000	7786.142	7381.70	9.207	9.2073
16640.000	7786.164	7381.73	9.207	9.2073
16645.000	7786.187	7381.75	9.207	9.2074
16650.000	7786.209	7381.78	9.207	9.2074
16655.000	7786.232	7381.80	9.207	9.2074
16660.000	7786.255	7381.83	9.208	9.2075
16665.000	7786.279	7381.85	9.208	9.2075
16670.000	7786.302	7381.88	9.208	9.2076
16675.000	7786.325	7381.91	9.208	9.2076
16680.000	7786.349	7381.94	9.208	9.2077
16685.000	7786.373	7381.97	9.208	9.2078
16690.000	7786.397	7381.99	9.208	9.2078
16695.000	7786.421	7382.02	9.208	9.2079
16700.000	7786.446	7382.05	9.208	9.2079
16705.000	7786.470	7382.08	9.208	9.2080
16710.000	7786.495	7382.11	9.208	9.2080
16715.000	7786.520	7382.15	9.208	9.2081
16720.000	7786.544	7382.18	9.208	9.2081
16725.000	7786.570	7382.21	9.208	9.2082
16730.000	7786.595	7382.24	9.208	9.2082
16735.000	7786.620	7382.28	9.208	9.2083
16740.000	7786.646	7382.31	9.208	9.2083
16745.000	7786.671	7382.34	9.208	9.2084

TABLE 9-VI

INERTIAL VELOCITY, RELATIVE VELOCITY,
 INERTIAL ACCELERATION, AND GRAVITATIONAL
 ACCELERATION - PREIGNITION SEQUENCE INITIATION
 TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
16750.000	7786.697	7382.38	9.209	9.2085
16755.000	7786.723	7382.41	9.209	9.2085
16760.000	7786.750	7382.45	9.209	9.2086
16765.000	7786.776	7382.48	9.209	9.2086
16770.000	7786.802	7382.52	9.209	9.2087
16775.000	7786.829	7382.56	9.209	9.2088
16780.000	7786.855	7382.59	9.209	9.2088
16785.000	7786.882	7382.63	9.209	9.2089
16790.000	7786.909	7382.67	9.209	9.2089
16795.000	7786.936	7382.71	9.209	9.2090
16800.000	7786.964	7382.75	9.209	9.2091
16805.000	7786.991	7382.79	9.209	9.2091
16810.000	7787.018	7382.82	9.209	9.2092
16815.000	7787.046	7382.86	9.209	9.2092
16820.000	7787.074	7382.91	9.209	9.2093
16825.000	7787.101	7382.95	9.209	9.2094
16830.000	7787.129	7382.99	9.210	9.2094
16835.000	7787.157	7383.03	9.210	9.2095
16840.000	7787.186	7383.07	9.210	9.2096
16845.000	7787.214	7383.11	9.210	9.2096
16850.000	7787.242	7383.16	9.210	9.2097
16855.000	7787.271	7383.20	9.210	9.2097
16860.000	7787.299	7383.24	9.210	9.2098
16865.000	7787.328	7383.29	9.210	9.2099
16870.000	7787.357	7383.33	9.210	9.2099
16875.000	7787.386	7383.38	9.210	9.2100
16880.000	7787.415	7383.42	9.210	9.2101
16885.000	7787.444	7383.47	9.210	9.2101
16890.000	7787.473	7383.51	9.210	9.2102
16895.000	7787.503	7383.56	9.210	9.2103
16900.000	7787.547	7383.62	9.211	9.2103
16905.000	7787.592	7383.68	9.211	9.2104
16910.000	7787.638	7383.75	9.211	9.2105
16915.000	7787.683	7383.81	9.211	9.2105
16920.000	7787.728	7383.87	9.211	9.2106
16925.000	7787.773	7383.94	9.211	9.2107
16930.000	7787.818	7384.00	9.211	9.2107
16935.000	7787.863	7384.06	9.211	9.2108
16940.000	7787.909	7384.13	9.211	9.2109
16945.000	7787.954	7384.19	9.211	9.2109

TABLE 9-VI

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
16950.000	7787.999	7384.26	9.211	9.2110
16955.000	7788.044	7384.32	9.211	9.2111
16960.000	7788.089	7384.39	9.211	9.2111
16965.000	7788.134	7384.45	9.212	9.2112
16970.000	7788.179	7384.52	9.212	9.2113
16975.000	7788.223	7384.58	9.212	9.2114
16980.000	7788.268	7384.65	9.212	9.2114
16985.000	7788.313	7384.71	9.212	9.2115
16990.000	7788.358	7384.78	9.212	9.2116
16995.000	7788.402	7384.85	9.212	9.2116
17000.000	7788.547	7385.01	9.273	9.2117
17005.000	7791.598	7388.09	9.273	9.2118
17010.000	7794.650	7391.16	9.273	9.2118
17010.000	7794.650	7391.16	9.273	9.2118
17010.000	7794.650	7391.16	11.884	9.2118
17012.600	7812.594	7409.11	12.454	9.2119
17015.000	7831.329	7427.86	12.455	9.2119
17016.000	7839.161	7435.69	12.484	9.2120
17020.000	7870.642	7467.19	12.579	9.2120
17025.000	7910.321	7506.89	12.577	9.2122
17030.000	7950.399	7546.98	12.623	9.2123
17035.000	7990.876	7587.48	12.663	9.2125
17040.000	8031.753	7628.38	12.706	9.2127
17045.000	8073.037	7669.68	12.748	9.2128
17050.000	8114.733	7711.39	12.789	9.2130
17055.000	8156.846	7753.53	12.831	9.2131
17060.000	8199.380	7796.08	12.873	9.2132
17065.000	8242.342	7839.06	12.916	9.2132
17070.000	8285.737	7882.47	12.960	9.2132
17075.000	8329.570	7926.32	13.005	9.2132
17080.000	8373.848	7970.61	13.050	9.2131
17085.000	8418.577	8015.35	13.097	9.2128
17090.000	8463.763	8060.54	13.145	9.2125
17095.000	8509.414	8106.20	13.193	9.2122
17100.000	8555.536	8152.33	13.243	9.2117
17105.000	8602.137	8198.94	13.294	9.2110
17110.000	8649.225	8246.03	13.347	9.2103
17115.000	8696.808	8293.61	13.401	9.2094
17120.000	8744.896	8341.70	13.456	9.2083
17120.910	8753.699	8350.50	12.656	9.2081

TABLE 9-VI

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
17125.000	8788.775	8385.57	12.690	9.2071
17130.000	8832.006	8428.80	12.714	9.2057
17135.000	8875.633	8472.41	12.756	9.2042
17140.000	8919.663	8516.43	12.801	9.2024
17145.000	8964.101	8560.85	12.847	9.2004
17150.000	9008.956	8605.69	12.893	9.1982
17155.000	9054.235	8650.95	12.941	9.1958
17160.000	9099.946	8696.63	12.991	9.1932
17165.000	9146.097	8742.76	13.042	9.1903
17170.000	9192.698	8789.32	13.095	9.1871
17175.000	9239.758	8836.35	13.149	9.1837
17180.000	9287.286	8883.84	13.206	9.1800
17185.000	9335.292	8931.80	13.264	9.1759
17190.000	9383.787	8980.25	13.325	9.1716
17195.000	9432.783	9029.19	13.388	9.1670
17200.000	9482.291	9078.65	13.454	9.1620
17205.000	9532.324	9128.62	13.523	9.1568
17210.000	9582.894	9179.13	13.594	9.1511
17215.000	9634.016	9230.18	13.668	9.1451
17220.000	9685.702	9281.80	13.746	9.1387
17225.000	9737.970	9333.99	13.827	9.1319
17230.000	9790.834	9386.77	13.913	9.1248
17235.000	9844.311	9440.17	14.002	9.1172
17240.000	9898.419	9494.19	14.096	9.1092
17245.000	9953.176	9548.85	14.195	9.1007
17250.000	10008.601	9604.18	14.299	9.0919
17255.000	10064.716	9660.19	14.408	9.0825
17260.000	10121.540	9716.91	14.523	9.0727
17265.000	10179.097	9774.35	14.645	9.0624
17270.000	10237.411	9832.55	14.774	9.0516
17275.000	10296.506	9891.52	14.911	9.0403
17280.000	10356.408	9951.29	15.056	9.0285
17285.000	10417.144	10011.89	15.211	9.0162
17290.000	10478.743	10073.35	15.375	9.0033
17295.000	10541.234	10135.70	15.553	8.9899
17300.000	10604.648	10198.96	15.745	8.9760
17305.000	10669.017	10263.17	16.100	8.9615
17310.000	10734.338	10328.33	16.210	8.9464
17315.000	10800.716	10394.53	16.346	8.9307
17318.570	10848.768	10442.46	16.448	8.9192

TABLE 9-VII

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - PREIGNITION
 SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR
 NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
16550.000	-0.028	86.636	32.571	
16555.000	-0.027	86.851	32.591	-124.207
16560.000	-0.027	87.067	32.609	-123.827
16565.000	-0.027	87.283	32.625	-123.447
16570.000	-0.027	87.499	32.641	-123.067
16575.000	-0.027	87.715	32.655	-122.686
16580.000	-0.026	87.931	32.668	-122.306
16585.000	-0.026	88.147	32.680	-121.925
16590.000	-0.026	88.364	32.690	-121.544
16595.000	-0.026	88.580	32.699	-121.164
16600.000	-0.026	88.797	32.707	-120.783
16605.000	-0.025	89.013	32.713	-120.402
16610.000	-0.025	89.230	32.718	-120.020
16615.000	-0.025	89.447	32.722	-119.639
16620.000	-0.025	89.664	32.725	-119.258
16625.000	-0.025	89.881	32.726	-118.877
16630.000	-0.024	90.098	32.726	-118.495
16635.000	-0.024	90.315	32.725	-118.114
16640.000	-0.024	90.531	32.723	-117.733
16645.000	-0.024	90.748	32.719	-117.352
16650.000	-0.024	90.965	32.714	-116.970
16655.000	-0.023	91.182	32.707	-116.589
16660.000	-0.023	91.398	32.700	-116.208
16665.000	-0.023	91.615	32.691	-115.827
16670.000	-0.023	91.831	32.681	-115.446
16675.000	-0.023	92.048	32.669	-115.065
16680.000	-0.022	92.264	32.656	-114.684
16685.000	-0.022	92.480	32.642	-114.303
16690.000	-0.022	92.696	32.627	-113.923
16695.000	-0.022	92.912	32.610	-113.542
16700.000	-0.021	93.127	32.592	-113.162
16705.000	-0.021	93.343	32.573	-112.782
16710.000	-0.021	93.558	32.553	-112.402
16715.000	-0.021	93.773	32.531	-112.022
16720.000	-0.021	93.988	32.508	-111.642
16725.000	-0.020	94.202	32.484	-111.263
16730.000	-0.020	94.416	32.458	-110.883
16735.000	-0.020	94.630	32.431	-110.504
16740.000	-0.020	94.844	32.403	-110.126
16745.000	-0.019	95.057	32.374	-109.747
				-109.369

TABLE 9-VII

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - PREIGNITION
 SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR
 NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
16750.000	-0.019	95.270	32.343	-108.991
16755.000	-0.019	95.483	32.312	-108.613
16760.000	-0.019	95.695	32.278	-108.235
16765.000	-0.019	95.907	32.244	-107.858
16770.000	-0.018	96.119	32.208	-107.481
16775.000	-0.018	96.330	32.172	-107.104
16780.000	-0.018	96.541	32.133	-106.728
16785.000	-0.018	96.751	32.094	-106.352
16790.000	-0.017	96.961	32.054	-105.977
16795.000	-0.017	97.171	32.012	-105.601
16800.000	-0.017	97.380	31.969	-105.226
16805.000	-0.017	97.589	31.924	-104.852
16810.000	-0.016	97.797	31.879	-104.478
16815.000	-0.016	98.005	31.832	-104.104
16820.000	-0.016	98.212	31.784	-103.731
16825.000	-0.016	98.419	31.735	-103.358
16830.000	-0.016	98.625	31.685	-102.985
16835.000	-0.015	98.831	31.633	-102.613
16840.000	-0.015	99.036	31.580	-102.241
16845.000	-0.015	99.241	31.526	-101.870
16850.000	-0.015	99.445	31.471	-101.499
16855.000	-0.014	99.649	31.415	-101.129
16860.000	-0.014	99.852	31.357	-100.759
16865.000	-0.014	100.054	31.298	-100.390
16870.000	-0.014	100.256	31.238	-100.021
16875.000	-0.013	100.457	31.177	-99.652
16880.000	-0.013	100.657	31.115	-99.285
16885.000	-0.013	100.857	31.051	-98.917
16890.000	-0.013	101.057	30.987	-98.550
16895.000	-0.012	101.255	30.921	-98.184
16900.000	-0.012	101.453	30.854	-97.818
16905.000	-0.012	101.651	30.786	-97.453
16910.000	-0.012	101.847	30.717	-97.088
16915.000	-0.011	102.043	30.646	-96.724
16920.000	-0.011	102.239	30.575	-96.360
16925.000	-0.011	102.433	30.502	-95.997
16930.000	-0.011	102.627	30.428	-95.635
16935.000	-0.010	102.820	30.353	-95.273
16940.000	-0.010	103.013	30.277	-94.911
16945.000	-0.010	103.205	30.200	-94.551

TABLE 9-VII

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - PREIGNITION
 SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR
 NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
16950.000	-0.010	103.395	30.122	-94.191
16955.000	-0.009	103.586	30.042	-93.831
16960.000	-0.009	103.775	29.962	-93.472
16965.000	-0.009	103.964	29.880	-93.114
16970.000	-0.009	104.152	29.798	-92.756
16975.000	-0.008	104.339	29.714	-92.399
16980.000	-0.008	104.525	29.629	-92.042
16985.000	-0.008	104.711	29.543	-91.687
16990.000	-0.008	104.895	29.456	-91.331
16995.000	-0.007	105.079	29.368	-90.977
17000.000	-0.007	105.262	29.279	-90.623
17005.000	-0.008	105.445	29.189	-90.269
17010.000	-0.009	105.626	29.098	-89.917
17010.000	-0.009	105.626	29.098	-89.917
17010.000	-0.009	105.626	29.098	-89.917
17012.600	-0.017	105.720	29.050	-89.733
17015.000	-0.024	105.807	29.006	-89.563
17016.000	-0.027	105.844	28.987	-89.493
17020.000	-0.036	105.988	28.912	-89.209
17025.000	-0.046	106.169	28.816	-88.854
17030.000	-0.052	106.350	28.719	-88.497
17035.000	-0.054	106.531	28.621	-88.139
17040.000	-0.052	106.712	28.520	-87.780
17045.000	-0.046	106.893	28.419	-87.420
17050.000	-0.036	107.074	28.315	-87.058
17055.000	-0.022	107.255	28.210	-86.695
17060.000	-0.003	107.436	28.104	-86.331
17065.000	0.020	107.616	27.996	-85.966
17070.000	0.047	107.797	27.886	-85.599
17075.000	0.079	107.978	27.774	-85.231
17080.000	0.115	108.158	27.661	-84.862
17085.000	0.155	108.338	27.546	-84.492
17090.000	0.200	108.519	27.430	-84.120
17095.000	0.249	108.699	27.311	-83.747
17100.000	0.302	108.879	27.191	-83.373
17105.000	0.360	109.058	27.069	-82.998
17110.000	0.423	109.238	26.946	-82.621
17115.000	0.490	109.417	26.820	-82.243
17120.000	0.562	109.596	26.693	-81.864
17120.910	0.576	109.629	26.670	-81.795

TABLE 9-VII INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - PREIGNITION
 SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR
 NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
17125.000	0.639	109.775	26.564	-81.483
17130.000	0.720	109.954	26.433	-81.102
17135.000	0.805	110.132	26.301	-80.719
17140.000	0.894	110.310	26.166	-80.335
17145.000	0.987	110.487	26.030	-79.951
17150.000	1.084	110.664	25.892	-79.565
17155.000	1.184	110.841	25.752	-79.178
17160.000	1.289	111.017	25.611	-78.791
17165.000	1.397	111.192	25.467	-78.402
17170.000	1.510	111.367	25.322	-78.012
17175.000	1.626	111.542	25.175	-77.622
17180.000	1.746	111.716	25.026	-77.230
17185.000	1.870	111.889	24.875	-76.837
17190.000	1.998	112.062	24.722	-76.443
17195.000	2.130	112.234	24.568	-76.048
17200.000	2.266	112.406	24.411	-75.653
17205.000	2.406	112.577	24.253	-75.256
17210.000	2.550	112.748	24.092	-74.858
17215.000	2.698	112.917	23.930	-74.459
17220.000	2.849	113.086	23.766	-74.059
17225.000	3.004	113.255	23.599	-73.659
17230.000	3.164	113.422	23.431	-73.257
17235.000	3.326	113.589	23.261	-72.854
17240.000	3.493	113.755	23.089	-72.450
17245.000	3.663	113.920	22.915	-72.046
17250.000	3.837	114.085	22.739	-71.640
17255.000	4.015	114.249	22.561	-71.233
17260.000	4.196	114.411	22.380	-70.826
17265.000	4.381	114.573	22.198	-70.417
17270.000	4.568	114.734	22.014	-70.007
17275.000	4.759	114.895	21.828	-69.597
17280.000	4.953	115.054	21.640	-69.185
17285.000	5.150	115.212	21.449	-68.772
17290.000	5.349	115.369	21.257	-68.359
17295.000	5.551	115.526	21.063	-67.944
17300.000	5.755	115.681	20.866	-67.529
17305.000	5.961	115.836	20.668	-67.112
17310.000	6.163	115.990	20.467	-66.695
17315.000	6.371	116.142	20.264	-66.276
17318.570	6.524	116.250	20.118	-65.977

TABLE 9-VIII

COMMANDED AND ACTUAL VEHICLE ATTITUDE ANGLES - PREIGNITION SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
16550.000	-116.18	-116.18	1.32	1.32	-0.00	-0.00
16555.000	-116.52	-116.52	1.31	1.31	-0.00	-0.00
16560.000	-116.86	-116.86	1.31	1.31	-0.00	-0.00
16565.000	-117.20	-117.20	1.30	1.30	-0.00	-0.00
16570.000	-117.54	-117.54	1.30	1.30	-0.00	-0.00
16575.000	-117.88	-117.88	1.29	1.29	-0.00	-0.00
16580.000	-118.22	-118.22	1.29	1.29	-0.00	-0.00
16585.000	-118.55	-118.55	1.29	1.29	-0.00	-0.00
16590.000	-118.89	-118.89	1.28	1.28	-0.00	-0.00
16595.000	-119.23	-119.23	1.28	1.28	-0.00	-0.00
16600.000	-119.57	-119.57	1.27	1.27	-0.00	-0.00
16605.000	-119.91	-119.91	1.27	1.27	-0.00	-0.00
16610.000	-120.25	-120.25	1.26	1.26	-0.00	-0.00
16615.000	-120.59	-120.59	1.26	1.26	-0.00	-0.00
16620.000	-120.93	-120.93	1.25	1.25	-0.00	-0.00
16625.000	-121.26	-121.26	1.25	1.25	-0.00	-0.00
16630.000	-121.60	-121.60	1.24	1.24	-0.00	-0.00
16635.000	-121.94	-121.94	1.24	1.24	-0.00	-0.00
16640.000	-122.28	-122.28	1.23	1.23	-0.00	-0.00
16645.000	-122.62	-122.62	1.23	1.23	-0.00	-0.00
16650.000	-122.96	-122.96	1.22	1.22	-0.00	-0.00
16655.000	-123.30	-123.30	1.22	1.22	-0.00	-0.00
16660.000	-123.64	-123.64	1.21	1.21	-0.00	-0.00
16665.000	-123.98	-123.98	1.21	1.21	-0.00	-0.00
16670.000	-124.31	-124.31	1.20	1.20	-0.00	-0.00
16675.000	-124.65	-124.65	1.20	1.20	-0.00	-0.00
16680.000	-124.99	-124.99	1.19	1.19	-0.00	-0.00
16685.000	-125.33	-125.33	1.19	1.19	-0.00	-0.00
16690.000	-125.67	-125.67	1.18	1.18	-0.00	-0.00
16695.000	-126.01	-126.01	1.18	1.18	-0.00	-0.00
16700.000	-126.35	-126.35	1.17	1.17	-0.00	-0.00
16705.000	-126.69	-126.69	1.17	1.17	-0.00	-0.00
16710.000	-127.02	-127.02	1.16	1.16	-0.00	-0.00
16715.000	-127.36	-127.36	1.16	1.16	-0.00	-0.00
16720.000	-127.70	-127.70	1.15	1.15	-0.00	-0.00
16725.000	-128.04	-128.04	1.14	1.14	-0.00	-0.00
16730.000	-128.38	-128.38	1.14	1.14	-0.00	-0.00
16735.000	-128.72	-128.72	1.13	1.13	-0.00	-0.00
16740.000	-129.06	-129.06	1.13	1.13	-0.00	-0.00
16745.000	-129.40	-129.40	1.12	1.12	-0.00	-0.00

TABLE 9-VIII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - PREIGNITION SEQUENCE INITIATION
 TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
16750.000	-129.73	-129.73	1.12	1.12	-0.00	-0.00
16755.000	-130.07	-130.07	1.11	1.11	-0.00	-0.00
16760.000	-130.41	-130.41	1.10	1.10	-0.00	-0.00
16765.000	-130.75	-130.75	1.10	1.10	-0.00	-0.00
16770.000	-131.09	-131.09	1.09	1.09	-0.00	-0.00
16775.000	-131.43	-131.43	1.09	1.09	-0.00	-0.00
16780.000	-131.77	-131.77	1.08	1.08	-0.00	-0.00
16785.000	-132.11	-132.11	1.07	1.07	-0.00	-0.00
16790.000	-132.45	-132.45	1.07	1.07	-0.00	-0.00
16795.000	-132.78	-132.78	1.06	1.06	-0.00	-0.00
16800.000	-133.12	-133.12	1.05	1.05	-0.00	-0.00
16805.000	-133.46	-133.46	1.05	1.05	-0.00	-0.00
16810.000	-133.80	-133.80	1.04	1.04	-0.00	-0.00
16815.000	-134.14	-134.14	1.04	1.04	-0.00	-0.00
16820.000	-134.48	-134.48	1.03	1.03	-0.00	-0.00
16825.000	-134.82	-134.82	1.02	1.02	-0.00	-0.00
16830.000	-135.16	-135.16	1.02	1.02	-0.00	-0.00
16835.000	-135.49	-135.49	1.01	1.01	-0.00	-0.00
16840.000	-135.83	-135.83	1.00	1.00	-0.00	-0.00
16845.000	-136.17	-136.17	1.00	1.00	-0.00	-0.00
16850.000	-136.51	-136.51	0.99	0.99	-0.00	-0.00
16855.000	-136.85	-136.85	0.98	0.98	-0.00	-0.00
16860.000	-137.19	-137.19	0.98	0.98	-0.00	-0.00
16865.000	-137.53	-137.53	0.97	0.97	-0.00	-0.00
16870.000	-137.87	-137.87	0.96	0.96	-0.00	-0.00
16875.000	-138.20	-138.20	0.96	0.96	-0.00	-0.00
16880.000	-138.54	-138.54	0.95	0.95	-0.00	-0.00
16885.000	-138.88	-138.88	0.94	0.94	-0.00	-0.00
16890.000	-139.22	-139.22	0.94	0.94	-0.00	-0.00
16895.000	-139.56	-139.56	0.93	0.93	-0.00	-0.00
16900.000	-139.90	-139.90	0.92	0.92	-0.00	-0.00
16905.000	-140.24	-140.24	0.92	0.92	-0.00	-0.00
16910.000	-140.58	-140.58	0.91	0.91	-0.00	-0.00
16915.000	-140.92	-140.92	0.90	0.90	-0.00	-0.00
16920.000	-141.25	-141.25	0.89	0.89	-0.00	-0.00
16925.000	-141.59	-141.59	0.89	0.89	-0.00	-0.00
16930.000	-141.93	-141.93	0.88	0.88	-0.00	-0.00
16935.000	-142.27	-142.27	0.87	0.87	-0.00	-0.00
16940.000	-142.61	-142.61	0.87	0.87	-0.00	-0.00
16945.000	-142.95	-142.95	0.86	0.86	-0.00	-0.00

TABLE 9-VIII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - PREIGNITION SEQUENCE INITIATION
 TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)
 (CONTINUED)

TI L	TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
17	16950.000	-143.29	-143.29	0.85	0.85	-0.00	-0.00
17	16955.000	-143.63	-143.63	0.84	0.84	-0.00	-0.00
17	16960.000	-143.96	-143.96	0.84	0.84	-0.00	-0.00
17	16965.000	-144.30	-144.30	0.83	0.83	-0.00	-0.00
17	16970.000	-144.64	-144.64	0.82	0.82	-0.00	-0.00
17	16975.000	-144.98	-144.98	0.81	0.81	-0.00	-0.00
17	16980.000	-145.32	-145.32	0.81	0.81	-0.00	-0.00
17	16985.000	-145.66	-145.66	0.80	0.80	-0.00	-0.00
17	16990.000	-146.00	-146.00	0.79	0.79	-0.00	-0.00
17	16995.000	-146.34	-146.34	0.78	0.78	-0.00	-0.00
17	17000.000	-146.67	-146.67	0.78	0.78	-0.00	-0.00
17	17005.000	-147.02	-147.02	0.77	0.77	-0.00	-0.00
17	17010.000	-147.36	-147.36	0.76	0.76	-0.00	-0.00
17	17010.000	-147.36	-147.36	0.76	0.76	-0.00	-0.00
17	17010.000	-147.36	-147.36	0.76	0.76	-0.00	-0.00
17	17012.600	-147.36	-147.39	0.76	0.76	-0.00	-0.00
17	17015.000	-147.36	-147.35	0.76	0.76	-0.00	0.00
17	17016.000	-147.03	-147.35	0.72	0.76	-0.00	0.00
17	17020.000	-148.12	-148.18	0.69	0.68	-0.00	0.00
17	17025.000	-148.33	-148.25	0.69	0.69	-0.00	0.00
17	17030.000	-148.54	-148.50	0.68	0.68	-0.00	0.00
17	17035.000	-148.76	-148.71	0.67	0.67	-0.00	0.00
17	17040.000	-149.00	-148.94	0.67	0.67	-0.00	0.00
17	17045.000	-149.20	-149.15	0.66	0.66	-0.00	0.00
17	17050.000	-149.39	-149.34	0.65	0.65	-0.00	0.00
17	17055.000	-149.57	-149.53	0.65	0.65	-0.00	0.00
17	17060.000	-149.75	-149.71	0.64	0.64	-0.00	0.00
17	17065.000	-149.93	-149.89	0.63	0.64	-0.00	0.00
17	17070.000	-150.11	-150.07	0.63	0.63	-0.00	0.00
17	17075.000	-150.28	-150.24	0.62	0.63	-0.00	0.00
17	17080.000	-150.45	-150.41	0.62	0.62	-0.00	0.00
17	17085.000	-150.62	-150.58	0.61	0.61	-0.00	0.00
17	17090.000	-150.79	-150.75	0.61	0.61	-0.00	0.00
17	17095.000	-150.95	-150.91	0.60	0.60	-0.00	0.00
17	17100.000	-151.11	-151.07	0.60	0.60	-0.00	0.00
17	17105.000	-151.27	-151.23	0.59	0.59	-0.00	0.00
17	17110.000	-151.43	-151.39	0.59	0.59	-0.00	0.00
17	17115.000	-151.58	-151.55	0.58	0.58	-0.00	0.00
17	17120.000	-151.74	-151.70	0.58	0.58	-0.00	0.00
17	17120.910	-151.76	-151.73	0.58	0.58	-0.00	0.00

TABLE 9-IX MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE,
 ANGLE OF ATTACK, AND NORMAL FORCE ANGLE
 - PREIGNITION SEQUENCE INITIATION TO J-2
 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
16550.000	9.69	-0.029	3.87	88.
16555.000	9.69	-0.029	3.87	88.
16560.000	9.69	-0.029	3.87	88.
16565.000	9.69	-0.029	3.87	89.
16570.000	9.69	-0.028	3.87	89.
16575.000	9.69	-0.028	3.87	89.
16580.000	9.69	-0.028	3.87	89.
16585.000	9.69	-0.028	3.87	89.
16590.000	9.69	-0.028	3.87	90.
16595.000	9.69	-0.027	3.87	90.
16600.000	9.69	-0.027	3.87	90.
16605.000	9.69	-0.027	3.87	90.
16610.000	9.69	-0.027	3.87	90.
16615.000	9.69	-0.026	3.87	90.
16620.000	9.69	-0.026	3.87	91.
16625.000	9.69	-0.026	3.87	91.
16630.000	9.69	-0.026	3.87	91.
16635.000	9.70	-0.026	3.87	91.
16640.000	9.70	-0.025	3.87	91.
16645.000	9.70	-0.025	3.87	92.
16650.000	9.70	-0.025	3.87	92.
16655.000	9.70	-0.025	3.87	92.
16660.000	9.70	-0.024	3.87	92.
16665.000	9.70	-0.024	3.87	92.
16670.000	9.70	-0.024	3.87	92.
16675.000	9.70	-0.024	3.87	92.
16680.000	9.70	-0.024	3.87	93.
16685.000	9.70	-0.023	3.87	93.
16690.000	9.70	-0.023	3.87	93.
16695.000	9.70	-0.023	3.87	93.
16700.000	9.70	-0.023	3.87	94.
16705.000	9.70	-0.022	3.87	94.
16710.000	9.70	-0.022	3.87	94.
16715.000	9.70	-0.022	3.87	94.
16720.000	9.70	-0.022	3.88	94.
16725.000	9.70	-0.021	3.88	94.
16730.000	9.70	-0.021	3.88	95.
16735.000	9.70	-0.021	3.88	95.
16740.000	9.70	-0.021	3.88	95.
16745.000	9.70	-0.021	3.88	95.

TABLE 9-IX

MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE,
 ANGLE OF ATTACK, AND NORMAL FORCE ANGLE
 - PREIGNITION SEQUENCE INITIATION TO J-2
 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
16750.000	9.70	-0.020	3.88	95.
16755.000	9.70	-0.020	3.88	96.
16760.000	9.70	-0.020	3.88	96.
16765.000	9.71	-0.020	3.88	96.
16770.000	9.71	-0.019	3.88	96.
16775.000	9.71	-0.019	3.88	96.
16780.000	9.71	-0.019	3.89	96.
16785.000	9.71	-0.019	3.89	97.
16790.000	9.71	-0.018	3.89	97.
16795.000	9.71	-0.018	3.89	97.
16800.000	9.71	-0.018	3.89	97.
16805.000	9.71	-0.018	3.89	97.
16810.000	9.71	-0.017	3.89	97.
16815.000	9.71	-0.017	3.89	98.
16820.000	9.71	-0.017	3.90	98.
16825.000	9.71	-0.017	3.90	98.
16830.000	9.71	-0.016	3.90	98.
16835.000	9.71	-0.016	3.90	98.
16840.000	9.71	-0.016	3.90	99.
16845.000	9.71	-0.016	3.90	99.
16850.000	9.71	-0.015	3.90	99.
16855.000	9.71	-0.015	3.91	99.
16860.000	9.71	-0.015	3.91	99.
16865.000	9.72	-0.015	3.91	99.
16870.000	9.72	-0.014	3.91	100.
16875.000	9.72	-0.014	3.91	100.
16880.000	9.72	-0.014	3.91	100.
16885.000	9.72	-0.014	3.92	100.
16890.000	9.72	-0.013	3.92	100.
16895.000	9.72	-0.013	3.92	100.
16900.000	9.72	-0.013	3.92	101.
16905.000	9.72	-0.012	3.92	101.
16910.000	9.72	-0.012	3.93	101.
16915.000	9.72	-0.012	3.93	101.
16920.000	9.72	-0.011	3.93	101.
16925.000	9.72	-0.011	3.93	102.
16930.000	9.72	-0.011	3.93	102.
16935.000	9.72	-0.011	3.94	102.
16940.000	9.72	-0.010	3.94	102.
16945.000	9.72	-0.010	3.94	102.

TABLE 9-IX

MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE,
 ANGLE OF ATTACK, AND NORMAL FORCE ANGLE
 - PREIGNITION SEQUENCE INITIATION TO J-2
 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
16950.000	9.73	-0.010	3.94	102.
16955.000	9.73	-0.010	3.94	102.
16960.000	9.73	-0.010	3.95	103.
16965.000	9.73	-0.009	3.95	103.
16970.000	9.73	-0.009	3.95	103.
16975.000	9.73	-0.009	3.95	103.
16980.000	9.73	-0.008	3.95	103.
16985.000	9.73	-0.008	3.96	103.
16990.000	9.73	-0.008	3.96	104.
16995.000	9.73	-0.008	3.96	104.
17000.000	9.73	-0.007	3.96	104.
17005.000	9.74	-0.009	3.97	104.
17010.000	9.74	-0.009	3.97	104.
17010.000	9.74	-0.009	3.97	104.
17010.000	9.74	-0.009	3.97	104.
17012.600	9.77	-0.018	3.82	105.
17015.000	9.79	-0.025	3.62	106.
17016.000	9.80	-0.028	3.55	106.
17020.000	9.84	-0.038	4.10	105.
17025.000	9.90	-0.049	3.82	106.
17030.000	9.95	-0.055	3.72	106.
17035.000	10.00	-0.057	3.59	107.
17040.000	10.06	-0.055	3.48	108.
17045.000	10.12	-0.049	3.36	108.
17050.000	10.17	-0.038	3.22	109.
17055.000	10.23	-0.023	3.07	110.
17060.000	10.29	-0.003	2.93	111.
17065.000	10.34	0.021	2.79	113.
17070.000	10.40	0.050	2.65	114.
17075.000	10.46	0.083	2.51	115.
17080.000	10.52	0.120	2.37	117.
17085.000	10.57	0.163	2.23	119.
17090.000	10.63	0.210	2.10	121.
17095.000	10.69	0.261	1.97	123.
17100.000	10.75	0.317	1.84	126.
17105.000	10.80	0.378	1.72	129.
17110.000	10.86	0.444	1.61	133.
17115.000	10.92	0.514	1.50	136.
17120.000	10.97	0.589	1.40	141.
17120.910	10.98	0.603	1.39	142.

TABLE 9-IX MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE,
ANGLE OF ATTACK, AND NORMAL FORCE ANGLE
- PREIGNITION SEQUENCE INITIATION TO J-2
CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
17125.000	11.02	0.669	1.31	146.
17130.000	11.07	0.754	1.21	155.
17135.000	11.12	0.843	1.18	159.
17140.000	11.16	0.936	1.15	163.
17145.000	11.21	1.033	1.13	167.
17150.000	11.25	1.134	1.12	171.
17155.000	11.30	1.239	1.11	176.
17160.000	11.34	1.349	1.11	-180.
17165.000	11.38	1.462	1.11	-176.
17170.000	11.42	1.579	1.12	-172.
17175.000	11.45	1.700	1.14	-169.
17180.000	11.49	1.825	1.15	-166.
17185.000	11.52	1.955	1.17	-163.
17190.000	11.56	2.088	1.19	-160.
17195.000	11.59	2.226	1.21	-158.
17200.000	11.62	2.367	1.23	-156.
17205.000	11.64	2.513	1.25	-154.
17210.000	11.67	2.662	1.26	-153.
17215.000	11.69	2.816	1.27	-152.
17220.000	11.73	2.973	1.28	-152.
17225.000	11.75	3.135	1.28	-152.
17230.000	11.78	3.300	1.28	-152.
17235.000	11.81	3.469	1.28	-152.
17240.000	11.83	3.642	1.27	-153.
17245.000	11.86	3.819	1.25	-155.
17250.000	11.88	3.999	1.23	-157.
17255.000	11.90	4.183	1.21	-160.
17260.000	11.92	4.371	1.18	-164.
17265.000	11.93	4.562	1.16	-169.
17270.000	11.95	4.757	1.14	-176.
17275.000	11.96	4.955	1.14	177.
17280.000	11.97	5.155	1.17	168.
17285.000	11.98	5.359	1.23	159.
17290.000	11.99	5.565	1.34	149.
17295.000	12.00	5.774	1.51	139.
17300.000	12.00	5.985	1.75	131.
17305.000	12.01	6.198	2.55	116.
17310.000	12.01	6.406	2.72	114.
17315.000	12.03	6.622	2.52	117.
17318.570	12.04	6.779	2.38	118.

TABLE 9-X

DYNAMIC PRESSURE, DYNAMIC PRESSURE TIMES ALPHA, AND AERODYNAMIC HEATING INDICATOR - PREIGNITION SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)

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)
16550.000	0.0	0.	
16555.000	0.0	0.	46729021.
16560.000	0.0	0.	46729021.
16565.000	0.0	0.	46729021.
16570.000	0.0	0.	46729021.
16575.000	0.0	0.	46729021.
16580.000	0.0	0.	46729021.
16585.000	0.0	0.	46729021.
16590.000	0.0	0.	46729021.
16595.000	0.0	0.	46729021.
16600.000	0.0	0.	46729021.
16605.000	0.0	0.	46729021.
16610.000	0.0	0.	46729021.
16615.000	0.0	0.	46729021.
16620.000	0.0	0.	46729021.
16625.000	0.0	0.	46729021.
16630.000	0.0	0.	46729021.
16635.000	0.0	0.	46729021.
16640.000	0.0	0.	46729021.
16645.000	0.0	0.	46729021.
16650.000	0.0	0.	46729021.
16655.000	0.0	0.	46729021.
16660.000	0.0	0.	46729021.
16665.000	0.0	0.	46729021.
16670.000	0.0	0.	46729021.
16675.000	0.0	0.	46729021.
16680.000	0.0	0.	46729021.
16685.000	0.0	0.	46729021.
16690.000	0.0	0.	46729021.
16695.000	0.0	0.	46729021.
16700.000	0.0	0.	46729021.
16705.000	0.0	0.	46729021.
16710.000	0.0	0.	46729021.
16715.000	0.0	0.	46729021.
16720.000	0.0	0.	46729021.
16725.000	0.0	0.	46729021.
16730.000	0.0	0.	46729021.
16735.000	0.0	0.	46729021.
16740.000	0.0	0.	46729021.
16745.000	0.0	0.	46729021.

TABLE 9-X

DYNAMIC PRESSURE, DYNAMIC PRESSURE TIMES ALPHA, AND AERODYNAMIC HEATING INDICATOR - PREIGNITION SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY) (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)
16750.000	0.0	0.	46729021.
16755.000	0.0	0.	46729021.
16760.000	0.0	0.	46729021.
16765.000	0.0	0.	46729021.
16770.000	0.0	0.	46729021.
16775.000	0.0	0.	46729021.
16780.000	0.0	0.	46729021.
16785.000	0.0	0.	46729021.
16790.000	0.0	0.	46729021.
16795.000	0.0	0.	46729021.
16800.000	0.0	0.	46729021.
16805.000	0.0	0.	46729021.
16810.000	0.0	0.	46729021.
16815.000	0.0	0.	46729021.
16820.000	0.0	0.	46729021.
16825.000	0.0	0.	46729021.
16830.000	0.0	0.	46729021.
16835.000	0.0	0.	46729021.
16840.000	0.0	0.	46729021.
16845.000	0.0	0.	46729021.
16850.000	0.0	0.	46729021.
16855.000	0.0	0.	46729021.
16860.000	0.0	0.	46729021.
16865.000	0.0	0.	46729021.
16870.000	0.0	0.	46729021.
16875.000	0.0	0.	46729021.
16880.000	0.0	0.	46729021.
16885.000	0.0	0.	46729021.
16890.000	0.0	0.	46729021.
16895.000	0.0	0.	46729021.
16900.000	0.0	0.	46729021.
16905.000	0.0	0.	46729021.
16910.000	0.0	0.	46729021.
16915.000	0.0	0.	46729021.
16920.000	0.0	0.	46729021.
16925.000	0.0	0.	46729021.
16930.000	0.0	0.	46729021.
16935.000	0.0	0.	46729021.
16940.000	0.0	0.	46729021.
16945.000	0.0	0.	46729021.

TABLE 9-X

DYNAMIC PRESSURE, DYNAMIC PRESSURE TIMES ALPHA, AND AERODYNAMIC HEATING INDICATOR - PREIGNITION SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY) (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)
16950.000	0.0	0.	46729021.
16955.000	0.0	0.	46729021.
16960.000	0.0	0.	46729021.
16965.000	0.0	0.	46729021.
16970.000	0.0	0.	46729021.
16975.000	0.0	0.	46729021.
16980.000	0.0	0.	46729021.
16985.000	0.0	0.	46729021.
16990.000	0.0	0.	46729021.
16995.000	0.0	0.	46729021.
17000.000	0.0	0.	46729021.
17005.000	0.0	0.	46729021.
17010.000	0.0	0.	46729021.
17010.000	0.0	0.	46729021.
17010.000	0.0	0.	46729021.
17010.000	0.0	0.	46729021.
17012.600	0.0	0.	46729021.
17015.000	0.0	0.	46729021.
17016.000	0.0	0.	46729021.
17020.000	0.0	0.	46729021.
17025.000	0.0	0.	46729021.
17030.000	0.0	0.	46729021.
17035.000	0.0	0.	46729021.
17040.000	0.0	0.	46729021.
17045.000	0.0	0.	46729021.
17050.000	0.0	0.	46729021.
17055.000	0.0	0.	46729021.
17060.000	0.0	0.	46729021.
17065.000	0.0	0.	46729021.
17070.000	0.0	0.	46729021.
17075.000	0.0	0.	46729021.
17080.000	0.0	0.	46729021.
17085.000	0.0	0.	46729021.
17090.000	0.0	0.	46729021.
17095.000	0.0	0.	46729021.
17100.000	0.0	0.	46729021.
17105.000	0.0	0.	46729021.
17110.000	0.0	0.	46729021.
17115.000	0.0	0.	46729021.
17120.000	0.0	0.	46729021.
17120.910	0.0	0.	46729021.

TABLE 9-X

DYNAMIC PRESSURE, DYNAMIC PRESSURE TIMES ALPHA, AND AERODYNAMIC HEATING INDICATOR - PREIGNITION SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR NOMINAL TRAJECTORY)
(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)
17125.000	0.0	0.	46729021.
17130.000	0.0	0.	46729021.
17135.000	0.0	0.	46729021.
17140.000	0.0	0.	46729021.
17145.000	0.0	0.	46729021.
17150.000	0.0	0.	46729021.
17155.000	0.0	0.	46729021.
17160.000	0.0	0.	46729021.
17165.000	0.0	0.	46729021.
17170.000	0.0	0.	46729021.
17175.000	0.0	0.	46729021.
17180.000	0.0	0.	46729021.
17185.000	0.0	0.	46729021.
17190.000	0.0	0.	46729021.
17195.000	0.0	0.	46729021.
17200.000	0.0	0.	46729021.
17205.000	0.0	0.	46729021.
17210.000	0.0	0.	46729021.
17215.000	0.0	0.	46729021.
17220.000	0.0	0.	46729021.
17225.000	0.0	0.	46729021.
17230.000	0.0	0.	46729021.
17235.000	0.0	0.	46729021.
17240.000	0.0	0.	46729021.
17245.000	0.0	0.	46729021.
17250.000	0.0	0.	46729021.
17255.000	0.0	0.	46729021.
17260.000	0.0	0.	46729021.
17265.000	0.0	0.	46729021.
17270.000	0.0	0.	46729021.
17275.000	0.0	0.	46729021.
17280.000	0.0	0.	46729021.
17285.000	0.0	0.	46729021.
17290.000	0.0	0.	46729021.
17295.000	0.0	0.	46729021.
17300.000	0.0	0.	46729021.
17305.000	0.0	0.	46729021.
17310.000	0.0	0.	46729021.
17315.000	0.0	0.	46729021.
17318.570	0.0	0.	46729021.

TABLE 9-XI NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - PREIGNITION SEQUENCE
INITIATION TO J-2 CUTOFF (ZERO-FGR
NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
16550.000	0.	0.	6580629.	32.402
16555.000	0.	0.	6580611.	32.422
16560.000	0.	0.	6580592.	32.440
16565.000	0.	0.	6580574.	32.456
16570.000	0.	0.	6580555.	32.472
16575.000	0.	0.	6580537.	32.486
16580.000	0.	0.	6580519.	32.499
16585.000	0.	0.	6580501.	32.510
16590.000	0.	0.	6580483.	32.521
16595.000	0.	0.	6580466.	32.530
16600.000	0.	0.	6580448.	32.538
16605.000	0.	0.	6580431.	32.544
16610.000	0.	0.	6580413.	32.549
16615.000	0.	0.	6580396.	32.553
16620.000	0.	0.	6580379.	32.556
16625.000	0.	0.	6580363.	32.557
16630.000	0.	0.	6580346.	32.557
16635.000	0.	0.	6580329.	32.556
16640.000	0.	0.	6580313.	32.553
16645.000	0.	0.	6580297.	32.550
16650.000	0.	0.	6580280.	32.545
16655.000	0.	0.	6580265.	32.538
16660.000	0.	0.	6580249.	32.531
16665.000	0.	0.	6580233.	32.522
16670.000	0.	0.	6580217.	32.512
16675.000	0.	0.	6580202.	32.500
16680.000	0.	0.	6580187.	32.487
16685.000	0.	0.	6580172.	32.473
16690.000	0.	0.	6580157.	32.458
16695.000	0.	0.	6580142.	32.441
16700.000	0.	0.	6580127.	32.424
16705.000	0.	0.	6580113.	32.404
16710.000	0.	0.	6580098.	32.384
16715.000	0.	0.	6580084.	32.362
16720.000	0.	0.	6580070.	32.339
16725.000	0.	0.	6580056.	32.315
16730.000	0.	0.	6580042.	32.290
16735.000	0.	0.	6580029.	32.263
16740.000	0.	0.	6580015.	32.235
16745.000	0.	0.	6580002.	32.206

TABLE 9-XI NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - PREIGNITION SEQUENCE
INITIATION TO J-2 CUTOFF (ZERO-FGR
NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
16750.000	0.	0.	6579989.	32.175
16755.000	0.	0.	6579976.	32.143
16760.000	0.	0.	6579963.	32.110
16765.000	0.	0.	6579950.	32.076
16770.000	0.	0.	6579938.	32.041
16775.000	0.	0.	6579925.	32.004
16780.000	0.	0.	6579913.	31.966
16785.000	0.	0.	6579901.	31.927
16790.000	0.	0.	6579889.	31.886
16795.000	0.	0.	6579877.	31.844
16800.000	0.	0.	6579866.	31.802
16805.000	0.	0.	6579854.	31.757
16810.000	0.	0.	6579843.	31.712
16815.000	0.	0.	6579832.	31.665
16820.000	0.	0.	6579821.	31.618
16825.000	0.	0.	6579810.	31.569
16830.000	0.	0.	6579800.	31.518
16835.000	0.	0.	6579789.	31.467
16840.000	0.	0.	6579779.	31.414
16845.000	0.	0.	6579769.	31.360
16850.000	0.	0.	6579759.	31.305
16855.000	0.	0.	6579749.	31.249
16860.000	0.	0.	6579739.	31.192
16865.000	0.	0.	6579730.	31.133
16870.000	0.	0.	6579720.	31.073
16875.000	0.	0.	6579711.	31.012
16880.000	0.	0.	6579702.	30.950
16885.000	0.	0.	6579693.	30.887
16890.000	0.	0.	6579685.	30.822
16895.000	0.	0.	6579676.	30.757
16900.000	0.	0.	6579668.	30.690
16905.000	0.	0.	6579660.	30.622
16910.000	0.	0.	6579652.	30.553
16915.000	0.	0.	6579644.	30.483
16920.000	0.	0.	6579636.	30.412
16925.000	0.	0.	6579629.	30.339
16930.000	0.	0.	6579622.	30.266
16935.000	0.	0.	6579614.	30.191
16940.000	0.	0.	6579607.	30.115
16945.000	0.	0.	6579601.	30.038

TABLE 9-XI NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - PREIGNITION SEQUENCE
INITIATION TO J-2 CUTOFF (ZERO-FGR
NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
16950.000	0.	0.	6579594.	29.960
16955.000	0.	0.	6579588.	29.881
16960.000	0.	0.	6579581.	29.801
16965.000	0.	0.	6579575.	29.720
16970.000	0.	0.	6579569.	29.637
16975.000	0.	0.	6579563.	29.554
16980.000	0.	0.	6579558.	29.469
16985.000	0.	0.	6579553.	29.384
16990.000	0.	0.	6579547.	29.297
16995.000	0.	0.	6579542.	29.209
17000.000	0.	0.	6579538.	29.121
17005.000	0.	0.	6579532.	29.031
17010.000	0.	0.	6579527.	28.940
17010.000	0.	0.	6579527.	28.940
17010.000	0.	0.	6579527.	28.940
17012.600	0.	0.	6579522.	28.892
17015.000	0.	0.	6579515.	28.848
17016.000	0.	0.	6579512.	28.829
17020.000	0.	0.	6579495.	28.754
17025.000	0.	0.	6579466.	28.659
17030.000	0.	0.	6579432.	28.562
17035.000	0.	0.	6579395.	28.464
17040.000	0.	0.	6579357.	28.364
17045.000	0.	0.	6579322.	28.263
17050.000	0.	0.	6579293.	28.160
17055.000	0.	0.	6579272.	28.055
17060.000	0.	0.	6579263.	27.949
17065.000	0.	0.	6579269.	27.842
17070.000	0.	0.	6579293.	27.732
17075.000	0.	0.	6579338.	27.621
17080.000	0.	0.	6579409.	27.508
17085.000	0.	0.	6579507.	27.394
17090.000	0.	0.	6579637.	27.278
17095.000	0.	0.	6579803.	27.160
17100.000	0.	0.	6580008.	27.040
17105.000	0.	0.	6580255.	26.919
17110.000	0.	0.	6580550.	26.795
17115.000	0.	0.	6580895.	26.670
17120.000	0.	0.	6581296.	26.544
17120.910	0.	0.	6581375.	26.520

TABLE 9-XI

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - PREIGNITION SEQUENCE
INITIATION TO J-2 CUTOFF (ZERO-FGR
NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
17125.000	0.	0.	6581755.	26.415
17130.000	0.	0.	6582277.	26.285
17135.000	0.	0.	6582865.	26.153
17140.000	0.	0.	6583525.	26.019
17145.000	0.	0.	6584258.	25.883
17150.000	0.	0.	6585070.	25.746
17155.000	0.	0.	6585963.	25.607
17160.000	0.	0.	6586943.	25.466
17165.000	0.	0.	6588011.	25.323
17170.000	0.	0.	6589174.	25.178
17175.000	0.	0.	6590435.	25.032
17180.000	0.	0.	6591797.	24.884
17185.000	0.	0.	6593266.	24.733
17190.000	0.	0.	6594846.	24.581
17195.000	0.	0.	6596540.	24.427
17200.000	0.	0.	6598354.	24.271
17205.000	0.	0.	6600291.	24.114
17210.000	0.	0.	6602357.	23.954
17215.000	0.	0.	6604556.	23.792
17220.000	0.	0.	6606893.	23.629
17225.000	0.	0.	6609372.	23.463
17230.000	0.	0.	6611998.	23.296
17235.000	0.	0.	6614777.	23.127
17240.000	0.	0.	6617712.	22.955
17245.000	0.	0.	6620810.	22.782
17250.000	0.	0.	6624074.	22.607
17255.000	0.	0.	6627510.	22.430
17260.000	0.	0.	6631122.	22.250
17265.000	0.	0.	6634917.	22.069
17270.000	0.	0.	6638899.	21.886
17275.000	0.	0.	6643073.	21.701
17280.000	0.	0.	6647443.	21.513
17285.000	0.	0.	6652016.	21.324
17290.000	0.	0.	6656796.	21.133
17295.000	0.	0.	6661787.	20.939
17300.000	0.	0.	6666995.	20.744
17305.000	0.	0.	6672423.	20.546
17310.000	0.	0.	6678073.	20.347
17315.000	0.	0.	6683950.	20.145
17318.570	0.	0.	6688289.	20.000

TABLE 9-XII

VEHICLE POSITION COORDINATES - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR
NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
16550.000	6089429.	78903.	2493453.
16555.000	6074548.	79829.	2529413.
16560.000	6059454.	80753.	2565285.
16565.000	6044148.	81675.	2601067.
16570.000	6028631.	82593.	2636758.
16575.000	6012903.	83510.	2672357.
16580.000	5996965.	84423.	2707862.
16585.000	5980817.	85334.	2743273.
16590.000	5964459.	86243.	2778588.
16595.000	5947893.	87148.	2813805.
16600.000	5931119.	88051.	2848924.
16605.000	5914138.	88951.	2883944.
16610.000	5896950.	89849.	2918862.
16615.000	5879555.	90743.	2953678.
16620.000	5861955.	91635.	2988392.
16625.000	5844149.	92523.	3023000.
16630.000	5826140.	93409.	3057503.
16635.000	5807926.	94292.	3091899.
16640.000	5789509.	95172.	3126187.
16645.000	5770890.	96049.	3160365.
16650.000	5752069.	96923.	3194433.
16655.000	5733047.	97794.	3228389.
16660.000	5713824.	98661.	3262232.
16665.000	5694401.	99526.	3295961.
16670.000	5674779.	100387.	3329575.
16675.000	5654958.	101246.	3363072.
16680.000	5634940.	102100.	3396452.
16685.000	5614724.	102952.	3429713.
16690.000	5594312.	103801.	3462854.
16695.000	5573705.	104646.	3495874.
16700.000	5552902.	105488.	3528771.
16705.000	5531905.	106326.	3561545.
16710.000	5510714.	107161.	3594195.
16715.000	5489331.	107993.	3626719.
16720.000	5467756.	108821.	3659116.
16725.000	5445989.	109645.	3691385.
16730.000	5424032.	110466.	3723525.
16735.000	5401884.	111284.	3755534.
16740.000	5379548.	112098.	3787412.
16745.000	5357024.	112908.	3819158.

TABLE 9-XII

VEHICLE POSITION COORDINATES - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR
NOMINAL TRAJECTORY)
(CONTINUED)

POSITION COORDINATES IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	X (METERS)	Y (METERS)	Z (METERS)
16750.000	5334312.	113715.	3850770.
16755.000	5311414.	114518.	3882248.
16760.000	5288329.	115318.	3913590.
16765.000	5265060.	116113.	3944794.
16770.000	5241607.	116905.	3975861.
16775.000	5217969.	117693.	4006789.
16780.000	5194150.	118478.	4037577.
16785.000	5170148.	119258.	4068223.
16790.000	5145966.	120035.	4098727.
16795.000	5121604.	120808.	4129088.
16800.000	5097062.	121577.	4159304.
16805.000	5072342.	122342.	4189375.
16810.000	5047444.	123102.	4219299.
16815.000	5022370.	123859.	4249076.
16820.000	4997120.	124612.	4278704.
16825.000	4971695.	125361.	4308182.
16830.000	4946096.	126106.	4337510.
16835.000	4920324.	126847.	4366686.
16840.000	4894380.	127583.	4395709.
16845.000	4868264.	128316.	4424579.
16850.000	4841978.	129044.	4453293.
16855.000	4815522.	129768.	4481852.
16860.000	4788898.	130488.	4510254.
16865.000	4762107.	131204.	4538499.
16870.000	4735148.	131915.	4566584.
16875.000	4708024.	132622.	4594510.
16880.000	4680735.	133324.	4622275.
16885.000	4653282.	134023.	4649879.
16890.000	4625666.	134717.	4677319.
16895.000	4597888.	135406.	4704596.
16900.000	4569950.	136091.	4731709.
16905.000	4541851.	136772.	4758656.
16910.000	4513593.	137448.	4785437.
16915.000	4485177.	138119.	4812050.
16920.000	4456604.	138786.	4838495.
16925.000	4427875.	139449.	4864771.
16930.000	4398990.	140107.	4890877.
16935.000	4369952.	140760.	4916811.
16940.000	4340761.	141409.	4942574.
16945.000	4311417.	142053.	4968163.

TABLE 9-XII

VEHICLE POSITION COORDINATES - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR
NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
16950.000	4281923.	142692.	4993579.
16955.000	4252278.	143327.	5018821.
16960.000	4222484.	143957.	5043887.
16965.000	4192543.	144582.	5068776.
16970.000	4162455.	145203.	5093488.
16975.000	4132220.	145818.	5118022.
16980.000	4101841.	146429.	5142377.
16985.000	4071319.	147035.	5166552.
16990.000	4040653.	147637.	5190546.
16995.000	4009846.	148233.	5214359.
17000.000	3978899.	148824.	5237989.
17005.000	3947805.	149411.	5261440.
17010.000	3916561.	149993.	5284716.
17010.000	3916561.	149993.	5284716.
17010.000	3916561.	149993.	5284716.
17012.600	3900237.	150294.	5296760.
17015.000	3885098.	150571.	5307859.
17016.000	3878770.	150686.	5312477.
17020.000	3853336.	151147.	5330920.
17025.000	3821272.	151720.	5353899.
17030.000	3788905.	152290.	5376796.
17035.000	3756233.	152858.	5399610.
17040.000	3723255.	153423.	5422340.
17045.000	3689971.	153986.	5444987.
17050.000	3656380.	154546.	5467549.
17055.000	3622481.	155103.	5490028.
17060.000	3588272.	155657.	5512421.
17065.000	3553752.	156209.	5534729.
17070.000	3518922.	156757.	5556952.
17075.000	3483778.	157303.	5579089.
17080.000	3448321.	157846.	5601141.
17085.000	3412550.	158387.	5623107.
17090.000	3376462.	158924.	5644986.
17095.000	3340058.	159458.	5666780.
17100.000	3303335.	159990.	5688487.
17105.000	3266292.	160519.	5710108.
17110.000	3228929.	161045.	5731642.
17115.000	3191243.	161568.	5753090.
17120.000	3153234.	162088.	5774452.
17120.910	3146284.	162182.	5778329.

TABLE 9-XII

VEHICLE POSITION COORDINATES - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR
NOMINAL TRAJECTORY)
(CONTINUED)

POSITION COORDINATES IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	X (METERS)	Y (METERS)	Z (METERS)
17125.000	3114908.	162605.	5795723.
17130.000	3076280.	163118.	5816894.
17135.000	3037351.	163629.	5837965.
17140.000	2998119.	164136.	5858937.
17145.000	2958584.	164640.	5879807.
17150.000	2918743.	165141.	5900577.
17155.000	2878596.	165638.	5921247.
17160.000	2838142.	166132.	5941815.
17165.000	2797380.	166623.	5962281.
17170.000	2756307.	167110.	5982647.
17175.000	2714924.	167594.	6002910.
17180.000	2673228.	168075.	6023072.
17185.000	2631218.	168552.	6043132.
17190.000	2588892.	169026.	6063090.
17195.000	2546249.	169496.	6082945.
17200.000	2503288.	169963.	6102699.
17205.000	2460006.	170426.	6122350.
17210.000	2416402.	170887.	6141899.
17215.000	2372474.	171343.	6161345.
17220.000	2328220.	171797.	6180689.
17225.000	2283638.	172246.	6199930.
17230.000	2238726.	172693.	6219068.
17235.000	2193482.	173136.	6238103.
17240.000	2147903.	173575.	6257036.
17245.000	2101987.	174011.	6275866.
17250.000	2055732.	174443.	6294592.
17255.000	2009134.	174873.	6313215.
17260.000	1962192.	175298.	6331734.
17265.000	1914901.	175720.	6350150.
17270.000	1867260.	176139.	6368461.
17275.000	1819264.	176554.	6386667.
17280.000	1770911.	176966.	6404769.
17285.000	1722197.	177374.	6422764.
17290.000	1673118.	177779.	6440652.
17295.000	1623669.	178180.	6458433.
17300.000	1573848.	178578.	6476105.
17305.000	1523648.	178972.	6493665.
17310.000	1473066.	179363.	6511111.
17315.000	1422095.	179751.	6528440.
17318.570	1385467.	180026.	6540740.

TABLE 9-XIII

VEHICLE VELOCITY COMPONENTS - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR
NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
16550.000	-2954.99	185.51	7200.81
16555.000	-2997.54	185.02	7183.24
16560.000	-3039.98	184.52	7165.42
16565.000	-3082.31	184.01	7147.35
16570.000	-3124.54	183.50	7129.03
16575.000	-3166.66	182.98	7110.46
16580.000	-3208.66	182.46	7091.64
16585.000	-3250.56	181.93	7072.57
16590.000	-3292.34	181.39	7053.25
16595.000	-3334.01	180.85	7033.69
16600.000	-3375.56	180.30	7013.89
16605.000	-3417.00	179.75	6993.83
16610.000	-3458.31	179.18	6973.54
16615.000	-3499.51	178.62	6952.99
16620.000	-3540.58	178.04	6932.21
16625.000	-3581.53	177.46	6911.18
16630.000	-3622.35	176.88	6889.91
16635.000	-3663.05	176.28	6868.40
16640.000	-3703.62	175.68	6846.65
16645.000	-3744.06	175.08	6824.66
16650.000	-3784.37	174.47	6802.44
16655.000	-3824.55	173.85	6779.97
16660.000	-3864.60	173.23	6757.27
16665.000	-3904.51	172.60	6734.33
16670.000	-3944.28	171.96	6711.15
16675.000	-3983.92	171.32	6687.74
16680.000	-4023.42	170.67	6664.10
16685.000	-4062.78	170.02	6640.22
16690.000	-4101.99	169.36	6616.11
16695.000	-4141.07	168.69	6591.77
16700.000	-4179.99	168.02	6567.20
16705.000	-4218.78	167.34	6542.40
16710.000	-4257.41	166.66	6517.37
16715.000	-4295.90	165.97	6492.12
16720.000	-4334.24	165.28	6466.63
16725.000	-4372.43	164.58	6440.92
16730.000	-4410.46	163.87	6414.99
16735.000	-4448.34	163.16	6388.83
16740.000	-4486.07	162.44	6362.44
16745.000	-4523.64	161.71	6335.84

TABLE 9-XIII

VEHICLE VELOCITY COMPONENTS - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR
NOMINAL TRAJECTORY)
(CONTINUED)

VELOCITY COMPONENTS IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
16750.000	-4561.05	160.99	6309.01
16755.000	-4598.30	160.25	6281.96
16760.000	-4635.39	159.51	6254.69
16765.000	-4672.32	158.76	6227.20
16770.000	-4709.09	158.01	6199.50
16775.000	-4745.70	157.25	6171.58
16780.000	-4782.13	156.49	6143.44
16785.000	-4818.41	155.72	6115.08
16790.000	-4854.51	154.95	6086.52
16795.000	-4890.44	154.17	6057.74
16800.000	-4926.21	153.38	6028.75
16805.000	-4961.80	152.59	5999.54
16810.000	-4997.22	151.79	5970.13
16815.000	-5032.46	150.99	5940.51
16820.000	-5067.53	150.18	5910.68
16825.000	-5102.42	149.37	5880.64
16830.000	-5137.14	148.55	5850.40
16835.000	-5171.67	147.73	5819.95
16840.000	-5206.03	146.90	5789.30
16845.000	-5240.20	146.07	5758.45
16850.000	-5274.19	145.23	5727.39
16855.000	-5307.99	144.39	5696.13
16860.000	-5341.62	143.54	5664.68
16865.000	-5375.05	142.68	5633.02
16870.000	-5408.30	141.82	5601.17
16875.000	-5441.36	140.96	5569.13
16880.000	-5474.22	140.09	5536.88
16885.000	-5506.90	139.22	5504.45
16890.000	-5539.39	138.34	5471.82
16895.000	-5571.68	137.45	5439.00
16900.000	-5603.79	136.56	5406.00
16905.000	-5635.70	135.67	5372.81
16910.000	-5667.42	134.77	5339.43
16915.000	-5698.94	133.87	5305.86
16920.000	-5730.26	132.96	5272.11
16925.000	-5761.38	132.05	5238.17
16930.000	-5792.30	131.13	5204.05
16935.000	-5823.02	130.21	5169.75
16940.000	-5853.53	129.28	5135.27
16945.000	-5883.84	128.35	5100.60

TABLE 9-XIII

VEHICLE VELOCITY COMPONENTS - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR
NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
16950.000	-5913.95	127.41	5065.76
16955.000	-5943.85	126.47	5030.74
16960.000	-5973.54	125.52	4995.54
16965.000	-6003.02	124.57	4960.17
16970.000	-6032.29	123.62	4924.62
16975.000	-6061.35	122.66	4888.90
16980.000	-6090.20	121.69	4853.01
16985.000	-6118.84	120.72	4816.95
16990.000	-6147.26	119.75	4780.72
16995.000	-6175.47	118.77	4744.33
17000.000	-6203.55	117.79	4707.82
17005.000	-6233.85	116.85	4672.74
17010.000	-6263.94	115.90	4637.48
17010.000	-6263.94	115.90	4637.48
17010.000	-6263.94	115.90	4637.48
17012.600	-6293.32	115.62	4627.89
17015.000	-6322.20	115.39	4620.20
17016.000	-6334.24	115.30	4616.99
17020.000	-6382.47	114.89	4604.12
17025.000	-6443.13	114.37	4587.61
17030.000	-6503.93	113.84	4571.08
17035.000	-6564.92	113.31	4554.46
17040.000	-6626.10	112.77	4537.75
17045.000	-6687.48	112.23	4520.95
17050.000	-6749.05	111.68	4504.08
17055.000	-6810.82	111.13	4487.15
17060.000	-6872.79	110.58	4470.16
17065.000	-6934.97	110.02	4453.12
17070.000	-6997.36	109.46	4436.03
17075.000	-7059.97	108.90	4418.90
17080.000	-7122.80	108.34	4401.74
17085.000	-7185.86	107.77	4384.54
17090.000	-7249.16	107.19	4367.31
17095.000	-7312.71	106.62	4350.07
17100.000	-7376.50	106.04	4332.80
17105.000	-7440.55	105.46	4315.53
17110.000	-7504.87	104.88	4298.25
17115.000	-7569.47	104.29	4280.97
17120.000	-7634.35	103.71	4263.70
17120.910	-7646.18	103.60	4260.56

TABLE 9-XIII

VEHICLE VELOCITY COMPONENTS - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (ZERO-FGR
NOMINAL TRAJECTORY)
(CONTINUED)

VELOCITY COMPONENTS IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
17125.000	-7695.36	103.07	4244.22
17130.000	-7755.60	102.42	4224.27
17135.000	-7816.05	101.77	4204.26
17140.000	-7876.71	101.12	4184.20
17145.000	-7937.59	100.46	4164.09
17150.000	-7998.70	99.80	4143.93
17155.000	-8060.04	99.13	4123.73
17160.000	-8121.62	98.47	4103.48
17165.000	-8183.46	97.80	4083.20
17170.000	-8245.56	97.13	4062.89
17175.000	-8307.93	96.45	4042.55
17180.000	-8370.58	95.78	4022.17
17185.000	-8433.53	95.10	4001.78
17190.000	-8496.78	94.42	3981.36
17195.000	-8560.36	93.74	3960.92
17200.000	-8624.27	93.05	3940.46
17205.000	-8688.52	92.37	3919.99
17210.000	-8753.14	91.68	3899.50
17215.000	-8818.13	90.99	3878.99
17220.000	-8883.52	90.31	3858.47
17225.000	-8949.32	89.62	3837.94
17230.000	-9015.55	88.92	3817.39
17235.000	-9082.23	88.23	3796.81
17240.000	-9149.38	87.54	3776.22
17245.000	-9217.03	86.85	3755.60
17250.000	-9285.20	86.15	3734.94
17255.000	-9353.91	85.46	3714.24
17260.000	-9423.19	84.77	3693.49
17265.000	-9493.07	84.07	3672.68
17270.000	-9563.58	83.38	3651.78
17275.000	-9634.76	82.69	3630.79
17280.000	-9706.63	81.99	3609.67
17285.000	-9779.24	81.30	3588.41
17290.000	-9852.63	80.61	3566.95
17295.000	-9926.85	79.91	3545.27
17300.000	-10001.93	79.22	3523.30
17305.000	-10077.93	78.54	3501.01
17310.000	-10155.20	77.88	3477.34
17315.000	-10233.21	77.22	3454.13
17318.570	-10289.40	76.75	3437.76

TABLE 9-XIV WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE
FROM CAPE KENNEDY - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
16550.000	2.958783E 05	1.920655E 01	208624.7	2253.011
16555.000	2.958772E 05	1.921905E 01	208612.6	2233.744
16560.000	2.958761E 05	1.923155E 01	208600.2	2214.477
16565.000	2.958751E 05	1.924405E 01	208587.3	2195.211
16570.000	2.958740E 05	1.925655E 01	208574.2	2175.946
16575.000	2.958729E 05	1.926905E 01	208560.9	2156.681
16580.000	2.958718E 05	1.928155E 01	208547.1	2137.416
16585.000	2.958708E 05	1.929405E 01	208533.2	2118.152
16590.000	2.958697E 05	1.930655E 01	208518.9	2098.888
16595.000	2.958686E 05	1.931905E 01	208504.3	2079.625
16600.000	2.958675E 05	1.933155E 01	208489.3	2060.363
16605.000	2.958665E 05	1.934405E 01	208474.2	2041.101
16610.000	2.958654E 05	1.935655E 01	208458.7	2021.839
16615.000	2.958643E 05	1.936905E 01	208442.9	2002.579
16620.000	2.958632E 05	1.938155E 01	208426.8	1983.319
16625.000	2.958622E 05	1.939405E 01	208410.5	1964.059
16630.000	2.958611E 05	1.940655E 01	208393.7	1944.801
16635.000	2.958595E 05	1.500000E 01	208376.8	1925.543
16640.000	2.958446E 05	1.557167E 01	208359.6	1906.286
16645.000	2.958298E 05	1.614335E 01	208342.0	1887.029
16650.000	2.958149E 05	1.671502E 01	208324.1	1867.774
16655.000	2.958000E 05	1.728670E 01	208306.1	1848.519
16660.000	2.957851E 05	1.785837E 01	208287.6	1829.265
16665.000	2.957702E 05	1.843005E 01	208268.9	1810.012
16670.000	2.957553E 05	1.900172E 01	208249.9	1790.760
16675.000	2.957404E 05	1.957340E 01	208230.5	1771.509
16680.000	2.957255E 05	2.014507E 01	208211.1	1752.259
16685.000	2.957106E 05	2.071675E 01	208191.0	1733.011
16690.000	2.956957E 05	2.128842E 01	208170.8	1713.763
16695.000	2.956808E 05	2.186010E 01	208150.6	1694.516
16700.000	2.956659E 05	2.243177E 01	208129.7	1675.271
16705.000	2.956510E 05	2.300345E 01	208108.7	1656.026
16710.000	2.956362E 05	2.357512E 01	208087.5	1636.784
16715.000	2.956213E 05	2.414680E 01	208065.9	1617.542
16720.000	2.956064E 05	2.471847E 01	208044.2	1598.302
16725.000	2.955915E 05	2.529015E 01	208021.9	1579.063
16730.000	2.955766E 05	2.586182E 01	207999.7	1559.826
16735.000	2.955617E 05	2.643350E 01	207976.9	1540.590
16740.000	2.955468E 05	2.700517E 01	207954.0	1521.356
16745.000	2.955319E 05	2.757685E 01	207931.0	1502.123

TABLE 9-XIV WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE
FROM CAPE KENNEDY - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
16750.000	2.955170E 05	2.814852E 01	207907.4	1482.893
16755.000	2.955021E 05	2.872020E 01	207883.7	1463.664
16760.000	2.954872E 05	2.929187E 01	207859.7	1444.437
16765.000	2.954723E 05	2.986355E 01	207835.5	1425.212
16770.000	2.954574E 05	3.043522E 01	207811.0	1405.989
16775.000	2.954426E 05	3.100690E 01	207786.2	1386.769
16780.000	2.954277E 05	3.157857E 01	207761.3	1367.550
16785.000	2.954128E 05	3.215025E 01	207735.9	1348.335
16790.000	2.953979E 05	3.272192E 01	207710.5	1329.121
16795.000	2.953830E 05	3.329360E 01	207684.8	1309.910
16800.000	2.953681E 05	3.386527E 01	207658.9	1290.702
16805.000	2.953532E 05	3.443695E 01	207632.7	1271.497
16810.000	2.953383E 05	3.500862E 01	207606.2	1252.295
16815.000	2.953234E 05	3.558030E 01	207579.5	1233.096
16820.000	2.953085E 05	3.615197E 01	207552.7	1213.900
16825.000	2.952936E 05	3.672365E 01	207525.4	1194.708
16830.000	2.952787E 05	3.729532E 01	207498.1	1175.519
16835.000	2.952638E 05	3.786700E 01	207470.5	1156.335
16840.000	2.952489E 05	3.843867E 01	207442.6	1137.154
16845.000	2.952341E 05	3.901035E 01	207414.7	1117.978
16850.000	2.952192E 05	3.958202E 01	207386.4	1098.806
16855.000	2.952043E 05	4.015370E 01	207357.8	1079.638
16860.000	2.951894E 05	4.072537E 01	207329.2	1060.476
16865.000	2.951745E 05	4.129705E 01	207300.3	1041.319
16870.000	2.951596E 05	4.186872E 01	207271.3	1022.168
16875.000	2.951447E 05	4.244040E 01	207241.9	1003.023
16880.000	2.951298E 05	4.301207E 01	207212.4	983.884
16885.000	2.951149E 05	4.358375E 01	207182.7	964.751
16890.000	2.951000E 05	4.415542E 01	207152.9	945.626
16895.000	2.950851E 05	4.472710E 01	207122.8	926.508
16900.000	2.950702E 05	1.400000E 02	207092.6	907.398
16905.000	2.950553E 05	1.400000E 02	207062.1	888.296
16910.000	2.950404E 05	1.400000E 02	207031.4	869.204
16915.000	2.950256E 05	1.400000E 02	207000.7	850.121
16920.000	2.950107E 05	1.400000E 02	206969.8	831.049
16925.000	2.949958E 05	1.400000E 02	206938.6	811.987
16930.000	2.949809E 05	1.400000E 02	206907.4	792.938
16935.000	2.949660E 05	1.400000E 02	206875.8	773.901
16940.000	2.949511E 05	1.400000E 02	206844.2	754.878
16945.000	2.949362E 05	1.400000E 02	206812.4	735.870

TABLE 9-XIV WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE
FROM CAPE KENNEDY - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
16950.000	2.949213E 05	1.400000E 02	206780.6	716.878
16955.000	2.949064E 05	1.400000E 02	206748.5	697.904
16960.000	2.948915E 05	1.400000E 02	206716.4	678.948
16965.000	2.948766E 05	1.400000E 02	206684.1	660.013
16970.000	2.948617E 05	1.400000E 02	206651.7	641.099
16975.000	2.948468E 05	1.400000E 02	206619.0	622.211
16980.000	2.948320E 05	1.400000E 02	206586.4	603.349
16985.000	2.948171E 05	1.400000E 02	206553.7	584.516
16990.000	2.948022E 05	1.400000E 02	206520.7	565.715
16995.000	2.947873E 05	1.400000E 02	206487.8	546.950
17000.000	2.947724E 05	1.825100E 04	206454.8	528.224
17005.000	2.947575E 05	1.825100E 04	206421.0	509.538
17010.000	2.947426E 05	1.825100E 04	206386.4	490.893
17010.000	2.947426E 05	1.825100E 04	206386.4	490.893
17010.000	2.947426E 05	2.073030E 05	206386.4	490.893
17012.600	2.934824E 05	2.333470E 05	206366.5	481.205
17015.000	2.921654E 05	2.333470E 05	206345.7	472.254
17016.000	2.916167E 05	2.333470E 05	206336.4	468.521
17020.000	2.894220E 05	2.333470E 05	206295.9	453.579
17025.000	2.866785E 05	2.333470E 05	206252.2	434.877
17030.000	2.839350E 05	2.333470E 05	206222.8	416.157
17035.000	2.811916E 05	2.333470E 05	206210.4	397.432
17040.000	2.784481E 05	2.333470E 05	206218.4	378.715
17045.000	2.757047E 05	2.333470E 05	206249.4	360.024
17050.000	2.729612E 05	2.333470E 05	206307.0	341.382
17055.000	2.702178E 05	2.333470E 05	206394.8	322.816
17060.000	2.674743E 05	2.333470E 05	206515.9	304.361
17065.000	2.647308E 05	2.333470E 05	206674.1	286.060
17070.000	2.619874E 05	2.333470E 05	206873.3	267.969
17075.000	2.592439E 05	2.333470E 05	207117.0	250.160
17080.000	2.565005E 05	2.333470E 05	207408.9	232.725
17085.000	2.537570E 05	2.333470E 05	207753.0	215.789
17090.000	2.510136E 05	2.333470E 05	208153.2	199.511
17095.000	2.482701E 05	2.333470E 05	208613.5	184.106
17100.000	2.455267E 05	2.333470E 05	209138.1	169.852
17105.000	2.427832E 05	2.333470E 05	209731.1	157.108
17110.000	2.400397E 05	2.333470E 05	210396.4	146.322
17115.000	2.372963E 05	2.333470E 05	211138.9	138.005
17120.000	2.345528E 05	2.333470E 05	211962.4	132.680
17120.910	2.340537E 05	2.060472E 05	212121.4	132.068

TABLE 9-XIV WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE
FROM CAPE KENNEDY - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
17125.000	2.320826E 05	2.060472E 05	212870.6	130.771
17130.000	2.296731E 05	2.060472E 05	213865.4	132.486
17135.000	2.272636E 05	2.060472E 05	214949.9	137.735
17140.000	2.248541E 05	2.060472E 05	216128.3	146.189
17145.000	2.224446E 05	2.060472E 05	217404.6	157.374
17150.000	2.200350E 05	2.060472E 05	218782.9	170.797
17155.000	2.176255E 05	2.060472E 05	220266.8	186.011
17160.000	2.152160E 05	2.060472E 05	221860.8	202.648
17165.000	2.128065E 05	2.060472E 05	223569.0	220.420
17170.000	2.103970E 05	2.060472E 05	225395.4	239.103
17175.000	2.079875E 05	2.060472E 05	227344.3	258.528
17180.000	2.055780E 05	2.060472E 05	229420.2	278.567
17185.000	2.031685E 05	2.060472E 05	231626.9	299.121
17190.000	2.007590E 05	2.060472E 05	233969.3	320.114
17195.000	1.983495E 05	2.060472E 05	236451.4	341.486
17200.000	1.959400E 05	2.060472E 05	239077.6	363.193
17205.000	1.935305E 05	2.060472E 05	241852.7	385.196
17210.000	1.911210E 05	2.060472E 05	244781.0	407.466
17215.000	1.887115E 05	2.060472E 05	247866.9	429.981
17220.000	1.863020E 05	2.060472E 05	251114.8	452.720
17225.000	1.838925E 05	2.060472E 05	254529.4	475.667
17230.000	1.814830E 05	2.060472E 05	258115.3	498.809
17235.000	1.790735E 05	2.060472E 05	261877.3	522.136
17240.000	1.766640E 05	2.060472E 05	265819.7	545.638
17245.000	1.742545E 05	2.060472E 05	269946.9	569.308
17250.000	1.718450E 05	2.060472E 05	274263.8	593.138
17255.000	1.694355E 05	2.060472E 05	278774.9	617.122
17260.000	1.670260E 05	2.060472E 05	283484.6	641.257
17265.000	1.646165E 05	2.060472E 05	288397.6	665.538
17270.000	1.622069E 05	2.060472E 05	293518.3	689.960
17275.000	1.597974E 05	2.060472E 05	298851.0	714.522
17280.000	1.573879E 05	2.060472E 05	304400.2	739.221
17285.000	1.549784E 05	2.060472E 05	310170.2	764.053
17290.000	1.525689E 05	2.060472E 05	316164.7	789.017
17295.000	1.501594E 05	2.060472E 05	322388.1	814.111
17300.000	1.477499E 05	2.060472E 05	328844.0	839.334
17305.000	1.453404E 05	2.060472E 05	335535.8	864.685
17310.000	1.429309E 05	2.060472E 05	342466.8	890.162
17315.000	1.405214E 05	2.060472E 05	349637.7	915.765
17320.000	1.381119E 05	2.060472E 05	357049.3	941.494

TABLE 9-XIV WEIGHT, THRUST, ALTITUDE, AND SURFACE RANGE
FROM CAPE KENNEDY - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	WEIGHT (POUNDS)	THRUST (POUNDS)	ALTITUDE (METERS)	SURFACE RANGE (NMI)
17324.017	1.361762E 05	2.060472E 05	363183.5	962.254

TABLE 9-XV

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
16550.000	7785.762	7381.34	9.207	9.2065
16555.000	7785.784	7381.36	9.207	9.2066
16560.000	7785.805	7381.38	9.207	9.2066
16565.000	7785.827	7381.40	9.207	9.2066
16570.000	7785.849	7381.42	9.207	9.2067
16575.000	7785.871	7381.44	9.207	9.2067
16580.000	7785.893	7381.46	9.207	9.2068
16585.000	7785.915	7381.48	9.207	9.2068
16590.000	7785.938	7381.50	9.207	9.2068
16595.000	7785.960	7381.52	9.207	9.2069
16600.000	7785.983	7381.54	9.207	9.2069
16605.000	7786.005	7381.56	9.207	9.2070
16610.000	7786.028	7381.59	9.207	9.2070
16615.000	7786.050	7381.61	9.207	9.2071
16620.000	7786.073	7381.63	9.207	9.2071
16625.000	7786.096	7381.65	9.207	9.2072
16630.000	7786.119	7381.68	9.207	9.2072
16635.000	7786.142	7381.70	9.207	9.2073
16640.000	7786.164	7381.73	9.207	9.2073
16645.000	7786.187	7381.75	9.207	9.2074
16650.000	7786.209	7381.78	9.207	9.2074
16655.000	7786.232	7381.80	9.207	9.2074
16660.000	7786.255	7381.83	9.208	9.2075
16665.000	7786.279	7381.85	9.208	9.2075
16670.000	7786.302	7381.88	9.208	9.2076
16675.000	7786.325	7381.91	9.208	9.2076
16680.000	7786.349	7381.94	9.208	9.2077
16685.000	7786.373	7381.97	9.208	9.2078
16690.000	7786.397	7381.99	9.208	9.2078
16695.000	7786.421	7382.02	9.208	9.2079
16700.000	7786.446	7382.05	9.208	9.2079
16705.000	7786.470	7382.08	9.208	9.2080
16710.000	7786.495	7382.11	9.208	9.2080
16715.000	7786.520	7382.15	9.208	9.2081
16720.000	7786.544	7382.18	9.208	9.2081
16725.000	7786.570	7382.21	9.208	9.2082
16730.000	7786.595	7382.24	9.208	9.2082
16735.000	7786.620	7382.28	9.208	9.2083
16740.000	7786.646	7382.31	9.208	9.2083
16745.000	7786.671	7382.34	9.208	9.2084

TABLE 9-XV

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
16750.000	7786.697	7382.38	9.209	9.2085
16755.000	7786.723	7382.41	9.209	9.2085
16760.000	7786.750	7382.45	9.209	9.2086
16765.000	7786.776	7382.48	9.209	9.2086
16770.000	7786.802	7382.52	9.209	9.2087
16775.000	7786.829	7382.56	9.209	9.2088
16780.000	7786.855	7382.59	9.209	9.2088
16785.000	7786.882	7382.63	9.209	9.2089
16790.000	7786.909	7382.67	9.209	9.2089
16795.000	7786.936	7382.71	9.209	9.2090
16800.000	7786.964	7382.75	9.209	9.2091
16805.000	7786.991	7382.79	9.209	9.2091
16810.000	7787.018	7382.82	9.209	9.2092
16815.000	7787.046	7382.86	9.209	9.2092
16820.000	7787.074	7382.91	9.209	9.2093
16825.000	7787.101	7382.95	9.209	9.2094
16830.000	7787.129	7382.99	9.210	9.2094
16835.000	7787.157	7383.03	9.210	9.2095
16840.000	7787.186	7383.07	9.210	9.2096
16845.000	7787.214	7383.11	9.210	9.2096
16850.000	7787.242	7383.16	9.210	9.2097
16855.000	7787.271	7383.20	9.210	9.2097
16860.000	7787.299	7383.24	9.210	9.2098
16865.000	7787.328	7383.29	9.210	9.2099
16870.000	7787.357	7383.33	9.210	9.2099
16875.000	7787.386	7383.38	9.210	9.2100
16880.000	7787.415	7383.42	9.210	9.2101
16885.000	7787.444	7383.47	9.210	9.2101
16890.000	7787.473	7383.51	9.210	9.2102
16895.000	7787.503	7383.56	9.210	9.2103
16900.000	7787.547	7383.62	9.211	9.2103
16905.000	7787.592	7383.68	9.211	9.2104
16910.000	7787.638	7383.75	9.211	9.2105
16915.000	7787.683	7383.81	9.211	9.2105
16920.000	7787.728	7383.87	9.211	9.2106
16925.000	7787.773	7383.94	9.211	9.2107
16930.000	7787.818	7384.00	9.211	9.2107
16935.000	7787.863	7384.06	9.211	9.2108
16940.000	7787.909	7384.13	9.211	9.2109
16945.000	7787.954	7384.19	9.211	9.2109

TABLE 9-XV

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
16950.000	7787.999	7384.26	9.211	9.2110
16955.000	7788.044	7384.32	9.211	9.2111
16960.000	7788.089	7384.39	9.211	9.2111
16965.000	7788.134	7384.45	9.212	9.2112
16970.000	7788.179	7384.52	9.212	9.2113
16975.000	7788.223	7384.58	9.212	9.2114
16980.000	7788.268	7384.65	9.212	9.2114
16985.000	7788.313	7384.71	9.212	9.2115
16990.000	7788.358	7384.78	9.212	9.2116
16995.000	7788.402	7384.85	9.212	9.2116
17000.000	7788.547	7385.01	9.273	9.2117
17005.000	7791.598	7388.09	9.273	9.2118
17010.000	7794.650	7391.16	9.273	9.2118
17010.000	7794.650	7391.16	9.273	9.2118
17010.000	7794.650	7391.16	11.884	9.2118
17012.600	7812.594	7409.11	12.454	9.2119
17015.000	7831.329	7427.86	12.455	9.2119
17016.000	7839.161	7435.69	12.542	9.2120
17020.000	7870.648	7467.21	12.059	9.2120
17025.000	7910.328	7506.93	11.992	9.2121
17030.000	7950.405	7547.04	12.008	9.2122
17035.000	7990.851	7587.52	12.044	9.2122
17040.000	8031.672	7628.37	12.079	9.2122
17045.000	8072.872	7669.59	12.112	9.2120
17050.000	8114.449	7711.18	12.142	9.2119
17055.000	8156.409	7753.15	12.173	9.2116
17060.000	8198.751	7795.50	12.204	9.2112
17065.000	8241.480	7838.23	12.237	9.2107
17070.000	8284.599	7881.33	12.270	9.2102
17075.000	8328.110	7924.83	12.304	9.2095
17080.000	8372.018	7968.71	12.339	9.2086
17085.000	8416.326	8012.99	12.376	9.2076
17090.000	8461.038	8057.66	12.413	9.2065
17095.000	8506.159	8102.74	12.452	9.2051
17100.000	8551.695	8148.22	12.493	9.2036
17105.000	8597.649	8194.11	12.534	9.2020
17110.000	8644.028	8240.41	12.577	9.2001
17115.000	8690.838	8287.14	12.622	9.1980
17120.000	8738.085	8334.30	12.669	9.1956
17120.910	8746.728	8342.92	11.914	9.1952

TABLE 9-XV

INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
17125.000	8781.080	8377.20	11.957	9.1931
17130.000	8823.490	8419.52	11.982	9.1902
17135.000	8866.210	8462.15	12.023	9.1872
17140.000	8909.277	8505.11	12.058	9.1839
17145.000	8952.690	8548.41	12.096	9.1803
17150.000	8996.453	8592.05	12.136	9.1764
17155.000	9040.572	8636.03	12.178	9.1722
17160.000	9085.054	8680.36	12.221	9.1678
17165.000	9129.903	8725.06	12.267	9.1630
17170.000	9175.128	8770.11	12.315	9.1579
17175.000	9220.735	8815.54	12.366	9.1524
17180.000	9266.732	8861.35	12.419	9.1466
17185.000	9313.127	8907.54	12.475	9.1405
17190.000	9359.930	8954.13	12.534	9.1340
17195.000	9407.151	9001.13	12.596	9.1271
17200.000	9454.798	9048.54	12.661	9.1198
17205.000	9502.884	9096.38	12.730	9.1121
17210.000	9551.419	9144.65	12.802	9.1040
17215.000	9600.416	9193.38	12.879	9.0955
17220.000	9649.889	9242.56	12.960	9.0865
17225.000	9699.851	9292.23	13.045	9.0771
17230.000	9750.317	9342.38	13.135	9.0673
17235.000	9801.303	9393.05	13.230	9.0569
17240.000	9852.826	9444.23	13.331	9.0461
17245.000	9904.903	9495.96	13.437	9.0349
17250.000	9957.554	9548.25	13.550	9.0231
17255.000	10010.798	9601.11	13.669	9.0108
17260.000	10064.656	9654.58	13.795	8.9980
17265.000	10119.151	9708.67	13.929	8.9847
17270.000	10174.307	9763.40	14.071	8.9709
17275.000	10230.147	9818.81	14.222	8.9565
17280.000	10286.700	9874.91	14.382	8.9416
17285.000	10343.992	9931.74	14.553	8.9261
17290.000	10402.054	9989.32	14.736	8.9101
17295.000	10460.916	10047.68	14.928	8.8935
17300.000	10520.610	10106.86	15.137	8.8763
17305.000	10581.172	10166.89	15.360	8.8585
17310.000	10642.638	10227.81	15.516	8.8402
17315.000	10704.994	10289.60	15.935	8.8213
17320.000	10768.415	10352.43	16.079	8.8019

TABLE 9-XV INERTIAL VELOCITY, RELATIVE VELOCITY,
INERTIAL ACCELERATION, AND GRAVITATIONAL
ACCELERATION - PREIGNITION SEQUENCE INITIATION
TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL VELOCITY (M/SEC)	RELATIVE VELOCITY (M/SEC)	INERTIAL ACCELERATION (M/SEC/SEC)	GRAVITATIONAL ACCELERATION (M/SEC/SEC)
17324.017	10820.164	10403.71	16.200	8.7858

TABLE 9-XVI INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING, GEODETIC LATITUDE, AND LONGITUDE - PREIGNITION SEQUENCE INITIATION TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
16550.000	-0.028	86.636	32.571	-124.207
16555.000	-0.027	86.851	32.591	-123.827
16560.000	-0.027	87.067	32.609	-123.447
16565.000	-0.027	87.283	32.625	-123.067
16570.000	-0.027	87.499	32.641	-122.686
16575.000	-0.027	87.715	32.655	-122.306
16580.000	-0.026	87.931	32.668	-121.925
16585.000	-0.026	88.147	32.680	-121.544
16590.000	-0.026	88.364	32.690	-121.164
16595.000	-0.026	88.580	32.699	-120.783
16600.000	-0.026	88.797	32.707	-120.402
16605.000	-0.025	89.013	32.713	-120.020
16610.000	-0.025	89.230	32.718	-119.639
16615.000	-0.025	89.447	32.722	-119.258
16620.000	-0.025	89.664	32.725	-118.877
16625.000	-0.025	89.881	32.726	-118.495
16630.000	-0.024	90.098	32.726	-118.114
16635.000	-0.024	90.315	32.725	-117.733
16640.000	-0.024	90.531	32.723	-117.352
16645.000	-0.024	90.748	32.719	-116.970
16650.000	-0.024	90.965	32.714	-116.589
16655.000	-0.023	91.182	32.707	-116.208
16660.000	-0.023	91.398	32.700	-115.827
16665.000	-0.023	91.615	32.691	-115.446
16670.000	-0.023	91.831	32.681	-115.065
16675.000	-0.023	92.048	32.669	-114.684
16680.000	-0.022	92.264	32.656	-114.303
16685.000	-0.022	92.480	32.642	-113.923
16690.000	-0.022	92.696	32.627	-113.542
16695.000	-0.022	92.912	32.610	-113.162
16700.000	-0.021	93.127	32.592	-112.782
16705.000	-0.021	93.343	32.573	-112.402
16710.000	-0.021	93.558	32.553	-112.022
16715.000	-0.021	93.773	32.531	-111.642
16720.000	-0.021	93.988	32.508	-111.263
16725.000	-0.020	94.202	32.484	-110.883
16730.000	-0.020	94.416	32.458	-110.504
16735.000	-0.020	94.630	32.431	-110.126
16740.000	-0.020	94.844	32.403	-109.747
16745.000	-0.019	95.057	32.374	-109.369

TABLE 9-XVI

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - PREIGNITION
 SEQUENCE INITIATION TO J-2 CUTOFF (FPR
 NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
16750.000	-0.019	95.270	32.343	-108.991
16755.000	-0.019	95.483	32.312	-108.613
16760.000	-0.019	95.695	32.278	-108.235
16765.000	-0.019	95.907	32.244	-107.858
16770.000	-0.018	96.119	32.208	-107.481
16775.000	-0.018	96.330	32.172	-107.104
16780.000	-0.018	96.541	32.133	-106.728
16785.000	-0.018	96.751	32.094	-106.352
16790.000	-0.017	96.961	32.054	-105.977
16795.000	-0.017	97.171	32.012	-105.601
16800.000	-0.017	97.380	31.969	-105.226
16805.000	-0.017	97.589	31.924	-104.852
16810.000	-0.016	97.797	31.879	-104.478
16815.000	-0.016	98.005	31.832	-104.104
16820.000	-0.016	98.212	31.784	-103.731
16825.000	-0.016	98.419	31.735	-103.358
16830.000	-0.016	98.625	31.685	-102.985
16835.000	-0.015	98.831	31.633	-102.613
16840.000	-0.015	99.036	31.580	-102.241
16845.000	-0.015	99.241	31.526	-101.870
16850.000	-0.015	99.445	31.471	-101.499
16855.000	-0.014	99.649	31.415	-101.129
16860.000	-0.014	99.852	31.357	-100.759
16865.000	-0.014	100.054	31.298	-100.390
16870.000	-0.014	100.256	31.238	-100.021
16875.000	-0.013	100.457	31.177	-99.652
16880.000	-0.013	100.657	31.115	-99.285
16885.000	-0.013	100.857	31.051	-98.917
16890.000	-0.013	101.057	30.987	-98.550
16895.000	-0.012	101.255	30.921	-98.184
16900.000	-0.012	101.453	30.854	-97.818
16905.000	-0.012	101.651	30.786	-97.453
16910.000	-0.012	101.847	30.717	-97.088
16915.000	-0.011	102.043	30.646	-96.724
16920.000	-0.011	102.239	30.575	-96.360
16925.000	-0.011	102.433	30.502	-95.997
16930.000	-0.011	102.627	30.428	-95.635
16935.000	-0.010	102.820	30.353	-95.273
16940.000	-0.010	103.013	30.277	-94.911
16945.000	-0.010	103.205	30.200	-94.551

TABLE 9-XVI

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - PREIGNITION
 SEQUENCE INITIATION TO J-2 CUTOFF (FPR
 NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
16950.000	-0.010	103.395	30.122	-94.191
16955.000	-0.009	103.586	30.042	-93.831
16960.000	-0.009	103.775	29.962	-93.472
16965.000	-0.009	103.964	29.880	-93.114
16970.000	-0.009	104.152	29.798	-92.756
16975.000	-0.008	104.339	29.714	-92.399
16980.000	-0.008	104.525	29.629	-92.042
16985.000	-0.008	104.711	29.543	-91.687
16990.000	-0.008	104.895	29.456	-91.331
16995.000	-0.007	105.079	29.368	-90.977
17000.000	-0.007	105.262	29.279	-90.623
17005.000	-0.008	105.445	29.189	-90.269
17010.000	-0.009	105.626	29.098	-89.917
17010.000	-0.009	105.626	29.098	-89.917
17012.600	-0.017	105.626	29.098	-89.917
17015.000	-0.024	105.720	29.050	-89.733
17016.000	-0.027	105.807	29.006	-89.563
17020.000	-0.030	105.844	28.987	-89.493
17025.000	-0.009	105.994	28.912	-89.209
17030.000	0.013	106.187	28.816	-88.854
17035.000	0.041	106.377	28.719	-88.497
17040.000	0.072	106.565	28.620	-88.139
17045.000	0.108	106.751	28.520	-87.780
17050.000	0.148	106.936	28.418	-87.420
17055.000	0.192	107.118	28.314	-87.058
17060.000	0.241	107.298	28.209	-86.696
17065.000	0.294	107.477	28.102	-86.332
17070.000	0.352	107.653	27.994	-85.967
17075.000	0.415	107.827	27.884	-85.600
17080.000	0.482	107.999	27.772	-85.233
17085.000	0.554	108.169	27.659	-84.864
17090.000	0.630	108.337	27.544	-84.494
17095.000	0.711	108.502	27.428	-84.122
17100.000	0.797	108.665	27.310	-83.750
17105.000	0.887	108.826	27.190	-83.376
17110.000	0.981	108.985	27.068	-83.001
17115.000	1.081	109.142	26.945	-82.624
17120.000	1.185	109.296	26.821	-82.246
17120.910	1.204	109.448	26.695	-81.867
		109.475	26.671	-81.798

TABLE 9-XVI

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
 GEODETIC LATITUDE, AND LONGITUDE - PREIGNITION
 SEQUENCE INITIATION TO J-2 CUTOFF (FPR
 NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
17125.000	1.291	109.600	26.567	-61.487
17130.000	1.399	109.757	26.437	-81.106
17135.000	1.512	109.910	26.306	-80.724
17140.000	1.628	110.061	26.174	-80.340
17145.000	1.749	110.209	26.040	-79.956
17150.000	1.873	110.355	25.904	-79.571
17155.000	2.001	110.498	25.767	-79.184
17160.000	2.133	110.638	25.628	-78.797
17165.000	2.269	110.775	25.488	-78.408
17170.000	2.409	110.910	25.346	-78.019
17175.000	2.552	111.042	25.202	-77.629
17180.000	2.699	111.172	25.057	-77.237
17185.000	2.850	111.298	24.911	-76.845
17190.000	3.005	111.422	24.763	-76.451
17195.000	3.164	111.543	24.614	-76.057
17200.000	3.326	111.661	24.463	-75.661
17205.000	3.491	111.776	24.310	-75.264
17210.000	3.661	111.888	24.157	-74.867
17215.000	3.833	111.998	24.001	-74.468
17220.000	4.010	112.104	23.845	-74.068
17225.000	4.189	112.207	23.687	-73.667
17230.000	4.372	112.308	23.527	-73.266
17235.000	4.559	112.405	23.366	-72.863
17240.000	4.748	112.499	23.204	-72.459
17245.000	4.941	112.591	23.040	-72.054
17250.000	5.136	112.679	22.876	-71.648
17255.000	5.335	112.763	22.709	-71.241
17260.000	5.536	112.845	22.542	-70.832
17265.000	5.740	112.924	22.373	-70.423
17270.000	5.947	112.999	22.203	-70.013
17275.000	6.155	113.071	22.031	-69.601
17280.000	6.366	113.140	21.859	-69.189
17285.000	6.579	113.205	21.685	-68.775
17290.000	6.794	113.267	21.510	-68.360
17295.000	7.010	113.326	21.334	-67.944
17300.000	7.227	113.382	21.156	-67.527
17305.000	7.445	113.434	20.978	-67.109
17310.000	7.663	113.484	20.798	-66.689
17315.000	7.876	113.529	20.618	-66.269
17320.000	8.092	113.572	20.436	-65.847

TABLE 9-XVI

INERTIAL FLIGHT-PATH ANGLE, INERTIAL HEADING,
GEODETTIC LATITUDE, AND LONGITUDE - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (FPR
NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	INERTIAL FLIGHT- PATH ANGLE (DEGREES)	INERTIAL HEADING (DEGREES)	GEODETTIC LATITUDE (DEGREES)	LONGITUDE (DEGREES)
17324.017	8.270	113.606	20.289	-65.507

TABLE 9-XVII
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - PREIGNITION SEQUENCE INITIATION
 TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
16550.000	-116.18	-116.18	1.32	1.32	-0.00	-0.00
16555.000	-116.52	-116.52	1.31	1.31	-0.00	-0.00
16560.000	-116.86	-116.86	1.31	1.31	-0.00	-0.00
16565.000	-117.20	-117.20	1.30	1.30	-0.00	-0.00
16570.000	-117.54	-117.54	1.30	1.30	-0.00	-0.00
16575.000	-117.88	-117.88	1.29	1.29	-0.00	-0.00
16580.000	-118.22	-118.22	1.29	1.29	-0.00	-0.00
16585.000	-118.55	-118.55	1.29	1.29	-0.00	-0.00
16590.000	-118.89	-118.89	1.28	1.28	-0.00	-0.00
16595.000	-119.23	-119.23	1.28	1.28	-0.00	-0.00
16600.000	-119.57	-119.57	1.27	1.27	-0.00	-0.00
16605.000	-119.91	-119.91	1.27	1.27	-0.00	-0.00
16610.000	-120.25	-120.25	1.26	1.26	-0.00	-0.00
16615.000	-120.59	-120.59	1.26	1.26	-0.00	-0.00
16620.000	-120.93	-120.93	1.25	1.25	-0.00	-0.00
16625.000	-121.26	-121.26	1.25	1.25	-0.00	-0.00
16630.000	-121.60	-121.60	1.24	1.24	-0.00	-0.00
16635.000	-121.94	-121.94	1.24	1.24	-0.00	-0.00
16640.000	-122.28	-122.28	1.23	1.23	-0.00	-0.00
16645.000	-122.62	-122.62	1.23	1.23	-0.00	-0.00
16650.000	-122.96	-122.96	1.22	1.22	-0.00	-0.00
16655.000	-123.30	-123.30	1.22	1.22	-0.00	-0.00
16660.000	-123.64	-123.64	1.21	1.21	-0.00	-0.00
16665.000	-123.98	-123.98	1.21	1.21	-0.00	-0.00
16670.000	-124.31	-124.31	1.20	1.20	-0.00	-0.00
16675.000	-124.65	-124.65	1.20	1.20	-0.00	-0.00
16680.000	-124.99	-124.99	1.19	1.19	-0.00	-0.00
16685.000	-125.33	-125.33	1.19	1.19	-0.00	-0.00
16690.000	-125.67	-125.67	1.18	1.18	-0.00	-0.00
16695.000	-126.01	-126.01	1.18	1.18	-0.00	-0.00
16700.000	-126.35	-126.35	1.17	1.17	-0.00	-0.00
16705.000	-126.69	-126.69	1.17	1.17	-0.00	-0.00
16710.000	-127.02	-127.02	1.16	1.16	-0.00	-0.00
16715.000	-127.36	-127.36	1.16	1.16	-0.00	-0.00
16720.000	-127.70	-127.70	1.15	1.15	-0.00	-0.00
16725.000	-128.04	-128.04	1.14	1.14	-0.00	-0.00
16730.000	-128.38	-128.38	1.14	1.14	-0.00	-0.00
16735.000	-128.72	-128.72	1.13	1.13	-0.00	-0.00
16740.000	-129.06	-129.06	1.13	1.13	-0.00	-0.00
16745.000	-129.40	-129.40	1.12	1.12	-0.00	-0.00

TABLE 9-XVII
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - PREIGNITION SEQUENCE INITIATION
 TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
16750.000	-129.73	-129.73	1.12	1.12	-0.00	-0.00
16755.000	-130.07	-130.07	1.11	1.11	-0.00	-0.00
16760.000	-130.41	-130.41	1.10	1.10	-0.00	-0.00
16765.000	-130.75	-130.75	1.10	1.10	-0.00	-0.00
16770.000	-131.09	-131.09	1.09	1.09	-0.00	-0.00
16775.000	-131.43	-131.43	1.09	1.09	-0.00	-0.00
16780.000	-131.77	-131.77	1.08	1.08	-0.00	-0.00
16785.000	-132.11	-132.11	1.07	1.07	-0.00	-0.00
16790.000	-132.45	-132.45	1.07	1.07	-0.00	-0.00
16795.000	-132.78	-132.78	1.06	1.06	-0.00	-0.00
16800.000	-133.12	-133.12	1.05	1.05	-0.00	-0.00
16805.000	-133.46	-133.46	1.05	1.05	-0.00	-0.00
16810.000	-133.80	-133.80	1.04	1.04	-0.00	-0.00
16815.000	-134.14	-134.14	1.04	1.04	-0.00	-0.00
16820.000	-134.48	-134.48	1.03	1.03	-0.00	-0.00
16825.000	-134.82	-134.82	1.02	1.02	-0.00	-0.00
16830.000	-135.16	-135.16	1.02	1.02	-0.00	-0.00
16835.000	-135.49	-135.49	1.01	1.01	-0.00	-0.00
16840.000	-135.83	-135.83	1.00	1.00	-0.00	-0.00
16845.000	-136.17	-136.17	1.00	1.00	-0.00	-0.00
16850.000	-136.51	-136.51	0.99	0.99	-0.00	-0.00
16855.000	-136.85	-136.85	0.98	0.98	-0.00	-0.00
16860.000	-137.19	-137.19	0.98	0.98	-0.00	-0.00
16865.000	-137.53	-137.53	0.97	0.97	-0.00	-0.00
16870.000	-137.87	-137.87	0.96	0.96	-0.00	-0.00
16875.000	-138.20	-138.20	0.96	0.96	-0.00	-0.00
16880.000	-138.54	-138.54	0.95	0.95	-0.00	-0.00
16885.000	-138.88	-138.88	0.94	0.94	-0.00	-0.00
16890.000	-139.22	-139.22	0.94	0.94	-0.00	-0.00
16895.000	-139.56	-139.56	0.93	0.93	-0.00	-0.00
16900.000	-139.90	-139.90	0.92	0.92	-0.00	-0.00
16905.000	-140.24	-140.24	0.92	0.92	-0.00	-0.00
16910.000	-140.58	-140.58	0.91	0.91	-0.00	-0.00
16915.000	-140.92	-140.92	0.90	0.90	-0.00	-0.00
16920.000	-141.25	-141.25	0.89	0.89	-0.00	-0.00
16925.000	-141.59	-141.59	0.89	0.89	-0.00	-0.00
16930.000	-141.93	-141.93	0.88	0.88	-0.00	-0.00
16935.000	-142.27	-142.27	0.87	0.87	-0.00	-0.00
16940.000	-142.61	-142.61	0.87	0.87	-0.00	-0.00
16945.000	-142.95	-142.95	0.86	0.86	-0.00	-0.00

TABLE 9-XVII

COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - PREIGNITION SEQUENCE INITIATION
 TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
16950.000	-143.29	-143.29	0.85	0.85	-0.00	-0.00
16955.000	-143.63	-143.63	0.84	0.84	-0.00	-0.00
16960.000	-143.96	-143.96	0.84	0.84	-0.00	-0.00
16965.000	-144.30	-144.30	0.83	0.83	-0.00	-0.00
16970.000	-144.64	-144.64	0.82	0.82	-0.00	-0.00
16975.000	-144.98	-144.98	0.81	0.81	-0.00	-0.00
16980.000	-145.32	-145.32	0.81	0.81	-0.00	-0.00
16985.000	-145.66	-145.66	0.80	0.80	-0.00	-0.00
16990.000	-146.00	-146.00	0.79	0.79	-0.00	-0.00
16995.000	-146.34	-146.34	0.78	0.78	-0.00	-0.00
17000.000	-146.67	-146.67	0.78	0.78	-0.00	-0.00
17005.000	-147.02	-147.02	0.77	0.77	-0.00	-0.00
17010.000	-147.36	-147.36	0.76	0.76	-0.00	-0.00
17010.000	-147.36	-147.36	0.76	0.76	-0.00	-0.00
17010.000	-147.36	-147.36	0.76	0.76	-0.00	-0.00
17012.600	-147.36	-147.39	0.76	0.76	-0.00	-0.00
17015.000	-147.36	-147.35	0.76	0.76	-0.00	0.00
17016.000	-146.36	-147.35	0.76	0.76	-0.00	0.00
17020.000	-142.44	-143.63	1.76	0.76	-0.00	0.00
17025.000	-142.61	-142.51	3.13	3.67	-0.00	0.00
17030.000	-142.76	-142.71	2.73	2.73	-0.00	0.00
17035.000	-142.93	-142.89	2.35	2.45	-0.00	0.00
17040.000	-143.14	-143.08	1.99	2.07	-0.00	0.00
17045.000	-143.27	-143.24	1.65	1.72	-0.00	0.00
17050.000	-143.40	-143.37	1.25	1.35	-0.00	0.00
17055.000	-143.52	-143.49	0.86	0.96	-0.00	0.00
17060.000	-143.64	-143.61	0.47	0.56	-0.00	0.00
17065.000	-143.76	-143.73	0.08	0.17	-0.00	0.00
17070.000	-143.88	-143.85	-0.31	-0.22	-0.00	0.00
17075.000	-144.00	-143.97	-0.70	-0.61	-0.00	0.00
17080.000	-144.12	-144.09	-1.09	-1.00	-0.00	0.00
17085.000	-144.24	-144.21	-1.48	-1.38	-0.00	0.00
17090.000	-144.36	-144.33	-1.86	-1.77	-0.00	0.00
17095.000	-144.48	-144.45	-2.25	-2.16	-0.00	0.00
17100.000	-144.60	-144.57	-2.63	-2.54	-0.00	0.00
17105.000	-144.72	-144.69	-3.02	-2.93	-0.00	0.00
17110.000	-144.84	-144.81	-3.40	-3.31	-0.00	0.00
17115.000	-144.96	-144.93	-3.79	-3.69	-0.00	0.00
17120.000	-145.08	-145.05	-4.17	-4.08	-0.00	0.00
17120.910	-145.11	-145.08	-4.55	-4.46	-0.00	0.00
			-4.62	-4.53	-0.00	0.00

TABLE 9-XVII
 COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - PREIGNITION SEQUENCE INITIATION
 TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
17125.000	-145.44	-145.27	-3.74	-4.50	-0.00	0.00
17130.000	-145.56	-145.51	-4.35	-4.22	-0.00	0.00
17135.000	-145.73	-145.70	-4.76	-4.63	-0.00	0.00
17140.000	-145.91	-145.86	-5.20	-5.10	-0.00	0.00
17145.000	-146.08	-146.04	-5.63	-5.53	-0.00	0.00
17150.000	-146.26	-146.22	-6.07	-5.96	-0.00	0.00
17155.000	-146.44	-146.40	-6.50	-6.39	-0.00	0.00
17160.000	-146.63	-146.59	-6.93	-6.83	-0.00	0.00
17165.000	-146.83	-146.78	-7.36	-7.25	-0.00	0.00
17170.000	-147.03	-146.98	-7.78	-7.68	-0.00	0.00
17175.000	-147.23	-147.18	-8.21	-8.11	-0.00	0.00
17180.000	-147.45	-147.39	-8.63	-8.53	-0.00	0.00
17185.000	-147.67	-147.61	-9.05	-8.95	-0.00	0.00
17190.000	-147.89	-147.84	-9.47	-9.37	-0.00	0.00
17195.000	-148.13	-148.07	-9.89	-9.79	-0.00	0.00
17200.000	-148.37	-148.31	-10.30	-10.20	-0.00	0.00
17205.000	-148.63	-148.56	-10.72	-10.62	-0.00	0.00
17210.000	-148.89	-148.83	-11.12	-11.03	-0.00	0.00
17215.000	-149.17	-149.10	-11.53	-11.43	-0.00	0.00
17220.000	-149.45	-149.38	-11.94	-11.84	-0.00	0.00
17225.000	-149.75	-149.68	-12.34	-12.24	-0.00	0.00
17230.000	-150.06	-149.99	-12.74	-12.64	-0.00	0.00
17235.000	-150.39	-150.31	-13.13	-13.04	-0.00	0.00
17240.000	-150.73	-150.65	-13.52	-13.43	-0.00	0.00
17245.000	-151.09	-151.01	-13.91	-13.82	-0.00	0.00
17250.000	-151.47	-151.38	-14.30	-14.21	-0.00	0.00
17255.000	-151.87	-151.78	-14.68	-14.59	-0.00	0.00
17260.000	-152.29	-152.19	-15.06	-14.97	-0.00	0.00
17265.000	-152.74	-152.63	-15.43	-15.34	-0.00	0.00
17270.000	-153.21	-153.10	-15.80	-15.72	-0.00	0.00
17275.000	-153.72	-153.59	-16.17	-16.08	-0.00	0.00
17280.000	-154.25	-154.12	-16.53	-16.44	-0.00	0.00
17285.000	-154.83	-154.69	-16.88	-16.80	-0.00	0.00
17290.000	-155.45	-155.30	-17.23	-17.15	-0.00	0.00
17295.000	-156.12	-155.95	-17.57	-17.49	-0.00	0.00
17300.000	-156.85	-156.66	-17.90	-17.82	-0.00	0.00
17305.000	-157.65	-157.45	-18.21	-18.14	-0.00	0.00
17310.000	-159.36	-158.32	-18.77	-18.44	-0.00	0.00
17315.000	-159.82	-159.83	-18.77	-18.76	-0.00	0.00
17320.000	-159.82	-159.82	-18.79	-18.78	-0.00	0.00

TABLE 9-XVII COMMANDED AND ACTUAL VEHICLE ATTITUDE
 ANGLES - PREIGNITION SEQUENCE INITIATION
 TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	COMMANDED PITCH (DEG)	ACTUAL PITCH (DEG)	COMMANDED YAW (DEG)	ACTUAL YAW (DEG)	COMMANDED ROLL (DEG)	ACTUAL ROLL (DEG)
17324.017	-159.83	-159.83	-18.79	-18.79	-0.00	0.00

TABLE 9-XVIII

MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE,
 ANGLE OF ATTACK, AND NORMAL FORCE ANGLE
 - PREIGNITION SEQUENCE INITIATION TO J-2
 CUTOFF (FPR NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
16550.000	9.69	-0.029	3.87	88.
16555.000	9.69	-0.029	3.87	88.
16560.000	9.69	-0.029	3.87	88.
16565.000	9.69	-0.029	3.87	88.
16570.000	9.69	-0.028	3.87	89.
16575.000	9.69	-0.028	3.87	89.
16580.000	9.69	-0.028	3.87	89.
16585.000	9.69	-0.028	3.87	89.
16590.000	9.69	-0.028	3.87	89.
16595.000	9.69	-0.028	3.87	90.
16600.000	9.69	-0.027	3.87	90.
16605.000	9.69	-0.027	3.87	90.
16610.000	9.69	-0.027	3.87	90.
16615.000	9.69	-0.027	3.87	90.
16620.000	9.69	-0.026	3.87	90.
16625.000	9.69	-0.026	3.87	91.
16630.000	9.69	-0.026	3.87	91.
16635.000	9.70	-0.026	3.87	91.
16640.000	9.70	-0.025	3.87	91.
16645.000	9.70	-0.025	3.87	92.
16650.000	9.70	-0.025	3.87	92.
16655.000	9.70	-0.025	3.87	92.
16660.000	9.70	-0.024	3.87	92.
16665.000	9.70	-0.024	3.87	92.
16670.000	9.70	-0.024	3.87	92.
16675.000	9.70	-0.024	3.87	92.
16680.000	9.70	-0.024	3.87	93.
16685.000	9.70	-0.023	3.87	93.
16690.000	9.70	-0.023	3.87	93.
16695.000	9.70	-0.023	3.87	93.
16700.000	9.70	-0.023	3.87	93.
16705.000	9.70	-0.022	3.87	94.
16710.000	9.70	-0.022	3.87	94.
16715.000	9.70	-0.022	3.87	94.
16720.000	9.70	-0.022	3.87	94.
16725.000	9.70	-0.021	3.88	94.
16730.000	9.70	-0.021	3.88	94.
16735.000	9.70	-0.021	3.88	95.
16740.000	9.70	-0.021	3.88	95.
16745.000	9.70	-0.021	3.88	95.

TABLE 9-XVIII

MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE,
 ANGLE OF ATTACK, AND NORMAL FORCE ANGLE
 - PREIGNITION SEQUENCE INITIATION TO J-2
 CUTOFF (FPR NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
16750.000	9.70	-0.020	3.88	95.
16755.000	9.70	-0.020	3.88	96.
16760.000	9.70	-0.020	3.88	96.
16765.000	9.71	-0.020	3.88	96.
16770.000	9.71	-0.019	3.88	96.
16775.000	9.71	-0.019	3.88	96.
16780.000	9.71	-0.019	3.89	96.
16785.000	9.71	-0.019	3.89	97.
16790.000	9.71	-0.018	3.89	97.
16795.000	9.71	-0.018	3.89	97.
16800.000	9.71	-0.018	3.89	97.
16805.000	9.71	-0.018	3.89	97.
16810.000	9.71	-0.017	3.89	97.
16815.000	9.71	-0.017	3.89	98.
16820.000	9.71	-0.017	3.90	98.
16825.000	9.71	-0.017	3.90	98.
16830.000	9.71	-0.016	3.90	98.
16835.000	9.71	-0.016	3.90	98.
16840.000	9.71	-0.016	3.90	99.
16845.000	9.71	-0.016	3.90	99.
16850.000	9.71	-0.015	3.90	99.
16855.000	9.71	-0.015	3.91	99.
16860.000	9.71	-0.015	3.91	99.
16865.000	9.72	-0.015	3.91	99.
16870.000	9.72	-0.014	3.91	100.
16875.000	9.72	-0.014	3.91	100.
16880.000	9.72	-0.014	3.91	100.
16885.000	9.72	-0.014	3.92	100.
16890.000	9.72	-0.013	3.92	100.
16895.000	9.72	-0.013	3.92	100.
16900.000	9.72	-0.013	3.92	101.
16905.000	9.72	-0.013	3.92	101.
16910.000	9.72	-0.012	3.92	101.
16915.000	9.72	-0.012	3.93	101.
16920.000	9.72	-0.012	3.93	101.
16925.000	9.72	-0.011	3.93	101.
16930.000	9.72	-0.011	3.93	102.
16935.000	9.72	-0.011	3.93	102.
16940.000	9.72	-0.011	3.94	102.
16945.000	9.72	-0.010	3.94	102.

TABLE 9-XVIII

MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE,
 ANGLE OF ATTACK, AND NORMAL FORCE ANGLE
 - PREIGNITION SEQUENCE INITIATION TO J-2
 CUTOFF (FPR NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
16950.000	9.73	-0.010	3.94	102.
16955.000	9.73	-0.010	3.94	102.
16960.000	9.73	-0.010	3.95	103.
16965.000	9.73	-0.009	3.95	103.
16970.000	9.73	-0.009	3.95	103.
16975.000	9.73	-0.009	3.95	103.
16980.000	9.73	-0.008	3.95	103.
16985.000	9.73	-0.008	3.96	103.
16990.000	9.73	-0.008	3.96	104.
16995.000	9.73	-0.008	3.96	104.
17000.000	9.73	-0.007	3.96	104.
17005.000	9.74	-0.009	3.97	104.
17010.000	9.74	-0.009	3.97	104.
17010.000	9.74	-0.009	3.97	104.
17010.000	9.74	-0.009	3.97	104.
17012.600	9.77	-0.018	3.82	105.
17015.000	9.79	-0.025	3.62	106.
17016.000	9.80	-0.028	3.55	106.
17020.000	9.84	-0.032	2.02	-17.
17025.000	9.90	-0.010	2.25	-64.
17030.000	9.95	0.014	2.25	-72.
17035.000	10.00	0.043	2.31	-82.
17040.000	10.06	0.076	2.41	-91.
17045.000	10.11	0.113	2.59	-99.
17050.000	10.16	0.155	2.86	-106.
17055.000	10.22	0.202	3.17	-112.
17060.000	10.27	0.253	3.49	-117.
17065.000	10.33	0.310	3.84	-121.
17070.000	10.38	0.370	4.19	-124.
17075.000	10.43	0.436	4.55	-127.
17080.000	10.48	0.506	4.92	-129.
17085.000	10.54	0.582	5.29	-131.
17090.000	10.59	0.662	5.66	-133.
17095.000	10.64	0.746	6.03	-134.
17100.000	10.69	0.836	6.40	-135.
17105.000	10.74	0.930	6.77	-137.
17110.000	10.79	1.030	7.14	-138.
17115.000	10.83	1.134	7.50	-139.
17120.000	10.88	1.242	7.87	-140.
17120.910	10.89	1.263	7.93	-140.

TABLE 9-XVIII

MACH NUMBER, RELATIVE FLIGHT-PATH ANGLE,
ANGLE OF ATTACK, AND NORMAL FORCE ANGLE
- PREIGNITION SEQUENCE INITIATION TO J-2
CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	MACH NUMBER	RELATIVE FLIGHT- PATH ANGLE (DEGREES)	ANGLE OF ATTACK (DEGREES)	NORMAL FORCE ANGLE (DEGREES)
17324.017	11.49	8.603	17.43	180.

TABLE 9-XIX

DYNAMIC PRESSURE, DYNAMIC PRESSURE TIMES ALPHA, AND AERODYNAMIC HEATING INDICATOR - PREIGNITION SEQUENCE INITIATION TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)

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)
16550.000	0.0	0.	46729021.
16555.000	0.0	0.	46729021.
16560.000	0.0	0.	46729021.
16565.000	0.0	0.	46729021.
16570.000	0.0	0.	46729021.
16575.000	0.0	0.	46729021.
16580.000	0.0	0.	46729021.
16585.000	0.0	0.	46729021.
16590.000	0.0	0.	46729021.
16595.000	0.0	0.	46729021.
16600.000	0.0	0.	46729021.
16605.000	0.0	0.	46729021.
16610.000	0.0	0.	46729021.
16615.000	0.0	0.	46729021.
16620.000	0.0	0.	46729021.
16625.000	0.0	0.	46729021.
16630.000	0.0	0.	46729021.
16635.000	0.0	0.	46729021.
16640.000	0.0	0.	46729021.
16645.000	0.0	0.	46729021.
16650.000	0.0	0.	46729021.
16655.000	0.0	0.	46729021.
16660.000	0.0	0.	46729021.
16665.000	0.0	0.	46729021.
16670.000	0.0	0.	46729021.
16675.000	0.0	0.	46729021.
16680.000	0.0	0.	46729021.
16685.000	0.0	0.	46729021.
16690.000	0.0	0.	46729021.
16695.000	0.0	0.	46729021.
16700.000	0.0	0.	46729021.
16705.000	0.0	0.	46729021.
16710.000	0.0	0.	46729021.
16715.000	0.0	0.	46729021.
16720.000	0.0	0.	46729021.
16725.000	0.0	0.	46729021.
16730.000	0.0	0.	46729021.
16735.000	0.0	0.	46729021.
16740.000	0.0	0.	46729021.
16745.000	0.0	0.	46729021.

TABLE 9-XIX

DYNAMIC PRESSURE, DYNAMIC PRESSURE TIMES ALPHA, AND AERODYNAMIC HEATING INDICATOR - PREIGNITION SEQUENCE INITIATION TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
(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)
16750.000	0.0	0.	46729021.
16755.000	0.0	0.	46729021.
16760.000	0.0	0.	46729021.
16765.000	0.0	0.	46729021.
16770.000	0.0	0.	46729021.
16775.000	0.0	0.	46729021.
16780.000	0.0	0.	46729021.
16785.000	0.0	0.	46729021.
16790.000	0.0	0.	46729021.
16795.000	0.0	0.	46729021.
16800.000	0.0	0.	46729021.
16805.000	0.0	0.	46729021.
16810.000	0.0	0.	46729021.
16815.000	0.0	0.	46729021.
16820.000	0.0	0.	46729021.
16825.000	0.0	0.	46729021.
16830.000	0.0	0.	46729021.
16835.000	0.0	0.	46729021.
16840.000	0.0	0.	46729021.
16845.000	0.0	0.	46729021.
16850.000	0.0	0.	46729021.
16855.000	0.0	0.	46729021.
16860.000	0.0	0.	46729021.
16865.000	0.0	0.	46729021.
16870.000	0.0	0.	46729021.
16875.000	0.0	0.	46729021.
16880.000	0.0	0.	46729021.
16885.000	0.0	0.	46729021.
16890.000	0.0	0.	46729021.
16895.000	0.0	0.	46729021.
16900.000	0.0	0.	46729021.
16905.000	0.0	0.	46729021.
16910.000	0.0	0.	46729021.
16915.000	0.0	0.	46729021.
16920.000	0.0	0.	46729021.
16925.000	0.0	0.	46729021.
16930.000	0.0	0.	46729021.
16935.000	0.0	0.	46729021.
16940.000	0.0	0.	46729021.
16945.000	0.0	0.	46729021.

TABLE 9-XIX

DYNAMIC PRESSURE, DYNAMIC PRESSURE TIMES
 ALPHA, AND AERODYNAMIC HEATING INDICATOR
 - PREIGNITION SEQUENCE INITIATION TO J-2
 CUTOFF (FPR NOMINAL TRAJECTORY)
 (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)
16950.000	0.0	0.	46729021.
16955.000	0.0	0.	46729021.
16960.000	0.0	0.	46729021.
16965.000	0.0	0.	46729021.
16970.000	0.0	0.	46729021.
16975.000	0.0	0.	46729021.
16980.000	0.0	0.	46729021.
16985.000	0.0	0.	46729021.
16990.000	0.0	0.	46729021.
16995.000	0.0	0.	46729021.
17000.000	0.0	0.	46729021.
17005.000	0.0	0.	46729021.
17010.000	0.0	0.	46729021.
17010.000	0.0	0.	46729021.
17010.000	0.0	0.	46729021.
17012.600	0.0	0.	46729021.
17015.000	0.0	0.	46729021.
17016.000	0.0	0.	46729021.
17020.000	0.0	0.	46729021.
17025.000	0.0	0.	46729021.
17030.000	0.0	0.	46729021.
17035.000	0.0	0.	46729021.
17040.000	0.0	0.	46729021.
17045.000	0.0	0.	46729021.
17050.000	0.0	0.	46729021.
17055.000	0.0	0.	46729021.
17060.000	0.0	0.	46729021.
17065.000	0.0	0.	46729021.
17070.000	0.0	0.	46729021.
17075.000	0.0	0.	46729021.
17080.000	0.0	0.	46729021.
17085.000	0.0	0.	46729021.
17090.000	0.0	0.	46729021.
17095.000	0.0	0.	46729021.
17100.000	0.0	0.	46729021.
17105.000	0.0	0.	46729021.
17110.000	0.0	0.	46729021.
17115.000	0.0	0.	46729021.
17120.000	0.0	0.	46729021.
17120.910	0.0	0.	46729021.

TABLE 9-XIX

DYNAMIC PRESSURE, DYNAMIC PRESSURE TIMES ALPHA, AND AERODYNAMIC HEATING INDICATOR - PREIGNITION SEQUENCE INITIATION TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY) (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)
17125.000	0.0	0.	46729021.
17130.000	0.0	0.	46729021.
17135.000	0.0	0.	46729021.
17140.000	0.0	0.	46729021.
17145.000	0.0	0.	46729021.
17150.000	0.0	0.	46729021.
17155.000	0.0	0.	46729021.
17160.000	0.0	0.	46729021.
17165.000	0.0	0.	46729021.
17170.000	0.0	0.	46729021.
17175.000	0.0	0.	46729021.
17180.000	0.0	0.	46729021.
17185.000	0.0	0.	46729021.
17190.000	0.0	0.	46729021.
17195.000	0.0	0.	46729021.
17200.000	0.0	0.	46729021.
17205.000	0.0	0.	46729021.
17210.000	0.0	0.	46729021.
17215.000	0.0	0.	46729021.
17220.000	0.0	0.	46729021.
17225.000	0.0	0.	46729021.
17230.000	0.0	0.	46729021.
17235.000	0.0	0.	46729021.
17240.000	0.0	0.	46729021.
17245.000	0.0	0.	46729021.
17250.000	0.0	0.	46729021.
17255.000	0.0	0.	46729021.
17260.000	0.0	0.	46729021.
17265.000	0.0	0.	46729021.
17270.000	0.0	0.	46729021.
17275.000	0.0	0.	46729021.
17280.000	0.0	0.	46729021.
17285.000	0.0	0.	46729021.
17290.000	0.0	0.	46729021.
17295.000	0.0	0.	46729021.
17300.000	0.0	0.	46729021.
17305.000	0.0	0.	46729021.
17310.000	0.0	0.	46729021.
17315.000	0.0	0.	46729021.
17320.000	0.0	0.	46729021.

TABLE 9-XIX

DYNAMIC PRESSURE, DYNAMIC PRESSURE TIMES
ALPHA, AND AERODYNAMIC HEATING INDICATOR
- PREIGNITION SEQUENCE INITIATION TO J-2
CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM
LIFTOFF
(SEC)
17324.017

DYNAMIC
PRESSURE
(LBS/(FT)SQ)
0.0

DYNAMIC PRESSURE
TIMES ALPHA
(LBS*DEG/(FT)SQ)
0.

AERODYNAMIC
HEATING INDICATOR
(FT*LBS/RAD*(FT)SQ)
46729021.

TABLE 9-XX

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - PREIGNITION SEQUENCE
INITIATION TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
16550.000	0.	0.	6580629.	32.402
16555.000	0.	0.	6580611.	32.422
16560.000	0.	0.	6580592.	32.440
16565.000	0.	0.	6580574.	32.456
16570.000	0.	0.	6580555.	32.472
16575.000	0.	0.	6580537.	32.486
16580.000	0.	0.	6580519.	32.499
16585.000	0.	0.	6580501.	32.510
16590.000	0.	0.	6580483.	32.521
16595.000	0.	0.	6580466.	32.530
16600.000	0.	0.	6580448.	32.538
16605.000	0.	0.	6580431.	32.544
16610.000	0.	0.	6580413.	32.549
16615.000	0.	0.	6580396.	32.553
16620.000	0.	0.	6580379.	32.556
16625.000	0.	0.	6580363.	32.557
16630.000	0.	0.	6580346.	32.557
16635.000	0.	0.	6580329.	32.556
16640.000	0.	0.	6580313.	32.553
16645.000	0.	0.	6580297.	32.550
16650.000	0.	0.	6580280.	32.545
16655.000	0.	0.	6580265.	32.538
16660.000	0.	0.	6580249.	32.531
16665.000	0.	0.	6580233.	32.522
16670.000	0.	0.	6580217.	32.512
16675.000	0.	0.	6580202.	32.500
16680.000	0.	0.	6580187.	32.487
16685.000	0.	0.	6580172.	32.473
16690.000	0.	0.	6580157.	32.458
16695.000	0.	0.	6580142.	32.441
16700.000	0.	0.	6580127.	32.424
16705.000	0.	0.	6580113.	32.404
16710.000	0.	0.	6580098.	32.384
16715.000	0.	0.	6580084.	32.362
16720.000	0.	0.	6580070.	32.339
16725.000	0.	0.	6580056.	32.315
16730.000	0.	0.	6580042.	32.290
16735.000	0.	0.	6580029.	32.263
16740.000	0.	0.	6580015.	32.235
16745.000	0.	0.	6580002.	32.206

TABLE 9-XX

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - PREIGNITION SEQUENCE
INITIATION TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
16950.000	0.	0.	6579594.	29.960
16955.000	0.	0.	6579588.	29.881
16960.000	0.	0.	6579581.	29.801
16965.000	0.	0.	6579575.	29.720
16970.000	0.	0.	6579569.	29.637
16975.000	0.	0.	6579563.	29.554
16980.000	0.	0.	6579558.	29.469
16985.000	0.	0.	6579553.	29.384
16990.000	0.	0.	6579547.	29.297
16995.000	0.	0.	6579542.	29.209
17000.000	0.	0.	6579538.	29.121
17005.000	0.	0.	6579532.	29.031
17010.000	0.	0.	6579527.	28.940
17010.000	0.	0.	6579527.	28.940
17010.000	0.	0.	6579527.	28.940
17012.600	0.	0.	6579522.	28.892
17015.000	0.	0.	6579515.	28.848
17016.000	0.	0.	6579512.	28.829
17020.000	0.	0.	6579495.	28.754
17025.000	0.	0.	6579481.	28.659
17030.000	0.	0.	6579482.	28.562
17035.000	0.	0.	6579501.	28.464
17040.000	0.	0.	6579540.	28.364
17045.000	0.	0.	6579603.	28.262
17050.000	0.	0.	6579693.	28.159
17055.000	0.	0.	6579813.	28.054
17060.000	0.	0.	6579967.	27.948
17065.000	0.	0.	6580159.	27.840
17070.000	0.	0.	6580392.	27.730
17075.000	0.	0.	6580670.	27.619
17080.000	0.	0.	6580996.	27.506
17085.000	0.	0.	6581375.	27.392
17090.000	0.	0.	6581811.	27.276
17095.000	0.	0.	6582307.	27.158
17100.000	0.	0.	6582868.	27.039
17105.000	0.	0.	6583497.	26.918
17110.000	0.	0.	6584200.	26.795
17115.000	0.	0.	6584979.	26.671
17120.000	0.	0.	6585841.	26.545
17120.910	0.	0.	6586007.	26.522

TABLE 9-XX

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - PREIGNITION SEQUENCE
INITIATION TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
16750.000	0.	0.	6579989.	32.175
16755.000	0.	0.	6579976.	32.143
16760.000	0.	0.	6579963.	32.110
16765.000	0.	0.	6579950.	32.076
16770.000	0.	0.	6579938.	32.041
16775.000	0.	0.	6579925.	32.004
16780.000	0.	0.	6579913.	31.966
16785.000	0.	0.	6579901.	31.927
16790.000	0.	0.	6579889.	31.886
16795.000	0.	0.	6579877.	31.844
16800.000	0.	0.	6579866.	31.802
16805.000	0.	0.	6579854.	31.757
16810.000	0.	0.	6579843.	31.712
16815.000	0.	0.	6579832.	31.665
16820.000	0.	0.	6579821.	31.618
16825.000	0.	0.	6579810.	31.569
16830.000	0.	0.	6579800.	31.518
16835.000	0.	0.	6579789.	31.467
16840.000	0.	0.	6579779.	31.414
16845.000	0.	0.	6579769.	31.360
16850.000	0.	0.	6579759.	31.305
16855.000	0.	0.	6579749.	31.249
16860.000	0.	0.	6579739.	31.192
16865.000	0.	0.	6579730.	31.133
16870.000	0.	0.	6579720.	31.073
16875.000	0.	0.	6579711.	31.012
16880.000	0.	0.	6579702.	30.950
16885.000	0.	0.	6579693.	30.887
16890.000	0.	0.	6579685.	30.822
16895.000	0.	0.	6579676.	30.757
16900.000	0.	0.	6579668.	30.690
16905.000	0.	0.	6579660.	30.622
16910.000	0.	0.	6579652.	30.553
16915.000	0.	0.	6579644.	30.483
16920.000	0.	0.	6579636.	30.412
16925.000	0.	0.	6579629.	30.339
16930.000	0.	0.	6579622.	30.266
16935.000	0.	0.	6579614.	30.191
16940.000	0.	0.	6579607.	30.115
16945.000	0.	0.	6579601.	30.038

TABLE 9-XX

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - PREIGNITION SEQUENCE
INITIATION TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	NORMAL FORCE (POUNDS)	AXIAL FORCE (POUNDS)	GEOCENTRIC RADIUS (METERS)	GEOCENTRIC LATITUDE (DEGREES)
17125.000	0.	0.	6586787.	26.418
17130.000	0.	0.	6587820.	26.289
17135.000	0.	0.	6588943.	26.159
17140.000	0.	0.	6590161.	26.027
17145.000	0.	0.	6591476.	25.893
17150.000	0.	0.	6592894.	25.758
17155.000	0.	0.	6594418.	25.621
17160.000	0.	0.	6596052.	25.483
17165.000	0.	0.	6597801.	25.343
17170.000	0.	0.	6599669.	25.202
17175.000	0.	0.	6601659.	25.059
17180.000	0.	0.	6603776.	24.915
17185.000	0.	0.	6606024.	24.769
17190.000	0.	0.	6608408.	24.622
17195.000	0.	0.	6610932.	24.473
17200.000	0.	0.	6613601.	24.323
17205.000	0.	0.	6616419.	24.172
17210.000	0.	0.	6619390.	24.018
17215.000	0.	0.	6622518.	23.864
17220.000	0.	0.	6625809.	23.708
17225.000	0.	0.	6629267.	23.551
17230.000	0.	0.	6632897.	23.392
17235.000	0.	0.	6636702.	23.232
17240.000	0.	0.	6640688.	23.071
17245.000	0.	0.	6644859.	22.908
17250.000	0.	0.	6649220.	22.744
17255.000	0.	0.	6653775.	22.578
17260.000	0.	0.	6658529.	22.412
17265.000	0.	0.	6663486.	22.244
17270.000	0.	0.	6668651.	22.074
17275.000	0.	0.	6674028.	21.904
17280.000	0.	0.	6679622.	21.732
17285.000	0.	0.	6685436.	21.559
17290.000	0.	0.	6691475.	21.385
17295.000	0.	0.	6697743.	21.210
17300.000	0.	0.	6704243.	21.034
17305.000	0.	0.	6710980.	20.856
17310.000	0.	0.	6717955.	20.677
17315.000	0.	0.	6725170.	20.498
17320.000	0.	0.	6732626.	20.317

D5-15481-1

TABLE 9-XX

NORMAL FORCE, AXIAL FORCE, GEOCENTRIC RADIUS,
AND GEOCENTRIC LATITUDE - PREIGNITION SEQUENCE
INITIATION TO J-2 CUTOFF (FPR NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM
LIFTOFF
(SEC)
17324.017

NORMAL
FORCE
(POUNDS)
0.

AXIAL
FORCE
(POUNDS)
0.

GEOCENTRIC
RADIUS
(METERS)
6738796.

GEOCENTRIC
LATITUDE
(DEGREES)
20.171

TABLE 9-XXI

VEHICLE POSITION COORDINATES - PREIGNITION
 SEQUENCE INITIATION TO J-2 CUTOFF (FPR
 NOMINAL TRAJECTORY)

POSITION COORDINATES IN
 APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	X (METERS)	Y (METERS)	Z (METERS)
16550.000	6089429.	78903.	2493453.
16555.000	6074548.	79829.	2529413.
16560.000	6059454.	80753.	2565285.
16565.000	6044148.	81675.	2601067.
16570.000	6028631.	82593.	2636758.
16575.000	6012903.	83510.	2672357.
16580.000	5996965.	84423.	2707862.
16585.000	5980817.	85334.	2743273.
16590.000	5964459.	86243.	2778588.
16595.000	5947893.	87148.	2813805.
16600.000	5931119.	88051.	2848924.
16605.000	5914138.	88951.	2883944.
16610.000	5896950.	89849.	2918862.
16615.000	5879555.	90743.	2953678.
16620.000	5861955.	91635.	2988392.
16625.000	5844149.	92523.	3023000.
16630.000	5826140.	93409.	3057503.
16635.000	5807926.	94292.	3091899.
16640.000	5789509.	95172.	3126187.
16645.000	5770890.	96049.	3160365.
16650.000	5752069.	96923.	3194433.
16655.000	5733047.	97794.	3228389.
16660.000	5713824.	98661.	3262232.
16665.000	5694401.	99526.	3295961.
16670.000	5674779.	100387.	3329575.
16675.000	5654958.	101246.	3363072.
16680.000	5634940.	102100.	3396452.
16685.000	5614724.	102952.	3429713.
16690.000	5594312.	103801.	3462854.
16695.000	5573705.	104646.	3495874.
16700.000	5552902.	105488.	3528771.
16705.000	5531905.	106326.	3561545.
16710.000	5510714.	107161.	3594195.
16715.000	5489331.	107993.	3626719.
16720.000	5467756.	108821.	3659116.
16725.000	5445989.	109645.	3691385.
16730.000	5424032.	110466.	3723525.
16735.000	5401884.	111284.	3755534.
16740.000	5379548.	112098.	3787412.
16745.000	5357024.	112908.	3819158.

TABLE 9-XXI

VEHICLE POSITION COORDINATES - PREIGNITION
 SEQUENCE INITIATION TO J-2 CUTOFF (FPR
 NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
16750.000	5334312.	113715.	3850770.
16755.000	5311414.	114518.	3882248.
16760.000	5288329.	115318.	3913590.
16765.000	5265060.	116113.	3944794.
16770.000	5241607.	116905.	3975861.
16775.000	5217969.	117693.	4006789.
16780.000	5194150.	118478.	4037577.
16785.000	5170148.	119258.	4068223.
16790.000	5145966.	120035.	4098727.
16795.000	5121604.	120808.	4129088.
16800.000	5097062.	121577.	4159304.
16805.000	5072342.	122342.	4189375.
16810.000	5047444.	123102.	4219299.
16815.000	5022370.	123859.	4249076.
16820.000	4997120.	124612.	4278704.
16825.000	4971695.	125361.	4308182.
16830.000	4946096.	126106.	4337510.
16835.000	4920324.	126847.	4366686.
16840.000	4894380.	127583.	4395709.
16845.000	4868264.	128316.	4424579.
16850.000	4841978.	129044.	4453293.
16855.000	4815522.	129768.	4481852.
16860.000	4788898.	130488.	4510254.
16865.000	4762107.	131204.	4538499.
16870.000	4735148.	131915.	4566584.
16875.000	4708024.	132622.	4594510.
16880.000	4680735.	133324.	4622275.
16885.000	4653282.	134023.	4649879.
16890.000	4625666.	134717.	4677319.
16895.000	4597888.	135406.	4704596.
16900.000	4569950.	136091.	4731709.
16905.000	4541851.	136772.	4758656.
16910.000	4513593.	137448.	4785437.
16915.000	4485177.	138119.	4812050.
16920.000	4456604.	138786.	4838495.
16925.000	4427875.	139449.	4864771.
16930.000	4398990.	140107.	4890877.
16935.000	4369952.	140760.	4916811.
16940.000	4340761.	141409.	4942574.
16945.000	4311417.	142053.	4968163.

TABLE 9-XXI

VEHICLE POSITION COORDINATES - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (FPR
NOMINAL TRAJECTORY)
(CONTINUED)

POSITION COORDINATES IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	X (METERS)	Y (METERS)	Z (METERS)
16950.000	4281923.	142692.	4993579.
16955.000	4252278.	143327.	5018821.
16960.000	4222484.	143957.	5043887.
16965.000	4192543.	144582.	5068776.
16970.000	4162455.	145203.	5093488.
16975.000	4132220.	145818.	5118022.
16980.000	4101841.	146429.	5142377.
16985.000	4071319.	147035.	5166552.
16990.000	4040653.	147637.	5190546.
16995.000	4009846.	148233.	5214359.
17000.000	3978899.	148824.	5237989.
17005.000	3947805.	149411.	5261440.
17010.000	3916561.	149993.	5284716.
17010.000	3916561.	149993.	5284716.
17010.000	3916561.	149993.	5284716.
17012.600	3900237.	150294.	5296760.
17015.000	3885098.	150571.	5307859.
17016.000	3878770.	150686.	5312477.
17020.000	3853336.	151147.	5330920.
17025.000	3821281.	151729.	5353911.
17030.000	3788934.	152316.	5376836.
17035.000	3756294.	152906.	5399695.
17040.000	3723360.	153498.	5422488.
17045.000	3690132.	154092.	5445214.
17050.000	3656608.	154685.	5467874.
17055.000	3622788.	155277.	5490468.
17060.000	3588671.	155866.	5512995.
17065.000	3554256.	156450.	5535456.
17070.000	3519542.	157028.	5557852.
17075.000	3484529.	157598.	5580182.
17080.000	3449216.	158160.	5602447.
17085.000	3413601.	158711.	5624646.
17090.000	3377684.	159249.	5646780.
17095.000	3341463.	159774.	5668850.
17100.000	3304939.	160283.	5690856.
17105.000	3268109.	160775.	5712797.
17110.000	3230973.	161248.	5734675.
17115.000	3193530.	161700.	5756490.
17120.000	3155778.	162130.	5778242.
17120.910	3148876.	162206.	5782193.

TABLE 9-XXI

VEHICLE POSITION COORDINATES - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (FPR
NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	POSITION COORDINATES IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	X (METERS)	Y (METERS)	Z (METERS)
17125.000	3117724.	162536.	5799926.
17130.000	3079383.	162921.	5821531.
17135.000	3040754.	163284.	5843058.
17140.000	3001835.	163623.	5864506.
17145.000	2962627.	163937.	5885875.
17150.000	2923128.	164224.	5907166.
17155.000	2883337.	164482.	5928378.
17160.000	2843254.	164708.	5949512.
17165.000	2802877.	164901.	5970567.
17170.000	2762206.	165058.	5991544.
17175.000	2721239.	165178.	6012443.
17180.000	2679976.	165258.	6033264.
17185.000	2638416.	165296.	6054006.
17190.000	2596556.	165290.	6074672.
17195.000	2554397.	165238.	6095259.
17200.000	2511937.	165137.	6115769.
17205.000	2469173.	164984.	6136201.
17210.000	2426106.	164779.	6156556.
17215.000	2382733.	164517.	6176833.
17220.000	2339054.	164196.	6197033.
17225.000	2295065.	163815.	6217156.
17230.000	2250766.	163370.	6237201.
17235.000	2206155.	162859.	6257170.
17240.000	2161230.	162278.	6277061.
17245.000	2115989.	161627.	6296874.
17250.000	2070430.	160900.	6316610.
17255.000	2024549.	160096.	6336268.
17260.000	1978347.	159212.	6355848.
17265.000	1931818.	158244.	6375350.
17270.000	1884962.	157191.	6394773.
17275.000	1837775.	156047.	6414116.
17280.000	1790254.	154811.	6433380.
17285.000	1742396.	153480.	6452562.
17290.000	1694198.	152049.	6471663.
17295.000	1645655.	150516.	6490680.
17300.000	1596766.	148876.	6509613.
17305.000	1547524.	147128.	6528459.
17310.000	1497926.	145267.	6547216.
17315.000	1447966.	143288.	6565880.
17320.000	1397639.	141190.	6584446.

D5-15481-1

TABLE 9-XXI

VEHICLE POSITION COORDINATES - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (FPR
NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM
LIFTOFF
(SEC)
17324.017

POSITION COORDINATES IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

X
(METERS)
1356940.

Y
(METERS)
139416.

Z
(METERS)
6599292.

TABLE 9-XXII

VEHICLE VELOCITY COMPONENTS - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (FPR
NOMINAL TRAJECTORY)

VELOCITY COMPONENTS IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

TIME FROM LIFTOFF (SEC)	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
16550.000	-2954.99	185.51	7200.81
16555.000	-2997.54	185.02	7183.24
16560.000	-3039.98	184.52	7165.42
16565.000	-3082.31	184.01	7147.35
16570.000	-3124.54	183.50	7129.03
16575.000	-3166.66	182.98	7110.46
16580.000	-3208.66	182.46	7091.64
16585.000	-3250.56	181.93	7072.57
16590.000	-3292.34	181.39	7053.25
16595.000	-3334.01	180.85	7033.69
16600.000	-3375.56	180.30	7013.89
16605.000	-3417.00	179.75	6993.83
16610.000	-3458.31	179.18	6973.54
16615.000	-3499.51	178.62	6952.99
16620.000	-3540.58	178.04	6932.21
16625.000	-3581.53	177.46	6911.18
16630.000	-3622.35	176.88	6889.91
16635.000	-3663.05	176.28	6868.40
16640.000	-3703.62	175.68	6846.65
16645.000	-3744.06	175.08	6824.66
16650.000	-3784.37	174.47	6802.44
16655.000	-3824.55	173.85	6779.97
16660.000	-3864.60	173.23	6757.27
16665.000	-3904.51	172.60	6734.33
16670.000	-3944.28	171.96	6711.15
16675.000	-3983.92	171.32	6687.74
16680.000	-4023.42	170.67	6664.10
16685.000	-4062.78	170.02	6640.22
16690.000	-4101.99	169.36	6616.11
16695.000	-4141.07	168.69	6591.77
16700.000	-4179.99	168.02	6567.20
16705.000	-4218.78	167.34	6542.40
16710.000	-4257.41	166.66	6517.37
16715.000	-4295.90	165.97	6492.12
16720.000	-4334.24	165.28	6466.63
16725.000	-4372.43	164.58	6440.92
16730.000	-4410.46	163.87	6414.99
16735.000	-4448.34	163.16	6388.83
16740.000	-4486.07	162.44	6362.44
16745.000	-4523.64	161.71	6335.84

TABLE 9-XXII

VEHICLE VELOCITY COMPONENTS - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (FPR
NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
16750.000	-4561.05	160.99	6309.01
16755.000	-4598.30	160.25	6281.96
16760.000	-4635.39	159.51	6254.69
16765.000	-4672.32	158.76	6227.20
16770.000	-4709.09	158.01	6199.50
16775.000	-4745.70	157.25	6171.58
16780.000	-4782.13	156.49	6143.44
16785.000	-4818.41	155.72	6115.08
16790.000	-4854.51	154.95	6086.52
16795.000	-4890.44	154.17	6057.74
16800.000	-4926.21	153.38	6028.75
16805.000	-4961.80	152.59	5999.54
16810.000	-4997.22	151.79	5970.13
16815.000	-5032.46	150.99	5940.51
16820.000	-5067.53	150.18	5910.68
16825.000	-5102.42	149.37	5880.64
16830.000	-5137.14	148.55	5850.40
16835.000	-5171.67	147.73	5819.95
16840.000	-5206.03	146.90	5789.30
16845.000	-5240.20	146.07	5758.45
16850.000	-5274.19	145.23	5727.39
16855.000	-5307.99	144.39	5696.13
16860.000	-5341.62	143.54	5664.68
16865.000	-5375.05	142.68	5633.02
16870.000	-5408.30	141.82	5601.17
16875.000	-5441.36	140.96	5569.13
16880.000	-5474.22	140.09	5536.88
16885.000	-5506.90	139.22	5504.45
16890.000	-5539.39	138.34	5471.82
16895.000	-5571.68	137.45	5439.00
16900.000	-5603.79	136.56	5406.00
16905.000	-5635.70	135.67	5372.81
16910.000	-5667.42	134.77	5339.43
16915.000	-5698.94	133.87	5305.86
16920.000	-5730.26	132.96	5272.11
16925.000	-5761.38	132.05	5238.17
16930.000	-5792.30	131.13	5204.05
16935.000	-5823.02	130.21	5169.75
16940.000	-5853.53	129.28	5135.27
16945.000	-5883.84	128.35	5100.60

TABLE 9-XXII

VEHICLE VELOCITY COMPONENTS - PREIGNITION
 SEQUENCE INITIATION TO J-2 CUTOFF (FPR
 NOMINAL TRAJECTORY)
 (CONTINUED)

TIME FROM LIFTOFF (SEC)	VELOCITY COMPONENTS IN APOLLO STANDARD COORDINATE SYSTEM NO. 13.		
	XDOT (M/SEC)	YDOT (M/SEC)	ZDOT (M/SEC)
16950.000	-5913.95		
16955.000	-5943.85	127.41	5065.76
16960.000	-5973.54	126.47	5030.74
16965.000	-6003.02	125.52	4995.54
16970.000	-6032.29	124.57	4960.17
16975.000	-6061.35	123.62	4924.62
16980.000	-6090.20	122.66	4888.90
16985.000	-6118.84	121.69	4853.01
16990.000	-6147.26	120.72	4816.95
16995.000	-6175.47	119.75	4780.72
17000.000	-6203.55	118.77	4744.33
17005.000	-6233.85	117.79	4707.82
17010.000	-6263.94	116.85	4672.74
17010.000	-6263.94	115.90	4637.48
17010.000	-6263.94	115.90	4637.48
17012.600	-6293.32	115.90	4637.48
17015.000	-6322.20	115.62	4627.89
17016.000	-6334.24	115.39	4620.20
17020.000	-6382.05	115.30	4616.99
17025.000	-6440.17	115.62	4604.70
17030.000	-6498.71	116.91	4591.72
17035.000	-6557.35	117.73	4578.42
17040.000	-6616.18	118.31	4565.17
17045.000	-6675.19	118.64	4551.91
17050.000	-6734.35	118.74	4538.61
17055.000	-6793.68	118.56	4525.34
17060.000	-6853.16	118.08	4512.10
17065.000	-6912.82	117.32	4498.88
17070.000	-6972.64	116.27	4485.69
17075.000	-7032.64	114.91	4472.55
17080.000	-7092.81	113.26	4459.44
17085.000	-7153.17	111.28	4446.38
17090.000	-7213.72	109.00	4433.37
17095.000	-7274.46	106.39	4420.42
17100.000	-7335.40	103.45	4407.53
17105.000	-7396.54	100.17	4394.70
17110.000	-7457.90	96.55	4381.94
17115.000	-7519.47	92.58	4369.25
17120.000	-7581.27	88.26	4356.65
17120.910	-7592.54	83.57	4344.13
		82.68	4341.86

D5-15481-1

TABLE 9-XXII

VEHICLE VELOCITY COMPONENTS - PREIGNITION
SEQUENCE INITIATION TO J-2 CUTOFF (FPR
NOMINAL TRAJECTORY)
(CONTINUED)

TIME FROM
LIFTOFF
(SEC)
17324.017

VELOCITY COMPONENTS IN
APOLLO STANDARD COORDINATE SYSTEM NO. 13.

XDOT
(M/SEC)
-10162.11

YDOT
(M/SEC)
-451.60

ZDOT
(M/SEC)
3688.29

227